
Enterprise PeopleTools 8.50 PeopleBook: Integration Broker

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Contents

Preface

PeopleSoft Integration Broker Preface	xxi
PeopleSoft Integration Broker	xxi

Chapter 1

Getting Started with PeopleSoft Integration Broker	1
PeopleSoft Integration Broker Overview	1
Implementing PeopleSoft Integration Broker	1
Other Sources of Information	4

Chapter 2

Understanding PeopleSoft Integration Broker	5
Introduction to PeopleSoft Integration Broker	5
Web Services	6
Integration Gateway	6
Integration Engine	6
Integration Gateway Architecture	7
Architecture Elements	7
Connectors	8
Gateway Manager	9
Gateway Services	9
Integration Engine Architecture	10
Service Operations	11
Service Operation Types	12
Operation Types	12
Inbound and Outbound Request Flows	14
Inbound Request Flow	14
Outbound Request Flow	17

Chapter 3

Understanding Messaging	21
Messaging Types	21
Asynchronous Messaging	21
Brokers, Contractors and Queues	21
Messaging System Server Processes	22
Dispatchers and Handlers	23
Asynchronous Service Operation Publication	24
Asynchronous Service Operation Subscription	28
Synchronous Messaging	31
Synchronous Service Operation Publication	31
Synchronous Service Operation Subscription	33

Chapter 4

Understanding PeopleSoft Integration Broker Metadata	35
PeopleSoft Integration Broker Metadata	35
Order of Precedence for Creating Integration Metadata	36

Chapter 5

Understanding Supported Message Structures	39
Integration Broker Message Structures	39
Internal Message Format for Request Messages	39
Internal Message Format for Response Messages	49
Local Compression	53
Accessing IBInfo Elements Using PeopleCode	54
PeopleSoft Rowset-Based Message Format	55
Understanding the PeopleSoft Rowset-Based Message Format	56
Rowset-Based Message Template	56
FieldTypes Section	57
MsgData Section	57
PSCAMA	59
Identifying Changes to Field-Level Attributes	61
PeopleSoft Timestamp Format	62
CDATA and Special Characters	62
Schema Restrictions	62
Rowset-Based Message Example	63
Nonrowset-Based Message Structures	65

XML Messages	65
SOAP-Compliant Messages	66
Non-XML Files	67
Using Nonrowset-Based Messages in Service Operations Exposed as WSDL	68
Message Part Structures	68
Understanding Message Part Structures	68
Rowset-Based Message Parts	69
Nonrowset-Based Message Parts	72
Message Container Structures	72
Example 1: XML Schema of a Container Message with Rowset-Based Message Parts	72
Example 2: XML Schema of a Container Message with Nonrowset-Based Message Parts	73

Chapter 6

Managing Messages	75
Understanding Managing Messages	75
Message Definitions	75
Message Types	75
Naming Conventions for Message Metadata	76
Message Record Structure	77
Underlying Record Definitions	77
Fields Defined as Uppercase	77
Message Aliases and Message Versions	77
Restrictions for Modifying Messages	77
Adding Message Definitions	78
Understanding Adding Message Definitions	78
Adding a Message Definition	78
Managing Rowset-Based Messages	81
Understanding Managing Rowset-Based Messages	82
Viewing Rowset-Based Message Structures	82
Inserting Root Records	85
Inserting Child and Peer Records	86
Specifying Record Aliases	88
Deleting Records	88
Excluding Fields from Messages	89
Specifying Field Name Aliases	89
Managing XML Message Schemas for Rowset-Based Messages	90
Enforcing Message Record and Field Aliases in Generated WSDL	92
Managing Nonrowset-Based Messages	93
Understanding Managing Nonrowset-Based Messages	93
Adding XML Message Schemas to Nonrowset-Based Messages	93
Editing Nonrowset-Based XML Schemas	94
Deleting Nonrowset-Based XML Message Schemas	94

Managing Message Parts	96
Understanding Message Parts	96
Creating Part Messages	97
Distinguishing Blank from Zero in Rowset-Based Part Messages	97
Reusing Rowset-Based Message Parts	97
Understanding Reusing Rowset-Based Message Parts	97
Reusing Rowset-Based Message Parts by Reference	98
Managing Container Messages	102
Understanding Managing Container Messages	102
Understanding Including Level 0 Rows for Message Parts in Container Messages	103
Adding Message Parts to Container Messages	105
Adding and Getting Container Messages Attributes	108
Generating XML Message Schemas for Container Messages	112
Viewing Service Operations that Reference Messages	113
Resolving Inconsistencies in Exported WSDL	113
Understanding Using Project Copy and Exported WSDL	114
Viewing Services Operations with Exported WSDL Inconsistencies	114
Clearing Exported WSDL Status Flags	116
Renaming and Deleting Message Definitions	117
Renaming Message Definitions	118
Deleting Message Definitions	119
Deleting Messages During Upgrade	119

Chapter 7

Sending and Receiving Messages	121
Understanding Sending and Receiving Messages	121
Prerequisites for Sending and Receiving Messages	121
Messaging Process Flows	122
Understanding Integration PeopleCode	123
Sending and Receiving PeopleCode	123
Application Classes	125
Routing Methods	125
Messaging Methods	129
Messaging PeopleCode	136
Generating and Sending Messages	137
Understanding Outbound Messaging	137
Handling Outbound Asynchronous Message Transmission	138
Handling Outbound Synchronous Transactions	140
Reading Exceptions for Outbound Synchronous Integrations	142
Overriding Synchronous Timeout Intervals at Runtime	143
Handling Cookies	144
Setting and Overriding Target Connector Properties at Runtime	144

Receiving and Processing Messages	148
Handling Inbound Asynchronous Transactions	149
Handling Inbound Synchronous Transactions	164
Simulating Receiving Messages from External Nodes	167
Processing Inbound Errors	168
Validating Data	168
Using the Exit Built-in Function	169
Using Message Object Functionality With Nonrowset-Based Messages	171
Using the SetXMLDoc Method	171
Using the GetXMLDoc Method	171
Generating Test Messages	172
Working With Message Segments	172
Understanding Message Segments	172
Understanding PeopleCode used to Work with Message Segments	172
Configuring Nodes to Handle Segmented Messages	174
Creating Message Segments	174
Deleting Message Segments	177
Sending and Receiving Segmented Messages between PeopleSoft Systems	178
Sending and Receiving Segmented Messages to/from Third-Party Systems	179
Accessing Segments in Messages	181
Viewing Message Segment Data	182
Using Restartable Processing for Publishing Large Messages in Batch	182

Chapter 8

Building Message Schemas	185
Understanding the Message Schema Builder	185
Message Schemas	185
Building, Importing, Modifying and Deleting Message Schemas	186
Selecting and Viewing Data in the Message Schema Builder	186
Selecting Data in the Message Schema Builder	186
Viewing Message Schema Details	188
Viewing XML Message Schema	190
Building Message Schemas for Rowset-Based Messages	190
Building a Message Schema for a Rowset-Based Message	191
Importing Message Schemas for Nonrowset-Based Messages	191
Importing a Message Schema for a Nonrowset-Based Message	191
Modifying Message Schemas	192
Modifying a Message Schema	192
Deleting Message Schemas	193
Understanding Deleting Message Schemas	193
Using the Message Schema Builder Page to Delete Message Schemas	193

Chapter 9

Managing Services	195
Understanding Managing Services	195
Common Elements Used in This Chapter	195
Accessing and Viewing Service Definitions	197
Accessing Service Definitions	197
Viewing WSDL Documents Generated for Services	198
Viewing Service Operation Information	199
Viewing Messages Defined for Service Operations	199
Adding and Configuring Service Definitions	200
Adding Service Operations to Service Definitions	202
Understanding Adding Service Operations to Service Definitions	202
Adding Existing Service Operations to Services	202
Adding and Configuring New Service Operations for Services	203
Restricting and Enabling Write Access to Service Definitions	203
Understanding Restricting Write Access to Service Definitions	204
Restricting Write Access to Service Definitions	204
Enabling Write Access to Service Definitions	205
Renaming and Deleting Service Definitions	206
Renaming Service Definitions	206
Deleting Service Definitions	207
Activating and Deactivating Services in Bulk	207

Chapter 10

Managing Service Operations	209
Understanding Managing Service Operations	209
Service Operations	210
Service Operation Types	210
Naming Conventions for Service Operation Metadata	210
Service Operation Aliases	210
Service Operation Versions	211
Monitoring Service Operations	211
Accessing and Viewing Service Operation Definitions	211
Accessing Service Operation Definitions	212
Viewing Service Operation Definitions	213
Adding Service Operation Definitions	216
Configuring Service Operation Definitions	216
Specifying General Service Operation Information	217
Defining Service Operation Version Information	217

Adding Handlers to Service Operations	220
Adding Routing Definitions	220
Activating and Inactivating Routing Definitions	221
Setting Permissions to Service Operations	221
Understanding Setting Permission to Service Operations	221
Setting Permission Access to Service Operations	221
Managing Service Operation Versions	222
Creating Service Operation Versions	222
Using Non-Default Service Operation Versions	223
Attaching Files to Service Operations	223
Understanding Attaching Files to Service Operations	223
Using the FTP Attachment Utility	223
Sending Attachment Information with Service Operations	224
Processing Attachment Information Included in Service Operations	225
Assigning Multiple Queues to Process Service Operations	226
Understanding Assigning Multiple Queues to Process Service Operations	227
Enabling Multi-Queue Service Operation Processing	227
Specifying Multiple Queues to Process Service Operations	227
Invoking Multiple Service Operations	228
Renaming and Deleting Service Operations	229
Renaming Service Operations	230
Deleting Service Operations	230

Chapter 11

Managing Service Operation Queues	233
Understanding Service Operation Queues	233
Adding Queue Definitions	233
Applying Queue Partitioning	235
Understanding Queue Partitioning	236
Selecting Partitioning Fields	236
Renaming and Deleting Queues	238
Renaming Queue Definitions	239
Deleting Queue Definitions	240
Deleting Queues During Upgrade	240

Chapter 12

Enabling Runtime Message Schema Validation	241
Understanding Message Schema Validation	241
Message Schema Validation	241
Message Schema Validation and Transformations	241

Message Schema Validation and Part Messages	242
Prerequisites for Validating Message Schemas	242
Selecting Service Operations	242
Selecting a Service Operation	242
Viewing Defined Message Schemas	244
Viewing XML Schemas Defined for Messages	244
Enabling Runtime Message Schema Validation	246
Using the Service Schema Validation Page to Enable Runtime Message Schema Validation	246
Using the Service Operations page to Enable Runtime Message Schema Validation	246

Chapter 13

Creating Component Interface-Based Services	247
Understanding Creating Component Interface-Based Services	247
Naming Conventions Integration Metadata Created	247
User-Defined Method Restrictions	248
Impact of Changing Component Interfaces	249
Prerequisites	249
Selecting Component Interfaces to Expose as Services	249
Selecting Component Interface Methods to Include as Service Operations	251
Generating Component Interface-Based Services	253
Generating Services and Service Operations from Component Interface Methods	253
Adding Message Names and Descriptions to Generated Service Operations	254
Viewing Component Interface-Based Service Definitions	255

Chapter 14

Managing Service Operation Handlers	259
Understanding Service Operation Handlers	259
Service Operation Handler Types	259
Handler Types and Messaging Types	260
Understanding Implementing Handlers	260
Adding Handlers to Service Operations	261
Understanding Adding Handler Definitions to Service Operations	262
Adding a Handler to a Service Operation	262
Specifying General Handler Details	263
Implementing Handlers Using Application Classes	264
Understanding Implementing Handlers Using Application Classes	264
Developing Application Classes for Implementing Handlers	265
Specifying Application Class Implementation Details	266
Implementing Handlers Using Application Engine Programs	267
Understanding Implementing Handlers Using Application Engine Programs	267

Specifying Application Engine Handler Implementation Details	268
Retrieving Service Operation Content from Application Engine Programs	268
Viewing Subscription Contract Status	269
Implementing Handlers Using Component Interfaces	270
Understanding Implementing Handlers Using Component Interfaces	270
Specifying Component Interface Handler Implementation Details	271
Implementing Handlers Using Bulk Load Processing	272
Understanding Implementing Handlers Using the Bulk Load Handler	272
Enabling Transactional Rollback	273
Specifying XML Record Attribute Values	275
Adding Data Structures for Nonrowset-Based Messages	276
Implementing Handlers Using Deprecated PeopleCode Handlers	277

Chapter 15

Managing Service Operation Routing Definitions	279
Understanding Routing Definitions	279
Routing Definitions	279
Routing Types	279
Defining Routing Definitions	280
Methods for Generating and Defining Routing Definitions	281
Routing Definition Naming Conventions	282
Routing Definition External Aliases	283
Service Operation Mapping	283
Graphical Routings View	283
Integration Status	284
Managing System-Generated Routing Definitions	284
Understanding Managing System-Generated Routing Definitions	284
Viewing System-Generated Routing Definition Status	284
Initiating System-Generated Routing Definitions	285
Regenerating System-Generated Routing Definitions	287
Creating Routing Definitions	287
Understanding Creating Routing Definitions	287
Adding Routing Definitions	289
Defining General Routing Information	292
Defining Routing Parameters for Requests and Responses	295
Overriding Gateway and Connector Properties	299
Defining Routing Properties	301
Using Introspection to Create Routing Definitions	302
Understanding Using Introspection to Create Routing Definitions	302
Prerequisites for Using Introspection to Create Routing Definitions	302
Selecting Service Operations for Which to Create Routing Definitions	303
Selecting Nodes to Introspect	304

Selecting Routing Definitions to Generate	305
View Introspection Results	307
Activating and Inactivating Routing Definitions	308
Understanding Activating and Inactivating Routing Definitions	308
Activating and Inactivating Routing Definitions in the Routing Component	308
Activating and Inactivating Routing Definitions in the Service Operations Component	309
Activating and Inactivating Routing Definitions in the Nodes Component	309
Viewing Routing Definitions in Graphical Format	309
Common Elements Used to View Routing Definitions in Graphical Format	310
Viewing a Routing Definition in Graphical Format	311
Viewing Integration Status and Activating Integration Metadata	313
Understanding Viewing Integration Status and Activating Integration Metadata	313
Viewing Inactive Integration Metadata	313
Activating Integration Metadata Using the Integration Status Page	313
Retrieving Routing Properties Programmatically	314
Searching for Duplicate External Routing Aliases	315
Renaming and Deleting Routing Definitions	316
Renaming Routing Definitions	317
Deleting Routing Definitions	318
Deleting Duplicate Routing Definitions	318

Chapter 16

Applying Filtering, Transformation and Translation	321
Understanding Filtering, Transformation, and Translation	321
Understanding Transform Programs	322
Transform Programs	322
Transformation Programming Languages	323
Third-Party Considerations	324
Defining Transform Programs	324
Understanding Defining Transform Programs	324
Defining a Transform Program	325
Developing Transform Programs Using PeopleSoft Application Engine	327
Understanding Developing Transform Programs Using PeopleSoft Application Engine	327
Inserting Steps and Actions into Transform Programs	328
Making Working Storage Data Available Globally	329
Preserving Record and Field Aliases	330
Tracing Transform Programs	331
Developing Transforms Using Oracle XSL Mapper	331
Understanding Oracle XSL Mapper	332
Development Considerations	332
Prerequisites	332
Installing Oracle XSL Mapper	333

Specifying the Installation Path and Classpath for Oracle XSL Mapper	333
Launching Oracle XSL Mapper	335
Accessing Oracle JDeveloper Documentation and Online Resources	336
Navigating in Oracle XSL Mapper	337
Mapping Records and Fields	340
Deleting Record and Field Maps	341
Viewing Raw XSLT Code	342
Testing XSL Maps	342
Adding and Modifying XSL Map Code	343
Invoking Transform Programs	344
Accessing Transform Message Data	345
Renaming or Deleting Transform Programs	347
Filtering Messages	347
Understanding Message Filtering	347
PeopleCode Filtering Example	348
Applying Transformations	349
Understanding Transformation	349
Using XSLT for Transformation	350
Applying Message Transformations at the Integration Gateway	351
Understanding Applying Message Transformations at the Integration Gateway	352
Developing and Implementing Gateway-Based Transformation Programs	352
Setting Integration Gateway Properties for Gateway-Based Transformations	353
Understanding Logged Errors	354
Performing Data Translation	355
Understanding Data Translation	355
Defining Codeset Groups	357
Defining Codesets	358
Defining Codeset Values	359
Importing and Exporting Codesets Between Databases	361
Deleting Codesets	362
Using XSLT for Data Translation	362
XSLT Translation Example	365
PeopleCode Translation Example	367
Rejecting Transformation Programs	369
Terminating Transformation Programs	369

Chapter 17

Managing Error Handling, Logging, Tracing, and Debugging	371
Understanding Error Handling, Logging, Tracing and Debugging	371
Understanding Integration Gateway Error Handling	371
Target Connector Error Handling	371
Listening Connector Error Handling	372

Integration Gateway Exception Types	372
Managing Integration Gateway Message and Error Logging	374
Understanding Message and Error Logging	374
Setting Up Message and Error Logging	374
Viewing Non-English Characters in Integration Gateway Log Files	374
Managing Message Logging	375
Managing Error Logging	376
Managing Application Server Logging and Tracing	377
Debugging Integrations	378
Debugging Handler PeopleCode	378
Handling Common Issues	379

Chapter 18

Providing Services	383
Understanding Providing Services	383
Understanding the Provide Web Service Wizard	383
Features of the Provide Web Service Wizard	383
Operation Types Supported	384
Requirements for Nonrowset-Based Message Schemas	384
Locations for Publishing WSDL Documents	384
UDDI Repositories and Endpoints	385
WSDL URL Formats	385
Provided WSDL Documents	386
PartnerLinkType Support	395
WSDL Document Versioning	397
Prerequisites for Providing Services	398
Common Elements Used in This Chapter	399
Providing Services	399
Understanding Using the Provide Web Service Wizard	400
Step 1: Select Services to Provide	400
Step 2: Select Service Operations	401
Step 3: View WSDL Documents	402
Step 4: Specify Publishing Options	404
Step 5: View the WSDL Generation Log	407
Accessing Generated WSDL Documents	407
Using WSDL URLs To Access Generated WSDL Documents	408
Using the WSDL Repository to Access Generated WSDL Documents	408
Deleting WSDL Documents	409
Understanding Deleting WSDL Documents	409
Deleting a WSDL Document	410

Chapter 19

Consuming Services	411
Understanding Consuming Services	411
Understanding the Consume Web Service Wizard	411
Consume Web Service Wizard Features	411
Operation Types Supported	411
Sources for Consuming WSDL Document	412
Integration Metadata Created by the Consume Web Service Wizard	412
Multiple Fault Messages	413
Multiple Root Elements in Message Schemas	413
Delivered Queues and Nodes	413
Binding Style of Consumed WSDL Documents	414
Working with Asynchronous Request/Response Service Operations	414
Prerequisites for Consuming Services	414
Common Elements Used in This Chapter	414
Setting the PS_FILEDIR Environment Variable for Consuming WSDL from Files	416
Understanding Setting the PS_FILEDIR Environment Variable	416
Setting PS_FILEDIR in Microsoft Windows Environments	416
Setting PS_FILEDIR in UNIX Environments	417
Using the Consume Web Service Wizard	417
Step 1: Select WSDL Source	417
Step 2: Select Service	419
Step 3: Select Service Ports	420
Step 4: Select Service Operations	421
Step 5: Convert Asynchronous Operations	421
Step 6: Rename Operation Messages	423
Step 7: Select a Queue for Asynchronous Operations	425
Step 8: Select the Receiver Node	426
Confirm and View Results	427
Accessing Integration Metadata for Consumed Services	428

Chapter 20

Integrating with BPEL Process-Based Services	431
Understanding Integrating with BPEL Processes	431
Oracle BPEL Process Manager	431
PeopleSoft-Delivered Application Classes for BPEL Integrations	431
Monitoring BPEL Process-Based Integrations	432
Securing BPEL Process-Based Integrations	432
Prerequisites for Integrating with BPEL Processes	433

Configuring the PeopleSoft-Delivered BPEL Node	434
Consuming BPEL Process–Based Services	435
Understanding Consuming BPEL Process-Based Services	435
Deploying BPEL Processes	436
Consuming WSDL Documents from BPEL Processes	436
Consuming Synchronous BPEL Operations	436
Consuming Asynchronous Request/Response BPEL Operations	438
Consuming Asynchronous Fire-and-Forget (One-Way) BPEL Operations	441
Providing PeopleSoft Services to BPEL Processes	444
Understanding Providing PeopleSoft Services to BPEL Processes	444
Providing Synchronous PeopleSoft Operations to BPEL Processes	444
Providing Asynchronous PeopleSoft Request/Response Operations to BPEL Processes	448

Chapter 21

Integrating with Oracle ESB-Based Services	451
Understanding Integrating with Oracle ESB-Based Services	451
Oracle ESB	451
Software Components	451
Securing Oracle ESB-Based Services	452
Prerequisites for Integrating with Oracle ESB–Based Services	453
Consuming and Invoking Oracle ESB-Based Services	454
Understanding Consuming and Invoking Oracle ESB-Based Services	454
Providing Oracle ESB–Based Services for Consuming in PeopleSoft	457
Consuming Oracle ESB-Based Services	457
Invoking Synchronous Oracle ESB-Based Services	458
Invoking Asynchronous Oracle ESB-Based Services	459
Providing and Invoking PeopleSoft Services in Oracle ESB	464
Understanding Providing and Invoking PeopleSoft Services in Oracle ESB	464
Prerequisites for Providing and Invoking PeopleSoft Services in Oracle ESB	464
Providing PeopleSoft Services	464
Invoking PeopleSoft Services in Oracle ESB	465

Chapter 22

Using the Inbound File Loader Utility	467
Understanding the Inbound File Loader Utility	467
File Processing	467
Understanding Development Activities	469
General Development Activities	469
Development Activities for PeopleSoft Integration Broker Processing	469

Creating File Layout Definitions	470
Development Activities for Application Class Processing	471
Prerequisites for Using the Inbound File Loader Utility	474
Setting Up Inbound File Loader Processing Rules	474
Understanding Setting Up Inbound File Loader Processing Rules	474
Setting Up Inbound File Loader Processing Rules	474
Initiating File Processing	477
Understanding Initiating File Processing	477
Initiating Inbound Flat File Processing	478
Testing Inbound Flat File Processing	479

Chapter 23

Copying Integration Metadata between PeopleSoft Databases	481
Copying Integration Metadata Between PeopleSoft Databases	481
Understanding Copying Integration Metadata Between PeopleSoft Databases	481
Understanding Data Dependencies and Relationships for Copying Data	482
Using Data Mover Scripts to Copy Message Schema and WSDL Data	484
Converting WSDL Documents and Message Schemas to Managed Objects	485
Understanding Converting WSDL Documents and Message Schema to Managed Objects	485
Using the Metadata Convert/Schema Convert Page	486
Converting WSDL Documents to Managed Objects	486
Converting Message Schemas to Managed Objects	487
Deleting Data from the Deprecated Data Repository	488
Managing Nodes Copied Between Databases and Upgraded from Earlier PeopleTools Releases	488

Appendix A

Integration Scenarios	491
Understanding Integration Setup	491
Integrating with PeopleSoft Integration Broker Systems	496
Understanding This Scenario	496
Configuring the System for This Scenario	497
Integrating with PeopleSoft Integration Broker Systems Through Firewalls	498
Understanding This Scenario	498
Configuring the System for This Scenario	500
Integrating with PeopleSoft Integration Broker Systems by Using Hubs	502
Understanding This Scenario	502
Understanding Hub Routing Types	503
Configuring Generic-Routing Hubs	504
Configuring Sender-Specified Routing Hubs	507
Integrating with Third-Party Systems	510

Understanding This Scenario	510
Configuring the System for This Scenario	511
Integrating with Third-Party Systems by Using Remote Gateways	512
Understanding This Scenario	513
Sending Messages to Third-Party Systems	516
Receiving Messages from Third-Party Systems	518
Integrating with PeopleTools 8.47 and Earlier PeopleTools 8.4x Systems	521
Understanding This Scenario	521
Configuring the System for This Scenario	522
Integrating with PeopleTools 8.1x Systems	524
Understanding This Scenario	524
Configuring the System for This Scenario	525

Appendix B

Transformation Example: Integration Between Two PeopleSoft Nodes	527
Understanding This Appendix	527
Using the Example	527
Integration Metadata for This Example	528
Creating Message Definitions	528
Message Definition: PeopleSoft SCM Node	528
Message Definition: PeopleSoft CRM Node	529
Setting Up the Codesets	531
Setting Up the Transformation	533
XSL Walkthrough	535
Transformation Processing: First Pass	536
Transformation Processing: Second Pass	539
Testing the Transformation	540

Appendix C

Understanding Migrated Integration Metadata	541
Understanding Migrated Integration Metadata	541
Node Objects	541
Channel Objects	542
Message Objects	542
Node Transaction and Relationship Objects	542
Understanding Migrated Integration PeopleCode	543
Application Classes	544
PeopleCode Methods	544
Built-In Functions	545
Other Migrated Constructs	545

Special Characters 545

Correcting Integration PeopleCode That Did Not Migrate 545

 Understanding Integration PeopleCode That Did Not Migrate 545

 Correcting Non-Migrated Integration PeopleCode 546

Index 549

PeopleSoft Integration Broker Preface

This preface provides an overview of the PeopleSoft Integration Broker PeopleBook.

PeopleSoft Integration Broker

PeopleSoft Integration Broker facilitates integrations with PeopleSoft and third-party systems. It features a services-oriented architecture that enables you to expose PeopleSoft business logic to PeopleSoft and third-party systems as services. It also allows you to consume and invoke services from other PeopleSoft and third-party systems. The PeopleSoft Integration Broker services framework supports synchronous and asynchronous messaging, and enables you to use a variety of communication protocols, while managing message structure, message content, and transport disparities.

This PeopleBook describes the procedures for using PeopleSoft Integration Broker to develop and administer services. These procedures include defining services, service operations, messages, queues, routings, and transformations. This PeopleBook also discusses developing the necessary PeopleCode to send, receive, and route service operations. It also discusses how to develop PeopleCode and XSLT code to filter, transform, and translate message content.

Other PeopleBooks discuss configuring and administering the integration system, monitoring integrations, and testing integrations.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Testing Tools and Utilities

PeopleBooks and the Online PeopleSoft Library

A companion PeopleBook called PeopleBooks and the Online PeopleSoft Library contains general information, including:

- Understanding the PeopleSoft online library and related documentation.
- How to send PeopleSoft documentation comments and suggestions to Oracle.
- How to access hosted PeopleBooks, downloadable HTML PeopleBooks, and downloadable PDF PeopleBooks as well as documentation updates.
- Understanding PeopleBook structure.
- Typographical conventions and visual cues used in PeopleBooks.
- ISO country codes and currency codes.

- PeopleBooks that are common across multiple applications.
- Common elements used in PeopleBooks.
- Navigating the PeopleBooks interface and searching the PeopleSoft online library.
- Displaying and printing screen shots and graphics in PeopleBooks.
- How to manage the PeopleSoft online library including full-text searching and configuring a reverse proxy server.
- Understanding documentation integration and how to integrate customized documentation into the library.
- Glossary of useful PeopleSoft terms that are used in PeopleBooks.

You can find this companion PeopleBook in your PeopleSoft online library.

Chapter 1

Getting Started with PeopleSoft Integration Broker

This chapter provides an overview of PeopleSoft Integration Broker and discusses considerations for how to:

- Plan the integration architecture.
- Plan integrations.
- Determine security.
- Plan for support.
- Assess staff skills.

PeopleSoft Integration Broker Overview

This PeopleBook describes using PeopleSoft Integration Broker to:

- Perform asynchronous and synchronous messaging among internal systems and third-party systems.
- Expose PeopleSoft business logic as web services to PeopleSoft and third-party systems.
- Consume and invoke web services from third-party and PeopleSoft systems.

Implementing PeopleSoft Integration Broker

This section provides information to consider before you begin to use PeopleSoft Integration Broker.

Planning the Integration Architecture

The two major components of PeopleSoft Integration Broker are the integration gateway and the integration engine. The integration gateway is a platform that manages the receipt and delivery of messages passed among systems through PeopleSoft Integration Broker. The integration engine is an application server process that routes messages to and from PeopleSoft applications as well as transforms the structure of messages and translates data according to specifications that you define.

When planning the integration architecture, evaluate historical integration data, current data, as well as expected growth and increased traffic. Consider the number of interfaces you have in production and how much system resources they use. Also consider how many of the interfaces will be nightly batch file loads, versus how many will be real-time service-based integrations. Devise simulated real-life integration scenarios where you can estimate the volume and the size of the transactions to a certain degree. Then use this information for benchmarking and stress testing—which should lead to performance tuning, hardware sizing, and so on.

Planning Integrations

In planning the integrations to develop and execute, consider the following:

- Real-time integrations or scheduled integrations.

Determine if your business needs are best served with real-time integration or scheduled integrations.

Scheduled batch processing and file loads are discussed in other PeopleBooks.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Process Scheduler*, "Getting Started With PeopleSoft Process Scheduler" and *Enterprise PeopleTools 8.50 PeopleBook: Application Engine*, "Getting Started With Application Engine."

- Inventory the integrations to develop.

Determine the systems and applications that will participate in each integration.

Consider dependencies on other systems owned by other groups having concurrent releases, and data dependencies within the context of synchronizing data between systems. Also consider if you will need permission from business owners to integrate with their systems.

- Generic integrations.

Consider if you can develop generic integrations. Perhaps in your current environment only two systems need to exchange information and they do so in a proprietary way. But consider that one day perhaps additional systems in your enterprise may also need to exchange that information with the source system. Will you need to develop transformations for systems that will be integrating later on? Can you develop the integration in a way so that other systems will be able to consume the service or subscribe to the information without requiring complex transformations?

- Determine the integrations that will require synchronous messaging and those that will asynchronous messaging.

In PeopleSoft Integration Broker synchronous integrations, all processing stops until a response is received. In PeopleSoft Integration Broker asynchronous integrations, each request is placed in a queue and is processed as soon as the system can accommodate the request.

Perhaps you may need to stop the processing of fulfilling an order until the system verifies that all requested items are available in inventory. In such a case, a synchronous integration is needed.

However the processing of support tickets probably should not stop if a system uses integration to add a new ticket to a queue. In such a scenario, an asynchronous integration might be appropriate.

- Prioritize integration development.

Plan to develop mission-critical integrations first, standard integrations next, and nice-to-have integrations last.

- Determine if data will need transformation or translation.
- Plan on using integration simulation tools.

Plan on using simulation tools such as PeopleSoft Send Master to simulate integrations with external systems that are not under your control. Even when you do control all systems that are being integrated, if you can't get the integration to work using Send Master, you definitely won't be able to get it working from the external system. Test integrations using Send Master before spending hours debugging a system.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools*, "Getting Started with PeopleSoft Integration Testing Utilities and Tools."

Determining Security

Unlike a public web service on the internet that retrieves a stock quote for a given ticker symbol, the web services and integrations in your PeopleSoft applications can expose sensitive information such as financial data. PeopleSoft Integration Broker facilitates transfer of information between systems; however, a security analyst must evaluate security requirements for each individual integration.

For example, security requirements might differ when interfacing with credit card processing vendors, versus publishing salary information out of human resources, versus synchronizing business units between applications, and so on.

Perhaps certain information should be available to the public, including systems outside of your company, such as how many inventory items are available for sale. Other information might be restricted to internal employees only, internal application systems only, or perhaps only certain users of a particular application system.

PeopleSoft Integration Broker allows you to secure each individual integration to the level of security required, as well as all integration data flowing over the wire.

Planning for Support

Develop a support plan for after "go-live." In doing so, consider the following:

- Determine who in your organization will support integration development and administration.
- Determine the type of error-notification and exception handling to implement to meet your support requirements. Consider that while system administrators can resolve communication failure between machines, they may not be able to resolve errors resulting from one system transmitting bad data to another. Analyst intervention may be required to correct the data. Stronger validation at point of data entry will result in fewer calls to a functional analyst to resolve integration issues.

Assessing Staff Skills

Assess the skills of the people who will perform development and administrative functions.

Developers working on the implementation of PeopleSoft Integration Broker should have familiarity, training or experience in the following PeopleSoft areas:

- PeopleTools.
- PeopleCode.
- Application Engine.

In addition, developers should have an understanding and research capabilities in:

- Extensible Markup Language (XML).
- XML schema.
- Simple Object Access Protocol (SOAP).
- Hypertext Transfer Protocol (HTTP).
- Web Services Description Language (WSDL).
- Universal Description, Discovery and Integration (UDDI) standard.
- Java programming language.

Other Sources of Information

In addition to the implementation considerations presented in this chapter, take advantage of all PeopleSoft sources of information, including the installation guides, release notes, PeopleBooks, curriculum, and red papers.

See Also

"PeopleSoft Integration Broker Preface," page xxi

Enterprise PeopleTools 8.50 PeopleBook: Getting Started with PeopleTools

Chapter 2

Understanding PeopleSoft Integration Broker

This chapter provides overview information about PeopleSoft Integration Broker and discusses:

- Integration gateway architecture.
- Integration engine architecture.
- Services.
- Inbound and outbound request flows.

Important! PeopleSoft Integration Broker interacts with a wide variety of third-party products. This PeopleBook is not an authoritative source of information about any third-party product. Most third-party products are delivered with their own documentation, which you should use as the primary source for information about them. This PeopleBook provides guidance that enables you to determine the configuration settings that PeopleSoft Integration Broker requires to work with third-party products. It does not address all configuration permutations. Examples of settings and data relative to a third-party product may not be correct for your particular situation. To properly configure PeopleSoft Integration Broker, you must apply your own expertise and obtain the most accurate and current information about third-party products.

Introduction to PeopleSoft Integration Broker

PeopleSoft Integration Broker is a middleware technology that:

- Performs asynchronous and synchronous messaging among internal systems and third-party systems.
- Exposes PeopleSoft business logic as web services to PeopleSoft and third-party systems.
- Consumes and invokes web services from third-party and PeopleSoft systems.

PeopleSoft Integration Broker enables you to perform these integrations among internal systems and third-party integration partners, while managing data structure, data format and transport disparities. Because of its modular design, you can reuse many elements that you develop for integrations.

PeopleSoft Integration Broker consists of two subsystems: the integration gateway and the integration engine. The integration gateway resides on a PeopleSoft web server, and the integration engine is installed on an application server as part of the PeopleSoft application.

Web Services

PeopleSoft Integration Broker enables you to provide web services to other PeopleSoft systems and external integration partners by generating Web Services Description Language (WSDL) documents from integration metadata. PeopleSoft supports providing WSDL documents to the PeopleSoft WSDL repository and Universal Description, Discovery, and Integration (UDDI) repositories.

The system enables you to consume WSDL documents from other PeopleSoft and third-party systems, and automatically creates integration metadata based on the consumed WSDL documents for processing integrations. You can consume WSDL documents from other PeopleSoft systems, UDDI repositories, WSDL URLs, and Web Services Inspection Language (WSIL) URLs.

Integration Gateway

The integration gateway is a platform that manages the receipt and delivery of messages passed among systems through PeopleSoft Integration Broker. It supports the leading TCP/IP application protocols used in the marketplace today and provides extensible interfaces to develop new connectors for communication with legacy, enterprise resource planning, and internet-based systems.

Additional features include:

- Backward compatibility for Extensible Markup Language (XML) links and PeopleSoft Application Messaging.
- Listening connectors and target connectors that transport messages between integration participants and the integration engine.

Note. This feature also enables you to build your own connectors to complement those delivered with PeopleSoft Integration Broker.

- Basic logging information concerning message receipt, delivery, and errors.
- Connection persistence with continuous open feeds to external systems through connectors, with full failover capabilities.
- Transport protocol and message format management so that when messages reach the integration engine, they have a PeopleSoft-compatible message format.

See Also

[Chapter 2, "Understanding PeopleSoft Integration Broker," Integration Gateway Architecture, page 7](#)

Integration Engine

The integration engine runs on the PeopleSoft application server. Rather than communicating directly with other applications, the integration engine sends and receives messages through one or more separately installed integration gateways.

The integration engine:

- Uses a modular architecture, so it can treat gateways as black boxes and communicate with them using standard connectors.
- Adapts elements of an existing integration to produce a new integration with only minor adjustments.
- Handles messages containing data in a variety of formats. Formats include the PeopleSoft rowset-based message format, and nonrowset-based message structures including , XML document object model messages, Simple Object Access Protocol (SOAP) messages, and non-XML files.
- Sends and receives messages asynchronously (like email) or synchronously (suspending activity to wait for a response).
- Applies message transmission type and routing based on specifications that you define in a PeopleSoft Pure Internet Architecture component.
- By developing and applying application engine transform programs, the application engine can transform message structure and translate data content according to specifications that you define in PeopleSoft Pure Internet Architecture components.

You develop transform application engine programs in PeopleCode or Extensible Stylesheet Language Transformation (XSLT) code.

These specifications can be reused for other integrations.

- Handles security features such as authentication, nonrepudiation, and cookies.

See Also

Chapter 2, "Understanding PeopleSoft Integration Broker," Integration Engine Architecture, page 10

Integration Gateway Architecture

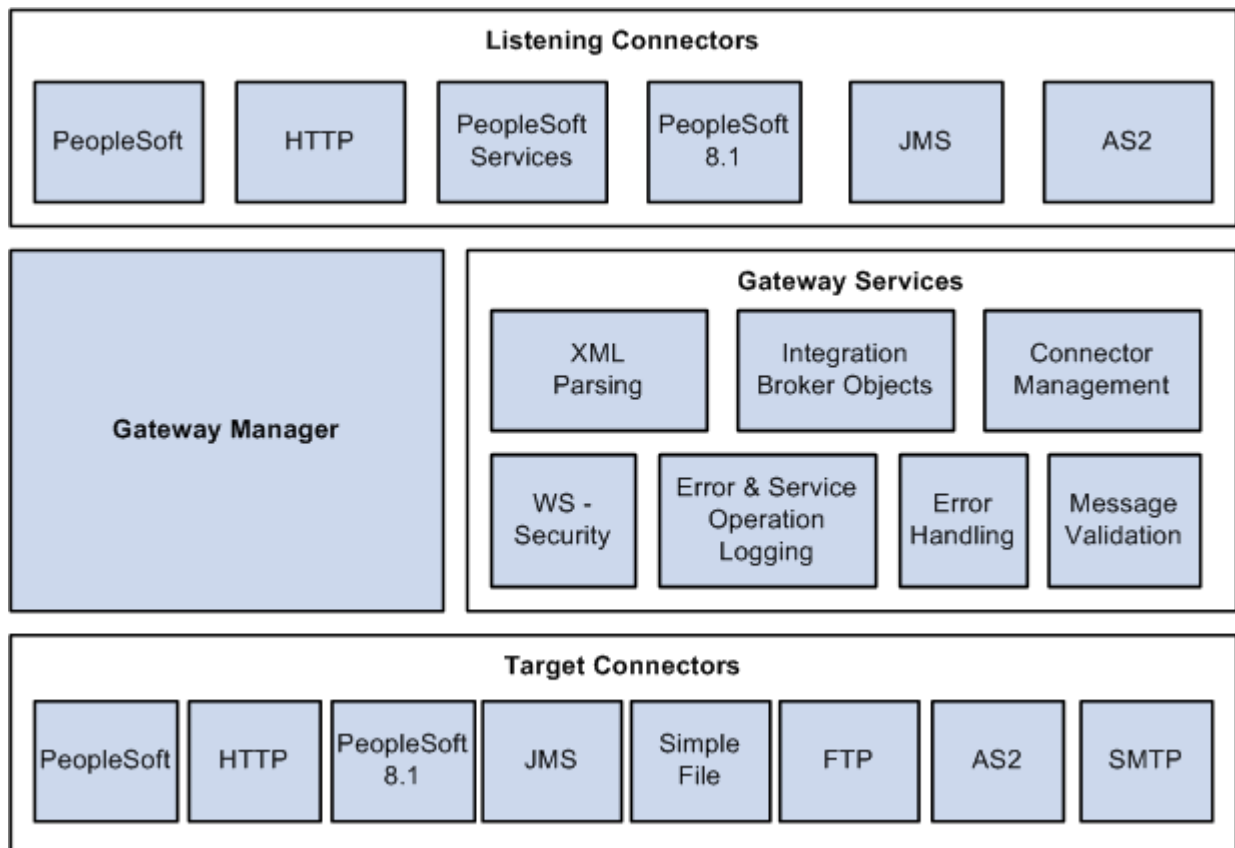
This section discusses:

- Architecture components.
- Connectors.
- Gateway manager.
- Gateway services.

Architecture Elements

You use an integration gateway to receive and send messages among integration participant systems.

Listening connectors receive incoming messages and deliver the incoming requests to the gateway manager, which is a dispatcher for messages that flow through an integration gateway. The gateway manager determines which target connector to use to properly deliver the messages to their intended recipients. The target connector then delivers the messages to the intended recipients using the recipients' preferred protocols.



Integration gateway architecture

Connectors

Listening connectors and target connectors transport messages between integration participants and the integration gateway. These connectors support asynchronous and synchronous message handling. Many connectors are configurable at the integration gateway and system levels.

Listening Connectors

Listening connectors receive incoming data streams and perform services based on the content of the stream. They are invoked externally by other PeopleSoft systems and third-party systems.

Target Connectors

Target connectors initiate communication with other PeopleSoft systems or third-party systems. A target connector might not receive a response from the target system during each operation, but every transmission requires a low-level acknowledgment.

PeopleSoft Integration Broker Connector SDK

The integration gateway provides a fully extensible model for developing new connectors built to the interface specification of the PeopleSoft Integration Broker software development kit (SDK) by PeopleSoft customers, consultants, and application developers.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Using Listening Connectors and Target Connectors"

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Using the Integration Broker Connector SDK"

Gateway Manager

The gateway manager processes every message that flows through an integration gateway and maintains links to the other major integration gateway components, including target connectors, listening connectors, and each of the gateway services.

Listening connectors invoke the gateway manager when they receive a request. The gateway manager uses the messaging objects `IBRequest` and `IBResponse` to determine how to route each request.

The gateway manager uses a number of the gateway services during this stage to perform operations such as message validation. The gateway manager then invokes the appropriate target connector based on the content of the message object and waits for a reply from the target connector. When the reply is received, the gateway manager forwards the reply to the calling listening connector.

If an error occurs, the gateway manager uses the error handling service and works with the service to prepare an error reply for the listening connector.

Gateway Services

This section describes the gateway services that the gateway manager uses.

XML Parsing

Most `IBRequest` objects and `IBResponse` objects that are processed in the system contain a content section that represents the actual business content sent.

Most of the time, these content sections contain XML data. Consequently, often connectors must parse and traverse XML. The standard Java XML objects are cumbersome for manipulating XML, so the integration gateway includes an XML parsing service consisting of objects that provide an intuitive interface for manipulating XML objects. This service is delivered as a set of three classes: `XmlDocument`, `XmlNode` and `XmlNodeList`.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*

Integration Broker Objects

Two objects comprise the messaging objects service in the integration gateway:

- `IBRequest`
- `IBResponse`

These objects represent the request and response that enter and exit PeopleSoft Integration Broker.

See [Chapter 5, "Understanding Supported Message Structures," page 39.](#)

Connector Management

The connector management service is a composite of several services that manage connectors. The gateway processes each IBRequest to determine the appropriate connector to call in each situation. This is primarily a message routing function that has varying levels of complexity abstracted from the connectors. The connector management service also processes the IBResponse returned by each connector.

WS-Security

WS-Security is an extension to the concept of the SOAP envelope header that enables applications to construct secure SOAP message exchanges. It also provides a means for associating security tokens with messages.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Setting Up Secure Integration Environments," Implementing Web Services Security.

Error and Service Operation Logging

Most components in the system use a standard error logging interface.

Each PeopleSoft-delivered connector uses the logging API in the same fashion, ensuring that an administrator can quickly drill down on problems or simply review the logs to see the IBRequest object, the IBResponse object, and even the raw data exchanged with integration participants.

See [Chapter 17, "Managing Error Handling, Logging, Tracing, and Debugging," page 371.](#)

Error Handling

The integration gateway provides a standard error handling interface that is exposed to each connector. This service provides error handling and error logging for most connectors delivered with PeopleSoft Integration Broker.

Message Validation

Messages that pass into PeopleSoft Integration Broker must contain certain elements to be processed. Because the integration gateway is the first component that processes messages sent to a PeopleSoft application, it performs basic validation—such as making sure that the message identifies its requestor and service operation name—to ensure that the integration engine and the target application can process them.

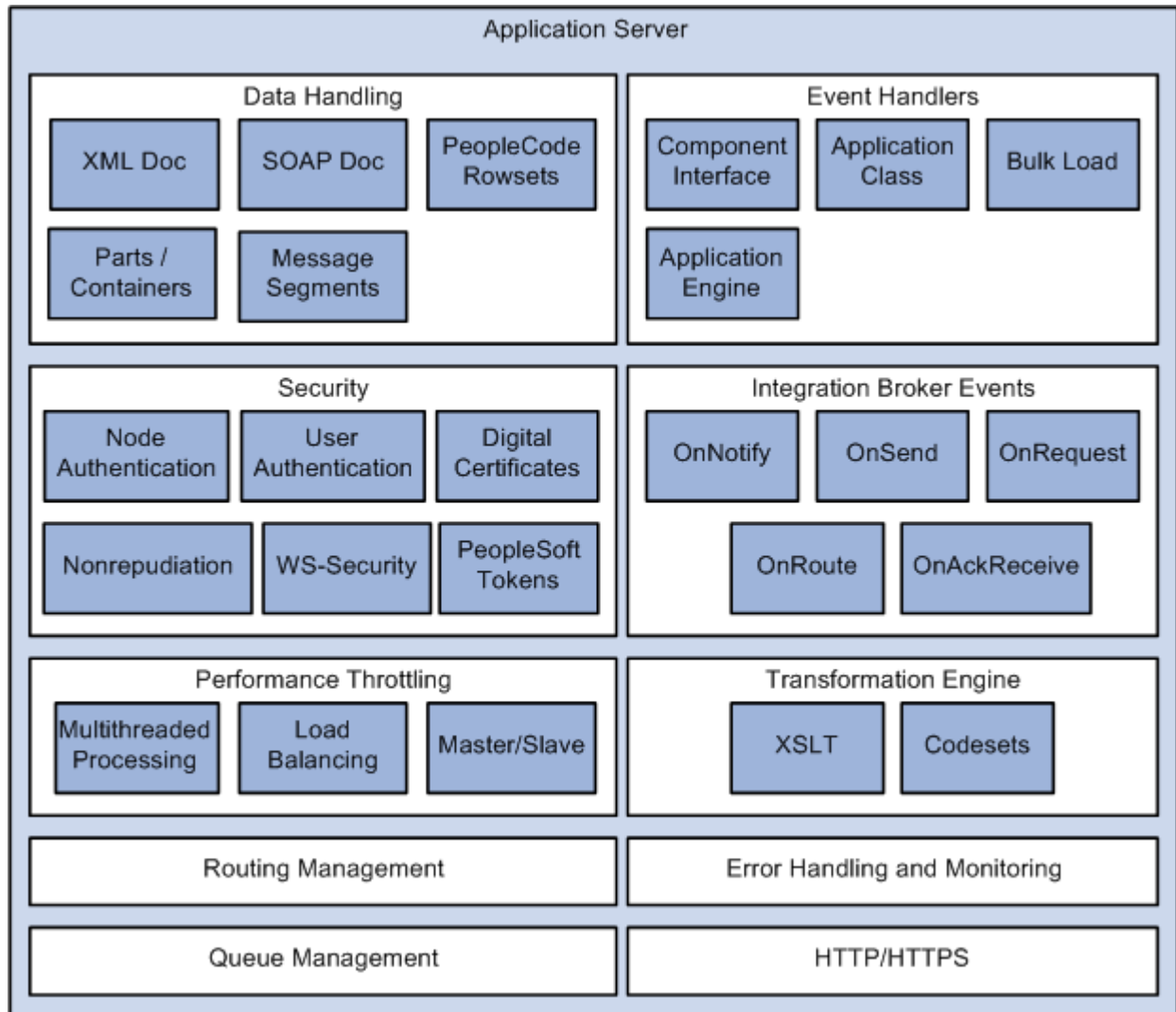
Integration Engine Architecture

The integration engine uses a variety of PeopleTools elements to create, implement, manage, and enhance integrations. Its modular architecture separates integration development activities from administrative activities.

The integration engine is a combination of PeopleSoft Application Designer definitions, PeopleSoft Pure Internet Architecture definitions, PeopleCode, and XSLT code, along with the underlying mechanisms that tie all these elements together. The underlying mechanisms include the request handlers that process both inbound and outbound messages according to the specifications in the development and administrative elements.

The integration engine resides on the PeopleSoft application server.

The following diagram shows the integration components that reside on the integration engine and the types of processing it performs.



Integration engine architecture

Service Operations

A service operation in the PeopleSoft system contains the processing logic for an integration and determines if the integration is to be processed synchronously or asynchronously. A service operation definition contains the following definitions:

- *Message*. A message contains the payload of the integration.
- *XML message schema*. Message schemas provide the physical description of the data that is being sent, including descriptions of fields, field types, field lengths, and so on.
- *Handler*. A service operation handler contains the processing logic for the service operation.
- *Routing*. A routing definition specifies the direction of the integration (inbound or outbound), routing alias names, transformations, and more.

Service Operation Types

PeopleSoft Integration Broker supports four types of service operations:

- Asynchronous one-way.
- Asynchronous request/response.
- Asynchronous to synchronous.
- Synchronous

Note. In this section the term *transaction* is used to describe the exchange of data between integration partners.

When PeopleSoft Integration Broker sends a service operation, the receiving system returns a response back to the sender. With asynchronous transactions, the response is automatically generated by the integration gateway, and it serves only to notify the sending system of the transmission status of the request. It is processed automatically by the application server, which uses that status information to update the Service Operations Monitor. With synchronous transactions, however, the response includes the content that is requested by the sending system, and it must be generated and returned by the receiving system.

Operation Types

PeopleSoft Integration Broker supports the operation types listed in the table.

For any operation type, the application must invoke PeopleCode, a component interface or data mover script to generate and send a service operation, or to receive and process a service operation.

<i>Operation Type</i>	<i>Routing</i>	<i>Actions</i>
Asynchronous — One Way.	Outbound.	<ol style="list-style-type: none"> 1. The application generates and sends a request. 2. One or more target system receives and processes the request.

Operation Type	Routing	Actions
Asynchronous — Request/Response.	Outbound.	<ol style="list-style-type: none"> 1. The application generates and sends a request. 2. The target system receives and processes the request. 3. Sometime later the target system sends a response which contains the transaction ID from the original request. This ID serves as the correlation ID. 4. The application processes the response using the correlation ID to map it back to the original request. The message sent back is a response in the form of a request.
Asynchronous to Synchronous.	Outbound.	<ol style="list-style-type: none"> 1. The application generates and sends a request. 2. A single target system receives and processes the request, then generates and sends a response. 3. The application receives and processes the response.
Synchronous.	Outbound.	<ol style="list-style-type: none"> 1. The application generates and sends a request. 2. The application suspends activity and waits for a response. 3. A single target system receives and processes the request, then generates and sends a response. 4. The application resumes its activity and receives and processes the response.
Asynchronous — One way.	Inbound.	<ol style="list-style-type: none"> 1. A source system generates and sends a request. 2. The application receives and processes the request.
Asynchronous — Request/Response.	Inbound.	<ol style="list-style-type: none"> 1. A source system generates and sends a request. 2. The application receives and processes the request. 3. Sometime later the application sends a response back to the source system. The response includes a unique identifier from the original request, which serves as a correlation ID. 4. The source system processes the response using the correlation ID to map it back to the original request.

Operation Type	Routing	Actions
Asynchronous to Synchronous.	Inbound.	<ol style="list-style-type: none"> 1. A source system generates and sends a request. 2. The application receives and processes the request, then generates and sends a response. 3. The source system receives and processes the response.
Synchronous.	Inbound.	<ol style="list-style-type: none"> 1. A source system generates and sends a request. 2. The source system suspends activity and waits for a response. 3. The application receives and processes the request, then generates and sends a response. 4. The source system resumes its activity and receives and processes the response.

See Also

Chapter 10, "Managing Service Operations," Service Operation Types, page 210

Inbound and Outbound Request Flows

This section discusses how inbound and outbound service operation flow through the architecture components of PeopleSoft Integration Broker.

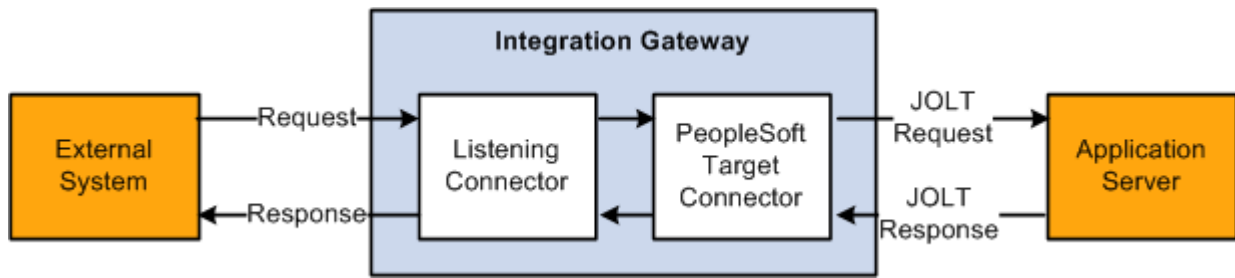
The PeopleSoft messaging architecture is discussed in greater detail in the Understanding Messaging chapter of this PeopleBook.

See Also

Chapter 3, "Understanding Messaging," page 21

Inbound Request Flow

This section describes the flow of a typical inbound request from an external system through PeopleSoft Integration Broker.



Flow of an inbound request through PeopleSoft Integration Broker

After the incoming request has been received by the integration gateway, the flow through PeopleSoft Integration Broker is the same, regardless of the listening connector used. With this in mind, no specific listening connector will be discussed here. The scenario is simple: a request is sent into the gateway, which then passes it on to the application server. The application server processes the request, and returns a response.

Step 1: External System Sends a Request to PeopleSoft Integration Broker

The first step is that an external system sends a request to PeopleSoft Integration Broker. The external system can be another PeopleSoft system or a third-party system.

Step 2: Request is Received by the Listening Connector

When a request is received by a listening connector, the first thing that the connector does is write the request to the gateway log file. (The gateway's integration properties file is used to set the logging level, which controls what is actually written to the log. If messages are not being seen in the log file, check to ensure that the log level is set correctly.) The request is written exactly as it is received. This is very useful in that it presents exactly what was sent on the wire, before the connector normalizes the service operation for use by the application server.

The connector then attempts to populate an internal request class with the particulars from the received request.

A term often used in conjunction with listening connectors is *credentials*. Incoming requests are thought to have two logical parts: the credentials and the body. The credentials can be thought of as the information required by PeopleSoft Integration Broker to process and deliver the payload of the message. The payload is located in the body. Since the credentials are separate from the body, the integration gateway does not need to parse or otherwise examine the request body for information on how to route it.

A request without credentials cannot be processed. If the integration gateway receives such a request an error will occur and an error message will be returned to the requestor.

Step 3: Request is Processed by the PeopleSoft Target Connector

In order for a request to be sent from the gateway to the application server, it must pass through the PeopleSoft target connector. This connector has two major responsibilities: it serializes the request to a string, and sends that string via a JOLT connection to the application server.

All communication between the gateway and the application server is done via the use of Multipurpose Internet Mail Extensions (MIME) messages. When the request is received by the connector, it builds a MIME message. Typically the MIME message will only have two sections. In the first, the credentials are stored in an XML document in a specific format. The second section stores the body.

At this point the request is in a standard format understood by both the gateway and the application server. All requests must eventually resolve to this format before they can be sent to the application server for processing. This format effectively isolates the application server from the protocols supported by the gateway; for the most part, there is no information present about what listening connector was initially invoked by the external request.

One credential element that may be present is the one for cookies. Obviously if this is set, the application server would be right in assuming that the request came through the HTTP listening connector. However, as a general rule the application server is isolated from the details of the protocol and the general broker code on the server does not care what listening connector was used for a given request.

Once the MIME message has been built, it is written to the gateway log.

Finally, the connector looks up the JOLT connection properties from the integration properties file and attempts to send the MIME to the application server. If these properties are not set up correctly, the gateway will be unable to send requests. This is a common source of error, so care should be taken when configuring this file.

An important point to keep in mind is that even though the MIME request to the application server may appear in the gateway log file, the actual request may not have made it to the application server, since the log entry is written before the service operation is sent. If a communication error occurs, the entry will still be present in the log file. However, if this situation occurs an exception will be thrown and an error log entry will also be created.

Step 4: Request is Received by the Application Server

When the MIME request is received by the application server, the system parses it into a request object. The MIME structure is not propagated into the server.

Assuming the request parses without error, the application server pre-processes it.

Pre-processing involves:

- Authenticating the service operation, depending on the authentication scheme configured. If the request fails authentication, an error is returned.
- Determining the direction of the service operation, by looking at the external alias on the routing definition that is associated with the service operation.
- Determining the runtime handler to invoke. Currently, there are three handler types supported by the integration broker: Ping, Synchronous, and Asynchronous. The service operation type determines the handler code to invoke. Synchronous service operations are passed to sync-specific code, and asynchronous service operations are passed to the publish/subscribe subsystem.

Once a request has been passed to its respective handler, further processing is dictated by the data and PeopleCode specific to a particular system. Or in the case of hub configurations, the request may immediately be routed to another external system.

Step 5: Response is Returned by the Application Server

Regardless of how the request is processed, a response must be returned by the application server to the gateway in the same thread of execution. The connection between the gateway and the application server is essentially synchronous, independent of the type of the service operation type. When the gateway sends a request to the application server, it expects and must get a response.

In the case of synchronous processing, the generation of the response is blocked by the processing of the request. A response cannot be generated until the service operation runs to completion. There may be a noticeable delay in receiving the response, depending on the processing required by the OnRequest method or if the request is being sent out of the broker to an external system for additional processing.

Asynchronous requests behave differently. Unlike synchronous requests, there is no blocking. A response is generated for an asynchronous request as soon as the request is placed on the publication queue. Because of this, a response generated for an asynchronous request is not a response in the strictest sense of the term. Such responses should really be considered acknowledgments that the pub/sub system has received the request. Receipt of such a response is not a guarantee that any applicable notification PeopleCode has been successfully run.

Responses are converted to the MIME standard by the application server, and are returned to the gateway.

Step 6: Response is Received by the PeopleSoft Target Connector

As soon as the MIME response is received by the PeopleSoft target connector, it is written to the gateway log file.

The MIME response is then parsed back into a gateway request object, and is then returned to the listening connector.

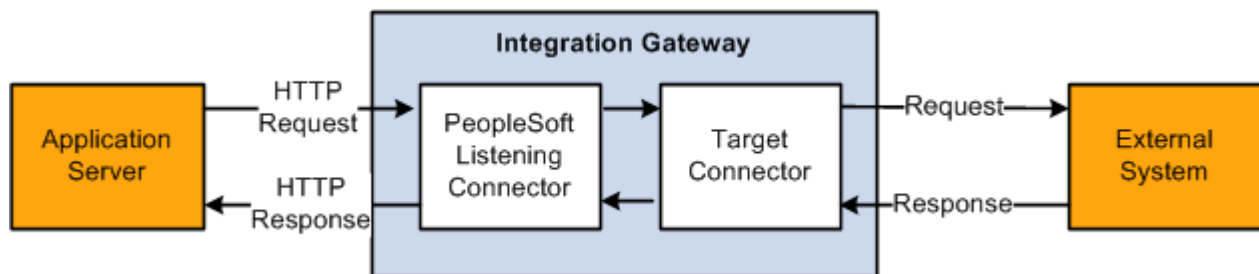
Step 7: Response is Received by the Listening Connector

The response object is returned to the listening connector, upon which the response is mapped to a response suitable for the given protocol.

It should be emphasized that, from the viewpoint of the listening connector, the processing of requests is done synchronously. A request is received by a listening connector which then converts it to a suitable format, makes a blocking call to the gateway to handle the message, and ultimately gets a response back all in the same thread of execution.

Outbound Request Flow

The following diagram shows an outgoing request through PeopleSoft Integration Broker.



Outgoing request through PeopleSoft Integration Broker to an external system

There are several scenarios that might result in a request being sent out of the broker. Requests can be sent in PeopleCode by using the Publish or SyncRequest methods of the Integration Broker class.

Regardless of how the request is created, the mechanism for sending it out of the broker is the same, and the flow is the same regardless of the specific outgoing target connector you invoke.

Step 1: Application Server Generates Request

Once an outgoing request has been generated, the application server must perform some basic processing before it can be sent out.

The application server looks at the request, and extracts the information about the node that it is being sent to.

If target connector information was not supplied via PeopleCode or as part of the routing, then the node name is then used to look up the name of the gateway to use, the target connector to use on that gateway, as well as any specific connector properties that need to be passed to the connector in order to handle the request. If this information is not found, an error will occur.

The application server modifies the outgoing request with the appropriate connector information.

The request is then converted to the MIME standard format, and is sent to the gateway over an HTTP connection.

The request must be sent to the PeopleSoft listening connector on the gateway. The application server uses the value of the Gateway URL defined for the given gateway. If this URL is not valid or does not point to the PeopleSoft listening connector, the application server will be unable to send the request.

Step 2: Request is Received by the PeopleSoft Listening Connector

When the MIME request is received by the PeopleSoft listening connector, it is written to the gateway log file.

The request is converted from MIME format to a gateway request object.

The connector then examines the request to determine what target connector the request is to be sent to; that target connector is then invoked.

Step 3: Request is Received by the Target Connector

The target connector validates the request. Each connector requires certain properties to be set, otherwise the request cannot be sent. For example, the HTTP target connector requires that the PrimaryURL be set. If any mandatory connector properties are missing or are invalid, an error will be thrown.

The target connector then converts the request into whatever format is required by the protocol.

The modified request is then written to the gateway log, and then sent out.

Step 4: Response is Received by the Target Connector

The response received by the target connector is written to the gateway log, and the response is used to build a gateway response object, which is then returned to the PeopleSoft listening connector.

Step 5: Response is Received by the PeopleSoft Listening Connector

The response object is then converted to the MIME standard format by the connector.

The MIME response is then written to the gateway log file, and is then returned to the application server.

Interactions with the gateway are always synchronous. If a request is sent to the gateway, a response should be expected.

Step 2 is an HTTP POST request made of the gateway, and the response created here in Step 5 is returned in response to that HTTP request. The HTTP connection is open for the duration of the processing for that request.

The response object is returned to the listening connector, upon which the response is mapped to a response suitable for the given protocol.

Chapter 3

Understanding Messaging

This chapter discusses:

- Asynchronous messaging.
- Synchronous messaging.

Note. For compatibility with previous PeopleTools releases, the PeopleSoft Integration Broker services-oriented architecture introduced in PeopleTools 8.48 overlays the messaging architecture from earlier PeopleTools 8.4x releases.

Messaging Types

PeopleSoft Integration Broker supports asynchronous and synchronous messaging.

Synchronous Messaging In synchronous messaging, a message is sent to a target system. The sending system must receive a response from the target system before it continues to process additional messages.

Asynchronous Messaging In asynchronous messaging, a message is sent to a target system. However, the sending system does not need to receive a response from the target system before it can continue processing messages. This type of messaging is also referred to as fire-and-forget messaging.

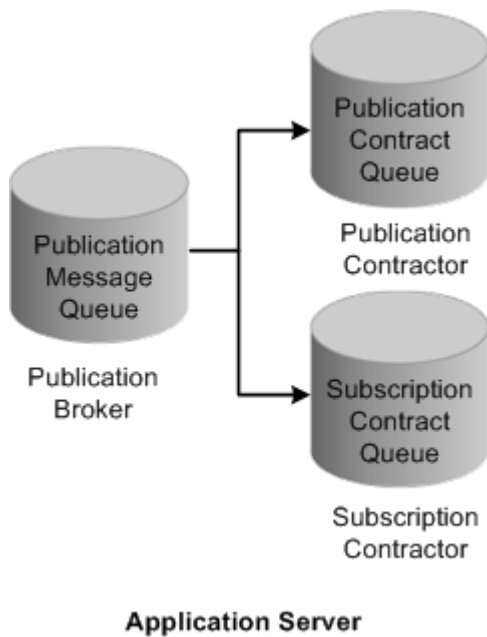
The remainder of this chapter discusses the PeopleSoft Integration Broker architecture for these messaging types.

Asynchronous Messaging

This section discusses the PeopleSoft Integration Broker asynchronous messaging architecture.

Brokers, Contractors and Queues

The publication broker, publication contractor, and subscription contractor services are the primary application server elements required for asynchronous messaging. The publication broker service routes the workload to both contractor server processes, as illustrated in the following diagram:



Brokers, contractors, and queues

- Publication broker** Acts as the routing mechanism. When an asynchronous service operation arrives in its queue, the publication broker service runs the defined routing rules. If the service operation needs to be published to a remote node, it routes the service operation to the publication contractor service. If the service operation is subscribed to on the local node, then the publication broker routes the service operation to the subscription contractor service. Routing involves submitting either a subscription or publication contract to the appropriate contractor, followed by an asynchronous call to the contractor service notifying it that work is waiting in the queue.
- Publication contractor** References the publication contract submitted by the publication broker service and performs an HTTP post of the publication service operation to the integration gateway. When the integration gateway sends a reply indicating that it received the publication service operation, the publication contractor service updates the publication contract with the status of subscription processing (*Done* or *Retry*).
- Subscription contractor** References the subscription contract submitted by the publication broker service and runs the appropriate notification PeopleCode. Then it updates the subscription contract concerning the status of the subscription processing.

Messaging System Server Processes

The application server offers six server processes to handle asynchronous service operations. They work in pairs to provide three primary services:

Service	Server Processes
Publication broker	<ul style="list-style-type: none"> • Broker dispatcher (PSBRKDSP) • Broker handler (PSBRKHND)
Publication contractor	<ul style="list-style-type: none"> • Publication dispatcher (PSPUBDSP) • Publication handler (PSPUBHND)
Subscription contractor	<ul style="list-style-type: none"> • Subscription dispatcher (PSSUBDSP) • Subscription handler (PSSUBHND)

Dispatchers and Handlers

Each of the publication broker, publication contractor, and subscription contractor is comprised of two individual server processes that work together to handle incoming requests. One server process functions as a dispatcher, while the other functions as a handler.

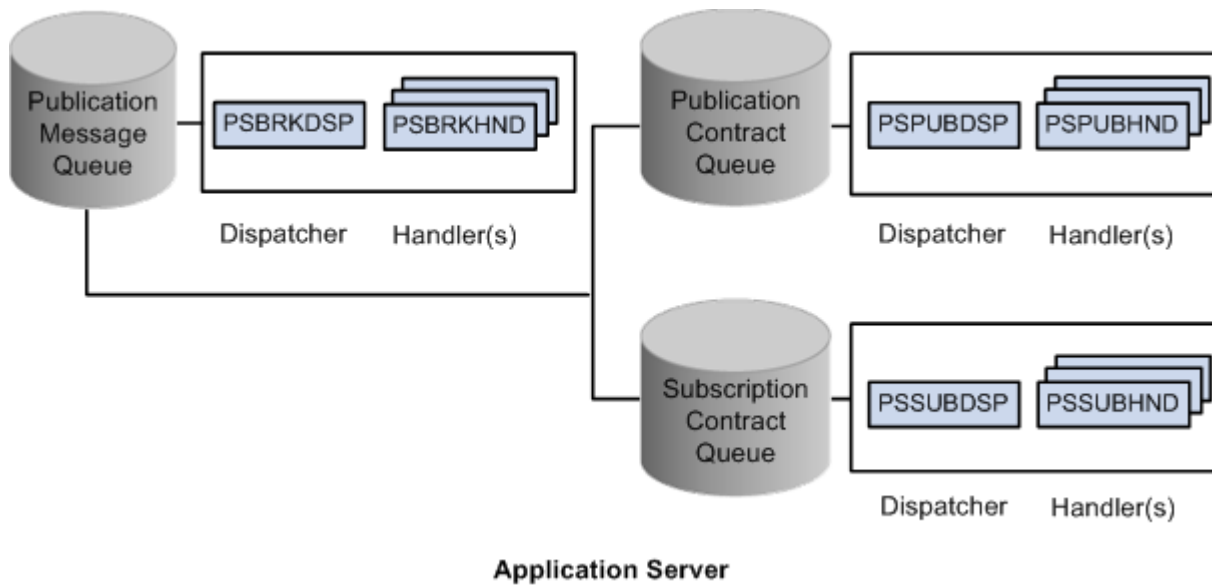
This relationship is analogous to the way that the application server handles workstation connections and requests. To handle the incoming client requests, the application server has a listener and a handler (or a pool of handlers). The listener receives the incoming requests and then routes them to an available handler.

Typically, one listener serves many handlers. The relationship between the dispatcher and the handlers is analogous to the relationship between the Jolt Server Listener (JSL) and the Jolt Server handler (JSH). In the case of the application messaging server processes, the dispatcher functions as the listener, and the handler as similar to the JSH.

For the services discussed in this section (publication contractor, subscription contractor, and publication broker) there are *at least* two server processes: a single dispatcher and one or more handlers. The PSxxxDSP server process is the dispatcher, and the PSxxxHND server process is the handler.

Note. The xxx represents BRK, PUB, or SUB. For example, in the case of the publication broker, PSBRKDSP is the dispatcher and PSBRKHND is the handler.

This diagram shows the messaging server processes grouped by their functions in the messaging architecture:



Dispatchers and handlers

Asynchronous Service Operation Publication

This section discusses:

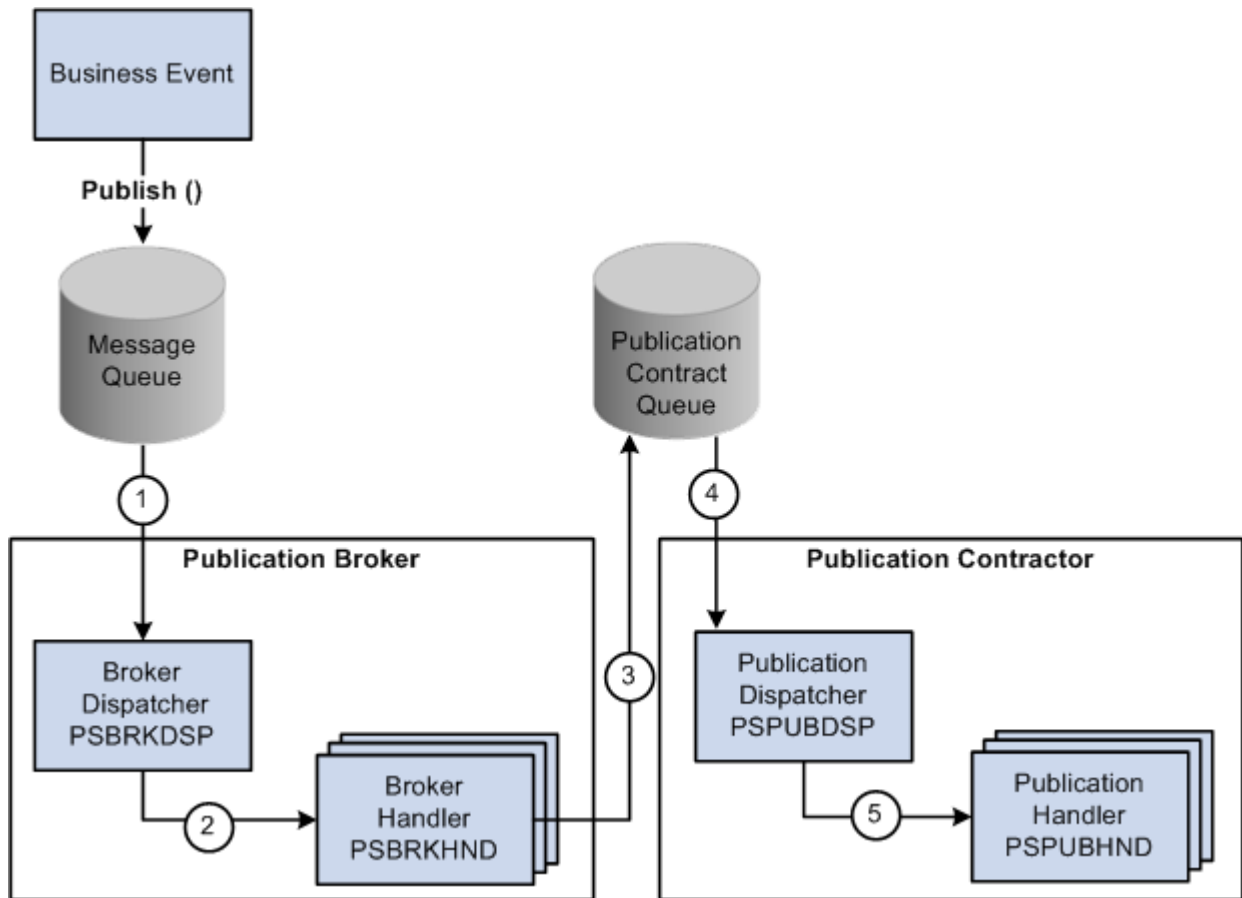
- Asynchronous publish of a service operation instance.
- Asynchronous publish of a publication contract.

Understanding Asynchronous Service Operation Publication

This section describes the flow of an asynchronous service operation publication through PeopleSoft Integration Broker, as well as the status of the service operations as they appear in Service Operations Monitor.

Asynchronous Publish of Service Operation Instances

This diagram shows an asynchronous publish of a service operation instance in the messaging system:



Asynchronous publication of an operation instance

The following table describes the processing steps of an asynchronous publication of a service operation instance in PeopleSoft Integration Broker:

Step	Process
1	<p>The service operation is published and enters the message queue.</p> <p>The instance is written to the PSAPMSGPUBHDR table in the database, but is not yet dispatched.</p> <p>The broker dispatcher process picks up the service operation instance from its queue.</p> <p>During this stage, the service operation instance status in the Service Operations Monitor is <i>New</i>.</p>
2	<p>The broker dispatcher process passes the service operation instance to the broker handler process.</p> <p>During this stage, the service operation instance status in the Service Operations Monitor is <i>Started</i>.</p>
3	<p>The broker handler process accepts the service operation instance, reads the data, and runs the routing rules to determine where the publication needs to be delivered.</p> <p>The broker handler process then writes a publication contract in the PSAPMSGPUBCON table and notifies the publication contractor service that it has an item to process.</p> <p>During this stage, the service operation instance status in the Service Operation Monitor is <i>Working</i>.</p>

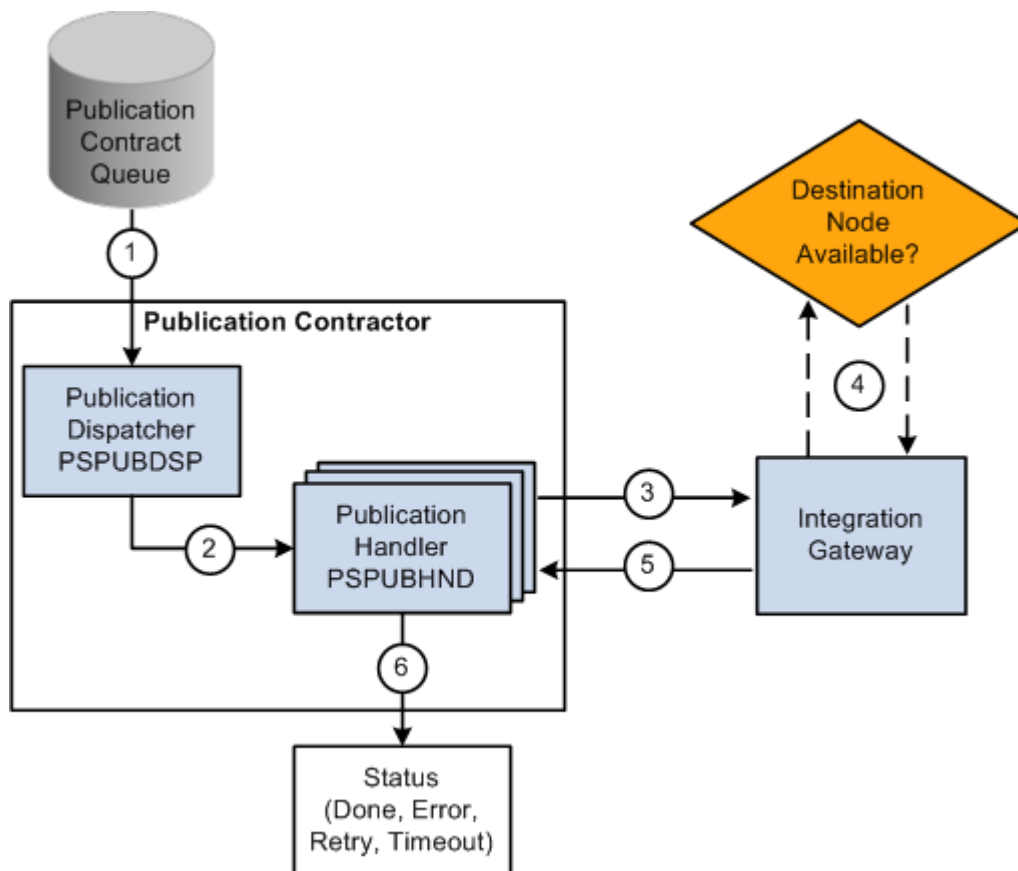
Step	Process
4	After the service operation is stored in the publication contract queue, the status of the publication contract in the Service Operations Monitor is <i>New</i> , the service operation instance status is <i>Done</i> , and the publication dispatcher process picks up the publication contract from its queue.
5	The publication dispatcher process passes the service operation instance to the publication handler process. During this stage, the publication contract status in the Service Operations Monitor is <i>Started</i> .

You view service operation instance status information on the Operation Instances page of the Service Operations Monitor. To access the page select PeopleTools, Integration Broker, Service Operations Monitor, Monitor, Asynchronous Services, Operation Instances.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Monitoring Asynchronous Service Operation Instances.

Asynchronous Publish of Publication Contracts

This diagram shows the flow of an asynchronous publication contract through the messaging system:



Asynchronous publish of a publication contract

The following table describes the processing steps of an asynchronous publish of a publication contract in PeopleSoft Integration Broker:

Step	Process
1	The publication dispatcher picks up the publication contract from the publication contract queue.
2	<p>The publication contract is written to the PSAPMSGPUBCON table in the database, but is not yet dispatched. The publication dispatcher process passes the publication contract to the publication handler process.</p> <p>At this stage the status of the publication contract in the Service Operation Monitor is <i>Started</i>.</p>
3	<p>The publication handler process accepts the publication contract and attempts to deliver the service operation to the integration gateway.</p> <p>At this stage, the status of the publication contract in the Service Operations Monitor is <i>Working</i>.</p>
4	The integration gateway attempts to pass the publication contract to the destination node.
5	The integration gateway passes the status of the publication contract back to the publication handler.
6	<p>The publication handler updates the Service Operations Monitor with the status of the publication contract. The typical statuses that displays in the Service Operations Monitor are:</p> <ul style="list-style-type: none"> • <i>Done</i>. The subscribing node successfully received the contract. • <i>Timeout</i>. The system timed out before the transaction processing was completed. • <i>Retry</i>. The system encountered an error. The retry is automatic. <p>When service operations have <i>Retry</i> status, the service operations are not resent until an internal ping is successful. This ping is similar to a node ping. The publication Contract dispatcher, as part of its on idle processing, pings a node that is in <i>Retry</i> status and verifies if the connection is reestablished. When the ping is successful the publication Contract dispatcher resends the service operation. The service operation goes back to the publication handler process and returns to <i>Working</i> status.</p>

You can view the status information for the publication contract using the publication Contracts page in the Service Operations Monitor. To access the page, select PeopleTools, Integration Broker, Service Operations Monitor, Monitor, Asynchronous Services, Publication Contracts.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Monitoring Publication Contracts.

The Service Operations Monitor may display statuses for publication contracts other than those discussed in this section.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Asynchronous Service Operation Statuses.

Asynchronous Service Operation Subscription

This section discusses:

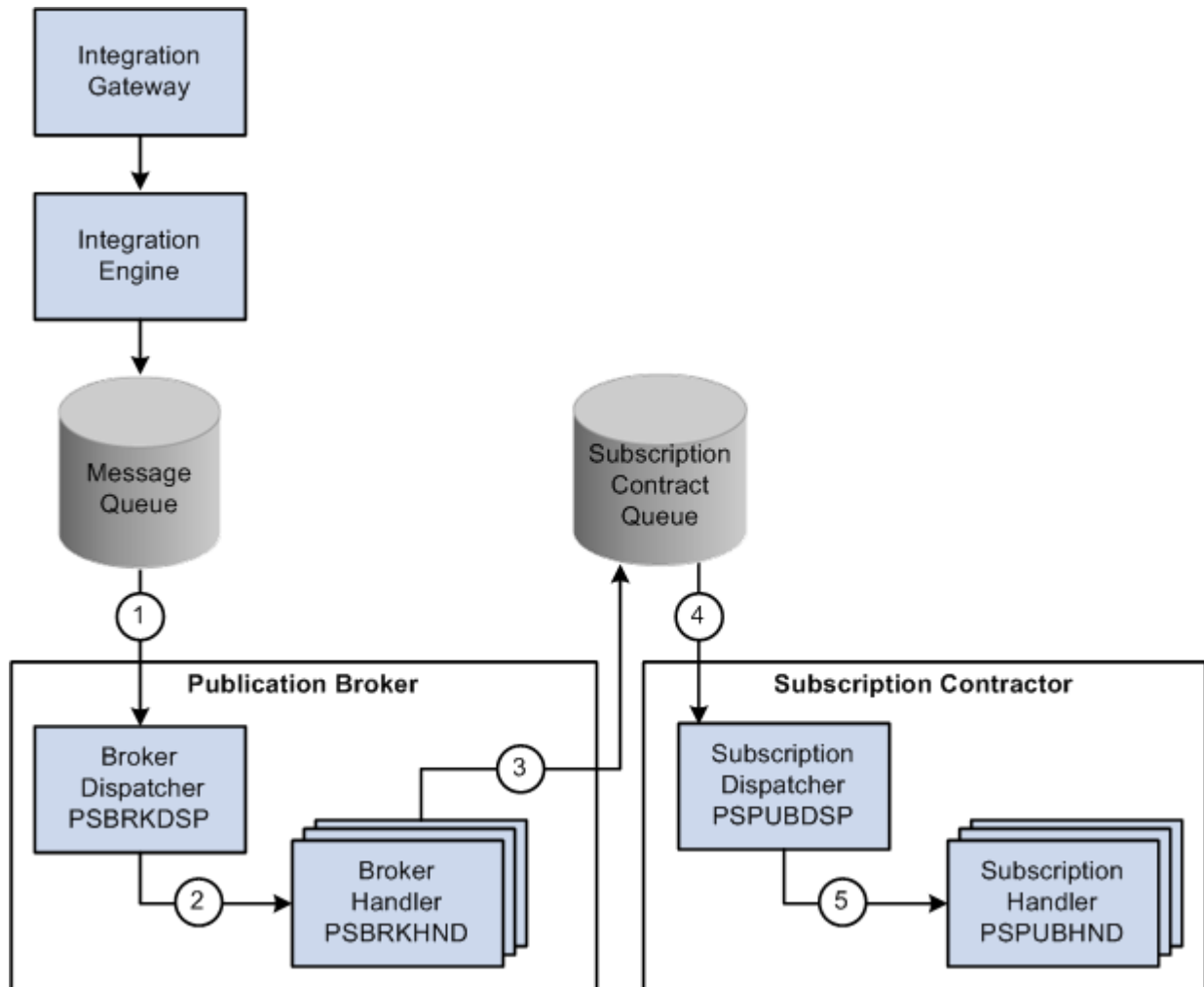
- Asynchronous subscription of a service operation instance.
- Asynchronous subscription contracts.

Understanding Asynchronous Service Operation Subscription

This section describes the flow of an asynchronous service operation subscription through PeopleSoft Integration Broker, as well as the service operation status at each stage of the process.

Asynchronous Subscription of Service Operation Instances

This diagram illustrates the flow of an asynchronous service operation subscription through PeopleSoft Integration Broker:



Asynchronous subscription of a service operation instance

The following table describes the processing steps of an asynchronous subscription of a service operation instance in PeopleSoft Integration Broker:

Step	Process
1	<p>The service operation enters the message queue. The instance is written to the database, but not yet dispatched</p> <p>The broker dispatcher process picks up the service operation instance from its queue.</p> <p>During this stage, the status of the service operation instance in the Service Operations Monitor is <i>New</i>.</p>
2	<p>The broker dispatcher process passes the service operation instance to the broker handler process.</p> <p>During this stage, the status of the service operation instance in the Service Operations Monitor is <i>Started</i>.</p>
3	<p>The broker handler process accepts the service operation instance, reads the data, and runs the subscription routing rules to determine if the service operation needs to be processed locally.</p> <p>During this stage, the status of the service operation instance in the Service Operations Monitor is <i>Working</i>.</p>
4	<p>The broker handler process then writes a subscription contract in the PSAPMSGPUBCON table (the subscription contract queue) and notifies the subscription contractor service that it has an item to process.</p> <p>During this stage, the status of the service operation instance in the Service Operations Monitor is <i>Working</i>.</p>
5	<p>Once the service operation is stored in the subscription contract queue, the status of the service operation instance in the Service Operations Monitor is <i>Done</i>.</p> <p>Processing of the subscription contract begins as the subscription dispatcher process picks up the subscription contract from its queue, and the status of the subscription contract in the Service Operations Monitor is <i>New</i>.</p> <p>In this example, at the point when the status of the asynchronous service operation instance is <i>Done</i>, the subscription contract status is <i>New</i>.</p> <p>Asynchronous subscription contract processing is described in the next section.</p>

You can view service operation instance status on the Operation Instances page of the Service Operations Monitor. To access this page, select PeopleTools, Integration Broker, Service Operations Monitor, Monitor, Asynchronous Services, Operation Instances.

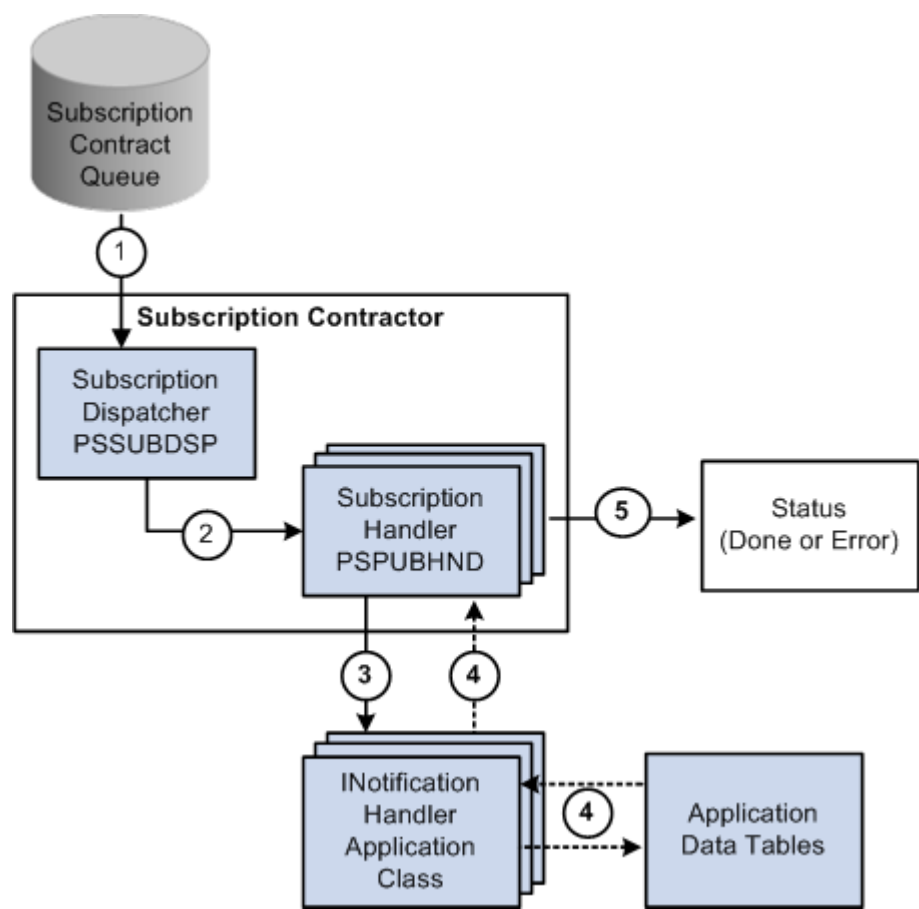
See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Monitoring Asynchronous Service Operation Instances.

The Service Operations Monitor may display statuses for subscription instances other than those discussed in this section.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Asynchronous Service Operation Statuses.

Asynchronous Subscription Contract

This diagram shows the flow of an asynchronous subscription contract:



Asynchronous subscription contract

The following table describes the processing steps of an asynchronous subscription contract in PeopleSoft Integration Broker:

Step	Process
1	The subscription dispatcher picks up the contract from the subscription contract queue.
2	The subscription dispatcher process passes the subscription contract to the subscription handler process. At this stage the status of the subscription contract in the Service Operations Monitor is <i>Started</i> .
3	The subscription handler process accepts the subscription contract and runs the notification PeopleCode.
4	In the example shown in the diagram, the notification PeopleCode then uses the service operation data to update application data tables. However, the notification PeopleCode can use the service operation data as input to look up information, create and publish another service operation, and so forth. At this stage, the status of the publication contract in the Service Operations Monitor is <i>Working</i> .

Step	Process
5	<p>The subscription handler passes the status of the subscription contract to the Service Operations Monitor. The typical statuses that display in the Service Operations Monitor for an asynchronous subscription contract are:</p> <ul style="list-style-type: none"> • <i>Done</i>. The notification PeopleCode ran successfully. • <i>Error</i>. An error occurred.

To view status information for subscription contracts, use the Subscription Contracts page in the Services Operation Monitor. To access the page select PeopleTools, Integration Broker, Service Operations Monitor, Monitor, Asynchronous Services, Subscription Contracts.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Monitoring Subscription Contracts.

The Service Operations Monitor may display statuses for subscription contracts other than those discussed in this section.

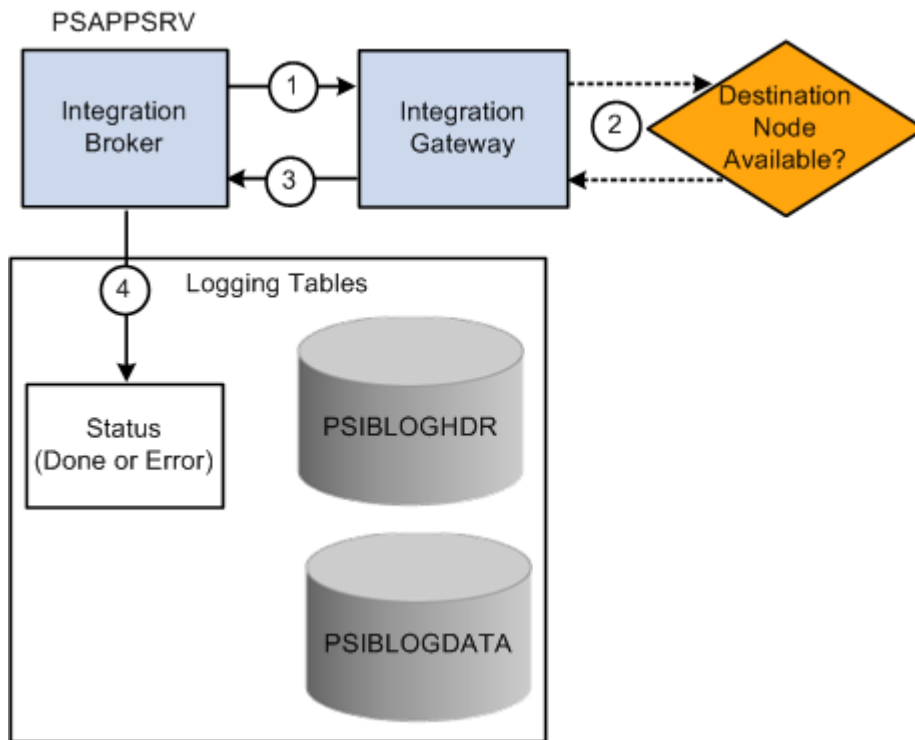
See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations," Asynchronous Service Operation Statuses.

Synchronous Messaging

This section discusses synchronous messaging in PeopleSoft Integration Broker.

Synchronous Service Operation Publication

This diagram illustrates using PeopleSoft Integration Broker to consume a synchronous service operation:



Synchronous service operation publication

The following table describes the processing steps for a synchronous publication of a service operation in PeopleSoft Integration Broker:

Step	Process
1	The integration engine sends the service operation to the integration gateway.
2	The integration gateway attempts to deliver the service operation to the destination node.
3	The integration gateway sends back the status information to the integration engine
4	<p>The integration engine updates the database tables as well as sends the status information to the Service Operations Monitor.</p> <p>The possible statuses in the Service Operations Monitor for a synchronous publication are:</p> <ul style="list-style-type: none"> <i>Done</i>. The integration gateway was able to deliver the service operation to the destination node. <i>Error</i>. The integration gateway was not able to deliver the service operation to the destination node.

You can view the status information for the invocation in the Service Operations Monitor using the Synchronous Services page. To access the page select PeopleTools, Integration Broker, Service Operations Monitor, Monitor, Synchronous Services.

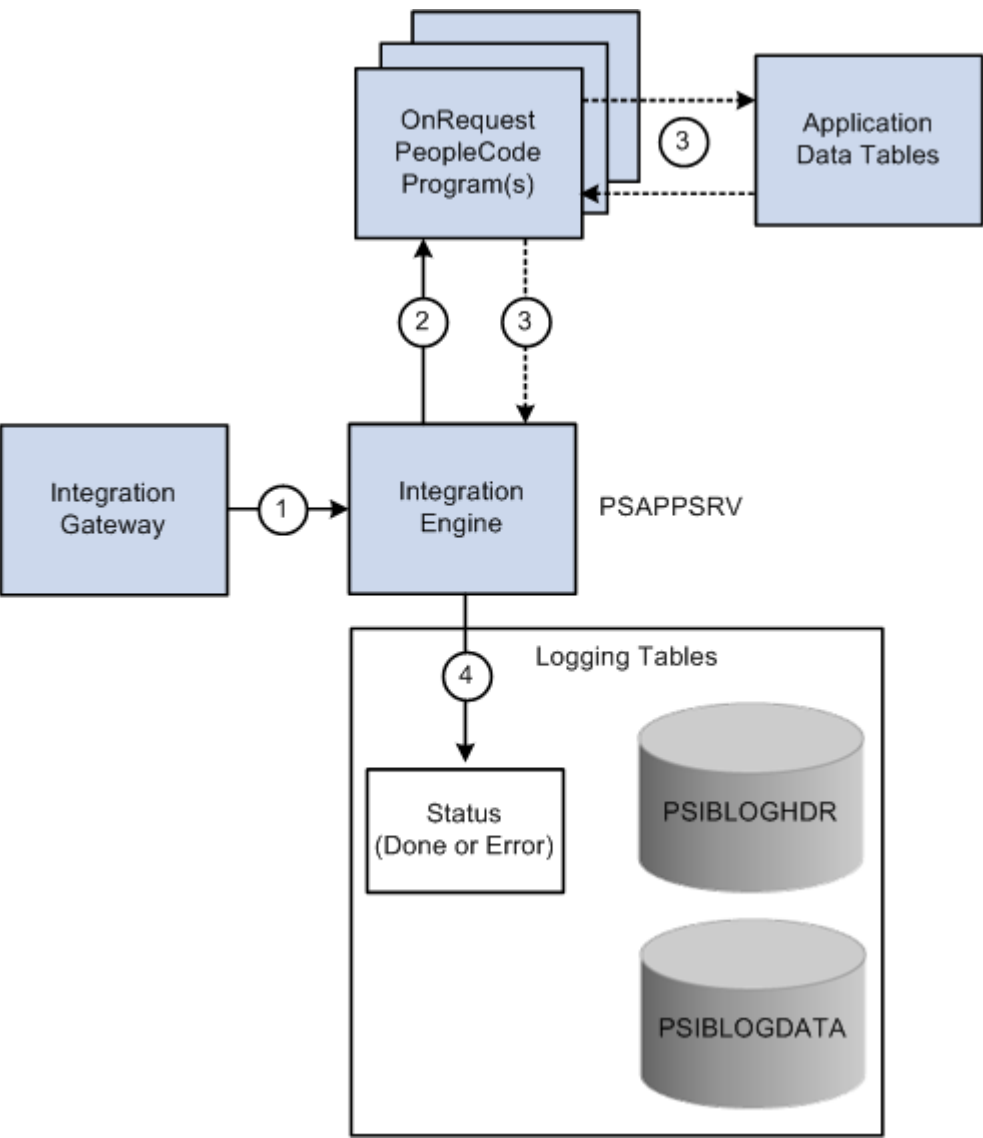
For status information for synchronous integrations to be available in the Service Operations Monitor, you must set the Logging Level parameter in the routing definition for the service operation.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor, "Monitoring Synchronous Service Operations"

Synchronous Service Operation Subscription

This diagram illustrates providing a synchronous service operation through PeopleSoft Integration Broker:



Synchronous service operation subscription

The following table describes the processing steps of a synchronous service operation subscription in PeopleSoft Integration Broker:

Step	Process
1	The integration gateway passes an inbound synchronous service operation to the integration engine.
2	The integration engine runs an OnRequest PeopleCode event program.
3	The OnRequest PeopleCode program attempts to update the application data tables.
4	<p>The integration engine updates the database tables as well as sends the status information to the Service Operations Monitor.</p> <p>The possible statuses in the Service Operations Monitor for a synchronous publication are:</p> <ul style="list-style-type: none"> • <i>Done</i>. The integration gateway was able to deliver the service operation to the destination node. • <i>Error</i>. The integration gateway was not able to deliver the service operation to the destination node.

For status information for synchronous integrations to be available in the Service Operations Monitor, you must set the Logging Level parameter in the routing definition for the service operation.

You can view the status information for the publication in the Service Operations Monitor by using the Synchronous Services page. Access this page by selecting PeopleTools, Integration Broker, Service Operations Monitor, Monitor, Synchronous Services.

See Also

[Chapter 15, "Managing Service Operation Routing Definitions," Defining General Routing Information, page 292](#)

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor, "Monitoring Synchronous Service Operations"

Chapter 4

Understanding PeopleSoft Integration Broker Metadata

This chapter provides a high-level overview of the integration metadata that you need to create to use PeopleSoft Integration Broker. This chapter discusses:

- Integration metadata
- Order of precedence for creating integration metadata

PeopleSoft Integration Broker Metadata

You use the following integration metadata to create and implement integrations using PeopleSoft Integration Broker

Integration PeopleCode	You use integration PeopleCode to send and receive messages, route messages and manipulate message content.
Integration gateway definitions	This definition is an application's internal representation of an installed integration gateway. An application requires at least the local gateway, through which it can send and receive messages. Multiple nodes can share the same local gateway, which might be the only gateway that you need for all of the integrations.
Message definitions	Message definitions provide the physical description of the data that is being sent, including fields, field types, and field lengths.
Node definitions	<p>Nodes represent any organization, application or system that will play a part in integrations. For example, nodes can represent customers, business units, suppliers, other trading partners, external or third-party software systems, and so on.</p> <p>Node definitions define the locations to or from which messages can be routed.</p> <p>Because an application can send messages to itself, a <i>default local node</i> definition that represents the application is delivered as part of the integration engine. Each PeopleSoft installation must have one, and only one, default local node</p>
Queue definitions	Queues group asynchronous services for processing. In addition, they can dictate the order of processing of the asynchronous service operations .

Routing definitions	Routing definitions determine the sender and receiver of an integration. Routing definitions allow you to specify inbound and outbound transformations that enable you to transform data structures into those that the sending or receiving systems can understand.
Service definitions	Service definitions group service operations into logical groups or categories.
Service operation definitions	Service operations define the processing logic of an integration. They specify the inbound, outbound and fault messages associated with an integration, the integration PeopleCode to invoke, and the routing to use.
Transformation programs	<p>A transformation or transform program is a type of Application Engine program that you develop and specify as part of a routing definition. PeopleSoft Integration Broker supports the use of Extensible Stylesheet Language Transformation (XSLT) code and PeopleCode for developing transform programs.</p> <p>Transform programs can transform, filter and translate data.</p>

Order of Precedence for Creating Integration Metadata

Create integration metadata in the following order:

1. Integration gateway definition.
2. Node definition.
3. Message definition.
4. Integration PeopleCode.
5. Transformation programs.
6. Queue definition.
7. Service definition.
8. Service operation definition.
9. Routing definition.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Defining Integration Gateways

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Chapter 6, "Managing Messages," page 75

Chapter 16, "Applying Filtering, Transformation and Translation," page 321

Chapter 11, "Managing Service Operation Queues," page 233

Chapter 7, "Sending and Receiving Messages," page 121

Chapter 9, "Managing Services," page 195

Chapter 10, "Managing Service Operations," page 209

Chapter 15, "Managing Service Operation Routing Definitions," page 279

Chapter 5

Understanding Supported Message Structures

This chapter discusses the message structures used by PeopleSoft Integration Broker to exchange request and response messages between the integration gateway and the application server, between other PeopleSoft systems, and between third-party integration partners. This chapter discusses:

- Internal message format for request messages.
- Internal message format for response messages.
- Accessing IBInfo elements using PeopleCode.
- Rowset-based message structure.
- PSCAMA.
- Identifying changes to field-level attributes.
- Nonrowset-based message structures.
- XML DOM-Compliant messages.
- SOAP-Compliant messages.
- Non-XML messages.
- Message part structures.
- Message container structures.

Integration Broker Message Structures

This section discusses the internal message formats for request messages and response messages, local compression, and how to access IBInfo elements.

Internal Message Format for Request Messages

This section discusses the format used to exchange request messages between the integration gateway and the application server. These messages are frequently referred to as IBRequest messages.

The Multipurpose Internet Mail Extension standard (MIME) is used as the basic structure for internal messaging. MIME has several advantages in that the standard is well-known and supported, and because it is text-based, it is human readable and easily serializable.

Messages using the internal format display in the integration gateway log file. Since the log file is a valuable tool for debugging, anyone reading the file will need to understand how the messages are structured.

Every request message contains three parts:

Headers	The first part of a request message contains headers which describe the attributes of the whole message.
IBInfo (Integration Broker Information)	The IBInfo (Integration Broker Information) section contains the credentials of the request as well as all other information required by the PeopleSoft Integration Broker to process the message. The IBInfo for a request has a specific XML structure which is used for all request messages in the system, regardless if the message is being sent to the application server or to the integration gateway.
Content section	The final section contains the message body of the original request. This is the payload and is what is ultimately delivered to the final destination.

The following is an example of a request message in the PeopleSoft internal MIME format:

```

Message-ID: <-123.123.123.123@nowhere >
Mime-Version: 1.0
Content-Type: multipart/related; boundary="Integration_Server_MIME_Boundary"
Content-ID: PeopleSoft-Internal-Mime-Message
PeopleSoft-ToolsRelease: 8.50

--Integration_Server_MIME_Boundary
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit
Content-ID: IBInfo
Content-Disposition: inline

<?xml version="1.0" ?>
  <IBInfo>
    <TransactionID>
      <![CDATA[ caa3a040-bde5-11da-914c-ecaede80d83b]]>
    </TransactionID>
    <ExternalOperationName>
      <![CDATA[ QE_FLIGHTPLAN_TRANSFORM.VERSION_1]]>
    </ExternalOperationName>
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      </OrigProcess>
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```

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```

```

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  </VisitedNodes>
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    </ConnectorName>
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  </Connector>
  <AttachmentSection ResponseAsAttachment="N" />
</IBInfo>

```

```

--Integration_Server_MIME_Boundary
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit
Content-ID: ContentSection0
Content-Disposition: inline

```

```

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7ro9tV/H6B7C1UN8GpbdsGmp9eXHRa09i3DVScz7f37IZue0Bfv1z0DxwqQ49AGXRPxh6BMrwU
J7tegSyiRRduR3se8TAgrehIBKmXSh6GHTQ5+POR1yANQ9lIb48ZH0YUykXAaYCMKVg5AEohI4L
mhAuHlAGiHwQHCKvDjhcVax4iJAwPfAv4KCHOX0/7PRRdw87utfFU53bp1X4K/MmvRDh5WLqFhy
CJajVz4+qLr4SyEJnFjZhLeSWzyqPTx6KpgOh9k6D/9z/lgQ1Ww==
--Integration_Server_MIME_Boundary--

```

IBRequest Header Section

The first part of a request message contains headers which describe the attributes of the whole message.

```
Message-ID: <-123.123.123.123@nowhere >
Mime-Version: 1.0
Content-Type: multipart/related; boundary="Integration_Server_MIME_Boundary"
Content-ID: PeopleSoft-Internal-Mime-Message
PeopleSoft-ToolsRelease: 8.50

--Integration_Server_MIME_Boundary
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit
Content-ID: IBInfo
Content-Disposition: inline
```

IBRequest IBInfo Section

The following example shows an IBInfo section for a request message that was sent from the application server to the integration gateway (formatted for easier reading):

```

<?xml version="1.0" ?>
  <IBInfo>
    <TransactionID>
      <![CDATA[ caa3a040-bde5-11da-914c-ecaede80d83b]]>
    </TransactionID>
    <ExternalOperationName>
      <![CDATA[ QE_FLIGHTPLAN_TRANSFORM.VERSION_1]]>
    </ExternalOperationName>
    <OperationType>async</OperationType>
    <From>
      <RequestingNode>
        <![CDATA[ QE_LOCAL]]>
      </RequestingNode>
      <RequestingNodeDescription>
        <![CDATA[ ]]>
      </RequestingNodeDescription>
      <NodePassword>
        <![CDATA[ password]]>
      </NodePassword>
      <ExternalUserName>
        <![CDATA[ ]]>
      </ExternalUserName>
      <ExternalUserPassword>
        <![CDATA[ ]]>
      </ExternalUserPassword>
      <AuthToken>
        <![CDATA[ owAAAAQDAgEBAAAAvAIAAAAAAAsAAAABABTaGRyAk4AbQg4AC4AMQ
          AwABTFZOonLEjJaPtR6v02oadvRUoSq2MAAAAFaFNkYXRhV3icHYhNDkAwGERfEQ
          srFyFN0cZSaGz8xAmcwA0dzug3yZv53gMUeWaM+s1IV11EFnZOysjBSv2bm01mZ1
          L3Dqt4GrETHSHtQCs6cWBM2ybr9fMBbP0LSQ== ]]>
      </AuthToken>
      <WSA-ReplyTo>
        <![CDATA[ ]]>
      </WSA-ReplyTo>
      <NodeDN>
        <![CDATA[ ]]>
      </NodeDN>
      <OrigUser>
        <![CDATA[ QEDMO]]>
      </OrigUser>
      <OrigNode>
        <![CDATA[ QE_LOCAL]]>
      </OrigNode>
      <OrigProcess>
        <![CDATA[ QE_FLIGHTDATA]]>
      </OrigProcess>
      <OrigTimeStamp>2006-03-27T15:02:39.280000-0800</OrigTimeStamp>
      <DirectGatewayRequest />
      <SyncServiceTimeout />
      <ExternalMessageID>
        <![CDATA[ ]]>
      </ExternalMessageID>
      <SegmentsUnOrder>N
    </SegmentsUnOrder>
      <ConversationID>
        <![CDATA[ ]]>
      </ConversationID>
      <WSA-MessageID>
        <![CDATA[ ]]>
      </WSA-MessageID>
      <InReplyToID>
        <![CDATA[ ]]>
      </InReplyToID>
      <DataChunk>

```

```

    <![CDATA[ ]]>
  </DataChunk>
  <DataChunkCount>
    <![CDATA[ ]]>
  </DataChunkCount>
</From>
<WS-Security>
  <WSTokenType>
    <![CDATA[ ]]>
  </WSTokenType>
</WS-Security>
<To>
  <DestinationNode>
    <![CDATA[ QE_IBTGT]]>
  </DestinationNode>
  <FinalDestinationNode>
    <![CDATA[ ]]>
  </FinalDestinationNode>
  <AppServerDomain>
    <![CDATA[ ]]>
  </AppServerDomain>
</To>
<Cookies>
  <![CDATA[ ]]>
</Cookies>
<PathInfo>
  <![CDATA[ ]]>
</PathInfo>
<HttpSession>
  <SessionID>
    <![CDATA[ ]]>
  </SessionID>
</HttpSession>
<QStrArgs />
<ContentSections>
  <ContentSection>
    <ID>ContentSection0</ID>
    <NonRepudiation>N</NonRepudiation>
    <Headers>
      <version>
        <![CDATA[ VERSION_1]]>
      </version>
      <encoding>
        <![CDATA[ base64(deflate)]]>
      </encoding>
      <encodedlength>
        <![CDATA[ 948(709)]]>
      </encodedlength>
      <length>
        <![CDATA[ 2840]]>
      </length>
    </Headers>
  </ContentSection>
</ContentSections>
<PublishNode>
  <![CDATA[ QE_LOCAL]]>
</PublishNode>
<Queue>
  <![CDATA[ QE_FLIGHTPLAN_CHNL]]>
</Queue>
<SubQueue>
  <![CDATA[ c9de8110-bde5-11da-be79-846b4e717ebf]]>
</SubQueue>
<VisitedNodes>

```

```

        <![CDATA[ QE_LOCAL| ] ]>
    </VisitedNodes>
    <Connector>
        <ConnectorName>
            <![CDATA[ PSFTTARGET ] ]>
        </ConnectorName>
        <ConnectorClassName>
            <![CDATA[ PeopleSoftTargetConnector ] ]>
        </ConnectorClassName>
        <RemoteFrameworkURL>
            <![CDATA[ ] ]>
        </RemoteFrameworkURL>
        <ConnectorParameters>
            <ConnectorParam>
                <Name>
                    <![CDATA[ URL ] ]>
                </Name>
                <Value>
                    <![CDATA[ ] ]>
                </Value>
            </ConnectorParam>
        </ConnectorParameters>
        <ConnectorHeaders />
    </Connector>
    <AttachmentSection ResponseAsAttachment="N" />
</IBInfo>

```

While the basic structure is the same for all requests, not all elements are always required. An example of this is the Connector section. The Connector XML is used to tell the integration gateway to route a message to the named target connector. It also lists configuration parameters for the outbound request. This XML would only be seen in requests sent from the application server to the integration gateway. For requests going in the other direction, the section would be empty.

Note. The only element that is always required is *ExternalOperationName*.

The following is a list of the most important elements that may appear in the IBInfo section:

<i>Element</i>	<i>Description</i>
IBInfo / ExternalOperationName	The name of the requested service operation.
IBInfo / Operation Type	(Optional.) This is the type of service operation. The valid values are: asynchronous, synchronous and ping.
IBInfo / TransactionID	(Optional.) The transaction ID is used to uniquely identify a request.
IBInfo / From / RequestingNode	(Optional.) The requesting node is the node that sent the request to the current system.
IBInfo / From / Password	(Optional.) This is the password for the requesting node.
IBInfo / From / DN	(Optional.) For incoming requests, the DN gives the Distinguished Name extracted from the certificate authentication process.
IBInfo / From / OrigNode	(Optional.) For requests that cross multiple nodes, OrigNode is used to identify the node that initiated the request.

Element	Description
IBInfo / From / OrigTimeStamp	(Optional.) This timestamp corresponds to the time that the request was created. For requests that cross nodes, this is the time that the first request was created.
IBInfo / To / DestinationNode	(Optional.) This is the node to which the request will be delivered.
IBInfo / To / FinalDestinationNode	(Optional.) In cases where the message will be passed across several nodes, this value specifies the ultimate target of the message.
IBInfo / QStrArgs	(Optional.) Specific to incoming HTTP requests. These are the query string parameters found when the request was received by the HTTP listening connector.
IBInfo / Cookies	(Optional.) Specific to incoming HTTP requests. This is cookie string found when the request was received by the HTTP listening connector.
IBInfo / PathInfo	(Optional.) Specific to incoming HTTP requests. This is the path information extracted from the request.
IBInfo / ContentSections / ContentSection	(Optional.) This node provides metadata about the text present in the ContentSection.
IBInfo / ContentSections / ContentSection / ID	(Optional.) The index number of the content section.
IBInfo / ContentSections / ContentSection / NonRepudiation	(Optional.) Indicates as to whether nonrepudiation should be performed.
IBInfo / ContentSections / ContentSection / Headers	(Optional.) Provides additional information about the data.
IBInfo / PublishingNode	(Optional.) The node that published the message.
IBInfo / Queue	(Optional.) The queue to which the service operation was published.
IBInfo / InternalInfo / AppMsg / SubQueue	(Optional.) The subqueue to which the service operation was published.
IBInfo / InternalInfo / AppMsg / VisitedNodes	(Optional.) The list of nodes that have already received this message. This is useful when a message is being propagated across multiple nodes.
IBInfo / InternalInfo / AppMsg / PublicationID	(Optional.) The publication ID for this message.
IBInfo / Connector	(Optional.) Connector information instructs the gateway as to how to process the request.
IBInfo / Connector / ConnectorName	(Optional.) This is the proper name of the target connector to invoke to send the message.
IBInfo / Connector / ConnectorClassName	(Optional.) This is the class name of the target connector to invoke.

Element	Description
IBInfo / Connector / ConnectorParameters	(Optional.) Connector parameters are processing instructions for the target connector to be invoked.
IBInfo / Connector / ConnectorHeaders	(Optional.) Connector headers provide further metadata about the contents of the message to be sent.

IBRequest Content Section

The content section of a request message features the message body.

```
--Integration_Server_MIME_Boundary
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit
Content-ID: ContentSection0
Content-Disposition: inline
eJydl1lP2zAUhu8n7T+g/gAKFdt6UYxOHCElFH9g0lRwE1UMTUimTRRN27+fk7SpvwItD/F5
eJydl1lP2zAUhu8n7T+7c TvG+c5WVz9/fl08ufhZfP46/lycn56NrlCnz8trklTVLRCglkBb
4wCrguhGFoUjw9P382/3w TvG+8btJ+Ug4GT+6f1ZnM5UZNOAMxrlhF18mrnXk76wWTaaUzTRh
OuxU7FS9hpopBxEbC5lSSuY6ggtJ+Ug4GT+TUSeK/q6hlyJhIIFY+fp8iwuE8yCYk40VpXgZVC
feml0ileSNlIRTYw+IhltwFDBG569KUuhU/KKgBQ8HVdR37VGeUHDzW9FIdtbx9oKlJJAnnDsWO
xmcrihZbfBIxyv4FYKys2Y5YyAolHgVrDHskz4hMpQU+cJpYJRxb7REamlnnz8DakEpoYSHWs2i
PakJCLbR7TlKlPaZnhEZv0yTSqCnXcWT2z4hMpQU+EiZalFLSQZ0TNQGkPiJHQLR2I3pYFU3V5y
TqrWX/yq7iirzTIWpCoS2blh9esVA0b4Mcm983lBORIJTWy//9q0JDg8AlNnc2ghbZrMQ6TFalnb
uBocflZQ59S0yAvjz0C3J3hsHd0lPQ/XFkLhUZVKYKJlQ7n1zjGJbMs6q6heNqquSEMTN+Y2Em69
hCZ7X/bCbQts8yNfv67Rwrysnzfr+1fbWg5rFmj1Q7n1zjGJbMs6q6heNqquSEMTN++bT
7ro9tV/H6B7ClUN8GpbdsGmp9eXHRaO9i3DVScz7f37IZue0Bfv1z0DxwqQ49AGXRKPxh6BMrwU
J7tegSyiRRduR3se8TAgrehiBKmXSh6GHTQ5+PORlyANQ9lIb48ZH0YUykXAaYCMKVg5AEoh
J7tegSyiRRduR3se8TAgrehiBKmXSh6GHTQ5+I4LmhAuHlAGiHwQHckvDjhcvAx4iJAwPfAv4KCHOX0
/7PRRdw87utfFU53bp1X4K/MmvRDh5WLqFhyCJa jVz4+qLr4SyEJnFjZhLeSWzyqPTx6KpgOh9k6D
/9z/lgQlWw==
```

Internal Message Format for Response Messages

The internal format for response messages parallels that for request messages, and has the same basic MIME structure. These messages are frequently referred to as IBResponse messages.

There are three logical components to a MIME response message: the IBResponse header section, the IBInfo section, and the Content section.

The following code shows an example of a response message:

```

Message-ID: <32004392.1143500580241.JavaMail.KCOLLIN2@PLE-KCOLLIN2>
Date: Mon, 27 Mar 2006 15:03:00 -0800 (PST)
Mime-Version: 1.0
Content-Type: multipart/related;
    boundary="-----=_Part_4_9069393.1143500580221"
Content-ID: PeopleSoft-Integration-Broker-Internal-Mime-Message
PeopleSoft-ToolsRelease: 8.50

-----=_Part_4_9069393.1143500580221
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit
Content-Disposition: inline
Content-ID: IBInfo

<?xml version="1.0"?><IBInfo><Status><StatusCode>0</StatusCode>
<MsgSet>158</MsgSet>

<MsgID>10000</MsgID><DefaultTitle>Integration Broker Response
Message</DefaultTitle>

</Status><ContentSections><ContentSection><ID>ContentSection0</ID>
<NonRepudiation>N</NonRepudiation></ContentSection></ContentSections></IBInfo>
-----=_Part_4_7210339.1008355101202

```

IBResponse Header

The first part of a response message contains headers which describe the attributes of the whole message.

```

Message-ID: <32004392.1143500580241.JavaMail.KCOLLIN2@PLE-KCOLLIN2>
Date: Mon, 27 Mar 2006 15:03:00 -0800 (PST)
Mime-Version: 1.0
Content-Type: multipart/related;
    boundary="-----=_Part_4_9069393.1143500580221"
Content-ID: PeopleSoft-Integration-Broker-Internal-Mime-Message
PeopleSoft-ToolsRelease: 8.50

```

IBResponse IBInfo Section

The format for the XML for the IBInfo for a response message is different than that for the request message. The following is a sample (formatted for easier reading):

```

<?xml version="1.0"?>
<IBInfo>
  <Status>
    <StatusCode>0</StatusCode>
    <MsgSet>158</MsgSet>
    <MsgID>10000</MsgID>
    <DefaultMsg>OK</DefaultMsg>
    <DefaultTitle>Integration Broker Response Message</DefaultTitle>
  </Status>
  <ContentSections>
    <ContentSection>
      <ID>ContentSection0</ID>
      <NonRepudiation>N</NonRepudiation>
    </ContentSection>
  </ContentSections>
</IBInfo>

```

The following is the list of all the elements that may be present in the IBInfo for a response:

Element	Description
IBInfo / Status / StatusCode	Describes the result of the request. The possible values are: <ul style="list-style-type: none"> 0 (zero). Request successfully processed. 10. Temporary error occurred. Request can be resent. 20. Fatal error occurred. Do not resend request. 30. Request message is a duplicate of a message previously received.
IBInfo / Status / MsgSet	The MessageSetNumber for this message in the Message Catalog. Message set number 158 is assigned to the PeopleSoft Integration Broker.
IBInfo / Status / MsgID	The Message Number for this message in the Message Catalog. If no errors occurred during the processing of the request, the MsgID will be set to the value '10000'.
IBInfo / Status / DefaultTitle	Used if the message catalog is unavailable. This value corresponds to the "Message Text" for a given entry in the message catalog.
IBInfo / Status / DefaultMsg	Used if the message catalog is unavailable. This value corresponds to the "Explanation" for a given entry in the message catalog.
IBInfo / Status / Parameters	Parameters may be used to provide additional information for error responses.
IBInfo / ContentSection	A description of the content section returned with the response. Note. Not all response messages will have a content section. The structure of the content section and all child elements is the same as was seen in the request IBInfo.

IBResponse Content Section

The content section of a response message features the message body only when working with SyncRequests

```
<?xml version="1.0"?>
<TestXml>This is a sample response message.</TestXml>
```

Error Codes and Message Catalog Entries

A response message may contain data relating to the processing of the request message, or it may contain error information if there were problems in fulfilling the request.

The status code describes the nature of the response message. The following table describes possible request message status codes and their meaning.

Value	Meaning	Description
0	Success	The message transport and processing were successful.

Value	Meaning	Description
10	Retry	The transport was not successful. PeopleSoft Integration Broker will perform its retry logic and send the message again.
20	Error	An error occurred.
30	Duplicate message	The transaction ID for the message has already been received.
40	Acknowledgement error	This status is used for SOAP messages and indicates that the contents of the data is not proper, but the transport was successful.
50	Acknowledgement hold	Used for asynchronous chunking of messages from PeopleSoft to PeopleSoft nodes when sending multiple message segments.

All PeopleSoft Integration Broker error messages are stored in the message catalog. A short and long description for every error can be found there. Catalog entries are given a number, and this number is used in the response messages.

Here is a sample error message:

```

Message-ID: <32004392.1143500580241.JavaMail.KCOLLIN2@PLE-KCOLLIN2>
Date: Mon, 27 Mar 2006 15:03:00 -0800 (PST)
Mime-Version: 1.0
Content-Type: multipart/related;
  boundary="-----_Part_4_9069393.1143500580221"
Content-ID: PeopleSoft-Integration-Broker-Internal-Mime-Message
PeopleSoft-ToolsRelease: 8.50

-----_Part_25_2235074.1008270392277
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit
Content-Disposition: inline
Content-ID: IBInfo

<?xml version="1.0"?><IBInfo><Status><StatusCode>10</StatusCode><MsgSet>158</MsgSet>
<MsgID>10721</MsgID><Parameters count="1"><Parm>404</Parm></Parameters>
<DefaultTitle>Integration Gateway Error</DefaultTitle></Status></IBInfo>
-----_Part_25_2235074.1008270392277--

```

All PeopleSoft Integration Broker errors use message set 158. The actual error seen here is 10721. Going to the message catalog, the description for message set 158, error 10721 is:

Message Text: Integration Gateway - External System Contact Error

Explanation: Integration Gateway was not able to contact the external system. The network location specified may be incorrect, or the site is permanently or temporarily down.

Therefore this error was created by the integration gateway when it tried to send a request message to an external system.

Local Compression

This section provides an overview of local compression and discusses how to:

- Set local compression for asynchronous messages.
- Set local compression for synchronous messages.
- Override local compression for synchronous messages.

Understanding Local Compression

The integration engine compresses and base64—encodes messages destined for the PeopleSoft listening connector on its local integration gateway.

Setting Local Compression for Asynchronous Messages

Asynchronous messages are always compressed and base64 encoded when sent to the integration gateway. There are no settings you need to make.

Setting Local Compression for Synchronous Messages

In PSAdmin you can set a threshold message size above which the system compresses synchronous messages. The setting is shown here:

```
Values for config section - Integration Broker
  Min Message Size For Compression=10000
```

```
Do you want to change any values (y/n)? [n]:
```

The value is the message size in bytes; the default value is *10000* (10 kilobytes). You can specify a setting of *0* to compress all messages.

To turn off compression, set the value to *-1*.

Warning! Turning compression off can negatively impact system performance when transporting synchronous messages greater than 1 MB. As a result, you should turn off compression only during integration development and testing.

Note. This setting does not affect the compression of messages that the integration gateway sends using its target connectors.

Overriding Local Compression for Synchronous Messages

You can override the PSAdmin message compression setting for synchronous messages at the transaction level. The following method on the IBInfo object in the Message class is provided for this purpose:

```
&MSG.IBInfo.CompressionOverride
```

The valid parameters for this method are: %IntBroker_Compress, %IntBroker_UnCompress, and %IntBroker_Compress_Reset.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*, "Message Classes."

See Also

Enterprise PeopleTools 8.50 PeopleBook: System and Server Administration, "Setting Application Server Domain Parameters"

Accessing IBInfo Elements Using PeopleCode

You can use the PeopleCode Message object to access IBRequest and IBResponse IBInfo data.

The following example demonstrates reading target connector information on a notification method for a rowset-based asynchronous message.

```
method OnNotify
    /* &_MSG as Message */
    /* Extends/implements PS_PT:Integration:INotificationHandler.OnNotify */
    /* Variable Declaration */

    integer &i;
    string &strReturn;
    rowset &RS;

    For &i = 1 To &MSG.IBInfo.IBConnectorInfo.GetNumberOfConnectorProperties()
        /* get Query arguments */

        &strReturn = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgName(&i);
        &strReturn = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgValue(&i);

    End-For;

    /* access the content data */

    &RS = &MSG.GetRowset();

end-method;
```

The following example demonstrates reading target connector information on notification method for a nonrowset-based asynchronous message.

```

method OnNotify
    /+ &_MSG as Message +/
    /+ Extends/implements PS_PT:Integration:INotificationHandler.OnNotify +/
    /* Variable Declaration */

    integer &i;

    string &&strReturn;

    xmldoc &xmldoc;

    For &i = 1 To &MSG.IBInfo.IBConnectorInfo.GetNumberOfConnectorProperties()

        &strReturn = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgName(&i);
        &strReturn = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgValue(&i);

    End-For;

    /* access the content data */

    &xmldoc = &MSG.GetXmlDoc();

end-method;

```

If an HTTP header is passed with a dollar sign (\$), PeopleSoft Integration Broker converts the dollar sign to an underscore (_).

PeopleSoft Rowset-Based Message Format

This section discusses the PeopleSoft rowset-based message format and discusses:

- FieldTypes section of a rowset-based message.
- MsgData section of a rowset-based message.
- PeopleSoft rowset-based message example.
- PeopleSoft timestamp format.
- CDATA and special characters.
- Schema restrictions.

This section also provides an example of a rowset-based message.

See Also

Chapter 5, "Understanding Supported Message Structures," Message Part Structures, page 68

Understanding the PeopleSoft Rowset-Based Message Format

To work with rowset-based messages—the PeopleSoft native format—you define a message in the PeopleSoft Pure Internet Architecture, insert records into the message definition in a hierarchical structure, and then populate the message and manipulate its contents by using the PeopleCode Rowset and Message classes. Externally, the message is transmitted as XML with a prescribed PeopleSoft schema.

The PeopleSoft message schema includes a PSCAMA record, which PeopleTools adds to every level of the message structure to convey basic information about the message and its data rows.

The Rowset and IntBroker classes are recommended for messaging between PeopleSoft applications. If a message is populated with data from a PeopleSoft application's database or component buffer, the Message class is best for handling that data.

Record and Field Aliases

You can specify an alias for any record or field in a rowset-based message definition. Each node participating in a transaction maintains its own independent definition of the message and its versions, including record and field names and their aliases.

When you send a message with an alias defined and the message is converted to XML for sending, only the alias appears in the XML. If you don't specify an alias, the original name is used. If the service operation is routed to multiple target nodes with different record or field naming schemes, you create for each target a separate service operation version with its own aliases and send each version separately.

The only requirement for a successful transaction is that the record and field names in the XML match either the original names or the aliases that are defined for that message and version at the node receiving the message. This behavior applies to both request and synchronous response messages, but typically only the source node applies aliases to accommodate the target node's naming scheme in both directions.

In a synchronous transaction, the request and response messages can be completely different from each other. Upon receiving a synchronous request, the target node generates and sends a response message. Upon receiving the response, the source node uses its defined aliases to find and reapply its original record and field names. The resulting inbound message contains the original names that were defined at the source node, not the aliases. Therefore, both the sending and receiving PeopleCode at the source node should expect to work with the source node's original record and field names.

See Also

[Chapter 5, "Understanding Supported Message Structures," PSCAMA, page 59](#)

[Chapter 7, "Sending and Receiving Messages," Understanding Integration PeopleCode, page 123](#)

[Chapter 16, "Applying Filtering, Transformation and Translation," page 321](#)

Rowset-Based Message Template

The following template shows the overall structure of a message in the PeopleSoft rowset-based message format:

```

<?xml version="1.0"?>
  <psft_message_name>
    <FieldTypes>
      ...
    </FieldTypes>
    <MsgData>
      <Transaction>
        ...
      </Transaction>
    </MsgData>
  </psft_message_name>

```

Note. *Psft_message_name* is the name of the message definition in the PeopleSoft database. Integration Broker inserts this message content into a standard PeopleSoft XML message wrapper for transmission.

FieldTypes Section

Each PeopleSoft message includes *field type* information. Fieldtype information conveys the name of each data record and its constituent fields, along with each field's data type. Your receiving application can use this information to validate data types. The field type information is contained in the *FieldTypes* section of the message.

There are two FieldTypes tags:

- Each record tag consists of the name of a record, followed by a *class* attribute with a single valid value: *R*. The record tag encloses that record's field tags.
- Each field tag consists of the name of a field, followed by a *type* attribute with three valid values: *CHAR* for a character field, *DATE* for a date field, and *NUMBER* for a numeric field.

Following is a simple FieldTypes template.

```

<FieldTypes>
  <recordname1 class="R">
    <fieldname1 type="CHAR" />
    <fieldname2 type="DATE" />
    <fieldname3 type="NUMBER" />
  </recordname1>
  <recordname2 class="R">
    <fieldname4 type="NUMBER" />
  </recordname2>
</FieldTypes>

```

Note. Third-party sending applications must include a valid FieldTypes section in each message. The PeopleSoft system expects fieldtype information for each record and field in the message.

MsgData Section

In addition to field type information, each PeopleSoft message contains data content in the *MsgData* section of the message. Between the MsgData tags are one or more *Transaction* sections. Each transaction represents one row of data.

Between the Transaction tags is a rowset hierarchy of records and fields. The record tags at each level contain the fields for that record, followed by any records at the next lower level.

The last record within a transaction is a fully specified PeopleSoft Common Application Message Attributes (PSCAMA) record, which provides information about the entire transaction. Immediately following the closing tag of *every* record below level 0 is a PSCAMA record containing only the AUDIT_ACTN field that specifies the action for that record.

Simple MsgData Template

Following is a simple MsgData template.

Note. The PSCAMA PUBLISH_RULE_ID and MSGNODENAME fields (shown emphasized) are used internally by certain PeopleSoft utilities, but third-party systems can generally ignore them and don't need to include them in messages.

```
<MsgData>
  <Transaction>
    <level0recname1 class="R">
      <fieldname1>value</fieldname1>
      <fieldname2>value</fieldname2>
      <level1recname1 class="R">
        <fieldname3>value</fieldname3>
        <fieldname4>value</fieldname4>
      </level1recname1>
      <PSCAMA class="R">
        <AUDIT_ACTN>value</AUDIT_ACTN>
      </PSCAMA>
      <level1recname2 class="R">
        <fieldname5>value</fieldname5>
      </level1recname2>
      <PSCAMA class="R">
        <AUDIT_ACTN>value</AUDIT_ACTN>
      </PSCAMA>
    </level0recname1>
    <level0recname2 class="R">
      <fieldname6>value</fieldname6>
    </level0recname2>
    <PSCAMA class="R">
      <LANGUAGE_CD>value</LANGUAGE_CD>
      <AUDIT_ACTN>value</AUDIT_ACTN>
      <BASE_LANGUAGE_CD>value</BASE_LANGUAGE_CD>
      <MSG_SEQ_FLG>value</MSG_SEQ_FLG>
      <PROCESS_INSTANCE>value</PROCESS_INSTANCE>
      <PUBLISH_RULE_ID>value</PUBLISH_RULE_ID>
      <MSGNODENAME>value</MSGNODENAME>
    </PSCAMA>
  </Transaction>
</MsgData>
```

See Also

Chapter 5, "Understanding Supported Message Structures," PSCAMA, page 59

PSCAMA

PeopleTools adds the PSCAMA record to every level of the message structure during processing. It isn't accessible in the message definition, but you can reference it as part of the Message object in the sending and receiving PeopleCode, and you can see it in the Integration Broker Monitor. PeopleCode processes this record the same way as any other record.

Note. PSCAMA records are automatically included in messages only if you insert database records to define the message structure. You can use the PeopleCode XmlDoc class to handle an inbound message containing PSCAMA records, but the PeopleCode Message class is much better suited for this.

PSCAMA contains fields that are common to all messages. The <PSCAMA> tag repeats for each row in each level of the transaction section of the message. The sender can set PSCAMA fields to provide basic information about the message; for example, to indicate the message language or the type of transaction a row represents. When receiving a message, your PeopleCode should inspect the PSCAMA records for this information and respond accordingly.

PSCAMA Record Definition

The PSCAMA record definition includes the following fields:

LANGUAGE_CD	Indicates the language in which the message is generated, so the receiving application can take that information into account when processing the message. When sending a message with component PeopleCode, the system sets this field to the user's default language code.
AUDIT_ACTN	Identifies each row of data as an Add, Change, or Delete action.
BASE_LANGUAGE_CD	(Optional.) Indicates the base language of the sending database. This is used by generic, full-table subscription PeopleCode to help determine which tables to update.
MSG_SEQ_FLG	(Optional.) Supports the transmission of large transactions that may span multiple messages. Indicates whether the message is a header (<i>H</i>) or trailer (<i>T</i>) or contains data (blank). The header and trailer messages don't contain message data. The receiving system can use this information to determine the start and end of the set of messages and initiate processes accordingly. For example, the header message might cause staging tables to be cleared, while the trailer might indicate that all of the data has been received and an update job should be initiated.
PROCESS_INSTANCE	(Optional.) Process instance of the batch job that created the message. Along with the sending node and publication ID, the receiving node can use this to identify a group of messages from the sending node.
PUBLISH_RULE_ID	(Optional.) Indicates the publish rule that is invoked to create the message. This is used by routing PeopleCode to locate the appropriate chunking rule, which then determines to which nodes the message should be sent. Third-party applications can ignore this field.

MSGNODENAME (Optional.) The node to which the message should be sent. This field is passed to the Publish utility by the Application Engine program. Routing PeopleCode must look for a value in this field and return that value to the application server. Third-party applications can ignore this field.

Language Codes

Each message can contain only one language code (the LANGUAGE_CD field) in the first PSCAMA record.

PeopleSoft language codes contain three characters and are mapped to corresponding International Organization for Standardization (ISO) locale codes in an external properties file. This mapping enables the PeopleSoft Pure Internet Architecture to derive certain defaults from the ISO locales that are stored in a user's browser settings. Your PeopleSoft application is delivered with a set of predefined language codes; you can define your own codes, as well.

Note. There can be only one language code for the entire message. To send messages in multiple languages, send multiple messages.

See *Enterprise PeopleTools 8.50 PeopleBook: Global Technology*, "Controlling International Preferences."

Audit Action Codes

A PSCAMA record appears following each row of the message. At a minimum, it contains an audit action code (the AUDIT_ACTN field), denoting the action to be applied to the data row. The audit action is required so that the receiving system knows how to process the incoming data.

The valid audit action codes match those that are used in the PeopleSoft audit trail processing: *A,C,D,K,N,O*, and blank.

The audit action values are set by the system or by the sending PeopleCode to specify that a record should be added, changed, or deleted:

Audit Action Code	Description
<i>A</i>	Add a noneffective or effective-dated row. To add an effective-dated row, the value is <i>A</i> . If you populate the row data by using the CopyRowsetDeltaOriginal method in the PeopleCode Message class, an additional record is created with an audit action value of <i>O</i> , containing the original values of the current effective-dated row.
<i>C</i>	Change non-key values in a row.
<i>D</i>	Delete a row.
<i>K</i>	If you change at least one key value in a row (in addition to any non-key values) and then populate the row data by using the CopyRowsetDeltaOriginal or CopyRowsetDelta methods in the Message class, an additional record is created with an audit action value of <i>K</i> , containing the original values of the current effective-dated row.
<i>N</i>	Change at least one key value in a row (in addition to any non-key values).

Audit Action Code	Description
<i>O</i>	If you change non-key values in a row and populate the row data by using the CopyRowsetDeltaOriginal method in the Message class, an additional record is created with an audit action value of <i>O</i> , containing the original values of the current effective-dated row.
Blank	Default value. If a row's content hasn't changed, the value is blank. This audit action code is also used to tag the parents of rows that have changed.

Other PSCAMA Considerations

You can update values on the PSCAMA record just like any other record in the message definition before sending the message.

The receiving process can access the fields in this record just like any other fields in the message.

The size of the PSCAMA record varies. In particular, notice a difference between the first PSCAMA record and the ones that follow. The first record contains all of the fields, while the other PSCAMA records have only the AUDIT_ACTN field, which is the only field that can differ for each row of data.

Although the first PSCAMA record is always present, not all of the remaining PSCAMA records are sent in the message. If a <PSCAMA> tag is not included for a specific row, you can assume that the row hasn't changed. In addition, if the <AUDIT_ACTN> tag is blank or null, you can also assume the row hasn't changed.

If you're receiving a message that has incremental changes, only the rows that have changed *and their parent rows* are present in the message.

You can view an example of an outbound message with the PSCAMA records inserted by testing your message definition using the Schema Tester.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools*, "Using the Schema Tester Utility."

Identifying Changes to Field-Level Attributes

When sending and receiving messages, all blank data values get stripped. As a result, you cannot determine if a field value is blank by definition, or if its value was stripped in the messaging process.

The PeopleCode CopyRowset functions CopyRowset, CopyRowsetDelta and CopyRowsetDeltaOriginal, feature an IsChanged attribute that automatically gets set to identify fields that have been changed. Any field that has been changed displays the attribute *IsChanged="Y"*.

Note. The IsChanged attribute applies only to rowset-based messages. For rowset-based message parts, use the Message Part Default Indicator field to distinguish blanks from zeros in part messages. The IsChanged attribute does not apply to nonrowset-based messages, including nonrowset-based container messages and nonrowset-based part messages.

For example:

```
<QE_ACNUMBER IsChanged="Y">2</QE_ACNUMBER>
```

Fields that had data and then were blanked contain the `IsChanged` attribute.

For example:

```
<DESCRLONG IsChanged="Y" />
```

Fields that were always blank and thus were not changed do not feature this attribute. For example:

```
<QE_NAVDESC />
```

If you are writing subscription PeopleCode you reference the `IsChanged` value of the field in the message rowset, as always. However, the blanks appear with the attribute `IsChanged="Y"`.

See Also

[Chapter 6, "Managing Messages," Distinguishing Blank from Zero in Rowset-Based Part Messages, page 97](#)

PeopleSoft Timestamp Format

The PeopleSoft format for all timestamps is ISO-8601. If any message fields are type timestamp, the following format is used:

```
CCYY-MM-DDTHH:MM:SS.ssssss+/-hhmm
```

Note. The ISO format specifies that the `+/-hhmm` parameter is optional, but PeopleSoft requires it. All date and time stamps in the header and the body of the message must include the Greenwich Mean Time (GMT) offset as `+/-hhmm`. This ensures that the timestamp is correctly understood by the receiving application.

CDATA and Special Characters

Consider the following points regarding rowset-based messages:

- You cannot use CDATA in message XML if you plan to use `GetRowSet` to parse the message.
- When using the ampersand character (&) in a string, it must be URL-encoded. For example: `&`. Passing only the ampersand character results in a PeopleCode error when you get the rowset values.
- Other special characters are best passed encoded as well, such as `>` for "<" and `<` for ">".

Schema Restrictions

For stronger schema validation control, some PeopleSoft field types have certain implicit restrictions regarding the format of field data that is acceptable in a runtime message. These restrictions appear in message schema.

The restrictions apply to fields having the following formats.

- Mixed case.
- Name.

- Phone number.
- Social security number.
- Uppercase.
- Zip code.

Note. These restrictions apply to rowset-based messages and rowset-based message parts.

The restrictions for each are shown in the following example:

```
<xsd:simpleType name="BASE_LANGUAGE_CD_TypeDef">
  <xsd:annotation>
    <xsd:documentation>BASE_LANGUAGE_CD is a character of length 3.
      Allows Uppercase characters including numbers
    </xsd:documentation>
  </xsd:annotation>
  <xsd:restriction base="xsd:string">
    <xsd:maxLength value="3"/>
    <xsd:whiteSpace value="preserve"/>
    <xsd:pattern value="([A-Z]|[0-9]|\P{Z}|\P{P}|\P{Lu})*"/>
  </xsd:restriction>
</xsd:simpleType>
```

Rowset-Based Message Example

The message data is enclosed in a tag with the name of the message, and consists of one FieldTypes section followed by one MsgData section. The FieldTypes section describes the records and fields that appear in the MsgData section, which contains the actual data.

Note. The PSCAMA record requires field type information just like any other record.

```

<SDK_BUS_EXP_APPR_MSG>
  <FieldTypes>
    <SDK_BUS_EXP_PER class="R">
      <SDK_EMPLID type="CHAR"/>
      <SDK_EXP_PER_DT type="DATE"/>
      <SDK_SUBMIT_FLG type="CHAR"/>
      <SDK_INTL_FLG type="CHAR"/>
      <SDK_APPR_STATUS type="CHAR"/>
      <SDK_APPR_INSTANCE type="NUMBER"/>
      <SDK_DESCR type="CHAR"/>
      <SDK_COMMENTS type="CHAR"/>
    </SDK_BUS_EXP_PER>
    <SDK_DERIVED class="R">
      <SDK_BUS_EXP_SUM type="NUMBER"/>
    </SDK_DERIVED>
    <SDK_BUS_EXP_DTL class="R">
      <SDK_CHARGE_DT type="DATE"/>
      <SDK_EXPENSE_CD type="CHAR"/>
      <SDK_EXPENSE_AMT type="NUMBER"/>
      <SDK_CURRENCY_CD type="CHAR"/>
      <SDK_BUS_PURPOSE type="CHAR"/>
      <SDK_DEPTID type="CHAR"/>
    </SDK_BUS_EXP_DTL>
    <PSCAMA class="R">
      <LANGUAGE_CD type="CHAR"/>
      <AUDIT_ACTN type="CHAR"/>
      <BASE_LANGUAGE_CD type="CHAR"/>
      <MSG_SEQ_FLG type="CHAR"/>
      <PROCESS_INSTANCE type="NUMBER"/>
    </PSCAMA>
  </FieldTypes>
  <MsgData>
    <Transaction>
      <SDK_BUS_EXP_PER class="R">
        <SDK_EMPLID>8001</SDK_EMPLID>
        <SDK_EXP_PER_DT>1998-08-22</SDK_EXP_PER_DT>
        <SDK_SUBMIT_FLG>N</SDK_SUBMIT_FLG>
        <SDK_INTL_FLG>N</SDK_INTL_FLG>
        <SDK_APPR_STATUS>P</SDK_APPR_STATUS>
        <SDK_APPR_INSTANCE>0</SDK_APPR_INSTANCE>
        <SDK_DESCR>Regional Users Group Meeting</SDK_DESCR>
        <SDK_COMMENTS>Attending Northeast Regional Users Group
        Meeting and presented new release functionality.
        </SDK_COMMENTS>
      <SDK_BUS_EXP_DTL class="R">
        <SDK_CHARGE_DT>1998-08-22</SDK_CHARGE_DT>
        <SDK_EXPENSE_CD>10</SDK_EXPENSE_CD>
        <SDK_EXPENSE_AMT>45.690</SDK_EXPENSE_AMT>
        <SDK_CURRENCY_CD>USD</SDK_CURRENCY_CD>
        <SDK_BUS_PURPOSE>Drive to Meeting</SDK_BUS_PURPOSE>
        <SDK_DEPTID>10100</SDK_DEPTID>
      </SDK_BUS_EXP_DTL>
      <PSCAMA class="R">
        <AUDIT_ACTN>A</AUDIT_ACTN>
      </PSCAMA>
      <SDK_BUS_EXP_DTL class="R">
        <SDK_CHARGE_DT>1998-08-22</SDK_CHARGE_DT>
        <SDK_EXPENSE_CD>09</SDK_EXPENSE_CD>
        <SDK_EXPENSE_AMT>12.440</SDK_EXPENSE_AMT>
        <SDK_CURRENCY_CD>USD</SDK_CURRENCY_CD>
        <SDK_BUS_PURPOSE>City Parking</SDK_BUS_PURPOSE>
        <SDK_DEPTID>10100</SDK_DEPTID>
      </SDK_BUS_EXP_DTL>
    </PSCAMA class="R">

```

```

        <AUDIT_ACTN>A</AUDIT_ACTN>
    </PSCAMA>
</SDK_BUS_EXP_PER>
<SDK_DERIVED class="R">
    <SDK_BUS_EXP_SUM>58.13</SDK_BUS_EXP_SUM>
</SDK_DERIVED>
<PSCAMA class="R">
    <LANGUAGE_CD>ENG</LANGUAGE_CD>
    <AUDIT_ACTN>A</AUDIT_ACTN>
    <BASE_LANGUAGE_CD>ENG</BASE_LANGUAGE_CD>
    <MSG_SEQ_FLG></MSG_SEQ_FLG>
    <PROCESS_INSTANCE>0</PROCESS_INSTANCE>
</PSCAMA>
</Transaction>
</MsgData>
</SDK_BUS_EXP_APPR_MSG>

```

Nonrowset-Based Message Structures

This section discusses nonrowset-based message structures that you can use with PeopleSoft Integration Broker. This section discusses:

- XML messages.
- SOAP-compliant messages.
- Non-XML files.

XML Messages

The World Wide Web Consortium (W3C) has established a Document Object Model (DOM) for accessing and manipulating structured data. The DOM specifies a standardized application programming interface (API) that provides a consistent, familiar way to work with almost any XML data. This API—the XML DOM—enables you to create, retrieve, navigate, and modify messages.

You define an XML message in the PeopleSoft Pure Internet Architecture by either uploading an XML file or entering an XML schema definition. The following example shows an XML message schema:

```

<?xml version="1.0"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" targetNamespace=
"http://xmlns.oracle.com/Common/schemas/COMPANY" xmlns="http://xmlns.
oracle.com/Common/schemas/COMPANY" elementFormDefault="qualified">
  <xsd:element name="Company" type="CompanyType"/>
  <xsd:complexType name="CompanyType">
    <xsd:sequence>
      <xsd:element name="Person" type="PersonType"/>
      <xsd:element name="Product" type="ProductType"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="PersonType">
    <xsd:sequence>
      <xsd:element name="Name" type="xsd:string"/>
      <xsd:element name="SSN" type="xsd:string"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ProductType">
    <xsd:sequence>
      <xsd:element name="Type" type="xsd:string"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

Then populate the message and manipulate its contents by using the PeopleCode XmlDoc class and built-in functions, which reflect the XML DOM.

Note. You can use the XmlDoc class to access inbound, rowset-based messages; however, the PeopleCode Message and Rowset classes handle the PeopleSoft native format more easily.

Use the XmlDoc class if *any* of the following is true:

- The message structure doesn't fit the PeopleSoft rowset model.
- The message data doesn't come from PeopleSoft database records.
- The third-party source or target node requires non-XML message data.

Although you can use the XmlDoc class to generate or process messages that use the SOAP protocol, the PeopleCode SoapDoc class is more efficient and is strongly recommended.

Note. Non-XML message data must be embedded in an XML wrapper, which you send and receive by using the XmlDoc class.

SOAP-Compliant Messages

The W3C SOAP specification defines synchronous transactions in a distributed web environment. SOAP is appropriate for Universal Description, Discovery, and Integration (UDDI) interactions, or to interact with SOAP-compliant servers.

You define a message in PeopleSoft Application Designer without inserting any records to define its structure, then populate the message and manipulate its contents by using the PeopleCode SoapDoc class and built-in functions, which comply with the W3C SOAP specification. The SoapDoc class is well-suited for messages that are populated with SOAP-compliant XML data.

SoapDoc complies with the W3C XML DOM specification. The SoapDoc class is based on the PeopleCode XmlDoc class, with some identical methods and properties. To send and receive SoapDoc messages, you must convert them to XmlDoc objects and use the XMLDoc built-in functions, SyncRequestXmlDoc and GetMessageXmlDoc. SoapDoc provides a property for handling the conversion easily.

Use the SoapDoc class if *all* of the following are true:

- The third-party source or target node requires SOAP-compliant messages.
- The third-party source or target node requires synchronous transactions.
- The message conforms to the SOAP specification.

See Also

[Chapter 7, "Sending and Receiving Messages," Generating and Sending Messages, page 137](#)

[Chapter 7, "Sending and Receiving Messages," Receiving and Processing Messages, page 148](#)

Non-XML Files

To send non-XML files through PeopleSoft Integration Broker to their destination, you must wrap them in the PeopleSoft non-XML message element, CDATA. However, when you send messages to third-party systems, the recipient systems may not be able to interpret that element.

If you are using the Publish or SyncRequest methods to send data, you can use the built-in function SetXMLDoc to remove the tags upon exiting the integration gateway or write a transformation to do so. If you choose neither of these options, the data remains in the wrapper through to the destination.

The following code example shows a non-XML file wrapped in the PeopleSoft non-XML message element, PsNonXml, for transport through PeopleSoft Integration Broker:

Note. The element PsNonXml is not case-sensitive.

```
<?xml version="1.0"?>
<AsyncRequest>
  <data PsNonXml="Yes">
    <![CDATA[<?xml version="1.0"?>101 123456789
12345678902 0510145 60094101First Bank First Bank 5200 University
000001 PPDDIRECT PAY020510020510000112345678000000162200000111 222
0000001000USA0000001 USA0000001 0000001110000001627123456
789131415511 0000001000 University 0123456780000
002 82000000020012345789000000001000000000001000 123456780000001
90000010000010000000200123457890000000010000000000010009999999999
999999999999999999999999999999999999999999999999999999999999999999
999999999999999999999999999999999999999999999999999999999999999999
999999999999999999999999999999999999999999999999999999999999999999
999999999999999999999999999999999999999999999999999999999999999999
999999999999999999999999999999999999999999999999999999999999999999
999999999999999999999999999999999999999999999999999999999999999999
11>
  </data>
</AsyncRequest>
```


You create messages using the Message Builder page in the PeopleSoft Pure Internet Architecture.

See Also

Chapter 5, "Understanding Supported Message Structures," PeopleSoft Rowset-Based Message Format, page 55

Chapter 5, "Understanding Supported Message Structures," Nonrowset-Based Message Structures, page 65

Chapter 6, "Managing Messages," page 75

Rowset-Based Message Parts

Rowset-based message parts provide all the ease of use of using rowsets, yet the generated XML message is industry standard and not PeopleSoft proprietary. Rowset-based message parts, like nonrowset-based parts, can only be part of a container type message.

These are the benefits of using Rowset-based parts:

- The XML schema generated is standard XML and not the PeopleSoft message format. Rowset-based message parts do not have a PSCAMA section, FieldTypes section, IsChanged attributes, and so forth.
- The message API for rowset-based parts is simple to use and understand.
- XML serialization and deserialization to and from part rowset is provided by Integration Broker framework.
- You can use a CopyRowSet type method to populate the rowset from another rowset (component rowset).

The following example shows a sample schema from a rowset-based message part:

```

<?xml version="1.0"?>
<xsd:schema elementFormDefault="qualified" targetNamespace="http://xmlns.
oracle.com/Enterprise/Tools/schemas/Part_1.V1" xmlns="http://xmlns.oracle.
com/Enterprise/Tools/schemas/Part_1.V1" xmlns:xsd="http://www.w3.org/
2001/XMLSchema">
  <xsd:element name="Part_1" type="Part_1_TypeShape"/>
  <xsd:complexType name="Part_1_TypeShape">
    <xsd:sequence>
      <xsd:element name="First_Part" type="First_PartMsgDataRecord_TypeShape"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="First_PartMsgDataRecord_TypeShape">
    <xsd:sequence>
      <xsd:element name="QE_ACNUMBER" type="QE_ACNUMBER_TypeDef"/>
      <xsd:element name="QE_WAYPOINT_NBR" type="QE_WAYPOINT_NBR_TypeDef"/>
      <xsd:element minOccurs="0" name="QE_BEARING" type="QE_BEARING_TypeDef"/>
      <xsd:element minOccurs="0" name="QE_RANGE" type="QE_RANGE_TypeDef"/>
      <xsd:element minOccurs="0" name="QE_ALTITUDE" type="QE_ALTITUDE_TypeDef"/>
      <xsd:element minOccurs="0" name="QE_LATITUDE" type="QE_LATITUDE_TypeDef"/>
      <xsd:element minOccurs="0" name="QE_LONGITUDE" type="QE_LONGITUDE_TypeDef"/>
      <xsd:element name="QE_HEADING" type="QE_HEADING_TypeDef"/>
      <xsd:element name="QE_VELOCITIES" type="QE_VELOCITIES_TypeDef"/>
      <xsd:element minOccurs="0" name="QE_NAVDESC" type="QE_NAVDESC_TypeDef"/>
    </xsd:sequence>
    <xsd:attribute fixed="R" name="class" type="xsd:string" use="required"/>
  </xsd:complexType>
  <xsd:simpleType name="QE_ACNUMBER_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_ACNUMBER is a number of length 10 with a decimal
        position of 0</xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:integer">
      <xsd:totalDigits value="10"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_WAYPOINT_NBR_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_WAYPOINT_NBR is a number of length 3 with a decimal
        position of 0</xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:integer">
      <xsd:totalDigits value="3"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_BEARING_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_BEARING is a character of length 10</xsd:⇒
documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:maxLength value="10"/>
      <xsd:whiteSpace value="preserve"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_RANGE_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_RANGE is a character of length 10</xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:maxLength value="10"/>
      <xsd:whiteSpace value="preserve"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_ALTITUDE_TypeDef">

```

```

    <xsd:annotation>
      <xsd:documentation>QE_ALTITUDE is a character of length 10</xsd:
documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:maxLength value="10"/>
      <xsd:whiteSpace value="preserve"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_LATITUDE_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_LATITUDE is a character of length 15
    </xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:maxLength value="15"/>
      <xsd:whiteSpace value="preserve"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_LONGITUDE_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_LONGITUDE is a character of length 15
    </xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:maxLength value="15"/>
      <xsd:whiteSpace value="preserve"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_HEADING_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_HEADING is a character of length 4
    </xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="MAG"/>
      <xsd:enumeration value="TRUE"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_VELOCITIES_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_VELOCITIES is a character of length 4
    </xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="ADC"/>
      <xsd:enumeration value="GPS"/>
      <xsd:enumeration value="INS"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="QE_NAVDESC_TypeDef">
    <xsd:annotation>
      <xsd:documentation>QE_NAVDESC is a character of length 30
    </xsd:documentation>
    </xsd:annotation>
    <xsd:restriction base="xsd:string">
      <xsd:maxLength value="30"/>
      <xsd:whiteSpace value="preserve"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:schema>

```

Nonrowset-Based Message Parts

A nonrowset-based message part schema is similar to a regular nonrowset-based message, however a nonrowset-based message part can be reused in multiple containers.

Message Container Structures

Message container structures hold rowset-based or nonrowset-based message part structures. All message parts assigned to a container must of the same type, rowset-based or nonrowset-based.

A message container is always a nonrowset-based message.

You create container messages using the Message Builder in the PeopleSoft Pure Internet Architecture.

See Also

[Chapter 5, "Understanding Supported Message Structures," Nonrowset-Based Message Structures, page 65](#)

[Chapter 6, "Managing Messages," page 75](#)

Example 1: XML Schema of a Container Message with Rowset-Based Message Parts

The following example shows a sample schema of a container message with three rowset-based message parts:

```

<?xml version="1.0"?>
<xsd:schema elementFormDefault="unqualified" targetNamespace="http://xmlns.
oracle.com/Enterprise/Tools/schemas/Part_Container.V1"
xmlns="http://xmlns.oracle.com/Enterprise/Tools/schemas/Part_Container.V1"
xmlns:Part_1.V1="http://xmlns.oracle.com/Enterprise/Tools/schemas/Part_1.V1"
xmlns:Part_2.V1="http://xmlns.oracle.com/Enterprise/Tools/schemas/Part_2.V1"
xmlns:Part_3.V1="http://xmlns.oracle.com/Enterprise/Tools/schemas/Part_3.V1"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/
Part_1.V1" schemaLocation="http://kcollin2042803:5000/PSIGW/PeopleSoft
ServiceListeningConnector?Operation=GetSchema&xsd=Part_1.V1"/>
  <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/
Part_3.V1" schemaLocation="http://kcollin2042803:5000/PSIGW/PeopleSoft
ServiceListeningConnector?Operation=GetSchema&xsd=Part_3.V1"/>
  <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/
Part_2.V1" schemaLocation="http://kcollin2042803:5000/PSIGW/PeopleSoft
ServiceListeningConnector?Operation=GetSchema&xsd=Part_2.V1"/>
  <xsd:element name="Part_Container" type="Part_ContainerType"/>
  <xsd:complexType name="Part_ContainerType">
    <xsd:sequence>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="Part_1" type="
Part_1.V1:Part_1_TypeShape"/>
      <xsd:element maxOccurs="10" minOccurs="0" name="Part_3" type="Part_3.V1:
Part_3_TypeShape"/>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="Part_2" type="
Part_2.V1:Part_2_TypeShape"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

Example 2: XML Schema of a Container Message with Nonrowset-Based Message Parts

The following example shows a sample schema from a container message that contains three nonrowset-based parts:

```

<?xml version="1.0"?>
<xsd:schema elementFormDefault="unqualified" targetNamespace="http://xmlns.
  oracle.com/Enterprise/Tools/schemas/NonRowSetContainer.v1"
xmlns="http://xmlns.oracle.com/Enterprise/Tools/schemas/NonRowSetContainer.v1"
xmlns:Part_One_NonRowset.v1="http://xmlns.oracle.com/Enterprise/Tools/
  schemas/Part_One.v1"
xmlns:Part_Three_NonRowset.v1="http://xmlns.oracle.com/Enterprise/Tools/
  schemas/Part_Two.v1"
xmlns:Part_Two_NonRowset.v1="http://xmlns.oracle.com/Enterprise/Tools/
  schemas/Part_Three.v1"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import schemaLocation="http://kcollin2042803:5000/PSIGW/PeopleSoft
    ServiceListeningConnector?Operation=GetSchema&xsd=Part_One_NonRowset.v1"/>
  <xsd:import schemaLocation="http://kcollin2042803:5000/PSIGW/PeopleSoft
    ServiceListeningConnector?Operation=GetSchema&xsd=Part_Two_NonRowset.v1"/>
  <xsd:import schemaLocation="http://kcollin2042803:5000/PSIGW/PeopleSoft
    ServiceListening Connector?Operation=GetSchema&xsd=Part_Three_Non
Rowset.v1"/>
  <xsd:element name="NonRowSetContainer" type="NonRowSetContainerType"/>
  <xsd:complexType name="NonRowSetContainerType">
    <xsd:sequence>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="Part_One_NonRowset"
        type="Part_One_NonRowset.v1:Part_One_TypeShape"/>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="Part_Two_NonRowset"
        type="Part_Two_NonRowset.v1:Part_Two_TypeShape"/>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="Part_Three_NonRowset"
        type="Part_Three_NonRowset.v1:Part_Three_TypeShape"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

Chapter 6

Managing Messages

This chapter provides an overview of managing messages and discusses how to:

- Add message definitions.
- Manage rowset-based messages.
- Manage nonrowset-based messages.
- Manage message parts.
- Reuse message parts.
- Manage container messages.
- View service operations that reference a message.
- Resolve inconsistencies in exported WSDL.
- Rename and delete message definitions.
- Delete messages during upgrade.

Understanding Managing Messages

This section provides an overview of messages.

Message Definitions

Message definitions provide the physical description of the data that is being sent, including fields, field types, and field lengths. You create message definitions in the PeopleSoft Internet Architecture.

Note. Messages are shapes that describe the contents of a service operation transaction. Unlike prior PeopleTools releases, messages do not contain any processing logic. All processing logic is defined in service operations, using service operation handlers.

Message Types

Four types of messages are available:

Rowset-based messages	For hierarchical data that is based on PeopleSoft records, you create a message definition by assembling records, organizing them into a hierarchy, and selecting fields from those records to include in the message. The result is a rowset that doesn't need to match an existing rowset structure in the application. Use the PeopleCode Rowset and operation classes to generate, send, receive, and process these messages.
Nonrowset-based messages	These messages can have virtually any structure and content. You create a message definition, but you do not insert any records. The message definition serves as a placeholder for the actual message. Use the PeopleCode XmlDoc and operation classes to generate, send, receive, and process these messages. If you're handling Simple Object Access Protocol (SOAP) compliant data, you can also use the SoapDoc class to generate and process these messages.
Container messages	<p>A container message is a nonrowset-based message that holds one or more part messages.</p> <p>A container message must contain all rowset-based messages <i>or</i> all nonrowset-based message parts.</p>
Message parts	Message parts are rowset-based messages or nonrowset-based messages that you designate as a part message, to be used in a container message.

The following table describes when to use a given message type:

Message Type	When to Use
Rowset-based message.	All PeopleSoft-to-PeopleSoft integrations.
Nonrowset-based message.	Integrations with third-party systems.
Container message with rowset-based message parts.	Exposing PeopleSoft services to third-party systems.
Container message with nonrowset-based message parts.	Exposing PeopleSoft services to third-party systems and need to provide nested parts.

Naming Conventions for Message Metadata

When naming the following message metadata, names cannot start with "xml," digits or special characters:

- Message names.
- Message aliases.
- Record aliases.
- Field aliases.

Message Record Structure

If a message handles PeopleSoft record data, that is, a rowset-based message, you must insert records in the message definition in an appropriate hierarchical structure.

However, if the message data doesn't map to a record hierarchy, do not insert any records. You supply or receive the data and its structure from an external source, using the PeopleCode XmlDoc or SoapDoc classes.

See [Chapter 7, "Sending and Receiving Messages," page 121](#).

Underlying Record Definitions

Records that you insert in a message definition have live references to the original record definitions. Any change that you make to an underlying record definition is automatically reflected by a change in the corresponding record in the message definition.

Fields Defined as Uppercase

If a message definition includes character fields that are defined as uppercase, then character data in those fields is automatically converted to uppercase when the message is received. This happens when the receiving PeopleCode inserts the message data in a rowset, and it overrides any previous changes in the data, including transformation and data translation.

Message Aliases and Message Versions

Message aliases are read-only once you save the message definition. As a result, once you create a message alias for a message definition, any subsequent versions of the message that you create use the original alias.

Restrictions for Modifying Messages

This section lists the conditions under which a message may become restricted and read-only. This list applies to all message types, including rowset-based messages, nonrowset-based messages, container messages, part messages, and subpart messages.

You cannot modify a message if one or more of the following conditions exists:

- The service to which a message is contained in a restricted service.
- The message is used internally by the system. For example, the delivered IB_GENERIC message is read-only and is used internally by the system.
- The message is referenced in the runtime tables.

To work around this, you must remove any entries in the runtime tables that reference the message.

- The message is used in a service operation where WSDL documents have been generated.
- The message is used in a service operation that has validation enabled.

Adding Message Definitions

This section discusses how to add a message definition to the system.

Understanding Adding Message Definitions

When you add a message definition to the system you first give the message a name and specify a message version. After doing so, you can then define additional aspects of the message definition.

Adding a Message Definition

The following example shows the Message Builder page that you use to name a new message definition and assign a version to it:

Message Builder - Add a New Value page

The following example shows the Message - Message Definition page that you use to configure a message after you create the message definition:

Message - Message Definition page when the message type is set to Nonrowset-based.

Different options appear on the Message–Message Definition page, depending on the type of message that you are defining.

By default the message type is set to *Nonrowset-based* as shown in the previous example.

If you select a *Rowset-based* or *Container message* type, additional options appear on the page with which you can work.

The following example shows the Message–Message Definition page when you select *Rowset-based* as the message type:

Message Definition

Schema

Message: ROWSET_TEST_MSG

Version: V1

Description:

Owner ID:

Comments:

Schema Exists: No

☐ Part Message

☐ Exclude Description in Schema

☐ Single Level 0 Row

☐ Include Namespace

☐ Suppress Empty XML Tags

Message Type

☒ Rowset-based
 ☐ Nonrowset-based
 ☐ Container

[View Records Only](#)
[View Included Fields Only](#)

[Add Record to Root](#)

Left | Right

[-] ROWSET_TEST_MSG

Message - Message Definition page when the message type is set to Rowset-based.

In the previous example, notice the additional options that display on the upper right portion of the page.

When you define a container message, it, too, has its own unique options that you define, as shown in the following example:

Message Definition

Schema

Message:

CONTAINER_TEST_MSG

Version:

V1

Alias:

Description:

Owner ID:

Comments:

Schema Exists:

No

☐

Part Message

Message Type


☐ Rowset-based


☐ Nonrowset-based

☒ Container

Add Parts

Parts

Customize | Find | View All |  First 1 of 1 Last

Message Name	Message Version	Sequence	Minimum Occurs	Maximum Occurs	*Unbound Maximum	
		0	0	1	N	

Messages - Message Definition page when the message type is set to Container.

Note. For asynchronous integrations, define a single message. For synchronous integrations, define two messages: one request message and one response message, unless the request and response have the same shape.

To add a message definition:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select the Add New Value tab.
3. From the Type drop-down list, select a message type to create. The options are:
 - *Container*. Select this value to add a container message to the system.
 - *Nonrowset*. Select this value to add a nonrowset-based message to the system.
 - *Part Nonrowset*. Select this value to add a nonrowset-based message part to the system.
 - *Part Rowset*. Select this value to add a rowset-based message part to the system.
 - *Rowset*. Select this value to add a rowset-based message to the system.
4. In the Message Name field, enter a name for the message.

The message name cannot exceed 30 characters. Do not include any spaces in the message name.

5. In the Version field, enter a version for the message.

The message version cannot exceed 30 characters. Do not include any spaces in the message version.

Accepted formats for the message version include:

- *Version_1.*
- *V1.*

6. Click the Add button.

The Messages - Message Definition page appears.

7. (Optional) In the Alias field, enter the name that the external system is expecting, if different from the value in the Message Name field.

This field appears only when you are defining nonrowset-based or container messages.

8. (Optional) Select the Message Parts check box if the message will be used as a message part in a container message definition.

9. (Optional) In the Description field, enter a description for the definition.

10. (Optional) From the Owner ID drop-down list box, select an owner for the definition.

The owner ID helps to determine the application team that last made a change to the definition. The values in the drop-down list box are translate table values that you can define in the OBJECTOWNERID field record.

11. (Optional) In the Comment field, enter any pertinent comments about the definition.

12. The next steps to adding a message definition depend on the type of message definition that you are creating:

- *Rowset-Based Message or Message Part.* You must add a root record to the definition before you can save it.

See [Chapter 6, "Managing Messages," Managing Rowset-Based Messages, page 81.](#)

- *Nonrowset-Based Message or Message Part.* The message definition is complete and you can click the Save button to save the changes. You can now add an XML message schema to the definition.

See [Chapter 6, "Managing Messages," Managing Nonrowset-Based Messages, page 93.](#)

- *Container Message.* You must add at least one message part to the definition before you can save the changes.

See [Chapter 6, "Managing Messages," Managing Container Messages, page 102.](#)

Managing Rowset-Based Messages

This section provides an overview of managing rowset-based message definitions and discusses how to:

- View rowset-based message structures.

- Insert root records.
- Insert child and peer records.
- Specify record aliases.
- Delete records.
- Exclude fields from messages.
- Specify field name aliases.
- Managing XML message schemas for rowset-based messages.
- Enforce message record and field aliases in generated WSDL.

Understanding Managing Rowset-Based Messages

This section provides overview information about managing rowset-based message definitions.

Root Records

When you create a rowset-based message, you must at a minimum insert a root record (level 0) into the definition.

Records and Record Fields

You create and modify records and record fields in PeopleSoft Application Designer.

Note. Avoid using derived/work records in messages. Work records don't behave like regular records when used with PeopleCode rowset methods. A good alternative is to use dynamic views.

Record and Record Field Aliases

Record and field aliases are optional parameters that are used for schema and XML generation.

When record and field aliases are used, the receiver of a message sees the alias names instead of the actual record and field names. The alias names are seen in the message definition, in message schemas, and on generated runtime XML that is sent to the receiver.

Note that the sender still codes to the actual record and field name.

XML Schema for Rowset-Based Messages

When you create or make changes to a rowset-based message definition, the system automatically generates message schema.

Viewing Rowset-Based Message Structures

This section discusses the three ways to view the structure of rowset-based message definitions. This section discusses how to:

- View the entire structure of rowset-based message definitions.
- View only the records in rowset-based message definitions.
- View only included records fields in rowset-based message definitions.

Viewing the Entire Structure of Rowset-Based Message Definitions

By default, when you open a rowset-based message definition PeopleSoft Integration Broker displays the complete message definition structure. The following graphic shows the complete message definition structure for the message *QE_FLIGHTPLAN*.



Complete message structure for the message QE_FLIGHTPLAN

The system displays the definition in a tree structure. Use the plus (+) and minus (-) buttons to expand and collapse the tree to view all records, subrecords and fields (both included and excluded) in the definition.

Record fields that are included in the message definition have a check next to them. Record fields that are not included in the message definition have a box next to them. In the previous graphic, *QE_RANGE* is the only record field that is not included in the *QE_FLIGHTPLAN* message definition.

You can view the record or field properties by clicking the record or field name.

To view the entire structure of a rowset-based message:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select a message to view.

The Messages-Message Definitions page appears and the entire structure of the message appears in a tree view.

3. Expand and collapse the tree to view the message structure.

Viewing Only the Records in Rowset-Based Message Definitions

You can use the Records Only page (IB_MESSAGE_TR_SEC) to view the records and subrecords in a rowset-based message definition. The following graphic shows the Records Only page:

Records Only



Records and subrecords for the QE_FLIGHTPLAN message displaying in the Records Only page

To view only the records in a rowset-based message:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select a message to view.

The Messages-Message Definitions page appears.

3. Just above the tree structure view of the message structure, click the View Records Only link.

The Records Only page appears and the records and subrecords in the message definition display in a hierarchical view.

4. Click the Return button to return to the Messages-Message Definitions page.

Viewing Only Included Record Fields in Rowset-Based Message Definitions

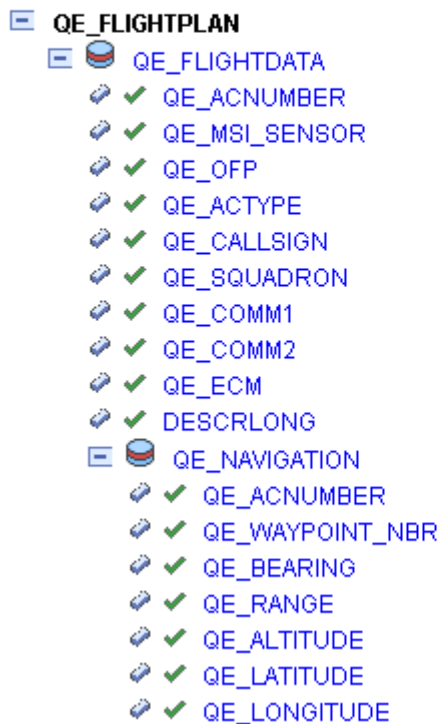
You can use the Included Fields Only page (IB_MESSAGE_TR_SEC) to view the included records fields for a rowset-based message definition. The following graphic shows a sample of the records and their included fields contained in the QE_FLIGHTPLAN message definition:

Included Fields Only

Message: QE_FLIGHTPLAN

Version: VERSION_1

Left | Right



Records and their included fields for the QE_FLIGHTPLAN message displaying in the Included Fields Only page.

Included fields are denoted by a green icon in the shape of a check mark.

To view included record fields in a rowset-based message:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select a message to view.

The Messages—Message Definitions page appears.

3. Just above the tree structure view of the message structure, click the View Included Fields Only link.

The Included Fields Only page appears and included records fields contained in the message display.

4. Click the Return button to return to the Messages-Message Definitions page.

Inserting Root Records

You insert a root record into a rowset-based message definition using the Add New Record page (IB_MESSAGE_TOP_SEC) shown in the following example:

Add New Record

New Record Name



Add New Record page

Note. There can only be one root record defined for each rowset-based message.

To insert a root record into a definition:

1. Access the Add New Record page.

Select PeopleTools, Integration Broker, Integration Setup, Messages. The Messages-Message Definitions page appears. Click the Add Record to Root link.

2. In the New Record Name field, enter the name of the record to add, or click the Lookup button to search for and select one.
3. Click the OK button.

The root record appears in the tree structure. Click the plus button to expand the tree and view fields that are associated with the record.

You can exclude fields from the record and specify field name aliases. Steps for performing these actions are described elsewhere in this chapter.

See [Chapter 6, "Managing Messages," Excluding Fields from Messages, page 89](#).

See [Chapter 6, "Managing Messages," Specifying Field Name Aliases, page 89](#).

Inserting Child and Peer Records


You insert child and peer records into a rowset-based message definition using the Message Record Properties page (IB_MESSAGE_REC_SEC) shown in the following example:

Message Record Properties





Record: QE_FLIGHTDATA
Alias Name: QE_FLIGHTDATA

▼ Action

☐ Delete Record
☐ Add Record

New Record Name: 

☐ Peer Record
☒ Child Record

▼ Field List Customize | Find |   First  1-10 of 10  Last

Field Name	Include	Alias
QE_ACNUMBER	<input checked="" type="checkbox"/>	<input type="text"/>
QE_MSI_SENSOR	<input checked="" type="checkbox"/>	<input type="text"/>
QE_OFF	<input checked="" type="checkbox"/>	<input type="text"/>
QE_ACTYPE	<input checked="" type="checkbox"/>	<input type="text"/>
QE_CALLSIGN	<input checked="" type="checkbox"/>	<input type="text"/>
QE_SQUADRON	<input checked="" type="checkbox"/>	<input type="text"/>
QE_COMM1	<input checked="" type="checkbox"/>	<input type="text"/>
QE_COMM2	<input checked="" type="checkbox"/>	<input type="text"/>
QE_ECM	<input checked="" type="checkbox"/>	<input type="text"/>
DESCRLONG	<input checked="" type="checkbox"/>	<input type="text"/>

Message Record Properties page

To insert a child or peer record into a rowset-based message definition:

- Access the Message Record Properties page.
 (Select PeopleTools, Integration Broker, Integration Setup, Messages. The Messages-Message Definitions page appears. Click the linked record name to which to add a peer or child record.)
- In the Action group box, select Add Record.
- In the New Record Name field, enter the name of the record to add, or click the Lookup button to search for and select a name.
- Select whether to add the record as a peer record or a child record.
 - Select Peer Record to add the record as a peer.
 - Select Child Record to add the record as a child.
- Click the OK button.

The Messages-Message Definitions page appears.

6. Click the Save button.

Specifying Record Aliases

You can specify aliases of the root, peer, and child records that you insert into rowset-based messages using the Message Record Properties page.

To specify a record alias:

1. Access the Message Record Properties page.
(Select PeopleTools, Integration Broker, Integration Setup, Messages. The Messages-Message Definitions page appears. Click the linked record name to which to specify an alias.)
2. In the Alias Name field, enter an alias name.
3. Click the OK button.

The Messages-Message Definitions page appears.

4. Click the Save button.

See Also

Chapter 6, "Managing Messages," Message Aliases and Message Versions, page 77

Deleting Records

This section describes how to delete records from a rowset-based message.

Note. Deleting the root record deletes all records and their associated fields that are inserted into the definition.

To delete a record:

1. Access the Message Record Properties page.
(Select PeopleTools, Integration Broker, Integration Setup, Messages. The Messages-Message Definitions page appears. Click the name of the record to delete.)
2. In the Action group box, select Delete Record.
3. Click the OK button.

The Messages-Message Definitions page appears.

4. Click the Save button.

Excluding Fields from Messages

You can exclude record fields from inclusion in a rowset-based message definition using the Message Field Properties page.

After you exclude fields from records, the tree view of the message definition on the Message Definitions page displays a red icon in the shape of box next to the excluded fields. The following example shows that the field *QE_ACNUMBER*, has been excluded from the *QE_FLIGHTDATA* record.



Fields excluded from the QE_FLIGHTDATA record

To exclude fields:

1. Access the Message Field Properties page.
 - a. Select PeopleTools, Integration Broker, Integration Setup, Messages. The Messages-Message Definitions page appears.
 - b. Click the plus button (+) to expand the record tree structure, and locate the field to exclude from the definition.
 - c. Click the name of the field to exclude.

The Message Field Properties page appears.

2. Click the name of the field to exclude.

3. Clear the Include check box.

4. Click the OK button.

The Messages-Message Definitions page appears.

5. Click the Save button.

Specifying Field Name Aliases

Use the Message Field Properties page to specify field name aliases.

To specify a field name alias:

1. Access the Message Field Properties page.
 - a. Select PeopleTools, Integration Broker, Integration Setup, Messages. The Messages-Message Definitions page appears.
 - b. Click the plus button (+) to expand the record tree structure, and locate the field to exclude from the definition.
 - c. Click the name of the field for which to specify a field name alias.

The Message Field Properties page appears.

2. In the Alias Name field, enter an alias name.
3. Click the OK button.

The Messages–Message Definitions page appears.

4. Click the Save button.

Managing XML Message Schemas for Rowset-Based Messages

This section discusses how to:

- View XML message schemas for rowset-based messages.
- Exclude descriptions in XML message schemas.
- Choose the number of level 0 rows to include in generated XML message schema.
- Include namespaces in generated XML message schemas.
- Suppress empty XML tags in message schema.

Viewing XML Message Schemas for Rowset-Based Messages

PeopleSoft Integration Broker automatically generates message schema for rowset-based messages when you save the message definition.

After you save a message definition on the Messages-Message Definitions page, click the Schema tab to view the generated XML message schema.

Excluding Descriptions in XML Message Schemas

Message data that is used to define services can have actual database record and field names in the generated XML message schema. PeopleSoft Integration Broker provides an option where you can exclude descriptions in generated message schemas so that sensitive information is not exposed.

The Messages–Message Definitions page features an Exclude Descriptions in Schema box that enables you to suppress descriptions in generated schema.

To exclude descriptions in XML message schemas:

1. Access the Messages—Message Definition page (PeopleTools, Integration Broker, Integration Setup, Messages).
2. Select the Exclude Description in Schema box.
3. Save the changes.

See [Chapter 6, "Managing Messages," Managing XML Message Schemas for Rowset-Based Messages, page 90.](#)

Choosing the Number of Level 0 Rows to Include in Generated XML Message Schema

You can choose to include a single level 0 row in the generated schema or all level 0 rows in the generated schema.

When you select the Single Level 0 Row check box, PeopleSoft Integration Broker includes a single level 0 row in the XML message schema when you Save the definition. If this box is not selected, then the system includes all level 0 rows in the message in the generated schema.

By default the Single Level 0 Row check box is not selected.

If you check the Single Level 0 Row check box to generate schema with one level 0 row, the level 0 row included in the schema is the first level 0 row the system encounters in the message.

Including Namespaces in Generated XML Message Schemas

PeopleSoft Integration Broker enables you to include a namespace in XML message schemas that you generate for rowset-based messages.

When working with a rowset-based message type, the Messages—Message Definition page displays an Include Namespace box. When the Include Namespace check box is selected, you can specify a namespace to include in the generated schema on the Messages-Schema page.

The following example shows the Namespace field as it appears on the Messages—Schema page:

The screenshot shows the 'Messages-Schema' page with two tabs: 'Message Definition' and 'Schema'. The 'Schema' tab is active. Below the tabs, the following fields are displayed:

- Message:** QE_ASYNC_TEST
- Version:** VERSION_1
- Namespace:** http://xmlns.oracle.com/Enterprise/Tools/schemas/QE_ASYNC_TEST.VER

Below these fields, the label **Schema:** is visible.

The Messages—Schema page with the default namespace from the Service Configuration page populating the Namespace field.

By default the Namespace field is populated with the namespace defined on the Service Configuration page, however you can change the namespace to use in the message schema as required.

To include a namespace in generated schema:

1. Access the Messages—Message Definition page (PeopleTools, Integration Broker, Integration Setup, Messages).
2. Check the Include Namespace box.
3. Click the Schema tab.

The Messages—Schema page appears. By default the namespace as defined on the Service Configuration page populates the Namespace field.

4. In the Namespace field enter the namespace to use in the generated XML message schema.
5. Click the Message Definition tab.
6. Save your changes.

The system generates the message schema and includes the namespace specified.

Suppressing Empty XML Tags in Message Schema

PeopleSoft Integration Broker enables you to suppress empty XML tags in message schema of rowset-based messages.

The Messages-Message Definition page features a Suppress Empty XML Tags check box.

When you select this box, message schema generated for the message will not include any XML tags that contain empty or Null values.

Enforcing Message Record and Field Aliases in Generated WSDL

PeopleSoft Integration Broker enables you to enforce record and field aliases in generated WSDL.

The Service Configuration page features a WSDL Generation Alias Check drop-down list that enables you to set a system check level for aliases on message definition records and fields.

You can set the following check levels:

<i>Check Level</i>	<i>Description</i>
Error.	If the system encounters a message definition without proper record and field aliases, it displays an error and it will not generate a WSDL document.
None.	Default. The system creates a WSDL document regardless of whether message records and fields are aliased or not.
Warning.	As the system creates a WSDL document it displays a warning it encounters messages definitions that do not have complete aliasing for records and/or fields. If the system encounters records or fields that do not have aliases defined, you can continue to generate the WSDL document or terminate the generation of the WSDL document.

To enforce message record and field aliases in generated WSDL:

1. Access the Service Configuration page (PeopleTools, Integration Broker, Configuration, Service Configuration).
2. From the WSDL Generation Alias Check drop-down list, select a value. The valid options are:
 - *Error.*
 - *None.*
 - *Warning.*

Managing Nonrowset-Based Messages

This section provides an overview of managing nonrowset-based messages and discusses how to:

- Add XML message schemas to nonrowset-based messages.
- Edit nonrowset-based XML message schemas.

Understanding Managing Nonrowset-Based Messages

After you create a nonrowset-based message definition, you do not need to complete any additional configuration steps for the definition, except to add an XML schema. The XML schema describes the data to be sent, and includes the field names, data types, field lengths and so on.

You may add or replace message schemas that are referenced by nonrowset-based messages in runtime tables. However, once you change a message schema for a nonrowset-based message, you must adjust the message for a successful integration.

See Also

Chapter 6, "Managing Messages," Adding Message Definitions, page 78

Adding XML Message Schemas to Nonrowset-Based Messages

To add an XML message schema to nonrowset-based messages:

Note. You cannot regenerate message schemas for messages that are defined as part of a restricted service.

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select the nonrowset-based definition to which you want to add an XML schema.

The Messages - Message Definitions page appears.

3. Click the Schema tab.

4. Click the Add Schema button.

The Schema page appears.

5. Add the XML schema to the message.

You can add the schema to the message in two ways:

- Click the Upload Schema From File button to browse for and upload a schema that you have already saved to a file.
- Enter the XML schema in the Schema text box that is provided.

6. Click the Save button.

If you define the message as a message part, you must supply a schema to save the message. All message parts require a schema at save time.

Editing Nonrowset-Based XML Schemas

After an XML message schema is added to a nonrowset-based message, you can edit the schema using the Schema page.

Note. You cannot regenerate message schemas for messages that are defined as part of a restricted service.

To edit nonrowset-based XML message schemas:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select the nonrowset-based definition that contains the schema that you want to edit.

The Messages - Message Definitions page appears.

3. Click the Schema tab.

The Schema page appears and displays the existing XML message schema for the definition.

4. Click the Edit Schema button.
5. In the Schema text box, make your changes and additions to the XML schema.
6. Click the Save button.

Deleting Nonrowset-Based XML Message Schemas

This section discusses how to:

- Delete individual nonrowset-based XML message schemas.
- Delete nonrowset-based XML message schema in bulk.

Deleting Individual Nonrowset-Based XML Message Schemas

Use the Messages-Schema page (IB_MESSAGE_BUILD2) to delete individual nonrowset-based XML message schema.

To delete an individual nonrowset-based XML message schema:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.

The Messages-Message Definitions page appears.

2. Click the Schema tab.

The Messages-Schema page appears.

3. Click the Delete Schema button.

Deleting Nonrowset-Based XML Message Schemas in Bulk

To delete one or more nonrowset-based XML message schemas, use the Message Schemas page (IB_HOME_PAGE6) in the Service Administration component (IB_HOME_PAGE). The following example shows the Message Schemas page:

WSDL Services Service Operations Messages **Message Schemas** Queues Routings

Service System Status: Development

Delete

Container, part, and rowset-based message schemas cannot be deleted.

Message Name:

Search

Select	Message Name	Version	Results
<input type="checkbox"/>			

Delete

Service Administration—Message Schemas page

To delete nonrowset-based XML message schemas in bulk:

1. Select PeopleTools, Integration Broker, Service Utilities, Service Administration.
2. Click the Message Schemas tab.

3. Choose the schema or schemas to delete.

To delete an individual schema, in the Message Name field enter the name of the message that contains the schema to delete.

To delete more than one schema, click the Search button to display all nonrowset-based message in the system than contain schema.

The message or messages appear in the Messages with Schema grid.

4. In the Select column, check the box next to each message name that contain schema you want to delete.

If deleting multiple schemas, use the forward and backward arrows and/or the Last and First links to page through the results and select schemas to delete.

5. Click the Delete button.

Managing Message Parts

This section discusses how to create message parts.

Understanding Message Parts

Message parts are individual message definitions that get used in container messages.

While message parts can be rowset-based or nonrowset-based, the advantage of using message parts comes when working with rowset-based messages. By using nonrowset-based message parts, you cannot take advantage of PeopleSoft Integration Broker's framework for creating message definitions, use of PeopleCode, serialization, porting, and so on. The following table highlights some of the advantages of using rowset-based message parts:

<i>Rowset-Based Message Parts</i>	<i>Nonrowset-Based Message Parts</i>
You can use the PeopleSoft Pure Internet Architecture to build rowset-based message parts.	You cannot use the PeopleSoft Pure Internet Architecture to build nonrowset-based message parts.
Message schema is automatically generated for rowset-based messages.	You must generate message schema for nonrowset-based message parts.
The mapping from XML to rowset is managed by the framework.	You must use the XMLDoc class to manipulate nonrowset-based message content. In addition, you must manually map the XML into XMLDoc for the parts.

Container messages are always nonrowset-based. So, if you use a container message that contains rowset-based part messages, the container messages sends XML that contains none of the standard PeopleSoft message XML structures, such as PSCAMA, FieldTypes, and so on. However, you can use the rowset-based classes and methods to populate and read the structure of each part message.

Creating Part Messages

To create a part message, create a standard rowset-based or nonrowset-based message and click the Part Message box on the Message Definition page.

When the service system status is set to *Production*, once a message is used in a container message, you cannot alter the message while it is associated with a container message.

You must generate schemas for all part messages before you can save them.

Schemas for rowset-based messages are automatically built when the message is saved. Schemas for nonrowset-based parts must be added in order to save the message.

See Also

[Chapter 6, "Managing Messages," Adding Message Definitions, page 78](#)

[Chapter 6, "Managing Messages," Managing Container Messages, page 102](#)

Distinguishing Blank from Zero in Rowset-Based Part Messages

The Message Definitions page features a Message Part Default Indicator field that appears when you select or define a rowset-based message part.

When you check the box, XML that has a value of 0 (zero) passed in an integer field, when serialized to a rowset, causes the IsChanged property flag on the field to set to *True*.

By default an integer field has a value of 0. So if a 0 or <blank> is passed in a field, the end result is a 0 when accessing the field via the rowset. However, if you check the Message Part Default Indicator box the IsChanged property on such a field is set to *True*, meaning that a 0 (zero) was passed in the field.

Reusing Rowset-Based Message Parts

This section discusses how to:

- Reuse rowset-based message parts by reference.
- Reuse rowset-based message parts by copy.

Understanding Reusing Rowset-Based Message Parts

PeopleSoft Integration Broker enables you to reuse rowset-based message parts by referencing another message part or by copying another message part.

Note. You cannot reuse message parts at Level 0.

Referencing Message Parts

A reference to a message part is read-only in the message part where it is referenced. To make changes to a referenced message part, you must make the changes to the referenced message part directly. All changes are then propagated to every message in which the message part is referenced.

Copying Message Parts

If you copy a message part, the system copies all records and fields and displays them at the record level. The records and fields become permanent to the new message and you can edit all records and fields directly in the message where the copied part exists. Changes you make to a copied message part are not propagated to other copies of the message part that may exist. You must make changes to a copied message part, you do so manually to each message part that you want to change.

Reusing Rowset-Based Message Parts by Reference

This section discusses how to:

- Reuse a message part by reference.
- Check for recursion.
- View referenced message part information.
- View where message parts are referenced.
- Modify referenced message parts.
- Delete referenced message parts

Reusing a Message Part by Reference

To reuse a message part by reference:

1. Create a rowset-based message part.
2. Add records to the message part per your requirements. At a minimum, you must add a Level 0 record.
3. In the tree view of the message part definition, click the name of the record off of which to add the reused message part.

The Message Record Properties page appears.

4. In the Action box, click Add Part Reference.
5. Identify if the message part is a peer part reference or a child part reference.

If you are working off the Level 0 record, these fields are read only and Child Part Reference is selected by default.

6. In the Reference Message Version field, click the Lookup button to select the message that the system should reference.

- Click the OK button.

The Messages-Message Definition page appears.

The reference part is identifiable in the tree view for the message part definition by the highlighted color on the root record of the referenced part. Since this is a reference, you can only view the reference part data structure. To make any modifications to the referenced part, you must open the message part directly and make your changes there. The system will propagate the changes to all messages that reference the message part.

Checking for Recursion

By default, the system checks up to 20 levels for recursion to ensure that no message part references itself. You can modify this setting to check for recursion in as few as three levels of records and as many as 50 levels.

This parameter is set in the Service Operations Monitor on the System Setup Options page (IB_SYSTEMSETUP). The following example shows the page:

System Setup Options

Rowset-based message parts maximum recursion level check.

Message builder depth limit:

Enable runtime Profile information for Sync/Async processing

☐ **IB Profile Status On**

System Setup Options page used to set the level of recursion checking for referenced message parts

To modify the recursion checking level:

- Access the System Setup Options page (select PeopleTools, Integration Broker, Configuration, System Setup Options)
- In the Message Builder Depth Limit field, enter a value between 3 and 50.
- Click the Save button.

Viewing Referenced Message Part Information

A referenced message part appears highlighted in the tree structure for a message. The following example shows that the message record *QE_ARMAMENT* is a referenced message part in the message *FLIGHTDATA*.

Message Definition

Schema

Message:FLIGHTDATA

Version:V1

Alias:

Description:

Owner ID:

Comments:PART MESSAGE

Schema Exists:Yes

☒Part Message

☐Message Part Default Indicator

☐Exclude Description in Schema

☐Suppress Empty XML Tags

Message Type

☒Rowset-based

☐Nonrowset-based

☐Container

[Part References](#)

[View Records Only](#)

[View Included Fields Only](#)

[Add Record to Root](#)

Left | Right

- FLIGHTDATA

QE FLIGHTDATA - [FlightData]

QE ACNUMBER - [ACNumber]

QE MSI SENSOR - [MSISensor]

QE OFP - [OFP]

QE ACTYPE - [ACType]

QE CALLSIGN - [CallSign]

QE SQUADRON - [Squadron]

QE COMM1 - [Comm1]

QE COMM2 - [Comm2]

QE ECM - [ECM]

DESCRLONG - [Desc]

QE NAVIGATION - [Navigation]

QE RADAR PRESET - [RADARPreset]

QE ARMAMENT - [Armament]

In this example, QE_ARMAMENT is highlighted and is therefore a referenced message part in the FLIGHTDATA message.

Note. You can make changes to a message part that is referenced in another part or subpart, as long as the message part is not in the runtime tables, has not been exported as WSDL, or is a restricted message.

If you click a referenced message part, the Part Reference page (IB_MESSAGE_PARTS2) appears, as shown in the following example:

Part Reference

Message Name:

ARMAMENT

Message Version:

v1

Record:

QE_ARMAMENT

Alias Name:

Armament

[View Definition](#)

☐ Delete Part Reference

Part Reference page

You can use the Part Reference page to view general information about the referenced message part as well as view the complete definition for the message part.

You can also use this page to delete the reference to the message part. Deleting a part reference is discussed elsewhere in this section.

See [Chapter 6, "Managing Messages," Deleting Referenced Message Parts, page 102.](#)

To view the complete message definition for a referenced message part, on the Part References page click the View Definition link. The Messages-Message Definitions page for the referenced message part appears, like the one shown in the following example:

Message Definition

Schema

Message:

ARMAMENT

Version:

v1

Alias:

Armament

Description:

Owner ID:

Comments:

Schema Exists:

Yes

☒ Part Message

☐ Message Part Default Indicator

☐ Exclude Description in Schema

☐ Suppress Empty XML Tags

Message Type

☒ Rowset-based

☐ Nonrowset-based

☐ Container

[Sub-part References](#)

[View Records Only](#)

[View Included Fields Only](#)

[Add Record to Root](#)

Left | Right

ARMAMENT

[QE_ARMAMENT - \[Armament\]](#)

Message definition for the Armament message part.

You can use the page to view details about the record structure, view the generated message schema, and so on.

Modifying Referenced Message Parts

To make a modification to a referenced message part, you must make the modification in the message part definition itself. You cannot modify a referenced message part from a message in which it is referenced.

Deleting Referenced Message Parts

You delete a referenced message part in the message where the part is referenced.

To delete a referenced message part:

1. Open the message definition that contains the referenced message part to delete.
2. In the tree structure view of the message definition, click the name of the referenced message part to delete.

The Part Reference page appears.

3. Check the Delete Part Reference box.
4. Click the OK button.

Managing Container Messages

This section provides an overview of managing container messages and discusses how to:

- Add message parts to container messages.
- Add and get container message attributes.
- Generate XML message schemas for container messages.

Understanding Managing Container Messages

Container messages are used for those situations where you want to produce XML that contains none of the standard PeopleSoft messaging XML structures, such as PSCAMA, FieldType, and so on, yet you want to use PeopleSoft rowset-based classes and methods to populate and read the message structure.

Container messages:

- Hold one or more message parts.
- Are always nonrowset-based messages.

The message parts you add to a container message must all be rowset-based message parts, or all nonrowset-based message parts.

When working with container messages that contain rowset-based message, PeopleSoft Integration Broker enables you to add attributes and attribute values to the container messages. Adding attributes to container messages enables you to provide integration partners with data and information, without the need to modify or provide the information in the container message definition or in any of the part message definitions.

Understanding Including Level 0 Rows for Message Parts in Container Messages

When you are working with a container message that holds rowset-based message parts, you can specify the minimum and the maximum number of level 0 rows for each message part.

When you are working with a container message, the Message Definition page, the Parts grid displays the following fields:

Minimum Occurs	The value you enter determines the minimum number of level 0 rows in the message part to include in the container message.
Maximum Occurs	<p>The value you enter in this field determines the maximum number of level 0 rows in the message part to include in the container message.</p> <p>By default the Maximum Occurs value is set to 1 to represent the single row of data on the level 0 record defined on the part (typical for component processing). However, for the case where more than one row of data is to be passed on the level 0 record, for example there is a single record defined on the message part and you want to send x number of rows of data, then increase the Maximum Occurs value to the value of x (the number of rows of data you are sending) or set the Unbounded Maximum field to Y.</p>
Maximum Unbounded	<p>The value you select determines if the system includes unlimited level 0 rows from the message part in the container message. The valid values are:</p> <ul style="list-style-type: none"> • <i>Y</i>. The number of level 0 rows from the part message that the system includes in the container messages is unlimited, or unbound. When you select this option all rows from a part message are included in the container message. • <i>N</i>. (Default) The number of level 0 rows from the part message that the system includes in the container message is limited. You must enter the maximum number of rows from the part message to include in the container message in the Maximum Occurs field.

Example: Message XML when Maximum Occurs is Set to a Non-Default Value

The section contains an example of a container message with three message parts: *QE_PART_1*, *QE_PART_2*, and *QE_PART_3*.

Each part contains only one record (level 0 record).

As described earlier in this section, the Maximum Occurs value is 1 by default.

In the following example *QE_PART_1* is defined on the container with a Maximum Occurs value of 2 and what is actually published in this case is two rows on the level 0 record for *QE_PART_1*, as shown in the example.

```

<?xml version="1.0"?>
<QE_PARTS xmlns="http://xmlns.oracle.com/Enterprise/Tools/schemas/
QE_PARTS.VERSION_1">
  <QE_PART_1>
    <QE_NAVIGATION class="R" xmlns="http://xmlns.oracle.com/Enterprise/
Tools/schemas/QE_PART_1.VERSION_1">
      <QE_ACNUMBER>100</QE_ACNUMBER>
      <QE_WAYPOINT_NBR>10</QE_WAYPOINT_NBR>
      <QE_BEARING/>
      <QE_RANGE/>
      <QE_ALTITUDE/>
      <QE_LATITUDE/>
      <QE_LONGITUDE/>
      <QE_HEADING/>
      <QE_VELOCITIES/>
      <QE_NAVDESC/>
    </QE_NAVIGATION>
  </QE_PART_1>
  <QE_PART_1>
    <QE_NAVIGATION class="R" xmlns="http://xmlns.oracle.com/Enterprise/
Tools/schemas/QE_PART_1.VERSION_1">
      <QE_ACNUMBER>100</QE_ACNUMBER>
      <QE_WAYPOINT_NBR>20</QE_WAYPOINT_NBR>
      <QE_BEARING/>
      <QE_RANGE/>
      <QE_ALTITUDE/>
      <QE_LATITUDE/>
      <QE_LONGITUDE/>
      <QE_HEADING/>
      <QE_VELOCITIES/>
      <QE_NAVDESC/>
    </QE_NAVIGATION>
  </QE_PART_1>
  <QE_PART_2>
    <QE_RADAR_PRESET class="R" xmlns="http://xmlns.oracle.com/Enterprise/
Tools/schemas/QE_PART_2.VERSION_1">
      <QE_ACNUMBER>2</QE_ACNUMBER>
      <QE_RADAR_SELECTION>1</QE_RADAR_SELECTION>
      <QE_RADARMODE>TWS</QE_RADARMODE>
      <QE_RADAR_OPERMODE>N</QE_RADAR_OPERMODE>
      <QE_BARSCAN>4B</QE_BARSCAN>
      <QE_RADARRANGE>40</QE_RADARRANGE>
      <QE_TGTAGE>8</QE_TGTAGE>
      <QE_CHANNELSET>B</QE_CHANNELSET>
      <QE_AZIMUTH>80</QE_AZIMUTH>
      <QE_PRF>H</QE_PRF>
    </QE_RADAR_PRESET>
  </QE_PART_2>
  <QE_PART_3>
    <QE_ARMAMENT class="R" xmlns="http://xmlns.oracle.com/Enterprise/Tools/
schemas/QE_PART_3.VERSION_1">
      <QE_ACNUMBER>2</QE_ACNUMBER>
      <QE_STATION_NBR>1</QE_STATION_NBR>
      <QE_AGMODE>CCIP</QE_AGMODE>
      <QE_BIT>SBIT</QE_BIT>
      <QE_WEAPONSPECS/>
    </QE_ARMAMENT>
  </QE_PART_3>
</QE_PARTS>

```

Adding Message Parts to Container Messages

This section discusses how to add message parts to container messages.

Use the Messages - Message Definitions page to add message parts to a container message. To access the page, select PeopleTools, Integration Broker, Integration Setup, Messages. The following example shows this page:

Message Definition

Schema

Message: CONTAINER_MSG
Version: V1
Alias:
Description:
Owner ID:
Comments:

Schema Exists: No
☐ Part Message

Message Type
☐ Rowset-based
☐ Nonrowset-based
☒ Container

[Add Parts](#)

Parts						
Message Name	Message Version	Sequence	Minimum Occurs	Maximum Occurs	*Unbound Maximum	
		0	0	1	N	

Messages - Message Definitions page for a container message definition

When you click the Add Parts link to specify a message, version, and message type to add, the Add Parts page (IB_MESSAGE_PARTS) appears as shown in the following example:

Add Parts

Message Name:

Message Version:

☒ Show Rowset-based Parts
☐ Show Nonrowset-based Parts

Add Parts page

For a message definition to be available for you to add to a container message, you must have selected the Message Parts check box when you created the message definition. In addition, container messages can contain only all rowset-based messages or all nonrowset-based messages.

After you add message parts to a container message, the Messages - Message Definitions page displays and the message parts that you have added to the message are listed in the Parts grid. The following examples show of three message parts that are added to a container message:

Message Definition

Schema

Message:CONTAINER_MSG

Version:V1

Alias:

Description:

Owner ID:

Comments:

Schema Exists:No

☐ Part Message

Message Type

☐ Rowset-based

☐ Nonrowset-based

☒ Container

Add Parts

Container Attributes

Parts

Customize | Find | View All | | | First 1-3 of 3 Last

Message Name	Message Version	Sequence	Minimum Occurs	Maximum Occurs	*Unbound Maximum	
QE PART 1	VERSION_1	<div>1</div>	<div>0</div>	<div>1</div>	<div>N</div>	<div></div>
QE PART 2	VERSION_1	<div>2</div>	<div>0</div>	<div>1</div>	<div>N</div>	<div></div>
QE PART 3	VERSION_1	<div>3</div>	<div>0</div>	<div>1</div>	<div>N</div>	<div></div>

A container message that contains three message parts

Click the name of any of the message parts that appear in the grid to open the individual message definition. If the service system status is set to *Production*, when assigned to a container message, you cannot modify a message definition. To modify the definition, you must delete it from the container message first. The following example shows how the *PART_1* message part displays if you click the message name in the Parts grid:

Message Definition

Schema

Message: QE_PART_1
Version: VERSION_1
Alias:
Description:
Owner ID:
Comments:

Schema Exists: Yes
☒ **Part Message**
☐ **Message Part Default Indicator**
☐ **Exclude Description in Schema**

☐ **Suppress Empty XML Tags**

Message Type
☒ **Rowset-based**
☐ **Nonrowset-based**
☐ **Container**

[Part References](#)
[View Records Only](#) [View Included Fields Only](#) [Add Record to Root](#)
[Left](#) | [Right](#)

QE_PART_1

[QE NAVIGATION](#)

The definitions for the part message QE_PART_1

Clicking the Part References link displays all messages to which the message part is assigned.

Note. Before you add nonrowset-based message parts to a container message, you must upload XML message schemas to each message part that you intend to include in the container message. Nonrowset-based part messages cannot be saved without a schema.

To add a message part to a container message:

1. Select PeopleTools, Integration Broker, Integration Setup, Messages.
2. Select a container message to which to add message parts.

The Messages - Message Definitions page appears.

3. Click the Add Parts link.

The Add Parts page appears.

4. Select a message to add.

You can use one of two methods to select a message to add:

- a. In the Message Name and Message Version fields, enter the message name and version to add.
- b. Select the Show Rowset-Based Parts option or the Show Nonrowset-Based Part option and click the Search button to display all rowset-based or nonrowset-based messages that are designated as part messages in the system.

Select one or more messages to include in the container message.

5. Click the OK button.

The Messages - Message Definitions page appears, with the Parts grid populated with the message or messages that you selected.

6. (Optional.) In the Parts grid, enter numeric values in the Sequence column to order message part placement in the container message.

If you do not enter any values, the system sequences the messages in the order in which you add them to the container message.

7. (Optional.) In the Minimum Occurs field, enter the number of minimum rows in the message part to include in the container message.
8. In the Maximum Occurs field, enter the maximum number of level 0 rows from the part message to include in the container message.
9. In the Unbound Maximum drop-down list, select whether to include all level 0 rows from the part in the container message.

Note. If you select *Y*, note that the Maximum Occurs field no longer displays on the page, as all rows are included in the container message.

The Minimum Occurs, Maximum Occurs and Unbound Maximum fields are described elsewhere in this section.

See [Chapter 6, "Managing Messages," Understanding Including Level 0 Rows for Message Parts in Container Messages, page 103](#).

Adding and Getting Container Messages Attributes

This section discusses how to:

- Add the language code of the message sender as an attribute to a container message.
- Add attribute names to a container message.
- Populate attribute values for container message attributes.
- Get attribute names and values from a container message.

This section also provides a summary of PeopleCode that you can use to populate attribute values and get attribute data from container messages.

Understanding Adding, Populating, and Getting Container Message Attributes

You can add attributes to container messages that contain rowset-based message parts to provide integration partners with data and information, without adding the information to the message definition.

To add attributes to a container message, you first define the attribute name, length, and required flag in the container message definition in the PeopleSoft Pure Internet Architecture. This information appears in generated container message schema. At runtime the attributes appear at the root level of the generated XML. Next you use PeopleCode to populate the attribute values using the IBInfo object. At runtime, PeopleSoft Integration Broker validates the attribute values against the lengths you defined in the container message definition.

PeopleSoft provides a number of IBInfo object methods to get attributes from container messages.

Adding Language Codes of the Message Senders as Attributes to Container Messages

The language code of the user who executed the publish or sync request is a common attribute to add to a container message. As such, PeopleSoft provides an Include Language Code attribute box, that when selected automatically includes the information as an attribute name and value in the container message.

The Include Language Code attribute box appears on the Container Attributes page shown in the following example:

Container Attributes

Message Name: CONTAINER_MSG

Version: V1

☒ **Include Language Code**

Container Attributes				
Customize Find View All First 1-2 of 2 Last				
*Attribute Name	Length	Required		
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="button" value="+"/>	<input type="button" value="-"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="button" value="+"/>	<input type="button" value="-"/>

Container Attributes page with the Include Language Code box selected.

To add the language code of the message sender as an attribute:

1. Access the Container Attributes page (PeopleTools, Integration Broker, Integration Setup, Messages and click the Container Attributes link).
2. Select the Include Language Code box.
3. Click the OK button.
4. The Messages—Message Definitions page appears.

Adding Attribute Names to Container Messages

After you add one or more rowset-based message parts to a container message and save the message, a Container Attributes link appears on the Messages-Message Definition page under the Message Type group box. When you click the Container Attributes link, the Container Attributes page (IB_MESSAGE_ATT_SEC) shown in the following example appears:

Container Attributes

Message Name: CONTAINER_MSG

Version: V1

☐ Include Language Code

Container Attributes				
Customize Find View All First 1-2 of 2 Last				
*Attribute Name	Length	Required		
MessageImportance	6	<input checked="" type="checkbox"/>		
DeveloperID	7	<input checked="" type="checkbox"/>		

Container message with two attribute names defined: MessageImportance, and DeveloperID.

To add an attribute name to a container message:

1. Access the Container Attributes page (PeopleTools, Integration Broker, Integration Setup, Messages and click the Container Attributes link).
2. In the Attribute Name field, enter a name for the attribute.
3. In the Length field, enter a numeric field length value.
4. (Optional.) Check the Required box if you want the attribute name to be required.
5. Click the OK button.

The Messages—Message Definitions page appears.

Populating Attribute Values for Container Message Attributes

PeopleSoft provides several IBInfo object methods within the Message object to populate container message attributes.

Here is an example of how to populate attributes. The attribute values will be validated at runtime against the defined lengths.

```
&MSG = CreateMessage(Operation.MY_SVC_OPERATION);

&ret = &MSG.IBInfo.AddContainerAttribute("MessageImportance", "Medium");
&ret = &MSG.IBInfo.AddContainerAttribute("DeveloperID", "mdawson");
```

Additional IBInfo objects that you can use for working with container message attributes are described elsewhere in this section.

Getting Attribute Names and Values from Container Messages

PeopleSoft provides several IBInfo object methods within the Message object to Get attribute information from container messages.

Note that if you attempt to read attributes within an Integration Broker event, such as OnNotify, OnRequest, and so on, you must first Get a part rowset to load the attributes into the Message object from the XML.

The following code snippet shows one example of how to read attributes from a container message:

```
RowSet = &MSG.GetPartRowset(1);
&index = &MSG.IBinfo.GetNumberOfContainerAttributes();

For &i = 1 To &index

    &attrName = &MSG.IBinfo.GetContainerAttributeName(&i);
    &attrValue = &MSG.IBinfo.GetContainerAttributeValue(&i);

End-For;
```

Additional IBInfo objects that you can use for working with container message attributes are described elsewhere in this section.

Summary of PeopleCode Use for Working With Container Message Attributes

The following table summarizes the PeopleCode methods that you can use for working container message attributes.

<i>Method</i>	<i>Description</i>
GetNumberOfContainerAttributes Syntax: <pre>&Integer = &MSG.IBInfo.GetNumberOfContainerAttributes();</pre>	Gets the number of container attributes
GetContainerAttributeName Syntax: <pre>&String = &MSG.IBInfo.GetContainerAttributeNames(Integer nIndex);</pre>	Returns the name of the container attribute based on an index.
GetContainerAttributeValue Syntax: <pre>&String = &MSG.IBInfo.GetContainerAttributeValue(Integer nIndex);</pre>	Returns the value of the container attribute based on an index.
AddContainerAttribute Syntax: <pre>&Bool = &MSG.IBInfo.AddContainerAttribute(string name, string value);</pre>	Add container attributes by passing in attribute name and value.
DeleteContainerAttribute Syntax: <pre>&Bool = &MSG.IBInfo.DeleteContainerAttribute(string name);</pre>	Delete a container attribute based on the attribute name.

Method	Description
ClearContainerAttributes Syntax: &MSG.IBInfo.ClearContainer⇒ Attributes();	Deletes all container attributes in the IBInfo object.

Generating XML Message Schemas for Container Messages

XML message schemas for container messages are automatically generated when you save the definition. You can view the generated XML message schema on the Messages - Schema page. To access the page, select PeopleTools, Integration Broker, Integration Setup, Messages and click the Schema tab.

The following example shows this page:

Message Definition

Schema

Message Name:

TEST_01

Updated:

12/13/2005 5:21:04PM

Version:

Version_1

Name Space:

http://xmlns.oracle.com/Enterprise/Tools/schemas/CONTAINER_TE.Vers

Schema:

```

<?xml version="1.0"?>
<xsd:schema elementFormDefault="qualified"
targetNamespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/CONTAINER_TE.Version_1"
xmlns="http://xmlns.oracle.com/Enterprise/Tools/schemas/CONTAINER_TE.Version_1"
xmlns:FIRST_MSG_PART.Version_1="http://xmlns.oracle.com/Enterprise/Tools/schemas/FIRST_MSG_PART.Version_1"
xmlns:SECOND_MSG_PART.Version_1="http://xmlns.oracle.com/Enterprise/Tools/schemas/SECOND_MSG_PART.Version_1"
xmlns:THIRD_MSG_PART.Version_1="http://xmlns.oracle.com/Enterprise/Tools/schemas/THIRD_MSG_PART.Version_1"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/FIRST_MSG_PART.Version_1"
schemaLocation="http://pho-mdawsona.peoplesoft.com/PSIGW/PeopleSoftServiceListeningConnector?
Operation=GetSchema&xsd=FIRST_MSG_PART.Version_1"/>
  <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/SECOND_MSG_PART.Version_1"
schemaLocation="http://pho-mdawsona.peoplesoft.com/PSIGW/PeopleSoftServiceListeningConnector?
Operation=GetSchema&xsd=SECOND_MSG_PART.Version_1"/>
  <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/THIRD_MSG_PART.Version_1"
schemaLocation="http://pho-mdawsona.peoplesoft.com/PSIGW/PeopleSoftServiceListeningConnector?
Operation=GetSchema&xsd=THIRD_MSG_PART.Version_1"/>
  <xsd:element name="CONTAINER_TEST_MSG" type="CONTAINER_TEST_MSGType"/>
  <xsd:complexType name="CONTAINER_TEST_MSGType">
    <xsd:sequence>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="FIRST_MSG_PART"
type="FIRST_MSG_PART.Version_1:FIRST_MSG_PART_TypeShape"/>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="SECOND_MSG_PART"
type="SECOND_MSG_PART.Version_1:SECOND_MSG_PART_TypeShape"/>
      <xsd:element maxOccurs="unbounded" minOccurs="0" name="THIRD_MSG_PART"
type="THIRD_MSG_PART.Version_1:THIRD_MSG_PART_TypeShape"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

System-generated XML message schema for container message with rowset-based message parts

The namespace that is used in the XML message schema becomes by default the value that is defined on the Service Configuration page. To change the namespace, enter a the new namespace on the Schema page in the Namespace field, the Message Definition tab, and save the change. The XML message schema is generated again by means of the modified namespace value.

Viewing Service Operations that Reference Messages

Use the Service Operation References page (IB_MESSAGE_SO_SEC) to view a list of service operations that contain a message. The Messages-Message Definitions page provides a link to this page. To access the page, select PeopleTools, Integration Broker, Integration Setup, Messages, and click the Service Operation References link.

The following example shows the Service Operation References page:

Service Operation References

Message: IB_EX_NONROWSET_CONTAINER

Version: v1

Service Operations		
Customize Find   First 1-2 of 2 Last		
Service Operation	Service Operation Version	Validation
IB_EX_MP_NONROWSET_ASYNC	v1	<input type="checkbox"/>
IB_EX_MP_NONROWSET_SYNC	v1	<input type="checkbox"/>

Service Operation References page show a list of service operations that contain the message IB_EX_NONROWSET_CONTAINER

The following page elements appear on the Service Operation References page:

Message	Name of the message that is referenced in one or more service operations.
Version	Version of the message that is reference in one or more service operations.
Service Operation	Name of the service operation that contains the message.
Service Operation Version	Version of the service operation that contains the message.
Validation	When the box is selected message schema has been generated for the message in the service operation.

Resolving Inconsistencies in Exported WSDL

This section discusses how to:

- View service operations with exported WSDL inconsistencies.
- Clear exported WSDL status flags.

Understanding Using Project Copy and Exported WSDL

When you generate WSDL for a service operation, the system sets an internal flag on the service operation that indicates that WSDL has been generated or exported for the specific service operation.

You may later decide to use Project Copy to copy the service operation to a new database. But you may decide not to or simply neglect to copy the exported WSDL to the new database.

Even though you have not copied the WSDL to the new database, the internal flag that says WSDL has been generated is still set on the service operation. As a result, the system expects WSDL to exist in the new database, when it does not. When this condition exists, the system displays a status message on the message definition(s) of messages referenced in the service operation.

When this condition exists, the options are:

- Clear the internal WSDL exported flag on the service operation.

Information about how to perform this task is discussed in this section.

- Use Project Copy to copy the WSDL to the new database.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Application Designer Lifecycle Management Guide*, "Copying Projects and Definitions."

- Regenerate the WSDL on the new database using the Provide Web Service wizard.

See [Chapter 18, "Providing Services," page 383](#).

Viewing Services Operations with Exported WSDL Inconsistencies

If the system detects a WSDL flag inconsistency, the following status message appears on the Messages-Message Definitions page for those message definitions referenced in the service operation for the WSDL in question:

Exported WSDL flag inconsistency detected. WSDL does not exist.

The following graphic shows an example of the Messages-Message Definitions page displaying the status message:

Message Definition

Schema

Status: Exported WSDL flag inconsistency detected. WSDL does not exist.

[Exported WSDL Inconsistency](#)

Message: FLIGHTPLAN

Version: v1

Alias:

Description:

Owner ID:

Comments:

Schema Exists: Yes

☐ Part Message

Message Type

- ☐ Rowset-based
- ☐ Nonrowset-based
- ☒ Container

[Service Operation References](#)

[Container Attributes](#)

Add Parts

Message Name	Message Version	Sequence	Minimum Occurs	*Unbound Maximum
FLIGHTDATA	V1	1	0	Y

Messages-Message Definitions page showing the "Exported WSDL flag inconsistency detected" status message and the Exported WSDL Inconsistency link.

In addition, an Exported WSDL Inconsistency link appears on the Messages-Message Definitions page. Click this link to view the Exported WSDL Inconsistencies page (IB_HOME_PAGE7_SEC). The following graphic shows an example of the page:

Exported WSDL Inconsistencies

Message: Service operations flagged as having exported WSDL need for that WSDL to exist in the repository. If this is not the case, the data is inconsistent. This error is caused by importing a service operation and not bringing along the related service or WSDL object via project copy.

[Service Admin](#)

Exported WSDL Inconsistent Operations	
Service Operation	Service Operation Version
FLIGHTPLAN	v3

Exported WSDL Inconsistencies page

The page displays service operations that exist in the database that are flagged as having WSDL exported, yet no WSDL exists in the database for them. The Exported WSDL Inconsistencies page features a Service Admin link. Clicking the link opens the Service Administration-WSDL page (IB_HOME_PAGE7). The Service Administration-WSDL page provides a options to clear internal exported WSDL flag.

Clearing Exported WSDL Status Flags

The Clear WSDL Status page (IB_HOME_PAGE7_SEC) enables you to clear the internal exported WSDL status flag for service operations that contain specific messages, or for all service operations in the database.





Note. Clearing the internal exported WSDL status flag on a service operation is one way to resolve a WSDL flag inconsistency. Other options for resolving this condition are discussed elsewhere in this chapter.

See [Chapter 6, "Managing Messages," Understanding Using Project Copy and Exported WSDL, page 114.](#)

The following example shows the Clear WSDL Status page:

Clear WSDL export status

Operations flagged as exported but without WSDL.

Service Operations		Customize Find View All  	First  1 of 1  Last
Service Operation	Version		
FLIGHTPLAN	v3		

Clear Export Status

Clear WSDL Export Status page accessed from the Exported WSDL Inconsistencies page.





Up to this point, this section has demonstrated accessing the Clear WSDL Export Status page starting from the Export WSDL Inconsistency link on a message definition, and then clicking on the Service Admin link from the Exported WSDL Inconsistencies page. When you access the page using this navigation, only the service operations that reference the message definition that you were originally viewing on the Messages-Message Definitions page appear. Further, those service operations that appear are those that are flagged as having WSDL exported, but for which there is none in the database.

You can also clear the WSDL export status flag for all service operations in the database that are in the inconsistent state of having been flagged as having WSDL generated, but no WSDL exists in the database for them. You can do so by accessing the Service Administration-WSDL page and clicking the Clear WSDL Export Status link. The Clear WSDL Export Status page appears populated with all service operations in the database that have inconsistent WSDL.

The following example shows the Clear WSDL Export Status page accessed from the Clear Export Status link on the Service Administration-WSDL page.

Clear WSDL export status

Operations flagged as exported but without WSDL.

Service Operations		Customize Find View All   First  1-10 of 21  Last
Service Operation	Version	
GENCOMPONENTURL_SO	v1	
PRCS_FINDREQUESTS	v1	
PRCS_GETPARAMS	v1	
PRCS_GETPROCESSNAMES	v1	
PRCS_GETPROMPT	v1	
PRCS_GETREPORT	v1	
PRCS_GETREQUEST	v1	
PRCS_SCHEDULE	v1	
PRCS_UPDATEREQUEST	v1	
PT_SES_CREF_GET	v1	

Clear Export Status

Clearing the WSDL export status flag for all service operations that are flagged as having WSDL exported but for which there is none in the database.

To clear the WSDL exported status flag:

1. Access the WSDL Export Status page using one of the following methods:
 - From a message definition that displays the "Exported WSDL flag inconsistency" status message: Click the Exported WSDL Inconsistency link. The Exported WSDL Inconsistencies page appears. Click the Service Admin link.
 - From the PeopleTools menu: Select PeopleTools, Integration Broker, Service Utilities, Service Administration. The Service Administration page appears. Click the WSDL tab. Click the Clear WSDL Export Status link.
2. Click the Clear Export Status button.

Renaming and Deleting Message Definitions

You can rename and delete messages using the Messages page (IB_HOME_PAGE5) in the Services Administration component (IB_HOME_PAGE). The Message page contains two sections: a Delete section that enables you to delete message definitions and a Rename section that enables you to rename message definitions.

To access the page, select PeopleTools, Integration Broker, Service Utilities, Service Administration, and click the Messages tab.

When you first access the Messages page, all sections are collapsed. Click the section header arrow buttons to expand and collapse each section.

The following example shows the Messages page with the Delete and Rename sections expanded:

The screenshot shows the 'Messages' tab selected in the top navigation bar. Below the navigation bar, the 'Service System Status' is set to 'Development'. The 'Delete' section is expanded, showing a 'Message Name' input field, a 'Search' button, and a table with one row. The 'Rename' section is also expanded, showing 'Message Name' and 'New Name' input fields, a 'Rename' button, and a 'Results' label. A 'Message Builder' link is visible next to the 'Message Name' field in the Rename section.

Service System Status: Development

Delete

Message Name:

Select	Message Name	Version	Description	Results
<input type="checkbox"/>				

Rename

Message Name:

New Name:

Results:

Services Administration Messages page with the Delete and Rename sections expanded

At the top of the page, the Service System Status field displays the current setting. The service system status, set on the Service Configuration page, affects the ability to rename and delete messages.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Configuring PeopleSoft Integration Broker for Handling Services."

Renaming Message Definitions

To rename a message definition:

Note. Renaming a message definition renames all versions.

1. Access the Services Administration - Messages page.
Select PeopleTools, Integration Broker, Service Utilities, Service Administration. Click the Messages tab.
2. Click the arrow next to the Rename section header to expand the section.
3. In the Message Name field, enter the message definition to rename, or click the Lookup button to search for and select the message to rename.

4. (Optional.) Click the Message Builder link to view details about the selected message in the Messages - Message Definitions page.

When you are done viewing the message details, click the Return button to return to the Services Administration - Messages page.

5. In the New Name field, enter the new name for the message definition.
6. Click the Rename button.

Deleting Message Definitions

When you delete a message definition the system also deletes its associated schema.

To delete a message definition:

1. Access the Services Administration - Messages page.
Select PeopleTools, Integration Broker, Service Utilities, Service Administration. Click the Messages tab.
2. Click the arrow next to the Delete section header to expand the section.
3. In the Message Name field, enter the name of the message to delete, and click the Search button.
Search results appear in the results grid.
4. In the results grid, select the check box next to the message or messages to delete.
5. Click the Delete button.

Deleting Messages During Upgrade

To delete a message definition in an application upgrade project, you must first make sure that no live instances of the message exist. Archive or delete any such messages in both the source and the target database. Otherwise, you receive an error message during the copy process indicating that the object is in use.

Chapter 7

Sending and Receiving Messages

This chapter discusses how to:

- Generate and send messages.
- Receive and process messages.
- Process inbound errors.
- Use Message object functionality with nonrowset-based messages.
- Generate test messages.
- Work with message segments.

Understanding Sending and Receiving Messages

To send and receive messages you use PeopleCode to:

- Send request messages from PeopleSoft Integration Broker to other systems.
- Receive response messages from other systems.
- Route messages.
- Manipulate message content.

Note. You can also send messages directly to the integration gateway, thereby bypassing processing on the integration engine.

Prerequisites for Sending and Receiving Messages

Before you can define PeopleCode to generate, send, receive, and process messages, you must define the message in PeopleSoft Internet Architecture.

Note. Once you create PeopleCode, you must also define nodes, services and service operations to implement a complete integration.

See [Chapter 4, "Understanding PeopleSoft Integration Broker Metadata," page 35.](#)

Messaging Process Flows

The integration engine uses asynchronous request processes and synchronous request processes to manage outbound and inbound messages. These processes examine the messaging elements that you create to determine how to treat each message.

Outbound Message Processing Flow

This section discusses message processing flow for outbound messages. In this section, the term process is used, and refers to either the integration engine's asynchronous request process or its synchronous request process, depending on the type of integration you are performing.

Outbound messages you send go through the following steps.

1. The application triggers the sending PeopleCode that you developed.
2. The PeopleCode program populates and sends the message by using an asynchronous or synchronous method.
3. The method that the PeopleCode uses to send the message triggers a request process in the application's integration engine.
4. The process searches the outbound routings that are associated with that service operation to determine the valid target nodes for the message.

The asynchronous process examines only asynchronous routings, and the synchronous process examines only synchronous routings. If for synchronous processing, a valid single outbound routing cannot be found, the sending method returns an error.

Note. Only active routings are considered for processing.

5. For each outbound routing that it finds, the process submits the message to the local gateway, along with transaction information about the node and the target connector that should be used to send the message.
6. The local gateway transmits the message to the specified target node through the specified target connector.
7. If this is a synchronous message, the process waits for the target node to pass a response message back through the gateway, then returns it to the calling PeopleCode method.

Inbound Message Processing Flow

Each received message goes through the following steps:

1. The application's gateway receives a request message from a remote node or gateway, which specifies the application as its target node.
2. The gateway submits the message to the application's integration engine, which searches for any inbound request routing parameter which has the same alias name as the external operation name passed in.

3. If a matching routing alias name isn't found, the integration engine returns an error message through the gateway to the sending node.

If a routing alias name is found, the integration engine invokes either the asynchronous request process or the synchronous request process, as appropriate, to handle the message.

Note. Any inbound routing alias that is found must have the proper permissions for that service operation for the process to proceed.

4. The process accesses the service operation that matches the routing alias name and passes the message to the service operation's handler associated with receiving PeopleCode.
 - The asynchronous request process invokes the service operation's handler OnNotify event PeopleCode.
 - The synchronous request process invokes the service operation's handler OnRequest event PeopleCode.
5. If this is a synchronous transaction, the process waits for the receiving PeopleCode to generate and return a response message, then passes it back to the sending node through the gateway.

Understanding Integration PeopleCode

This section discusses the PeopleCode used for integrations and describes:

- Sending and receiving PeopleCode.
- Integration application classes.
- Integration methods.
- Messaging methods.
- Error-handling methods.
- Messaging PeopleCode.

Sending and Receiving PeopleCode

This section discusses the PeopleCode you use for sending messages from PeopleSoft Integration Broker to other systems, and the PeopleCode you use for receiving messages from other systems.

Sending PeopleCode

PeopleCode for sending messages can be located in PeopleCode events associated with records, record fields, and components, and in application engine programs.

The PeopleCode method used to send messages is highlighted in the following table.

Transmission Type	Sending PeopleCode	Comments
Synchronous	SyncRequest method.	The SyncRequest method belongs to the IntBroker class.
Asynchronous	Publish method.	The Publish method belongs to the IntBroker class.

To work with rowset-based messages in SOAP format, transform the SOAP documents into XML documents and then use the IntBroker class SyncRequest or Publish methods. To work with nonrowset-based messages in SOAP format use the SOAPDoc class.

Receiving PeopleCode

The PeopleCode that you use to receive a message must be associated with the message definition. The transmission type of the message determines the location of the PeopleCode program.

Implement the OnRequest method for synchronous messages. Implement the OnNotify method for asynchronous messages. Both methods are located in the PS_PT application package, in the Integration sub-package, in the IRequestHandler and INotificationHandler classes, respectively.

Transmission Type	Message Structure	Receiving PeopleCode	Comments
Synchronous	Rowset-based	Message is passed into the method.	Implement the OnRequest method in the IRequestHandler application interface.
Synchronous	Nonrowset-based	Message is passed into the method.	Implement the OnRequest method in the IRequestHandler application interface.
Asynchronous	Rowset-based	Message is passed into the method.	Implement the OnNotify method in the INotificationHandler application interface.
Asynchronous	Nonrowset-based	Message is passed into the method.	Implement the OnNotify method in the INotificationHandler application interface.

To get content data out of a request message, use the following guidelines.

Message Structure	PeopleCode	Comments
Rowset-based	GetRowSet method.	None.
Nonrowset-based	GetXMLDoc method.	You can also use Message class functionality with nonrowset-based messages. See Chapter 7, "Sending and Receiving Messages," Using Message Object Functionality With Nonrowset-Based Messages, page 171.

Application Classes

Application classes house the processing logic for asynchronous and synchronous messages. By implementing the Integration Broker application classes, you can reuse code and access other benefits of application classes.

The following application classes exist for PeopleSoft Integration Broker. See the individual applicable application class interfaces for more information about the methods contained in an application class.

To access these application classes, in PeopleSoft Application Designer, open the PS_PT application package and open the Integration subpackage.

Note. All of the Integration Broker application classes are defined as interfaces. This means that there is no native implementation of them: you must import them to your program and implement them if you want to use them.

<i>Application Class</i>	<i>Methods Contained in Application Class</i>	<i>Comments</i>
INotificationHandler	<ul style="list-style-type: none"> OnNotify OnError 	This interface is the equivalent of the Subscription Message event PeopleTools releases prior to PeopleTools 8.48.
IReceiver	<ul style="list-style-type: none"> OnAckReceive OnError 	This interface is the equivalent of the OnAckReceive Message event in PeopleTools releases prior to PeopleTools 8.48.
IRequestHandler	<ul style="list-style-type: none"> OnRequest OnError 	This interface is the equivalent of the OnRequest Message event in PeopleTools releases prior to PeopleTools 8.48.
IRouter	<ul style="list-style-type: none"> OnRouteSend OnRouteReceive OnError 	This interface is the equivalent of the OnRouteSend and OnRouteReceive Message events in PeopleTools releases prior to PeopleTools 8.48.
ISend	<ul style="list-style-type: none"> OnRequestSend OnError 	This interface is the equivalent of the OnSend Message event in PeopleTools releases prior to PeopleTools 8.48.

Each of the methods contained in these application classes is described in this section.

Routing Methods

Routing methods determine how a message is routed to or from PeopleSoft Integration Broker.

OnRouteSend Method

Implement the OnRouteSend method for outbound synchronous and asynchronous service operations to specify to what node PeopleSoft Integration Broker routes a message. The implementation of this method enables you to apply PeopleCode that filters the destination nodes to which PeopleSoft Integration Broker routes messages.

The OnRouteSend method is contained in the IRouter application class, which is contained in the PS_PT application package, in the Integration subpackage.

When the application PeopleCode is invoked to send a message, the routing definitions in the local database provide a list of target nodes to which PeopleSoft Integration Broker can route the message. The integration engine's request handler invokes the service operation's OnRouteSend event. You can implement the OnRouteSend method in the application package associated with the handler for this service operation, which enables you to apply additional PeopleCode that determines the final target nodes.

You can use OnRouteSend to validate the outbound service operation's target node list, prevent the message from transmitting, or redirect it to a completely different set of targets.

Note the following PeopleCode built-in constants that you can use with the OnRouteSend method:

%IntBroker_ROUTE_N Do not send this operation to any of the possible nodes.
ONE

%IntBroker_ROUTE_S Send this operation to a selected list of nodes. The node list should be an array of
OME strings in the property destinationNodes.

%IntBroker_ROUTE_A Send this operation to all nodes that have a valid routing.
LL

OnRouteSend enables you to account for multiple synchronous targets. Only one target node at a time can receive a request message sent with a synchronous transaction. Even though you can define the same outbound synchronous transaction for multiple nodes, you must make sure the transaction resolves to a single target node or the transaction fails.

The following pseudo code shows an implementation of this class:

```

import PS_PT:Integration:IRouter;

class RoutingHandler implements PS_PT:Integration:IRouter
  method RoutingHandler();
  property array of any destinationNodes;
  method OnRouteSend(&_MSG As Message) Returns integer;
end-class;

/* constructor */
method RoutingHandler
end-method;

method OnRouteSend
  /+ &_MSG as Message +/
  /+ Returns Integer +/
  /+ Extends/implements PS_PT:Integration:IRouter.OnRouteSend +/
  /* Variable Declaration */
  Local any &aNodeList;
  Local any &rootNode;
  Local any &xmlDoc;

  /* Check the message for the instructions on how to execute
  the OnRouteSend.*/

  &xmlDoc = &_MSG.GetXmlDoc();
  &rootNode = &xmlDoc.DocumentElement;
  &aNodeList = &rootNode.GetElementsByTagName("OnRouteSend");

  If (&aNodeList.Len <> 1) Then

    /* No Nodes are in the list, therefore exit. */
    Exit;
  Else

    /* check the value of the node to determine the action to
    take. */

    Evaluate &aNodeList [1].NodeValue
    When "True"
      Return (%IntBroker_ROUTE_ALL);
      Break;
    When "False"
      Return (%IntBroker_ROUTE_NONE);
      Break;
    When-Other

      /* assume that this is to be routed to the node given */
      Local array &nodeArray;
      &nodeArray = CreateArray();
      &nodeArray.Push(&aNodeList [1].NodeValue);

      Local string &sIBVariableTest = GetCurrentType(&nodeArray);
      Evaluate &sIBVariableTest
      When "Array"
        &destinationNodes = &nodeArray.Clone();
        Return %IntBroker_ROUTE_SOME;
      When "BooleanTrue"
        Return %IntBroker_ROUTE_ALL;
      When "BooleanFalse"
        Return %IntBroker_ROUTE_NONE;
      End-Evaluate;
      Break;

    End-Evaluate;
  End-If;
end-method;

```

```
End-If ;  
end-method ;
```

OnRouteReceive Method

Implement the OnRouteReceive method for inbound synchronous and asynchronous service operations to apply PeopleCode that determines whether the default local node accepts inbound messages.

The OnRouteReceive method is contained in the IRouter application class, which is contained in the PS_PT application package, in the Integration subpackage.

When the integration engine receives a message, the transaction definitions in the local database provide a list of source nodes from which the application can accept the message. The integration engine's request handler invokes the service operation's OnRouteReceive event. You can implement the OnRouteReceive method in the application package associated with the handler for this service operation, which enables you to apply PeopleCode that determines whether the default local node accepts the inbound message. You can employ this event regardless of the message transmission type.

The following is an example implementation of this method:

```

import PS_PT:Integration:IRouter;

class RoutingHandler implements PS_PT:Integration:IRouter
  method RoutingHandler();
  property array of any destinationNodes;
  method OnRouteReceive(&_MSG As Message) Returns boolean;
end-class;

/* constructor */
method RoutingHandler
end-method;

method OnRouteReceive
  /+ &_MSG as Message +/
  /+ Returns Boolean +/
  /+ Extends/implements PS_PT:Integration:IRouter.OnRouteReceive +/
  /* Variable Declaration */
  Local any &aNodeList;
  Local any &rootNode;
  Local any &xmlDoc;

  /* Check the message for instructions on how to execute
  the OnRouteReceive.*/

  &xmlDoc = &_MSG.GetXmlDoc();
  &rootNode = &xmlDoc.DocumentElement;
  &aNodeList = &rootNode.GetElementsByTagName("OnRouteReceive");

  If (&aNodeList.Len <> 1) Then

    /* A single node must be present. */
    Exit;
  Else

    /* check the value of the node to determine the action to
    take. */

    Evaluate &aNodeList [1].NodeValue
    When "True"
      Return ( True);
      Break;
    When "False"
      Return ( False);
      Break;
    When-Other
      /* don't recognize the value. */
      Exit;
    End-Evaluate;

  End-If;
end-method;

```

Messaging Methods

This section describes methods used in messaging and the application classes in which they are contained.

Outbound Messaging Methods

This section describes methods used on outbound messages from PeopleSoft to other systems.

OnRequestSend

Implement for outbound synchronous and asynchronous service operations to override connector properties before sending a message to the integration gateway.

This method is contained in the ISend application class.

The OnRequestSend method passes in a message to your derived application class method. The returned value needs to be a message.

The following is an example implementation of this method.

```
import PS_PT:Integration:ISend;

class SendHandler implements PS_PT:Integration:ISend
  method SendHandler();
  method OnRequestSend(&_MSG As Message)
    Returns Message;
end-class;

/* constructor */
method SendHandler
end-method;

method OnRequestSend
  /* &_MSG as Message */
  /* Returns Message */
  /* Extends/implements PS_PT:Integration:ISend. */
  /* OnRequest Send */
  /* Variable Declaration */
  Local any &tempNode;
  Local any &rootNode;
  Local any &xmlDoc;
  Local any &msg;

  &msg = &_MSG;

  &xmlDoc = &msg.GetXmlDoc();

  /* Add a node to the doc to prove that we can
    edit it in this event. */

  &rootNode = &xmlDoc.DocumentElement;

  &tempNode = &rootNode.AddElement("OnSend");
  &tempNode.NodeValue = "If you see this, then
the Sync OnSend PCode has altered the message";

  /* and write the data back into the message */

  &msg.SetXmlDoc(&xmlDoc);

  Return (&msg);
end-method;
```

See [Chapter 7, "Sending and Receiving Messages," Setting and Overriding Target Connector Properties at Runtime, page 144.](#)

When using the ISend handler with message parts, specifically with rowset-based message parts, the rowsets of the parts must be retrieved *in the order* that the content data will be sent.

The following is an example that can be used for ISend events that use rowset-based parts (even for the cases where one is just overriding the connectors):

```
method OnRequestSend
    /+ &MSG as Message +/
    /+ Returns Message +/
    /+ Extends/implements PS_PT:Integration:ISend. +/
    /+ OnRequestSend +/
    If (&MSG.IsPartsStructured) Then
        Local number &i;
        Local Rowset &rs;
        For &i = 1 To &MSG.PartCount
            &rs = &MSG.GetPartRowset(&i);
        End-For;
    End-If;

    Return &MSG;

end-method;
```

OnAckReceive

Implement for outbound asynchronous service operations to access the body of a message acknowledgement to check for SOAP faults.

This method is contained in the IReceiver application class.

The following is an example implementation of this method.

```
import PS_PT:Integration:IReceiver;

class AckReceiveHandler implements PS_PT:
    Integration:=>
    IReceiver
        method AckReceiveHandler();
        method OnAckReceive(&_MSG As Message) Returns
            integer;
    end-class;

/* constructor */
method AckReceiveHandler
end-method;

method OnAckReceive
    /+ &_MSG as Message +/
    /+ Returns Integer +/
    /+ Extends/implements PS_PT:Integration:+/
    /+ IReceiver.OnAck Receive +/
    /* Variable Declaration */
    /*
    /* We return a hardcoded value. In this case, a
    message error.*/

    Return (%Operation_Error);

end-method;
```

See [Chapter 7, "Sending and Receiving Messages," Handling Inbound Asynchronous Transactions, page 149.](#)

Inbound Messaging Methods

This section describes methods used on inbound messages to PeopleSoft from other systems.

OnRequest

Implement for inbound synchronous service operations.

This method is contained in the IRequestHandler application class.

The following is an example implementation of this method:

```
class RequestHandler implements PS_PT:Integration:
  IRequestHandler
  method RequestHandler();
  method OnRequest(&_MSG As Message) Returns
    Message;
end-class;

/* constructor */
method RequestHandler
end-method;

method OnRequest
  /* &_MSG as Message */
  /* Returns Message */
  /* Extends/implements PS_PT:Integration: */
  /* IRequestHandler.OnRequest */
  /* Variable Declaration */
  Local any &tempNode;
  Local any &descNode;
  Local any &rootNode;
  Local any &xmlDoc;
  Local any &xmldata;
  Local any &msg;

  &msg = CreateMessage(Operation.QE_IB_SYNC_RESP,%Int⇒
    Broker_response);

  &xmldata = "<?xml version='1.0'?>
    <QE_IB_PeopleCode_Test⇒/>";

  &xmlDoc = CreateXmlDoc(&xmldata);

  &rootNode = &xmlDoc.documentelement;

  &descNode = &rootNode.AddElement("Description");
  &descNode.NodeValue = "Sync test of OnRouteSend.";

  &tempNode = &rootNode.addelement("OnRequest");
  &tempNode.NodeValue = "If you see this,
    then the On Request PCode created the response
    message";

  &msg.SetXmlDoc(&xmlDoc);

  Return &msg;
```

OnNotify

Implement for inbound asynchronous service operations. This method can be used for code that does subscription processing, and for validating and loading message data.

This method is contained in the INotificationHandler application class.

The following is an example implementation of this method:

```
import PS_PT:Integration:INotificationHandler;

class NotificationHandler implements PS_PT:Integration:⇒
INotificationHandler
    method NotificationHandler();
    method OnNotify(&_MSG As Message);
end-class;

/* constructor */
method NotificationHandler
end-method;

method OnNotify
    /* + &_MSG as Message + */
    /* + Extends/implements PS_PT:Integration:INotification⇒
Handler.OnNotify + */
    /* Variable Declaration */

    Local Rowset &rs;

    &rs = &MSG.GetRowset();

    /* process data from rowset */
end-method;
```

OnResponse

Implement for inbound response asynchronous service operations.

This method can be used for code that does response subscription processing. This method is contained in the INotificationHandler application class.

The following is an example implementation of this method and shows how to get the request TransactionID.

```
import PS_PT:Integration:INotificationHandler;

class RESPONSE_NOTIFICATION implements PS_PT:
  Integration:INotificationHandler
    method RESPONSE_NOTIFICATION();
    method OnNotify(&MSG As Message);

end-class;

/* constructor */
method RESPONSE_NOTIFICATION
  %Super = create PS_PT:Integration:INotificationHandler⇒
  ();
end-method;

method OnNotify
  /* &MSG as Message */
  /* Extends/implements PS_PT:Integration:+/
  /* INotification Handler.OnNotify */

  Local Rowset &rs;
  Local boolean &Ret;
  Local string &TransactionID;

  &rs = &MSG.GetRowset();

  If &MSG.IsSourceNodeExternal Then

    /* if the request came from an external non
    PeopleSoft System then you can get the
    original TransactionID from the WSA_MessageID
    from the request message. */

    &TransactionID = &MSG.IBInfo.WSA_MessageID;

  Else

    /* if the request came from a PeopleSoft
    System then get the original TransactionID
    from the nReplyToID */

    &TransactionID = &MSG.IBInfo.InReplyToID;

  End-If;

end-method;
```

Error-Handling Methods

Each application class contained in the Integration application subpackage contains an OnError method that you can use for custom error handling.

Custom error handling can include sending an email notification or entering data in a log when an error occurs.

For the `IRequestHandler` application class, the `OnError` function returns a string. This enables you to send back custom error messages, for example SOAP faults, to non-PeopleSoft consumers. If the message consumed was a SOAP message and the custom error message is already wrapped in SOAP, it will not be modified and is sent as-is. However, if the `OnError` message is not SOAP, it is wrapped as a standard SOAP fault and returned to the sender.

If the message consumer is another PeopleSoft system the message set/message ID framework applies.

If an error occurs the `OnError` method, if implemented, is automatically invoked. The type of exception can be viewed by using the `Message` object to retrieve an `Exception` object populated with information about the error, using the message class `IBException` property.

The following is an example of the `OnError` method implementation:

```
/*On Error Implementation */
method OnError
    /*+ &MSG as Message +/
    /*+ Returns String +/
    /*+ Extends/implements PS_PT:Integration:IRequestHandler.OnError +/
    Local integer &nMsgNumber, &nMsgSetNumber;
    Local string &sText;

    &nMsgNumber = &MSG.IBException.MessageNumber;
    &nMsgSetNumber = &MSG.IBException.MessageSetNumber;
    rem    &sText = &exception.DefaultText;
    &sText = &MSG.IBException.ToString();

    /* ADD SPECIFIC ERROR INFO HERE */
    Return &sText;

end-method;
```

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*, "Exception Class."

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*, "Message Classes," `IBException`.

Messaging PeopleCode

Messaging PeopleCode enables you to manipulate message content. The messaging PeopleCode classes you can use for this are:

Message classes	Use for rowset or nonrowset-based messages.
SOAPDoc class	Use for SOAP-compliant messages.
XMLDoc classes	Use for XML messages.

XML and SOAP-compliant messages are nonrowset-based messages. You can use their respective classes to manipulate message content, or use the `Message` classes.

See Also

Chapter 7, "Sending and Receiving Messages," Using Message Object Functionality With Nonrowset-Based Messages, page 171

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "Message Classes"

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "SOAPDoc Class"

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "XmlDoc Class"

Generating and Sending Messages

This section provides an overview of outbound messaging and discusses how to:

- Handle outbound asynchronous message transmission.
- Handle outbound synchronous message transmission.
- Read exceptions for outbound synchronous integrations.
- Handle cookies in messages.

Understanding Outbound Messaging

Successful outbound messaging relies on sending messages in the proper order and on testing the messages. Messages containing non-XML data have special considerations.

Message Order

PeopleSoft Integration Broker guarantees that messages are delivered in the order in which you send them and that they are single-threaded at the PeopleSoft receiving node. However, message order is not part of the queue definition. You must send messages in the proper order.

Note. You can modify this behavior by using queue partitioning.

See Chapter 11, "Managing Service Operation Queues," Applying Queue Partitioning, page 235.

Message Testing

Make sure that you adequately unit-test and system-test your messages.

Unit-test a message by triggering the PeopleCode that sends the message and then view the message details in Service Operations Monitor. From the Service Operations Monitor, you can view the contents of each field to verify that the message data is formatted correctly.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*

You can also test handler code using the Handler Tester utility.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools*

Message Class Outbound PeopleCode

Use the record class `SelectByKey` method whenever possible to get data that isn't in the component buffer.

If the record names are the same, use the standard record methods, such as `SelectByKey`, `Insert`, and `Update`, on the message records.

There are no automatic checks for message size. You must do it programmatically. Use the following code at level 0 to control message size when dealing with multiple transactions:

```
If &Msg.Size > %MaxMessageSize
```

Note. The `OnRouteSend` method enables you to apply PeopleCode that filters the destination nodes.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*, "Record Class."

Non-XML Data

If you're generating a non-XML outbound message, it's up to you to insert the message content into a special XML section containing a CDATA tag:

```
<xml psnonxml="yes">
  <![CDATA[nonXML_message_data]]>
```

Handling Outbound Asynchronous Message Transmission

To send a message asynchronously, use the `IntBroker` class `Publish` method in:

- A record field PeopleCode event.
- A component PeopleCode event.

When publishing from a component, publish messages only from the `SavePostChange` event, using the `deferred mode` property.

- An Application Engine program.
- An implementation of the `OnNotify` method.
- An implementation of the `OnRequest` method .

The `OnRequest` service operation event is triggered only when an inbound transaction occurs. However, when the receiving PeopleCode runs, the program can also send messages.

Message Class Outbound Asynchronous Example

The following example uses the `Publish` method in the PeopleCode `IntBroker` class:

```

Local Message &MSG;
Local Rowset &SALES_ORDER, &RS;

/*Get a pointer to the component buffer rowset */
&SALES_ORDER = GetLevel0();
/*Create an instance of the SALES_ORDER_ASYNC message object */
&MSG = CreateMessage(OPERATION.SALES_ORDER_ASYNC);

/*Copy the rows from the rowset to the message object */
&MSG.CopyRowset(&SALES_ORDER);
/*Send the message */
%IntBroker.Publish(&MSG);

```

XmlDoc Class Outbound Asynchronous Example

The following example uses the Publish method:

```

Local XmlDoc &xmlRequestDoc;
Local Message &MSG;

/*Create an XmlDoc Object */
&xmlRequestDoc = CreateXmlDoc();

/* Parse a URL or input XML file into an XmlDoc */

&bool = &xmlRequestDoc.ParseXmlFrom URL("C:\pt\appserv\files\
input.xml");

/* Populate message with XML data */
&MSG = CreateMessage(OPERATION.XmlRequest);

&MSG.SetXmlDoc(&xmlRequestDoc);

/* Sent request */

%IntBroker.Publish(&MSG);

```

Identifying SOAP Faults

You can implement the OnAckReceive method to access IBInfo data. This enables you to read the content of acknowledgements returned by recipient systems of asynchronous SOAP messages. The ability to access acknowledgement content is useful when sending SOAP messages, since although there may be no HTTP protocol errors while sending them, SOAP faults may occur.

If the message is nonrowset-based, use the message class GetXmlDoc method to get the response data. This returns an XmlDoc object.

If the message is rowset-based, use the message class GenXMLString method to get the response data. This returns a string object which you can load into an XmlDoc object.

If SOAP faults are found, you can set the status equal to Error so that the errors appear in the Service Operations Monitor for the publication contract.

The following code example shows how to use GetXmlDoc and GenXMLString in an implementation of the OnAckReceive method. Valid status overrides are %Operation_Done, %Operation_Error, and %Operation_Retry:

```

import PS_PT:Integration:IReceiver;

class AckReceiveHandler implements PS_PT:Integration:IReceiver
    method AckReceiveHandler();
    method OnAckReceive(&MSG As Message) Returns integer;
end-class;

/* constructor */
method AckReceiveHandler
end-method;

method OnAckReceive
    /+ &MSG as Message +/
    /+ Returns Integer +/
    /+ Extends/implements PS_PT:Integration:IReceiver.OnAckReceive +/
    /* Variable Declaration */

    If &MSG.IsStructure Then

        /* if message is rowset-based */
        &str = &MSG.GenXMLString();

    Else
        /* if message is nonrowset-based */
        &xmldoc = &MSG.GetXmlDoc();

    End-If;

    Return (%Operation_Done);

end-method;

```

You can also implement the OnAckReceive method to read response content data returned from third-party systems when using the HTTP target connector.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "XmlDoc Class"

Handling Outbound Synchronous Transactions

Use the IntBroker class SyncRequest method for handling outbound synchronous transfers. To send a message synchronously, you can employ SyncRequest in:

- The record field SavePreChange PeopleCode event.
- The record field SavePostChange PeopleCode event.
- The record field Workflow PeopleCode event.
- The record field FieldChange PeopleCode event.
- An implementation of the OnRequest method.
- An implementation of the OnNotify method.

Note. The OnRequest and OnNotify events are triggered only when an inbound transaction occurs, however, when the receiving PeopleCode runs, it can also send messages.

The response message that is returned from an outbound synchronous transaction is no different from an inbound request message. Once you have it in a Message, XmlDoc, or SoapDoc object, it has the same properties as any other object of that type and can, therefore, be treated exactly the same way.

See [Chapter 7, "Sending and Receiving Messages," Receiving and Processing Messages, page 148.](#)

Message Class Outbound Synchronous Example 1

The following example uses the IntBroker class SyncRequest method:

```
Local Message &MSG, &response;
Local Rowset &SALES_ORDER;

&SALES_ORDER = GetLevel0();
&MSG = CreateMessage(OPERATION.SALES_ORDER_SYNC);
&MSG.CopyRowsetDelta(&SALES_ORDER);

/* send the synchronous request; the return value is the response
message object */
&response = %IntBroker.SyncRequest(&MSG);

/* check the response status; 0 means OK */
If (&response.ResponseStatus = 0) Then
    /* process the response */
    MY_SALES_ORDER_SYNC.ORDER_ID = &response.GetRowset().GetRow(1)
    .GetRecord(Record.SO_RESPONSE).GetField(Field.ORDER_ID).Value;
else

    /* do error handling */

End-If;
```

Message Class Outbound Synchronous Example 2

The following example shows the use of CopyTo to get the data back from the response and into the component buffer, and therefore the page:

```

Local Message &msgZipRequest, &msgZipResponse;
Local Rowset &RS, &rsMessageRowset;

&RS = GetLevel0();
&msgZipRequest = CreateMessage(OPERATION.ZIP_REQUEST);
&msgZipRequest.CopyRowset(&RS);
/* send the synchronous request; the return value is the response
message object */

&msgZipResponse = %IntBroker.SyncRequest(&msgZipRequest,
Node.ZIPTOCITYANDSTATE);

/* check the response status; 0 means OK */
If (&msgZipResponse.ResponseStatus = 0) Then
    /* process the response */
    &rsMessageRowset = &msgZipResponse.GetRowset();
    &rsMessageRowset.CopyTo(&RS);
else
    /* do error handling */
End-If;

```

XmlDoc Class Outbound Synchronous Example

The following example uses the IntBroker class SyncRequest method:

```

Local Message &MSG, &RESP_MSG;
Local XmlDoc &flightplan_xmldoc, &xmldocReturn;
Local XmlNode &ac_number, &msi_sensor, &ofp;

&flightplan_xmldoc = CreateXmlDoc("");

&ac_number = &flightplan_xmldoc.CreateDocumentElement("flightplan");

&msi_sensor = &ac_number.AddElement("msi_sensor");
&msi_sensor.NodeValue = "flir";
&ofp = &ac_number.AddElement("ofp");
&ofp.NodeValue = "8.44";

&MSG = CreateMessage(Message.SYNC_REQUEST_EXAMPLE);

&MSG.SetXmlDoc(&flightplan_xmldoc);

&RESP_MSG = &MSG.SyncRequest();

&xmldocReturn = &RESP_MSG.GetXmlDoc();

&return_data = &xmldocReturn.GenXmlString();

```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "XmlDoc Class"

Reading Exceptions for Outbound Synchronous Integrations

The Routing – Routings Definition page features a User Exception check box that enables you to capture Integration Broker exceptions for outbound synchronous integrations using PeopleCode.

Note. Do not use Try/Catch PeopleCode to attempt to read exceptions on outbound SyncRequest calls.

The following code example shows how to read captured exceptions:

```
&Return_MSG = %IntBroker.SyncRequest(&MSG);
If &Return_MSG.ResponseStatus = %IB_Status_Success Then

/* process the response message */
&RS = &MSG.GetPartRowset();

Else

/* evaluate the error and either throw a PeopleCode exception or continue⇒
processing */
&error_string = &Return_MSG.IBException.ToString();
&nErrorMsgNumber = &Return_MSG.IBException.MessageNumber;
&nErrorMsgSetNumber = &Return_MSG.IBException.MessageSetNumber;

End-If;
```

See Also

Chapter 15, "Managing Service Operation Routing Definitions," Defining General Routing Information, page 292

Overriding Synchronous Timeout Intervals at Runtime

For long-running outbound synchronous transactions, you can override the default timeout period the transaction at runtime using the SyncServiceTimeout property. The default synchronous timeout period is five minutes.

The HTTP header file is modified to take this parameter. The value you set is sent to the integration gateway where it is used for the HTTP timeout.

The SyncServiceTimeout property takes a time (in seconds). The property is read-write.

The following code example shows how to use the property. To use this property, note that you must override and setup the target connector properties for the transaction. As the example demonstrates, there are helper methods that load properties based on node or transaction.

```
&MSG.SetXmlDoc(&xmlReq);
&MSG.IBInfo.LoadConnectorPropFromNode(Node.EAI);
&MSG.IBInfo.SyncServiceTimeout = 360000;
&MSG.IBInfo.ConnectorOverride = True;
&MSG_Resp = %IntBroker.SyncRequest(&MSG, Node.EAI);
&xmlResponseDoc = &MSG_Resp.GetXmlDoc();
```

See Also

Chapter 7, "Sending and Receiving Messages," Setting and Overriding Target Connector Properties at Runtime, page 144

Enterprise PeopleTools 8.50 PeopleBook: System and Server Administration, "PeopleSoft Timeout Settings"

Handling Cookies

PeopleSoft Integration Broker provides basic cookie handling for exchanges that are initiated by your PeopleSoft application. You can accept a synchronous response message containing cookies, save those cookies in a global variable, and later return them to the remote node in an outbound synchronous or asynchronous request message. This is a typical application of cookies in a web interaction.

Cookies are implemented as an IBInfo class property, Cookies. You can access this property only in an inbound synchronous response message or an outbound request message.

Receiving Cookies Example

The following example retains the cookies from a response message to a global variable:

```
Local Message &SalesRequest, &SalesResponse;
Local Rowset &SALES_ORDER;
Global string &SalesCookies;

&SALES_ORDER = GetLevel0();
&SalesRequest = CreateMessage(OPERATION.SALES_ORDER_SYNC);
&SalesRequest.CopyRowsetDelta(&SALES_ORDER);

/* Send the synchronous request; the return value is the response
message object */
&SalesResponse = %IntBroker.SyncRequest(&SalesRequest);

/* Retrieve cookies from the response message */
&SalesCookies = &SalesResponse.IBInfo.IBConnectorInfo.Cookies;
```

Returning Cookies Example

The following example retrieves the previously retained cookies from the global variable and inserts them into a new request message:

```
Local Message &SalesRequest, &SalesResponse;
Local Rowset &SALES_ORDER;
Global string &SalesCookies;

&SALES_ORDER = GetLevel0();
&SalesRequest = CreateMessage(OPERATION.SALES_ORDER_SYNC);
&SalesRequest.CopyRowsetDelta(&SALES_ORDER);

/* Insert the cookies in the request message */
&SalesRequest.IBInfo.IBConnectorInfo.Cookies = &SalesCookies;

/* Send the asynchronous request */
%IntBroker.Publish(&SalesRequest);
```

Setting and Overriding Target Connector Properties at Runtime

PeopleSoft Integration Broker enables you to dynamically override target connector properties at runtime that have previously been set at the node, connector and transaction levels. To set or override target connectors at runtime, use the PeopleCode IBInfo object, the Connector Info object and implement the OnRequestSend method.

Note. Properties set at the PeopleCode level take precedence over those set at the node, connector and routing level.

- | | |
|-----------------------------|---|
| IBInfo object | <p>An IBInfo object is instantiated from a message object.</p> <p>You can use this object in publishing or synchronous request PeopleCode. You can also use it in your implementation of the OnRequestSend method.</p> |
| ConnectorInfo object | <p>A ConnectorInfo object is instantiated from an IBInfo object. Use this object for reading and writing connector name/value pair information to and from the IBRequest.</p> <p>You can use this object in publishing or synchronous request PeopleCode. You can also use it in your implementation of the OnRequestSend method.</p> |
| OnRequestSend Method | <p>The OnRequestSend method is included in the ISend application class. Use your implementation of this method to override target connector properties at runtime for a subscribing node transaction.</p> <p>This event associated with the service operation executes before any transformations are processed.</p> <p>You can use this event for asynchronous and synchronous messages.</p> |

Since data is always carried with the message, you can use the IBInfo object, ConnectorInfo object and your implementation of the OnRequestSend method to populate connector information in the publishing PeopleCode and then override it for a specific node.

Setting and Overriding Target Connector Properties Using the OnRequestSend Event

You can use implement the OnRequestSend method to override IBInfo and connector properties at runtime for a subscribing node transaction.

Any content data that is changed on the message or XMLDoc is sent to the subscribing node or used within a transformation.

To override the properties of a target connector, you must set the following statement to *true*:

```
&MSG.IBInfo.ConnectorOverride=true
```

If a publication contract fails as a result of using an implementation of the OnRequestSend method to override connector properties at runtime, correct the PeopleCode in your implementation and resubmit the message.

Example: Setting Target Connector Properties Using the OnRequestSend Method

The following example shows loading all connectors that exist for the node and adding one additional property, Filename.

```

import PS_PT:Integration:ISend;

class SendHandler implements PS_PT:Integration:ISend
  method SendHandler();
  method OnRequestSend(&Msg As Message) Returns Message;
end-class;

/* constructor */
method SendHandler
end-method;

method OnRequestSend
  /* &MSG as Message */
  /* Returns Message */
  /* Extends/implements PS_PT:Integration:ISend.OnRequestSend */
  /* Variable Declaration */
  Local Any &Bo;
  Local Message &Msg;

  &Bo = &MSG.IBInfo.LoadConnectorPropFromNode("nodename");

  &Bo = &MSG.IBInfo.IBConnectorInfo.AddConnectorProperties
    ("FILENAME", "temp", %Property);
  &MSG.IBInfo.ConnectorOverride = True;

  Return (&Msg);
end-method;

```

Example: Overriding Connector Properties Using the OnRequestSend Method

The following example demonstrates overriding target connector properties using an implementation of the OnRequestSend method for a rowset-based asynchronous message.

```

import PS_PT:Integration:ISend;

class SendHandler implements PS_PT:Integration:ISend
  method SendHandler();
  method OnRequestSend(&Msg As Message) Returns Message;
end-class;

/* constructor */
method SendHandler
end-method;

method OnRequestSend
  /+ &MSG as Message +/
  /+ Returns Message +/
  /+ Extends/implements PS_PT:Integration:ISend.OnRequestSend +/
  /* Variable Declaration */
  Local Boolean &bRet;

  &bRet= &MSG.IBInfo.LoadConnectorProp("FILEOUTPUT");
  &MSG.IBInfo.ConnectorOverride = True;
  &bRet= &MSG.IBInfo.IBConnectorInfo.AddConnectorProperties
    ("sendUncompressed", "Y", %Header);
  &bRet= &MSG.IBInfo.IBConnectorInfo.AddConnectorProperties
    ("FilePath", "c:\temp", %Property);

  Return (&Msg);

End-Method;

```

The following example demonstrates overriding target connector properties using an implementation of the `OnRequestSend` method for a nonrowset-based asynchronous message.

```

import PS_PT:Integration:ISend;

class SendHandler implements PS_PT:Integration:ISend
  method SendHandler();
  method OnRequestSend(&Msg As Message) Returns Message;
end-class;

/* constructor */
method SendHandler
end-method;

method OnRequestSend
  /* &MSG as Message */
  /* Returns Message */
  /* Extends/implements PS_PT:Integration:ISend.OnRequestSend */
  /* Variable Declaration */

  Local XmlDoc &xmldoc;
  Local Boolean &bRet;

  // if you have to access the content data for content based
  // decisions, do this
  &xmldoc = &MSG.GetXmlDoc();

  &bRet= &MSG.IBInfo.LoadConnectorProp("FILEOUTPUT");
  &MSG.IBInfo.ConnectorOverride = True;
  &bRet= &MSG.IBInfo.IBConnectorInfo.AddConnectorProperties
    ("sendUncompressed", "Y", %Header);
  &bRet= &MSG.IBInfo.IBConnectorInfo.AddConnectorProperties
    ("FilePath", "c:\temp", %Property);

  Return (&MSG);

End-Method;

```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "Message Classes," IBInfo Class

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "Message Classes," IBConnectorInfo Collection

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "Message Classes"

Receiving and Processing Messages

This section discusses how to handle:

- Inbound asynchronous transactions.
- Inbound synchronous transactions.
- Simulating receiving messages from external nodes.

Note. The OnRouteReceive method can be implemented to apply PeopleCode that determines whether the default local node accepts the inbound message.

Handling Inbound Asynchronous Transactions

Implement the OnNotify method in the PS_PT application package, in the Integration sub-package, to handle inbound asynchronous transactions. All the examples in this section are assumed to be implementations of the OnNotify method.

Message Class Inbound Asynchronous Example 1

The following example implements the OnNotify method.

```

import PS_PT:Integration:INotificationHandler;

class FLIGHTPROFILE implements PS_PT:Integration:INotificationHandler
  method FLIGHTPROFILE();
  method OnNotify(&_MSG As Message);
end-class;

/* constructor */
method FLIGHTPROFILE
end-method;

method OnNotify
  /*+ &_MSG as Message +/
  /*+ Extends/implements PS_PT:Integration:INotificationHandler.+
  /*+ OnNotify +/
  /* Variable Declaration */
  Local any &outstring;
  Local any &i;
  Local any &CRLF;

  Local Message &MSG;
  Local Rowset &rs, &rs1;
  Local Record &FLIGHTDATA, &REC;

  Local string &acnumber_value, &msi_sensor_value, &ofp_value,
  &actype_value, &callsign_value, &squadron_value, &comm1_value,
  &comm2_value, &ecm_value;

  Local XmlDoc &xmldoc;
  Local string &return_string_value;
  Local boolean &return_bool_value;

  &CRLF = Char(13) | Char(10);

  &MSG = &_MSG;

  &rs = &MSG.GetRowset();
  &REC = &rs(1).QE_FLIGHTDATA;

  &FLIGHTDATA = CreateRecord(Record.QE_FLIGHTDATA);
  &REC.CopyFieldsTo(&FLIGHTDATA);

  /* Parse out Message Data */
  &acnumber_value = &FLIGHTDATA.QE_ACNUMBER.Value;
  &msi_sensor_value = &FLIGHTDATA.QE_MSI_SENSOR.Value;
  &ofp_value = &FLIGHTDATA.QE_OFP.Value;
  &actype_value = &FLIGHTDATA.QE_ACTYPE.Value;
  &callsign_value = &FLIGHTDATA.QE_CALLSIGN.Value;
  &squadron_value = &FLIGHTDATA.QE_SQUADRON.Value;
  &comm1_value = &FLIGHTDATA.QE_COMM1.Value;
  &comm2_value = &FLIGHTDATA.QE_COMM2.Value;
  &ecm_value = &FLIGHTDATA.QE_ECM.Value;

  &outstring = "Send Async FLight test";

  /* Construct Output String */
  &outstring = &outstring | &acnumber_value | &CRLF |
  &msi_sensor_value |
  &CRLF | &ofp_value | &CRLF | &actype_value | &CRLF |
  &callsign_value |
  &CRLF | &squadron_value | &CRLF | &comm1_value | &CRLF |
  &comm2_value |
  &CRLF | &ecm_value;

```

```
/* Log Output String into page record */
&FLIGHTDATA.GetField(Field.DESCRLONG).Value = &outstring;

SQLExec("DELETE FROM PS_QE_FLIGHTDATA");
&FLIGHTDATA.Insert();

end-method;
```

Message Class Inbound Asynchronous Example 2

The following example shows notification PeopleCode that checks the PSCAMA to determine the audit action code and that examines the language code to determine whether related language processing is needed:

```

method OnNotify
  /+ &MSG as Message +/

  /* Simple PeopleCode Notification- - Check the PSCAMA*/
  Local Rowset &MSG_RS;
  Local Record &REC_NAME_PREFIX, &REC, &REC_RL;
  Local integer &I;
  Local string &ACTION, &LNG, &BASE_LNG, &RELLNG, &KEY1, &KEY2;

  &MSG_RS = &MSG.GetRowset();
  For &I = 1 To &MSG_RS.RowCount /* Loop through all transactions */
    &REC = &MSG_RS.GetRow(&I).GetRecord(Record.NAME_PREFIX_TBL);
    /* Get Audit Action for this transaction */
    &ACTION = &MSG_RS.GetRow(&I).PSCAMA.AUDIT_ACTN.Value;
    /* Get Language code for this transaction */
    &LNG = &MSG_RS.GetRow(&I).PSCAMA.LANGUAGE_CD.Value;
    &BASE_LNG = %Language;

    Evaluate &ACTION /*****
      /***** Add a Record *****/
      /*****
    When "A"
      /* Add the base language record */
      &REC_NAME_PREFIX = CreateRecord(Record.NAME_PREFIX_TBL);
      &REC.CopyFieldsTo(&REC_NAME_PREFIX);
      &REC_NAME_PREFIX.ExecuteEdits();
      If &REC_NAME_PREFIX.IsEditError Then
        /* error handling */

      Else
        &REC_NAME_PREFIX.Insert();
        /* Need error handling here if insert fails */
        If &LNG <> %Language Then
          /* add related language record */
          &RELLNG = &REC.RelLangRecName;
          &REC_RL = CreateRecord(Record.NAME_PREFIX_LNG);
          &REC.CopyFieldsTo(&REC_RL);
          &REC_RL.LANGUAGE_CD.Value = &LNG;
          &REC_RL.Insert();

          /* Need error handling here if insert fails */
        End-If;
      End-If;
    End-If;

    /*****
    /***** Change a Record *****/
    /*****
    /**** Using record objects ****/

    When "C"
      /* Get the Record - insert it */
      &KEY1 = &REC.GetField(Field.NAME_PREFIX).Value;
      &REC_NAME_PREFIX = CreateRecord(Record.NAME_PREFIX_TBL);

      &REC_NAME_PREFIX.NAME_PREFIX.Value = &REC.GetField(Field.
NAME_PREFIX).Value;
      If &REC_NAME_PREFIX.SelectByKey() Then

        &REC.CopyFieldsTo(&REC_NAME_PREFIX);
        &REC_NAME_PREFIX.ExecuteEdits();
        If &REC_NAME_PREFIX.IsEditError Then
          /* error handling */
        Else

```

```

        &REC_NAME_PREFIX.Update();
    End-If;
Else
    &REC.CopyFieldsTo(&REC_NAME_PREFIX);
    &REC_NAME_PREFIX.ExecuteEdits();
    If &REC_NAME_PREFIX.IsEditError Then
        /* error handling */
    Else
        &REC_NAME_PREFIX.Insert();
    End-If;
End-If;

/***** Delete a Record *****/
/**** Using SQLExec *****/

When "D"
    /* Get the Record using SQLExec- error */
    &KEY1 = &REC.GetField(Field.NAME_PREFIX).Value;
    SQLExec("Select NAME_PREFIX from PS_NAME_PREFIX_TBL where
NAME_PREFIX = :>1", &KEY1, &KEY2);
    If None(&KEY2) Then
        /* Send to error log */
    Else
        SQLExec("Delete from PS_NAME_PREFIX_TBL where
NAME_PREFIX = :1", &KEY1);

        SQLExec("Delete from PS_NAME_PREFIX_LNG where
NAME_PREFIX = :1", &KEY1);
    End-If;
End-Evaluate;
End-For;

end-method;

```

Message Class Inbound Asynchronous Example 3

The following example shows OnNotify PeopleCode with multiple transactions:

```

method OnNotify
    /+ &MSG as Message +/
    Local Rowset &HDR_RS, &LN_RS;
    Local Record &HDR_REC, &hdr_rec_msg, &LN_REC, &LN_REC_MSG;
    Local integer &I, &J;

    /*This notification peoplecode processes messages that may*/
    /*contain multiple Header (MSR_HDR_INV) transactions that may*/
    /*have multiple line (DEMAND_INF_INV) transactions. The data */
    /*is inserted into identically structured header/line tables*/
    /*(MSR_HDR_INV2 and DEMAND_INF_INV2)*/

    /* Create record objects for the Header and Lines that will be */
    /* inserted into */

    &HDR_REC = CreateRecord(Record.MSR_HDR_INV2);
    &LN_REC = CreateRecord(Record.DEMAND_INF_INV2);

    /* Create an App. Message Rowset that includes the
    MSR_HDR_INV (Header) and DEMAND_INF_INV (Line)*/
    &HDR_RS = &MSG.GetRowset();

    /* Clear out all the Headers and Lines */
    SQLExec("DELETE FROM PS_MSR_HDR_INV2 WHERE BUSINESS_UNIT =
    'M04A1'");
    SQLExec("DELETE FROM PS_DEMAND_INF_INV2 WHERE BUSINESS_UNIT =
    'M04A1'");

    /* Loop through all the headers in the message */
    For &I = 1 To &HDR_RS.ActiveRowCount
        /* Instantiate the row within the Header portion of the
        App Message rowset to which data will be copied */
        &hdr_rec_msg = &HDR_RS.GetRow(&I).GetRecord(Record.MSR_HDR_INV);

        /* Copy data from the level 0 (Header portion) of
        &STOCK_MSG message structure into the Header record object */
        &hdr_rec_msg.CopyFieldsTo(&HDR_REC);

        &HDR_REC.Insert();

        /* Create Rowset that includes the DEMAND_INF_INV (Line)
        portion of the App Message Rowset */
        &LN_RS = &HDR_RS(&I).GetRowset(1);
        /* Loop through all the lines within this header transaction */

        For &J = 1 To &LN_RS.ActiveRowCount
            /* Instantiate the row within the Line portion of the
            App Message rowset to which data will be copied */
            &LN_REC_MSG = &LN_RS.GetRow(&J).GetRecord(Record.
            DEMAND_INF_INV);
            /* copy data into the Level 1 (Line portion) of &STOCK_MSG*/
            /* object */
            &LN_REC_MSG.CopyFieldsTo(&LN_REC);
            &LN_REC.Insert();
        End-For;
    End-For;
end-method;

```

Message Class Inbound Asynchronous Example 4

There's a practical limit to how large a message can be, and this can be controlled by a system-wide variable called `%MaxMessageSize`. The system administrator can change this size in the PSOPTIONS settings. This size can be set only for all messages, not for individual definitions.

PeopleCode that populates a Message object should include code that is similar to the following example to check the message size before inserting a new Level 0 row.

Note. Always code the `%MaxMessageSize` checkpoint at the Level 0 record. A batch of transactions can be split across multiple messages, but *do not* split a single transaction (logical unit of work) into multiple messages.

```

Local SQL &hdr_sql, &ln_sql;
Local Message &MSG;
Local Rowset &hdr_rs, &ln_rs;
Local Record &hdr_rec, &ln_rec, &hdr_rec_msg, &ln_rec_msg;

/* This PeopleCode will publish messages for a simple Header/
Line record combination. Multiple Header/Lines are copied to the
message until the %MaxMessageSize is exceeded at which point a
new message is built. This references MSR_HDR_INV (Header) and
DEMAND_INF_INV (Line) records */

/* Create an instance of the STOCK_REQUEST message */
&MSG = CreateMessage(OPERATION.STOCK_REQUEST);

/* Create an App. Message Rowset that includes the
MSR_HDR_INV (Header) and DEMAND_INF_INV (Line)*/
&hdr_rs = &MSG.GetRowset();

/* Create a SQL object to select the Header rows */
&hdr_sql = CreateSQL("Select * from PS_MSR_HDR_INV
    WHERE BUSINESS_UNIT='M04A1'
    AND ORDER_NO LIKE 'Z%' ORDER BY BUSINESS_UNIT,ORDER_NO");
&I = 1;

/* Create record objects for the Header and Lines */
&ln_rec = CreateRecord(Record.DEMAND_INF_INV);
&hdr_rec = CreateRecord(Record.MSR_HDR_INV);

/* Loop through each Header row that is fetched */
While &hdr_sql.Fetch(&hdr_rec)
    /* Publish the message if its size exceeds the MaxMessageSize
    /* specified in Utilities/Use/PeopleTools Options */
    If &MSG.Size > %MaxMessageSize Then
        %IntBroker.Publish(&MSG);
        &I = 1;
        /* Create a new instance of the message object */
        &MSG = CreateMessage(OPERATION.STOCK_REQUEST);
        &hdr_rs = &MSG.GetRowset();
    End-If;
    If &I > 1 Then
        &hdr_rs.InsertRow(&I - 1);
    End-If;
    /* Instantiate the row within the Header portion of the
    App Message rowset to which data will be copied */
    &hdr_rec_msg = &hdr_rs.GetRow(&I).GetRecord(Record.MSR_HDR_INV);
    /* Copy data into the level 0 (Header portion) of
    /* &MSG message structure */
    &hdr_rec.CopyFieldsTo(&hdr_rec_msg);

    /* Publish the last message if it has been changed*/
    If &hdr_rec_msg.IsChanged Then
        %IntBroker.Publish(&MSG);
    End-If;
End-While;

```

Message Class Inbound Asynchronous Example 5

The following code example shows how to get data out of the IBInfo object for a rowset-based message.

```

Local Rowset &rs, &rs1;
Local Record &FLIGHTDATA, &REC;

Local string &acnumber_value, &msi_sensor_value, &ofp_value,
    &actype_value, &callsign_value, &squadron_value, &comm1_value,
    &comm2_value, &ecm_value, &datetime;
Local XmlDoc &xmldoc;
Local string &data;
Local boolean &return_bool_value;

&CRLF = Char(13) | Char(10);

/* this is how one would access data from IBInfo and
/* IBConnectorInfo objects*/
&return_bool_value = &MSG.IBInfo.ConnectorOverride;

For &i = 1 To &MSG.IBInfo.IBConnectorInfo.GetNumberOfConnector
Properties()

    &data = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgName(&i);
    &data = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgValue(&i);

End-For;

&MSG.IBInfo.IBConnectorInfo.ClearConnectorProperties();

&data = &MSG.IBInfo.IBConnectorInfo.ConnectorName;
&data = &MSG.IBInfo.IBConnectorInfo.ConnectorClassName;
&data = &MSG.IBInfo.IBConnectorInfo.RemoteFrameworkURL;
&data = &MSG.IBInfo.IBConnectorInfo.PathInfo;
&data = &MSG.IBInfo.IBConnectorInfo.Cookies;

For &i = 1 To &MSG.IBInfo.IBConnectorInfo.GetNumberOfQueryStringArgs()

    &data = &MSG.IBInfo.IBConnectorInfo.GetConnectorPropertiesName(&i);
    &data = &MSG.IBInfo.IBConnectorInfo.GetConnectorPropertiesValue
        (&i);
    &data = &MSG.IBInfo.IBConnectorInfo.GetConnectorPropertiesType(&i);

End-For;

&MSG.IBInfo.IBConnectorInfo.ClearQueryStringArgs();

&data = &MSG.IBInfo.MessageType;
&data = &MSG.IBInfo.RequestingNodeName;
&data = &MSG.IBInfo.OrigUser;
&data = &MSG.IBInfo.OrigNode;
&data = &MSG.IBInfo.AppServerDomain;
&data = &MSG.IBInfo.OrigProcess;
&data = &MSG.IBInfo.OrigTimeStamp;
&data = &MSG.IBInfo.DestinationNode;
&data = &MSG.IBInfo.FinalDestinationNode;
&data = &MSG.IBInfo.SourceNode;
&data = &MSG.IBInfo.MessageName;
&data = &MSG.IBInfo.MessageVersion;
&data = &MSG.IBInfo.VisitedNodes;

/* get the content data from the message rowset*/
&rs = &MSG.GetRowset();
&REC = &rs(1).QE_FLIGHTDATA;

&FLIGHTDATA = CreateRecord(Record.QE_FLIGHTDATA);
&REC.CopyFieldsTo(&FLIGHTDATA);

```

```

/* Parse out Message Data */
&acnumber_value = &FLIGHTDATA.QE_ACNUMBER.Value;
&msi_sensor_value = &FLIGHTDATA.QE_MSI_SENSOR.Value;
&ofp_value = &FLIGHTDATA.QE_OFP.Value;
&actype_value = &FLIGHTDATA.QE_ACTYPE.Value;
&callsign_value = &FLIGHTDATA.QE_CALLSIGN.Value;
&squadron_value = &FLIGHTDATA.QE_SQUADRON.Value;
&comm1_value = &FLIGHTDATA.QE_COMM1.Value;
&comm2_value = &FLIGHTDATA.QE_COMM2.Value;
&ecm_value = &FLIGHTDATA.QE_ECM.Value;
&datetime = &FLIGHTDATA.ACTIONDTM.Value;

&outstring = "Send Async FLight test";

/* Construct Output String */
&outstring = &outstring | &acnumber_value | &CRLF | &msi_sensor_value
| &CRLF | &ofp_value | &CRLF | &actype_value | &CRLF
| &callsign_value | &CRLF | &squadron_value | &CRLF
| &comm1_value | &CRLF | &comm2_value | &CRLF | &ecm_value |
&datetime;

/* Log Output String into page record */
&FLIGHTDATA.GetField(Field.DESCLONG).Value = &outstring;

SQLExec("DELETE FROM PS_QE_FLIGHTDATA");
&FLIGHTDATA.Insert();

```

Message Class Inbound Asynchronous Example 6

The following code example shows how to get data out of the IBInfo object for a nonrowset-based message.

```

Local XmlDoc &xmldoc;
Local XmlNode &node, &root, &acct_id_node, &acct_name_node,
    &address_node, &phone_node;
Local string &outstring, &CRLF;
Local Record &FLIGHT_DATA_INFO, &REC;

Local string &data;
Local boolean &return_bool_value;

/* this is how one would access data from IBInfo and
/* IBConnectorInfo objects*/

&return_bool_value = &MSG.IBInfo.ConnectorOverride;

For &i = 1 To &MSG.IBInfo.IBConnectorInfo.GetNumberOfConnector
    Properties()

    &data = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgName(&i);
    &data = &MSG.IBInfo.IBConnectorInfo.GetQueryStringArgValue(&i);

End-For;

&MSG.IBInfo.IBConnectorInfo.ClearConnectorProperties();

&data = &MSG.IBInfo.IBConnectorInfo.ConnectorName;
&data = &MSG.IBInfo.IBConnectorInfo.ConnectorClassName;
&data = &MSG.IBInfo.IBConnectorInfo.RemoteFrameworkURL;
&data = &MSG.IBInfo.IBConnectorInfo.PathInfo;
&data = &MSG.IBInfo.IBConnectorInfo.Cookies;

For &i = 1 To &MSG.IBInfo.IBConnectorInfo.GetNumberOfQueryStringArgs()

    &data = &MSG.IBInfo.IBConnectorInfo.GetConnectorPropertiesName(&i);
    &data = &MSG.IBInfo.IBConnectorInfo.GetConnectorPropertiesValue
        (&i);
    &data = &MSG.IBInfo.IBConnectorInfo.GetConnectorPropertiesType(&i);

End-For;

&MSG.IBInfo.IBConnectorInfo.ClearQueryStringArgs();

&data = &MSG.IBInfo.MessageType;
&data = &MSG.IBInfo.RequestingNodeName;
&data = &MSG.IBInfo.OrigUser;
&data = &MSG.IBInfo.OrigNode;
&data = &MSG.IBInfo.AppServerDomain;
&data = &MSG.IBInfo.OrigProcess;
&data = &MSG.IBInfo.OrigTimeStamp;
&data = &MSG.IBInfo.DestinationNode;
&data = &MSG.IBInfo.FinalDestinationNode;
&data = &MSG.IBInfo.SourceNode;
&data = &MSG.IBInfo.MessageName;
&data = &MSG.IBInfo.MessageVersion;
&data = &MSG.IBInfo.VisitedNodes;

&xmldoc = &MSG.GetXmlDoc();

&CRLF = Char(13) | Char(10);

&root = &xmldoc.DocumentElement;

/* Get values out of XMLDoc */
&node_array = &root.GetElementsByTagName("actype");

```

```

&ac_type_node = &node_array.Get(1);
&ac_type_value = &ac_type_node.NodeValue;

&node_array = &root.GetElementsByTagName("msi_sensor");
&msi_sensor_node = &node_array.Get(1);
&msi_sensor_value = &msi_sensor_node.NodeValue;

&node_array = &root.GetElementsByTagName("callsign");
&callsign_node = &node_array.Get(1);
&callsign_value = &callsign_node.NodeValue;

&node_array = &root.GetElementsByTagName("ofp");
&ofp_node = &node_array.Get(1);
&ofp_value = &ofp_node.NodeValue;

&outstring = "GetDataout of xmldoc Test";

&outstring = &outstring | &CRLF | &ac_type_value | &CRLF |
&msi_sensor_node
    | &CRLF | &callsign_value | &CRLF | &ofp_value;

/* Write out the result string */
SQLExec("DELETE FROM PS_QE_FLIGHT_DATA");
&FLIGHT_DATA_INFO = CreateRecord(Record.QE_FLIGHT_DATA);
&FLIGHT_DATA_INFO.GetField(Field.DESCRLONG).Value = &outstring;
&FLIGHT_DATA_INFO.Insert();

```

Message Class Inbound Asynchronous Example 7

The following example show a notification that could be an implementation of the OnNotify method, using a component interface in the notification. This example shows error trapping and has multilanguage support:

```

Component string &PUBNODENAME;
/* save pubnodename to prevent circular publishes */
Local Message &MSG;
Local Rowset &MSG_ROWSET, &cur_rowset;
Local ApiObject &oSession;
Local ApiObject &CONTACT_CI;
Local number &I;
Local string &KEY1;
Local Record &REC;
Local boolean &BC_CREATE, &ADD;
Local boolean &TRANSACTION_ERROR, &MSG_ERROR;
/** Transaction/Message Error Flags**/

Function errorHandler()
    Local ApiObject &oPSMessageColl;
    Local ApiObject &oPSMessage;
    Local string &strErrMsgSetNum, &strErrMsgNum, &strErrMsgText,
        &strErrType;
    &oPSMessageColl = &oSession.PSMessages;
    For &I = 1 To &oPSMessageColl.Count
        &oPSMessage = &oPSMessageColl.Item(&I);
        &strErrMsgSetNum = &oPSMessage.MessageSetNumber;
        &strErrMsgNum = &oPSMessage.MessageNumber;
        &strErrMsgText = &oPSMessage.Text;
        &LogFile.WriteLine(&strErrType | " (" | &strErrMsgSetNum | "," |
            | &strErrMsgNum | ") - " | &strErrMsgText);
    End-For;
    rem ***** Delete the Messages from the collection *****;
    &oPSMessageColl.DeleteAll();
End-Function;

Function DO_CI_SUBSCRIBE()

    &oSession = %Session;

    &CONTACT_CI = &oSession.GETCOMPONENT(CompIntfc.CONTACT);
    If (&CONTACT_CI = Null) Then
        /* Replace this message with Tools message set when available */
        Error MsgGet(91, 58, " Unable to get the Component Interface.");
        Exit (1);
    End-If;

    /** Set Component Interface Properties **/
    &CONTACT_CI.GetHistoryItems = True;
    &CONTACT_CI.Interactivemode = False; /** set this to True while
        debugging **/
    rem Send messages to the PSMessage Collection;
    &oSession.PSMessagesMode = 1;

    &MSG_ERROR = False;

    For &I = 1 To &MSG_ROWSET.ActiveRowCount

        /** Set Session Language Code Property **/
        &REGIONALSETTINGS = &oSession.RegionalSettings;
        &REGIONALSETTINGS.LanguageCd = &MSG_ROWSET(&I).PSCAMA.
            LANGUAGE_CD.Value;

        &TRANSACTION_ERROR = False;
        &BC_CREATE = False;

        /** Instantiate Component Interface **/
        &KEY1 = &MSG_ROWSET(&I).CONTACT_TBL.PERSON_ID.Value;
        &CONTACT_CI.PERSON_ID = &KEY1;

```

```

Evaluate &MSG_ROWSET(&I).PSCAMA.AUDIT_ACTN.Value
When = "A"
When = "N"
    &ADD = True;

    /* Check if Keys already exist. */
    &CONTACT_CIColl = &CONTACT_CI.Find();

    /*If None(&EXISTS) Then*/
    If &CONTACT_CIColl.Count = 0 Then
        If &CONTACT_CI.Create() Then
            &BC_CREATE = True;
        Else
            /* Replace this message with Tools message set
            when available */
            Warning MsgGet(18022, 56, "Error creating Component
            Interface for transaction %1", &I);
            &TRANSACTION_ERROR = True;
        End-If;
    Else
        If Not &CONTACT_CI.Get() Then
            /* Replace this message with Tools message set
            when available */
            Warning MsgGet(18022, 59, "Could not Get Component
            Interface for transaction %1", &I);
            &TRANSACTION_ERROR = True;
        End-If;
    End-If;
    Break;
When = "C"
    &ADD = False;
    If Not &CONTACT_CI.Get() Then
        /* Replace this message with Tools message set when
        available */
        Warning MsgGet(18022, 59, "Could not Get Component
        Interface for transaction %1", &I);
        &TRANSACTION_ERROR = True;
    End-If;
    Break;
When = "D"
When = "K"
When-Other
    /* delete and old key action codes not allowed at this
    time */
    &TRANSACTION_ERROR = True;
    Warning MsgGet(18022, 61, "Audit Action 'D' not allowed on
    transaction %1", &TRANSACTION);
    Break;
End-Evaluate;

&CONTACT_CI.CopyRowset(&MSG_ROWSET, &I);

If Not &TRANSACTION_ERROR Then
    If Not &CONTACT_CI.save() Then
        /* Replace this message with Tools message set when
        available */
        Warning MsgGet(18022, 57, "Error saving Component
        Interface for transaction %1", &TRANSACTION);
        &TRANSACTION_ERROR = True;
    End-If;
End-If;

/** close the last Component Interface in preparation for

```

```

        getting the next **/
    If Not &CONTACT_CI.Cancel() Then
        /* Replace this message with Tools message set when
           available */
        Warning MsgGet(18022, 58, "Error Canceling Component
           Interface for transaction %1", &TRANSACTION);
        Exit (1);
    End-If;

    /* Reset &TRANSACTION_ERROR to "False" for &BusComp.Save()
       to execute if no
    /* Transaction Error found in the next Transaction. */
    &TRANSACTION_ERROR = False;

End-For;

If &TRANSACTION_ERROR Then
    &MSG_ERROR = True;
End-If;

End-Function;

/**** Main Process ****/
&MSG.ExecuteEdits(%Edit_Required + %Edit_TranslateTable);
If &MSG.IsEditError Then
    &MSG_ERROR = True;
Else
    &PUBNODENAME = &MSG.PubNodeName;
    &MSG_ROWSET = &MSG.GetRowset();
    /* Do Component Interface subscribe */
    DO_CI_SUBSCRIBE();
End-If;

If &MSG_ERROR Then
    Exit (1);
End-If;

```

XmlDoc Class Inbound Asynchronous Example

The following example uses the GetXmlDoc method.

```

Local XmlDoc &Document;
Local XmlNode &node, &root;
Local string &outstring;
Local Rowset &LEVEL0;
Local Record &SALES_ORDER_INFO, &REC;

&CRLF = Char(13) | Char(10);

& Document = &MSG.GetXmlDoc();

&root = & Document.DocumentElement;
&child_count = &root.ChildNodeCount;

/* Get values out of XmlDoc */
&node_array = &root.GetElementsByTagName("QE_ACCT_ID");
&acct_id_node = &node_array.Get(2);
&account_id_value = &acct_id_node.NodeValue;

&node_array = &root.GetElementsByTagName("QE_ACCOUNT_NAME");
&acct_name_node = &node_array.Get(2);
&account_name_value = &acct_name_node.NodeValue;

&node_array = &root.GetElementsByTagName("QE_ADDRESS");
&address_node = &node_array.Get(2);
&address_value = &address_node.NodeValue;

&node_array = &root.GetElementsByTagName("QE_PHONE");
&phone_node = &node_array.Get(2);
&phone_value = &phone_node.NodeValue;

&outstring = "GetMessageXmlDoc Test";
&outstring = &outstring | &CRLF | &account_id_value | &CRLF
              | &account_name_value | &CRLF | &address_value | &CRLF |
              &phone_value;

&SALES_ORDER_INFO = CreateRecord(Record.QE_SALES_ORDER);
&SALES_ORDER_INFO.GetField(Field.QE_ACCT_ID).Value =
    &account_id_value;
&SALES_ORDER_INFO.GetField(Field.DESCRLONG).Value = &outstring;
&SALES_ORDER_INFO.Update();

```

Handling Inbound Synchronous Transactions

Implement the OnRequest method in the PS_PT application package, in the Integration subpackage, to handle inbound synchronous transactions. All the examples in this section are assumed to be implementations of the OnRequest method.

Message Class Inbound Synchronous Example

The following example implements both the OnRequest method and the OnError method

```

import PS_PT:Integration:IRequestHandler;

class RequestMan implements PS_PT:Integration:IRequestHandler
    method RequestMan();
    method OnRequest(&MSG As Message) Returns Message;
    method OnError(&MSG As Message) Returns string;
end-class;

/* constructor */
method RequestMan
    %Super = create PS_PT:Integration:IRequestHandler();
end-method;

method OnRequest
    /+ &MSG as Message +/
    /+ Returns Message +/
    Local Message &response;

    &response = CreateMessage(Operation.SYNC_REMOTE,
    %IntBroker_Response);

    &response.GetRowset().GetRow(1).GetRecord(Record.QE_FLIGHTDATA).
    GetField(Field.DESCRLONG).Value = &MSG.GenXMLString();

    Return &response;
end-method;

method OnError
    /+ &MSG as Message +/
    /+ Returns String +/
    /+ Extends/implements PS_PT:Integration:IRequestHandler.OnError +/
    Local integer &nMsgNumber, &nMsgSetNumber;
    Local string &sText;

    &nMsgNumber = &MSG.IBException.MessageNumber;
    &nMsgSetNumber = &MSG.IBException.MessageSetNumber;
    rem    &sText = &exception.DefaultText;
    &sText = &MSG.IBException.ToString();

    /* ADD SPECIFIC ERROR INFO HERE */
    Return &sText;
end-method;

```

XmlDoc Class Inbound Synchronous Example

The following example uses the GetXmlDoc method:

```

Local XmlDoc &xmlRequestDoc;
Local XmlDoc &xmlResponseDoc;
Local XmlNode &select;
Local Message &Return_MSG;
Local array of XmlNode &whereClause;

Local string &recordName;
Local string &fieldName;
Local string &fieldValue;
Local Rowset &outputRowset;
Local boolean &return_bool_value;

&xmlRequestDoc = &MSG.GetXmlDoc();
&select = &xmlRequestDoc.DocumentElement;

&recordName = &select.GetAttributeValue("record");
&outputRowset = CreateRowset(@"Record." | &recordName));

&whereClause = &select.GetElementsByTagName("where");
If &whereClause <> Null And
    &whereClause.Len <> 0 Then
    &fieldName = &whereClause.Get(1).GetAttributeValue("field");
    &fieldValue = &whereClause.Get(1).GetAttributeValue("value");
    &outputRowset.Fill("WHERE " | &fieldName | " = :1", &fieldValue);
Else
    &outputRowset.Fill();
End-If;

&Return_MSG = CreateMessage(OPERATION.EXAMPLE, %Int⇒
Broker_Response);
&xmlResponseDoc = &Return_MSG.GetXmlDoc();
&b = &xmlResponseDoc.CopyRowset(&outputRowset);
Return &Return_MSG;

```

SoapDoc Class Inbound Synchronous Example

The following example uses the GetXmlDoc method.

Note. Because GetXmlDoc returns an XmlDoc object, you must receive the inbound request message as an XmlDoc object, then convert it to a SoapDoc object to process it with SOAP methods.

```

Local XmlDoc &request, &response;
Local string &strXml;
Local SoapDocs &soapReq, &soapRes;
Local Message &Response_Message;

&soapReq = CreateSoapDoc();

&request = &MSG.GetXmlDoc();
&soapReq.XmlDoc = &request;
&OK = &soapReq.ValidateSoapDoc();
&parmN = &soapReq.GetParmName(1);
&parmV = &soapReq.GetParmValue(1);

&Response_Message = CreateMessage(OPERATION.SoapExample,
%IntBroker_Response);

&response = &Response_Message.GetXmlDoc();
&soapRes = CreateSoapDoc();
&soapRes.AddEnvelope(0);
&soapRes.AddBody();
&soapRes.AddMethod("StockPrice", 1);
&soapRes.AddParm(&parmN, &parmV);
&soapRes.AddParm("Price", "29");
&OK = &soapRes.ValidateSoapDoc();

&response = &soapRes.XmlDoc;
Return &Response_Message;

```

Simulating Receiving Messages from External Nodes

You can use PeopleCode to simulate receiving asynchronous messages from external nodes, including running transformations.

Use can use the IntBroker class InboundPublish method to work with rowset-based and nonrowset-based messages.

The following example shows an inbound publish as part of an OnNotify method implementation with a rowset-based message:

```

Local Message &MSG_REMOTE;
Local Rowset &rs;

&rs = &MSG.GetRowset();
/*create the message to be re-published from a simulated remote node*/

&MSG_REMOTE = CreateMessage(OPERATION.QE_FLIGHTPLAN);

&MSG_REMOTE.IBInfo.RequestingNodeName = "QE_IBTGT";

&MSG_REMOTE.IBInfo.ExternalOperationName = &MSG_REMOTE.OperationName | "." |
&MSG_REMOTE.OperationVersion;

&MSG_REMOTE.CopyRowset(&rs);

&Ret = %IntBroker.InBoundPublish(&MSG_REMOTE);

```

The following example shows an inbound publish as part of an OnNotify implementation with a nonrowset-based message:

```

Local Message &MSG_REMOTE;
Local XmlDoc &xmldoc;
Local Rowset &rs;

&xmldoc = &MSG.GetXmlDoc();
/*create the message to be re-published from a simulated remote node*/

&MSG_REMOTE = CreateMessage(OPERATION.QE_FLIGHTPLAN);

/* populate the Remote Message with data to be re-published*/

&MSG_REMOTE.SetXmlDoc(&xmldoc);

%IntBroker.InBoundPublish(&MSG_⇒
REMOTE, Node.REMOTE_NODE);

```

Processing Inbound Errors

This section discusses how to:

- Validate data.
- Use the Exit built-in function.
- Correct messaging errors.

Validating Data

You validate data differently depending on the PeopleCode class that you're using to receive the message.

XMLDoc Class Validation

You can validate incoming XML DOM-compliant messages by using the XmlDoc document type definition (DTD) that is delivered with your PeopleSoft application.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*, "XmlDoc Class."

SoapDoc Class Validation

You can validate SOAP-compliant messages by using the ValidateSoapDoc method in the PeopleCode SoapDoc class.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference*, "SOAPDoc Class."

Message Class Validation

Have a message receiving process validate incoming data by:

- Using the ExecuteEdits method in the code to invoke the definitional edits.

- Calling PeopleCode validation built-in functions (if they already exist, for example in a FUNCLIB record, or if validation logic can be encapsulated within a small set of built-in functions) from within the receiving PeopleCode.
- Calling a component interface or Application Engine program from the receiving process (for complex validation logic).

This enables you to reuse logic that is embedded in the component.

The `ExecuteEdits` method uses the definitional edits to validate the message. You can specify the following system variables alone or in combination. If you don't specify a variable, all of the edits are processed.

- `%Edit_DateRange`
- `%Edit_OneZero`
- `%Edit_PromptTable`
- `%Edit_Required`
- `%Edit_TranslateTable`
- `%Edit_YesNo`

The following example processes all edits for all levels of data in the message structure:

```
&MYMSG.ExecuteEdits();
```

The following example processes the Required Field and Prompt Table edits:

```
&RECPURCHASEORDER.ExecuteEdits(%Edit_Required +  
    %Edit_PromptTable);
```

`ExecuteEdits` uses *set processing* to validate data. Validation by using a component interface or a PeopleCode built-in function is usually done with row-by-row processing. If a message contains a large number of rows per rowset, consider writing the message to a staging table and calling an Application Engine program to do set processing if you want additional error checking.

`ExecuteEdits` sets several properties on several objects if there are any errors:

- `IsEditError` is set on the Message, Rowset, Row, and Record objects if any fields contain errors.
- `EditError`, `MessageNumber`, and `MessageSetNumber` are set on the Field object that contains the error.

If you don't want to use `ExecuteEdits`, you can set your own errors by using the field properties. Setting the `EditError` property to `True` automatically sets the `IsEditError` message property to `True`. You can also specify your own message number, message set number, and so on, for the field. If you use the `Exit(1)` built-in function, the message status changes to `Error` when you finish setting the fields that are in error.

Using the Exit Built-in Function

Use the `Exit` built-in function to invoke a messaging error process when the application finds an error. This works only when you use the PeopleCode Message class to process inbound transactions. The same error processing is invoked automatically if PeopleTools finds an unexpected error, such as a Structured Query Language (SQL) error. The `Exit` built-in function has an optional parameter that affects how the error is handled.

To handle error processing in application tables, use the Exit built-in function with no parameter, or just let the notification process finish normally. This marks the message receipt as successful and commits the data.

To handle the error tracking and correction with PeopleSoft Integration Broker, use the Exit built-in function with 1 as a parameter to log the errors, perform a rollback, and stop processing.

Using the Exit Built-in Function Without Parameters

In the Exit () form (that is, Exit without any parameters specified), all data is committed and the message is marked as complete. Use this to indicate that everything processed correctly and to stop program processing. Note, though, that the message status is set to Complete; therefore, you can't detect or access errors in the Service Operations Monitor. If errors did occur, the subscription code should write them to a staging table, and then you must handle all of the error processing.

The Exit built-in function:

- Sets the message status in the application message queue for the subscription to Done.
- Commits the transaction.
- Stops processing.

Following is an example of using Exit without a parameter:

```
&MSG.ExecuteEdits();
If &MSG.IsEditError then
    App_Specific_Error_Processing();
    Exit();
Else
    Specific_Message_Processing();
End-if;
```

Using the Exit Built-in Function with Parameters

When you supply a 1 as a parameter for the Exit built-in function, the function:

- Processes a rollback.
- Sets the message status in the message queue for the subscription to Error.
- Writes the errors to the subscription contract error table.
- Stops processing.

You can view all errors that have occurred for this message in the Service Operations Monitor, even those errors that are detected by ExecuteEdits.

Following is an example of using the Exit function with 1 as a parameter:

```
&MSG.ExecuteEdits();
If &MSG.IsEditError then
    Exit(1);
Else
    Process_Message();
End-if;
```

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor

Using Message Object Functionality With Nonrowset-Based Messages

Prior to the PeopleTools 8.44 release, there were two distinct paths for writing and executing PeopleCode for PeopleSoft Integration Broker which were based on whether you were working with rowset-based XML messages or nonrowset-based XML messages.

For rowset-based XML messages, you could use a rowset and all the properties and methods associated with the Message class. For nonrowset-based XML messages, you could not use the Message class, but instead used built-in functions such as PublishXmlDoc and GetMessageXmlDoc. In addition, when working with nonrowset-based messages and these built-in functions, you could only access content data.

Effective with the PeopleTools 8.44 release, when working with nonrowset-based XML messages you can use *all* of the functionality of the Message object using two new methods, SetXMLDoc and GetXMLDoc.

SetXMLDoc Use this method to load and pass nonrowset-based data into the Message object.

GetXMLDoc Use this method to get nonrowset-based data out of the message object.

Using the SetXMLDoc Method

The following example shows how to use SetXMLDoc to use the Message object to publish a nonrowset-based message.

```
//&XmlDoc holds the nonrowset-based data as before.

// create an instance of the Message object
&MSG = CreateMessage(OPERATION.QE_F18_ASYNC_XMLDOC);
// Load the Message object with the xmldoc data.
&MSG.SetXmlDoc(&XmlDoc);
// perform a publish for the nonrowset-based message
%IntBroker.Publish(&MSG);
```

Using the GetXMLDoc Method

The following code example shows how to use GetXMLDoc to get nonrowset-based XML out of the Message object.

```
Local XMLDOC &XmlDoc;

// get an xmldoc object loaded with the content data.
&XmlDoc = &MSG.GetXmlDoc();
```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "Message Classes"

Generating Test Messages

Use the Handler Tester utility to generate test messages.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools*

Working With Message Segments

This chapter provides an overview of message segments and discusses how to:

- Configure nodes to handle segmented messages.
- Create message segments.
- Delete message segments.
- Send and receive segmented messages between PeopleSoft systems.
- Send and receive segmented messages to/from third-party systems.
- Access message segments.
- View message segment data.
- Use restartable processing for publishing large messages in batch.

Understanding Message Segments

When you create message segments, you can divide rowset-based and nonrowset-based messages into multiple data containers, or segments, for sending. Depending on the order in which you send a message that contains message segments, the receiving system can process the message as a whole, or process one segment at a time while the others are compressed in memory or held in the application database.

As a result creating message segments can enhance system performance and message exchange, especially when you are working with large messages that exceed one gigabyte (1 GB).

To create and manage message segments, you use several methods and properties of the PeopleCode Message class.

Understanding PeopleCode used to Work with Message Segments

This section discusses:

- Methods used with message segments.
- Properties used with message segments.

Methods Used with Message Segments

The following table lists the PeopleCode methods you can use when you work with message segments.

Method	Class	Description
CreateNextSegment	Message	Designates the end point of one segment and the beginning of a new segment.
DeleteOrphanedSegments	IntBroker	Used to delete segments that might have been orphaned if you were processing message segments using a PeopleSoft Application Engine program that had to be restarted.
DeleteSegment	Message	Deletes a segment.
GetSegment	Message	Gets the segment specified by the passed value. The passed value is the segment number.
UpdateSegment	Message	Use this method to update data within the current segment.

Note. Use the DeleteSegment and UpdateSegment methods only when storing segments data in memory. These methods do not function when segment data is stored in the database.

Properties Used with Message Segments

The following table lists PeopleCode properties that you can use when you work with message segments.

Property	Class	Description
CurrentSegment	Message	Returns a number, indicating which segment is the current segment.
SegmentsUnOrder	IBInfo	Determines whether to process message segments in order or unordered. This property pertains to asynchronous messages only. The values are: <ul style="list-style-type: none"> • <i>True</i>: Process message segments unordered. • <i>False</i>: Process message segments in order. (Default.)
SegmentCount	Message	Returns the total number of segments in a message.

<i>Property</i>	<i>Class</i>	<i>Description</i>
SegmentsByDatabase	Message	<p>Enables you to override where message segment data is stored for a message.</p> <p>The values are:</p> <ul style="list-style-type: none"> • <i>True</i>: Store message segments awaiting processing in the application database. • <i>False</i>: Store message segments awaiting processing in memory. (Default.)

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference

Configuring Nodes to Handle Segmented Messages

This section describes how to configure nodes to handle segmented messages.

Understanding Configuring Nodes to Handle Segmented Messages

Before you can send segmented messages, you must configure the remote node defined on the local system to handle segmented messages by setting the Segment Aware option on the Node Definitions page in the PeopleSoft Pure Internet Architecture.

Warning! Do not set the Segment Aware option for remote PeopleSoft 8.45 or earlier nodes, or for third-party systems. If you do so, the receiving system will consume only the first segment of the messages and ignore any subsequent segments.

Configuring a Node to Handle Segmented Messages

To configure a node to handle segmented messages:

1. Select PeopleTools, Integration Broker, Integration Setup, Node Definitions.
2. Select a node with which to work and click OK.

The Node Definitions page appears.

3. Select the Segment Aware box.
4. Click the Save button.

Creating Message Segments

This section provides an overview of creating message segments and message segment numbers and discusses how to:

- Create message segments.
- Count the number of segments in messages.
- Store message segments awaiting processing.
- Override where to store message segment awaiting processing.
- Specify the order in which to process message segments.
- Chunk asynchronous segmented messages.

Understanding Creating Message Segments

By default every message has one segment.

To create multiple message segments use the `CreateNextSegment` method in the location in the message where you want one segment to end and next segment to begin. Continue this process until you have created the desired number of segments for the message.

Segments can contain any number of rowsets of data (rowset-based messages) or rows of data (nonrowset-based messages).

Understanding Message Segment Numbers

When you create a message segment, PeopleSoft Integration Broker assigns a message segment number to the segment.

The first message segment has a message segment number of 1, and message segment numbers are incremented by one sequentially thereafter. As an example, if you break a message into three segments, the first segment number is 1, the second segment number is 2, and the third segment number is 3.

Creating Message Segments

The following example shows using the `CreateNextSegment` method to create three segments in the message `QE_FLIGHTPLAN`, populating each segment with data from the component buffer.

```
&MSG = CreateMessage(OPERATION.QE_FLIGHTPLAN);

&rs=&MSG.GetRowset();
//Now populate rowset
// End of first segment. Beginning of second segment.
&MSG.CreateNextSegment();

&rs=&MSG.GetRowset();
//Now populate rowset
//End of second segment. Beginning of third segment.
&MSG.CreateNextSegment();

&rs=&MSG.GetRowset();
//Now populate rowset

%IntBroker.Publish(&MSG);
```

Counting the Number of Segments in Messages

You might have the need to determine the number of segments in a message. Use the `SegmentCount` property to determine this information.

Storing Message Segments Awaiting Processing

By default, message segments awaiting processing are stored in memory until all segments are processed. Once all segments are processed, PeopleSoft Integration Broker sends all data as one message.

Use the `MessageSegmentFromDB` parameter in PSAdmin to specify the number of segments to keep in memory before writing segmented messages to the database. The default value is *10*.

For synchronous messages, if the number of segments sent for processing exceeds the set for the `MessageSegmentsFromDB` parameter, an error occurs.

Overriding Where to Store Message Segments Awaiting Processing

You can override the number of segments to keep in memory before writing segmented messages to the database for a single message using the `SegmentsByDatabase` property of the `Message` class.

<i>Storage Location</i>	<i>Description</i>
Memory	<p>When message segments are stored in memory, PeopleSoft Integration Broker writes all segments as one message to the database when you send the message.</p> <p>To store message segment data in memory, set the <code>SegmentsByDatabase</code> property to <i>False</i>. (Default.)</p>
Application database	<p>When message segments are stored in the database, PeopleSoft Integration Broker writes the segments to the database individually. When you store message segments in the database you can have an infinite number of segments in a message.</p> <p>To store message segment data in the application database, set the <code>SegmentsByDatabase</code> property to <i>True</i>.</p>

When you store message segments in memory, the number of segments is limited by the value set in the `MessageSegmentFromDB` parameter in PSAdmin in the Setting for PUB/SUB servers section of the file.

When working with asynchronous messages, if you create more message segments than the value set, all segments are written to the database automatically and the `SegmentsByDatabase` property will automatically be set to *True*.

For synchronous messages, attempting to create more segments than the specified value will result in an error message.

Specifying the Order in Which to Process Message Segments

When you work with segmented asynchronous messages you can specify that PeopleSoft Integration Broker process the segments in order or unordered, using the `SegmentsUnOrder` property of the `Message` class.

Message Segment Processing	Description
In order	<p>When Integration Broker processes message segments in order, it decompresses all message segments sequentially and then processes the message as a whole. In this situation, only one publication or subscription contract is created.</p> <p>To process message segment in order, set the SegmentsUnOrder property to <i>False</i>.</p>
Unordered	<p>When Integration Broker processes message segments unordered, it decompresses and processes all segments in parallel. In this situation, the system creates one publication or subscription contract for each message segment.</p> <p>To process message segment unordered, set the SegmentsUnOrder property to <i>True</i>.</p>

If you attempt to send ordered segmented messages to a node that is not segment aware an error message will be created and can be viewed on the Message Errors tab on the Message Details page in Service Operations Monitor.

See *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*

Chunking Asynchronous Segmented Messages

Chunking asynchronous segmented messages sends message in blocks to the receiving node.

When using chunking, message instances display in *Hold* status in the Service Operations Monitor until all chunks are received. Once all chunks are received, the message status switches to *New*.

Note. Chunking applies to ordered asynchronous messages only.

The number of segments to chunk for an asynchronous message is determined by the value you set for the MessageSegmentByDatabase parameter in PSAdmin. The default value is *10*.

As an example, if a message has 20 segments and you set MessageSegmentByDatabase to 5, PeopleSoft Integration Broker will send four groups (array of messages) of segments to the integration gateway, and each group will contain five segments.

Deleting Message Segments

You can delete message segments in a message only before you publish the message.

Use the DeleteSegment method of the Message class to perform the action.

You cannot delete the first segment in a message.

The following example demonstrates using the DeleteSegment method in an implementation of the OnRequestSend method.

```

import PS_PT:Integration:ISend;

class Send implements PS_PT:Integration:ISend
  method Send();
  method OnRequestSend(&message As Message) Returns Message;
  method OnError(&message As Message)
end-class;

/* constructor */
method Send
  %Super = create PS_PT:Integration:ISend();
end-method;

method OnRequestSend
  /* &message as Message */
  /* Returns Message */
  /* Extends/implements PS_PT:Integration:ISend.OnRequestSend */
  Local integer &segment_number, &i;
  Local Rowset &rs;

  For &i = 1 To &message.SegmentCount
    &rs = Null;
    &message.GetSegment(&i);

    &rs = &message.GetRowset();

    /* determine that segment 3 needs to be deleted. */
    &segment_number = &i;

  End-For;

  &message.DeleteSegment(&segment_number);

  Return &message;
end-method;

method OnError
  /* &message as Message */
  /* Extends/implements PS_PT:Integration:ISend.OnError */
end-method;

```

Sending and Receiving Segmented Messages between PeopleSoft Systems

This section discusses how to:

- Send segmented messages to PeopleSoft systems.
- Receive segmented messages from PeopleSoft systems.

Sending Segmented Messages to PeopleSoft Systems

To send a segmented message, use sending PeopleCode and events as you would with any other message.

Use the PeopleSoft target connector when the receiving node is a PeopleSoft system. The PeopleSoft target connector automatically handles message segments, and no additional configuration is required on the connector.

Before sending a transaction with message segments, on the sending PeopleSoft system, be sure that the Segment Aware box is selected for the remote node that represents the receiving system.

Receiving Segmented Messages from PeopleSoft Systems

To receive segmented message from PeopleSoft systems, use notification PeopleCode or implement the OnRequest method.

Use the PeopleSoft listening connector to receive transactions that contain message segments from other PeopleSoft systems. The PeopleSoft listening connector automatically handles message segments, and no additional configuration is required on the connector.

Sending and Receiving Segmented Messages to/from Third-Party Systems

This section discusses how to:

- Send segmented messages to third-party systems.
- Receive segmented messages from third-party systems.

Understanding DataChunkCount and DataChunk Properties

PeopleSoft Integration Broker uses two properties to communicate to sending and receiving systems the number of message segments that are contained in a transaction:

DataChunkCount	Indicates the total number of data chunks or message segments contained in the transaction.
DataChunk	Indicates the number of the data chunk or message segment that you are sending. For example, if there are a total of seven data chunks in the transaction, and the current segment is the third chunk, the DataChunk value for the current message is 3.

Note that when you are sending and receiving message segments between PeopleSoft systems these properties are not used. The PeopleSoft target and listening connectors perform all necessary processing.

Sending Segmented Messages to Third-Party Systems

To send segmented messages from PeopleSoft systems to third-party system, use one of the following target connectors:

- AS2 target connector
- HTTP target connector
- JMS target connector
- SMTP target connector

No additional target connector configuration is required to send segmented messages. These connectors read the messaging PeopleCode on the integration gateway and determine the number of segments contained in the transaction. They then populate the DataChunkCount and DataChunk parameters and include this information with each outbound segment sent. All of these connectors except for the HTTP target connector send the DataChunkCount and DataChunk information in the message header of each outbound message segment. The HTTP target connector includes the DataChunkCount and DataChunk parameter information in the HTTP header of each outbound message segment.

Before sending a transaction with message segments, on the PeopleSoft system, be sure that the Segment Aware box is selected for the remote node that represents the third-party integration partner.

Receiving Segmented Messages from Third-Party Systems

At this time, only the HTTP listening connector can be used to receive message segments from third-party systems.

To receive segmented messages with third-party integration partners, the third-party must specify the following DataChunkCount and DataChunk parameters in the HTTP properties, query arguments, or SOAP header:

The receiving PeopleSoft system must use the HTTP listening connector as only this connector monitors transactions for these parameters.

After the third party sends in the first segment, the PeopleSoft system sends an acknowledgement to the third-party system. The acknowledgment contains a transaction ID that the third-party integration partner must include with all subsequent segments.

The following bullet points describe sample processing for a third-party integration partner sending a transaction to a PeopleSoft system that contains three segments:

1. First segment processing:
 - a. The third-party integration partner prepares the first message/segment of the transaction. In the HTTP properties, query string, or SOAP header, it sets the DataChunk equal to *1* indicating the first chunk, and sets the DataChunkCount equal to *3* indicating total number of chunks to be sent for the transaction.
 - b. When the request is received by the PeopleSoft system the data chunk is saved in the database as a segment.
 - c. In the Service Operations Monitor the transaction displays a status of *Hold*.
 - d. The PeopleSoft system sends an acknowledgement to the third-party system, which includes a transaction ID.

Note. The third-party integration partner must include the transaction ID as part of all subsequent requests for the transaction. The PeopleSoft system uses the transaction ID to identify the segments that belong to the transaction.

2. Second segment processing:
 - a. The third-party integration partner prepares the second message/segment of the transaction. In the HTTP properties, query string, or SOAP header, it sets the DataChunk equal to 2 indicating that the message is the second chunk, and sets the DataChunkCount equal to 3 indicating total number of chunks to be sent for the transaction. It also specifies the transaction ID sent by the PeopleSoft system in the acknowledgement for the first segment.
 - b. When the request is received by the PeopleSoft system the data chunk is saved in the database as a segment.
 - c. In the Service Operations Monitor the transaction displays a status of *Hold*.
3. Third segment processing:
 - a. The third-party integration partner prepares the third message/segment of the transaction. In the HTTP properties, query string, or SOAP header, it sets the DataChunk equal to 3 indicating that the message is the third chunk, and sets the DataChunkCount equal to 3 indicating total number of chunks to be sent for the transaction. It also specifies the transaction ID sent by the PeopleSoft system in the acknowledgement for the first segment.
 - b. When the request is received by the PeopleSoft system the data chunk is saved in the database as a segment.
 - c. Since the PeopleSoft system has received all of the segments in the transaction, in the Service Operations Monitor the transaction displays a status of *New*.
 - d. The PeopleSoft system processing the transaction like any other transaction at this point.

The PeopleCode to read the data chunks/segments is the Message Segment API.

Accessing Segments in Messages

After you receive a segmented message, use the GetSegment method of the Message class to access message segment data.

After you access a message segment, use the Message class GetRowset or GetXmlDoc methods to work with the contents of the segment.

Warning! You can access only one segment in a message at a time. When you access a message segment, PeopleSoft Integration Broker removes the previously accessed message segment from memory.

When you access a message segment, set the existing rowset to null to eliminate storing multiple rowsets in the data cache.

The following example shows using the GetSegment method to access a message segment in the message QE_FLIGHTDATA.

```

For &i = 1 To &MSG.SegmentCount
    &rs = Null; //Null the rowset to remove it from memory
    &MSG.GetSegment(&i);

    &rs = &MSG.GetRowset();
    &REC = &rs(1).QE_FLIGHTDATA;

    &FLIGHTDATA = CreateRecord(Record.QE_FLIGHTDATA);
    &REC.CopyFieldsTo(&FLIGHTDATA);

    /* Parse out Message Data */
    &acnumber_value = &FLIGHTDATA.QE_ACNUMBER.Value;
    &msi_sensor_value = &FLIGHTDATA.QE_MSI_SENSOR.Value;
    &ofp_value = &FLIGHTDATA.QE_OFP.Value;
    &actype_value = &FLIGHTDATA.QE_ACTYPE.Value;
    &callsign_value = &FLIGHTDATA.QE_CALLSIGN.Value;
    &squadron_value = &FLIGHTDATA.QE_SQUADRON.Value;
    &comm1_value = &FLIGHTDATA.QE_COMM1.Value;
    &comm2_value = &FLIGHTDATA.QE_COMM2.Value;
    &ecm_value = &FLIGHTDATA.QE_ECM.Value;

    &outstring = "Send Async Flight test";

    /* Construct Output String */
    &outstring = &outstring | &acnumber_value | &CRLF |
    &msi_sensor_value | &CRLF | &ofp_value | &CRLF | &actype_value |
    &CRLF | &callsign_value | &CRLF | &squadron_value | &CRLF |
    &comm1_value | &CRLF | &comm2_value | &CRLF | &ecm_value;

    /* Log Output String into page record */
    &FLIGHTDATA.GetField(Field.DESCRLONG).Value = &outstring;

    SQLExec("DELETE FROM PS_QE_FLIGHTDATA");
    &FLIGHTDATA.Insert();

End-For;

```

Viewing Message Segment Data

The Service Operations Monitor Message Details page provides information about messages that contain segments.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor

Using Restartable Processing for Publishing Large Messages in Batch

This section provides an overview, prerequisites and setup steps for using restartable processing for publishing large asynchronous segmented messages in batch.

Understanding Using Restartable Processing

PeopleSoft provides a PeopleSoft Application Engine library module, IB_SEGTEST, that you can use as a template to create a module to aid in processing large messages and messages in batch for outbound asynchronous PeopleSoft Integration Broker segment data with restart capability.

With restart capability, if there is an abnormal program termination, you can correct any data errors and continue processing from the point of the last commit without having to reload message segment data from the beginning.

Understanding the IB_SEGTEST Application Engine Library Module

This section provides overview information for using the IB_SEGTEST

The IB_SEGTEST library module consists of three sections:

- Section 1: Section1. The main processing section.
- Section 2: ABORT. Use to trigger a user abort of the running application engine program
- Section 3: CLEANSEG. An independent section you can call to clean up pending segment data that had been committed to the database but is no longer to be used.

Prerequisites

To use the information provided in this section, you should have a thorough understanding of PeopleSoft Application Engine.

Using the IB_SEGTEST Library Module

This section provides an overview of the high-level list of tasks to perform to set up a PeopleSoft Application Engine program to perform restartable message processing.

1. Make a copy of IB_SEGTEST, including all sections and PeopleCode.

From here on, the copy of the application engine library module is referred to as IB_SEGTEST1, but you can use any name you choose.

2. In the State Records tab of IB_SEGTEST1, verify that PSIBSEGRSTR_AET is the default state record. Replace PT_EIP_ERR_AET with whatever state record is used in the main application engine program that will be calling the Library module.

Note that IB_SEGTEST1 is flagged as not restartable. Since database commits will be performed in the middle of PeopleCode processing, the only way the commits can take effect is if the module is flagged as not restartable.

3. The application engine program used to call IB_SEGTEST1 should be restartable.

Always issue a commit in the step prior to calling the library module IB_SEGTEST1.

4. In the application engine program that will be calling IB_SEGTEST1, insert a step to call IB_SEGTEST1, section Section1. Insert the step at the point in time when you want to do the message publish. You must issue a commit prior to calling this section, otherwise there will be a 'Unable to Process Commit' error issued from within IB_SEGTEST1.

5. Add PSIBSEGRSTR_AET as an additional state record to the calling application engine program.
6. Since both programs now share state records, when IB_SEGTEST1 is called, all state record values will be passed on to the called module. Presumably all application values needed to extract application data would be stored in the application state record.
7. Modify the PeopleCode in IB_SEGTEST1.Section1. Several comments have been added to the code to aid in the modifications. Note the following:
 - Change `&MSG = CreateMessage(OPERATION.QE_FLIGHTPLAN)` to create whatever message will be used.
 - `SegmentsByDatabase` should always be set to `True`.
 - The `While` loop is used to simulate application code processing large volumes of data. This can be changed to meet application needs. However, pay close attention as to when commits are issued, when state records are updated, when new segments are created, and finally, when the message publish is executed. The order of these events is crucial to proper workability. In the sample program, also note how to break out of the `While` loop.
 - Note the location where the application state record needs to be updated. A comment instructs in the `PeopleCode` provides instructions on where to perform this task.
 - Do not remove the `Exit(1)` from the end of the `PeopleCode`. This is necessary to bypass the `Abort` action that is coded into the same `Step`.
 - If in the middle of processing, the application code determines that an abort needs to be triggered, an `Exit(0)` can be coded. This triggers the `Abort` step to be called, which will terminate application engine processing. A restart could then be issued if processing needs to continue.

If you determine that a message no longer needs to be published, the calling application engine program could then call the `CLEANSEG` step to get rid of all the pending data that has been saved in the database. Alternatively, the `Abort` step could be modified to call `CLEANSEG` if on any abort, no old data is to be kept.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Application Engine

Chapter 8

Building Message Schemas

This chapter provides an overview of the message Schema Builder and describes how to:

- Select and view data in the message Schema Builder.
- Build message schemas for rowset-based messages.
- Import message schemas for nonrowset-based messages.
- Modify message schemas.
- Delete message schemas.

Understanding the Message Schema Builder

The message Schema Builder enables you to build, import, modify and delete XML message schemas.

Note. The terms *message schema*, *XML message schema*, and *schema* are used interchangeably in this chapter.

To test message schemas during development, use the Schema Tester utility.

Use the Service Operations - General page to enable runtime validation for a service operation, or use the Service Schema Validation page to enable validation for several service operations at a time.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools, "Using the Schema Tester Utility"

[Chapter 12, "Enabling Runtime Message Schema Validation," page 241](#)

Message Schemas

An *XML message schema* describes a model for the arrangement of tags and text in a valid XML document. A schema provides a common vocabulary for a particular application that exchanges documents.

Building, Importing, Modifying and Deleting Message Schemas

You can use the Message Schema Builder to manage message schemas for rowset-based messages in the application database.

Note. You can also use the pages of the Message Builder component to manage rowset-based and nonrowset-based schemas. However, the Message Builder enables you to work with only one message schema at a time, whereas , the Message Schema Builder enables you to perform actions, such as building and deleting message schemas, on multiple messages at a time.

Note. You cannot use the Message Schema Builder to build schemas for message parts or container messages. You must use the Message Builder component to build schemas for these message types.

Rowset-Based Message Schemas

Use the Message Schema Builder to generate, regenerate, view or delete rowset-based message schemas.

You cannot regenerate or delete a rowset-based message schema that is a message part. Part and container schemas are automatically generated at save time so there's no need to explicitly regenerate or delete them.

Nonrowset-Based Message Schemas

Use the Message Schema Builder to import new nonrowset-based schemas into the database, modify existing nonrowset-based message schemas, or delete them.

Schemas for nonrowset-based message parts can be deleted or modified, but message parts should never be without a schema. After deleting a nonrowset-based message part, you should always import or enter a new schema for the message.

Selecting and Viewing Data in the Message Schema Builder

This section discusses how to:

- Select data in the Message Schema Builder.
- View message schema data details.
- View XML message schema code.

Selecting Data in the Message Schema Builder

When you access the Message Schema Builder component (IB_SCHEMABUILD) the Schema Builder page (IB_SCHEMABUILD) displays a search engine to use to search for messages and message schema data with which to work and view.

To access the Schema Builder page, select PeopleTools, Integration Broker, Service Utilities, Message Schema Builder.

Message Schema Builder

Message Criteria

Message Name:

Owner ID:

Schema

☐ Schema Exists
☐ No Schema
☒ Both

Structure

☐ Rowset-based
☐ Nonrowset-based
☒ Both

☒ [Select All](#)
☐ [Clear All](#)

Schema Builder page

The Schema Builder page provides the following options for searching for data with which to work and view in the application database.

Message Name (Optional.) Click the Lookup button to locate a message definition with which to work.

If you do not select a message name, the search will be based on all message definitions in the application database.

Owner ID (Optional.) From the Owner ID drop-down list, select the owner ID for the message definition.

The owner ID helps to determine the application team that last made a change to a message definition. The values in the drop-down list box are translate table values that you can define in the OBJECTOWNERID field record.

Schema Select from the following options in the Schema group box:

- **Schema Exists.** Select this option to search message versions for which schemas have been built.
- **No Schema.** Select this option to search message versions for which no schemas have been built.
- **Both. (Default.)** Select this option to search all message versions.

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187

Structure

Select from the following options in the Structure group box:

- Rowset-based. Select this option to search for rowset-based message versions.
- Nonrowset-based. Select this option to search for nonrowset-based message versions.
- Both. (Default.) Select this option to search for rowset-based and nonrowset-based message versions.

Search

Click the button to search the database based on the criteria selected.

Viewing Message Schema Details

When you search for data in the Schema Builder, message detail results appear in the Message Schemas grid.

2. Locate the message with which you want to work.

See Chapter 8, "Building Message Schemas," Selecting Data in the Message Schema Builder, page 186.

The Schema Builder page appears.

3. In the Message Schema section, check the boxes next to the message names that contain schemas you want to delete.
4. Click the Delete Selected Schemas button.

3. In the Service Operations field, enter the service operation name to delete and click the Search button.
Search results appear in the results grid.
4. In the results grid, check the box next to the service operation or service operations to delete.
5. Click the Delete button.

Integration Status

When you use the Graphical View link to view a routing definition in graphical format, an Integration Not Active link displays if any metadata associated with the integration is inactive. Inactive metadata might include the routing definition, the service operation, a service operation handler, and so on.

If you click the Integration Not Active link an Integration Status page appears and you can view activate the metadata.

Managing System-Generated Routing Definitions

This section discusses how to:

- View system-generated routing definition status.
- Initiate system-generated routing definitions.
- Regenerate system-generated routing definitions.

Understanding Managing System-Generated Routing Definitions

The PeopleSoft system can automatically generate any-to-local and local-to-local routing definitions when you save a service operation definition.

After the system generates the routing definition, you can view and fine-tune the definition as needed using the pages in the Routings component.

In addition, if you make any changes to a service operation after the system has generated a routing definition for it, you can have the system regenerate a routing definition. However, any modifications made to the routing definition are lost when you regenerate it.

Viewing System-Generated Routing Definition Status

The Service Operations-General page (IB_SERVICE) features a Routing Status box that you can use to verify if any system-generated routing definitions exist for a service operation. To access the page select PeopleTools, Integration Broker, Integration Setup, Service Operations.

The following example shows the Routing Status box:

<i>Service Operation Type</i>	<i>Sender is Local</i>	<i>Receiver is Local</i>	<i>Inbound Request Routing</i>	<i>Outbound Request Routing</i>	<i>Inbound Response Routing</i>	<i>Outbound Response Routing</i>
Asynchronous-to-synchronous	Y	N	N	Y	Y	N
Asynchronous-to-synchronous	N	Y	Y	N	N	Y
Asynchronous-to-synchronous	N	N	Y	Y	Y	Y

Asynchronous request/response service operations may have the following routing parameters:

<i>Service Operation Type</i>	<i>Sender is Local</i>	<i>Receiver is Local</i>	<i>Inbound Request Routing</i>	<i>Outbound Request Routing</i>	<i>Inbound Response Routing</i>	<i>Outbound Response Routing</i>
Asynchronous Request / Response	Y	Y	N	Y	Y	N
Asynchronous Request / Response	Y	N	N	Y	Y	N
Asynchronous Request / Response	N	Y	Y	N	N	Y
Asynchronous Request / Response	N	N	Y	Y	Y	Y

Adding Routing Definitions

This section discusses how to add routing definitions to the integration system.

Understanding Adding Routing Definitions

The following table describes the location within the PeopleSoft system where you can add routing definitions to the system:

<i>Page</i>	<i>Page Object ID</i>	<i>Component</i>	<i>Component Object ID</i>	<i>Navigation</i>
Routings Definition	IB_ROUTING DEFN	Routings.	IB_ROUTINGDE FN	PeopleTools, Integration Broker, Integration Setup, Routings

Page	Page Object ID	Component	Component Object ID	Navigation
Service Operations - Routings	IB_SERVICE RTNGS	Service Operations	IB_SERVICE	PeopleTools, Integration Broker, Integration Setup, Service Operations. Select the Routings tab.
Node - Routings	IB_NODEROUTINGS	Nodes.	IB_NODE	PeopleTools, Integration broker, Integration Setup, Nodes. Select the Routings tab.

Note. When using the RSS feeds functionality you may need to create a routing definition for a non-default service operation version. The only location that you can add a routing definition for a non-default service operation version is in the Routings component.

Adding Routing Definitions Using the Routings Component

The following graphic shows the page used to add a routing record when using the Routings component:

Routing Definitions

The screenshot shows the 'Routing Definitions' page. At the top, there are two tabs: 'Find an Existing Value' (light blue) and 'Add a New Value' (dark blue). Below the tabs is a text input field with the label 'Routing Name:'. At the bottom of the visible area is a yellow button with the text 'Add'.

Adding a routing record from the Routings component

To add a routing record using the Routings component:

1. Select PeopleTools, Integration Broker, Integration Setup, Routings.
2. Click the Add a Value tab.
3. In the Routing Name field, enter a name for the routing definition.
4. Click the Add button.

The routing definition is added to the system and the Routing Definitions page appears where you can define the routing details.

See [Chapter 15, "Managing Service Operation Routing Definitions," Defining General Routing Information, page 292.](#)

Node Definitions

Connectors

Portal

WS Security

Routings

Node Name:

TEST_NODE

Routing Name:

Add

Routing Definitions										Customize	Find	View All		First	1 of 1	Last
Selected	Name	Service Operation	Service Operation Version	Operation Type	Sender Node	Receiver Node	Direction	Status	Results							
<input type="checkbox"/>																

Adding a routing definition from the Nodes-Routings page.

To add a routing definition from the Nodes-Routings page:

1. Access the Nodes-Routings page (PeopleTools, Integration Broker, Integration Setup, Nodes. Click the Routings tab.)
2. In the Routing Name field, enter a name for the routing definition.
3. Click the Add button.

The routing definition is added to the system and the Routing Definitions page appears where you can define the routing details.

See [Chapter 15, "Managing Service Operation Routing Definitions," Defining General Routing Information, page 292.](#)

Defining General Routing Information

After you add a routing definition to the system use the pages of the Routing component to define the routing details. The following graphic shows the Routing Definitions page that you use to define general routing information, as accessed from the Service Operations-Routings page.

Routing Definitions

Parameters

Connector Properties

Routing Properties

Routing Name:

QE_PO_SYNC

☒ Active

*Service Operation:

QE_PO_SYNC

☐ System Generated

Version:

V1

*Description:

QE_PO_SYNC

[Graphical View](#)

Comments:

*Sender Node:

QE_LOCAL

*Receiver Node:

QE_IBTGT

Operation Type:

Synchronous

☒ User Exception

Object Owner ID:

*Log Detail:

Header and Detail

OnSend Handler:

Routings – Definitions page

The various ways to access this page are discussed in the previous section.

See Chapter 15, "Managing Service Operation Routing Definitions," Understanding Adding Routing Definitions, page 289.

When you add a routing definition from a service operation record, the PeopleSoft system automatically populates some of the data on this page based on the data in the service operations record from which you created the routing. Automatically populated data includes the service operation name, version, and routing type.

Routing Name	Indicates the name of the routing definition. This name is specified when you add a routing definition to the system.
Service Operation	Enter the name of the service operation that will use the routing. If you access the Routings component from the Service Operations-Routing tab, PeopleSoft Integration Broker automatically populates this information.
Active	(Optional.) Check the box to activate the routing. By default, new routing definition are active. If any of the referenced nodes are inactive, you cannot activate the routing.
System Generated	When selected, indicates that the PeopleSoft system generated the routing definition.

Version	Indicates the version of the service operation selected.
Description	Description of the routing definition. If you do not enter a description, this value defaults to the name of the service operation associated with the routing definition upon save.
Graphical View	Click this link to view saved routing definitions in graphical format. <u>See Chapter 15, "Managing Service Operation Routing Definitions," Viewing Routing Definitions in Graphical Format, page 309.</u>
Comments	(Optional.) Enter comments about the routing definition.
Sender Node	Enter the name of the sending node.
Receiving Node	Enter the name of the receiving node.
Routing Type	Indicates the service operation type. PeopleSoft Integration Broker automatically populates this information when you select the service operation.
User Exception	The User Exception check box displays only for synchronous service operations. (Optional.) Check the box to enable exception handling using PeopleCode. When enabled and an error occurs you can handle any errors in the calling PeopleCode. If not enabled any errors that occur cause the program to stop.
Object Owner ID	(Optional.) From the drop-down list box, select the owner of the definition. The owner ID helps to determine the application team that last made a change to the definition. The values in the drop-down list box are translate table values that you can define in the OBJECTOWNERID field record.
Accept Compression	(Optional.) The Accept Compression check box displays only for inbound synchronous service operations. Check the box for the system to send the response to the consumer compressed. You must compress the response before sending, using PeopleCode or by setting the Min Message Size Compression parameter in PSAdmin. You can override the compression of the response using PeopleCode by setting the CompressionOverride property on IBInfo. The following example shows sample PeopleCode to override compression of the response message: <pre>&MSG.IBInfo.CompressionOverride = %IntBroker_Compress; Set/Get property for Compression override. Valid parms : => %IntBroker_Compress, %IntBroker_UnCompress, %IntBroker_> Compress_Reset</pre>

Log Detail

The Log Detail drop-down list box displays only for synchronous service operations.

This option enables you to set the level of information logging for synchronous messages that is viewable in the Service Operations Monitor.

The valid values are:

- *Header.*

Log header information only. With this option, you can view synchronous message header information in the Service Operations Monitor.

- *Header and Detail.* Log header and message detail information. With this option, you can view synchronous message header information and XML message content on in the Service Operations Monitor.

(Default.)

- *No Logging.* (Default.) Turn off all logging. No information is available to view in the Service Operations Monitor.

OnSend Handler

This field displays when an OnSend handler is defined for the service operation and the sending node is the local node. It also displays when you the system is serving as a hub, and neither the sender nor receiver are local.

Select a handler from the list. This handler runs when a message is sent or received to perform processing logic.

Schema Validation Details

This field displays only when working with any-to-local routing definitions.

(Optional.) When this check box is selected and a schema validation error occurs the raw schema parser errors are returned to the consumer within the default message CDATA tag. If the check box is not selected (Default) then if a schema validation error occurs the systems uses the standard message set/ ID framework to generate the error.

OnReceive Handler

This field displays when an OnReceive handler is defined for the service operation and:

- The sending node is the local node.
- The service operation type is asynchronous request/response where the sender is not local and the receiver is local.
- The system is serving as a hub, and neither the sender nor receiver are local.

Select a handler from the list. This handler runs when a message is sent or received to perform processing logic.

Defining Routing Parameters for Requests and Responses

This section provides an overview of defining transformations for any-to-local routing definitions and discusses how to define general routing parameters.

Understanding Transformations on Any-to-Local Routing Definitions

If you define a transformation on an any-to-local routing definition, the system uses the input message.version on the transform for the inbound request for WSDL. If a transform is defined on the outbound response, then the system uses the message.version on the output of the transformation for WSDL.

In cases where the input message.version or output message.version are not defined on the transform, the system uses the request or response message.version defined on the service operation for WSDL.

Note that any-to-local routing definitions are read-only when WSDL has been exported. As a result, you cannot change the in/out message transformation, aliases, and so on.

Defining Routing Parameters

Use the Routings-Parameters page (IB_ROUTINGDEFNDOC) to view and define parameters for requests and responses associated with a service operation. Information you define includes, routing external aliases for inbound and outbound requests and responses, as well as any inbound or outbound transformations to invoke.

To access the Routings - Parameters page, select PeopleTools, Integration Broker, Integration Setup, Routings and click the Parameters tab. The following graphic shows the Routings-Parameter page:

Routing Definitions

Parameters

Connector Properties

Routing Properties

Routing Name:

QE_PO_SYNC

Service Operation:

QE_PO_SYNC

Service Operation Version:

V1

Sender Node:

QE_LOCAL

Receiver Node:

QE_IBTGT

Parameters

Type:

Inbound Response

External Alias:

QE_PO_SYNC.V1

[Alias References](#)

Message.Ver into Transform 1:

Transform Program 1:

Transform Program 2:

Message.Ver out of Transforms:

Type:

Outbound Request

External Alias:

QE_PO_SYNC.V1

[Alias References](#)

Message.Ver into Transform 1:

Transform Program 1:

Transform Program 2:

Message.Ver out of Transforms:

Routings – Parameters page

The following page elements display on the Routings-Parameters page:

Type	Specifies the routing direction and the type of message (request or response) associated with the service operation. This information is automatically populated from the service operation definition.
------	---

Message.Ver out of Transforms

(Optional.) Enter the name of the message after all transform program have completed processing.

For inbound messages, this is the message name and version that the PeopleSoft system is expecting.

For outbound messages, this is the message name and version that the integration partner system is expecting.

When the Routings-Parameters page first displays values for the Message.Ver into Transform 1 and Message.Ver out of Transforms fields display values to assist you in choosing transform programs. After you save the page, values do not appear in these fields unless the transform programs have an input/output messages associated with them.

Note. Based on the transform selected, the message.version of the inbound request or response and the message.version of the outbound request or response that the system populated on the page can be different then those specified on the component. Should this occur a warning message displays and you can accept or reject the message.version information populated on the Routings - Parameters page. If you reject the message.version information populated on the page, you can modify the fields with the appropriate message.version information, or change the information that is specified on the component.

Overriding Gateway and Connector Properties

The Routings-Connector Properties page (IB_ROUTINGDEFCON) enables you to override the default integration gateway and target connector that the local node uses to communicate with an endpoint for a specific routing definition.

Note. The Routings-Connector Properties page displays in the Routings component only if the receiving node is not the local node.

The following graphic shows the Routings-Connector Properties pages used to define connector properties for a routing definition:

Routing Definitions

Parameters

Connector Properties

Routing Properties

Routing Name:

QE_PO_SYNC

Service Operation:

QE_PO_SYNC

Service Operation Version:

V1

Gateway ID:

Connector ID:

Routings-Connector Properties page

After you select an integration gateway and target connector with which to work, the system displays the required properties for the connector that you can set and override. To set or override additional properties add them to the properties list with the desired values.

Routing Definitions

Parameters

Connector Properties

Routing Properties

Routing Name:

QE_PO_SYNC

Service Operation:

QE_PO_SYNC

Service Operation Version:

V1


Gateway ID:

LOCAL

Connector ID:

HTTPTARGET

Connector Properties

Customize | Find | View All |  First 1-3 of 3 Last

Property ID	Property Name	Value		
HEADER	sendUncompressed	Y	+	-
HTTPPROPERT	Method	POST	+	-
PRIMARYURL	URL		+	-

Properties for the HTTP target connector

Gateway ID Click the Lookup button to select an integration gateway.

Connector ID Click the Lookup button to select a target connector that resides on the gateway entered in the Gateway ID field.

After you select a target connector, its required properties appear.

Save Click the Save button to save your changes.

Overriding Default Integration Gateways

To override the default integration gateway, use the Gateway ID field Lookup button to select a gateway. You must also select a target connector on the new gateway to use and define properties for that connector.

Overriding Default Target Connectors

To override the default target connector on the default integration gateway, use the Gateway ID field Lookup button to select the default gateway. Use the Connector ID field Lookup button to select a different target connector that resides on the gateway and then define properties for the new connector.

Overriding Default Connector Properties

To override the default target properties for the default target connector, use the Gateway ID field Lookup button to select the default gateway. Use the Connector ID field Lookup button to select the default target connector and then adjust the gateway properties as appropriate.

Defining Routing Properties

This section provides an overview of routing properties and discusses how to add them in the form of name/value pairs to routing definitions.

Understanding Routing Properties

Routing properties are user-defined name/value pairs that denote data contained in transformations defined for a routing definition.

Once they know the name/value pairs in a transformation, developers can extract the data from transformations using application classes. Developers might use the name/value pairs data to add to XML, perform SELECT actions in tables, and so on.

Defining Routing Property Name/Value Pairs

Use the Routings-Routing Properties page (IB_ROUTINGDEFNPROP) to add routing properties to a routing definition. The following example shows the Routings-Routing Properties page:

Routing Properties page

To add routing property name/value pairs:

1. Access the Routings-Routing Properties page (PeopleTools, Integration Broker, Integration Setup, Routings and click the Routing Properties tab).
2. From the Type drop-down list box, select a property type. The options are:
 - *Category*.
 - *Ident*.
 - *Search*.
3. In the Prop. Name field, enter a name for the property.
4. (Optional.) In the Value field, enter a value for the property.
5. (Optional.) In the Comment field, enter a comment or description for the name/value pair.
6. Click the plus button (+) to add additional rows and property name/value pairs.
7. Click the Save button.

Using Introspection to Create Routing Definitions

This section discusses how to:

- Select service operations for which to create routing definitions.
- Select the node to introspect.
- Select routing definitions to generate.
- View introspection results.

Understanding Using Introspection to Create Routing Definitions

You can introspect PeopleTools 8.50 nodes to create inbound or outbound point-to-point routing definitions on nodes that have matching service operations and versions for the local node. You can introspect *PIA* and *External* nodes types.

The following table lists the actions you can perform using introspection:

<i>Routing Definition On Local Node</i>	<i>Routing Definition on Introspected Node</i>	<i>Introspection Option</i>
Inbound point-to-point routing.	None.	Delete routing on local node.
Outbound point-to-point routing.	None.	Delete routing on local node.
None.	Inbound point-to-point routing.	Create outbound point-to-point routing.
None.	Outbound point-to-point routing.	Create inbound point-to-point routing.
None.	Any-to-local routing. (Inbound.)	Create outbound point-to-point routing.

Prerequisites for Using Introspection to Create Routing Definitions

The following prerequisites exist for using introspection to create routing definitions:

- Nodes to be introspected must be active. To verify that a node is active, open the node definition for the node and make sure that the Active box is checked on the definition.
- External nodes to be introspected must have a WSIL URL defined on the node definition.


2. Enter search criteria for the services operations for which to generate routing definition. Provide one or more of the search criteria to narrow your search. Select no search criteria to retrieve a list of all service operations in the database.
 - In the Service field, enter a service name.
 - In the Service Operation field, enter a service operation name.
 - From the Object Owner ID drop-down list box, select the object owner of the service to provide.
3. Click the Search button.
A Select Operations grid appears that contains the search results.
4. Check the box next to each service operation for which to generate a routing definition.
To clear a selection, check the box again.
5. Click the Select Nodes button to proceed to select nodes to introspect.


Selecting Nodes to Introspect

Use the Introspection and Deployment Validation-Select Nodes page (PTIB_INTROSPECT_1) to select the nodes to introspect. The following example shows this page:

Introspection and Deployment Validation

Select Nodes

Node Name: 

Node Type: 

Select	Node Name	Description	Node Type	Active	WSIL URL
<input checked="" type="checkbox"/>	QE_IBTGT	Test Asyn & Sync Cross node	PIA	Yes	<input type="checkbox"/>

☒ [Select All](#) ☐ [Clear All](#)

[Return to Service Operations](#)

Select Nodes page with the node QE_IBGT selected for introspection.

To select nodes to introspect:

1. Enter one or more of the following search criteria to search for a node:

- In the Node Name field, enter a node name.
- From the Node Type drop-down list box, select a node type. The options are:

PIA Designates the node as a PeopleSoft database that uses PeopleSoft Integration Broker.

External Designates the node as an entity that doesn't use PeopleSoft Integration Broker.

Note. The ICType node type displays in the list, however you cannot introspect the ICType node type to create routing definitions.

- Select no search criteria to retrieve a list of all nodes defined in the database.
2. Click the Search button.

A Select Nodes grid appears that contains the search results.

3. Check the box next to the nodes to introspect.

If a node displays in the list, but isn't available for selection, the check box is grayed out. A node may not be available for selection due to not being active or in the case of external nodes, no WSIL URL is defined on the node definition.

4. Click the Introspect Selected Nodes button to introspect the node or nodes that you selected.

Click the Return to Service Operations link at any time to go back to the Deployment Validation-Select Operations page to modify the selection of service operations for which to generate routing definitions.

Selecting Routing Definitions to Generate

Use the Introspection and Deployment Validation-Introspection Results page (PTIB_INTROSPECT_2) to view the introspection results and select the routing definitions to generate.

Introspection and Deployment Validation

Introspection Results

Find | View All | First 1 of 1 Last

Service: QE_FLIGHTPLAN_SYNC

Service: QE_FLIGHTPLAN_SYNC

Default Version: VERSION_1

Operation Results

Customize | Find | View All | [Grid Icon] | First 1 of 1 Last

Selected Flag	Action	Direction	Node	Introspection Results	Updated on
<input checked="" type="checkbox"/>	Create routing	Sending To	QE_IBTGT	Point-to-point routing found. Routing can be created.	

☒ Select All

☐ Clear All

Perform Selected Actions

[Return to Select Operations](#)

[Return to Select Nodes](#)

Selection the action to create a point-to-point routing.

After you introspect one or more nodes an Operation Results box displays for each service operation for which you are generating routing definitions. Select the actions to perform and click the Perform Selected Actions button.

The following page elements appear on the Introspection and Deployment Validation-Introspection Results page:

- Service

The name of the service.
- Service Operation

The name of the service operation.
- Default Version

The default version of the service operation.
- Action

Indicates the possible action to perform on the service operation. The valid values are:
 - None. Displays when a valid routing already exists between nodes. Also displays if there are no matching routing definitions on sending and receiving nodes.
 - Delete Routing. Displays when there is a routing on the source node, but no corresponding routing on the target node.
 - Create Routing.. Displays when matching routing definitions are present on the sending and receiving nodes.
- Direction

Indicates if the direction of the transaction is inbound or outbound. The valid values are:
 - Sending To. Indicates an outbound routing.
 - Receiving From. Indicates an inbound routing.
 - Blank. No routing found.
- Node

Indicates the name of the node introspected.

Introspection Results	<p>Indicates the results of the introspection. The valid values are:</p> <ul style="list-style-type: none"> • <i>A Routing exists locally. No routing found on the node. Delete local routing?.</i> A routing definition exists on the local database, but there is no corresponding routing on the introspected node. You may delete the routing definition on the local node. • <i>No Match Found.</i> Indicates that no matching routing was found on the introspected node. • <i>Routing Created.</i> The PeopleSoft system found a matching routing definition on the introspected node and created the routing. • <i>Routing Deleted.</i> The PeopleSoft system deleted the routing. • <i>Any-to-Local routing found. Routing can be created.</i> The target system has an any-to-local routing defined, meaning that it will accept transactions from any node. A routing will be created. • <i>Point-to-point routing found. Routing can be created.</i> • <i>Valid Routings Found.</i> Routing definitions between systems already exist.
Updated On	Indicates the date and time that a change or delete action was performed in the current session.
Select All	Click the button to select to perform all actions listed in the Action field for each service operation displayed.
Clear All	Click the button to clear all selections.
Perform Selected Action	Click the button to perform the action described for selected Action fields in the Operation Results grid for each service operation.
Return to Select Operations	<p>Click the link to go back to the Deployment Validation-Select Operations page to modify the selection of service operations for which to generate routing definitions.</p> <p>This option displays only when introspection is initiated from the Deployment Validation component.</p>
Return to Service Operation	<p>Click the link to go back to the Service Operations page.</p> <p>This option displays only when introspection is initiated from the Service Operations page.</p>
Return to Select Nodes	Click the link to go back to the Introspection and Deployment Validation-Select Nodes page to modify the selection of nodes to introspect.

View Introspection Results

After the system performs the selected actions, the following Introspection Results page (PTIB_INTROSPECT_2) appears:

Introspection and Deployment Validation

Introspection Results

Find | View AllFirst1 of 1Last

Service: QE_FLIGHTPLAN_SYNC

Service: QE_FLIGHTPLAN_SYNC

Default: VERSION_1

Operation:

Version:

Operation Results

Customize | Find | View All | [Grid Icon] | [List Icon]

First1 of 1Last

Selected Flag	Action	Direction	Node	Introspection Results	Updated on
<input type="checkbox"/>	None	Sending To	QE_IBTGT	Routing created.	07/27/09 11:21:07AM

☒ Select All

☐ Clear All

Perform Selected Actions

[Return to Select Operations](#)

[Return to Select Nodes](#)

Introspection Results page showing that the routing was created.

The Introspection Results field shows the status for each routing definition.

You can view routing definitions created using the Routing Definition page or the Service Operations-Routings page.

See Also

- Chapter 15, "Managing Service Operation Routing Definitions," Defining General Routing Information, page 292
- Chapter 15, "Managing Service Operation Routing Definitions," Renaming Routing Definitions, page 317

Activating and Inactivating Routing Definitions

- This section discusses how to:
- Use the Routings component to activate and inactivate routing definitions.
 - Use the Service Operations component to activate and inactivate routing definitions.
 - Use the Nodes component to activate and inactivate routing definitions.

Understanding Activating and Inactivating Routing Definitions

You can use the Routings component or the Service Operations component to activate and inactivate routing definitions.

Activating and Inactivating Routing Definitions in the Routing Component

You can use the Routings-Routing Definitions page to activate and inactivate a routing definition.

To activate or inactivate a routing definition:

1. Select PeopleTools, Integration Broker, Integration Setup, Routings.
Select a routing definition with which to work.
2. Perform one of the following actions:
 - To activate the routing definition, check the Active check box.
 - To inactivate the routing definition, clear the Active check box.
3. Click the Save button.

Activating and Inactivating Routing Definitions in the Service Operations Component

You can also activate and inactivate routing definitions in the Service Operations component using the Service Operations-Routings page.

See [Chapter 10, "Managing Service Operations," Activating and Inactivating Routing Definitions, page 221.](#)

Activating and Inactivating Routing Definitions in the Nodes Component

You can use the Nodes-Routings page to access a routing definition and to activate or inactivate a routing.

To activate or inactivate a routing definition from the Nodes component:

1. Select PeopleTools, Integration Broker, Integration Setup, Nodes.
2. Click the Routings tab.
3. Locate the routing definition to activate or inactivate and click the Details link.

The routing definition appears in the Routing Definitions page.

4. Perform one of the following actions:
 - To activate the routing definition, check the Active check box.
 - To inactivate the routing definition, clear the Active check box.
5. Click the Save button.

Viewing Routing Definitions in Graphical Format

This section discusses common elements used to view routing definitions in graphical format. It also discusses how to view routing definitions in graphical format.

Common Elements Used to View Routing Definitions in Graphical Format



This symbol denotes an integration participant.

Online and in color documents the light blue-colored symbol denotes the PeopleSoft system. A gray-colored symbol denotes the integration partner of the PeopleSoft system.

The symbol shown here is light blue and denotes the PeopleSoft system.



The left-facing arrow denotes an outbound flow of data from the PeopleSoft system.



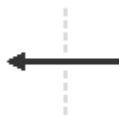
This symbol denotes a transformation. This can occur on the inbound or outbound side of the integration.



This symbol denotes the outbound flow of data from the PeopleSoft system out of the integration gateway.



This left-facing arrow denotes the inbound flow of data to the PeopleSoft system.



This symbol denotes the inbound flow of data into the integration gateway of the PeopleSoft system.

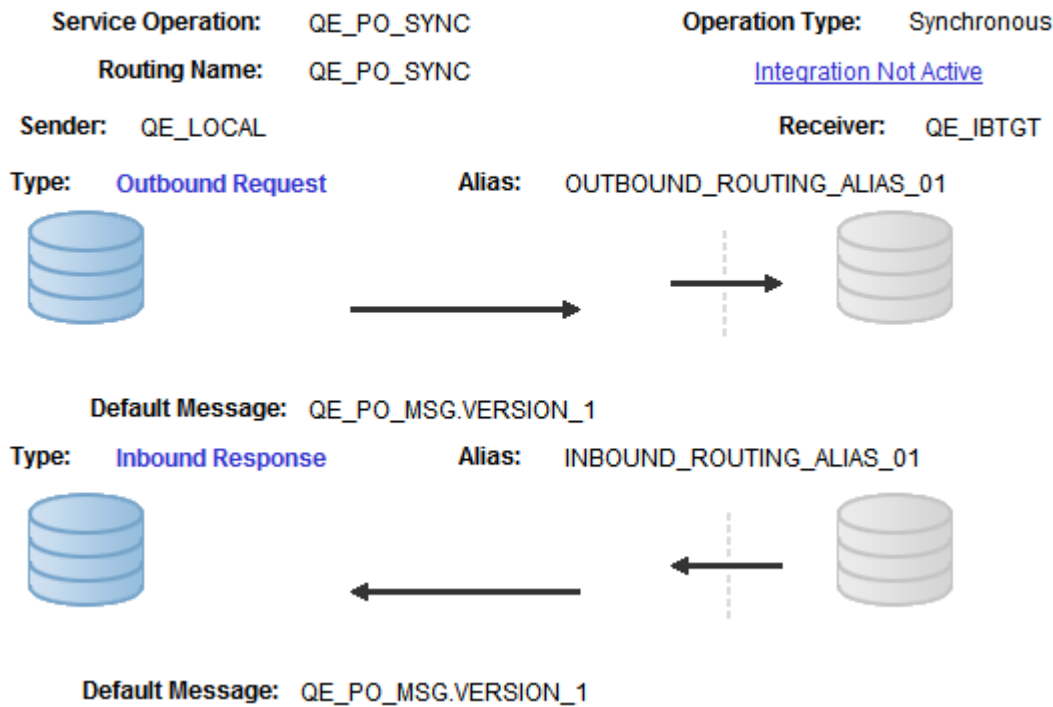
Alias	Name of the routing alias.
Default Message	<p>Name of the default message as it leaves or enters the PeopleSoft system.</p> <p>For outbound messages, this is the message name <i>before</i> any transformations are applied.</p> <p>For inbound messages, this is the message name <i>after</i> any transformations are applied.</p>
In Message	The inbound message name before any transformations have been applied.
In Resp Transform	Click the link to view information about transformations applied to the inbound response message.

Integration Not Active	<p>This link displays when one or more of the following items are inactive for an integration:</p> <ul style="list-style-type: none"> • Routing definition. • Service operation version. • Handler. • Service operation permissions. <p>Click the link to view the inactive items.</p> <p>See Chapter 15, "Managing Service Operation Routing Definitions," Viewing Integration Status and Activating Integration Metadata, page 313.</p>
Out Message	Name of the outbound message after any transformation have been applied.
Out Req Transform	Click the link to view information about transformations applied to the outbound request message.
Receiver	Name of the receiving node.
Return	Click the button to return to the previous page.
Routing Name	Name of the routing definition.
Operation Type	The service operation type.
Sender	Name of the sending node.
Service Operation	Service operation name and version.
Type	<p>Type of request on the PeopleSoft system. The possible values are:</p> <ul style="list-style-type: none"> • Outbound Request. • Inbound Request. • Inbound Response. • Outbound Response.

Viewing a Routing Definition in Graphical Format

The Integration Broker Routing Graphic page (IB_IMAGETEST2), shown in the following example, displays routing definition data in graphical format:

Integration Broker Routing Graphic



The routing definition QE_PO_SYNC in graphical format.

The example shows that the service operation *QE_PO_SYNC* is associated with the routing. It also shows that the routing type is *Synchronous*.

The sending node is *QE_LOCAL*, and the node is depicted graphically by the cylinders on the left side of the example. The receiving node is *QE_IBTGT* and is depicted graphically by the cylinders on the right side of the example.

The example shows the outbound request from the node *QE_LOCAL* to the node *QE_IBTGT* has a routing alias of *OUTBOUND_ROUTING_ALIAS.V1*. It also shows that the outbound default message associated with the routing is *QE_PO_MSG.VERSION_1*.

When the node *QE_IBTGT* sends back its response, it has a routing alias of *INBOUND_ROUTING_ALIAS.V1* and the message associated with the response is *QE_PO_MSG.VERSION_1*.

The dotted line depicts the integration gateway, and depending on the arrow direction shows the service operation leaving or entering the gateway.

Note in the example that an *Integration Not Active* link displays at the top right of the page. This indicates that one or more pieces of metadata associated with the integration is not active. Click the link to view and activate the data.

See Also

Chapter 15, "Managing Service Operation Routing Definitions," Viewing Integration Status and Activating Integration Metadata, page 313

Viewing Integration Status and Activating Integration Metadata

This section discusses how to:

- View inactive integration metadata.
- Activate integration metadata using the Integration Status page.

Understanding Viewing Integration Status and Activating Integration Metadata

When you view a routing definition in graphical format, if any metadata associated with the integration is inactive, an Integration Not Active link displays on the Integration Broker Routing Graphic page. You can click the link to open an Integration Status page, where you can view the inactive metadata and activate the data.

Note. The Integration Not Active link displays only when an integrations contains metadata that is not set to *Active*.

Viewing Inactive Integration Metadata

To view inactive metadata for an integration, from the Integration Broker Routing Graphic page, click the Integration Not Active link. The Integration Status page (IB_IMAGETEST_SEC), shown in the following example, displays:

Integration Status

Issues Encountered	
Problem	Actions
Service Operation Inactive	Activate Operation Version
Handler Inactive - OnRequestSend	Activate Handler

The Integration Status page lists the metadata that you need to activate.

The issues encountered box lists the metadata that is inactive and that you must activate before you can invoke the service operation.

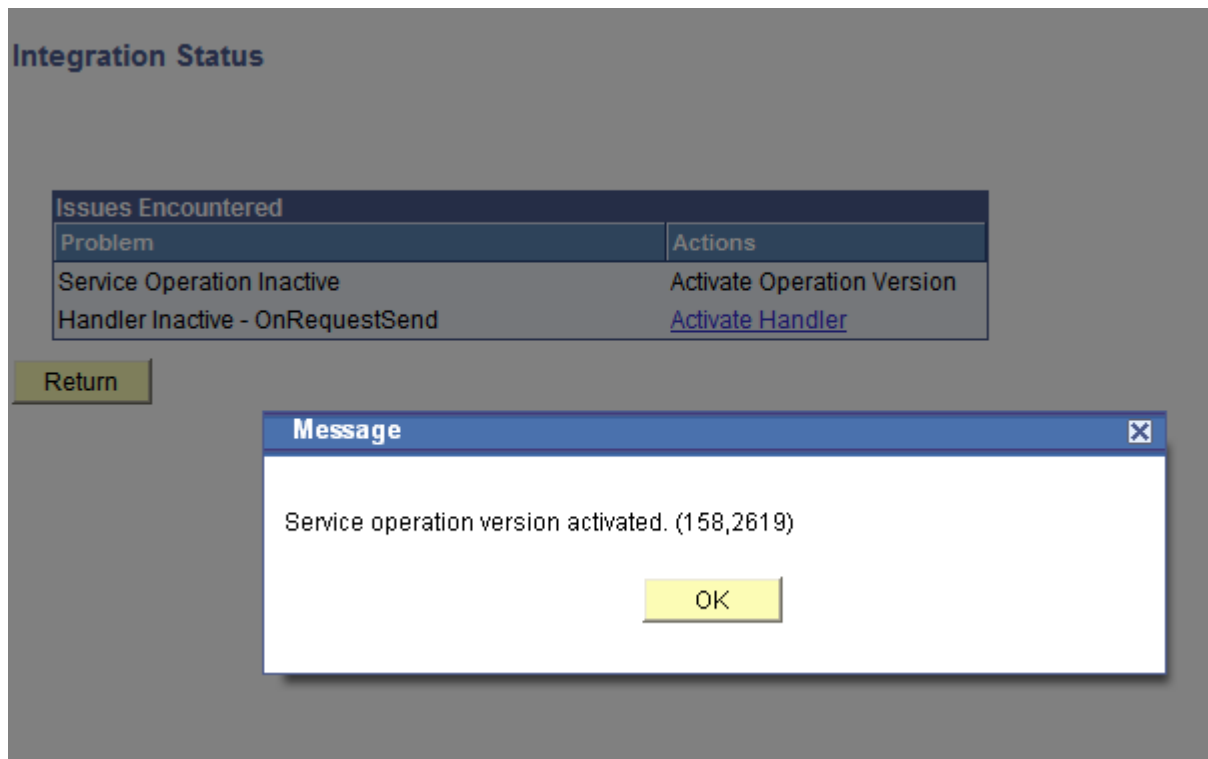
The links in the Actions column enable you to activate the associated metadata directly from this page.

See [Chapter 15, "Managing Service Operation Routing Definitions," Activating Integration Metadata Using the Integration Status Page, page 313.](#)

Activating Integration Metadata Using the Integration Status Page

The system activates the associated metadata and displays a message when the data is successfully activated.

The following example shows the successful activation of a service operation from the Integration Status page.



Successfully activating integration metadata from the Integration Status page.

To activate metadata for an integration using the Integration Status page:

1. From the Integration Broker Routing Graphic page, click the Integration Not Active link.
The Integration Status page appears.
2. In the Actions column, click an action to complete.
The system processes the action and displays a message that the metadata is activated.
3. Click the OK button.
4. Repeat the steps to activate additional metadata.
5. Click the Return button to go back to the Integration Broker Routing Graphic page.

Retrieving Routing Properties Programmatically

The `%TransformData.routingDefnName` property enables you to retrieve the routing definition name for a transaction, and allows you to retrieve the routing properties respectfully.

You use this property in a PeopleSoft Application Engine program as follows:

```
string rtgDefnName = %TransformData.routingDefnName
```


2. Click the Parameters tab.

The Parameters page appears.

3. Locate the request or response for which to check for duplicate external routing alias names.

Click the Alias Reference link.

If duplicate external routing alias names are found, the Alias Name Reference page appears and lists the routing definitions with which any duplicate aliases are associated. Otherwise, the system displays a message indicating that no duplicate aliases exist in the system.

Renaming and Deleting Routing Definitions

You can rename and delete routing definitions using the Routings page (IB_HOME_PAGE_4) in the Service Administration component (IB_HOME_PAGE).

The Routings tab contains three sections: a Delete section that enables you to delete routing definition, a Rename section that enables you to rename routing definitions, and a Delete Duplicate Routings section that enables you to view and delete duplicate routing definitions.

When you first access the Routings tab, the sections are collapsed. Click the section header arrow buttons to expand and collapse each section.

The following example shows the Routings tab with both Delete and Rename sections expanded:

WSDL
Services
Service Operations
Messages
Message Schemas
Queues
Routings

Service System Status: Development

Delete

Routing Name:

Routing Definitions
Customize | Find | View All |
First 1 of 1 Last

Select	Routing Name	Results
<input type="checkbox"/>		

Rename

Routing Name:

New Name:

Results:

Delete Duplicate Routings

Service Administration—Routings page

The service system status that you set on the Services Configuration page affects the ability to rename services.

This section discusses renaming and deleting routings. See the following section for information about deleting duplicate routings.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Configuring PeopleSoft Integration Broker for Handling Services," Understanding Configuring PeopleSoft Integration Broker for Handling Services; *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Configuring PeopleSoft Integration Broker for Handling Services," Setting Service Configuration Properties and [Chapter 15, "Managing Service Operation Routing Definitions," Deleting Duplicate Routing Definitions, page 318.](#)

Renaming Routing Definitions

To rename a routing definition:

1. Select PeopleTools, Integration Broker, Service Utilities, Service Administration. Select the Routings tab.

The Routing page appears.

2. Click the arrow next to the Rename section header to expand the section.
3. In the Routing Name field, enter the routing definition to rename, or click the Lookup button to search for and select one.
4. In the New Name field, enter the new name for the routing definition.
5. Click the Rename button.

After you click the Rename button, the Results field displays a message that the action was successful or displays a warning or error message with a description of the problem.

Deleting Routing Definitions

To delete a routing definition:

1. Select PeopleTools, Integration Broker, Service Utilities, Service Administration. Select the Routing tab.
The Routing page appears.
2. Click the arrow next to the Delete section header to expand the section.
3. In the Routing Name field, enter the name of the routing definition to delete, and click the Search button.
Search results display in the Routings grid.
4. Select the check box next to the routing definition or routing definitions to delete.
5. Click the Delete button.

Deleting Duplicate Routing Definitions

Application upgrades and the PeopleSoft Application Designer project copy process can cause duplicate routings in the PeopleSoft system.

The Service Administration - Routings page (IB_HOME_PAGE_4) features a Delete Duplicate Routings section that enables you to search for duplicate routings in the system and delete them. When you first access the page, all sections on the page are collapsed. Click the arrow next to the Delete Duplicate Routings section title to expand the section.

The following graphic shows the Service Administration—Routings page with the Delete Duplicate Routings section expanded:

WSDL
Services
Service Operations
Messages
Message Schemas
Queues
Routings

Service System Status: Development

Delete

Rename

Delete Duplicate Routings

Search

Routing Definitions						
Select	Operation	Version	Type	Sender Node	Receiver Node	Results
<input type="checkbox"/>						

Delete

Delete Duplicate Routings section of the Service Administration–Routings page.

The page displays active duplicate routings only.

To delete duplicate routings:

1. Select PeopleTools, Integration Broker, Service Utilities, Service Administration. Click the Routings tab.

The Routings page appears.

2. Click the arrow next to the Delete Duplicate Routings section title to expand the section.
3. Click the Search button to search the system for duplicate routing definitions.

Duplicate routing definitions populate the Routing Definitions grid and all duplicates are selected for deletion.

4. Clear the Select box for any routing definitions you do not want to delete.
5. Click the Delete button.

The Routing Definitions grid displays up to 100 routing definitions at a time. The maximum number of rows returned at a time is 1000. Use the arrow buttons to move from page to page through the search results. If the maximum number of rows is reached, an information message appears that indicates the maximum has been reached. After you delete the routing definitions, click the Search button again to return more rows.

Chapter 16

Applying Filtering, Transformation and Translation

This chapter discusses how to:

- Define transform programs.
- Develop transforms programs using PeopleSoft Application Engine.
- Develop transforms programs using Oracle XSL Mapper.
- Invoke transform programs.
- Access transform message data.
- Rename or delete transform programs.
- Filter messages.
- Apply transformations.
- Perform data translation.
- Reject transformation programs.
- Terminate transformation programs.

Understanding Filtering, Transformation, and Translation

Filtering, transformation, and translation are all accomplished by applying an Application Engine *transform program* to an outbound or inbound message. You can use these programs to:

- *Filter* a message based on its content, to determine whether to pass it through to its destination or to subsequent steps of the transform program.
- Perform *transformation* on a message to make its structure comply with the receiving system's requirements.

- Perform *data translation* on a message so that its data is represented according to the receiving system's conventions.

Simple translation might be required if the two systems use different values to represent the same information for a given field.

Complex translation might involve augmenting or replacing groups of fields with a completely different structure and encoding.

If your PeopleSoft application uses the PeopleCode XmlDoc or SoapDoc classes to generate or process a message, the message probably doesn't adhere to the PeopleSoft rowset-based message format.

Filtering, transformation, or translation can be necessary for messages sent between two PeopleSoft Integration Broker nodes, or between a PeopleSoft Integration Broker node and a third-party application.

See Also

[Chapter 5, "Understanding Supported Message Structures," page 39](#)

Understanding Transform Programs

This section provides overview information about transform programs.

Transform Programs

A transform program is a type of PeopleSoft Application Engine program. After you create a new transform application engine program, you add steps and actions to the program, and then add code to the steps and actions that performs data transformation, filtering or translation.

To develop a transform program, you must know the initial structure and possibly the content of the message with which you are working, as well as the structure (and content) of the result you want to achieve. Make sure that all participating nodes agree on a format or employ transformations to accommodate the variations from node to node.

The message data is made available to your transform program in a PeopleCode system variable after being extracted from the wrapper in which it was transmitted. The format of this wrapper depends on the transmission method, but is irrelevant to the transform program.

Any participating node with PeopleSoft Integration Broker installed — the source, the target, or a hub — can apply a transform program to a given message.

You specify which transform program to apply within a routing definition for a service operation.

Note. With PeopleSoft Integration Broker, the term *node* refers to a system or application participating in an integration, but in this chapter a *node* is also a structural element in an XML document. The context in which the term is used should make its meaning clear.

Transform programs cannot modify the following messaging features:

Third-party XSLT development tools may generate a wrapper that specifies a different URI. Make sure the URI in your program is exactly as shown here, or your program may not work as expected.

You can find more information about XSLT at the World Wide Web Consortium (W3C) web site.

Third-Party Considerations

When no transformation is applied, applications using PeopleSoft Integration Broker send, and expect to receive, messages containing data that conforms to a minimum XML message structure: the PeopleSoft rowset-based message format.

When exchanging messages with third-party applications, you can:

- Employ a transformation at the PeopleSoft end of each transaction to convert messages to or from the PeopleSoft rowset-based message format.
- Require third-party applications to send and receive messages that comply with the PeopleSoft rowset-based message format. Third-party applications must comply with the rowset-based message format if *both* of the following are true:
 - Your PeopleSoft application uses the PeopleCode Message and Rowset classes to generate and send, or receive and process messages with Integration Broker.
 - You don't want to employ PeopleSoft Integration Broker transformations to accommodate the third-party application.

Note. Third parties can submit messages to PeopleSoft Integration Broker systems using any listening connector registered with the local gateway. Regardless of the message data format, the third-party system is responsible for properly constructing the wrapper that contains the message data, and using the appropriate tools and protocols to address the connector.

Defining Transform Programs

This section discusses how to define transform programs.

Understanding Defining Transform Programs

This section contains information about defining transform programs

Transform Program Type

To create a transform program, in the Program Properties dialog box for the application engine program you must specify that the program type is *Transform Only*. After you select this option, input message name, output message name, input root element and output root element fields display.

Input and Output Message Names

When developing a transformation program, PeopleSoft Integration Broker enables you to specify the schema of the message that is going into the transform (input message and version), as well as the schema of the message that is the output of the program (output message and version).

Note. You must specify this information when using the Oracle XSL Mapper to develop transformation programs.

These fields are required when developing transformations using the Oracle XSL Mapper.

In all other cases, these fields are optional, since there may be occasions where a transformation is general in nature and used by many messages. For example, it might be a transform that changes certain fields regardless of the message shape. In cases such as these, you would not want to define a specific input or output shape, since the transform program is only changing fields.

Input and Output Root Elements

When working with nonrowset-based messages, there may be situations where the schemas for input and output messages have multiple root elements. However, Oracle XSL Mapper uses only one of the root elements on the input side as well as only one on the output side.

When using Oracle XSL Mapper to build XSLT transformations, you may specify the input and output root elements in the Program Properties dialog box. If you do not specify an input or output root element, Oracle XSL Mapper uses the first root element in the schema.

Defining a Transform Program

To define a transform program, create a new application engine object in PeopleSoft Application Designer. Then in the Program Properties dialog box you specify the program type as a transform program.

The following graphic shows the Program Properties dialog box for an application engine program. Note that the Program Type field displays *Transform Only*.

The screenshot shows the 'Program Properties' dialog box with the 'Advanced' tab selected. The dialog has four tabs: 'General', 'State Records', 'Temp Tables', and 'Advanced'. The 'Advanced' tab contains the following controls:

- ☐ Disable Restart
- ☐ Application Library
- ☐ Batch Only
- Message Set: 0 (dropdown)
- Program Type: Transform Only (dropdown)
- Input Message Name: (dropdown)
- Input Message Version: (dropdown)
- Input Root Element: (text field)
- Output Message Name: (dropdown)
- Output Message Version: (dropdown)
- Output Root Element: (text field)

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Program Properties — Advanced tab

To define a transform program:

1. In PeopleSoft Application Designer, select File, New, App Engine Program and click the OK button.
A new application engine program window appears.
2. On the toolbar, click the *Properties* button.
The Program Properties dialog box appears.
3. Click the Advanced tab.
4. From the Program Type drop-down list box, select *Transform Only*.
Additional fields relating to input messages, output messages and root elements appear.
5. Select an input message and version:
 - a. From the Input Message Name drop-down list box, select the name of the message before transformation is applied.
 - b. From the Input Message Version drop-down list box, select the version of the input message.

6. In the Input Root Element field, enter the name of the input schema root element to use.

Enter a value in this field if the input message has multiple root elements. If the input message has multiple root elements and you do not enter an input root element, the first root element in the message is used for transformation.

This field is disabled when the input message is a rowset-based message.

7. Select an output message and version.
 - a. From the Output Message Name drop-down list box, select the name of the message after transformation is applied.
 - b. From the Output Message Version drop-down list box, select the version of the output message.

8. In the Output Root Element field, enter the name of the output schema root element to use.

This field is disabled when working with rowset-based messages.

9. Click the OK button.
10. The Program Properties dialog box closes.
11. Select File, Save.

Developing Transform Programs Using PeopleSoft Application Engine

This section discusses how to:

- Insert steps and actions into transform programs.
- Work with transform programs.
- Access message data.
- Make working data available globally.
- Preserve record and field aliases.

Understanding Developing Transform Programs Using PeopleSoft Application Engine

Following are some points to keep in mind when working with transform programs:

- Each transform program step operates on the message content that results from the previous step, so you can break your transform program into a sequence of discrete steps.
- Multiple transform actions within a step can produce unwanted effects, so insert each XSLT or PeopleCode action in its own step.

- XSLT works only on XML DOM-compliant data, so PeopleSoft Integration Broker assures that both outbound and inbound messages are in XML DOM-compliant form when transform programs are applied to them.
- XSLT is not supported by PeopleSoft on the OS/390 or z/OS operating systems. Transformations must use PeopleCode on these platforms.

A transformation can modify an entire message until it no longer resembles the original. So can a data translation. In a transformation, you must hard-code what you want to accomplish, whereas the data translation relies on a repository of *codeset metadata* that you define. This means you can establish consistent rule-based translations and reuse the same translation rules without having to reenter them.

Although you can combine transformation and data translation in a single transform step, it's better to keep these processes in separate steps and produce a modular program that you can more easily maintain, with code you can reuse in other transform programs.

Inserting Steps and Actions into Transform Programs

This section describes how to insert steps and actions into transform programs.

Understanding Inserting Steps and Actions

After you define a transform program, you insert steps and actions as you would with any other application engine program to construct the transformation program.

The two types of actions you can add to steps when building a transform program are *XSLT* and *PeopleCode*.

Inserting XSLT Actions

When you select *XSLT* as the step action type you can develop the transform code using Oracle XSL Mapper or you can hand-code the program.

Installing, configuring and using Oracle XSL Mapper to develop transform programs is discussed elsewhere in this chapter.

See [Chapter 16, "Applying Filtering, Transformation and Translation," Developing Transforms Using Oracle XSL Mapper, page 331.](#)

Note. After selecting XSLT as the action type, you must save the program before you can choose to use Oracle XSL Mapper or hand-code the program.

To insert XSLT actions:

1. From the Action Type drop-down list, select *XSLT*.
2. (Optional.) In the XSLT Description field, enter a description for the XSLT action.
3. Save the transform program.

A Graphical Mapper drop-down list appears.

4. Choose how to code the XSLT action:

- To use Oracle XSL Mapper, click the XSLT action to highlight it. Then double-click the action to launch the mapper tool.
- To hand-code the program, from the Graphic Mapper drop-down list box, select *No*. Right-click the action and select View XSLT.

5. Create code for the step/action.

- If using Oracle XSL Mapper, beginning mapping records and fields as appropriate.
- If hand-coding using XSLT, right-click the action and select View XSLT. The programming window appears and you can begin coding.

Inserting PeopleCode Actions

To insert PeopleCode actions:

1. From the Action Type drop-down list, select *PeopleCode*.
2. (Optional.) In the PeopleCode Description field, enter a description for the PeopleCode action.
3. Save the program.
4. Right-click and select View PeopleCode to open the programming window.
5. Enter PeopleCode appropriate for the step and action.

Making Working Storage Data Available Globally

XSLT transform steps can't access external data, but PeopleCode can. XSLT also has no global variables. However, the message itself is global, and can be used to pass working or external data to all steps in the transform program. During a PeopleCode step, you can add a special node to the message to contain the data, which is then available to subsequent transform steps.

Following is an example of a minimal input message:

```
<?xml version="1.0"?>
<Header>
  <LANGUAGE_CODE>en_us</LANGUAGE_CODE>
  <STATUS_CODE>1000</STATUS_CODE>
</Header>
```

The following PeopleCode inserts a node in the message to contain working data, by convention called *psft_workingstorage*. Then the PeopleCode inserts the current system date into that node:

```
/* Get the data from the AE Runtime */
Local TransformData &incomingData = %TransformData;
/* Set a temp object to contain the incoming document */
Local XmlDoc &inputDoc = &incomingData.XmlDoc;
/* Add a working storage node*/
Local XmlNode &wrkStorageNode =
  &inputDoc.DocumentElement.AddElement("psft_workingstorage");
/* Add the current system date to the working storage*/
Local XmlNode &sysDateNode = &wrkStorageNode.AddElement("sysdate");
&sysDateNode.NodeValue = String(%Date);
```

Following is the resulting output message:

```
<?xml version="1.0"?>
<Header>
  <LANGUAGE_CODE>en_us</LANGUAGE_CODE>
  <STATUS_CODE>0</STATUS_CODE>
  <psft_workingstorage>
    <sysdate>2002-01-24</sysdate>
  </psft_workingstorage>
</Header>
```

Any subsequent transform step now has access to the current system date. Make sure the last step that uses the *psft_workingstorage* node removes it from the final output, as with this XSLT fragment:

```
<xsl:template match="psft_workingstorage">
  <!-- Do not copy this node -->
</xsl:template>
```

Preserving Record and Field Aliases

When you apply a transform program to a rowset-based message, Integration Broker submits the message to the program in its final XML DOM compliant form, with any aliases you defined in place of the corresponding original record and field names.

In a PeopleCode transformation, the message is initially available as an XmlDocument object. However, you may want to transform the message using the PeopleCode Rowset class. Because XmlDocument object structure is compatible with Rowset object structure, you can copy the XML data to a rowset using the XmlDocument class CopyToRowset method.

Because the rowset to which you copy the data must be based on a message object instantiated from your original message, the rowset uses the message's original record and field names. If you defined aliases for any of the message records or fields, you must ensure that the rowset uses those aliases instead, or the XmlDocument data won't copy successfully.

The following set of conditions summarizes this situation:

- The message definition includes at least one record or field alias.
- You're applying a transform program to the message.
- Your transform program includes a PeopleCode step.
- The PeopleCode step uses a Rowset object to hold the message data.

Using Optional CopyToRowset Parameters

To make sure the rowset object uses the record and field aliases that exist in the XML data, you must specify two optional string parameters in the CopyToRowset method, which convey the message name and version:

```
CopyToRowset(&Rowset, Message_Name, Version)
```

The integration engine uses any aliases it finds in the specified message definition to rename the appropriate records and fields in the rowset object before copying the data. Following is an example of a rowset-based transform step that preserves aliases:

```

Local Message &TempMSG;
Local Rowset &TempRS;

/* Get the data from the AE Runtime */
Local TransformData &tempData = %TransformData;
/* Set a temp object to contain the incoming document */
Local XmlDocument &tempDoc = &tempData.XmlDoc;

/* Create a working rowset (no aliases used) */
&TempMSG = CreateMessage(Message.MyMsgName);
&TempRS = &TempMSG.GetRowset();

/* Copy message data to rowset (restoring aliases) */
&OK = &tempDoc.CopyToRowset(&TempRS, "MY_MSG_NAME", "MY_MSG_VERSION");

/* . . . Transform rowset data. . . */

/* Copy transformed rowset back to XmlDocument object */
&OK = &tempDoc.CopyRowset(&TempRS, "MY_MSG_NAME", "MY_MSG_VERSION");

```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "XmlDoc Class," XmlDoc Methods

Tracing Transform Programs

For debugging purposes, you can trigger a trace of your transform program by adding a specific value to the Application Engine *trace* parameter, in one of the following ways:

- Specify the TRACE switch on the Application Engine command line, with the value 8192 added, for example:

```
-TRACE 8192
```

- Add the value 8192 to the TRACEAE parameter in the appropriate application server or Process Scheduler server configuration file, for example:

```
TRACEAE=8192
```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "XmlDoc Class"

Enterprise PeopleTools 8.50 PeopleBook: Application Engine, "Tracing Application Engine Programs"

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Process Scheduler, "Using the PSADMIN Utility"

<http://www.w3.org/Style/XSL/>

Developing Transforms Using Oracle XSL Mapper

This section discusses how to develop transformations using Oracle XSL Mapper.

Understanding Oracle XSL Mapper

Oracle USA has developed a tool that enables you to graphically map records and fields and that creates the underlying XSLT transformation code for you. You launch this tool directly from a PeopleSoft application engine transformation program. When you save the XSLT code in Oracle XSL Mapper, it automatically gets saved to the application database and your application engine transform program.

Note. You cannot use Oracle XSL Mapper to modify XSLT that you've hand-coded or created with any other XSLT editing tool.

Oracle XSL Mapper is an Oracle JDeveloper plug-in. Check the My Oracle Support website for information about supported versions.

See <http://www.oracle.com>.

Development Considerations

Note the following as you develop transformations using Oracle XSL Mapper:

- When you save XSL maps that you create in the mapper, the underlying XSL code is automatically saved to the application engine program.
- The mapper does not support codesets and working storage constructs. You must add these constructs manually into the XSL code using the Source view of the mapper.

Prerequisites

To use Oracle XSL Mapper you must:

- Install Oracle BPEL Designer.

Oracle XSL Mapper is part of Oracle JDeveloper that comes as part Oracle BPEL Designer. You get Oracle BPEL Designer with the download of Oracle BPEL Process Manager .

- In PeopleSoft Configuration Manager, specify the path to the Oracle JDeveloper installation location.
- All messages used in the mapper must have schemas generated for them.

For rowset-based messages, use the Message Definitions–Schema page to generate schemas. For nonrowset-based messages, use the Message Definitions–Schema page to add or import schemas for these types of messages.

- You must create a Transform Only application engine program and define the program properties described earlier in this chapter.

Installing Oracle XSL Mapper

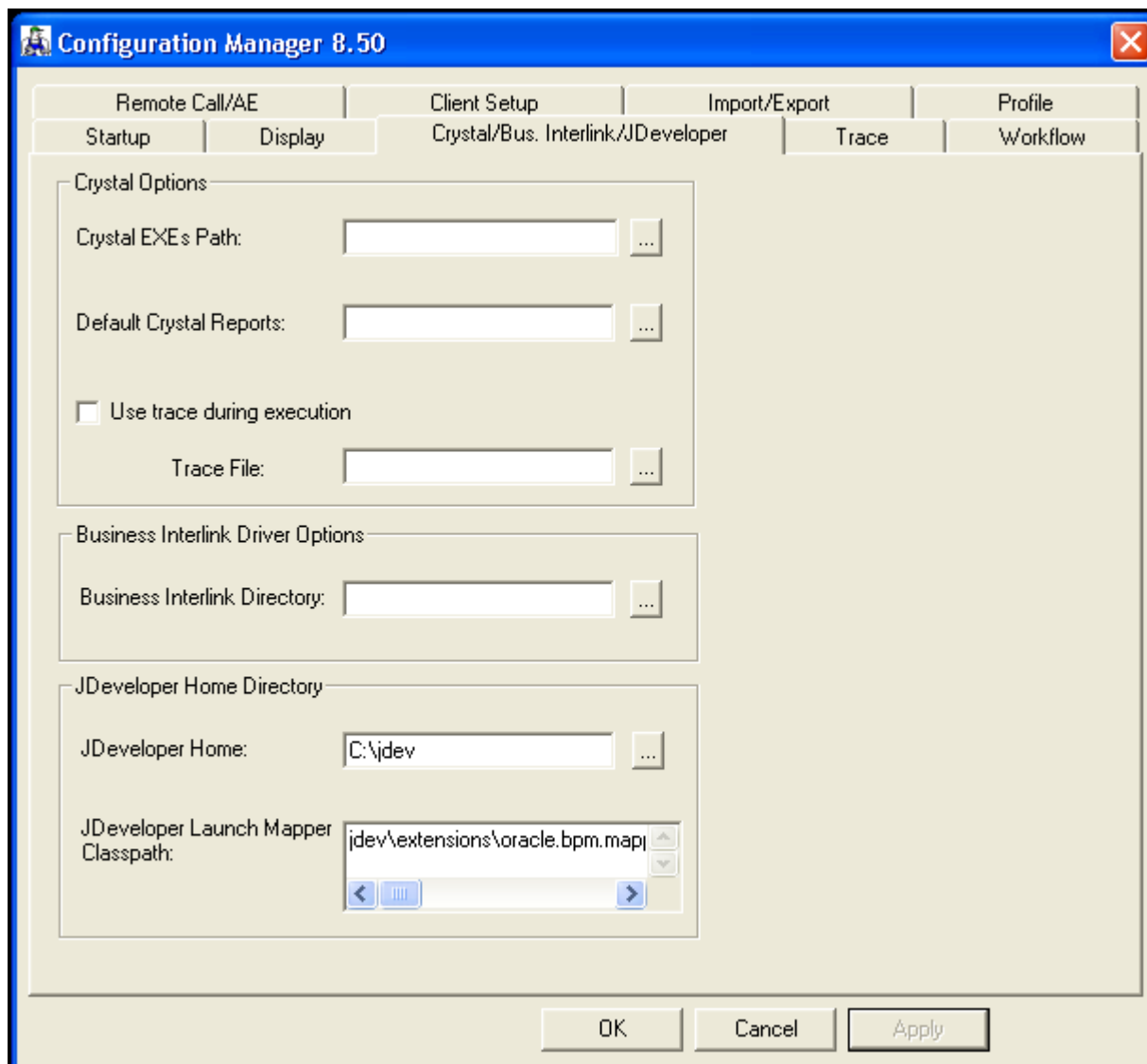
Oracle XSL Mapper is a tool that provides the ability to rapidly create XSL-based transformation maps to support integration of PeopleSoft to third-party applications deployed through Integration Broker. The Oracle XSL Mapper is a component of Oracle BPEL Designer and is included in Oracle JDeveloper. Access to this feature requires the download of Oracle JDeveloper at the location below.

See <http://www.oracle.com/technology/index.html>.

Note. After you install Oracle XSL Mapper do not move or delete the installed jar files from the default installation location. The PeopleSoft system reads this information from the default location for proper functioning of the feature.

Specifying the Installation Path and Classpath for Oracle XSL Mapper

For Oracle XSL mapper to function, the JDeveloper installation location and classpath must be specified in the PeopleSoft system in the PeopleSoft Configuration Manager. You enter this information on the Crystal/Bus. Interlinks/JDeveloper tab shown in the following example:



The JDeveloper <Home> location and classpath defined in PeopleSoft Configuration Manager

After you enter the JDeveloper installation location, the PeopleSoft system autodetects the classpath information and automatically populates the information in PeopleSoft Configuration Manager.

To specify the path to the Oracle XSL Mapper installation location and classpath:

1. Open PeopleSoft Configuration Manager (pscfg.exe).
2. Click the Crystal/Bus. Interlink/JDeveloper tab.
3. Locate the JDeveloper Home Directory section at the bottom of the page.
4. In the JDeveloper Home field, enter the path or browse to the location where JDeveloper is installed.
5. Click the Apply button.

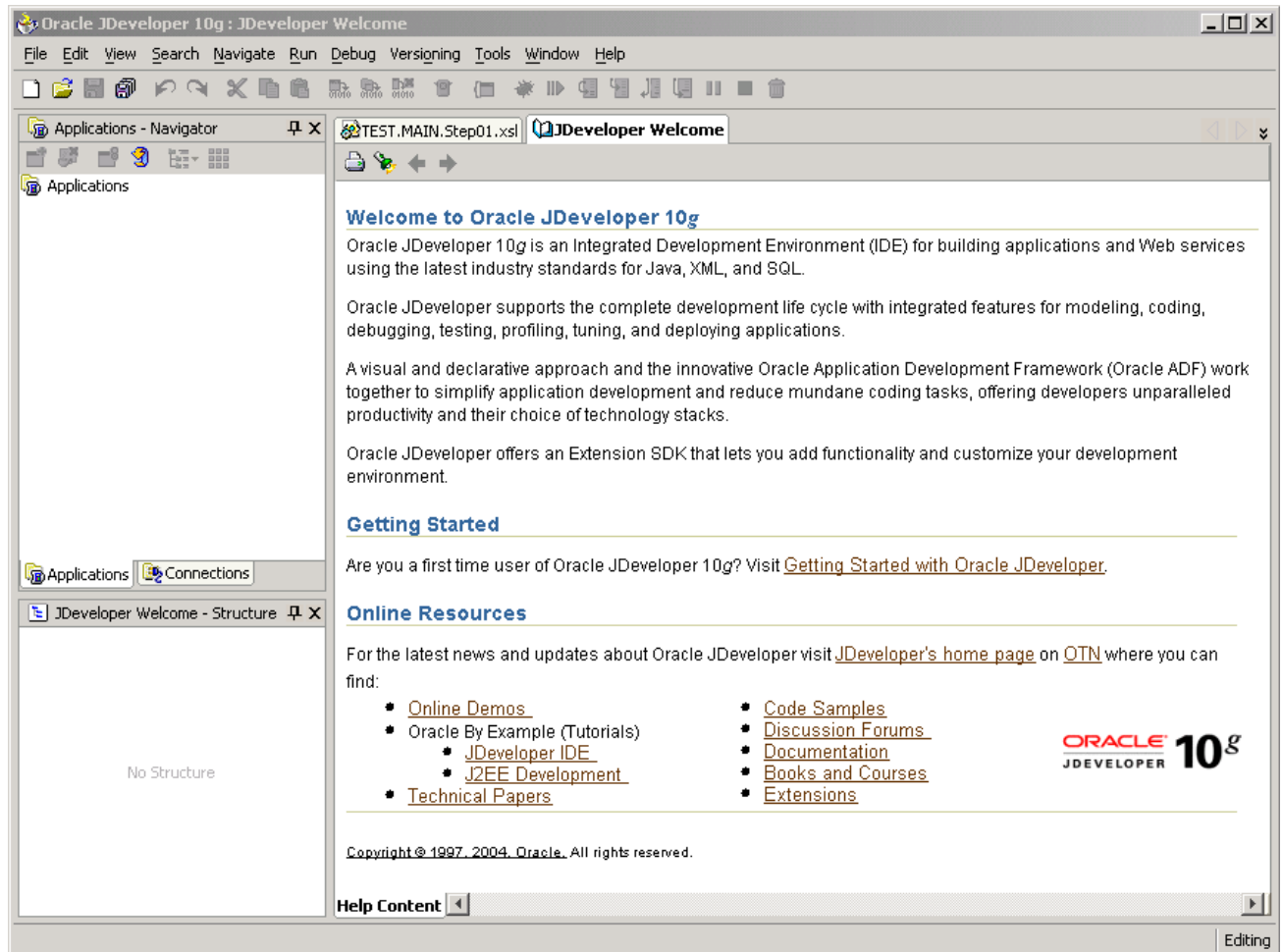
The system populates the JDeveloper Launch Mapper Classpath with the appropriate variables for your version of JDeveloper.

- Click the OK button.

Launching Oracle XSL Mapper

You launch Oracle XSL Mapper from within an application engine transform program.

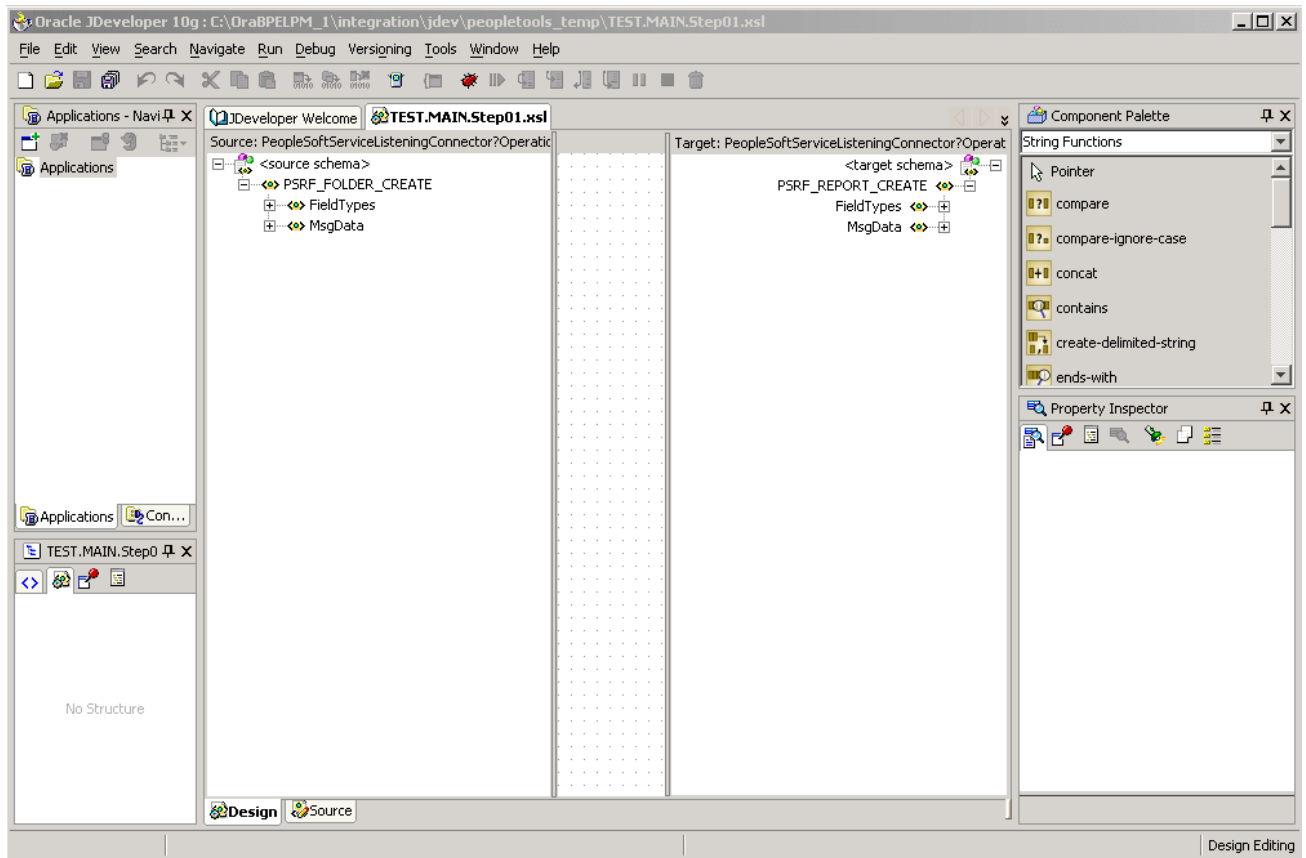
The first time you launch the mapper, the Oracle JDeveloper Welcome window appears.



JDeveloper Welcome window

Note. The first time you launch Oracle XSL Mapper a Configure Tile Type Associations dialog box appears. While using the mapper you do not work with any Java files and you can disregard the dialog box.

The Oracle JDeveloper Welcome window displays only the first time you access JDeveloper. When you subsequently open Oracle XSL Mapper, the transform program appears in the Design view.



Oracle XSL Mapper–Design view

The transform program name in the mapper takes the following format:
`<transform_program_name>.<section_name>.<step_name>.xml` .

To launch Oracle XSL Mapper:

1. Create a *Transform Only* application engine program and define the program properties described earlier in this chapter.
2. Double-click the XSLT action.
3. Access the Oracle XSL Mapper–Design view.

When accessing the mapper for the first time, when you double-click the XSLT action and launch Oracle JDeveloper the JDeveloper Welcome window appears. To switch to the Design view, above the Source pane, click the transform file name tab or from the Window menu click the transform file name.

In subsequent attempts to launch the mapper, double-clicking the XSLT action automatically opens the transform program in the Design view.

Accessing Oracle JDeveloper Documentation and Online Resources

This section provides information for access online Help, documentation and other resources for using Oracle XSL Mapper.

Online Help

Online Help is available via the Help menu while working with Oracle XSL Mapper.

Additional Oracle JDeveloper Documentation and Online Resources

As mentioned earlier in this section, Oracle XSL Mapper is a plug-in to Oracle JDeveloper. Documentation for the mapper is contained in the Oracle JDeveloper documentation set.

Note. The information provided in this section is current as of the publish date of this PeopleBook.

On the Developer Welcome page of the Oracle XSL Mapper there are links to documentation and online resources located on the Oracle web site.

In addition you can visit the Oracle Technology Network website to access documentation. Oracle JDeveloper documentation resources that may be helpful include:

- *Oracle Application Development Framework Guidelines Manual* .
- *Oracle Application Development Framework Case Manual*.
- *Installation Guide*.
- *Release Notes*.
- *J2EE Developer Online Help (the main documentation library)*

Navigating in Oracle XSL Mapper

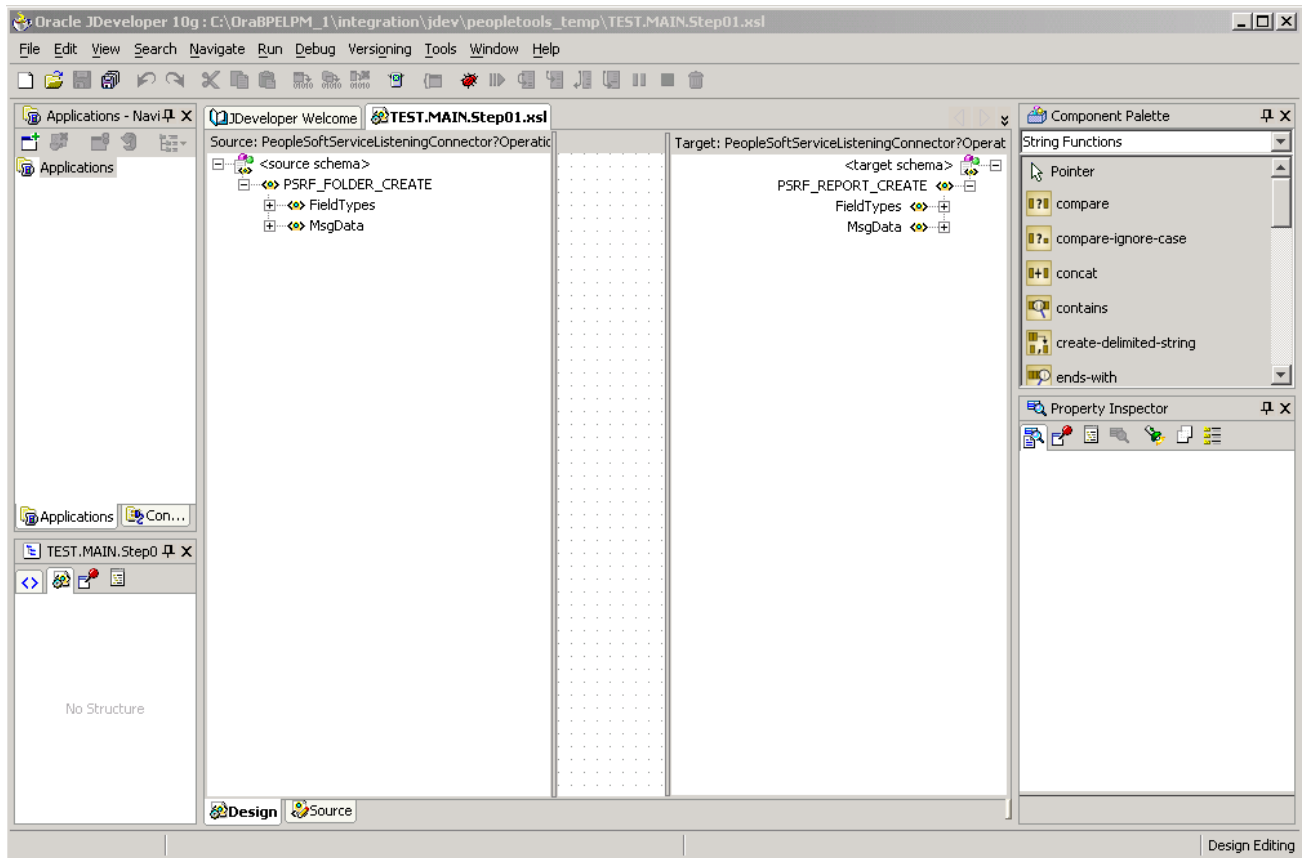
This discusses how to:

- Navigate in the Design View.
- Navigate in the Source View.

Note. This section features a brief discussion of some of the key components and areas of the Oracle XSL Mapper development tool. The Oracle JDeveloper documentation provides in-depth details about using the Oracle XSL Mapper.

Navigating in the Design View

To access the Design view of Oracle XSL Mapper, click the Design tab at the bottom of the mapper. The following graphic shows the Oracle XSL Mapper – Design view:



Oracle XSL Mapper – Design view

Use the Design view to map records and fields.

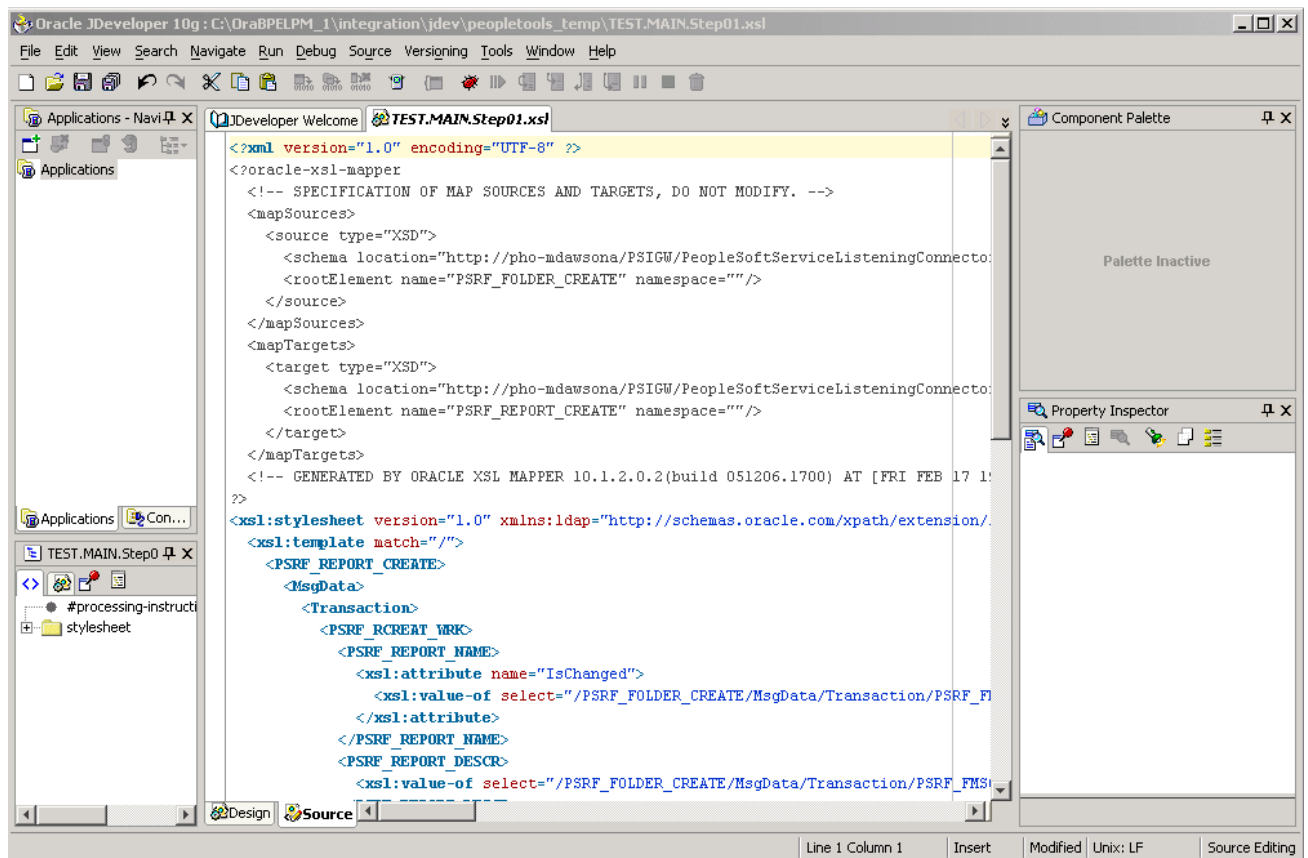
A few of the key areas of the Design view are discussed here. For additional information on Design view features, see the Oracle XSL Mapper documentation.

- | | |
|-----------------------------------|--|
| Title Bar | The title bar displays the full path to the Oracle JDeveloper installation location and the name of the current transform program. |
| Developer Welcome tab | Click the tab to display links to online resources, such as documentation, online demos and code samples. |
| Transform Program name tab | Click to access the transform program. |
| Source | <p>The Source pane in the Oracle XSL Mapper main development view provides a hierarchical view of the source or input message and schema.</p> <p>Click the plus (+) button and the minus (-) button to expand and collapse data shown.</p> <p>Drag the edges of the pane in or out to adjust the viewing area.</p> |

Target	<p>The Target pane in the Oracle XSL Mapper main development view provides a hierarchical view of the target or output message and schema.</p> <p>Click the plus (+) button and the minus (-) button to expand and collapse data shown.</p> <p>Drag the edges of the pane in or out to adjust the viewing area.</p>
Design tab	<p>Located at the bottom left-side of the window, click the tab to display the area where you map records and fields.</p>
Source tab	<p>Located at the bottom left-side of the window, click the tab to view and edit the raw XSLT code generated by Oracle XSL Mapper.</p>

Navigating in the Source View

To access the Source view of Oracle XSL Mapper, click the Source tab at the bottom of the mapper. The following graphic shows the Oracle XSL Mapper–Source view:



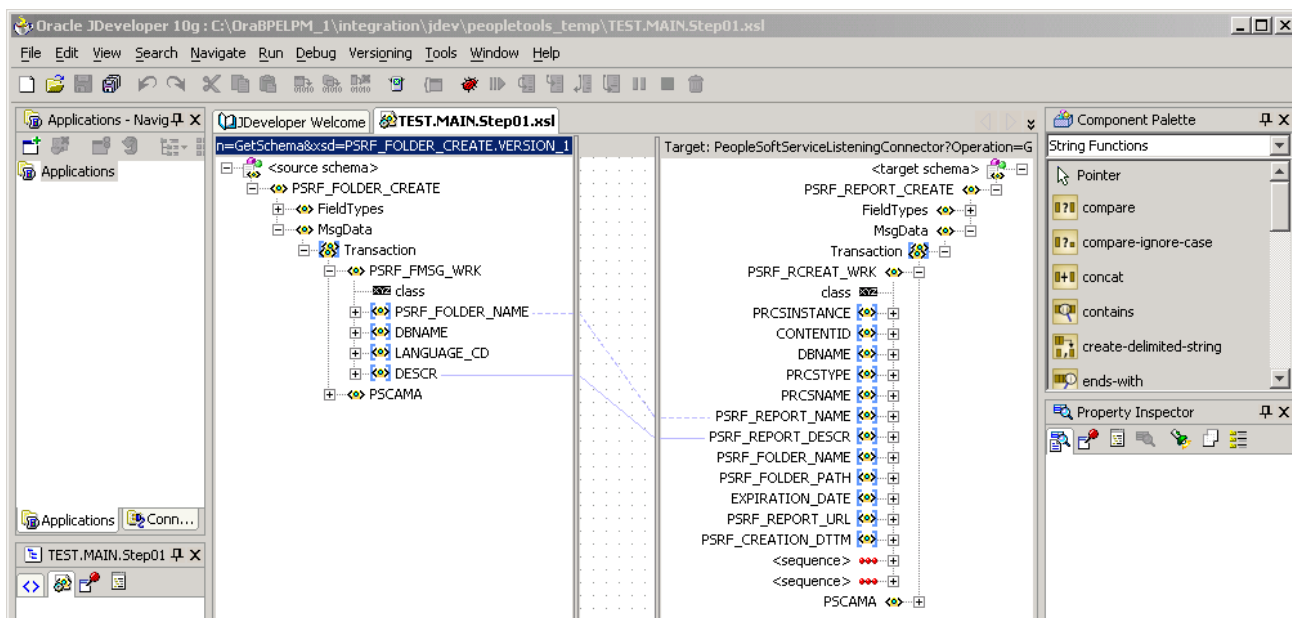
Oracle XSL Mapper–Source view

Use the Source view to view and edit the raw XSL code generated by the mapper.

For additional information on Source view features, see the Oracle XSL Mapper documentation.

Mapping Records and Fields

To map records and fields, you drag record names and field names from the source pane to the target pane in the mapper. The following graphic shows an example of mapping several fields:



Mapping fields in Oracle XSL Mapper–Design view

A solid green line appears as you drag the cursor from the source pane to the target pane. When you release the cursor, the line turns blue to show the association.

To map records and fields:

1. Open the Design view of Oracle XSL Mapper.
2. Expand the contents of both the source and target panes.

Click the plus (+) button to expand each level or section until all records and fields appear.

Note. When working with rowset-based messages the content to map is located in the MsgData section.

3. In the source pane, click on the icon to the left of a record or field name and drag it to the name of the record or field in the target pane to which you want to map.

Repeat this step for each record or field to map.

4. Click the Save button.

Deleting Record and Field Maps

If you have not saved the program and want to delete the last map you made, simply right click in the Design view and select Undo Link. Otherwise, follow the instructions in this section.

To delete a record or field map:

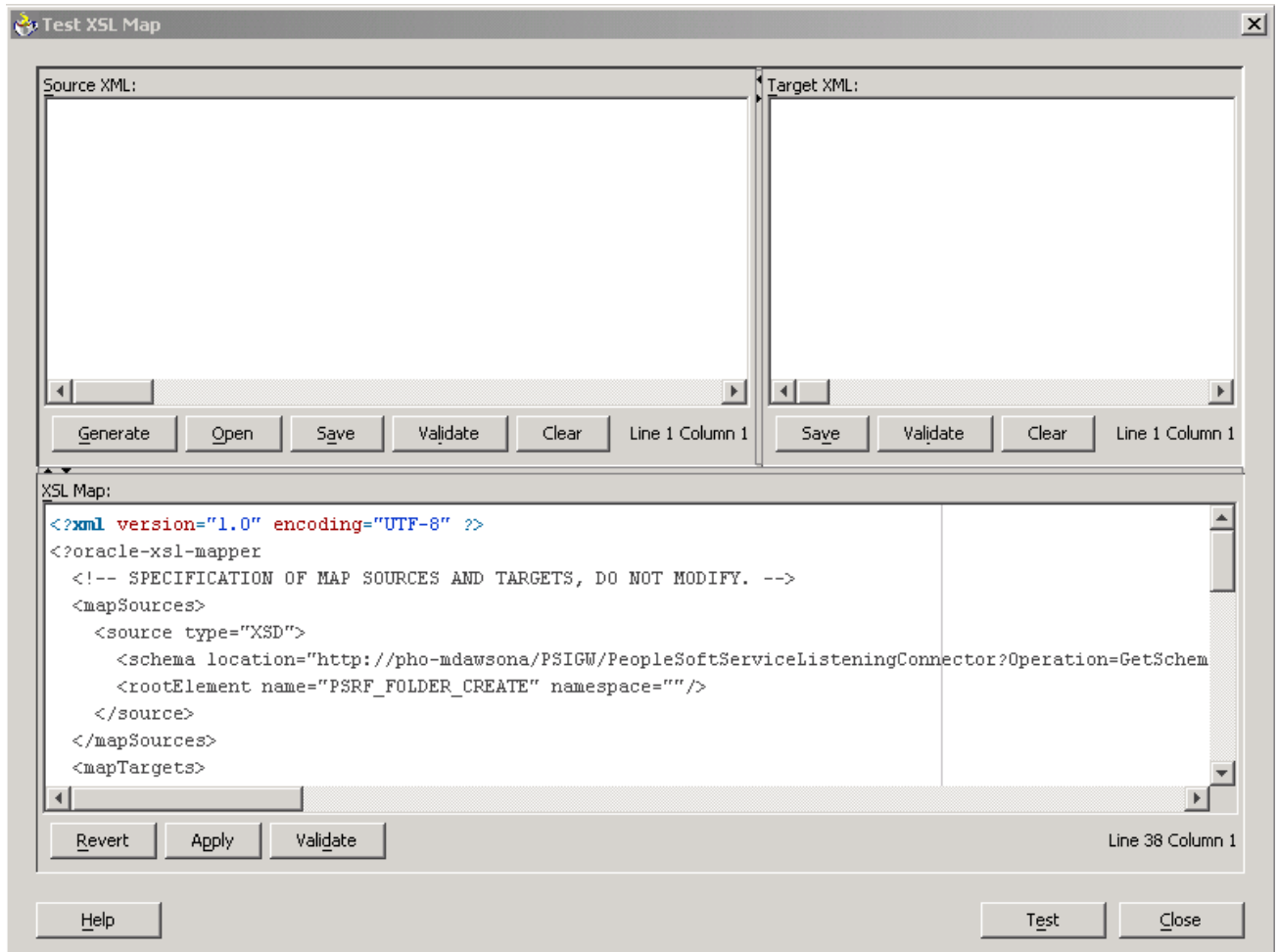
1. In the source pane, click the record or field name.
2. From the Edit menu, click Delete.
3. Save the changes.

Viewing Raw XSLT Code

After you have made all of the record and field maps for the program. Click the Source tab at the bottom of the window to generate and view the raw XSL.

Testing XSL Maps

You can test XSL maps for validity that you generate in the mapper using the Test XSL Map window shown in the following graphic:



Test XSL Map window

The code created by the record and field mapping displays in the bottom portion of the window.

Note. This Oracle XSL Mapper test feature tests the validity of the XSLT map code. It does not test the transformation. To test a transformation, use the Transformation Test tool in the PeopleSoft Pure Internet Architecture.

To test XSLT code:

1. Access the Oracle XSL Mapper–Source view.
2. Right-click anywhere in the code area and select Test.

The Test XSL Map window appears.

3. In the XSL Map section of the window, click the Validate button.

A validation success or error message displays.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools, "Using the Transformation Test Utility"

Adding and Modifying XSL Map Code

If you add code to XSLT that you create using Oracle XSL Mapper that contains any PeopleSoft-related elements it will not compile successfully, unless you create a configuration file of PeopleSoft elements that the mapper should ignore. After you create this file specify the file location and name in the Oracle XSL Mapper Preferences.

Creating Elements to Ignore Configuration Files

For example, you could add code that contains the following elements:

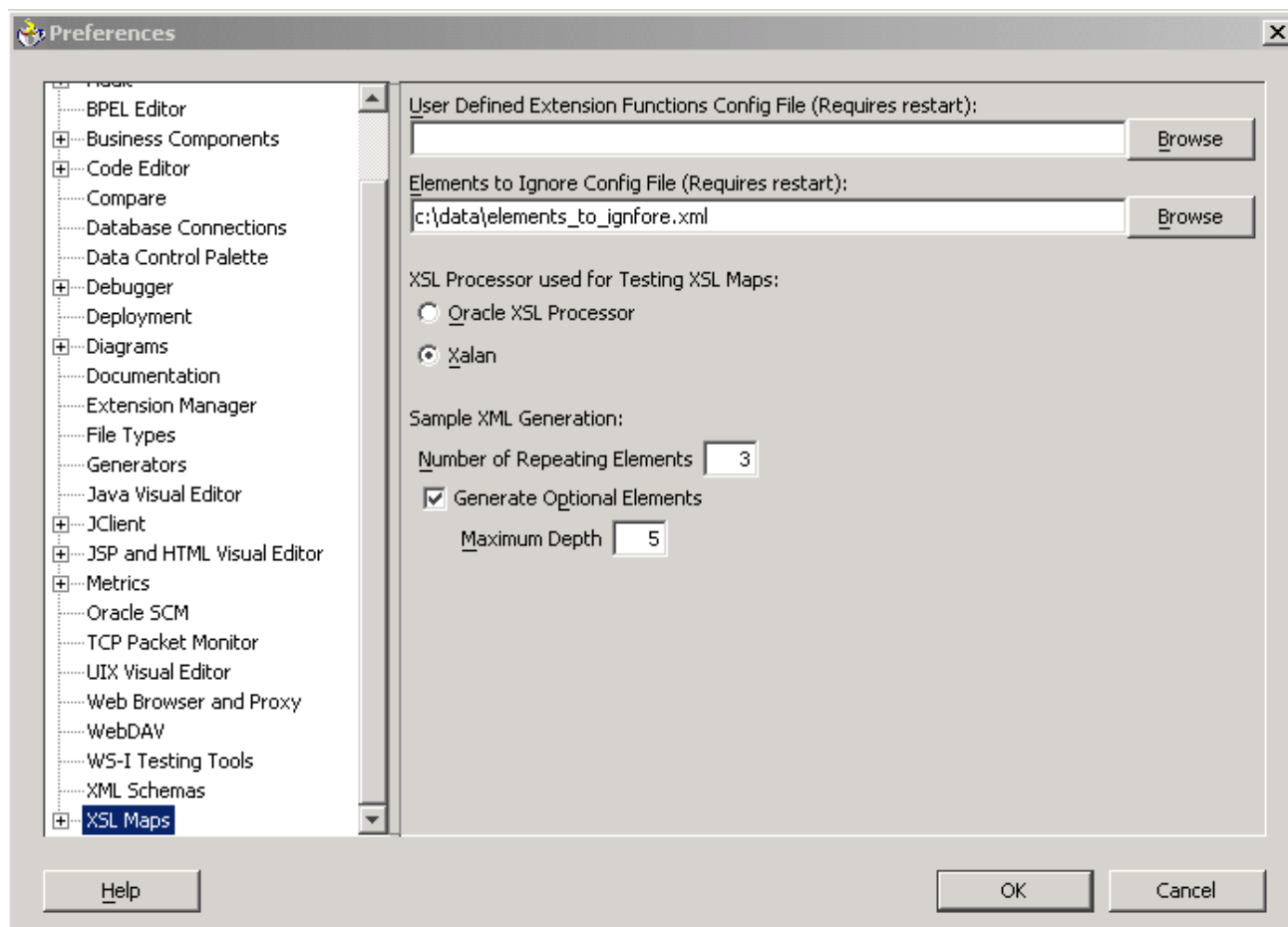
```
<element name = "psft_function">
<element name = "psft_workingstorage">
```

You would create a file using the following format, which tells Oracle XSL Mapper to ignore those elements:

```
<?XML version='1.0' encoding='windows-1252'?>
<elements-to-ignore>
  <element name = "psft_function"/>
  <element name = "psft_workingstorage"/>
</elements-to-ignore>
```

Specifying Elements to Ignore Configuration Files in Oracle XSL Mapper Preferences

Once you create the file of PeopleSoft elements to ignore, enter the file location and name in the mapper Preferences dialog box. The following graphic shows the Preferences dialog box:



Preferences dialog box

To specify an elements to ignore configuration file in Oracle XSL Mapper preferences:

1. In Oracle XSL Mapper, from the Tools menu, select Preferences.
The Preferences dialog appears.
2. In the list on the left-side of the window, click XSL Maps.
3. In the Elements to Ignore Conf. File (Requires Restart) field, enter or browse to the location of the elements to ignore configuration file that you created.
4. Click the OK button.

You must restart Oracle JDeveloper for the system to recognize the configuration file.

Invoking Transform Programs

Your transform program is invoked by PeopleSoft Integration Broker if you specify its name in the a routing definition for a service operation.

Accessing Transform Message Data

When PeopleSoft Integration Broker invokes a transform program, it inserts the message content into a PeopleCode system variable, `%TransformData`, which remains in scope throughout the program. Each step can access the variable in turn and modify its content, which then becomes available to the next step.

XSLT and PeopleCode steps access `%TransformData` differently:

- In XSLT, the data is automatically made available to your program. The XSLT program is literally a presentation of the output structure and data, which includes *xs/tags* that reference, process and incorporate the input data into the output structure. There's no need to explicitly refer to `%TransformData`, which automatically receives the interpreted result of the XSLT.
- In PeopleCode, use the PeopleCode *TransformData* class to access `%TransformData`. You then access the XML data as a property of the TransformData object called *XmlDoc*, which you assign to an *XmlDoc* object and process normally. Because the *XmlDoc* object is a reference to the data portion of `%TransformData`, your modifications are automatically passed back to the system variable.

Using the TransformData Class

The PeopleCode TransformData class has several properties:

Property	Description
XmlDoc	Contains the XML message data. You can assign this to an <i>XmlDoc</i> object and process the data using the <i>XmlDoc</i> class methods and properties. This property is read/write.
Status	Communicates the success or failure of the transform program step to PeopleSoft Integration Broker. Set to 0 for success, the default value. Set to 1 to indicate that the message failed a filtering step. Set to 2 to indicate an error occurred. This property is read/write. <u>See Chapter 16, "Applying Filtering, Transformation and Translation," Filtering Messages, page 347.</u>
SourceNode	The name of the node sending the message. This property is read only.
DestNode	The name of the node receiving the message. This property is read only.
SourceMsgName	The name of the message at the sending node. This property is read only.
DestMsgName	The name of the message at the receiving node. This property is read only.

Property	Description
SourceMsgVersion	The name of the message version at the sending node. This property is read only.
DestMsgVersion	The name of the message version at the receiving node. This property is read only.
routingDefnName	Retrieves the routing definition name for the transaction. You can then programmatically retrieve the routing properties specified on the Routings - Routing Properties page.
rejectTransform	<p>Terminates the transaction for asynchronous service operation types.</p> <p>If you set this property for a transform in inbound asynchronous transaction the system will not create a subscription contract. In the Service Operation Monitor Details page for the transaction an informational message will be part of the error message link indicating that the transaction was terminated.</p> <p>If you set this property for an outbound asynchronous transactions the publication contract status in the Service Operation Monitor will be updated to <i>Done</i>. The message will not be sent out and an error message will once again be part of the Service Operation Monitor Details page for the transaction indicating the transaction was terminated.</p>

Note. Because transform programs can apply to both request and synchronous response messages, the node *sending* the message could be a synchronous transaction target node that's sending a response back to the synchronous transaction source node, which in this case is the *receiving* node.

Handling Non-XML Data

Because they work only with XML DOM-compliant data, neither XSLT nor PeopleCode transform steps can process non-XML data. The XML DOM provides a way to incorporate such data into an XML structure so your transform programs won't produce errors.

If you're generating a non-XML outbound message in your PeopleSoft application, it's up to you to insert your message content into a special element containing a CDATA tag, as follows:

```
<any_tag psnonxml="yes">
  <![CDATA[your_nonXML_message_content]]>
</any_tag>
```

Note. *Any_tag* can be any tag you want to use.

The following restrictions apply to the content of inbound non-XML messages, such as those in CSV or PDF format, sent by third-party applications:

- Inbound non-XML text messages must be encoded as UTF-8-compliant characters.
- Inbound non-text, or binary, messages must be encoded in base64 format.

Renaming or Deleting Transform Programs

To invoke a transform program, you specify it as part of a routing definition. If you subsequently rename or delete that transform program, it still appears in the routing definition, so service operations using that modifier will fail. To prevent this, do the following:

- If you rename a transform program, make sure you reselect it by its new name in any routing definitions that apply it.
- If you delete a transform program, make sure you select a different program (or no program) in any routing definitions where that apply it.

Filtering Messages

This section provides an overview of message filtering and discusses how to work with a PeopleCode filtering example.

Understanding Message Filtering

You use filtering to suppress an input message based on its content. For example, you can suppress all inbound purchase order messages that specify order quantities less than the minimum number required for a discount.

Place filtering steps early in your Application Engine transform program; each message suppressed by the filter is one less message for subsequent steps to process.

You must use PeopleCode for filtering, so it'll probably be a distinct step. Because you must use the `XmlDoc` and `XmlNode` classes in your PeopleCode transform steps, you can analyze messages in any way that those classes support.

Filtering requires the following actions in your PeopleCode program:

1. Retrieve the message content from the `%TransformData` system variable.
2. Examine your filtering criteria.
3. If the message meets your criteria, do nothing further. It remains intact in the `%TransformData` system variable for the next transform program step to process.
4. If the message fails to meet your criteria, replace the entire message content with a single node called *Filter*, containing the reason it failed.

```
<?xml version="1.0"?>
<Filter>reason_for_failure</Filter>
```

5. Set the `TransformData Status` property to *1* to indicate failure.

PeopleSoft Integration Broker examines the *Status* property after each step, and terminates the transform program if its value is *1*. You can then view the message in Integration Broker Monitor and see the reason for the failure.

PeopleCode Filtering Example

The following example of filtering presents an input message, the PeopleCode filtering program, and the resulting output message.

Input Message

This is the input to the filtering step. Notice the line item order quantities (shown in emphasis):

```
<?xml version="1.0"?>
<PurchaseOrder>
  <Destination>
    <Address>123 Vine Street</Address>
    <Contact>
      <Name>Joe Smith</Name>
    </Contact>
    <Delivery type="ground">
      <Business>FedEx</Business>
    </Delivery>
  </Destination>
  <Payment>
    <CreditCard cardtype="visa">9999-9999-9999-9999</CreditCard>
  </Payment>
  <LineItems count="2">
    <Li locale="en_us" number="1">
      <Quantity>4</Quantity>
      <ProductName>pencil</ProductName>
      <UOM>box</UOM>
    </Li>
    <Li locale="en_us" number="2">
      <Quantity>10</Quantity>
      <ProductName>paper</ProductName>
      <UOM>large box</UOM>
    </Li>
  </LineItems>
</PurchaseOrder>
```

Note. Although this input message isn't in the PeopleSoft rowset-based message format, it is valid XML.

PeopleCode Filtering Program

This filtering program examines the line item order quantities of the input message and generates the output message that follows. The key statements are in bold:

```

/* Get the data from the AE Runtime */
Local TransformData &tempData = %TransformData;
/* Set a temp object to contain the incoming document */
Local XmlDoc &tempDoc = &tempData.XmlDoc;

/* Find the line items quantities contained in the incoming Purchase Order */
Local array of XmlNode &quantities =
    &tempDoc.DocumentElement.FindNodes("LineItems/Li/Quantity");
/* Temp storage of a node */
Local XmlNode &tempNode;

/* Loop through the quantities and make sure they are all above 5 */
For &i = 1 To &quantities.Len
    /* Set the temp node*/
    &tempNode = &quantities [&i];
    /* Make sure the node isn't empty*/
    If ( Not &tempNode.IsNull) Then

        /* Check the value, if not greater than 5 this does not pass filter*/
        If (Value(&tempNode.NodeValue) < 5) Then
            /* Clear out the doc and put in the "Filter" root node */
            If (&tempDoc.ParseXmlString("<?xml version='1.0'?'><Filter/>")) Then
                /* Get the new root node and set the value
                /* to be the reason for failing filter */
                &rootNode = &tempDoc.DocumentElement;
                &rootNode.NodeValue = "Line item quantity was found
                that was less than 5!";
                /* Set the status of the transformation to 1 for failed filter*/
                &tempData.Status = 1;
            End-If;
            Break;
        End-If
    End-If
End-For;

```

Output Message

This is the result of applying the PeopleCode filtering program:

```

<?xml version="1.0"?>
<Filter>Line item quantity was found that was less than 5!</Filter>

```

Applying Transformations

This section provides an overview of transformation and discusses using XSLT for transformation.

Understanding Transformation

Use a transformation when one node sends a request or response message with a data structure different from the structure required by the other node. One or both of the participating nodes can be PeopleSoft applications. At either end of the transaction, any of the following structure types may be required:

- The PeopleSoft rowset-based message format.
- An XML DOM-compliant non-rowset-based structure. This is generic XML data.

- A SOAP-compliant XML structure. This is also XML DOM-compliant.
- A non-XML structure. Third-party applications are more likely than PeopleSoft applications to require this type.

Your transformation can be between different structure types or between different structures of the same type.

See Also

Chapter 5, "Understanding Supported Message Structures," page 39

Using XSLT for Transformation

An XSLT transformation simulates the original message structure, then specifies how to treat nodes within that structure. You can:

- Copy the original content of a node without changing anything.
- Define and insert a new version of a node.
- Enter any structure or content directly.
- Eliminate a node by omitting reference to it, or by not inserting anything new in its place.

XSLT Transformation Example

The XSLT wrapper is required.

```
<?xml version="1.0"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
```

The primary node tag matches the original message structure by matching its top level content tag, the message name (QE_SYNC_MSG). Between the message template tags, you can insert any structure or content you want. PeopleSoft Integration Broker replaces each *xsl* tag with the data it references, producing a transformed message as the output of the step.

```
<xsl:template match="QE_SYNC_MSG">
  <QE_SYNC_MSG>
    <xsl:copy-of select="FieldTypes"/>
    <MsgData>
      <Transaction>
        <xsl:apply-templates select="MsgData/Transaction/QE_SALES_ORDER"/>
        <xsl:copy-of select="MsgData/Transaction/PSCAMA"/>
      </Transaction>
    </MsgData>
  </QE_SYNC_MSG>
</xsl:template>
```

The following node example is defined to match a record in the input message by its top level content tag, the record name (QE_SALES_ORDER). This template is applied by the *xsl:apply-templates* tag of the preceding node (shown emphasized).

Between the record template tags, you can insert any structure or content you want. In this example, *90* is prepended to the QE_ACCT_ID value, and the QE_ACCOUNT_NAME field is renamed to QE_ACCOUNT (shown emphasized). Also, any existing value in the DESCRLONG field is removed, and the remaining fields are passed through with their original values.

```
<xsl:template match="QE_SALES_ORDER">
  <QE_SALES_ORDER><xsl:attribute name="class">
    <xsl:value-of select="@class"/></xsl:attribute>
    <xsl:variable name="temp" select="QE_ACCT_ID"/>
    <QE_ACCT_ID><xsl:value-of select="concat(90,$temp)"/></QE_ACCT_ID>
    <QE_ACCOUNT><xsl:value-of select="QE_ACCOUNT_NAME"/></QE_ACCOUNT>
    <QE_ADDRESS><xsl:value-of select="QE_ADDRESS"/></QE_ADDRESS>
    <QE_PHONE><xsl:value-of select="QE_PHONE"/></QE_PHONE>
    <QE_FROMROWSET/>
    <QE_TOROWSET/>
    <QE_SEND_SOA_BTN/>
    <QE_SEND_SOS_BTN/>
    <DESCRLONG></DESCRLONG>
  </QE_SALES_ORDER>
</xsl:template>
```

Finally, you need the closing wrapper tag:

```
</xsl:stylesheet>
```

Note. You can find more information about XSLT at the World Wide Web Consortium (W3C) web site.

Note. A working transformation example using XSLT is provided in the PeopleTools SDK. The location of the example is <PS_HOME> \sdk\pstransform\samples\TRANSFORMTST.xml.

See Also

<http://www.w3.org/Style/XSL/>

Applying Message Transformations at the Integration Gateway

Typically, you apply filtering, transformation, and data translation to a message at the node level on the application server by using a transaction modifier to invoke an Application Engine transform program. However, on systems with high transaction volumes, Application Engine transformations can constrict message throughput. To improve performance, you can apply XSLT transformation programs at an integration gateway.

Note. While you may apply transformations at the integration gateway level, PeopleSoft strongly recommends that you apply them at the application server level due to a more robust infrastructure to support them.

See <http://www.apache.com>.

Understanding Applying Message Transformations at the Integration Gateway

Only XSLT transformations can be applied at the gateway. Message filtering, data translation, and PeopleCode transformations must still be applied at the node using an Application Engine transform program, and can be applied in addition to gateway-based transformations.

You can apply XSLT transformations at any gateway that handles the message you want to transform.

When a gateway with transformation enabled processes an IBRequest, it examines the transformation properties in the `integrationGateway.properties` file to determine if they specify a transformation for the same message with the same source and target nodes as the IBRequest. If these values match, the gateway compiles the specified XSLT transformation program and applies it to the message, then sends the transformed message to the target node.

Note. The IBRequest can specify only a `RequestingNode` or only a `DestinationNode`, but it must specify at least one of these values—`ig.DefaultServer.LocalNode` supplies the other one.

With synchronous transactions, the gateway applies transformations only to the request message, not to the response message. If the original message is compressed and base64 encoded, the gateway decompresses and decodes it before applying the transformation, then compresses and encodes it again before sending.

Note. The integration gateway retains all compiled XSLT transformation programs in a memory cache to improve performance during subsequent transformations. If you edit the code of a transformation program that's been used before, you must purge the compiled programs from the cache so the new version will be recompiled. To do this, click the Refresh button on the gateway definition.

Developing and Implementing Gateway-Based Transformation Programs

Developing and implementing gateway-based transform programs requires the following activities:

1. Determine if the message you want to transform qualifies for gateway-based transformation:
 - The message content must be XML-DOM compliant.
 - The message must not have nonrepudiation activated.
2. Develop the XSLT transformation program.

See [Chapter 16, "Applying Filtering, Transformation and Translation," Applying Transformations, page 349.](#)

You can develop, test and debug the program within Application Engine, but you must save the program code as an external text file. Place the file in any location that can be accessed from the integration gateway machine, for example:

```
C:\XSLProgs\MyTransform.xml
```

3. Configure the appropriate gateway property settings in the `integrationGateway.properties` file to enable the transformation.

See [Chapter 16, "Applying Filtering, Transformation and Translation," Setting Integration Gateway Properties for Gateway-Based Transformations, page 353.](#)

4. Refresh the gateway properties.

Setting Integration Gateway Properties for Gateway-Based Transformations

To apply gateway-based transformations, set the following properties in the `integrationGateway.properties` file.

For each message you want to transform, you must create a set of property entries using the same number, which associate a given transformation program with that message. However, you can specify the same transformation program for multiple messages.

When entering these settings, each transformation must be numbered for identification, using the convention `ig.transform1`, `ig.transform2`, `ig.transform3`, and so on.

<i>Property</i>	<i>Description</i>
<code>ig.isGatewayTransformationEnabled</code>	Specify whether transformation is enabled for this gateway. Valid values are: <ul style="list-style-type: none"> <code>TRUE</code>. Transformation is enabled. <code>FALSE</code>. Transformation is disabled — the integration gateway will ignore the other transformation properties. This is the default value.
<code>ig.DefaultServer.LocalNode</code>	Enter the name of the node definition that will be used as the source or destination node for a given transformation if either of those values isn't identified; for example you must specify: <pre>ig.DefaultServer.LocalNode=DEF_NODE</pre> All transformations require that you specify both a source node and a destination node. This property applies if either the <code>ig.transformN.SourceNode</code> property or the <code>ig.transformN.DestinationNode</code> property is empty or invalid, or if the <code>IBRequest</code> doesn't specify either <code>RequestingNode</code> or <code>DestinationNode</code> .
<code>ig.transforms</code>	Specify the number of transformations configured in the <code>integrationGateway.properties</code> file; for example: <pre>ig.transforms=7</pre>
<code>ig.transformN.XSL</code>	Enter the full path and filename of transformation program <i>N</i> . Your path specification must use either double back slashes or single forward slashes as separators; for example: <pre>ig.transform4.XSL=C:\\XSLProgs\\MyTransform.xml ig.transform4.XSL=C:/XSLProgs/MyTransform.xml ig.transform4.XSL=/usr/xsls/MyTransform.xml</pre>
<code>ig.transformN.MessageName</code>	Enter the name of the message to be transformed by transformation program <i>N</i> ; for example: <pre>ig.transform4.MessageName=MY_MSG_A</pre>

Property	Description
ig.transformN.SourceNode	<p>Enter the name of the source node from which the original message is being sent, or enter the value <i>ANY</i>; for example:</p> <pre>ig.transform4.SourceNode=NODE_Aig.transform4. SourceNode=ANY</pre> <p>If this value is <i>ANY</i>, the value of the ig.DefaultServer.LocalNode property will be used instead.</p>
ig.transformN.DestinationNode	<p>Enter the name of the target node to which the transformed message is being sent, or enter the value <i>ANY</i>; for example:</p> <pre>ig.transform4.DestinationNode=NODE_Big.transform4. DestinationNode=ANY</pre> <p>If this value is <i>ANY</i>, the value of the ig.DefaultServer.LocalNode property will be used instead.</p>
ig.transformN.DestinationMessageName	<p>(Optional.) Enter the name that the target node uses for the transformed version of the message, if it's different from the original message name; for example:</p> <pre>ig.transform4.DestinationMessageName=MY_MSG_B</pre> <p>This enables the gateway to rename the message before sending it, so the target node will recognize and accept it.</p>

Understanding Logged Errors

If an error occurs when you refresh the gateway properties or during a transformation, it's entered in the gateway's error log file.

Integration Gateway Refresh Errors

After you specify integration gateway properties and refresh the gateway, errors can be generated for the following reasons:

- No value is specified for ig.transformN.XSL.
- No value is specified for ig.transformN.MessageName.
- No value is specified for both ig.DefaultServer.LocalNode and ig.transformN.SourceNode.
- No value is specified for both ig.DefaultServer.LocalNode and ig.transformN.DestinationNode.
- The gateway is in the process of loading, compiling or caching a transformation program.

Runtime Transformation Errors

Errors are generated for the following reasons when the gateway attempts to apply a transformation:

- Nonrepudiation is enabled for the message.
- The integration gateway is unable to transform the message.
- The integration gateway is unable to decompress and decode the message.

- The integration gateway is unable to compress and encode the message.
- The IBRequest does not specify a RequestingNode and no value is specified for `ig.DefaultServer.LocalNode`.
- The IBRequest does not specify a DestinationNode and no value is specified for `ig.DefaultServer.LocalNode`.
- The IBRequest specifies neither a RequestingNode nor a DestinationNode.

Performing Data Translation

This section provides an overview of data translation and discusses how to:

- Define codeset groups.
- Define codesets.
- Define codeset values.
- Import and export codesets between databases.
- Delete codesets.
- Use XSLT for data translation.
- Work with an XSLT translation example.
- Work with a PeopleCode translation example.

Understanding Data Translation

Use data translation to modify message content rather than structure, although you can also make local structural changes. It's most appropriate when the sending and receiving systems use different field values, or different combinations of fields and their values, to represent the same information.

Following is a sample scenario:

- Application A transmits customer names in four fields: *Title*, *First*, *Middle*, and *Last*.
- Application B uses two fields: *Last* and *First*. It doesn't use a title, but includes the middle name as part of the *First* field.
- Application C uses only one field: *AccountID*.

Clearly the representation used by one application won't be understood by either of the other two. PeopleSoft Integration Broker can apply a transform program to translate each of these representations into a version appropriate to the receiving application.

One Integration Broker node can store in its codeset repository the equivalent fields and values used by another node. When it receives a message from the other node containing a customer name, it can use its codeset repository to translate the information into the form it prefers. It can likewise reverse the process for messages outbound to the other node.

For a given integration, you can allocate the responsibility for performing data translation in different ways. You can distribute the translation activity among the participating nodes, or you can designate one Integration Broker node to do all the data translation as a hub, whether the messages are inbound, outbound, or being redirected between the other nodes. Using a single node, if possible, can reduce the need for duplicating repository data.

Data Translation Elements

The following elements constitute the codeset repository, managed as PeopleSoft Pure Internet Architecture components:

Codeset group	<p>Maintains a list of the significant data fields and their values that a particular node might send in an initial message. These are name/value pairs a translation program might find (match) and use as the basis for determining what the result message should contain. These name/value pairs are known as <i>match names</i> and <i>match values</i>.</p> <p>Each PeopleSoft Integration Broker node that requires data translation must belong to a codeset group.</p>
Codeset	<p>A specific set of match name/match value pairs selected from an existing codeset group. The selected name/value pairs are the basis for possible field value combinations that you want to match in a message, and to which your translation program can respond by modifying the message content. Each codeset typically represents one set of fields that require translation for a given message.</p>
Codeset values	<p>A codeset value is a named value you define, also known as a <i>return value</i>. Your translation program can output the return value as a result of matching a specific combination of match values from a codeset.</p> <p>You associate multiple combinations of codeset values with the combination of an initial codeset group, a codeset from that initial group, and a result codeset group. For each permutation of match values selected from the codeset, you define a different combination of codeset values to apply to your result message.</p>

The other key element of data translation is your translation program, which invokes the codesets and codeset values you've defined.

Data Translation Development Sequence

You must initially define these elements in a particular order:

1. Two codeset groups.
2. A codeset based on one of the codeset groups.
3. A set of codeset values.
4. A data translation program, in XSLT or PeopleCode.

However, it's unlikely that you'll be able to fully define any of these elements without some trial and error. You may find you'll have to modify and extend each element in turn as you develop your data translation program.

5. Select a match value from the set defined for the selected match name.

Note. You can leave the value blank. If so, you should do the same for each match name in this codeset, in addition to any other values you select for them. A combination consisting of *all* blank values is treated as a wild card by PeopleSoft Integration Broker, which enables it to respond to unanticipated values specified in your translation program with default behavior that you define.

6. Repeat steps 3 through 5 to enter all the name/value pairs that may need to be matched.

The name/value pairs you select should encompass only the possible value combinations that your translation program needs to match for a single translation. You define a different codeset for each translation based on this codeset group.

Defining Codeset Values

Use the Codeset Values page (IB_CODESETVAL) in the Codeset Values component (IB_CODESETVAL). Select PeopleTools, Integration Broker, Integration Setup, Codesets, Codeset Values to access the Codeset Values page.

Codeset Values

From Group CS_SAP_01

Codeset Name PS_SAP_PO_01

To Group CS_PSFT_01

Codesets
Find | View All
First 1 of 1 Last

Description SHIPMENTMETHOD_SAP_PS_01

Parameters
Customize | Find | View All
First 1-4 of 4 Last

Select	Match Name	Match Value
<input type="checkbox"/>	locale	
<input checked="" type="checkbox"/>	locale	en_us
<input type="checkbox"/>	uom	
<input checked="" type="checkbox"/>	uom	box

Codeset Values
Customize | Find | View All
First 1-2 of 2 Last

*Return Name	Return Value		
PS_LOCALE_01	en_uk	+	-
PS_UOM_01	carton	+	-

Codeset Values page

To define codeset values:

1. Add a new value and select a codeset group name for the *From* group.

This is the codeset group to which the initial node belongs.

2. Select a codeset name from the codesets based on the group you selected.

This is the codeset whose match name/match value permutations you wish to match.

3. Select a codeset group name for the *To* group.

This is the codeset group to which the result node belongs.

4. Click Add.

The Codeset Values page appears. The upper grid contains the selected codeset's match name/match value pairs, and the lower grid contains the return values you specify. Each permutation that you define has its own Description field, which can help you distinguish between permutations that may be subtly different from each other.

Note. To configure an existing codeset values definition, enter its *From* group, codeset name and *To* group on the search page.

5. Select check boxes to define a permutation of match name/match value pairs.

For each match name, you can select at most one match value.

A permutation consisting of all blank values serves as a wild card; it matches any input value combination that isn't matched by any other permutation. However, a permutation with some blank and some non-blank values works differently; it requires the names with blank values to actually match blank field values in the input data.

Note. You'll generally define only permutations that you expect the input data to contain, but make sure you allow for unforeseen match values by including permutations with all blank values. You can then specify default return values for those permutations. With a large number of match names in the codeset, you can make sure to catch all unforeseen combinations by defining a permutation with all blank match values.

6. In the Code Set Values grid, enter a return name, and a return value for that name.

You can use any return name you want, because only your codeset translation program refers to it. Your translation program can use the return value as a field value or as a node name in the output data.

Important! The set of return names you define *must be identical* for all of the permutations of match name/match value pairs for the current codeset in this definition. Your translation program invokes the codeset and applies the return names from this definition, but it can't anticipate which permutations will be matched, or which actual return values it's applying — just the return names.

7. (Optional.) In the Code Set Values grid, add a new row and repeat step 6.

Add as many return name/return value pairs as you need for your output based on the current permutation. If the permutation is matched in the input data, the code set values you define for that permutation become available for you to call and insert in the output data.

8. (Optional.) At the top level of this page, add a new row and repeat steps 5 through 7.

This inserts a new permutation row, in which you can define a different permutation of match name/match value pairs that you expect for the current codeset. For each permutation, you'll define a separate, independent set of codeset values.

Importing and Exporting Codesets Between Databases

PeopleSoft provides two Data Mover scripts that you can use to import and export codesets between databases:

- CODESET_DELETE_IMPORT.DMS

Use this script to purge and then import codeset data into a target database.

- CODESET_EXPORT.DMS

Use this script to export codeset data from a source database to a target database.

Deleting Codesets

Before you delete a codeset, you must delete any codeset values associated with it.

Deleting Codeset Values

To delete codeset values for a codeset:

1. Select PeopleTools, Integration Broker, Integration Setup, Codesets, Codeset Values. The Codeset Values page displays.
2. In the Find an Existing Value tab, in the Codeset Name field, enter the name of the code set you want to delete, or use the Lookup button to locate it.
3. In the Codeset Values section, clear the Select box for each match name corresponding to the code set match name you want to delete, or click the minus (-) button to delete the entire code set scroll area.

Repeat this process for as many codeset match names that are used.

4. Click the Save button.

Deleting Codesets

To delete a codeset:

1. Select PeopleTools, Integration Broker, Integration Setup, Codesets, Codeset.
2. Select the codeset to delete. The Codeset page displays.
3. Locate the row that contains the codeset you want to delete, and click the minus (-) button on that row.
4. Click the Save button.

Using XSLT for Data Translation

Once you've defined the match name/match value permutations for a given codeset and defined the return values for those permutations, you can write an XSLT translation program that invokes the codeset and applies the return values.

An XSLT translation is based on XSLT transformation structure. However, although you could combine both tasks into a single program, it's better to keep them separate for easier understanding and maintenance.

Psft_function Nodes

To implement data translation capability, PeopleSoft Integration Broker provides a custom XSLT tag called *psft_function*. Each *psft_function* node in your program comprises a single instance of data translation that invokes a particular codeset and applies a specified set of codeset values.

Runtime invocation of codesets in XSLT is a two part process: first the input document is transformed and then all instances of *psft_function* are resolved in the output document.

Note. You can insert a *psft_function* node anywhere inside the XSLT template containing the fields you want to translate. However, you'll find it easiest to place it at or near the point in the template where the return values will go, to avoid having to specify a complex path to that location.

The *psft_function* tag has the following attributes:

<i>Attribute</i>	<i>Use</i>
name	Set to <i>codeset</i> .
codesetname	Identifies the codeset whose name/value permutations you want to match in the input data. The routing that invokes this transform program identifies the initial and result nodes involved, and PeopleSoft Integration Broker examines their definitions to determine the <i>From</i> group and <i>To</i> group. The combination of these two keys and the codeset name identifies the codeset values definition to apply.
source	(Optional.) Overrides the name of the initial node specified by the routing. PeopleSoft Integration Broker uses the specified node's codeset group as the <i>From</i> group key, thus invoking a different codeset values definition.
dest	(Optional.) Overrides the name of the result node specified by the routing. PeopleSoft Integration Broker uses the specified node's codeset group as the <i>To</i> group key, thus invoking a different codeset values definition.

Note. The *source* and *dest* attributes don't change the initial and result nodes specified in the routing; they just invoke the codeset groups to which those nodes belong.

Following is an example of *psft_function* using all of its attributes:

```
<psft_function name="codeset" codesetname="PS_SAP_PO_01"
  source="SAP_02" dest="PSFT_03">...</psft_function>
```

Parm and Value Nodes

The *psft_function* node can contain two tags, *parm* and *value*:

- Use the *parm* tag to specify a match name from the codeset values definition that you specified for this translation. You do this with the tag's only attribute: *name*. Set this to a match name from the codeset values definition.

The *parm* node should contain a match value, usually specified as an *xsl:value-of* tag that identifies where the value resides in the input data. Use one *parm* node for each distinct match name in the codeset values definition.

- Use the *value* tag to specify a return name from the codeset values definition that you specified for this translation. Also use the *value* tag to identify where to place the return value assigned to that return name for the matched permutation and how to apply that value.

Use one *value* node for each return name in the codeset values definition that you want in your output.

Value Tag Attributes

The *value* tag has the following attributes:

Attribute	Use
name	Identifies a return name from the codeset values definition you specified for this translation. The return value assigned to this return name can be used as a data value or as a node name in your output depending on the attributes you specify.
select	Identifies an XSLT path (XPATH) to the location where the return value should be applied in the output data.
createIfDNE	(Optional.) Set to <i>yes</i> to ensure that the node specified by the <i>select</i> attribute is created if it does not exist yet. The return value is inserted as the value of that node.
createNodeFromValue	(Optional.) Set to <i>yes</i> to use the return value as the name of a new node, created where the <i>select</i> attribute specifies. The <i>value</i> tag can contain a valid XSLT value for that node, usually specified as an <i>xsl:value-of</i> tag that identifies where the value resides in the input data.

Following is an example of a *value* node:

```
<value name="PS_RET_01" select="." createNodeFromValue="yes"><xsl:value-of
  select="CreditCard"/></value>
```

See Also

Chapter 16, "Applying Filtering, Transformation and Translation," Using XSLT for Transformation, page 350

<http://www.w3.org/Style/XSL/>

XSLT Translation Example

The following example of XSLT data translation presents an example input message, the XSLT translation program, and the resulting output message.

Input Message

This is the input to the XSLT translation:

```
<?xml version="1.0"?>
<PurchaseOrder>
  <Destination>
    <Address>123 Vine Street</Address>
    <Contact>
      <Name>Joe Smith</Name>
    </Contact>
    <Delivery type="ground">
      <Business>FedEx</Business>
    </Delivery>
  </Destination>
  <Payment>
    <CreditCard cardtype="visa">9999-9999-9999-9999</CreditCard>
  </Payment>
  <LineItems count="2">
    <Li locale="en_us" number="1">
      <Quantity>15</Quantity>
      <ProductName>pencil</ProductName>
      <UOM>box</UOM>
    </Li>
    <Li locale="en_us" number="2">
      <Quantity>10</Quantity>
      <ProductName>paper</ProductName>
      <UOM>large box</UOM>
    </Li>
  </LineItems>
</PurchaseOrder>
```

Note. Although this input message isn't in the PeopleSoft rowset-based message format, it is valid XML.

XSLT Data Translation Program

This translation program processes the input message in this example and generates the output message that follows. The statements shown emphasized demonstrate some uses of the *psft_function* node:

```

<?xml version="1.0"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <xsl:template match="PurchaseOrder">
    <po>
      <xsl:apply-templates/>
    </po>
  </xsl:template>

  <xsl:template match="Destination">
    <dest>
      <address><xsl:value-of select="Address"/></address>
      <name><xsl:value-of select="Contact/Name"/></name>
      <delivery>
        <type>
          <psft_function name="codeset" codesetname="PS_SAP_PO_03"
            dest="PSFT_03">
            <parm name="type"><xsl:value-of select="Delivery/@type"/>
            </parm>
            <value name="PS_RET_01" select="."/>
          </psft_function>
        </type>
        <carrier>
          <psft_function name="codeset" codesetname="PS_SAP_PO_03"
            source="SAP_03">
            <parm name="Business"><xsl:value-of select="Delivery/
              Business"/></parm>
            <value name="PS_RET_01" select="."/>
          </psft_function>
        </carrier>
      </delivery>
    </dest>
  </xsl:template>

  <xsl:template match="Payment">
    <payment>
      <psft_function name="codeset" codesetname="PS_SAP_PO_02">
        <parm name="cardtype"><xsl:value-of select="CreditCard/
          @cardtype"/></parm>
        <value name="PS_RET_01" select="."
          createNodeFromValue="yes"><xsl:value-of select="CreditCard"/>
        </value>
      </psft_function>
    </payment>
  </xsl:template>

  <xsl:template match="Li">
    <li><xsl:attribute name="id"><xsl:value-of select="@number"/></xsl:attribute>
      <name><xsl:value-of select="ProductName"/></name>
      <qty><xsl:value-of select="Quantity"/></qty>
      <uom>
        <psft_function name="codeset" codesetname="PS_SAP_PO_01">
          <parm name="locale"><xsl:value-of select="@locale"/></parm>
          <parm name="uom"><xsl:value-of select="UOM"/></parm>
          <value name="PS_RET_01" select="."/>
          <value name="PS_RET_02" select="../type" createIfDNE="yes"/>
        </psft_function>
      </uom>
    </li>
  </xsl:template>
</xsl:stylesheet>

```

Output Message

This is the result of applying the XSLT translation:

```
<po>
  <li id=" ">
    <name>pencil</name>
    <qty>15</qty>
    <uom>Carton</uom>
    <type>Bic</type>
  </li>
  <li id=" ">
    <name>paper</name>
    <qty>10</qty>
    <uom>Box</uom>
    <type>Bic</type>
  </li>
  <dest>
    <address>123 Vine Street</address>
    <name>Joe Smith</name>
    <delivery>
      <type>Ground</type>
      <carrier>Federal Express</carrier>
    </delivery>
  </dest>
  <payment>
    <VISA>4024-9920-9892-8982</VISA>
  </payment>
</po>
```

PeopleCode Translation Example

Although XSLT is the recommended language for using the codeset repository to translate message data, you can use PeopleCode for this purpose as well. Because XSLT works only with XML DOM-compliant message data, you must use PeopleCode if the message you're translating contains non-XML data, including formats like comma separated values (CSV).

Once you've defined the match name/match value permutations for a codeset with respect to a given target codeset group and defined the return values for those permutations, you can write a PeopleCode translation program that invokes that codeset and applies the return values.

FindCodeSetValues Built-in Function

To implement data translation capability, Integration Broker provides a PeopleCode built-in function called *FindCodeSetValues*, which takes four parameters and returns a two dimensional array.

The following example of PeopleCode data translation presents an example input message, the PeopleCode translation program, and the resulting output message.

Input Message

This is the input to the PeopleCode translation:

```
<?xml version="1.0"?>
<Header>
  <LANGUAGE_CODE>en_us</LANGUAGE_CODE>
  <STATUS_CODE>0</STATUS_CODE>
</Header>
```

PeopleCode Data Translation Program

This translation program processes the input message in this example, and generates the output message that follows. The statement shown emphasized demonstrates the use of the FindCodeSetValues function:

```
/* Get the data from the AE Runtime */
Local TransformData &incomingData = %TransformData;

/* Set a temp object to contain the incoming document */
Local XmlDoc &tempDoc = &incomingData.XmlDoc;

/* Find the Language and status codes value*/
Local string &langCode = &tempDoc.DocumentElement.FindNode("LANGUAGE_CODE").
  Node Value;
Local string &statusCode = &tempDoc.DocumentElement.FindNode("STATUS_CODE").
  Node Value;

/* Create an array to hold the name value pairs */
Local array of array of string &inNameValuePairsAry;

/* Load the array with some values */
&inNameValuePairsAry = CreateArray(CreateArray("LANG", &langCode),
  CreateArray("STATUS", &statusCode));

/* Find the codeset values */
&outAry = FindCodeSetValues("STATUS_CHANGE", &inNameValuePairsAry,
  &incomingData.SourceNode, &incomingData.DestNode);

/* Create the new output doc */
If &tempDoc.ParseXmlString("<?xml version=" "1.0" "><NewHeader/>") Then

  /* Make sure something was returned */
  If &outAry.Len > 0 Then

    /* Create the new Status Code Node */
    Local XmlNode &statusCodeNode = &tempDoc.DocumentElement.AddElement("STATUS");

    /* Since this is a 2D array, get the Return Value*/
    &statusCodeNode.NodeValue = &outAry [1][2];
  End-If;
End-If;
```

Output Message

This is the result of applying the PeopleCode translation:

```
<?xml version="1.0"?>
<NewHeader>
  <STATUS>Open</STATUS>
</NewHeader>
```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode Language Reference, "PeopleCode Built-in Functions," FindCodeSetValues

Rejecting Transformation Programs

Situations may arise when you may want to terminate a transaction. For example, you may not want a transaction published to a specific node.

Using the %TransformData.rejectTransform property and the %IB_Transform_Rejected built-in function, you can terminate asynchronous transactions based on content data.

You set this property in a PeopleSoft Application Engine transform program as follows:

```
%TransformData.rejectTransform = %IB_Transform_Rejected;
```

If you set the %TransformData.rejectTransform property within a transform of an inbound asynchronous transaction, the system will not create a subscription contract and the data is not sent. If you view such a transaction in the Service Operations Monitor, the Operation Instances page displays a status of *Done*. If you open the Asynchronous Details page in the monitor, an Error link displays. If you click the link an informational message appears that indicates that the transaction was terminated.

If you set this property for an outbound asynchronous transaction, the Publication Contracts page in the Service Operations Monitor will show a contract status of *Done* for the transaction. However, the system does not send the message and, as with the inbound scenario, the Asynchronous Details page for the transaction will display an Error link. If you click the link an informational message appears that indicates that the transaction was terminated.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor, "Monitoring Asynchronous Service Operations," Asynchronous Service Operation Statuses

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor, "Monitoring Asynchronous Service Operations," Monitoring Asynchronous Service Operation Instances

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor, "Viewing Asynchronous Service Operation Details"

Terminating Transformation Programs

If you need to terminate a transform program for reasons that aren't considered error conditions by PeopleSoft Integration Broker, you can use a PeopleCode step to force the transform program to terminate and generate a readable error message as well.

To generate an error:

1. Replace the entire message content with a single node called *Error*, containing the reason for the error.

```
<?xml version="1.0"?>  
<Error>reason_for_error</Error>
```

2. Set the TransformData *Status* property to 2 to indicate error status.

PeopleSoft Integration Broker examines the *Status* property after each step and terminates the transform program if its value is 2. You can then view the message in Service Operations Monitor and see the reason for the error.

Note. If an XSLT or PeopleCode step fails for reasons that you haven't taken into account, Integration Broker automatically sets the *Status* property to 2 and aborts the transform program, but you can't provide your own error message.

Chapter 17

Managing Error Handling, Logging, Tracing, and Debugging

This chapter provides an overview of integration gateway error handling and discusses how to:

- Manage integration gateway message and error logging.
- Manage application server logging and tracing.
- Debug integrations.

Understanding Error Handling, Logging, Tracing and Debugging

Error handling, logging, tracing, and debugging with PeopleSoft Integration Broker can occur on an integration gateway, application server, or application engine, depending on the type and location of processing.

Understanding Integration Gateway Error Handling

Error handling is an integration gateway service that assists connectors to manage errors that occur during processing. Errors on the integration gateway are handled by target connectors and listening connectors.

This section discusses:

- Target connector error handling.
- Listening connector error handling.
- Integration gateway exception types.

Target Connector Error Handling

The Target Connector Interface (TCI) specifies the methods that target connectors must implement for the integration gateway to manage them. These methods include a set of standard exceptions that target connectors generate when they experience errors during processing.

Listening connectors or the gateway manager catch these exceptions and provide an appropriate implementation for each. When the source of the message is an integration engine, the gateway manager catches the exceptions. Otherwise, listening connectors are responsible for handling exceptions that are generated during processing.

Listening Connector Error Handling

Unlike target connectors, listening connectors are not managed by the gateway manager and, therefore, do not adhere to any interface. However, a listening connector must invoke the gateway manager to pass a message from the integration gateway to the integration engine.

The gateway manager has predefined exceptions.

In general, exceptions are thrown in a target connector and caught by a listening connector. As a result, a listening connector must catch these exceptions and handle them as appropriate. Typically, the listening connector generates an error message and sends it back to the requester.

Integration Gateway Exception Types

This section discusses integration gateway exception types.

Standard Exceptions

The following standard error and exception types are handled by the integration gateway, target connectors, and listening connectors:

<i>Exception Type</i>	<i>Description</i>
DuplicateMessageException	<p>A target connector attempted to process a message that has already been processed. This is usually discovered based on an error that is attained from the external system that is being contacted.</p> <p>Of the connectors that are delivered with the PeopleSoft software, only the PeopleSoft 8.1 target connector (PSFT81TARGET) can generate this exception. Target connectors are not required to generate this exception.</p>
ExternalApplicationException	<p>The message reached its intended destination but could not be processed.</p> <p>Determining that the destination could not process a message requires significant knowledge of the destination system, which a target connector might not have. Whenever possible, a target connector should attempt to determine this situation; otherwise this task must be decentralized and handled outside of the integration gateway.</p> <p>For example, the HTTP target connector (HTTPTARGET) generates this exception when the external system returns an HTTP system code of 500.</p>

Exception Type	Description
ExternalSystemContactException	<p>The target connector cannot establish a connection with the intended destination. This is one of the most common exceptions.</p> <p>When this exception is thrown during an asynchronous transaction, PeopleSoft Integration Broker tries to resend the message until successful.</p>
GeneralFrameworkException	A general error occurred.
InvalidMessageException	A connector or the gateway manager determined that the message cannot be processed because of missing or erroneous information in a request or response.
MessageMarshallingException	<p>A gateway service's attempt to get information from an IBRequest or IBResponse failed. This can occur when the gateway services attempt to access a content section of a document by using an out-of-range index from one of the following methods:</p> <ul style="list-style-type: none"> • GetContentSectionAt(index) • GetContentSectionInfoAt(index) • RemoveContentSectionAt(index) <p>If you try to access IBRequest or IBResponse with an out-of-range index by using any of these methods, this exception is thrown automatically and processing is interrupted.</p>
MessageUnmarshallingException	<p>A gateway service's attempt to build an IBRequest or IBResponse failed. Failure can occur when:</p> <ul style="list-style-type: none"> • Instantiating an IBRequest or IBResponse from a Multipurpose Internet Mail Extensions (MIME) format where the message that was sent does not comply with the PeopleSoft MIME format. • Instantiating an IBRequest by using the PS_XML format and passing an invalid PS_XML message. <p>This is typically from the HTTP listening connector.</p> <ul style="list-style-type: none"> • Setting invalid values to methods, such as setTransactionID or setMessageType. <p>These failures cause the integration gateway to generate this exception automatically and processing is interrupted.</p>

Java Exceptions

Target connectors and listening connectors can handle miscellaneous Java exceptions, such as NullPointerException and ArrayOutOfBoundsException.

Managing Integration Gateway Message and Error Logging

This section provides an overview of message and error logging and discusses how to:

- Set up message and error logging.
- View non-English characters in integration gateway log files.
- Manage message logging.
- Manage error logging.

Understanding Message and Error Logging

Error and message logging is a gateway service that you use to monitor messages that flow through the integration gateway.

Logging takes place within both target and listening connectors. Connectors can log all message requests and responses. As a result, you can use logging to:

- Track message flow.
- Troubleshoot processing errors.

Setting Up Message and Error Logging

By default, an integration gateway logs all errors and warnings, as well as information of important, standard, and low importance.

Set up message and error logging by using the `integrationGateway.properties` file. Use the Logging Setting section to view or change default settings, such as the level of gateway logging, where the system writes log files, the maximum size of the log file, and the number of file backups or archives to keep.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Setting Logging Properties

Viewing Non-English Characters in Integration Gateway Log Files

To view non-English characters in integration gateway log files, enable UTF-8 encoding in your web browser. For example, if you are using Microsoft Internet Explorer 5.5, you can enable UTF-8 encoding by selecting View, Encoding, Unicode (UTF-8). If you are using Netscape Navigator 6.0, you can enable UTF-8 encoding by selecting View, Character Encoding, Unicode (UTF-8).

Managing Message Logging

Message logging records the following information for messages that pass through the integration gateway:

- Time and date.
- Message description.
- Content of the passed message object.
- Message level.

The default location of the integration gateway message log is
<PIA_HOME>\websrv\<DOMAIN>\applications\peoplesoft\PSIGW.war\msgLog.html.

Change the location of the log in the integrationGateway.properties file.

Message Logging in Target Connectors

Message logging in a target connector occurs:

- Before delivering the request to the external system.

The connector logs the request in the format in which the external system delivered it. For example, an HTTP target connector logs the exact HTTP output stream request. The PeopleSoft target connector logs the MIME request to be sent to the integration engine.

- After it receives a response from the external system.

The connector logs the response in the format in which it receives it. For example, an HTTP target connector logs the exact HTTP input stream response. The PeopleSoft target connector logs the MIME response that it received from the integration engine.

Message Logging in Listening Connectors

Message logging in a listening connector occurs:

- At the point where the request enters the system.

The connector logs the request in the format in which the sending system delivers it. For example, the HTTP listening connector logs the exact HTTP input stream request. The PeopleSoft listening connector logs the MIME request that it received from the integration engine.

- Following the delivery of a response to the requestor system.

The connector logs the response in the format in which it was delivered. For example, the HTTP listening connector logs the exact HTTP output stream response. The PeopleSoft listening connector logs the MIME response that it sent back to the integration engine.

Message Logging Methods and Parameters

Invoke the logMessage method for integration gateway message logging:

```
logMessage(String Description, Object message, int MessageLevel)
```

Use the following parameters:

<i>Parameter</i>	<i>Description</i>
Description	Specify a description as a string.
Object	Specify the message object. Typically this object is an IBRequest or IBResponse. If another object is passed, the toString method is invoked for the object, and the result is logged.
MessageLevel	<p>Set the relative importance of the information that you are logging. The ig.log.level property setting in the integrationGateway.properties file determines the log level that is currently in effect. If the MessageLevel value that is passed here is less than or equal to the ig.log.level property setting, the message is written to the log file.</p> <p>Values are:</p> <ul style="list-style-type: none"> • 3: Important information. • 4: Standard information. • 5: Low-importance information. <p>The ig.messageLog.filename property in the integrationGateway.properties file determines the log file location.</p>

Managing Error Logging

Error logging captures processing errors that occur in the integration gateway. When an error occurs, the following information is logged:

- Error level.
- Description.
- Message catalog entry information.
- Stack trace identifying the problem.
- IBRequest and IBResponse (if available).

The default location of the integration gateway error log is

<PIA_HOME>\webserv\<DOMAIN>\applications\peoplesoft\PSIGW.war\errorLog.html

Change the location of the log in the integrationGateway.properties file.

Error Logging Methods and Parameters

Invoke the logError method for integration gateway error logging:

```
logError (String Description, IBRequest, IBResponse, int ErrorLevel, Throwable)
```

Use the following parameters:

Parameter	Description
Description	Specify a description as a string.
IBRequest	Specify the IBRequest for this transaction, if available. If not available, pass Null.
IBResponse	Specify the IBResponse for this transaction, if available. If not available, pass Null.
ErrorLevel	<p>Specify whether the log is written to permanent storage. This determines the severity of the error. The <code>ig.log.level</code> property in the <code>integrationGateway.properties</code> file determines the log level that is currently in effect. If the <code>ErrorLevel</code> value that is passed here is less than or equal to the <code>ig.log.level</code> property setting, the error is written to the log file.</p> <p>Values are:</p> <ul style="list-style-type: none"> • <code>100</code>: Language exception. • <code>1</code>: Standard gateway exception. • <code>2</code>: Warning. <p>The <code>ig.errorLog.filename</code> property in the <code>integrationGateway.properties</code> file determines the log file location.</p>
Throwable	Specify the Java exception or error that is associated with the error. This is used to log the stack trace that is associated with the error.

The gateway manager and delivered listening connectors feature built-in error logging that invokes the `logError` method. The delivered target connectors do not feature built-in error logging, and instead generate errors to the gateway manager or listening connectors, where they are handled or logged.

Managing Application Server Logging and Tracing

Use the PeopleSoft Application Server Administration menu to:

- View application server and Oracle Tuxedo log files.

See *Enterprise PeopleTools 8.50 PeopleBook: System and Server Administration*, "Using PSADMIN Menus," Editing Configuration and Log Files.

- Trace Structured Query Language (SQL) and PeopleCode on your domains.

See *Enterprise PeopleTools 8.50 PeopleBook: System and Server Administration*, "Setting Application Server Domain Parameters," Trace Options.

- Set the level of network tracing (log fence).

See *Enterprise PeopleTools 8.50 PeopleBook: System and Server Administration*, "Setting Application Server Domain Parameters," Domain Settings.

- View the certificate authentication logs, including information about mismatched distinguished names and certificates that are not in the database.

This information is contained in the APPSRV.LOG file.

You can also use the tracing functionality in PeopleSoft Application Engine, which enables you to monitor the performance of transforms in your implementation of PeopleSoft Integration Broker.

See Also

Chapter 16, "Applying Filtering, Transformation and Translation," page 321

Enterprise PeopleTools 8.50 PeopleBook: Application Engine, "Tracing Application Engine Programs"

Debugging Integrations

This section discusses how to:

- Debug handler PeopleCode.
- Handle common issues.

Debugging Handler PeopleCode

Use the Handler Tester utility to debug service operation handler PeopleCode.

The Handler Tester utility enables you to use the PeopleSoft Pure Internet Architecture to test any of the following handler types:

- OnSend.
- OnRequest
- OnRouteReceive
- OnRouteSend.
- OnAckReceive
- OnNotify.

You can test handlers without setting up a routing definition, without having pub/sub booted on your application server, and without impacting other developer activity on the system.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools, "Using the Handler Tester Utility"

Handling Common Issues

Use this table to handle common issues in PeopleSoft Integration Broker:

Area or Suspected Issue	Debugging Suggestion
Application server exceptions.	Check the application server log: <PS_CFG_HOME>\appserv\<Domain>\LOGS\ appsrv.log
Message handlers are not running.	Check the application server domain status or queue status in the PeopleSoft Application Server Administration menu (PSAdmin). Select Domain Status, Server Status or Domain Status, Queue Status.
Integration gateway.	Check the integrationGateway.properties file and verify the property settings. The default file location is <PIA_HOME>\webserv\<DOMAIN>\applications\peoplesoft\PSIGW.war\WEB-INF\integrationGateway.properties.
Integration gateway.	Check the integration gateway message log. The default file location is <PIA_HOME>\webserv\<DOMAIN>\applications\peoplesoft\PSIGW.war\msgLog.html.
Queues are paused.	Check the Service Operations Monitor. Select PeopleTools, Integration Broker, Service Operations Monitor, Administration, Queue Status.
A node is paused.	Check the Service Operations Monitor. Select PeopleTools, Integration Broker, Service Operations Monitor, Administration, Node Status.
Incorrect gateway uniform resource locator (URL).	Check the Gateways component to verify that the integration gateway URL is correct. Select PeopleTools, Integration Broker, Configuration, Gateways.
Node inactive.	Check the node definition. Select PeopleTools, Integration Broker, Integration Setup, Nodes.

<i>Area or Suspected Issue</i>	<i>Debugging Suggestion</i>
Subscription PeopleCode is missing or incorrect.	Check the Service Operations Monitor. Select PeopleTools, Integration Broker, Monitoring, Asynchronous Services, Subscription Contracts..
A service operation is inactive.	Check the service operation definition in the PeopleSoft Pure Internet Architecture. Select PeopleTools, Integration Broker, Integration Setup, Service Operations.
There are transform problems.	<ul style="list-style-type: none"> • Check the Application Engine object in PeopleSoft Application Designer. • For before and after images, check the Service Operations Monitor. <p>For asynchronous service operations, , select PeopleTools, Integration Broker, Service Operations Monitor, Monitoring, Asynchronous Details. Click the View XML link for the publication contract or subscription contract.</p> <p>For synchronous service operations, select PeopleTools, Integration Broker, Service Operations Monitor, Monitoring, Synchronous Details. Use the Log Type drop-down list box to select Request Transformed or Response Transformed, and then click View XML.</p> <ul style="list-style-type: none"> • Verify that the TraceAE flag in the following directory equals 8192: <PS_CFG_HOME>\appserv\<Domain>\psappsrv.cfg <p>Setting the TraceAE flag in the psappsrv.cfg file instructs the application server to generate a transformation trace log with the .aet extension, written to the following directory:</p> <p><PS_CFG_HOME>\appserv\<Domain>\LOGS\ <operID>_<machine name>.AET</p> <p>The log file contains:</p> <ul style="list-style-type: none"> • The original XML structure as it entered the transformation engine. • The output of the XML as it passed through each step of the transform program.

<i>Area or Suspected Issue</i>	<i>Debugging Suggestion</i>
Integration Broker security	<p>Set the application server logging level to 4 or greater to capture information related to the following situations:</p> <ul style="list-style-type: none">• No routing at source node.• No routing at target node.• User invoking a service operation has different permissions than specified on the service operation on the source node.• No node password found on source node.• No node password found on target node.• Mismatched node password on source and target nodes.• No permissions set for the service operation on the source node.

Chapter 18

Providing Services

This chapter discusses how to:

- Provide services.
- Access generated WSDL documents.
- Delete WSDL documents.

Understanding Providing Services

PeopleSoft Integration Broker features a Provide Web Service wizard that steps you through the task of providing web services.

Understanding the Provide Web Service Wizard

This section provides an overview of the Provide Web Service wizard.

Features of the Provide Web Service Wizard

The Provide Web Service component (IB_WSDL_EXPORT) features a wizard you can use to provide web services. You can publish WSDL documents to the WSDL repository in the PeopleSoft system or publish WSDL documents to external UDDI repositories.

After you generate a WSDL document, the Provide Web Service wizard displays a WSDL URL for each document you generated. This enables you to access the WSDL document content using the WSDL URL. In addition, PeopleSoft Integration Broker provides a WSIL URL which lists the provided services and corresponding WSDL URLs.

You can use the Provide Web Service wizard to select one or more services for which to generate WSDL documents. The system generates a separate WSDL document for each service.

Other features include:

- Supports WS-interopability standards for WSDL.
- Provides WSDL version 1.1 documents.
- Provided WSDL documents include WS-Addressing header elements for asynchronous request/response operation types.

- Provided WSDL documents include WS-Security elements . UsernameToken and SAMLToken types are supported.
- Provided WSDL documents include PartnerLinkType elements, which are used when consumed by a BPEL application.

Operation Types Supported

The Provide Web Service wizard can create WSDL documents for service operations having the following operation types:

- Synchronous.
- Asynchronous one-way.
- Asynchronous request/response.

Requirements for Nonrowset-Based Message Schemas

This section discusses requirements and considerations for creating nonrowset-based message schemas for service operations in order to generate WSDL documents using the Provide Web Service wizard.

Note. The PeopleSoft system automatically generates message schemas for rowset-based messages.

Target Namespace

Nonrowset-based message schemas must contain a target namespace. If no target namespace exists in the schema an error occurs when the system generates the WSDL document.

You may define multiple schema imports to the same target namespace, but different schema locations must be defined.

Multiple Root Element and Complex Type Tags

If the PeopleSoft system finds multiple root <element> or <complexType> tags in nonrowset-based message schemas, only the first one is referenced in the WSDL document or container message schema.

In addition, the WSDL would allow schema imports to the same target namespace but different schema locations and use <xsd:include> when the schema Namespace is same as the WSDL namespace.

See Also

Chapter 18, "Providing Services," Prerequisites for Providing Services, page 398

Locations for Publishing WSDL Documents

Using the Provide Web Service wizard, you can publish WSDL documents to the follow locations:

- PeopleSoft WSDL repository. (Application database.)

The PeopleSoft WSDL repository is the default publishing location. All generated WSDL documents are published to the PeopleSoft WSDL repository. You may publish WSDL documents to a UDDI repository in addition to the WSDL repository.

- Universal Description, Discovery, and Integration (UDDI) repositories.

Services published to UDDI repositories are available to other PeopleSoft and external systems. If another PeopleSoft system wants to invoke an exported service from UDDI, it can consume the WSDL document from the UDDI reference into its system to create a service and routing definition.

UDDI Repositories and Endpoints

When publishing a WSDL document to a UDDI repository, the PeopleSoft system publishes the current endpoint value defined in the Target Location field in the Service Configuration page.

The endpoint value in the actual WSDL document is a dynamic one, since you can change the target location value, for example, when you move from development to production.

If you change the target location you should change the endpoints of previously published WSDL documents, either manually in the UDDI registry or by republishing the WSDL documents to your UDDI repository using the changed endpoint.

WSDL URL Formats

After you publish a WSDL document using the Provide Web Service wizard, the system displays a WSDL URL. The URL provided is the path to the WSDL document location in the WSDL repository in the PeopleSoft Pure Internet Architecture. The URL is used by external systems that will be invoking a PeopleSoft service.

The default URL format is path style. The following example shows a WSDL URL in path format:

```
http://localhost/PSIGW.war/PeopleSoftServiceListeningConnector/PT_WORKLIST.1.wsdl
```

The path style URL is generated by appending the WSDL document name to the target location value specified in the Service Configuration page.

PeopleSoft Integration Broker also supports a query parameter format. The following example shows a WSDL URL in query parameter format:

```
http://PeopleSoftServiceListeningConnector?Operation=GetWSDL&wsdl=PT_WORKLIST.1
```

The query parameter style URL is generated by passing either the WSDL document name or service name.version or service alias.version as a query parameter.

PeopleSoft still supports the query parameter format, however path format is preferred. Note that if using query parameter format, manual intervention may be required if the schema target location is changed.

Provided WSDL Documents

Every WSDL document you generate using PeopleSoft Integration Broker is divided into sections. This section describes the WSDL document sections and provides an example of the WSDL template that the PeopleSoft system uses to generate WSDL, as well as example WSDL documents for each of the supported operation types.

Sections of Provided WSDL Documents

WSDL documents that you provide using PeopleSoft Integration Broker contain the following sections:

Section	Description
<definitions>	Specifies the namespaces for the WSDL document, W3C XML Schema and SOAP. A unique namespace will be captured from the Service definition, which will be used to define the WSDL namespaces. The format of this namespace is as follows: <code>http://xmlns.oracle.com/Enterprise/<AppName>/<ServiceName></code> . When a service is defined within an application database, the namespace field is defaulted to the service namespace defined on the Service Configuration page.
<partnerLinktype>	A partnerLinkType defines the role of services and the port Type.
<types>	Captures the simple and complex types required by the schema of the request and response message definitions of the service operations. For services with component interface handlers, some of the system methods, such as Create and Get, will require complex message types resembling the structure of the component interface buffer.
<message>	Defines the abstract messages required for the selected operations. The data types for these are obtained from the Types section of the WSDL document.
<portType>	Features a named set of abstract operations and the abstract messages involved. This section includes all operations of the service selected for export.
<binding>	Specifies the network protocol and data format of messages used for a specific port type. For providing web services PeopleSoft utilizes SOAP packaging and HTTP transport protocols. The data format of messages is the Document style format.
<operation>	This is an abstract definition of a service operation, which specifies request/response/fault messages.
<service>	A service groups together endpoints that implement a common interface.

Note. In WSDL documents generated by the PeopleSoft system, WS-Security policies are assigned to the bind operation section.

Example 1: WSDL Template

The following example is the WSDL document template that the PeopleSoft system uses when it generates WSDL documents. The elements in bold are WSDL document sections discussed in the previous section:

```

definitions name="DefinitionsName"
  targetNamespace="NamespaceURI"
  xmlns:prefix="NamespaceURI"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  <plnk:partnerLinkType name="PartnerLinkTypeName">
    <!-- Provider Role -->
    <plnk:role name="ProviderRoleName">
      <plnk:portType name="ProviderPortTypeReference">
        </plnk:role>
    <!-- In case of Async Request/Response this role is also required -->
    <plnk:role name="RequestorRoleName">
      <plnk:portType name="CallbackPortTypeReference">
        </plnk:role>
    </plnk:partnerLinkType>
  <types>
    <!-- One or more schemas -->
  </types>
  <message name="MessageName">
    <part name="PartName" type="TypeNameReference"/>
  </message>
  <portType name="PortName">
    <operation name="OperationName">
      <input message="MessageNameReference"/>
      <output message="MessageNameReference"/>
      <fault message="MessageNameReference"/>
    </operation>
  </portType>
  <binding name="BindingName" type="PortNameReference">
    <soap:binding style="rpc|document"
      transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="OperationName">
      <soap:operation soapAction="ActionValue"/>
      <input>
        <soap:body
          encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
          namespace="TargetNamespace"
          use="encoded"/>
      </input>
      <output>
        <soap:body
          encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
          namespace="TargetNamespace"
          use="encoded"/>
      </output>
    </operation>
  </binding>
  <service name="ServiceName">
    <port name="PortName" binding="BindingNameReference">
      <soap:address location="URL"/>
    </port>
  </service>
</definitions>

```

Example 2: Synchronous WSDL Example

The following example shows a synchronous WSDL document provided by the PeopleSoft system:

```

<?xml version="1.0" ?>
<wsdl:definitions name="PT_WORKLIST.1"
  targetNamespace="http://xml.namespace.oracle.com/services"
  xmlns:GetWorklistEntryStatusRequest.v1="http://xmlns.oracle.com/
    Enterprise/Tools/schemas/PT_WL_GET_INSTANCE_REQ_CONT.v1"
  xmlns:GetWorklistEntryStatusResponse.v1="http://xmlns.oracle.com/
    Enterprise/Tools/schemas/PT_WL_GET_INSTANCE_RESP_CONT.v1"
  xmlns:OperationFault.V1="http://xmlns.oracle.com/schemas/Fault"
  xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:tns="http:
    //xml.namespace.oracle.com/services"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:wsp="http://schemas.xmlsoap.org/ws/2002/12/policy">
  <wsp:UsagePolicy wsdl:Required="true" />
  <plnk:partnerLinkType name="PT_WORKLIST_PartnerLinkType">
    <plnk:role name="PT_WORKLIST_Provider">
      <plnk:portType name="tns:PT_WORKLIST_PortType" />
    </plnk:role>
  </plnk:partnerLinkType>
  <wsdl:types>
    <xsd:schema elementFormDefault="qualified"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema">
      <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/
        schemas/PT_WL_GET_INSTANCE_REQ_CONT.v1" schemaLocation="Get
        WorklistEntryStatusRequest.v1.xsd" />
      <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/
        schemas/PT_WL_GET_INSTANCE_RESP_CONT.v1" schemaLocation="
        GetWorklistEntryStatusResponse.v1.xsd" />
      <xsd:import namespace="http://xmlns.oracle.com/schemas/Fault"
        schemaLocation="OperationFault.V1.xsd" />
    </xsd:schema>
  </wsdl:types>
  <wsdl:message name="GetWorklistEntryStatusRequest.v1">
    <wsdl:part element="GetWorklistEntryStatusRequest.v1:GetWorklist
      EntryStatusRequest" name="parameter" />
  </wsdl:message>
  <wsdl:message name="GetWorklistEntryStatusResponse.v1">
    <wsdl:part element="GetWorklistEntryStatusResponse.v1:GetWorklist
      EntryStatusResponse" name="parameter" />
  </wsdl:message>
  <wsdl:message name="OperationFault.V1">
    <wsdl:part element="OperationFault.V1:OperationFault" name="parameter" />
  </wsdl:message>
  <wsdl:portType name="PT_WORKLIST_PortType">
  <wsdl:operation name="GetWorklistEntryStatus">
    <wsdl:documentation>Get worklist keys and status</wsdl:documentation>
    <wsdl:input message="tns:GetWorklistEntryStatusRequest.v1" name=
      "GetWorklistEntryStatusRequest.v1" />
    <wsdl:output message="tns:GetWorklistEntryStatusResponse.v1" name=
      "GetWorklistEntryStatusResponse.v1" />
    <wsdl:fault message="tns:OperationFault.V1" name="OperationFault.V1" />
  </wsdl:operation>
  </wsdl:portType>
  <wsdl:binding name="PT_WORKLIST_Binding" type="tns:PT_WORKLIST_PortType">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/
      soap/http" />
    <wsdl:operation name="GetWorklistEntryStatus">
      <soap:operation soapAction="GetWorklistEntryStatus.V1" style=
        "document" />
      <wsp:Policy wsu:Id="UsernameTokenSecurityPolicyPasswordOptional"
        xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-
        wss-wssecurity-utility-1.0.xsd">
        <wsp:ExactlyOne>
          <wsp:All>

```

```

    <wsse:SecurityToken wsp:Usage="wsp:Required" xmlns:wsse="
      http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
      wssecurity-secext-1.0.xsd">
      <wsse:TokenType>wsse:UserNameToken</wsse:TokenType>
      <Claims>
        <SubjectName MatchType="wsse:Exact" />
        <UsePassword wsp:Usage="wsp:Optional" />
      </Claims>
    </wsse:SecurityToken>
  </wsp:All>
</wsp:ExactlyOne>
</wsp:Policy>
<wsdl:input name="GetWorklistEntryStatusRequest.v1">
  <soap:body encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
    use="literal" />
</wsdl:input>
<wsdl:output name="GetWorklistEntryStatusResponse.v1">
  <soap:body encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
    use="literal" />
</wsdl:output>
<wsdl:fault name="OperationFault.V1">
  <soap:fault encodingStyle="http://schemas.xmlsoap.org/soap/
    encoding/" name="OperationFault.V1" use="literal" />
</wsdl:fault>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="WorklistServices">
  <wsdl:documentation>Peopletools Worklist</wsdl:documentation>
  <wsdl:port binding="tns:PT_WORKLIST_Binding" name="PT_WORKLIST_Port">
    <soap:address location="http://sbandyop-pc/PSIGW.war/PeopleSoftService
      ListeningConnector" />
  </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

Example 3: Asynchronous Request/Response WSDL Document

The following example shows an asynchronous request/response WSDL document provided by the PeopleSoft system:

```

<?xml version="1.0"?>
<wsdl:definitions name="PT_WORKLIST.1"
targetNamespace="http://xml.namespace.oracle.com/services"
xmlns:CreateWorklistEntryRequest.v1="http://xmlns.oracle.com/Enterprise/
Tools/schemas/PT_WL_CREATE_REQUEST_CONT.v1"
xmlns:CreateWorklistEntryResponse.v1="http://xmlns.oracle.com/Enterprise/
Tools/schemas/PT_WL_CREATE_RESPONSE_CONT.v1"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:tns="http://xml.
namespace.oracle.com/services" xmlns:wsa="http://schemas.xmlsoap.org/ws/
2003/03/addressing"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2002/12/policy">
  <wsp:UsagePolicy wsdl:Required="true"/>
  <plnk:partnerLinkType name="PT_WORKLIST_PartnerLinkType">
    <plnk:role name="PT_WORKLIST_Provider">
      <plnk:portType name="tns:PT_WORKLIST_PortType"/>
    </plnk:role>
    <plnk:role name="PT_WORKLIST_Requester">
      <plnk:portType name="tns:PT_WORKLIST_CallbackPortType"/>
    </plnk:role>
  </plnk:partnerLinkType>
  <wsdl:types>
    <xsd:schema elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/
2001/XMLSchema">
      <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/
schemas/PT_WL_CREATE_REQUEST_CONT.v1" schemaLocation="CreateWorklist
EntryRequest.v1.xsd"/>
      <xsd:import namespace="http://xmlns.oracle.com/Enterprise/Tools/
schemas/PT_WL_CREATE_RESPONSE_CONT.v1" schemaLocation="CreateWorklist
EntryResponse.v1.xsd"/>
      <xsd:import namespace="http://schemas.xmlsoap.org/ws/2003/03/
addressing" schemaLocation="http://schemas.xmlsoap.org/ws/2003/
03/addressing"/>
    </xsd:schema>
  </wsdl:types>
  <wsdl:message name="CreateWorklistEntryRequest.v1">
    <wsdl:documentation>Create worklist item Request</wsdl:documentation>
    <wsdl:part element="CreateWorklistEntryRequest.v1:CreateWorklist
EntryRequest" name="parameter"/>
  </wsdl:message>
  <wsdl:message name="CreateWorklistEntryResponse.v1">
    <wsdl:part element="CreateWorklistEntryResponse.v1:CreateWorklist
EntryResponse" name="parameter"/>
  </wsdl:message>
  <wsdl:message name="InitiateHeader">
    <wsdl:documentation>SOAP Header message for correlating Asynchronous
callback</wsdl:documentation>
    <wsdl:part element="wsa:MessageID" name="MessageID"/>
    <wsdl:part element="wsa:ReplyTo" name="ReplyTo"/>
  </wsdl:message>
  <wsdl:message name="CallbackHeader">
    <wsdl:documentation>SOAP Header message for callback Asynchronous
operation</wsdl:documentation>
    <wsdl:part element="wsa:RelatesTo" name="RelatesTo"/>
  </wsdl:message>
  <wsdl:portType name="PT_WORKLIST_PortType">
    <wsdl:operation name="CreateWorklistEntry">
      <wsdl:documentation>Create worklist Entry. This is the Request Operation
in a Asynchronous Request/Response pair. Callback Operation :
CreateWorklistEntry_CALLBACK</wsdl:documentation>
      <wsdl:input message="tns:CreateWorklistEntryRequest.v1" name="
CreateWorklistEntryRequest.v1"/>

```

```

    </wsdl:operation>
</wsdl:portType>
<wsdl:portType name="PT_WORKLIST_CallbackPortType">
  <wsdl:operation name="CreateWorklistEntry_CALLBACK">
    <wsdl:documentation>Create worklist Entry - Callback. This is the
      Callback Operation in a Asynchronous Request/Response pair.
    </wsdl:documentation>
    <wsdl:input message="tns:CreateWorklistEntryResponse.v1" name=
      "CreateWorklistEntryResponse.v1"/>
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="PT_WORKLIST_Binding" type="tns:PT_WORKLIST_PortType">
  <soap:binding style="document" transport="http://schemas.xmlsoap.
    org/soap/http"/>
  <wsdl:operation name="CreateWorklistEntry">
    <soap:operation soapAction="CreateWorklistEntry.V1" style="document"/>
    <wsp:Policy wsu:Id="UsernameTokenSecurityPolicyPasswordOptional"
      xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
        wssecurity-utility-1.0.xsd">
      <wsp:ExactlyOne>
        <wsp:All>
          <wsse:SecurityToken wsp:Usage="wsp:Required" xmlns:wsse=
            "http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
              wssecurity-secext-1.0.xsd">
            <wsse:TokenType>wsse:UserNameToken</wsse:TokenType>
            <Claims>
              <SubjectName MatchType="wsse:Exact"/>
              <UsePassword wsp:Usage="wsp:Optional"/>
            </Claims>
          </wsse:SecurityToken>
        </wsp:All>
      </wsp:ExactlyOne>
    </wsp:Policy>
    <wsdl:input name="CreateWorklistEntryRequest.v1">
      <soap:header encodingStyle="" message="tns:InitiateHeader" part=
        "MessageID" use="literal" wsdl:required="false"/>
      <soap:header encodingStyle="" message="tns:InitiateHeader" part=
        "ReplyTo" use="literal" wsdl:required="false"/>
      <soap:body encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
        use="literal"/>
    </wsdl:input>
  </wsdl:operation>
</wsdl:binding>
<wsdl:binding name="PT_WORKLIST_CallbackBinding" type="tns:
  PT_WORKLIST_CallbackPortType">
  <soap:binding style="document" transport="http://schemas.xmlsoap.
    org/soap/http"/>
  <wsdl:operation name="CreateWorklistEntry_CALLBACK">
    <soap:operation soapAction="CreateWorklistEntry_CALLBACK.V1" style=
      "document"/>
    <wsp:Policy wsu:Id="UsernameTokenSecurityPolicyPasswordOptional"
      xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
        wssecurity-utility-1.0.xsd">
      <wsp:ExactlyOne>
        <wsp:All>
          <wsse:SecurityToken wsp:Usage="wsp:Required" xmlns:wsse=
            "http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
              wssecurity-secext-1.0.xsd">
            <wsse:TokenType>wsse:UserNameToken</wsse:TokenType>
            <Claims>
              <SubjectName MatchType="wsse:Exact"/>
              <UsePassword wsp:Usage="wsp:Optional"/>
            </Claims>
          </wsse:SecurityToken>
        </wsp:All>
      </wsp:ExactlyOne>
    </wsp:Policy>
  </wsdl:operation>
</wsdl:binding>

```

```

        </wsp:All>
    </wsp:ExactlyOne>
</wsp:Policy>
<wsdl:input name="CreateWorklistEntryResponse.v1">
    <soap:header encodingStyle="" message="tns:CallbackHeader"
        part="RelatesTo" use="literal" wsdl:required="true"/>
    <soap:body encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
        use="literal"/>
</wsdl:input>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="WorklistServices">
    <wsdl:documentation>Peopletools Worklist</wsdl:documentation>
    <wsdl:port binding="tns:PT_WORKLIST_Binding" name="PT_WORKLIST_Port">
        <soap:address location="http://ORACLE_ENDPOINT"/>
    </wsdl:port>
</wsdl:service>
<wsdl:service name="WorklistServices_Callback">
    <wsdl:documentation>Peopletools Worklist - Callback</wsdl:documentation>
    <wsdl:port binding="tns:PT_WORKLIST_CallbackBinding" name=
        "PT_WORKLIST_Callback_Port">
        <soap:address location="http://Client.EndPoint.Set.By Caller"/>
    </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

Example 4: Asynchronous One-Way WSDL Document

The following example shows an asynchronous one-way WSDL document provided by the PeopleSoft system:

```

<?xml version="1.0" ?>
<wsdl:definitions name="QEPC_FLO_MSG.1" targetNamespace="http://xmlns.
oracle.com/Enterprise/Tools/services/QEPC_FLO_MSG.1"
  xmlns QEPC_FLO_MSG.VERSION_1="http://xmlns.oracle.com/Enterprise/
  Tools/schemas/QEPC_FLO_MSG.VERSION_1" xmlns:plnk="http://schemas.
xmlsoap.org/ws/2003/05/partner-link/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:tns="http:
//xmlns.oracle.com/Enterprise/Tools/services/QEPC_FLO_MSG.1"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:wsp="http://schemas.xmlsoap.org/ws/2002/12/policy">
  <wsp:UsagePolicy wsdl:Required="true" />
  <plnk:partnerLinkType name="QEPC_FLO_MSG_PartnerLinkType">
    <plnk:role name="QEPC_FLO_MSG_Provider">
      <plnk:portType name="tns:QEPC_FLO_MSG_PortType" />
    </plnk:role>
  </plnk:partnerLinkType>
  <wsdl:types>
    <xsd:schema elementFormDefault="qualified"
      targetNamespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/
QEPC_FLO_MSG.VERSION_1"
      xmlns="http://xmlns.oracle.com/Enterprise/Tools/schemas/
QEPC_FLO_MSG.VERSION_1"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema">
      <xsd:element name="QEPC_FLO_MSG" type="xsd:string" />
    </xsd:schema>
  </wsdl:types>
  <wsdl:message name="QEPC_FLO_MSG.VERSION_1">
    <wsdl:part element="QEPC_FLO_MSG.VERSION_1:QEPC_FLO_MSG" name=
"parameter" />
  </wsdl:message>
  <wsdl:portType name="QEPC_FLO_MSG_PortType">
    <wsdl:operation name="QEPC_FLO_MSG">
      <wsdl:documentation>Test</wsdl:documentation>
      <wsdl:input message="tns:QEPC_FLO_MSG.VERSION_1" name="QEPC_FLO_
MSG.VERSION_1" />
    </wsdl:operation>
  </wsdl:portType>
  <wsdl:binding name="QEPC_FLO_MSG_Binding" type="tns:QEPC_FLO_MSG_
PortType">
    <soap:binding style="document" transport="http://schemas.xmlsoap.
org/soap/http" />
    <wsdl:operation name="QEPC_FLO_MSG">
      <soap:operation soapAction="QEPC_FLO_MSG.v1" style="document" />
      <wsp:Policy wsu:Id="UsernameTokenSecurityPolicyPasswordOptional"
        xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-
wss-wssecurity-utility-1.0.xsd">
        <wsp:ExactlyOne>
          <wsp:All>
            <wsse:SecurityToken wsp:Usage="wsp:Required" xmlns:wsse="
http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
wssecurity-secext-1.0.xsd">
              <wsse:TokenType>wsse:UserNameToken</wsse:TokenType>
              <Claims>
                <SubjectName MatchType="wsse:Exact" />
                <UsePassword wsp:Usage="wsp:Optional" />
              </Claims>
            </wsse:SecurityToken>
          </wsp:All>
        </wsp:ExactlyOne>
      </wsp:Policy>
      <wsdl:input name="QEPC_FLO_MSG.VERSION_1">
        <soap:body encodingStyle="http://schemas.xmlsoap.org/soap/
encoding/" use="literal" />
      </wsdl:input>

```

```

        </wsdl:operation>
    </wsdl:binding>
    <wsdl:service name="QEPC_FLO_MSG">
        <wsdl:documentation>File Utilities Test</wsdl:documentation>
        <wsdl:port binding="tns:QEPC_FLO_MSG_Binding" name="QEPC_FLO_MSG_Port">
            <soap:address location="http://sbandyop-pc/PSIGW.war/PeopleSoft
                ServiceListeningConnector" />
        </wsdl:port>
    </wsdl:service>
</wsdl:definitions>

```

PartnerLinkType Support

A service may play a single or dual role in a partnership with a business process.

In a one-way partnership the service may play a single role of provider, whereas in a two-way partnership the service may play the roles of a provider as well as a requester (for callbacks). This type of partnership is termed by Business Process Execution Language (BPEL) as a PartnerLinkType.

A service may participate in different types of partnerships with a process or another service. In each of these partnerships, the service may play a single or dual role.

PartnerLinkType Structure

To ease the task of process developers consuming PeopleSoft services, a basic PartnerLinkType structure is provided in the PeopleSoft-provided WSDL. Process developers may or may not choose to use this PartnerLinkType structure.

The following table describes details of the PartnerLinkType structure for each service operation type:

Operation Type	PartnerLinkType Description
Synchronous	The PartnerLinkType has a single Provider role.
Asynchronous one-way	The PartnerLinkType has a single Provider role.
Asynchronous Request/Response	The PartnerLinkType has two roles for the Provider portType and the Requester Callback portType.

The following sections feature examples of the PartnerLinkType structures the PeopleSoft system generates for each service operation type.

Example 1: Synchronous PartnerLinkType Structure

The following example shows the PartnerLinkType structure that the PeopleSoft system generates for an inbound synchronous service operation:

```

<portType name="HelloWorldSync">
  <operation name="process">
    <input message="client:HelloWorldSyncRequestMessage" />
    <output message="client:HelloWorldSyncResponseMessage" />
  </operation>
</portType>

<plnk:partnerLinkType name="HelloWorldSyncPLType">
  <plnk:role name="HelloWorldSyncProvider">
    <plnk:portType name="wsdl_target:HelloWorldSync" />
  </plnk:role>
</plnk:partnerLinkType>

```

Example 2: Asynchronous One-Way PartnerLinkType Structure

The following example shows the PartnerLinkType structure that the PeopleSoft system generates for an inbound asynchronous one-way service operation.

```

<portType name="UpdateOrderAsync">
  <operation name="UpdateOrder">
    <input message="client:OrderRequestMessage" />
  </operation>
</portType>

<plnk:partnerLinkType name="UpdateOrderAsyncPLType">
  <plnk:role name="UpdateOrderAsyncProvider">
    <plnk:portType name="wsdl_target:UpdateOrderAsync" />
  </plnk:role>
</plnk:partnerLinkType>

```

Example 3: Asynchronous Request/Response PartnerLinkType Structure

The following example shows the PartnerLinkType structure that the PeopleSoft system generates for an inbound asynchronous request/response service operation:

```

<!--
PortType definition
-->

    <!-- portType implemented by the QuoteConsumer PeopleSoft service -->
    <portType name="QuoteConsumer">
        <operation name="GetQuote">
            <input message="tns:QuoteConsumerRequestMessage" />
        </operation>
    </portType>

    <!-- portType implemented by the requester of QuoteConsumer PeopleSoft service
        for asynchronous callback purposes
    -->
    <portType name="QuoteConsumerCallback">
        <operation name="GetQuoteCallback">
            <input message="tns:QuoteConsumerResultMessage" />
        </operation>
    </portType> <!--
PartnerLinkType definition
-->

    <!-- the QuoteConsumer partnerLinkType binds the service and
        requestor portType into an asynchronous conversation.
    -->
    <plnk:partnerLinkType name="QuoteConsumerPLType">
        <plnk:role name="QuoteConsumerProvider">
            <plnk:portType name="wsdl_target:QuoteConsumer" />
        </plnk:role>
        <plnk:role name="QuoteConsumerRequester">
            <plnk:portType name="wsdl_target:QuoteConsumerCallback" />
        </plnk:role>
    </plnk:partnerLinkType>
</definitions>

```

WSDL Document Versioning

When the Service System Status in the Services Configuration page is set to *Production* and you attempt to regenerate a WSDL document for a service, PeopleSoft Integration Broker versions and stores the WSDL document in the WSDL repository under the following condition: You have previously generated a WSDL document for the same service and new service operations have been added that you selected to include in the new WSDL document.

In this case, the system appends a version number to the service namespace to enable unique qualification of elements and attributes in the new WSDL version. The new version number is also appended to the WSDL document name. The latest WSDL document version is marked as *Default* in the WSDL repository.

When the Service System Status in the Services Configuration page is set to *Development* and you regenerate a WSDL document for a service, the existing WSDL document is overwritten.

Multiple WSDL versions generated from the same service display in a grid on the Services page and include a timestamp and version for each generated WSDL document. Only one of these can be the default version.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Configuring PeopleSoft Integration Broker for Handling Services"

Chapter 9, "Managing Services," Viewing WSDL Documents Generated for Services, page 198

Prerequisites for Providing Services

The following prerequisites exist for providing services:

- The PeopleSoft system must be configured for handling services. Use the Services Configuration page to define the service namespace, schema namespace, target location and service system status.
- If publishing services to a UDDI repository you must:
 - Have the UDDI server set up, configured and running.
 - Have business entities and categories set up on the UDDI server that you intent to query from the Provide Web Service wizard.
 - Specify the UDDI server and other relevant information within the PeopleSoft system using the Services Configuration-UDDI Configuration page.
- Service operations in services to provide must have any-to-local routing definitions defined.
- There must be a minimum of one service operation associated with the service that you select for which to generate a WSDL document.
- For services that contain service operations with nonrowset-based messages, schemas must exist. The message schema must contain a target namespace. If no target namespace exists an error will occur when the system attempts to generate the WSDL document.

PeopleSoft automatically generates schema for services that contain operations with rowset-based messages.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Configuring PeopleSoft Integration Broker for Handling Services"

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Specifying UDDI Repositories in PeopleSoft Systems for Providing and Consuming Services"

Chapter 15, "Managing Service Operation Routing Definitions," page 279

Chapter 10, "Managing Service Operations," page 209

Chapter 8, "Building Message Schemas," page 185

Common Elements Used in This Chapter

Description	Description of the service, service operation or WSDL source.
Fault Message	<p>Name of the fault message.</p> <p>Depending on how generated, the name of the fault message can include the version in the following format: <i>MessageName.Version</i>.</p>
Operation Type and Operation	<p>Type of service operation.</p> <p>See Chapter 10, "Managing Service Operations," Service Operation Types, page 210.</p>
Request Message	<p>Name and version of the request message in the following format: <i>MessageName.Version</i>.</p>
Response Message	<p>Name and version of the response message in the following format: <i>MessageName.Version</i>.</p>
Routing External Alias	<p>External Alias from the routing definition for a service operation. Unless overridden, defaults to the format <i>OperationAlias.Version</i>.</p>
Select	Check the box to select the WSDL service.
Service	Name of the service that contains the service operations to include in the generated WSDL documents.
Service Operation	Name of the service operations for which to generate WSDL documents.

Providing Services

This section discusses how to use the Provide Web Service wizard to:

- Select services to provide.
- Select service operations.
- View WSDL documents.
- Specify publishing options.
- View the WSDL Generation Log.

Understanding Using the Provide Web Service Wizard

The Provide Web Service component (IB_WSDLEXP_SRCH) features a wizard you can use to provide web services. You can publish WSDL documents to the WSDL repository in the PeopleSoft system or external UDDI repositories.

After you generate a WSDL document, the Provide Web Service wizard displays a WSDL URL for each document you generated. This enables you to access the WSDL document content using the WSDL URL. In addition, you can modify the URL to access the WSDL document content using a WSIL URL.

Note. For a service to be available to provide, an any-to-local routing must exist for the service. In addition, there must be a minimum of one service operations associated with the service.

You can use the Provide Web Service wizard to select one or more services for which to generate WSDL documents. A separate WSDL document is generated for each service.

See Also

Chapter 18, "Providing Services," Prerequisites for Providing Services, page 398

Step 1: Select Services to Provide

Use the Select Services page (IB_WSDLEXP_SRCH) to search for and select the services that contain the service operations to include the WSDL documents that you generate. The following example shows the page:

Provide Web Service Wizard **Step 1 of 4**

1 2 3 4 Next >

Select Services

Enter search criteria and click Search. Select one or more services you would like to provide.

Search Criteria	
Service Name:	begins with <input type="text"/>
Description:	begins with <input type="text"/>
Object Owner ID:	equals <input type="text"/> <input type="button" value="v"/>

Provide Web Service - Select Services to Provide page

You can search by the full or partial service name and service description. You can also search by object owner ID, if one is defined for the service. You can enter one or more of these criteria when performing your search.

To select services to provide:

1. Access the Provide Web Service Wizard – Select Services page (PeopleTools, Integration Broker, Web Services, Provide Services).
2. Enter search criteria for the services to provide by performing one or more of the following:
 - In the Service Name field, enter a full or partial service name.
 - In the Description field, enter the full or partial description of the service.
 - From the Object Owner ID drop-down list box, select the object owner of the service to provide.
 - Select no search criteria to retrieve a list of all services in the database for which any-to-local routing definitions have been generated.
3. Click the Search button.

A Services grid appears that contains the search results.

The search results only list services which have at least one service operation with an any-to-local routing.

4. Check the box next to each name of the services to provide.

To clear a selection, check the box again.

5. Click the Next button to proceed to the next step in the wizard, selecting service operations.

Step 2: Select Service Operations

The following graphic shows the Select Service Operations page (IB_WSDL_EXP_OPER):

Provide Web Service Wizard **Step 2 of 4**

1 2 3 4 < Previous Next >

Select Service Operations

Select one or more operations for each service.

Service: QE_PO **Description:** QE Purchase Order

☐ Use Service Alias in WSDL **Service Alias:**

☐ Use Secure Target Location

Operations						
	Service Operation	Description	Operation Type	Request Message	Response Message	Fault Message
<input type="checkbox"/>	QE_PO_ASYNC.V1	QE_PO_ASYNC	Asynchronous - One Way	QE_PO_MSG.VERSION_1	.	.
<input type="checkbox"/>	QE_ROUTE_ARR.V1	QE_ROUTE_ARR	Asynch Request/Response	QE_PO_MSG.VERSION_1	QE_PO_MSG.VERSION_1	.

☒ [Select All](#) ☐ [Clear All](#)

Provide Web Service - Select Service Operations page

Use the page to select the service operations from each service that you selected in the previous step to include in the WSDL document.

The Use Service Alias in WSDL option on the page enables you to specify that the system use the service alias name in the generated WSDL, rather than the actual service name.

The Use Secure Target Location option enables you to export the WSDL to the URL specified in the Secure Target Location field on the Service Configuration page. If you do not check this option, WSDL is exported to the URL specified in the Target Location field on the Service Configuration page.

To select service operations to include in a WSDL document:

1. Check the box next to each service operation to include.
To clear a selection, check the box again.
2. (Optional) Select the Use Service Alias in WSDL check box to include the alias name for the service in the generated WSDL instead of the actual service name.
3. Click the Next button to proceed to the next step in the wizard.

The next step to providing WSDL documents is previewing the WSDL document that will be provided.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Configuring PeopleSoft Integration Broker for Handling Services," Target Locations

Step 3: View WSDL Documents

After you select the service operations to include in a WSDL document, you can preview the WSDL before actually publishing it.

The following graphic shows the View WSDL page (IB_WSDLEXP_PVIEW). Use the page to preview a WSDL document before you actually generate it.



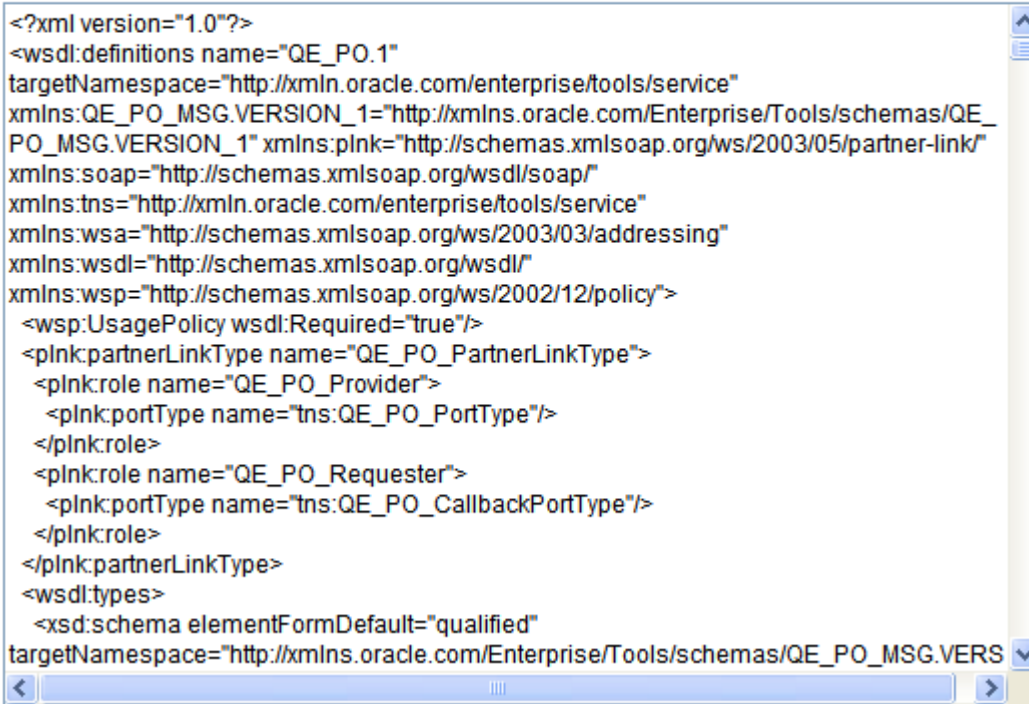
Provide Web Service - View WSDL page

Each service for which a WSDL document will be generated is listed. Click theView WSDL link to view the WSDL document for each service that you have selected.

When you click the View WSDL link, the WSDL displays in the WSDL Viewer page (IB_WSDLEXPVIEW_SEC). The following example shows the WSDL document for the *QE_PO* service in the WSDL Viewer page.

WSDL Viewer

Service: QE_PO



```
<?xml version="1.0"?>
<wsdl:definitions name="QE_PO.1"
targetNamespace="http://xmlns.oracle.com/enterprise/tools/service"
xmlns:QE_PO_MSG.VERSION_1="http://xmlns.oracle.com/Enterprise/Tools/schemas/QE_PO_MSG.VERSION_1" xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tns="http://xmlns.oracle.com/enterprise/tools/service"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/03/addressing"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2002/12/policy">
  <wsp:UsagePolicy wsdl:Required="true"/>
  <plnk:partnerLinkType name="QE_PO_PartnerLinkType">
    <plnk:role name="QE_PO_Provider">
      <plnk:portType name="tns:QE_PO_PortType"/>
    </plnk:role>
    <plnk:role name="QE_PO_Requester">
      <plnk:portType name="tns:QE_PO_CallbackPortType"/>
    </plnk:role>
  </plnk:partnerLinkType>
  <wsdl:types>
    <xsd:schema elementFormDefault="qualified"
targetNamespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/QE_PO_MSG.VERS
```

WSDL Viewer page displaying WSDL for the QE_PO service.

To preview WSDL documents:

1. Click the View WSDL link for a service.

The WSDL document for the service appears in the WSDL Viewer.

2. Click the Return button to return to the View WSDL page.
3. Click the Next button to proceed to the next step in the wizard.

The next section discusses the next step to providing a service, selecting the location of where to publish the WSDL documents.

Step 4: Specify Publishing Options

After you preview the WSDL, use the Specify Publishing Options page (IB_WSDLEXP_LOC) to specify the publish location of the generated WSDL documents. The following graphic shows the page:

Provide Web Service Wizard

Step 4 of 4



< Previous

Finish

Specify Publishing Options

The WSDL for the selected services will be published to the PeopleSoft WSDL Repository. You can also publish the WSDLs to one or more UDDI Servers.

☐ Publish to UDDI☒ WSDL Repository

Provide Web Service - Specify Publishing Options page

By default the system publishes all WSDL documents to the PeopleSoft WSDL repository.

Select the Publish to UDDI check box to publish the WSDL to a UDDI repository in addition to the PeopleSoft WSDL repository.

Providing WSDL Documents to UDDI Repositories

Before providing a WSDL document to a UDDI repository, you must configure the UDDI repository in the PeopleSoft system.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Specifying UDDI Repositories in PeopleSoft Systems for Providing and Consuming Services."

When you select the Publish to UDDI check box, the Select UDDI Servers box appears where you specify the UDDI repository to which to publish the WSDL. The following graphic shows the Select UDDI Servers section:

Provide Web Service Wizard


[< Previous](#)
[Finish](#)

Specify Publishing Options

The WSDL for the selected services will be published to the PeopleSoft WSDL Repository. You can also publish the WSDLs to one or more UDDI Servers.

☒ **Publish to UDDI**

Select UDDI Servers

View All First 1 of 1 Last

*UDDI Name:

Get Business Entities

Select Business Entity

Find

First 1 of 1 Last

Select	Business Entity Name
<input type="checkbox"/>	

Select UDDI Categories

First 1 of 1 Last

UDDI Category Name	UDDI Category Value		

☒ **WSDL Repository**

Select UDDI Servers section of the Specify Publishing Options page.

To provide a WSDL document to a UDDI repository:

1. From the UDDI Name drop-down list box, select the UDDI server to which you are publishing the WSDL.
2. Click the Get Bus. Entities button.

The Select Business Entity section lists the business entities that are available to select for the UDDI server.

3. Check the box next to each business entity name to include.
4. Click the UDDI Category Name lookup button to display a list of UDDI categories and select a UDDI category. Click the OK button.
5. In the Category Value field, enter a value for the category.
6. To add additional categories, in the Select UDDI Categories section, click the plus button to add a row and repeat step 5 and step 6.
7. Click the Finish button.

The Results page appears and displays the WSDL generation log.

Step 5: View the WSDL Generation Log

Use the Results page shown in the following example to view the WSDL Generation Log:

Provide Web Service Wizard

Confirm Results

View the WSDL Generation Log to confirm the results of the wizard.

WSDL Generation Log:

Service: QE_PO has been exported.
Inserted WSDL: QE_PO.1 in the repository
Generated WSDL URL: http://buffy.us.oracle.com:8920/QE_PO.1.wsdl

The WSDL Generate Log box shows that WSDL has been exported for the QE_PO service.

The WSDL Generation Log provides the name of the services and URL for each WSDL document generated.

You can cut and paste the URL into a browser to access the WSDL document. You can also access the WSDL document using the WSDL repository.

To provide another service, click the Provide Another Service button and return to step 1 of the wizard.

You can also click the Generate SOAP Template button to access the Generate SOAP utility to generate SOAP message templates for request messages, response messages and fault messages found in the WSDL document. You can then use the templates to test SOAP messages in the Handler Tester, Transformation Test Tool and Send Master utilities.

See Also

Enterprise PeopleTools 8.50 PeopleBook: Integration Testing Utilities and Tools, "Using the Generate SOAP Template Utility"

Accessing Generated WSDL Documents

This section discusses how to:

- Use WSDL URLs to access generated WSDL documents.
- Use the WSDL repository to access generated WSDL documents.

Using WSDL URLs To Access Generated WSDL Documents

The last page of the Provide Web Service wizard, the Confirm Results page (IB_WSDLEXP_RSLTS), displays a WSDL generation log. The text box contains WSDL URLs for each WSDL document you generated.

To access the WSDL, copy a WSDL URL from the WSDL generation log and paste it into a browser of your choice to access the WSDL document.

Using the WSDL Repository to Access Generated WSDL Documents

Access the WSDL Repository page (PeopleTools, Integration Broker, Integration Setup, Services. Click the View WSDL link.)

The following example shows the WSDL Repository page:

WSDL Repository

Service: QE_PO

WSDL

Find

First

1 of 1

Last

WSDL: QE_PO.1

☒ Default

Last Upd DtTm: 07/06/2009 1:14:02PM

[View WSDL](#)

Exported Service Operations

Customize

Find

View All

First

1-3 of 3

Last

Operation	Routing External Alias	Request Message	Response Message	Fault Message
QE_PO_ASYNC	QE_PO_ASYNC.V1	QE_PO_MSG.VERSION_1		
QE_ROUTE_ARR	QE_ROUTE_ARR.V1	QE_PO_MSG.VERSION_1		
QE_ROUTE_ARR_CALLBACK	QE_ROUTE_ARR_CALLBACK.V1	QE_PO_MSG.VERSION_1		

WSDL Repository page for the QE_PO service.

The WSDL Repository page lists the WSDL documents that exist for a service.

The previous example shows the two WSDL documents, *QE_PO_ASYNC* and *QE_ROUTE_ARR*, that were exported using the Provide Web Service wizard.

The selected and disabled Default check box indicates the default WSDL document for the service. The WSDL document last generated is the default version.

Note. Default WSDL documents for a service are used only when the service system status is *Production*.

To change the default version, you must provide the service again, and choose a different set of service operations to include in the new default version.

Descriptions of the other fields displayed on this page are discussed at the beginning of this chapter.

See [Chapter 18, "Providing Services," Common Elements Used in This Chapter, page 399](#).

To access the WSDL document, click the View WSDL link. the WSDL Viewer page appears and displays the content of the WSDL document. The following example shows the WSDL Viewer displaying the *QE_PO.1* WSDL document:

WSDL Viewer

WSDL: QE_PO.1



```
<?xml version="1.0"?>
<wsdl:definitions name="QE_PO.1"
targetNamespace="http://xmlns.oracle.com/enterprise/tools/service"
xmlns:QE_PO_MSG.VERSION_1="http://xmlns.oracle.com/Enterprise/Tools/schemas/QE_PO_MSG.VERSION_1" xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tns="http://xmlns.oracle.com/enterprise/tools/service"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/03/addressing"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2002/12/policy">
  <wsp:UsagePolicy wsdl:Required="true"/>
  <plnk:partnerLinkType name="QE_PO_PartnerLinkType">
    <plnk:role name="QE_PO_Provider">
      <plnk:portType name="tns:QE_PO_PortType"/>
    </plnk:role>
    <plnk:role name="QE_PO_Requester">
      <plnk:portType name="tns:QE_PO_CallbackPortType"/>
    </plnk:role>
  </plnk:partnerLinkType>
  <wsdl:types>
    <xsd:schema elementFormDefault="qualified"
targetNamespace="http://xmlns.oracle.com/Enterprise/Tools/schemas/QE_PO_MSG.VERSION_1"
xmlns="http://xmlns.oracle.com/Enterprise/Tools/schemas/QE_PO_MSG.VERSION_1">

```

The QE.PO.1 WSDL document

Click the Return button to return to the WSDL Repository page.

See Also

[Chapter 18, "Providing Services," WSDL Document Versioning, page 397](#)

Deleting WSDL Documents

This section discusses how to delete WSDL documents.

Understanding Deleting WSDL Documents

The service system status affects the ability to delete WSDL documents.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Configuring PeopleSoft Integration Broker for Handling Services," Understanding Configuring PeopleSoft Integration Broker for Handling Services and *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Configuring PeopleSoft Integration Broker for Handling Services," Setting Service Configuration Properties.

Deleting a WSDL Document

Use the Service Administration-WSDL page to delete WSDL documents generated for a service. The following example shows the page:

The screenshot shows the Service Administration-WSDL page. At the top, there are tabs for WSDL, Services, Service Operations, Messages, Message Schemas, Queues, and Routings. Below the tabs, the Service System Status is set to Development. A link for Clear WSDL Export Status is visible. The main section is titled 'Delete' and contains a Service field with a Search button. Below this is a table with columns: Select, Service, WSDL Name, and Results. The table currently shows one row with a checkbox in the Select column. A Delete button is located at the bottom of the section.

Select	Service	WSDL Name	Results
<input type="checkbox"/>			

Service Administration-WSDL page

To delete a WSDL document

1. Access the Services Administration - WSDL page (select PeopleTools, Integration Broker, Service Utilities, Service Administration).
2. Click the arrow next to the Delete section header to expand the section.
3. In the Service field, enter the name of the service that contains the WSDL document to delete, and click the Search button.

Search results appear in the results grid.

4. In the results grid, select the check box next to the WSDL document to delete.
5. Click the Delete button.

The Clear WSDL Export Status link that appears on this page is discussed elsewhere in this PeopleBook.

See [Chapter 6, "Managing Messages," Resolving Inconsistencies in Exported WSDL](#), page 113.

Chapter 19

Consuming Services

This chapter discusses how to:

- Set the PS_FILEDIR environment variable for consuming WSDL from files.
- Consume services.
- Access integration metadata for consumed services.

Understanding Consuming Services

PeopleSoft Integration Broker can consume external services by way of consuming WSDL documents and generates PeopleSoft integration metadata, so that PeopleSoft applications can invoke outbound synchronous and outbound asynchronous services.

PeopleSoft Integration Broker features a Consume Web Service wizard that steps you through the task of consuming WSDL documents.

Understanding the Consume Web Service Wizard

This section discusses the Consume Web Service wizard.

Consume Web Service Wizard Features

The Consume Web Service wizard supports:

- WS-interopability standards for WSDL.
- Consumption of WSDL version 1.1 documents.
- Consuming WSDL with SOAP, HTTP-GET/POST bindings.
- Nested URIs to resolve WSDL fragments.

Operation Types Supported

You can consume WSDL documents for the following service operation types:

- Synchronous.
- Asynchronous one-way.
- Asynchronous request/response.

Sources for Consuming WSDL Document

You can use the Consume Web Service wizard to consume WSDL documents from the following sources:

- UDDI repositories.
- WSDL URL.
- WSIL registries.
- File.
- Legacy PeopleSoft WSDL documents.

Integration Metadata Created by the Consume Web Service Wizard

The Consume Web Service wizard creates the following integration metadata in the PeopleSoft system from the consumed WSDL documents:

Note. The internal name is the name that the PeopleSoft system assigns to the metadata and is the definition name that appears in the PeopleSoft system.

<i>Metadata</i>	<i>Internal Name</i>	<i>Version</i>	<i>Comments</i>
Service definitions	Same name as the <service> element name in the WSDL document that the PeopleSoft system consumed.	Version one, denoted as: .V1	NA
Service operation definitions	Same name as the <service operation> element name in the WSDL document that the PeopleSoft system consumed.	Version one, denoted as: .V1	NA

Metadata	Internal Name	Version	Comments
Message definitions	System-generated name in the format <i>M<unique number></i> . For example: <i>M120508438</i> .	Version one, denoted as: <i>.V1</i>	Includes request messages, response messages, and fault messages, as appropriate. Messages can be unstructured or containers. You can rename the system-generated message names in the wizard using more meaningful names. The consume process also generates schemas for each message. All schemas are unstructured.
Routing definitions	System-generated name in the format <i>~IMPORTED~<unique number></i> . For example: <i>~IMPORTED~14857</i> .	Version one, denoted as: <i>.V1</i>	System creates a point-to-point routing.

Multiple Fault Messages

If a WSDL operation has multiple faults, PeopleSoft Integration Broker creates a part message for each fault in the WSDL operation. The system then creates a container message and places the fault part messages in the container. The container message is assigned as a fault message to the created service operation.

Multiple Root Elements in Message Schemas

In a WSDL document, the schema defined in the `<types>` section may have multiple root elements, corresponding to multiple messages used by one or more operations. When the PeopleSoft system consumes such a WSDL document, the entire message schema contained in the WSDL document gets associated with each of the service operation messages when the PeopleSoft system generates the integration metadata.

Use the element name that appears in the Comments text box of the message definition to construct the XML data for the correct schema fragment in the message.

Delivered Queues and Nodes

PeopleSoft delivers a queue, *WSDL_QUEUE*, and a node, *WSDL_NODE*, that the Consume Web Service wizard uses as defaults.

You may use these objects or select other existing queues or nodes.

Binding Style of Consumed WSDL Documents

The binding style of consumed WSDL documents appears in the service operation definition for the consumed service. The Default Service Operation Version section of the Service Operations page features a Comments box. The binding style appears in that box.

Working with Asynchronous Request/Response Service Operations

If a WSDL document has two port types with a single input message in each operation, the Consume Web Service wizard displays step where you can convert a pair of asynchronous one-way operations to a single asynchronous request/response operation. In this step you can special the request and callback service operations and convert the operation.

Prerequisites for Consuming Services

To consume services you must set properties in the Service Configuration component as follows:

- Use the Services Configuration page to define the service namespace, schema namespace, target location, and service system status.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Configuring PeopleSoft Integration Broker for Handling Services."
- If consuming services from a UDDI repository, you must first specify the UDDI server and other relevant information within the PeopleSoft system using the Services Configuration-UDDI Configuration page.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Specifying UDDI Repositories in PeopleSoft Systems for Providing and Consuming Services."
- To consume WSDL from a file, you must set the PS_FILEDIR environment variable on your machine.

See Chapter 19, "Consuming Services," Setting the PS_FILEDIR Environment Variable for Consuming WSDL from Files, page 416.
- Evaluate your security requirements.

Common Elements Used in This Chapter

Description	Description of the WSDL source.
Endpoint	<p>According to the W3C, "An association between a binding and a network address, specified by a URI, that may be used to communicate with an instance of a service."</p> <p>A URI that accepts messages containing document-oriented or procedure-oriented information.</p>

Internal Message	Name of the consumed request message, response message or fault message in the PeopleSoft system
Internal Operation	Name of the consumed service operation in the PeopleSoft system
Internal Service	Name of the consumed service in the PeopleSoft system
Next	Click the button to advance to the next step in the wizard.
Operation Type/Operation	Type of service operation. See <u>Chapter 10, "Managing Service Operations," Service Operation Types, page 210.</u>
Previous	Click the button to go back to the previous step in the wizard.
Select	Check the box to select the WSDL service or WSDL operation on which to perform an action.
View WSDL	Click the link to view the WSDL document for a service from the WSDL source.
WSDL Port	According to the W3C: <ul style="list-style-type: none"> • "A port indicates a specific location for accessing a service using a specific protocol and data format." • "The network address of an endpoint and the binding to which it adheres."
WSDL Fault Message	Name of the fault message specified in the WSDL document that the PeopleSoft system is consuming.
WSDL Request Message	Name of the request message specified in the WSDL document that the PeopleSoft system is consuming.
WSDL Response Message	Name of the response message specified in the WSDL document that the PeopleSoft system is consuming.
WSDL Service	The name of the external service in the WSDL document that the PeopleSoft system is consuming.
WSDL Source	Indicates the source of the service that the PeopleSoft system is consuming.
WSDL URL	Displays the WSDL URL, WSIL URL, File name or UDDI server name of the WSDL source.

See Also

<http://www.w3.org/TR/wsdl>

Setting the PS_FILEDIR Environment Variable for Consuming WSDL from Files

This section discusses how to:

- Set the PS_FILEDIR environment variable in Microsoft Windows environments.
- Set the PS_FILEDIR environment variable in UNIX environments.

Understanding Setting the PS_FILEDIR Environment Variable

Before you can use PeopleSoft Integration Broker to consume WSDL from a file, you must set the PS_FILEDIR environment variable on the application server machine. If you do not set this variable and attempt to consume WSDL from a file, you will receive an error that the WSDL cannot be parsed.

Note. You must set this variable only if you will be consuming WSDL from a file.

Setting PS_FILEDIR in Microsoft Windows Environments

To set the PS_FILEDIR environment variable in Microsoft Windows environments:

1. Close any open DOS windows.
2. On your desktop, right-click the My Computer icon and click Properties.
The System Properties dialog appears.
3. Click the Advanced tab.
4. In the Environment Variables section, click the Environment Variables button.

The Environment Variables dialog box appears.

5. In the User variables for <user name> section, click New.

A New User Variable dialog box displays.

- a. In the Variable Name field enter *PS_FILEDIR*.
- b. In the Variable Value field, enter *c:\temp*.
- c. Click the OK button to close the dialog box.

6. In the System variables section, click New. The New System Variable dialog box appears.

- a. In the Variable Name field enter *PS_FILEDIR*.
- b. In the Variable Value field, enter *c:\temp*.
- c. Click the OK button to close the dialog box.

7. Click the OK button again to exit the System Properties dialog box.

Setting PS_FILEDIR in UNIX Environments

To set the PS_FILEDIR variable in UNIX use one of the following commands as appropriate for your UNIX environment:

- `export PS_FILEDIR = <PS_HOME>/file`
- `setenv PS_FILEDIR = <PS_HOME>/file`

The path you specify in either command is the location from where the system will upload files.

Using the Consume Web Service Wizard

This section discusses how to use the Consume Web Service wizard to:

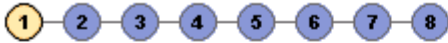
- Select the WSDL source.
- Select a service.
- Select a service port.
- Select service operations.
- Convert asynchronous operations.
- Rename operation messages.
- Select a queue for asynchronous operations.
- Select the receiver node.
- Confirm and view results.

Step 1: Select WSDL Source

Use the Select WSDL Source page (IB_WSDL_IMP_LOC) to select the source for consuming a WSDL document. The following example shows the page:

Consume Web Service Wizard

Step 1 of 8



Next >

Select WSDL Source

Select the source of the WSDL you would like to consume.

WSDL Sources	
<input type="radio"/> UDDI	<input type="text"/>
<input type="radio"/> WSDL URL	<input type="text"/>
<input type="radio"/> WSIL URL	<input type="text"/>
<input type="radio"/> File	<input type="text"/> <input type="button" value="Load from File"/>
<input type="radio"/> Legacy WSDL (Prior to 8.48)	

Select WSDL Source page

To select the WSDL source:

1. Access the Select WSDL Source page (PeopleTools, Integration Broker, Web Services, Consume Services).

2. Select the radio button next to one of the following values and enter the information specified:

UDDI

To consume a WSDL document from a UDDI repository, select the UDDI radio button.

After you select the radio button, select the UDDI repository from the drop-down list box.

To use this option, you must first specify the UDDI repository in the PeopleSoft system.

See [Chapter 19, "Consuming Services," Prerequisites for Consuming Services, page 414.](#)

WSDL URL

To consume a WSDL document from a WSDL URL, select the WSDL URL radio button.

After you select the radio button, enter the URL in the WSDL URL field.

WSIL URL

To consume a WSDL document from a WSIL URL, select the WSIL URL radio button.

After you select the radio button, enter a URL in the WSIL URL field.

File

To consume a WSDL document from a file, perform one of the following actions:

- In the File field, enter the path and file name. For example:
c:\temp\sample.wsdl.
- Browse for the file location and name.
 - a. Click the Load from File button.
A file upload page appears.
 - b. Click the Browse button to search for and select the file location and name.
 - c. Click the Upload button.

The Select WSDL Source page appears with the file location and name populated in the File field.

Legacy WSDL (Prior to 8.48)

Select this option to consume a PeopleSoft WSDL document generated from releases prior to PeopleTools 8.48.

3. Click the Next button to proceed to the next step in the wizard.

Step 2: Select Service

Use the Select Service page (IB_WSDL_IMP_SVC) to select the services to consume. The following example shows the page:

Consume Web Service Wizard **Step 2 of 8**

1 2 3 4 5 6 7 8 < Previous Next >

Select Service

Select one or more services to consume.

WSDL Source: File **Description:** LoanService.wsdl

Services			
Select	WSDL Service	WSDL Uri	
<input type="checkbox"/>	LoanService	LoanService.wsdl	View WSDL
<input type="checkbox"/>	LoanServiceCallback	LoanService.wsdl	View WSDL

Select Service page

Before selecting services to consume, you can click the View WSDL link to view the WSDL for each service. The WSDL document opens in a browser. Close the browser when you have finished viewing the WSDL document.

WSDL documents that the PeopleSoft system consumes from pre-PeopleTools 8.48 systems display in an edit box.

To select services to consume:

1. Check the box next to each service to consume.
To clear a selection, check the box again.
2. Click the Next button to proceed to the next step in the wizard.

Step 3: Select Service Ports

If a service you select has more than one port, the Select Service Ports page (IB_WSDL_IMP_SVC2) appears. The following example shows the page:

Consume Web Service Wizard **Step 3 of 8**

1 2 3 4 5 6 7 8 < Previous Next >

Select Service Ports

The service you selected has more than one port. Select one or more service ports.
Complete routings will only be created for SOAP bindings.

WSDL Source: File **Description:** LoanService.wsdl

Services				
Select	WSDL Service	Internal Service	WSDL Port	Endpoint
<input type="checkbox"/>	LoanService	LOANSERVICE	LoanServicePort	http://localhost:8080/axis/services/AxisLoan View WSDL
<input type="checkbox"/>	LoanServiceCallback	LOANSERVICECALLBACK	LoanServiceCallbackPort	View WSDL

Select Service Ports page

Multiple port options only appear when you are working with asynchronous request/response operations in a WSDL document or the service has multiple bindings. Typically, when working with this operation type, you select both options.

To select service ports, in the Select column, check the box next to each service.

Step 4: Select Service Operations

Use the Select Service Operations page (IB_WSDL_IMP_OPR) to select the operations in the selected service to consume. The following example shows the page:

Consume Web Service Wizard **Step 4 of 8**

1 2 3 **4** 5 6 7 8 < Previous Next >

Select Service Operations

Select one or more service operations to consume.

Internal Service: LOANSERVICE [View WSDL](#)

Service Operations				
Select	WSDL Operation	Internal Operation	WSDL Port Type	Operation Type
<input checked="" type="checkbox"/>	initiate	INITIATE	LoanService	Asynchronous - One Way
<input checked="" type="checkbox"/>	onResult	ONRESULT	LoanServiceCallback	Asynchronous - One Way

Select Service Operations page

To select service operations to consume, in the Select column, check the box next to each service operation to consume.

Step 5: Convert Asynchronous Operations

The Convert Asynchronous Operations page (IB_WSDL_IMP_ASYNOP) appears when the system detects that you are consuming two asynchronous one-way operations. The two asynchronous one-way operations appear in the Asynchronous One-Way Operations section on the page as shown in the following example:

Consume Web Service Wizard

Step 5 of 8



< Previous

Next >

Convert Asynchronous Operations

Two Asynchronous One-Way operations can be converted to one Asynchronous Request/Response operation by identifying the Request and Callback operation pair. Select the pair and click Convert.

Internal Service:

LOANSERVICE

[View WSDL](#)

Async Request/Response Pair

Request Operation:

Callback Operation:

Convert

Asynchronous One-Way Operations

First 1-2 of 2 Last

WSDL Operation	WSDL Request Message	WSDL Fault Message
initiate	LoanServiceRequestMessage	
onResult	LoanServiceResultMessage	LoanServiceFaultMessage

Asynchronous Request/Response Operations

First 1 of 1 Last

WSDL Operation	WSDL Request Message	WSDL Response Message	WSDL Fault Message

Convert Asynchronous Operations

This page enables you to convert the two operations into a single asynchronous request/response operation type.

WSDL specification 1.1 has no standards for specifying an asynchronous request/response operation. Hence, the Consume Web Service wizard is not able to automatically detect such operations in a WSDL 1.1 document.

To make this conversion, you must specify the request operation and the callback operation, using the Request Operation and Callback Operation fields on the page. The system populates the possible values to select in each field from the operation selected.

After you make the conversion the new asynchronous request/response operation appears in the Asynchronous Request/Response Operations section of the page. The following example shows the Convert Asynchronous Operations page after making such a conversion:

Consume Web Service Wizard

Step 5 of 8



< Previous

Next >

Convert Asynchronous Operations

Two Asynchronous One-Way operations can be converted to one Asynchronous Request/Response operation by identifying the Request and Callback operation pair. Select the pair and click Convert.

Internal Service:

LOANSERVICE

[View WSDL](#)

Async Request/Response Pair

Request Operation:

Callback Operation:

Convert

Asynchronous One-Way Operations

First 1 of 1 Last

WSDL Operation	WSDL Request Message	WSDL Fault Message

Asynchronous Request/Response Operations

First 1 of 1 Last

WSDL Operation	WSDL Request Message	WSDL Response Message	WSDL Fault Message	
initiate	LoanServiceRequestMessage	LoanServiceResultMessage	LoanServiceFaultMessage	-

Convert Asynchronous Operations page after the operation conversion

To convert two one-way asynchronous operations into one asynchronous request/response operation:

1. From the Request Operation drop-down list box, select the request operation.
2. From the Callback Operation drop-down list box, select the callback operation.
3. Click the Convert button.

The single operation appears in the Asynchronous Request/Response Operations grid at the bottom of the page.

Clicking the minus button (-) at the end of a data row in the Asynchronous Request/Response grid undoes the conversion.

Step 6: Rename Operation Messages

The Rename Operation Messages page (IB_WSDL_IMP_MSGS) is shown in the following example:

Consume Web Service Wizard

Step 6 of 8



< Previous

Next >

Rename Operation Messages

Message names are generated automatically. You can optionally change them to more meaningful names.

Internal Service: LOANSERVICE

[View WSDL](#)

Operations		View All	First	1 of 1	Last
Internal Operation:	INITIATE	Operation Type: Asynch Request/Response			
Messages		First	1-3 of 3	Last	
WSDL Request Message:	LoanServiceRequestMessage				
Internal Message:	<input type="text" value="M976888331"/>				
WSDL Response Message:	LoanServiceResultMessage				
Internal Message:	<input type="text" value="M560829492"/>				
WSDL Fault Message:	LoanServiceFaultMessage				
Internal Message:	<input type="text" value="M898760947"/>				

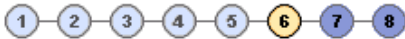
Rename Operation Messages page

When the system creates request, response and fault messages from the consumed service, it provides them with system-generated names. The previous example shows system-generated names appearing for all messages.

Use the page to rename the messages to more meaningful names. The following example shows all messages renamed:

Consume Web Service Wizard

Step 6 of 8



< Previous

Next >

Rename Operation Messages

Message names are generated automatically. You can optionally change them to more meaningful names.

Internal Service:

LOANSERVICE

[View WSDL](#)

Operations		View All	First	1 of 1	Last
Internal Operation:	INITIATE	Operation Type: Asynch Request/Response			
Messages First 1-3 of 3 Last					
WSDL Request Message:	LoanServiceRequestMessage				
Internal Message:	<input type="text" value="LOANSVC_REQ_MSG"/>				
WSDL Response Message:	LoanServiceResultMessage				
Internal Message:	<input type="text" value="LOANSVC_RESP_MSG"/>				
WSDL Fault Message:	LoanServiceFaultMessage				
Internal Message:	<input type="text" value="LOANSVC_FAULT_MSG"/>				

Renamed service operation messages

To rename operation messages:

1. Clear the system-generated name from a message name field.
2. Enter a new name in the field.
3. Click the Next button to proceed to the next step in the wizard.

The system checks whether the user-entered message name already exists in the database and displays an error if the name exists.

Step 7: Select a Queue for Asynchronous Operations

The Select a Queue for Asynchronous Operations page (IB_WSDL_IMP_QUEUE) appears only when you are consuming asynchronous one-way and asynchronous request/response operations. The following example shows the page:

Consume Web Service Wizard **Step 7 of 8**

1 2 3 4 5 6 7 8 < Previous Next >

Select a Queue for Asynchronous Operations

Select the queue to be used for each asynchronous operation.

Internal Service: LOANSERVICE [View WSDL](#)

Operations		Find	First	1 of 1	Last
Internal Operation:	INITIATE	Operation Type: Asynch Request/Response			
<input checked="" type="radio"/> Use Default Queue	WSDL_QUEUE				
<input type="radio"/> Use Existing Queue	<input type="text"/>				

Select a Queue for Asynchronous Operations page

Note. This page appears only when asynchronous operations are being consumed from the WSDL document.

Use the Select a Queue for Asynchronous Operations page to select a service operation queue for an asynchronous service operation.

PeopleSoft delivers a queue, *WSDL_QUEUE*, to which it assigns asynchronous service operations by default. However, you can select a different queue to use.

To select a queue for asynchronous operations:

1. Click the Use Existing Queue radio button.
2. From the Use Existing Queue drop-down list box, select the queue to use for the service operation.
3. Click the Next button to proceed to the next step in the wizard.

Step 8: Select the Receiver Node

Use the Select the Receiver Node page (IB_WSDL_IMP_NODE) to select the receiving node for the service. The following example shows the page:

Consume Web Service Wizard
Step 8 of 8

12345678

< Previous
Finish

Select the Receiver Node

Select the receiver node for this service.

Internal Service: LOANSERVICE [View WSDL](#)

☒ Use Default Node

☐ Use Existing Node

WSDL_NODE

Select the Receiver Node page

PeopleSoft delivers a node, *WSDL_NODE*, that the system uses as the receiving node by default. However, you can select a different receiving node.

If you use the Default node as the receiver node, the system adds connector property overrides to the default node in the generated service operation routing.

Note. You can apply WS-Security to services you consume using the Consume Web Service wizard. The node you select in this step determines how you implement WS-Security for these services.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Setting Up Secure Integration Environments," Implementing WS-Security on Services Consumed Using the Consume Web Service Wizard.

To select a receiving node for a service operation:

1. Click the Use Existing Node radio button.
2. From the Use Existing Node drop-down list box, select the receiving node to use for the service operation.
3. Click the Finish button to proceed to the next step in the wizard.

Confirm and View Results

The final page in the Consume Web Service wizard is the Confirm Results page (IB_WSDL_IMP_RSLTS) shown in the following example:

Consume Web Service Wizard

Confirm Results

View the logs below to confirm the creation of the service and service operations you selected. You can choose to consume another service or view the service that was just consumed.

Internal Service: LOANSERVICE

Operations		First	1 of 1	Last
Operation Name:	INITIATE	Operation Type: Asynch Request/Response		
WSDL Import Log:				
Created/Updated Operation : INITIATE. Created Request Message : LOANSVC_REQ_MSG. Generated schema for Message : LOANSVC_REQ_MSG Created Response Message : LOANSVC_RESP_MSG.				
View Consumed Service		Consume Another Service		

Confirm Results page

The Confirm Results page provides a WSDL Import Log. The WSDL Import log provides a summary of the WSDL import and lists the integration metadata created. The following example shows the contents of the WSDL Import Log for the example shown in this chapter of consuming a service:

```
Created/Updated Operation : INITIATE.
Created Request Message : LOANSVC_REQ_MSG.
Generated schema for Message : LOANSVC_REQ_MSG
Created Response Message : LOANSVC_RESP_MSG.
Generated schema for Message : LOANSVC_RESP_MSG
Created Fault Message : LOANSVC_FAULT_MSG.
Failed to generate schema for Message : LOANSVC_FAULT_MSG
Created Routing: ~IMPORTED~18003 for Operation: INITIATE
Created Operation Version: V1
```

The Confirm Results page also features the following page elements:

View Consumed Service Click the button to open the consumed service in the Services component.

See Chapter 9, "Managing Services," Accessing and Viewing Service Definitions, page 197.

Consume Another Service Click the button to go back to step 1 of the Consume Web Service wizard and consume another service.

Accessing Integration Metadata for Consumed Services

After using the Consume Web Service wizard to consume a service into the PeopleSoft system, use the Service component to access, view and modify the integration metadata created.

The following example shows the service definition for the *LOANSERVICE* service created with the Consume Web Service wizard.

Services

Service: LOANSERVICE
***Description:**
Comments:
Service Alias:
Object Owner ID:
***Namespace:**

[Link Existing Operations](#) [View WSDL](#)

Service Operations

Service Operation:

Operation Type:

Add

Existing Operations

Customize | Find | View All | |

First 1 of 1 Last

Operation

Message Links

Operation.Default Version	Description	Active	Operation Type	
INITIATE.V1	INITIATE	<input checked="" type="checkbox"/>	Asy Rq/Rsp	

Service definition for the service LOANSERVICE

The example shows that when consuming a service, the PeopleSoft system creates active versioned service operations for all operations of the service. In addition, the system saves the consumed WSDL documents for the service operations and you can view the WSDL documents by clicking the View WSDL link.

In the Existing Operations section, click the name of the service operation to open the Service Operations component. Use the Service Operations component to view and modify service operation data and message data, add handlers, and view and modify routing definitions created by the system.

Use one of the following methods to access the Services page and access and view integration metadata for a consumed service:

- On the Consume Web Service Wizard Results page, click the View Consumed Service link.
- Select PeopleTools, Integration Broker, Integration Setup, Services and select the name of the consumed service for which to view data.

See Also

Chapter 9, "Managing Services," Accessing and Viewing Service Definitions, page 197

Chapter 20

Integrating with BPEL Process-Based Services

This chapter provides an overview of integrating with Business Process Execution Language (BPEL) processes, lists prerequisites for integrating with BPEL processes, and discusses how to:

- Configure the PeopleSoft-delivered BPEL node.
- Consume BPEL process services.
- Provide PeopleSoft services to BPEL processes.

Understanding Integrating with BPEL Processes

PeopleSoft enables you to integrate with BPEL processes.

Oracle BPEL Process Manager

You can use any BPEL runtime engine for integrations with BPEL processes. The developer version of Oracle BPEL Process Manager is the BPEL engine that is referenced in this chapter.

See Also

<http://www.oracle.com/technology/index.html>

Oracle JDeveloper Installation Guide

PeopleTools Installation Guide for your database

Oracle BPEL Process Manager Quick Start Guide

Oracle BPEL Process Manager Developer's Guide

PeopleSoft-Delivered Application Classes for BPEL Integrations

PeopleSoft provides several application classes for launching and controlling BPEL process instances. The following application classes are located in the PT_BPEL application package and are accessible in PeopleSoft Application Designer:

These classes are for use only when you use Oracle BPEL Process Manager as the BPEL runtime engine.

- AsyncFFSend

This class provides the onSend handler implementation when calling a BPEL web service in an asynchronous fire and forget fashion.

- BPELUtil

This class provides utility methods for interacting with BPEL processes from PeopleSoft systems.

- IBUtil

This class provides utility methods to access PeopleSoft Integration Broker metadata.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "BPEL Classes"

Monitoring BPEL Process-Based Integrations

PeopleTools provides the following tools and logs for monitoring, tracing, and debugging integrations on PeopleSoft systems:

- Service Operations Monitor.
- Integration gateway logs.
- PeopleSoft application server logs.

In addition, your BPEL runtime engine may provide additional tools for monitoring integrations. For example, Oracle BPEL Process Manager provides the Oracle BPEL Process Manager Console for managing, administering, and debugging processes that are deployed on the BPEL server. In addition, the Oracle Application Server (OAS) logs may also provide additional details. Check your BPEL runtime engine documentation for additional information about monitoring tools that are provided.

See Also

Chapter 17, "Managing Error Handling, Logging, Tracing, and Debugging," page 371

Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor

Securing BPEL Process-Based Integrations

PeopleSoft Integration Broker provides a number of options that you can use to secure integrations. These include securing integrations at one or more of the following levels:

- Web server.
- Gateway level.

- Application server level.
- Node level.
- User level.
- Service operation level.
- And so on.

It is important to fully investigate these security options and implement those that best suit your business needs.

It is also important that you investigate the security options available for the BPEL runtime engine that you are using and to implement those security options that fulfill your security requirements.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Setting Up Secure Integration Environments"

Security Documentation for your BPEL runtime engine

Prerequisites for Integrating with BPEL Processes

For creating integrations with BPEL processes, you must have PeopleSoft Integration Broker configured and running.

Note. This section discusses prerequisite configuration steps on the PeopleSoft system for creating integrations with BPEL processes. Check your BPEL runtime engine software documentation for setup and configuration steps that you must perform on the runtime engine prior to performing integrations.

The following list is a partial checklist of items to configure:

- When configuring the `integrationGateway.properties` file, be sure to set the `ig.isc.serverURL` property equal to the name of the machine running the integration engine.
- When configuring the PeopleTools application server, set the PUB/SUB option to *Yes*. This value is required for asynchronous integrations.
- On the Integration Broker Quick Configuration page, be sure to activate the application server domain by setting the Domain Status to *Active*.
- On the Integration Broker Services Configuration page, be sure to set the service namespace, the schema namespace, and the target location.
- To load files into PeopleTools from the file system, set `PS_FILEDIR` and `PS_SERVDIR` in the system variables on your machine.
- PeopleSoft delivers a node, *BPEL*, specifically for BPEL integrations when you are using Oracle BPEL Process Manager as the runtime engine. If you are using Oracle BPEL Process Manager, you must configure this node. Steps to configure the *BPEL* node are provided elsewhere in this chapter.

The *Understanding Creating and Implementing Integrations* chapter of this PeopleBook contains additional information about creating and implementing integrations on PeopleSoft systems.

See Also

Chapter 4, "Understanding PeopleSoft Integration Broker Metadata," page 35

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Using the Integration Broker Quick Configuration Page"

Configuring the PeopleSoft-Delivered BPEL Node

PeopleTools delivers a node called *BPEL* for use for BPEL integrations when you are using Oracle BPEL Process Manager as the runtime engine.

Note. You must configure the BPEL node only if you are using Oracle BPEL Process Manager as the BPEL runtime engine.

To configure BPEL node properties:

1. Select PeopleTools, Integration Broker, Integration Setup, Nodes.
2. Search for and open the node *BPEL*.

The Node Definitions page appears.

3. Modify any other fields on the Node Definitions page as required.

See *Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration*, "Adding and Configuring Nodes," Defining Node Parameters.

4. Click the Properties link at the bottom of the page.

The Node Properties page appears.

Note. To view the complete BPEL property name in any of the Property Name fields, insert your cursor in a field and use your keyboard arrow keys to scroll through and view the complete field name.

5. Set the value of the BPELCONSOLEURL property to the URL of the BPEL console.
6. Set the BPELDOMAIN property to the name of the domain that you are using for the BPEL server.
7. Click the OK button.

Note. Do not set any values for the BPELDOMAINPWD property. This property is reserved for future use.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Consuming BPEL Process–Based Services

This section provides an overview of consuming BPEL process-based services and discusses how to:

- Deploy BPEL processes.
- Import WSDL documents from BPEL processes.
- Consume synchronous BPEL operations.
- Consume asynchronous request/response BPEL operations.
- Consume asynchronous one-way BPEL operations.

In addition, the end of this section provides development considerations for consuming BPEL web services.

Understanding Consuming BPEL Process-Based Services

This section provides overview information about consuming BPEL process-based services.

Development Considerations

When consuming BPEL process-based services, consider that:

- XML content representing the payload must be constructed carefully and exactly.
- The XML namespace in the top-level element of the XML fragment representing the payload is obtained from the WSDL of the BPEL service operation.
- The `LaunchSyncBPELProcess` and `LaunchASyncBPELProcess` methods do not specify the actual endpoints to which a message is sent. This endpoint is inferred by PeopleSoft Integration Broker at runtime based on the active routing that is associated with the service operation. An exception is raised if no routing exists or if more than one active routing exists.
- When using the `LaunchSyncBPELProcess` and `LaunchASyncBPELProcess` methods, you must configure the routings for the message so that exactly one active routing exists for a message. Failure to supply exactly one routing results in a runtime exception.
- PeopleSoft Integration Broker automatically maps an external service operation to an internal PeopleSoft operation. If you attempt to import an external operation that contains the same name as an internal operation that already exists, PeopleSoft Integration Broker provides the new operation with a unique name and new metadata that maps the internal name to the external name. Make sure to use the unique internal name when calling any of the application class methods in the `PT_BPEL` application package.
- For the asynchronous request/response operations, you must select the correct callback (response) operation for a given service request. This is achieved during the Convert step in the Consume Web Service wizard.

Deploying BPEL Processes and Importing WSDL Documents

The first two steps for consuming any type of BPEL service are to deploy the BPEL process and import the generated WSDL document into the PeopleSoft system.

The following two sections discuss performing these tasks and must be completed before consuming BPEL operations.

Deploying BPEL Processes

The first step in consuming a BPEL process-based service is to deploy the BPEL process in the BPEL runtime engine, thereby generating a WSDL document. See the documentation for your BPEL runtime engine for information about performing this task.

The PeopleSoft system can consume WSDL documents from a UDDI repository, WSDL URL, WSIL URL, or file.

When deploying a BPEL process, note the URL of the WSDL document. You must provide the document location when consuming the WSDL into the PeopleSoft system.

Consuming WSDL Documents from BPEL Processes

To consume WSDL from a BPEL process into the PeopleSoft system use the Consume Web Service component in the PeopleSoft Pure Internet Architecture.

During the consume WSDL process you are prompted to choose a receiving node. If Oracle BPEL Process Manager is your BPEL runtime engine, it is preferred to select the PeopleTools-delivered *BPEL* node as the receiving node. The *BPEL* node is delivered with BPEL-server related information, such as the BPEL console URL and BPEL domain, already added. However, during consumption you can use the default *WSDL_NODE* or any other external node.

Make a note of the web service operation for the process that you are importing as you will call this operation in PeopleCode.

See Also

[Chapter 19, "Consuming Services," page 411](#)

Consuming Synchronous BPEL Operations

This section provides an overview of consuming synchronous BPEL operations and discusses how to:

- Create synchronous BPEL requests.
- Invoke synchronous BPEL operations.
- Process synchronous BPEL responses.

Understanding Consuming Synchronous BPEL Operations

Before consuming synchronous BPEL operations, you must deploy a BPEL process and import the generated WSDL document into the PeopleSoft system.

See [Chapter 20, "Integrating with BPEL Process-Based Services," Deploying BPEL Processes, page 436](#) and [Chapter 20, "Integrating with BPEL Process-Based Services," Consuming WSDL Documents from BPEL Processes, page 436](#).

Creating Synchronous BPEL Requests

In this step, you use the PeopleSoft-delivered BPEL application classes to create a request message and initialize it with the message content, or payload. The payload is the content that will be sent as part of the soap body to invoke the BPEL process.

The first step is to create a BPELUtil object.

```
&bpe1 = create PT_BPEL:BPELUtil();
```

Next, create the request message and specify the operation to invoke. In the following pseudo code example, *PROCESS* is the operation to be invoked.

```
&payload = "<?xml version='1.0'?>
<SyncCalcProcessRequest xmlns='http://xmlns.oracle.com/SyncCalc'>
<messageid>TestId::0123456789</messageid><op>+</op><input1>9</input1>
<input2>3</input2></SyncCalcProcessRequest>";

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.PROCESS, %IntBroker_Request);
&msg.SetXmlDoc(&xml);
```

Invoking Synchronous BPEL Operations

To invoke a synchronous BPEL operation, use the LaunchSyncBPELProcess method of the BPELUtil application class.

The following example shows pseudo code for invoking a synchronous operation.

```
&reply = &bpe1.LaunchSyncBPELProcess(&OP_NAME="PROCESS", &msg, "", "");
```

Processing Synchronous BPEL Responses

The following PeopleCode example shows sample pseudo code for processing a synchronous BPEL response.

```
If All(&reply) Then
    &responseStr = &reply.GenXMLString();
End-If;
```

Example: Consuming Synchronous BPEL Operations

The following pseudo code provides an example of all the PeopleCode discussed earlier in this section.

```

import PT_BPEL:*;

Local PT_BPEL:BPELUtil &bpel;
Local string &url, &transactionId,
&payload, &responseStr, &OP_NAME;
Local Message &msg, &reply;
Local XmlDocument &xml;

/* --- creating a BPELUtil object---*/
&bpel = create PT_BPEL:BPELUtil();

/* --- setting operation name --- */
&OP_NAME="PROCESS";
&transactionId = "TestId::0123456789";

&payload = "<?xml version='1.0'?><SyncCalcProcessRequest xmlns=
'http://xmlns.oracle.com/SyncCalc'><messageid>TestId::0123456789</messageid>
<op>+</op><input1>9</input1><input2>3</input2></SyncCalcProcessRequest>";

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.PROCESS, %IntBroker_Request);
&msg.SetXmlDoc(&xml);

&reply = &bpel.LaunchSyncBPELProcess(&OP_NAME, &msg, "", "");
If All(&reply) Then
    &responseStr = &reply.GenXMLString();
End-If;
&url = &bpel.GetSyncBPELProcessInstanceUrl("BPEL", &transactionId);

```

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "BPEL Classes"

Consuming Asynchronous Request/Response BPEL Operations

This section provides an overview of consuming asynchronous request/response BPEL operations and discusses how to:

- Create an asynchronous request/response BPEL request.
- Invoke an asynchronous request/response BPEL operation.
- Create a handler to process the asynchronous request/response BPEL response.
- Add a handler to a service operation to process the asynchronous request/response BPEL response.

This section also features a comprehensive example of the PeopleCode discussed in this section.

Understanding Consuming Asynchronous Request/Response BPEL Operations

Before consuming asynchronous request/response BPEL operations, you must deploy a BPEL process and import the generated WSDL document into the PeopleSoft system.

When you consume an Asynchronous Request/Response WSDL, you must identify the request and callback operations correctly in the Consume Web Service wizard.

See [Chapter 20, "Integrating with BPEL Process-Based Services," Deploying BPEL Processes, page 436](#) and [Chapter 20, "Integrating with BPEL Process-Based Services," Consuming WSDL Documents from BPEL Processes, page 436](#).

Creating Asynchronous Request/Response BPEL Requests

In this step, you use the PeopleSoft-delivered BPEL application classes to create a request message and initialize it with the message content, or payload. The payload is the SOAP request (envelope) that will be sent to the BPEL process as a service.

```
&bpel = create PT_BPEL:BPELUtil();
```

Next, create the request message and specify the operation to invoke. In the following pseudo code example, *CALCULATE* is the operation to be invoked:

```
&payload = "<?xml version='1.0'?>
<ASyncCalcProcessRequest xmlns='http://xmlns.oracle.com/ASyncCalc'>
<op>+</op><input1>9</input1><input2>3</input2></ASyncCalcProcessRequest>";

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.CALCULATE, %IntBroker_Request);
&msg.SetXmlDoc(&xml);
```

Invoking Asynchronous Request/Response BPEL Operations

To invoke an asynchronous BPEL operation, use the `LaunchASyncBPELProcess` method of the `BPELUtil` application class.

The following example shows pseudo code for invoking an asynchronous operation.

```
&responseStr = &bpel.LaunchASyncBPELProcess(&OP_NAME="CALCULATE", &msg, "", "");
```

Creating Handlers to Process Asynchronous Request/Response BPEL Responses

When you imported the asynchronous request/response BPEL WSDL document into the PeopleSoft system, the system automatically created a request message and response message for each service operation that is contained in the WSDL document.

To process the response, you must create a handler and add it to the service operation definition.

To create a handler for the response to an asynchronous request/response operation, use PeopleSoft Application Designer to extend the `PS_PT:Integration:INotificationHandler` application class and use the `OnResponse` method to code the response. When PeopleSoft Integration Broker receives the response for the service operation, Integration Broker will use the handler code to process the response.

The following example shows a sample pseudocode application class that is designed to handle the response:

```

import PS_PT:Integration:INotificationHandler;

class ASyncTestHandler implements PS_PT:Integration:INotificationHandler
    method ASyncTestHandler();
    method OnNotify(&MSG As Message);
end-class;

/* constructor */
method ASyncTestHandler
end-method;

method OnNotify
    /+ &MSG as Message +/
    /+ Extends/implements PS_PT:Integration:INotificationHandler.OnNotify +/

    Local File &MYFILE;
    &MYFILE = GetFile("C:\temp\item.txt", "W", %FilePath_Absolute);

    If &MYFILE.IsOpen Then
        &MYFILE.WriteLine("--- Response Received ---");
        &MYFILE.WriteLine(&MSG.GenXMLString());
        &MYFILE.Close();
    End-If;
end-method;

```

Adding Handlers to Operations to Process Asynchronous Request/Response BPEL Responses

After you create the response handler, you must add it to the service operation definition. To perform this task, use the Service Operations—Handlers page. To access this page, select PeopleTools, Integration Broker, Integration Setup, Service Operations, and click the Handlers tab.

Example: Consuming Asynchronous Request/Response BPEL Operations

The following pseudo code provides a full example of all the PeopleCode discussed earlier for creating the asynchronous request and invoking the service operation.

```

import PT_BPEL:*;

Local PT_BPEL:IBUtil &ibutil;
Local PT_BPEL:BPELUtil &bpel;
Local string &url, &domain, &pwd, &opType, &asyncUrl, &transactionId,
&payload, &responseStr, &OP_NAME;
Local number &routings;
Local Message &msg, &reply;
Local XmlDoc &xml;

/* --- creating a BPELUtil object --- */
&bpel = create PT_BPEL:BPELUtil();

/* --- setting operation name --- */
&OP_NAME = "CALCULATE";

&payload = "<?xml version='1.0'?><ASyncCalcProcessRequest xmlns=
'http://xmlns.oracle.com/ASyncCalc'><op>+</op><input1>9</input1>
<input2>3</input2></ASyncCalcProcessRequest>";

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.CALCULATE, %IntBroker_Request);
&msg.SetXmlDoc(&xml);

&responseStr = &bpel.LaunchASyncBPELProcess(&OP_NAME, &msg, "", "");
/*The Instance URL would be available only after the instance is created on the
BPEL engine. Programmatically wait for URL if needed*/
&url = &bpel.GetASyncBPELProcessInstanceUrl(&responseStr);

```

See Also

[Chapter 14, "Managing Service Operation Handlers," page 259](#)

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "BPEL Classes"

Consuming Asynchronous Fire-and-Forget (One-Way) BPEL Operations

This section provides an overview of consuming asynchronous fire-and-forget BPEL operations and discusses how to:

- Create an asynchronous fire-and-forget BPEL requests.
- Invoke an asynchronous fire-and-forget BPEL operation.
- Add handlers to assign correlation IDs to requests.

Note. BPEL asynchronous fire-and-forget operations correspond to asynchronous one-way operations in PeopleSoft systems.

This section also features a comprehensive example of the PeopleCode discussed in this section.

Understanding Consuming Asynchronous Fire-and-Forget BPEL Operations

Before consuming asynchronous fire-and-forget BPEL operations, you must deploy a BPEL process and import the generated WSDL document into the PeopleSoft system.

See [Chapter 20, "Integrating with BPEL Process-Based Services," Deploying BPEL Processes, page 436](#) and [Chapter 20, "Integrating with BPEL Process-Based Services," Consuming WSDL Documents from BPEL Processes, page 436](#).

Creating Asynchronous Fire-and-Forget BPEL Requests

In this step, you use the PeopleSoft-delivered BPEL application classes to create a request message and initialize it with the message content, or payload. The payload is the SOAP request (envelope) that will be sent to the BPEL process as a service.

The first step is to create a BPELUtil object.

```
&bpe1 = create PT_BPEL:BPELUtil();
```

Next, create the request message and specify the operation to invoke. In the following pseudo code example, *FIREANDFORGET* is the operation to be invoked:

```
&payload = "<?xml version='1.0'?>
<ASyncFFProcessRequest xmlns='http://xmlns.oracle.com/ASyncFF'>
<input>test</input></ASyncFFProcessRequest>";

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.FIREANDFORGET, %IntBroker_Request);
&msg.SetXmlDoc(&xml);
```

Invoking Asynchronous Fire and Forget BPEL Operations

To invoke an asynchronous BPEL operation, use the *LaunchASyncBPELProcess* method of the BPELUtil application class.

The following example shows pseudo code for invoking an asynchronous operation:

```
&responseStr = &bpe1.LaunchASyncBPELProcess(&OP_NAME, &msg, "", "");
```

Adding Handlers to Assign Correlation IDs to Requests

You can create a handler to add a WSA_MessageID to the SOAP request header before the request is dispatched for the BPEL process.

To create a such a handler use PeopleSoft Application Designer to extend the PS_PT:Integration:ISend application class and use the *ASyncFFSend* method.

The following example shows a sample pseudocode application class to perform this task:

```

import PS_PT:Integration:ISend;
import PT_BPEL:IBUtil;

class AsyncFFSend implements PS_PT:Integration:ISend
  method AsyncFFSend();
  method OnRequestSend(&MSG As Message) Returns Message;
end-class;

/* constructor */
method AsyncFFSend
end-method;

method OnRequestSend
  /+ &MSG as Message +/
  /+ Returns Message +/
  /+ Extends/implements PS_PT:Integration:ISend.OnRequestSend +/

  &MSG.IBInfo.WSA_MessageID = &MSG.TransactionId;
  Return &MSG;
end-method;

```

Example: Consuming Asynchronous Fire-and-Forget BPEL Processes

The following pseudo code provides a full example of all the PeopleCode discussed earlier for creating the asynchronous request and invoking the service operation.

```

import PT_BPEL:*;

Local PT_BPEL:BPELUtil &bpeL;
Local string &url, &payload, &responseStr, &OP_NAME;
Local Message &msg, &reply;
Local XmlDoc &xml;

/* --- creating a BPELUtil object --- */
&bpeL = create PT_BPEL:BPELUtil();

/* --- setting operation name --- */
&OP_NAME = "FIREANDFORGET";

&payload = "<?xml version='1.0'?><ASyncFFProcessRequest xmlns='http:
//xmlns.oracle.com/ASyncFF'><input>test</input></ASyncFFProcessRequest>";

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.FIREANDFORGET, %IntBroker_Request);
&msg.SetXmlDoc(&xml);

&responseStr = &bpeL.LaunchASyncBPELProcess(&OP_NAME, &msg, "", "");

Example: Consuming Asynchronous Fire-and-Forget BPEL Processes
/*The Instance URL would be available only after the instance is created on the
BPEL engine. Programmatically wait for URL if needed*/
&url = &bpeL.GetASyncBPELProcessInstanceIdUrl(&responseStr);

```

See Also

Chapter 14, "Managing Service Operation Handlers," page 259

Enterprise PeopleTools 8.50 PeopleBook: PeopleCode API Reference, "BPEL Classes"

Providing PeopleSoft Services to BPEL Processes

This section provides an overview of providing services to BPEL processes and discusses how to:

- Provide PeopleSoft synchronous operations to BPEL processes.
- Provide PeopleSoft asynchronous request/response operations to BPEL processes.

Understanding Providing PeopleSoft Services to BPEL Processes

This section provides overview information for providing services to BPEL processes.

Container Messages and Message Parts

If using container messages and message parts, create rowset-based parts in nonrowset-based containers. Doing so ensures that the XSchema that is generated for messages will not include PeopleTools-specific auditing information (PSCAMA). Typically, you do not want this auditing information to be included in the generated XSchema when integrating with BPEL processes.

Provide Web Service Wizard

When providing services to systems using BPEL, consider the following guidelines:

- The providing web services step using the Provide Web Service wizard described in this section is for synchronous and asynchronous request/response operations and is required only for an external client to be able to consume a PeopleSoft service.
- When providing the service, the WSDL document is exported to the WSDL repository in the PeopleSoft Pure Internet Architecture. Optionally, you can select to export the WSDL to a UDDI repository. PeopleSoft uses relative path URL for schemas referenced in the WSDL documents the system generates.
- After generating the WSDL document, carefully inspect the results using the WSDL Generation Log (the last page of the Provide Web Services wizard).

The WSDL Generation Log contains the *Generated WSDL URL*. Copy this URL and store it somewhere carefully. You will need this WSDL URL later when calling the PeopleSoft-provided web service operation from the BPEL process.

See Also

[Chapter 6, "Managing Messages," Managing Container Messages, page 102](#)

[Chapter 18, "Providing Services," page 383](#)

Providing Synchronous PeopleSoft Operations to BPEL Processes

This section discusses how to:

- Build synchronous PeopleSoft services.
- Provide synchronous PeopleSoft services as WSDL documents.
- Consume the service in a BPEL process and invoke the BPEL process.

Building Synchronous PeopleSoft Services

This section lists the steps for building synchronous PeopleSoft services. Detailed documentation for each step is provided elsewhere in this PeopleBook. See the end of this section for links to the appropriate documentation.

1. Define request and response messages to be associated with the service operation.

Use the appropriate XSchema for each message.

Schema for the messages are needed for generating the WSDL. If rowset-based messages are used in the operation, simply save the message definition to generate the schema. If nonrowset messages are used in the operation, you must manually provide schema. These schema will determine the request and response format during integration.

Examples of XSchema for request and response messages are provided at the end of this section.

2. Create a handler to process the request message.

Extend the PS_PT:Integration:IRequestHandler application class using the OnRequest method. The output of the handler will be communicated back as the response to the received request.

An code example of an OnRequest handler is provided at the end of this section.

3. Create a new service.

4. Add a synchronous operation to the service.

- Generate an any-to-local routing definition for the operation.
- Add permissions to the service operation.
- Add the OnRequest handler that you created in step 2 to the operation by referencing the package name, path, and class ID of the handler that you created in step 2.

See [Chapter 7, "Sending and Receiving Messages," page 121](#); [Chapter 14, "Managing Service Operation Handlers," page 259](#); [Chapter 9, "Managing Services," page 195](#) and [Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216](#).

Providing Synchronous PeopleSoft Services as WSDL Documents

Use the Provide Web Services wizard to export the service and generate a WSDL document.

See [Chapter 18, "Providing Services," page 383](#).

Consuming Services in BPEL Processes and Invoking Services from BPEL Processes

The last step is to consume the PeopleSoft-provided service in a BPEL process and then invoke the consumed service.

See the documentation that is provided with your BPEL runtime engine for the steps that are necessary to accomplish this step.

Example 1: Providing Synchronous Operations – Sample Request Message

The following pseudo code shows an example of a request message:

```
<?xml version="1.0"?>
<xsd:schema targetNamespace="http://xmlns.oracle.com/Enterprise/Tools
/schemas/PSFTCALCREQUESTMESSAGE.V1" xmlns="http://xmlns.oracle.com
/Enterprise/Tools/schemas/PSFTCALCREQUESTMESSAGE.V1" xmlns:xsd="http:
//www.w3.org/2001/XMLSchema">
  <xsd:element name="PSFTCalcRequestMessage" type="PSFTCalcRequestMessage_Type⇒
Shape"/>
  <xsd:complexType name="PSFTCalcRequestMessage_TypeShape">
    <xsd:sequence>
      <xsd:element name="op" type="xsd:string"/>
      <xsd:element name="input1" type="xsd:decimal"/>
      <xsd:element name="input2" type="xsd:decimal"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

Example 2: Providing Synchronous Operations – Sample Response Message

The following pseudo code shows an example of a response message:

```
<?xml version="1.0"?>
<xsd:schema targetNamespace="http://xmlns.oracle.com/Enterprise/Tools
/schemas/PSFTCALCRESPONSEMESSAGE.V1" xmlns="http://xmlns.oracle.com
/Enterprise/Tools/schemas/PSFTCALCRESPONSEMESSAGE.V1" xmlns:xsd="http:
//www.w3.org/2001/XMLSchema">
  <xsd:element name="PSFTCalcResponseMessage" type=
"PSFTCalcResponseMessage_TypeShape"/>
  <xsd:complexType name="PSFTCalcResponseMessage_TypeShape">
    <xsd:sequence>
      <xsd:element name="result" type="xsd:decimal"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

Example 3: Providing Synchronous Operations – OnRequest Handler

The following pseudo code shows an example of creating an OnRequest handler by extending the PS_PT:Integration:IRequestHandler application class:

```

import PS_PT:Integration:IRequestHandler;

class InboundSyncRequestHandler implements PS_PT:Integration:IRequestHandler
    method InboundSyncRequestHandler();
    method onRequest(&MSG As Message) Returns Message;
    method onError(&MSG As Message) Returns string;
end-class;

method InboundSyncRequestHandler
end-method;

method onRequest
    /+ &MSG as Message +/
    /+ Returns Message +/
    /+ Extends/implements PS_PT:Integration:IRequestHandler.OnRequest +/

    Local Message &response;
    Local File &MYFILE;
    Local XmlDocument &xml, &inxml;
    Local string &payload, &oper, &input1, &input2;
    Local array of XmlNode &nodes;
    Local XmlNode &node;

    &nodes = CreateArray(&node);
    &inxml = &MSG.GetXmlDoc();
    &nodes = &inxml.GetElementsByTagName("op");
    &oper = &nodes [1].NodeValue;
    &nodes = &inxml.GetElementsByTagName("input1");
    &input1 = &nodes [1].NodeValue;
    &nodes = &inxml.GetElementsByTagName("input2");
    &input2 = &nodes [1].NodeValue;

    &payload = "<?xml version='1.0'?><PSFTCalcResponseMessage xmlns='http://xmlns.oracle.com/Enterprise/Tools/schemas/PSFTCALCRESPONSEMESSAGE.V1'><result xmlns='>9</result></PSFTCalcResponseMessage>";

    &xml = CreateXmlDoc(&payload);
    &response = CreateMessage(Operation.PSFTCALCULATE, %IntBroker_Response);
    &response.SetXmlDoc(&xml);

    Return &response;
end-method;

method onError
    /+ &MSG as Message +/
    /+ Returns String +/
    /+ Extends/implements PS_PT:Integration:IRequestHandler.OnError +/

    Local integer &nMsgNumber, &nMsgSetNumber;
    Local string &str;

    &nMsgNumber = &MSG.IBException.MessageNumber;
    &nMsgSetNumber = &MSG.IBException.MessageSetNumber;
    &str = &MSG.IBException.DefaultText;

    Return &str;
end-method;

```

Providing Asynchronous PeopleSoft Request/Response Operations to BPEL Processes

This section discusses how to:

- Build asynchronous request/response PeopleSoft services.
- Provide an asynchronous request/response PeopleSoft service as a WSDL document.
- Consume the service in a BPEL process and invoke the BPEL process.

Building Asynchronous Request/Response PeopleSoft Services

This section lists the steps for building asynchronous request/response PeopleSoft services. Detailed documentation for each step is provided elsewhere in this PeopleBook. See the end of this section for links to the appropriate documentation.

1. Define request and response messages to be associated with the service operation.

Use the appropriate XSchema for each message.

Examples of XSchema for request and response messages are provided at the end of this section.

2. Create a handler to process the request message.

Extend the PS_PT:Integration:INotificationHandler application class using the OnNotify method. The output of the handler will be communicated back as the response to the received request.

A code example of an OnNotify handler is provided at the end of this section.

3. Create a new service.

4. Add an Asynch Request/Response operation to the service.

- Generate an any-to-local routing definition for the operation.
- Add permissions to the service operation.
- Add the OnNotify handler that you created in step 2 to the operation by referencing the package name, path, and class ID of the handler.

For Asynchronous Request/Response PeopleSoft services, you must invoke the UpdateConnectorResponseProperty method of the BPELUtil class in OnNotify before sending the asynchronous response to BPEL. This will override the default content-type from text/plain to text/xml as expected by BPEL. If this is not done, BPEL will return an HTTP 415 Unknown Media-Type error.

See [Chapter 7, "Sending and Receiving Messages," page 121](#); [Chapter 14, "Managing Service Operation Handlers," page 259](#); [Chapter 9, "Managing Services," page 195](#) and [Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216](#).

Providing Asynchronous PeopleSoft Services as WSDL Documents

Use the Provide Web Services wizard to export the service and generate a WSDL document.

See [Chapter 18, "Providing Services,"](#) page 383.

Consuming Services in BPEL Processes and Invoking Services from BPEL Processes

The last step is to consume the PeopleSoft-provided service in a BPEL process and then invoke the consumed service.

See the documentation that is provided with your BPEL runtime engine for the steps that are necessary to accomplish this step.

Example 1: Providing Asynchronous Request/Response Operations – Sample Request Message

The following pseudo code shows an example of a request message:

```
<?xml version="1.0"?>
<xsd:schema targetNamespace="http://xmlns.oracle.com/Enterprise/Tools
/schemas/PSFTCALCREQUESTMESSAGE.V1" xmlns="http://xmlns.oracle.com
/Enterprise/Tools/schemas/PSFTCALCREQUESTMESSAGE.V1" xmlns:xsd="http:
//www.w3.org/2001/XMLSchema">
  <xsd:element name="PSFTCalcRequestMessage" type=
"PSFTCalcRequestMessage_TypeShape"/>
  <xsd:complexType name="PSFTCalcRequestMessage_TypeShape">
    <xsd:sequence>
      <xsd:element name="op" type="xsd:string"/>
      <xsd:element name="input1" type="xsd:decimal"/>
      <xsd:element name="input2" type="xsd:decimal"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

Example 2: Providing Asynchronous Request/Response Operations – Sample Response Message

The following pseudo code shows an example of a response message:

```
<?xml version="1.0"?>
<xsd:schema targetNamespace="http://xmlns.oracle.com/Enterprise/Tools
/schemas/PSFTCALCRESPONSEMESSAGE.V1" xmlns="http://xmlns.oracle.com
/Enterprise/Tools/schemas/PSFTCALCRESPONSEMESSAGE.V1" xmlns:xsd="http:
//www.w3.org/2001/XMLSchema">
  <xsd:element name="PSFTCalcResponseMessage" type=
"PSFTCalcResponseMessage_TypeShape"/>
  <xsd:complexType name="PSFTCalcResponseMessage_TypeShape">
    <xsd:sequence>
      <xsd:element name="result" type="xsd:decimal"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

Example 3: Providing Asynchronous Request/Response Operations – Sample OnNotify Handler

The following pseudo code shows an example of creating an OnNotify handler by extending the PS_PT:Integration:INotification application class. Note that you must invoke the UpdateConnectorResponseProperty method of the BPELUtil class before performing the publish.

```

import PS_PT:Integration:INotificationHandler;

class InboundASyncResponseHandler implements PS_PT:Integration:
INotificationHandler
    method OnNotify(&MSG As Message);

end-class;

method OnNotify
    /+ &MSG as Message +/
    /+ Extends/implements PS_PT:Integration:INotificationHandler.OnNotify +/

    Local Message &response;
    Local string &payload;
    Local XmlDocument &xml;
    Local File &MYFILE;

    &payload = "<?xml version='1.0'?><PSFTCalcResponseMessage xmlns=
'http://xmlns.oracle.com/Enterprise/Tools/schemas
/PSFTCALCRESPONSEMESSAGE.V1'><result xmlns="">9</result></PSFTCalcResponse=
Message>";

    &xml = CreateXmlDoc(&payload);
    &response = CreateMessage(Operation.PSFTASYNCCALCULATE,
%IntBroker_Response);
    &response.SetXmlDoc(&xml);
    &response.IBInfo.WSA_MessageID = &MSG.IBInfo.WSA_MessageID;
    &response.IBInfo.WSA_ReplyTo = &MSG.IBInfo.WSA_ReplyTo;
    &bpel.UpdateConnectorResponseProperties(&response);
    %IntBroker.Publish(&response);
end-method;

```

Chapter 21

Integrating with Oracle ESB-Based Services

This chapter discusses how to:

- Consume and invoke Oracle ESB-based services.
- Provide and invoke PeopleSoft services in Oracle ESB.

Understanding Integrating with Oracle ESB-Based Services

This section provides an overview of integration with Oracle ESB-based services.

Oracle ESB

Oracle Enterprise Service Bus (ESB) is a component of Oracle Fusion Middleware that separates integration concerns from applications and business logic. It moves data among disparate applications, both within and outside of an enterprise. It provides a messaging infrastructure and uses open standards to connect, transform, and route business documents.

Oracle ESB cannot provide services. Instead, it virtualizes endpoints and mediates between a client and a provider of a service.

For more information about Oracle ESB visit the Oracle Technology Network online and enter the keywords *Oracle ESB*.

See Also

<http://www.oracle.com/technology/products/index.html>

Software Components

You must install the following software components to perform integrations using Oracle ESB:

Software Component	Description
PeopleTools	Installs the PeopleSoft application server and the web. Also installs PeopleSoft Integration Broker and the PeopleSoft SOA, including the integration gateway, publication/subscription system, Provide Services Wizard, Consume Services Wizard, and so on.
Oracle SOA Suite	Installs the Oracle services-oriented architecture, including Oracle Enterprise Manager.
Oracle JDeveloper Studio	Oracle JDeveloper Studio features the Oracle BPEL Designer and the ESB Designer used to develop BPEL and ESB projects.

Check the My Oracle Support website for the currently certified versions of Oracle SOA and Oracle JDeveloper Studio for use with PeopleTools.

Check PeopleTools and Oracle documentation for installation tips and useful information.

See Also

PeopleTools Installation Guide for your database

Oracle SOA Suite Quick Start Guide

Oracle SOA Suite Installation Guide

Oracle JDeveloper Installation Guide

Oracle BPEL Process Manager Quick Start Guide

Oracle Enterprise Service Bus Quick Start Guide

Oracle Enterprise Service Bus Installation Guide

<http://www.oracle.com/technology/products/index.html>

Securing Oracle ESB-Based Services

PeopleSoft Integration Broker provides a number of options that you can use to secure integrations. These include securing integrations at one or more of the following levels:

- Web server.
- Gateway level.
- Application server level.
- Node level.
- User level.
- Service operation level.
- And so on.

It is important to fully investigate these security options and implement those that best suit your business needs.

It is also important that you investigate the security options available for the Oracle SOA Suite and Oracle JDeveloper and to implement those security options that fulfill your security requirements.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Setting Up Secure Integration Environments"

Prerequisites for Integrating with Oracle ESB-Based Services

For creating integrations with Oracle ESB services you must have PeopleSoft Integration Broker configured and running.

Note. This section discusses prerequisite configuration steps on the PeopleSoft system for integrating with Oracle ESB services. Check your Oracle documentation for setup and configuration steps that you must perform on Oracle JDeveloper, Oracle BPEL Process Manager, and Oracle ESB.

The following list is a partial checklist of items to configure:

- In PeopleTools ensure that the application server and web server are installed and running.
- On the Nodes-Node Definitions page, create a node to represent Oracle ESB. Set the Node Type field to *External* for this node.
- When configuring the integrationGateway.properties file, be sure to set the ig.isc.serverURL property equal to the name of the machine running the integration engine.
- When configuring the PeopleTools application server, set the PUB/SUB option to *Yes*. This value is required for asynchronous integrations.
- On the Integration Broker Quick Configuration page, be sure to activate the application server domain by setting the Domain Status to *Active*.
- On the Integration Broker Services Configuration page, be sure to set the service namespace, the schema namespace, and the target location.
- To load files into PeopleTools from the file system, set PS_FILEDIR and PS_SERVDIR in the system variables on your machine.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Using the Integration Broker Quick Configuration Page"

[Chapter 4, "Understanding PeopleSoft Integration Broker Metadata," page 35](#)

Consuming and Invoking Oracle ESB-Based Services

This section discusses how to:

- Provide Oracle ESB-based services for consuming in PeopleSoft.
- Consume Oracle ESB-based services.
- Invoke synchronous Oracle ESB-based services.
- Invoke asynchronous Oracle ESB-based services.

Understanding Consuming and Invoking Oracle ESB-Based Services

This section provides information about consuming Oracle ESB-Based services.

Oracle ESB Projects When PeopleSoft is a Consumer

Oracle ESB cannot provide a service. It can only mediate between a client and the provider of the service.

Hence, if Peoplesoft is the consumer of an ESB service, the ESB project will contain a SOAP service (like BPEL) that will implement the business logic. Further there will be a routing service that will route the SOAP request message from Peoplesoft to the underlying webs service implementation.

Service Routing Types

There are two types of routing services: synchronous and asynchronous. The type of routing service determines the type of ESB project. An ESB project with a synchronous routing service defined is a synchronous ESB project; an ESB project with an asynchronous routing service defined is an asynchronous ESB project.

Oracle ESB Nested and Nonnested WSDL

PeopleSoft systems can consume WSDL documents that are nested or nonnested. This section provides additional information on each type.

Using nested WSDL documents allows you to separate the different elements of a service definition into independent documents that you can consume as needed.

Using nested WSDL helps you to write clearer definitions by enabling you to separate the definitions according to their level of abstraction. It also maximizes the ability to reuse service definitions.

The following example shows a nested WSDL document. The document is separated into three smaller documents: data type definitions, abstract definitions, and specific service bindings.

The following example shows a data type definition WSDL document:

```
//data type definitions WSDL//
<schema attributeFormDefault="unqualified"
  elementFormDefault="qualified"
  targetNamespace="http://xmlns.oracle.com/SynchAdd_BPEL"
  xmlns="http://www.w3.org/2001/XMLSchema">
  <element name="SynchAdd_BPELProcessRequest">
    <complexType>
      <sequence>
        <element name="input1" type="integer"/>
        <element name="input2" type="integer"/>
      </sequence>
    </complexType>
  </element>
</schema>
```

The following example show an abstract definition WSDL document:

```
<?xml version="1.0" encoding="UTF-8" ?>
<definitions name="NestedAsyncFFAdd_RS"
  targetNamespace="http://oracle.com/esb/namespaces/NestedAsyncFFAdd_ESB"
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:tns="http://oracle.com/esb/namespaces/NestedAsyncFFAdd_ESB"
  xmlns:inpl="http://xmlns.oracle.com/SynchAdd_BPEL">
  <types>
    <schema xmlns="http://www.w3.org/2001/XMLSchema">
    <import namespace="http://xmlns.oracle.com/SynchAdd_BPEL"
      schemaLocation="SynchAdd_Req.xsd" />
    </schema>
    </types>
    <message name="SynchAdd_BPELProcessRequest_request">
    <part name="SynchAdd_BPELProcessRequest"
      element="inpl:SynchAdd_BPELProcessRequest" />
    </message>
    <portType name="NestedESBAsyncFFAdd_ppt">
    <operation name="NestedESBAsyncFFAdd">
    <input message="tns:SynchAdd_BPELProcessRequest_request" />
    </operation>
    </portType>
  </definitions>
```

The following example shows a service bindings WSDL document:

```

<?xml version="1.0" encoding="UTF-8" ?>
<definitions targetNamespace="http://oracle.com/esb/namespaces/NestedAsyncFFAdd_⇒
ESB/concrete"
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:tns="http://oracle.com/esb/namespaces/NestedAsyncFFAdd_ESB/concrete"
xmlns:ws="http://www.example.com/webservice" xmlns:http="http:
//schemas.xmlsoap.org/wsdl/http/"
xmlns:plt="http://schemas.xmlsoap.org/ws/2003/05/partner-link/"
xmlns:esb="http://www.oracle.com/esb/" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/" xmlns:wsdl="http:
//schemas.xmlsoap.org/wsdl/"
xmlns:import="http://oracle.com/esb/namespaces/NestedAsyncFFAdd_ESB">
<import namespace="http://oracle.com/esb/namespaces/NestedAsyncFFAdd_ESB"
location="http://bng-psft-
0100:8888/esb/slide/ESB_Projects/PS_Consumer_NestedAsyncFFAdd_ESB/NestedAsyncFFAdd_
ESB_NestedAsyncFFAdd_RS.wsdl" />
<binding name="__soap_NestedAsyncFFAdd_RS_NestedESBAsyncFFAdd_ppt"
type="import:NestedESBAsyncFFAdd_ppt">
<soap:binding xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" style="document"
transport="http://schemas.xmlsoap.org/soap/http" />
<operation name="NestedESBAsyncFFAdd">
<soap:operation xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" style="document"
soapAction="NestedESBAsyncFFAdd" />
<input>
<soap:body xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" use="literal" />
</input>
</operation>
</binding>
<binding name="__esb_NestedAsyncFFAdd_RS_NestedESBAsyncFFAdd_ppt"
type="import:NestedESBAsyncFFAdd_ppt">
<esb:binding />
<operation name="NestedESBAsyncFFAdd">
<esb:operation eventname="
NestedAsyncFFAdd_ESB.NestedAsyncFFAdd_RS.NestedESBAsyncFFAdd" />
<input />
</operation>
</binding>
<service name="ESB_NestedAsyncFFAdd_RS_Service">
<port name="__soap_NestedAsyncFFAdd_RS_NestedESBAsyncFFAdd_ppt"
binding="tns:__soap_NestedAsyncFFAdd_RS_NestedESBAsyncFFAdd_ppt">
<soap:address xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" location="http:⇒
//bng-psft-
0100:8888/event/NestedAsyncFFAdd_ESB/NestedAsyncFFAdd_RS" />
</port>
<port name="__esb_NestedAsyncFFAdd_RS_NestedESBAsyncFFAdd_ppt"
binding="tns:__esb_NestedAsyncFFAdd_RS_NestedESBAsyncFFAdd_ppt"/>
</service>
<plt:partnerLinkType name="NestedESBAsyncFFAdd_pptLT">
<plt:role name="NestedESBAsyncFFAdd_pptProvider">
<plt:portType name="tns:NestedESBAsyncFFAdd_ppt" />
</plt:role>
</plt:partnerLinkType>

```

Oracle ESB WSDL Bindings

A WSDL document binding provides the protocol and data format specification for a particular port type.

Oracle ESB WSDL documents can have SOAP bindings or Oracle ESB native bindings.

Note. Oracle ESB WSDL documents to be consumed by PeopleSoft system must be of the SOAP type. SOAP binding adhere to the SOAP protocol. Choosing the Oracle ESB native binding type may result in unpredictable behavior in PeopleSoft systems.

PeopleSoft Integration Broker Consume Services Wizard

To consume Oracle ESB-based services use the PeopleSoft Integration Broker Consume Services Wizard. The wizard enables you to consume WSDL provided by integration partners. In turn, the wizard creates PeopleSoft service, service operation, message, and routing definitions for the WSDL, thereby enabling you to manage and invoke the service in PeopleSoft.

See [Chapter 19, "Consuming Services," Understanding the Consume Web Service Wizard, page 411](#).

Providing Oracle ESB–Based Services for Consuming in PeopleSoft

This section lists the general steps for providing Oracle ESB–based services for consuming in PeopleSoft systems. All steps are performed in Oracle ESB except where otherwise noted:

1. Create the ESB project.

Remember that the type of routing service (synchronous or asynchronous) you associate to the project determines the project type (synchronous or asynchronous).

2. Register the project with the Oracle ESB server.

Use the Oracle ESB Console to verify that you successfully registered the project.

3. On the machine on which Oracle ESB is deployed, verify that the virtual host and port values are set.

By default the virtual host is set to *localhost*. You must set the virtual host to the IP address or host name.

4. On the Definitions tab, note the WSDL URL of the routing service.

Note. Write down the WSDL URL of the routing service. You must enter this URL in the PeopleSoft system to consume the service.

Consuming Oracle ESB-Based Services

To consume WSDL from an ESB-based service into the PeopleSoft system use the Consume Web Service component in the PeopleSoft Pure Internet Architecture.

As you use the Consume Services Wizard keep the following points in mind:

- The source of the WSDL is a WSDL URL. Enter the URL of the routing service that you noted on the Definitions tab in Oracle ESB.
- When prompted to select service ports select the service(s) who's name start with "SOAP." This ensures that the PeopleSoft system uses the correct binding type to create the routing metadata.
- Make a note of the service operations that you consume. You need these names when you create PeopleCode to create the request message and invoke the service.

- When prompted to select a receiving node select the Use Existing Node option. Next, enter or search for the external node that you created to represent the ESB system.
- When consuming asynchronous services you can use the default queue option or select a different queue.

See Also

Chapter 19, "Consuming Services," page 411

Invoking Synchronous Oracle ESB-Based Services

This section discusses how to:

- Manage routing definitions for invoking synchronous Oracle ESB-based services.
- Set message and error logging for invoking synchronous Oracle ESB-based services.
- Invoke a synchronous Oracle ESB-based service.

Prerequisites for Invoking Synchronous Oracle ESB-Based Services

Before you can invoke a synchronous Oracle ESB-based service, you must first consume it. Consuming Oracle ESB-based services is described elsewhere in this section.

See Chapter 21, "Integrating with Oracle ESB-Based Services," Consuming Oracle ESB-Based Services, page 457.

Managing Routing Definitions for Invoking Synchronous Oracle ESB-Based Services

The PeopleSoft Integration Broker Consume Services Wizard creates an outbound routing definition for the consumed service.

Before you invoke a synchronous Oracle ESB-based service in the PeopleSoft system, ensure the following for the routing definition:

On the Routings-Connector Properties page (PeopleTools, Integration Broker, Integration Setup, Routings. Click the Connector Properties tab) and perform the following tasks:

- Ensure that the Connector ID field is set to *HTTPTARGET*.
- Ensure that the value in the Primary URL field is set to the endpoint URL.
- Set any other HTTP target connector properties as desired.

Setting Message and Error Logging for Invoking Synchronous Oracle ESB-Based Services

To capture the maximum amount to message and error logging and information when you invoke the service, set the following options:

- On the Routings- Routing Definitions page (PeopleTools, Integration Broker, Integration Setup, Routings), set the value in the Log Detail field to *Header and Detail*.

- In the `integrationGateway.properties` file, set the `ig.log.level` property equal to 5.

A setting of 5 is the default value.

Invoking a Synchronous Oracle ESB-Based Service

The following sample PeopleCode demonstrates one way to invoke the synchronous ESB-based service:

```
Local string &payload, &responseStr;
Local Message &msg, &reply;
Local XmlDoc &xml;

/* --- set input request message--- */
&payload = "<?xml version='1.0' encoding='UTF-8'><SynchAdd_BPELProcessRequest
xmlns='http://xmlns.oracle.com/SynchAdd_BPEL'><input1>1234</input1><input2>1234</input2></SynchAdd_BPELProcessRequest>";
MessageBox(0, "Request Message", 0, 0, &payload);

&xml = CreateXmlDoc(&payload);
&msg = CreateMessage(Operation.ESBSYNCAADD, %IntBroker_Request);
&msg.SetXmlDoc(&xml);

&reply = %IntBroker.SyncRequest(&msg);

If All(&reply) Then
    &responseStr = &reply.GenXMLString();
    MessageBox(0, "Request Message", 0, 0, (&responseStr));
Else
    WinMessage("Error. No reply (or NULL) from LaunchSynchBPELProcess");
End-If;
```

On execution the system displays the request message that the system sends to Oracle ESB.

If the invocation is successful, the system displays another box that shows the response from Oracle ESB as shown in the following example:

Use the PeopleSoft Integration Broker message logs to view the flow of the messages. You can also use the Integration Broker Service Operations Monitor to view information about the outbound transaction.

Use the Oracle ESB Console to check for the ESB instance and for the successful invocation of the ESB service.

See [Chapter 17, "Managing Error Handling, Logging, Tracing, and Debugging," Managing Integration Gateway Message and Error Logging, page 374](#) and *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Synchronous Service Operations."

Invoking Asynchronous Oracle ESB-Based Services

This section discusses how to:

- Create acknowledgements for invoking asynchronous Oracle ESB-based services.
- Manage routing definitions for invoking asynchronous Oracle ESB-based services.
- Set message and error logging for invoking asynchronous Oracle ESB-based services.
- Invoke an asynchronous Oracle ESB-based service.

Understanding Invoking Asynchronous Oracle ESB-Based Services

An asynchronous service is also referred to as a fire-and-forget service.

Prerequisites for Invoking Asynchronous Oracle ESB-Based Services

Before you can invoke an asynchronous Oracle ESB-based service, you must first consume it. Consuming Oracle ESB-based services is described elsewhere in this section.

See [Chapter 21, "Integrating with Oracle ESB-Based Services," Consuming Oracle ESB-Based Services, page 457.](#)

Creating Acknowledgments for Invoking Asynchronous Oracle ESB-Based Services

To handle acknowledgement data for an asynchronous service operation, create an OnReceive handler that uses the OnAckReceive method that is implemented as an application class. After doing so, you must register the application class with the PeopleSoft service operation.

The following code example shows sample code to create the handler:

```

import PS_PT:Integration:IReceiver;

class AsynchFF_AckReceive implements PS_PT:Integration:IReceiver
    method AsynchFF_AckReceive();
    method OnAckReceive(&MSG As Message) Returns integer;
end-class;

/* constructor */
method AsynchFF_AckReceive
end-method;

method OnAckReceive
    /* &MSG as Message */
    /* Returns Integer */
    /* Extends/implements PS_PT:Integration:IReceiver.OnAckReceive */
    /* Variable Declaration */

If &MSG.IsStructure Then

    /* if message is rowset-based */
    Local string &str = &MSG.GenXMLString();

Else
    /* if message is nonrowset-based */
    Local XmlDoc &xmldoc = &MSG.GetXmlDoc();
    Local string &str1 = &xmldoc.GenXmlString();
    Local File &MYFILE;

    &MYFILE = GetFile("C:\Temp\ESB\PS_Consume\ESBasynchffack.txt", "W",
%FilePath_Absolute);
    If &MYFILE.IsOpen Then
        &MYFILE.WriteString(&str1);
        &MYFILE.WriteLine("");
        &MYFILE.WriteString(String(%Operation_Done));
        &MYFILE.Close();
    End-If;
End-If;

    Return (%Operation__Done);
end-method;

```

To create an acknowledgement for consumed asynchronous Oracle ESB-based services:

1. Create an OnReceive handler that uses the OnAckReceive method that is implemented as an application class.

See [Chapter 14, "Managing Service Operation Handlers," Implementing Handlers Using Application Classes, page 264.](#)

2. Open the service operation definitions for the consumed service operation.
3. Click the Handler tab.

The Service Operations-Handlers page appears.

4. Add a handler with the following characteristics:

Name	Enter any name. For example: <i>AckReceive</i> .
Type	From the drop-down list select <i>OnReceive</i> .
Implementation	From the drop-down list select <i>Application Class</i> .
Status	From the status drop-down list select <i>Active</i> .

5. Click the Details link.

The Handler Details page appears.

6. At a minimum enter the following details about the application class:

Package Name	Enter the package name that contains the class that you want to specify.
Path	Enter :(a colon).
Class ID	Enter the name of the application class that contains the method that you want to specify.
Method	From the drop-down list select <i>OnAckReceive</i> .

Managing Routing Definitions for Invoking Asynchronous Oracle ESB-Based Services

The PeopleSoft Integration Broker Consume Services Wizard creates an outbound routing definition for the consumed service.

Before proceeding to invoke the service, ensure the following on the routing definition:

- On the Routings-Routing Definitions page (PeopleTools, Integration Broker, Integration Setup, Routings), in the OnReceive Handler field, enter or select *OnAckReceive*.

This is the acknowledgement.

- On the Routings-Connector Properties page (PeopleTools, Integration Broker, Integration Setup, Routings. Click the Connector Properties tab).
 - Ensure that the Connector ID field is set to *HTTPTARGET*.
 - Ensure that the value in the Primary URL field is set to the endpoint URL.
 - Set any other HTTP target connector properties as desired.

Setting Message and Error Logging for Invoking Asynchronous Oracle ESB-Based Services

To capture the maximum amount of message and error logging and information when you invoke the service, in the integrationGateway.properties file, set the ig.log.level property equal to 5.

A setting of 5 is the default value.

Invoking an Asynchronous Oracle ESB-Based Service

The following sample PeopleCode demonstrates one way to invoke the asynchronous Oracle ESB-based service:

```
Local string &payload, &responseStr;
Local Message &msg, &reply;
Local XmlDocument &xml;

/* --- setting the input request message --- */

&payload = "<?xml version='1.0' encoding='UTF-8'?><SynchAdd_BPPELProcessRequest
xmlns='http://xmlns.oracle.com/SynchAdd_BPPEL'><input1>6789</input1><input2>6789<=>
/inpu
t2></SynchAdd_BPPELProcessRequest>";
MessageBox(0, "Request Message", 0, 0, &payload);

&xml = CreateXmlDoc(&payload);

&msg = CreateMessage(Operation.ESBASYNCFADD, %IntBroker_Request);

&msg.SetXmlDoc(&xml);

%IntBroker.Publish(&msg);
&responseStr = &msg.TransactionId;

MessageBox(0, "Message Transaction ID-Response from LaunchAsyncBPPELProcess", 0, 0,
&responseStr);

MessageBox(0, "Acknowledgement from ESB", 0, 0, "For Ack Msg from ESB , go look at=>
the
file C:\temp\ESB\PS_Consume\ESBasynchfack.txt");
```

When you execute the PeopleCode the PeopleSoft system the following information in consecutive message boxes:

1. The request message that it sends to Oracle ESB.
2. The transaction ID for the asynchronous request.
3. The file location of the acknowledgement it received from Oracle ESB

displays

You can use the PeopleSoft Integration Broker message logs to view the flow of the messages. You can also use the Integration Broker Service Operations Monitor to view information about the outbound transaction.

You can also use the Oracle ESB Console to check for the message instance and for the successful invocation of the ESB service.

See [Chapter 17, "Managing Error Handling, Logging, Tracing, and Debugging," Managing Integration Gateway Message and Error Logging, page 374](#) and *Enterprise PeopleTools 8.50 PeopleBook: Integration Broker Service Operations Monitor*, "Monitoring Asynchronous Service Operations."

Providing and Invoking PeopleSoft Services in Oracle ESB

This section discusses how to:

- Provide PeopleSoft services to Oracle ESB
- Invoke PeopleSoft services in Oracle ESB

Understanding Providing and Invoking PeopleSoft Services in Oracle ESB

This section provides an overview of providing and invoking PeopleSoft services in Oracle ESB.

Oracle ESB Projects When PeopleSoft is a Provider

To invoke a PeopleSoft service in Oracle ESB, you must create a project in Oracle ESB.

See *Oracle Enterprise Service Bus Quick Start Guide*

PeopleSoft Integration Broker Provide Services Wizard

To provide PeopleSoft services to Oracle ESB you use the PeopleSoft Integration Broker Provide Services Wizard. The wizard enables you to generate WSDL documents based on services you create in PeopleSoft Integration Broker. You then provide the generated WSDL to Oracle ESB.

Prerequisites for Providing and Invoking PeopleSoft Services in Oracle ESB

You must create the PeopleSoft services you wish to provide, prior to using generating WSDL and providing the WSDL to Oracle ESB.

Other prerequisites may exist in Oracle JDeveloper or Oracle ESB. Refer to the Oracle documentation for more information.

Providing PeopleSoft Services

Use the PeopleSoft Integration Broker Provide Web Service Wizard to generate a WSDL document for the service you wish to provide to Oracle ESB.

The wizard provides you the option to publish the WSDL to a UDDI repository that you define, or to the WSDL repository in PeopleSoft Integration Broker. You can choose either publishing option.

The last page is the WSDL Generation Log which provides the name of the services and URL for each WSDL document generated. You will use this information when you invoke the services in Oracle ESB.

See Also

[Chapter 18, "Providing Services," page 383](#)

Invoking PeopleSoft Services in Oracle ESB

This section describes how to invoke synchronous and asynchronous services in Oracle ESB.

Creating an ESB Project to Invoke PeopleSoft Services

After you use the PeopleSoft Integration Broker Provide Web Service wizard to generate WSDL, the next step is to invoke the services in Oracle ESB. To do so, you must create an ESB project type in Oracle JDeveloper.

See *Oracle Enterprise Service Bus Quick Start Guide*

The following are general steps to follow to configure the Oracle ESB project after you initially create it. Refer to the Oracle documentation for detailed information and instructions:

1. Modify the project so that the SOAP service points to the PeopleSoft WSDL URL generated when you provided the service in PeopleSoft,
2. Use the Make option to build the project.
3. Use the Register with ESB option to register the project with Oracle ESB.

This command allows you to register the services created using Oracle JDeveloper to the Enterprise Service Bus.

A message appears that indicates you successfully registered the services with the Oracle ESB server.

To view, monitor or make runtime adjustments to the ESB configuration, use the Oracle ESB Console.

When you have successfully registered the services on the Oracle ESB Server, you can view them in the Services Panel in Oracle JDeveloper. Click the ESB system to view the ESB system flow in the Configuration Area on the right side.

Invoking a Service in Oracle

As of the printing date of this PeopleBook, Oracle ESB does not feature a test page. To test and invoke ESB web services, use the Oracle SOA Suite's Oracle Enterprise Manager.

See *Oracle Enterprise Manager documentation*.

Chapter 22

Using the Inbound File Loader Utility

This chapter provides an overview of the Inbound File Loader utility processing and discusses how to:

- Set up processing rules.
- Initiate file processing.
- Test inbound flat file processing.

Understanding the Inbound File Loader Utility

When external systems send inbound transactions consisting of flat files, you can use the Inbound File Loader utility to translate the incoming files into service operations and process them.

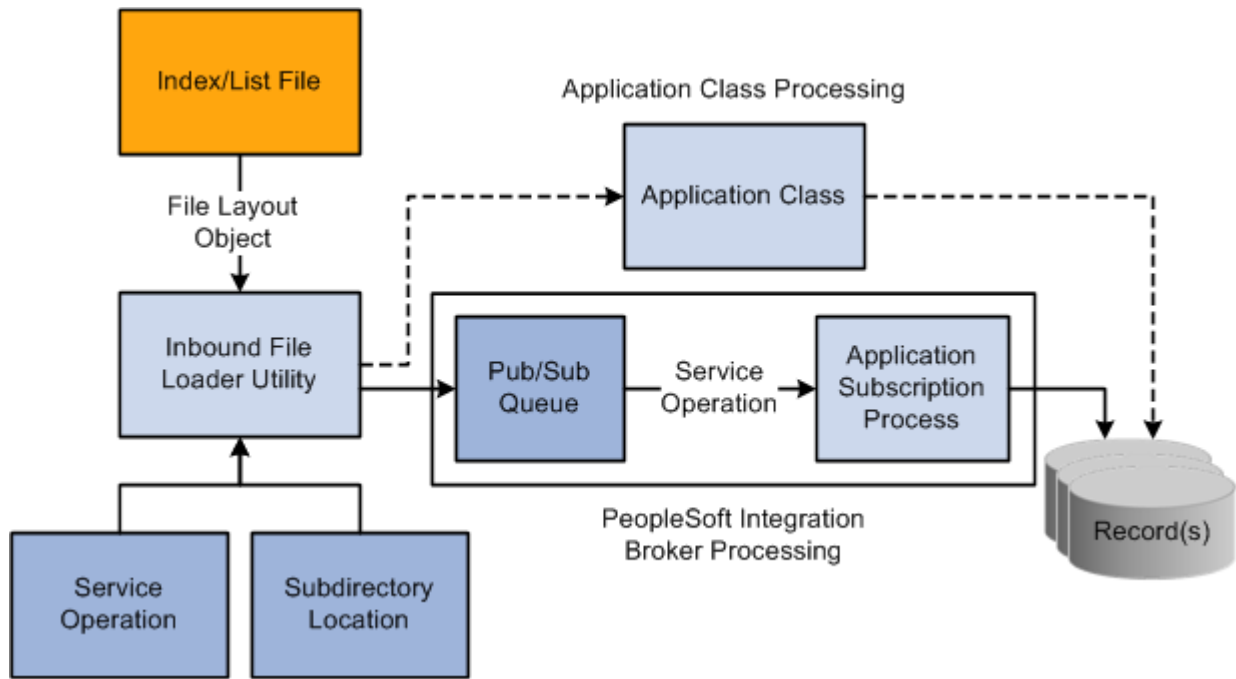
The Inbound File Loader utility provides two options for translating and processing files:

- Use PeopleSoft Integration Broker to convert file data into service operations and publish them locally. Then, subscribe to the service operations and insert the data into the tables.
- Write an application class that will read the contents of files and insert the data directly into the tables

Note. You can only use one processing method at any given time. Application class processing always overrides PeopleSoft Integration Broker processing.

File Processing

This section discusses the processing flow for the Inbound File Loader utility.



Inbound File Loader utility processing flow

The flow for inbound file processing using the Inbound File Loader utility is:

1. The utility receives a flat file in the form of a file layout object from an external system.

The flat file consists of either:

- A data file that contains the relevant data.
- An index file that contains pointers to the data.

Each index file lists the names of a set of data files to be processed. Each line of the index file must be a plain text file that contains only one field: a file name with full directory path information.

These files contain the application data, which is in one of the following formats: fixed record, Comma Separated Values (CSV), or XML.

Note. The wildcards "*" and "?" may only be used in the filename and not in the directory path.

2. The utility reads the file that is submitted for processing:

- If the file is an index file, the Inbound File Loader utility loads the list of data files that are associated with each index file to be processed into a parameter table.
- If it is a single data file, the utility inserts the single data file into a parameter table.

Note. If additional fields in the file layout are not in the message definition, the additional fields are ignored during the copying of the flat file data to the message and are not included in the message.

3. The utility loops through the list of data files to be processed and reads each data file.

4. The utility uses either PeopleSoft Integration Broker or application class processing logic to read the file contents and process the data.

- PeopleSoft Integration Broker processing.

When using Integration Broker processing logic, the Inbound File Loader utility copies the rowsets of the data files into the message, publishes the service operation locally, and then the receiving system receives the service operation and initiates normal inbound data processing.

- Application class processing.

You can build an application class to read the contents of the inbound file as rowsets and implement the necessary processing logic to write to the underlying tables.

5. To add file archiving, delete logic to prevent files from processing again, and so on, when defining processing rules, you can optionally specify an application engine program name and section. If specified, the utility calls the program and section as a final step to the inbound file process.

Understanding Development Activities

This section discusses development activities for using the Inbound File Loader utility and describes:

- General development activities
- Development activities for PeopleSoft Integration Broker processing.
- Creating file layout definitions.
- Development activities for application class processing.

General Development Activities

This section discusses general development activities for using the Inbound File Loader utility using either PeopleSoft Integration Broker processing or application class processing.

Determining the Format for Inbound Data

Determine the necessary format of the inbound data. If there is an industry standard, use it for your file definition. If there is no industry standard, create a file layout object.

Development Activities for PeopleSoft Integration Broker Processing

This section discusses development activities for using the PeopleSoft Integration Broker processing in conjunction with the Inbound File Loader utility.

1. Create a message definition in the PeopleSoft Pure Internet Architecture.

The structure of the message definition must be similar to the structure of the file layout definition that you created.

2. Create a service.
3. Create an asynchronous one-way service operation for the service.
4. Create a local-to-local routing definition for the service operation.
5. Create an OnNotification handler and call the functional library IB_FILE_SUBCODE.

PeopleTools delivers this functional library and it can be used for any generic notification.

The following example shows code an OnNotification handler calling the functional library:

```
import PS_PT:Integration:INotificationHandler;

class QUSubscribe implements PS_PT:Integration:INotificationHandler
    method QUSubscribe();
    method OnNotify(&_MSG As Message);
end-class;

Declare Function Subscribe PeopleCode FUNCLIB_IBFILE.IB_FILE_SUBCODE FieldFormula;

/* constructor */
method QUSubscribe
end-method;

method OnNotify
    /* + &_MSG as Message +/
    /* + Extends/implements PS_PT:Integration:INotificationHandler.OnNotify +/
    /* Variable Declaration */

    Local Message &MSG;
    Local Rowset &MSG_ROWSET;

    &MSG = &_MSG;

    Subscribe(&MSG);

end-method;
```

6. Define processing rules in the Inbound File Loader Rules page in the PeopleSoft Pure Internet Architecture.
7. Initiate flat file processing using the Inbound File Processing page.
8. Test the inbound flat file processing.

Creating File Layout Definitions

When you use the Inbound File Loader utility, you use file layout definitions to read and write data from flat files. Use the following guidelines when creating file layout definitions:

- Create a file layout definition with the same structure as the message definition to support the vendor file format.

- The hierarchical structure of the data in the file layout definition must match that of the message definition. For example, suppose a message has three levels:
 - Level 0, containing record A.
 - Level 1, containing records B and C.
 - Level 2, containing record D.

All file layouts that are associated with this message must also have record A in level 0, record B and C in level 1, and record D in level 2.

Note. The file layout does not need to contain the exact same fields as the message definition

- For every record in a file layout definition, add a new file field, `AUDIT_ACTN`, as the first field in the record (except when the field already exists in the application table).
- You can associate more than one file layout to a single message. For example, vendor A may have a different number of fields than vendor B, so you may have two file layouts: one for vendor A and one for vendor B.
- Specify the file ID uniquely to include a row in a file, which is necessary in mapping the data to its proper record. Include start and end points when dealing with more than one record in a file layout.
- Each record in the file layout has a file record ID attribute. Do not confuse this with the file layout ID. The file layout ID determines whether a new layout is encountered for multiple file layout processing.

Development Activities for Application Class Processing

This section discusses development activities for application class processing using the Inbound File Loader utility. This section discusses how to:

1. Create an application class.
2. Specify processing rules.

Creating Application Classes

This section discusses creating an application class for processing flat files in conjunction with the Inbound File Loader utility.

The application class you create must implement the `IProcessFile` interface. The signature of the interface is shown here:

```

interface IProcessFile
    /* Any initialization is done in this function*/
    method Init (&fldDefName As string, &msgName As string) Returns boolean;

    /* Contains processing logic that stores the Rowset data into the respective⇒
       tables */
    method Process(&fldDefName As string, &msgName As string, &rs As Rowset) Returns⇒
        boolean;

    /* This method shall contain logic for cleanup operations */
    method Finish(&fldDefName As string, &msgName As string) Returns boolean;
end-interface;

```

The application class you create must implement the following three methods:

- Init
- Process
- Finish

If the Replace Data check box is selected in the Inbound File Loader Rule page, the Init method will be called. The Finish method is the last method to be invoked by the utility. Any post-processing clean up code can be implemented with this function.

The logic in the Process method stores the file contents in staging tables. You can add logic in the Finish method to move the data from staging tables to the actual transaction tables as a final process.

The Init, Process and Finish methods must return a boolean value of *True* for successful completion of the file processing. If methods Init and Finish are not used, return a default value of *True*.

The following example shows an application class implementing the IProcessFile interface:

```

import PTIB:Interfaces:IProcessFile;

class InboundFileProcess implements PTIB:Interfaces:IProcessFile

method Init(&fldDefName As string, &msgName As string) Returns boolean;

method Process(&fldDefName As string, &msgName As string, &rs As Rowset) Returns⇒
    boolean;

method Finish(&fldDefName As string, &msgName As string) Returns boolean;

end-class;

method Init
    /+ &fldDefName as String, +/
    /+ &msgName as String +/
    /+ Returns Boolean +/
    /+ Extends/implements PTIB:Interfaces:IProcessFile.Init +/

    //This function will be called when the Replace Data flag is
    //enabled
    //add initialization code, such as cleaning up the table before
    //reading in the data from the file

    Return True;
end-method;

method Process
    /+ &fldDefName as String, +/
    /+ &msgName as String, +/
    /+ &rs as Rowset +/
    /+ Returns Boolean +/
    /+ Extends/implements PTIB:Interfaces:IProcessFile.Process +/

    //Add the code that inserts/updates/delete data in the table

    Return True;
end-method;

method Finish
    /+ &fldDefName as String, +/
    /+ &msgName as String +/
    /+ Returns Boolean +/
    /+ Extends/implements PTIB:Interfaces:IProcessFile.Finish +/

    //This function will be called when the Replace Data flag is
    //enabled
    // Clean up logic goes here (if any)

    Return True;
end-method;

```

Specifying Processing Rules

After you create an application class, you must access the Inbound File Loader Rules page and specify the following information:

- Root Package ID.
- Path.

- Class name.

Prerequisites for Using the Inbound File Loader Utility

The prerequisites for using the Inbound File Loader utility are:

- PeopleSoft Integration Broker must be configured and running.
- PeopleSoft Process Scheduler must be configured in PSAdmin.
- Create a file definition layout as described previously in this chapter.

See [Chapter 22, "Using the Inbound File Loader Utility," Creating File Layout Definitions, page 470.](#)

- If using PeopleSoft Integration Broker processing, complete the development activities for PeopleSoft Integration Broker processing described previously in this chapter.

See [Chapter 22, "Using the Inbound File Loader Utility," Development Activities for PeopleSoft Integration Broker Processing, page 469.](#)

- If using application class processing develop an application class that implements the IProcessFile interface and specify the processing rules as described previously in this chapter.

See [Chapter 22, "Using the Inbound File Loader Utility," Development Activities for Application Class Processing, page 471.](#)

Setting Up Inbound File Loader Processing Rules

This section discusses how to set up inbound flat file processing rules.

Understanding Setting Up Inbound File Loader Processing Rules

The Inbound File Loader utility uses information you define in the Inbound File Loader Rules page to determine the file layout and message combination, as well as other file attributes necessary for processing files.

Setting Up Inbound File Loader Processing Rules

Use the Inbound File Loader Rules page to specify the file layout and message to process, as well as define the parameters for processing. To access the page, select PeopleTools, Integration Broker, File Utilities, Inbound File Loader Rules. The following examples shows the page:

Inbound File Loader Rules

File Identifier:

TEST

Processing Options

*Inbound File:

File Type

☒ Data File

☐ Index File

File Layout ID:

*Status:

Inactive

Message Options

☐ Replace Data

Publish From:

Alternate Processing

Root Package ID:

Path:

Class Name:

Post-Processing

Program Name:

Section:

File Layout Mappings

Customize | Find | View All |   First 1 of 1 Last

Sequence	*Definition Name	*Service Operation		
	<div></div>	<div></div>	<div>+</div>	<div>-</div>

Inbound File Loader Rules page

Note. You can process multiple inbound flat files at one time. By specifying an inbound index file as part of the Inbound File Loader utility parameters. The system reads all input files within the index file and uses the associated file layout object and message to convert the data. Similarly, specify a wildcard in the filename in the inbound file rule component, but make sure that all files that meet the wildcard criteria correspond to the file layout and message mapping that are defined.

File Identifier

Displays the inbound file that you are associating with the rule.

Inbound File	Enter the index file name or the data file name of the inbound file to process. Specify the full path information. The PeopleCode program uses the <i>%filepath_absolute</i> variable when opening the file.
File Type	<p>In the File Type section, select the type of inbound file. The options are:</p> <ul style="list-style-type: none"> • Data File • Index File
File Layout ID	(Optional.) Enter a file layout ID to associate with the file. The file layout ID is used in a multiple file layout processing. This identifier indicates that the data that follows belongs in a new file layout.
Status	<p>From the Status drop-down list, select whether this inbound file rule is active. The valid options are:</p> <ul style="list-style-type: none"> • Active. • Inactive. (Default.)
Replace Data	<p>Check the box to indicate that the inbound file processing is a destructive load process.</p> <p>A destructive load process involves replacing the contents of the tables with new data from the file being processed. In a destructive load process, the service operations must be subscribed in the same order as they are published to ensure transactional integrity.</p> <p>If this check box is selected, the utility publishes a header message. The header message is a trigger in the subscription process to initialize tables before receiving the data messages. The subscription PeopleCode logic must check for the header message and perform any cleanup operation .</p> <p>The utility then publishes data messages containing the data followed by a Trailer Message. The trailer message is used as a trigger in the subscription process to indicate that all the data messages have been received.</p> <p>If the Replace Data check box is not selected, only data messages are published.</p> <p>When used in the context of application class processing, if the Replace Data flag is selected, the Init() and Finish() methods of the specified application class are invoked.</p>
Publish From	<p>Select the name of the publishing node.</p> <p>Use this option to simulate an inbound asynchronous transaction from an external node.</p> <p>While using this feature, you must create an inbound asynchronous transaction on the node from where the message is published.</p>
Root Package ID	Select the root package ID of the application class.
Path	Select the qualifying path of the application class.

Class Name	Select the application class name that contains the file processing logic.
Program Name and Section	Select a PeopleSoft Application Engine program and section to invoke when the utility finishes processing data.
Definition Name	Specify the file layout definition for the file(s) being processed. If the File Layout ID field is blank, this field should contain only one entry. If the File Layout ID field is not blank, this scroll area must contain an entry for each file layout definition name that is specified in the inbound file.
Service Operation	For every row in this scroll area, specify a service operation. The utility uses the message(s) defined within the service operation to copy the file rowsets into message rowsets

Note. Use the wildcards * and ? for the file name but not for the directory path. The file layout and service operation must be valid for all files that meet the wildcard criteria.

Initiating File Processing

This section discusses how to initiate inbound flat file processing.

Understanding Initiating File Processing

The Inbound File Processing page runs the Application Engine process PTIB_INFILE that initiates the file-to-message processing. The file-to-message processing function reads the file rowset and publishes it as a message.

If an index file exists when the inbound conversion process runs, the application engine program loads the list of files to be converted into a parameter table and completes a commit. The application engine program uses the list of files within the parameter table to restart the processing if a particular flat file fails. If a single data file is provided, then the rowset processing immediately begins.

The file publish process goes through each of the rowsets of the file layout and copies them into the message row sets.

If the audit action (AUDIT_ACTN) exists in the file, it is copied to the PSCAMA record. If the audit action does not exist in the file, the publishing process uses the default value that is specified in the file layout field property.

The Inbound File Loader utility publishes a new message when one of the following exists:

- The size of the data in the service operation exceeds the value of the Maximum Message Size field set in the PeopleTools Options page.

To view the value in the field, select PeopleTools, Utilities, Administration, PeopleTools Options.

- A new file layout is detected.

- End of file is reached.

The application engine program completes a commit every time a message is published from a file. After conversion, the flat file remains in the parameter table with a status of *Processed*.

Note. The file layout should exactly match the message layout (excluding the PSCAMA record) and should use the same character set as that used by the file: either American National Standards Institute or Unicode.

Initiating Inbound Flat File Processing

Use the Inbound File Processing page to initiate flat file processing. Select PeopleTools, Integration Broker, File Utilities, Inbound File Processing. The Inbound File Processing page, shown in the following example, appears:

Inbound File Processing

Run Control ID: 2

Report ManagerProcess MonitorRun

Process Request

Find | View AllFirst1 of 1Last

*Request ID:

+ -

Process Frequency

☐ Process Once

☐ Always Process

☐ Don't Run

Parameters

*File Identifier:

☐ Index Flag

File Layout ID:

Inbound File:

Inbound File Processing page

- Request ID

Enter a unique identifier to track the request.
- Process Frequency

Select the frequency for processing the file. The options are:

 - Process Once.
 - Always.
 - Don't Run.

File Identifier	Select or enter the name of the file identifier that you set up in the Inbound File Loader Rules. page. The file identifier is tied to the publish rules.
Index Flag	A read-only field that indicates if the file being processed is an index file or a data file. When checked, the Inbound File Loader utility is processing an index file.
File Layout ID	A read-only field that displays the file layout ID associated with the file in the Inbound File Loader Rules page.
Inbound File	A read-only field that displays the name of the file being processed.

Testing Inbound Flat File Processing

To test inbound files:

1. Create a sample flat file, or ask the third-party vendor for a sample flat file.
2. Set up processing rules for the test.

Select PeopleTools, Integration Broker, File Utilities, Inbound File Loader Rules to access the Inbound File Loader Rules page.

See [Chapter 22, "Using the Inbound File Loader Utility," Setting Up Inbound File Loader Processing Rules, page 474.](#)

3. Initiate file processing.

Select PeopleTools, Integration Broker, File Utilities, Inbound File Processing to access the Inbound File Processing page.

See [Chapter 22, "Using the Inbound File Loader Utility," Initiating Inbound Flat File Processing, page 478.](#)

4. Verify the inbound processing created a message that contains the sample flat file data.
 - a. If you used application class processing, verify if the production or staging tables are loaded with the correct field values. For production tables, look in the PeopleSoft application pages. For staging tables, use either the PeopleSoft application pages or run a query by using PeopleSoft Query.
 - b. If you used PeopleSoft Integration Broker for file processing, use the Service Operations Monitor to ensure the inbound file processing created a service operation that contains the sample flat file data.

Verify that the standard inbound notification process received the message and processed it into the application tables.

Determine whether the values become the inherited values (if you used the inherited value feature in file layout).

Validate that the production or staging tables loaded with the correct field values. For production tables, look in the PeopleSoft application pages. For staging tables, use either the PeopleSoft application pages or run a query by using PeopleSoft Query.

Ensure that the date formats conform.

Chapter 23

Copying Integration Metadata between PeopleSoft Databases

This chapter discusses how to:

- Copy integration metadata between PeopleSoft databases.
- Use data mover scripts to copy message schemas and WSDL.
- Converting message schemas and WSDL to managed objects.
- Manage nodes copied between databases and upgraded from earlier PeopleTools releases.

Copying Integration Metadata Between PeopleSoft Databases

This section provides an overview of copying metadata between PeopleSoft 8.50 databases and discusses data dependences and relationships when copying data.

Understanding Copying Integration Metadata Between PeopleSoft Databases

You can use PeopleSoft Application Designer's Project Copy functionality to copy integration metadata between PeopleSoft databases.

Message schema and WSDL became managed objects beginning with the PeopleTools 8.50 release. As a result, you can use Project Copy to copy message schemas and WSDL documents between PeopleTools 8.50 databases. However, to copy schema and WSDL between PeopleTools 8.50 databases and PeopleTools 8.49 or PeopleTools 8.48 databases, you must use the provided data mover scripts. These data mover scripts are discussed elsewhere in this chapter.

See [Chapter 23, "Copying Integration Metadata between PeopleSoft Databases," Using Data Mover Scripts to Copy Message Schema and WSDL Data, page 484.](#)

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Application Designer Lifecycle Management Guide, "Copying Projects and Definitions"

Understanding Data Dependencies and Relationships for Copying Data

When copying data between databases, you must be aware of data dependencies and relationships to ensure that no errors occur and to lessen the chance of encountering orphaned data.

Note. References to 'Project Copy' in the following table are references to the Project Copy feature in PeopleSoft Application Designer.

<i>Object Name</i>	<i>Comments</i>
Services.	<p>You can use Project Copy to copy services between databases.</p> <p>WSDL documents that exist for a service are not automatically copied with a service. You must include them in the copy project.</p>
WSDL documents.	<p>To copy WSDL to another PeopleTools 8.50 system, use Project Copy. To copy WSDL to earlier releases of PeopleTools, you must use data mover scripts to copy the data to the target database.</p>
Service operations.	<p>A service operation is tied to a service. If you copy a service operation in a project, the target database must already contain the service to which the service operation is tied in the database. If it does not, you must include that service in the copy project.</p> <p>Service operations cannot exist in a database without at least one service operation version - the default version. So when copying a service operation between databases, you need to be aware what the default service operation is and that you may possibly have to copy it to the target database as well.</p> <p>In addition, keep in mind that the relationship between services and service operations is stored as part of the Service object. So for example, if a service contains three operations you delete one of the three operations, you must include the service in the project. After the operation delete, the service is now linked to the remaining two operations and so it has changed and would need to be copied to the target database. It is not be enough to only copy the deleted operation in a Delete project; Deleting just the service operation doesn't delete the link to the service. If you don't follow this recommendation, you'll have orphaned data.</p>

Object Name	Comments
Service operation versions.	<p>A service operation version refers to a specific service operation. If you copy a service operation version, the target database must already contain the service operation. If it does not, you must include that service operation in the copy project.</p> <p>In addition, service operation versions refer to messages. If you copy a service operation version, the messages that are referenced for that service operation version must exist on the target database. If they do not, you must include them in the copy project.</p> <p>If WSDL documents have been generated for a service operation version, they are not automatically copied during the Project Copy process. Further, once you have copied a service operation version to the target database, it may appear that WSDL documents exist for a service operation version, when they do not. To avoid this situation, after you copy a service operation version to the target database, open the service definition to which the service operation belongs.</p> <p>If the View WSDL link appears, and when you click it WSDL appears, go back to the source database and export the generated WSDL documents to the target database. Another option is to delete the WSDL documents associated with a service operation before the Project Copy, and regenerate them on the target database.</p>
Service operation handlers.	<p>A service operation handler refers to a specific service operation. If you copy a service operation handler, the target database must already contain the service operation to which the handler refers. If it does not, you must include that service operation in the copy project.</p>
Service operation routings.	<p>Routing names are keys in the system.</p> <p>If you copy a routing, the sending and receiving nodes must be defined on the target database. If they are not defined on the target database, you must include them in your copy project.</p> <p>Routings reference a specific service operation version. If you copy a routing, the target database must already contain the service operation version to which the routing refers. If it does not, you must include that service operation version in the project.</p> <p>Routings also reference nodes. If you copy a routing, the target database must already contain the nodes being referenced. An exception to this is the local default node. During project copy, any routing referencing the local default node will be modified to reference the default local node of the target system.</p> <p>If the system detects a duplicate routing definition during the project copy process, the routing definition in the project being copied overwrites the routing definition in the database. To detect and delete any duplicate routings in the database outside the project copy process, run the duplicate routings check.</p> <p>See Chapter 15, "Managing Service Operation Routing Definitions," Deleting Duplicate Routing Definitions, page 318.</p>
Messages.	<p>Container messages and message parts must have message schemas to function properly. You should also move message schemas along with your messages.</p>
Service operation queues.	NA

Object Name	Comments
Message schemas.	<p>To copy message schemas to another PeopleTools 8.50 system, use Project Copy. To copy message schemas to earlier releases of PeopleTools, you must use data mover scripts to copy the data to the target database.</p> <p>You should copy message schema along with all messages you copy from one database to another.</p>

See Also

Chapter 23, "Copying Integration Metadata between PeopleSoft Databases," Using Data Mover Scripts to Copy Message Schema and WSDL Data, page 484

Using Data Mover Scripts to Copy Message Schema and WSDL Data

The following table lists the data mover scripts that PeopleSoft provides to move message schema and WSDL documents between PeopleTools 8.50 databases and PeopleTools 8.48 databases or PeopleTools 8.49 databases. These scripts are located in the <PS_HOME>\scripts directory.

Object	Script Name	Description
Message schema.	PSIBMSGSCHEMA_EXP.DMS	Export a message schema from a PeopleTools 8.50 database.
Message schema.	PSIBMSGSCHEMA_IMP.DMS	Import a message schema into a PeopleTools 8.50 database.
WSDL document.	PSIBWSDL_EXP.DMS	Export a WSDL document from a PeopleTools 8.50 database.
WSDL document.	PSIBWSDL_IMP.DMS	Import a WSDL document into a PeopleTools 8.50 database.

The WSDL data mover scripts move WSDL by WSDL name, not service name. Therefore it is possible to select specific WSDL for importing/exporting for a given service.

You may encounter errors while moving large WSDL documents and schemas from a Microsoft SQL, Oracle or Informix platform to a Sybase or DB2 (UNIX or OS/390) platform, because of size restrictions in Sybase and DB2. The maximum size of WSDL documents from Microsoft SQL, Oracle or Informix platforms to DB2 or Sybase platforms is described in the following table:

Platform	Maximum WSDL Size (Bytes)
DB2 – UNIX	32700
DB2 – OS/390	31744
Sybase	32000

Converting WSDL Documents and Message Schemas to Managed Objects

This section discusses how to:

- Use the Metadata WSDL/Schema Convert page.
- Convert WSDL documents and message schemas to managed objects.
- Convert message schemas to managed objects.
- Delete data from the deprecated data repository.

Understanding Converting WSDL Documents and Message Schema to Managed Objects

This section discusses converting WSDL documents and XML message schema to managed objects. It also discusses the deprecated data repository.

WSDL Documents and Message Schema as Managed Objects

Beginning in PeopleTools 8.50, WSDL documents and XML message schema are managed objects.

After you copy WSDL and schema from earlier releases, PeopleSoft Integration Broker enables you to convert the data to managed objects. (To copy WSDL and XML message schema from earlier versions of PeopleTools, use the data mover scripts described previously in this chapter.)

See [Chapter 23, "Copying Integration Metadata between PeopleSoft Databases," Using Data Mover Scripts to Copy Message Schema and WSDL Data, page 484.](#)

In addition, during the PeopleTools upgrade process the system automatically attempts to convert WSDL and schema metadata into managed objects. However, if the system is unable to convert the copied or upgraded data, you can convert it in the PeopleTools 8.50 system.

Deprecated Data Repository

WSDL documents and XML message schema data that you copy from earlier PeopleTools releases to a PeopleTools 8.50 database is stored in a deprecated data repository in the database. WSDL and schema that do not properly convert to managed objects during the upgrade process are also stored in this repository.

After you convert WSDL and schema to managed objects, the system moves the data to the metadata repository.

You can leave data that you do not convert in the deprecated data repository, or you can delete it from the system.

Using the Metadata Convert/Schema Convert Page

Use the Service Administration – Metadata Convert/Schema Convert page (IB_META_CONV) to convert WSDL documents and message schemas to managed objects. To access the page select PeopleTools, Integration Broker, Service Utilities, Service Administration and click the Metadata WSDL/Schema Convert tab. The following graphic shows the Service Administration – Metadata Convert/Schema Convert page:

⏪

Routings

Deprecated PeopleCode

Service Activate/Deactivate

Metadata WSDL/Schema Convert

Service:

Search

Non-Metadata WSDL

Customize | Find | View All | First 1 of 1 Last

Select	Service	WSDL Name	WSDL Exists	Results
<input type="checkbox"/>			<input type="checkbox"/>	

Convert

Delete

Message Name:

Search

Non-Metadata Schemas

Customize | Find | View All | First 1 of 1 Last

Select	Message	Version	Schema Exists	Results
<input type="checkbox"/>			<input type="checkbox"/>	View Schema

Convert

Delete

Metadata WSDL/Schema Convert page

Use the top portion of the page to convert WSDL documents to managed objects. Use the bottom portion of the page to convert XML message schemas to managed objects. The page enables you to work with one WSDL document or message schema at a time, or you can work with all data in the deprecated data repository at once.

When working with message schema, you can also use the provided View Schema link on the page to view schemas before converting them.

This page also enables you to delete data from the deprecated data repository that you do not want to convert to managed objects or that you no longer need.

The following sections describe how to accomplish these tasks in greater detail.

Converting WSDL Documents to Managed Objects

This section discusses how to convert WSDL documents to managed objects.

To convert a WSDL document to a managed object:

1. Access the Service Administration – Metadata Convert/Schema Convert page (PeopleTools, Integration Broker, Service Utilities, Service Administration, Metadata Convert/Schema Convert).

2. Select the WSDL document(s) to convert:

- To select a specific service for which to convert WSDL, in the Service field, enter the service name.
- To select from all services in the deprecated data repository, click the Search button under the Service field.

Search results appear in the Non-Metadata WSDL grid.

3. In the Non-Metadata WSDL grid, check the box next to each service name for which to convert WSDL.

If a check appears in the WSDL Exists box, WSDL already exists as a managed object for the service. You can choose to use the existing WSDL, or select the box in the Select column to convert the WSDL again and overwrite the existing WSDL.

4. Click the Convert button under the Non-Metadata WSDL grid..

5. The status of the conversion for each service you selected appears in the Results field.

Converting Message Schemas to Managed Objects

This section discusses how to convert XML message schema to managed objects.

To convert message schemas to managed objects:

1. Access the Service Administration – Metadata Convert/Schema Convert page (PeopleTools, Integration Broker, Service Utilities, Service Administration, Metadata Convert/Schema Convert).

2. Select the XML message schema(s) to convert:

- To select a specific schema to convert, in the Message Name field, enter the message name.
- To select from all schema in the deprecated data repository, click the Search button under the Message Name field.

Search results appear in the Non-Metadata Schemas grid.

3. In the Non-Metadata Schemas grid, check the box next to each message name that contains the schema to convert.

If a check appears in the Schema Exists box, XML message schema already exists as a managed object for the message. You can choose to use the existing managed object schema, or select the box in the Select column to convert the schema again and overwrite the existing schema.

4. Click the Convert button under the Non-Metadata Schemas grid.

5. The status of the conversion for each message schema that you converted appears in the Results field.

If you are unable to convert a schema to a managed object, rebuild the schema:

- For rowset-based messages, open the message in the Messages-Message Definition page and save the message. Upon Save, PeopleSoft Integration Broker automatically builds the schema for the message.

- For nonrowset-based messages use one of the following options to rebuild the schema:
 - Access the schema using the View Schema link on the Metadata Convert/Schema Convert page and copy it to the Messages-Schema page and correct and save the schema.
 - Access the schema using the View Schema link on the Metadata Convert/Schema Convert page and copy it into an XML editor and correct the schema. Then upload it into the system using the Messages-Schema page.
 - Upload or create a new schema using the Messages-Schema page.

See Also

Chapter 6, "Managing Messages," Managing XML Message Schemas for Rowset-Based Messages, page 90

Chapter 6, "Managing Messages," Adding XML Message Schemas to Nonrowset-Based Messages, page 93

Deleting Data from the Deprecated Data Repository

This section discusses how to delete WSDL documents and XML message schemas from the deprecated data repository.

To delete data from the deprecated data repository:

1. Access the Service Administration – Metadata Convert/Schema Convert page (PeopleTools, Integration Broker, Service Utilities, Service Administration, Metadata Convert/Schema Convert).
2. Select the WSDL document(s) or XML message schema(s) to delete:
 - To select a specific WSDL document to delete, in the Service field, enter the service name.
 - To select from all services in the deprecated data repository, click the Search button under the Service field.
 - To select a specific schema to delete, in the Message Name field, enter the message name.
 - To select from all schema in the deprecated data repository, click the Search button under the Message Name.

Search results appear in the appropriate WSDL or schema grid.

3. In the WSDL or schema grid, check the Select box next to the data to delete.
4. Click the Delete button under the grid in which the data to delete appears.

Managing Nodes Copied Between Databases and Upgraded from Earlier PeopleTools Releases

The user ID on any nodes that you copy to a database using Project Copy or that you upgrade from earlier PeopleTools releases must be:

- Valid in the target database.
- Assigned to the permission lists of any service operation that you intend to use.

Appendix A

Integration Scenarios

This appendix provides an overview of the basic integration scenarios you can implement using PeopleSoft Integration Broker and discusses how to:

- Integrate with PeopleSoft Integration Broker systems.
- Integrate with PeopleSoft Integration Broker systems through a firewall.
- Integrate with PeopleSoft Integration Broker systems by using hubs.
- Integrate with third-party systems.
- Integrate with third-party systems by using remote gateways.
- Integrate with PeopleTools 8.47 and earlier PeopleTools 8.4x systems.
- Integrate with PeopleTools 8.1x systems.

Understanding Integration Setup

An integration engine is automatically installed as part of your PeopleSoft application, and an integration gateway is installed as part of the PeopleSoft Pure Internet Architecture. However, there's no requirement that your integration gateway be on the same machine as the integration engine.

In general, the high-level tasks that you perform to configure any of the integration scenarios are:

- Define a local integration gateway.
- Define a remote integration gateway.
- Set integration gateway properties.
- Set up a local node.
- Set up a remote node.
- Create service operations with inbound and outbound routing definitions.

You may not need to perform all of these tasks. For example, if you don't need to communicate through a firewall, you probably don't need to define a remote gateway.

Application messaging, the precursor to PeopleSoft Integration Broker, employed content-based routing—each message had to provide its own routing information, which was defined in the message header. With PeopleSoft Integration Broker, you define the routing information separately. You can apply multiple routings to a message and change the routings independent of the message definition.

Defining Local and Remote Integration Gateways

On each PeopleSoft Integration Broker system in your configuration, you must specify a local integration gateway. The local gateway is the application's first point of contact with other PeopleSoft applications, third-party systems, PeopleSoft Integration Broker hubs, and remote gateways. You must define exactly one local gateway for each integration engine, but a single installed gateway can serve multiple engines. The web server where the integration gateway resides can be any machine on which you've installed the PeopleSoft Pure Internet Architecture.

To define the local gateway, use the Gateways component (IB_GATEWAY) to:

- Add the gateway that the application will use to communicate with other systems.
- Specify the uniform resource locator (URL) of the gateway's PeopleSoft listening connector.

This is the connector that receives messages from an integration engine (including the default local node) or another integration gateway.

- Register the target connectors that are delivered with PeopleSoft Integration Broker.

These target connectors are automatically installed during the PeopleSoft Pure Internet Architecture installation process. When you subsequently define local and remote nodes, you specify—from the list of installed target connectors—which connector the local gateway should use to send messages to each node.

Note. The remote gateway default connector setting in the integrationGateway.properties file, `ig.connector.defaultremoteconnector`, determines through which connector the gateway routes messages that are bound for other gateways. By default, this property is set to the HTTP target connector, `HTTPPTARGET`. Never change this setting unless you develop a custom connector to handle this routing.

An integration gateway also includes a set of listening connectors, which are likewise installed with the PeopleSoft Pure Internet Architecture. You don't need to specify these connectors directly; third-party systems send messages to the gateway by specifying the URL of an appropriate listening connector.

Setting Integration Gateway Properties

You set integration gateway properties by using the gateway's primary configuration file, called `integrationGateway.properties`. You must set an Oracle Jolt connect string in this file to enable communication with each PeopleSoft Integration Broker node that will be involved in an integration that uses this gateway.

The following example shows the required Oracle Jolt connect string setting:

```
ig.isc.<nodename>.serverURL=//<machine_name>:<jolt_port>
ig.isc.<nodename>.userid=<database_user_id>
ig.isc.<nodename>.password=<database_password>
ig.isc.<nodename>.toolsRel=<peopletools_release_version>
```

Note. You can also configure a default Oracle Jolt connect string to specify the target node to use when a message arrives at the gateway but doesn't specify a node name matching any of the existing entries. The default Oracle Jolt connect string settings are identical to the others, except that they don't include a node name. You can specify any PeopleSoft Integration Broker node as the default node, including any of the existing entries.

Configuring Local and Remote Nodes

Use the Nodes component (IB_NODE) to configure local and remote nodes.

When you configure nodes, use the Nodes - Connectors page to specify the gateway and target connector to use to send messages to each node. Use the information in the following table as a guide for choosing the appropriate information for the configuration scenarios that are described in this appendix:

Scenario	System	Node Definition	Connector
PeopleSoft as a web service provider.	NA	NA.	Not applicable (NA)*
PeopleSoft Integration Broker to PeopleSoft Integration Broker.	Both applications.	Default local.	NA*
PeopleSoft Integration Broker to PeopleSoft Integration Broker.	Both applications.	Remote.	PSFTTARGET (PeopleSoft target connector)
PeopleSoft Integration Broker to PeopleSoft systems.	Both applications.	Default local.	NA*
PeopleSoft Integration Broker to PeopleSoft systems.	Both applications.	Remote.	PSFTTARGET (PeopleSoft target connector)
PeopleSoft Integration Broker to PeopleSoft Integration Broker by using a remote gateway.	Both applications.	Default local.	NA*
PeopleSoft Integration Broker to PeopleSoft Integration Broker by using a remote gateway.	Both applications.	Remote.	PSFTTARGET
PeopleSoft Integration Broker to PeopleSoft Integration Broker by using a hub.	Both applications.	Default local.	NA*
PeopleSoft Integration Broker to PeopleSoft Integration Broker by using a hub.	Both applications.	Remote.	PSFTTARGET

Scenario	System	Node Definition	Connector
PeopleSoft Integration Broker to PeopleSoft Integration Broker by using a hub.	PeopleSoft Integration Broker hub.	Default local.	NA*
PeopleSoft Integration Broker to PeopleSoft Integration Broker by using a hub.	PeopleSoft Integration Broker hub.	Remote	PSFTTARGET
PeopleSoft Integration Broker to a third party.	PeopleSoft Integration Broker.	Default local.	NA*
PeopleSoft Integration Broker to a third party.	PeopleSoft Integration Broker.	Remote.	Third-party connector, as appropriate: <ul style="list-style-type: none"> • HTTPTARGET (HTTP target connector) • JMSTARGET (Java Message Service [JMS] target connector) target connector) • FTPTARGET (File Transfer Protocol [FTP] target connector) • SMTPTARGET (Simple Mail Transfer Protocol [SMTP] target connector)
PeopleSoft Integration Broker to a third party.	Third-party system.	NA.	NA
PeopleSoft Integration Broker to a third party by using a remote gateway.	PeopleSoft Integration Broker.	Default local.	NA*

Scenario	System	Node Definition	Connector
PeopleSoft Integration Broker to a third party by using a remote gateway.	PeopleSoft Integration Broker.	Remote.	Third-party connector, as appropriate: <ul style="list-style-type: none"> • HTTPTARGET • JMSTARGET • FTPTARGET • SMTPTARGET
PeopleSoft Integration Broker to a third party by using a remote gateway.	Third-party system.	NA.	NA
PeopleSoft Integration Broker to PeopleSoft Integration Broker on PeopleTools 8.47 and earlier PeopleTools 8.4x systems.	Both applications.	Default local.	NA
PeopleSoft Integration Broker to PeopleSoft Integration Broker on PeopleTools 8.47 and earlier PeopleTools 8.4x systems.	Both applications.	Remote.	PSFTTARGET (PeopleSoft target connector)
PeopleSoft Integration Broker to PeopleTools 8.1x systems.	PeopleSoft Integration Broker.	Default local.	NA*
PeopleSoft Integration Broker to PeopleTools 8.1x systems.	PeopleSoft Integration Broker.	Remote.	PSFT81TARGET (PeopleSoft 8.1 target connector)
PeopleSoft Integration Broker to PeopleTools 8.1x systems.	PeopleSoft 8.1x system.	NA. Set up message nodes, message channels, messages, and so on.	NA

* The default connector is PSFTTARGET, but it is not used.

See Also

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Using the integrationGateway.properties File

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

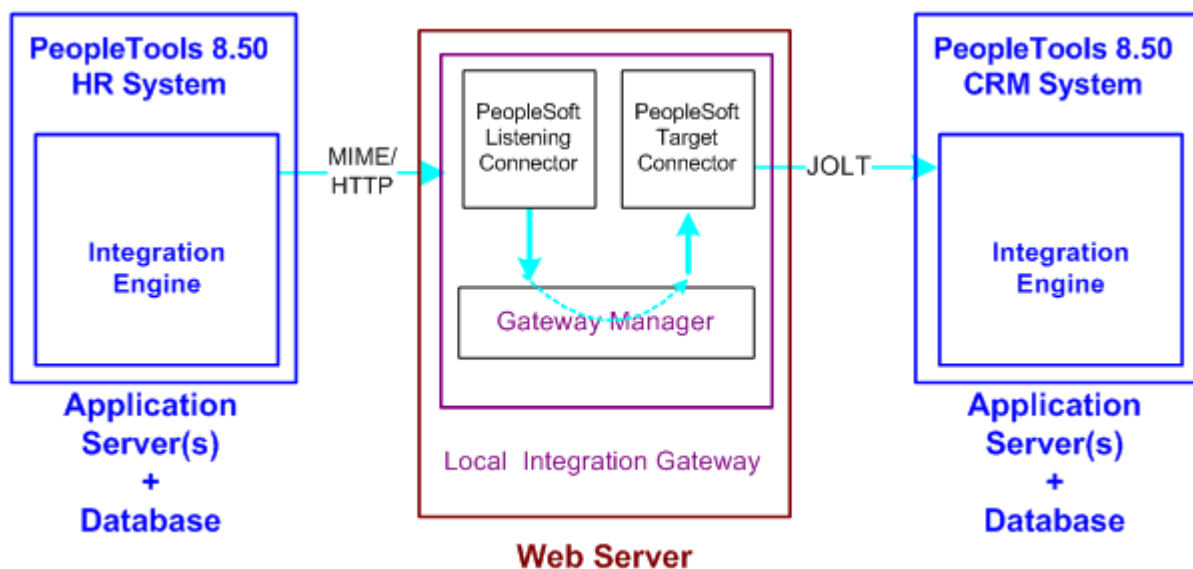
Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Integrating with PeopleSoft Integration Broker Systems

This section provides an overview of this scenario and discusses how to configure the system for this scenario.

Understanding This Scenario

This diagram shows a PeopleSoft Human Resources system communicating with a PeopleSoft Customer Relationship Management (PeopleSoft CRM) system and shows the configuration and interaction of PeopleSoft Integration Broker components:



Integrations with PeopleSoft Integration Broker systems

This communication can be synchronous or asynchronous.

Configuring the System for This Scenario

This section describes the source and destination system configuration tasks, based on the scenario shown in the previous diagram. In this example, the PeopleSoft Human Resources system is the source system and the PeopleSoft CRM system is the destination system.

This section discusses how to configure:

- The integration gateway.
- The PeopleSoft Human Resources system.
- The PeopleSoft CRM system.

Configuring the Integration Gateway

The only required property that you must set for the local gateway is the Oracle Jolt connect strings that enable the gateway to find the PeopleSoft CRM system. Set this property in the `integrationGateway.properties` file.

Configuring the PeopleSoft Human Resources System

Perform the following tasks on the PeopleSoft Human Resources system:

1. Define the local integration gateway for the PeopleSoft Human Resources system by using the Gateways component.

Any integration gateway that you've installed and configured to find the PeopleSoft CRM system can serve this role. Specify the gateway's PeopleSoft listening connector as the gateway's URL.

2. Configure the default local node definition that represents the PeopleSoft system by using the Nodes component.

This node is delivered predefined on the system.

3. Define a remote node to represent the PeopleSoft CRM system.

Because the PeopleSoft CRM system uses PeopleSoft Integration Broker, specify the local gateway for the PeopleSoft Human Resources system and its PeopleSoft target connector on the Node Definitions - Connectors page.

4. Define a service operation that specifies the request message, the service operation handler definition and routing definition.

The routing is a point-to-point routing where the PeopleSoft CRM node is the receiving node and the PeopleSoft HR system is the sending node.

Configuring the PeopleSoft CRM System

Perform the following tasks on the PeopleSoft CRM system:

1. Define the local integration gateway for the PeopleSoft CRM system by using the Gateways component.

Any integration gateway that you've installed and configured can serve this role, including the local gateway for the PeopleSoft Human Resources system. Specify the gateway's PeopleSoft listening connector as the gateway's URL.

2. Configure the default local node definition that represents the PeopleSoft CRM system by using the Nodes component.

This node is delivered predefined on the system.

3. Define a remote node to represent the PeopleSoft Human Resources system.

Because the PeopleSoft Human Resources system uses PeopleSoft Integration Broker, specify the local gateway for the PeopleSoft CRM system and its PeopleSoft target connector on the Node Definitions - Connectors page.

4. Define a service operation that specifies the request message, the service operation handler definition and routing definition.

The routing is a point-to-point routing where the PeopleSoft CRM node is the receiving node and the PeopleSoft HR system is the sending node.

5.

See Also

[Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491](#)

[Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216](#)

[Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216](#)

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

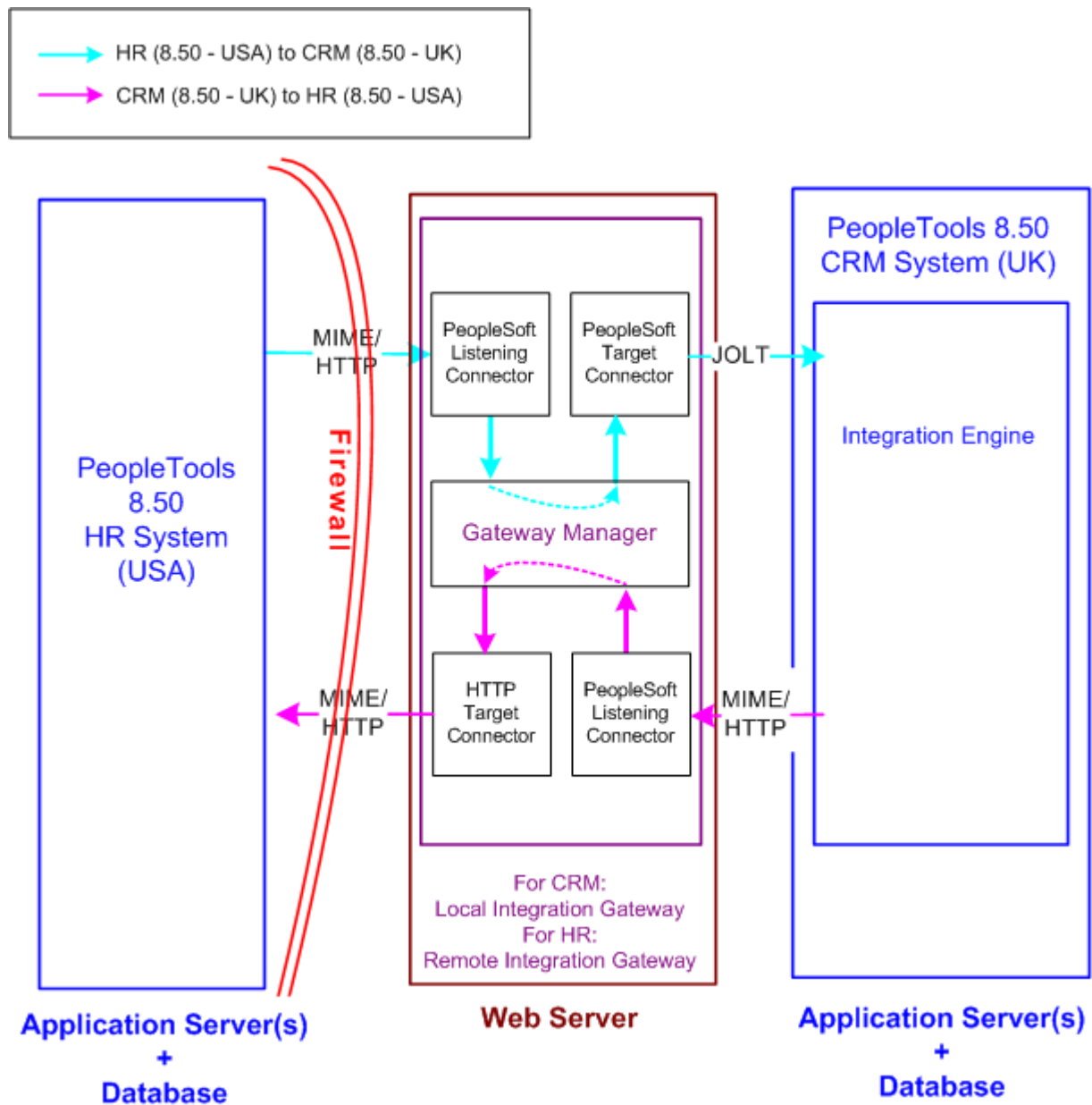
Integrating with PeopleSoft Integration Broker Systems Through Firewalls

This section provides an overview of this scenario and discusses how to configure the system for this scenario.

Understanding This Scenario

Use a remote gateway configuration when connections with an integration participant are not possible through the internet. This type of implementation enables you to communicate with wide area networks (WANs) and local area networks (LANs) where a firewall is present.

This diagram shows the configuration of PeopleSoft Integration Broker components for integrations with other PeopleSoft Integration Broker systems by using a remote gateway:



Integrations with PeopleSoft Integration Broker systems by using remote gateways

For this configuration scenario, one PeopleSoft application and one integration gateway reside on each side of the firewall. The integration gateway can reside on the same physical machine on which you have installed the PeopleSoft application, or it can reside on its own machine.

In this configuration scenario, PeopleSoft Integration Broker uses the default remote gateway connector, the HTTP target connector, on the local gateway to send messages to the PeopleSoft listening connector on the remote gateway. Routing all messages through the local gateway enables each PeopleSoft Integration Broker system to keep its own centralized log of all integration messages.

Because this example shows two-way communication and assumes that the same service operation is being exchanged, the PeopleSoft Human Resources (USA) system and the PeopleSoft CRM (UK) system are source systems when they send messages, and they're destination systems when they receive messages.

Keep in mind the following as you review these configuration tasks:

- You should use a single integration gateway for all applications that reside on the same side of a firewall.
- The local integration gateway for one application is the remote integration gateway for the other application.

Configuring the System for This Scenario

This section describes the configuration tasks for each of the components that are shown in the previous diagram.

This section discusses how to configure:

- The PeopleSoft Human Resources (USA) system.
- The PeopleSoft Human Resources (USA) integration gateway.
- The PeopleSoft CRM (UK) system.
- The PeopleSoft CRM (UK) integration gateway.

Configuring the PeopleSoft Human Resources (USA) System

On the PeopleSoft Human Resources (USA) system:

1. Define a local integration gateway.

Use the Gateways component to define the local PeopleSoft Human Resources (USA) gateway.

2. Define a remote integration gateway.

The remote integration gateway for the PeopleSoft Human Resources (USA) system is the PeopleSoft CRM (UK) gateway. Use the Gateways component to define a new gateway, and for the gateway URL, specify the PeopleSoft listening connector of the PeopleSoft CRM (UK) gateway.

3. Define the default local node.

Use the Nodes component to define the default local node, which represents the PeopleSoft Human Resources (USA) system.

4. Define a remote node.

The remote node that you define represents the PeopleSoft CRM (UK) system. When you set up the remote node, specify the PeopleSoft CRM (remote) integration gateway and the PeopleSoft target connector on that gateway.

5. For the outbound integration, define a service operation that specifies the request and response messages, the service operation handler definition, and the outbound routing definition.

The outbound routing is a point-to-point routing where the PeopleSoft HR node is the sending node and the PeopleSoft CRM node is the receiving node.

6. For the inbound integration, on the same service operation create a routing definition where the PeopleSoft HR system is the receiving node and the PeopleSoft CRM system is the sending node.

Note. The external alias you specify on the inbound routing definition must match the external alias on the outbound routing definition you created in the previous step.

Configuring the PeopleSoft Human Resources (USA) Integration Gateway

The only required integration gateway property that you must set for the PeopleSoft Human Resources (USA) integration gateway is the Oracle Jolt connect strings that enable communication with the integration engine on the PeopleSoft Human Resources (USA) system. Set this property in the `integrationGateway.properties` file.

Configuring the PeopleSoft CRM (UK) System

On the PeopleSoft CRM (UK) system:

1. Define a local integration gateway.

Use the Gateways component to define the local PeopleSoft CRM (UK) gateway.

2. Define a remote integration gateway.

The remote integration gateway for the PeopleSoft CRM (UK) system is the PeopleSoft Human Resources (USA) gateway. Use the Gateways component to define a new gateway, and for the gateway URL, specify the PeopleSoft listening connector of the PeopleSoft Human Resources (USA) gateway.

3. Define the default local node.

Use the Nodes component to define the default local node, which represents the PeopleSoft CRM (UK) system.

4. Define a remote node.

The remote node that you define represents the PeopleSoft Human Resources (USA) system. When you set up the remote node, specify the PeopleSoft Human Resources (remote) integration gateway and the PeopleSoft target connector on that gateway.

5. For the outbound integration, define a service operation that specifies the request and response messages, the service operation handler definition, and the outbound routing definition.

The outbound routing is a point-to-point routing where the PeopleSoft HR node is the receiving node and the PeopleSoft CRM node is the sending node.

6. For the inbound integration, on the same service operation create a routing definition where the PeopleSoft HR system is the sending node and the PeopleSoft CRM system is the receiving node.

Note. The external alias you specify on the inbound routing definition must match the external alias on the outbound routing definition you created in the previous step.

Configuring the PeopleSoft CRM (UK) Integration Gateway

The only required integration gateway property that you must set for the PeopleSoft CRM (UK) integration gateway is the Oracle Jolt connect strings that enable communication with the integration engine on the PeopleSoft CRM (UK) system. Set this property in the `integrationGateway.properties` file.

See Also

[Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491](#)

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

[Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216](#)

[Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216](#)

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Integrating with PeopleSoft Integration Broker Systems by Using Hubs

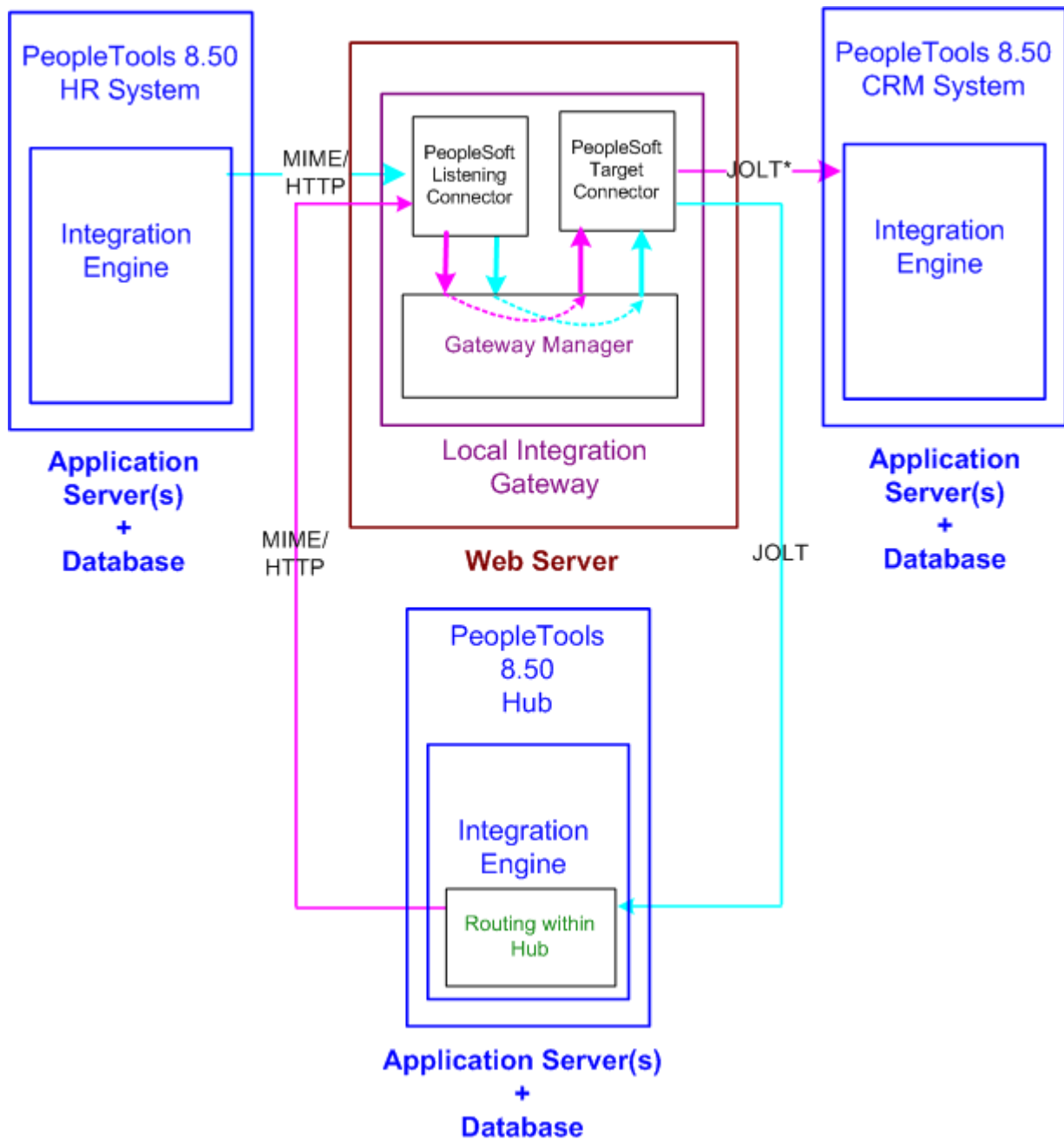
This section provides overviews of this scenario and hub routing types and discusses how to configure:

- Generic routing hubs.
- Sender-specified routing hubs.

Understanding This Scenario

A PeopleSoft Integration Broker hub configuration includes an integration engine that houses routing rules and transformations. All integrations are routed through the hub, which enables you to centralize routing rules and offload the transformation process.

This diagram shows a one-way hub configuration scenario that involves a PeopleSoft Human resources system and a PeopleSoft CRM system:



Integrations with PeopleSoft Integration Broker systems using a hub.

In this scenario, all of the routing rules and transformations are located on the hub.

To implement integrations between the two systems without a hub, you must set up a complete set of complementary routing rules and transformations on each node.

Understanding Hub Routing Types

There are two hub routing types: generic routing and sender-specified routing. The configuration steps for a hub vary, depending on which routing type you choose.

With generic routing, all transactions from the participating systems are sent directly to a hub for routing and transformation.

With sender-specified routing, a destination node name is passed as a parameter to a PeopleCode Publish or SyncRequest method, such as %intBrokerPublish or %intBroker.SyncRequest, to explicitly route the outbound transactions to the necessary node. Using sender-specified routing requires that you define the explicit destination nodes on the sending system. However, you can configure the system so that PeopleSoft Integration Broker passes these outbound transactions to the hub for possible rerouting and transformation.

Note. You must use sender-specific routing when you're using PublishXMLDoc to asynchronously publish an XML object.

Regardless of which hub routing you use, you must configure each PeopleSoft application's integration engine, the integration gateway, and the PeopleSoft Integration Broker hub. A PeopleSoft Integration Broker hub can be an installed PeopleSoft application, or it can have only a stand-alone PeopleTools database installed, which includes the integration engine.

Configuring Generic-Routing Hubs

By using the elements in the previous diagram as an example, this section provides an overview of how to configure a generic-routing hub. In the scenario, the PeopleSoft Human Resources system, the PeopleSoft CRM system, and the hub must all point to the same integration gateway and use the same gateway URL.

This section discusses how to configure:

- The PeopleSoft Human Resources system.
- The PeopleSoft CRM system.
- The PeopleSoft hub.
- The integration gateway.
- The generic-routing hub.

Configuring the PeopleSoft Human Resources System

On the PeopleSoft Human Resources system:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Set up a local node.

Use the Nodes component to set up the local node, which represents the PeopleSoft Human Resources system.

3. Set up a remote node.

Use the Nodes component to set up the remote node, which represents the hub system.

4. Create a service operation.

Use the Service Operations component to set up a service operation. Define the request message, service operation handler definition, and routing definition.

Create a point-to-point routing definition where the PeopleSoft HR system is the sending node and the hub system is the receiving node.

Configuring the PeopleSoft CRM System

On the PeopleSoft CRM system:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Set up a local node.

Use the Node Definition component to set up the local node, which represents the PeopleSoft CRM system.

3. Set up a remote node.

Use the Node Definition component to set up the remote node, which represents the hub system.

4. Create a service operation.

Use the Service Operations component to set up a service operation.

Create an inbound point-to-point routing definition where the sending node is the hub system and the receiving node is the PeopleSoft CRM system.

Configuring the PeopleSoft Hub

On the PeopleSoft hub:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Set up a local node.

Use the Node Definition component to set up the local node, which represents the hub system.

3. Set up remote nodes.

Set up two remote nodes: one that represents the PeopleSoft Human Resources system and another that represents the PeopleSoft CRM system.

4. Create a service operation.

Use the Service Operations component to set up a service operation.

Create an outbound point-to-point routing definition where the sending node is the PeopleSoft HR system and the receiving node is the PeopleSoft CRM system.

Configuring the Integration Gateway

You must set integration gateway properties for the local gateway. The only required properties are the Oracle Jolt connect string properties that enable communication with the integration engines on the PeopleSoft Human Resources, PeopleSoft CRM, and PeopleSoft hub systems. Set these properties in the integrationGateway.properties file.

Configuring the Generic-Routing Hub

For all messages going through the hub, you must set up a service operation and routing on the hub. By using the systems in the diagram as an example, the following table shows the node, service operation, and routing configurations that are required for generic routing through a hub:

<i>Item to Configure</i>	<i>PeopleSoft Human Resources System</i>	<i>Integration Broker Hub</i>	<i>PeopleSoft CRM System</i>
Local nodes	Rename the default local node to represent the PeopleSoft Human Resources system.	Rename the default local node to represent the hub.	Rename the default local node to represent the PeopleSoft CRM system.
Remote nodes	Define a remote node to represent the hub system.	Define remote nodes to represent the PeopleSoft Human Resources and CRM systems.	Define a remote node to represent the hub.
Service operations and routings.	Define outbound routing to the hub system.	Create a service operation that contains an outbound point-to-point routing definition where the sending node is the PeopleSoft HR system and the receiving node is the PeopleSoft CRM system.	Define inbound routing from the hub system.

See Also

[Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491](#)

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

[Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216](#)

[Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216](#)

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Configuring Sender-Specified Routing Hubs

By using the systems shown in the previous diagram as an example, this section provides an overview of how to configure a sender-specific routing hub. The PeopleSoft Human Resources system is the sending system and the PeopleSoft CRM system is the receiving system. In this scenario, the sending system, the receiving system, and the hub must all point to the same gateway and use the same gateway URL.

This section discusses how to configure:

- The PeopleSoft Human Resources (sending) system.
- PeopleSoft CRM (receiving) system.
- The PeopleSoft hub.
- The integration gateway.
- The sender-specified routing hub.

Configuring PeopleSoft Human Resources (Sending) System

On the PeopleSoft Human Resources system:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Set up a local node.

Use the Nodes component to set up the local node, which represents the PeopleSoft Human Resources system.

3. Set up remote nodes.

Set up two remote nodes: one for the receiving system (PeopleSoft CRM in the example) and one for the hub. When setting up the PeopleSoft CRM remote node, on the Nodes-Node Definitions page in the Hub Node field, enter the node name of the hub system.

4. Create a service operation.

Use the Service Operations component to create a service operation that contains an outbound point-to-point routing definition where the sending node is the PeopleSoft HR system and the receiving node is the PeopleSoft CRM system.

Configuring PeopleSoft CRM (Receiving System)

On the PeopleSoft CRM system:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Set up a local node.

Use the Nodes component to set up the local node, which represents the PeopleSoft CRM system.

3. Set up a remote node.

Use the Nodes component to set up a node that represents the hub.

4. Create a service operation.

Use the Service Operations component to create a service operation that contains an inbound point-to-point routing definition where the sending node is the hub system and the receiving node is the PeopleSoft CRM system.

5. Create a service operation.

Use the Service Operations component to create a service operation that contains an inbound point-to-point routing definition where the sending node is the hub system and the receiving node is the PeopleSoft CRM system.

Configuring the PeopleSoft Hub

On the PeopleSoft hub:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Set up a local node.

Use the Nodes component to set up the local node, which represents the hub system.

3. Set up remote nodes.

Use the Nodes component to set up two remote nodes: one for the PeopleSoft Human Resources system and one for the PeopleSoft CRM system.

4. Create a service operation.

Use the Service Operations component to create a service operation that contains a point-to-point routing where the sending node is the PeopleSoft HR node and the receiving node is the CRM node.

Configuring the Integration Gateway

The only required integration gateway properties for the local integration gateway are the Oracle Jolt connect string properties that enable communication with the integration engines on the target PeopleSoft Integration Broker systems. Set these properties in the `integrationGateway.properties` file.

Configuring the Sender-Specified Routing Hub

For all messages going through the hub, you must set up transactions and relationships on the hub. By using the systems in the previous diagram as example, the following table shows the node, transaction, and relationship configurations that are required for sender-specified routing through a hub from the PeopleSoft Human Resources system:

<i>Item to Configure</i>	<i>PeopleSoft Human Resources System</i>	<i>PeopleSoft Integration Broker Hub</i>	<i>PeopleSoft CRM System</i>
Local nodes	Rename the default local node to represent the PeopleSoft Human Resources system.	Rename the default local node to represent the hub.	Rename the default local node to represent the PeopleSoft CRM system.
Remote nodes	Define remote nodes to represent the PeopleSoft CRM and hub systems.	Define remote nodes to represent the PeopleSoft Human Resources and CRM systems.	Define a remote node to represent the hub.
Service operations and routings.	Create a service operation that contains an outbound point-to-point routing definition that specifies the receiving node is the PeopleSoft CRM system.	Create a service operation that contains a point-to-point routing where the sending node is the PeopleSoft HR node and the receiving node is the CRM node.	Create a service operation that contains an inbound point-to-point routing definition where the sending node is the hub system and the receiving node is the PeopleSoft CRM system.

All messages to the PeopleSoft CRM node are the result of publish statements, which include these target node parameters:

- msg.Publish(Node.CRM)
- SyncRequest(Node.CRM)
- %intBroker.publish(&MyDoc, Message.MyMessage, Node.CRM)
- %intBroker.SyncRequest(&MyDoc, Message.MyMessage, Node.CRM)

See Also

Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216

Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Integrating with Third-Party Systems

This section provides an overview of this scenario and discusses how to configure the system for this scenario.

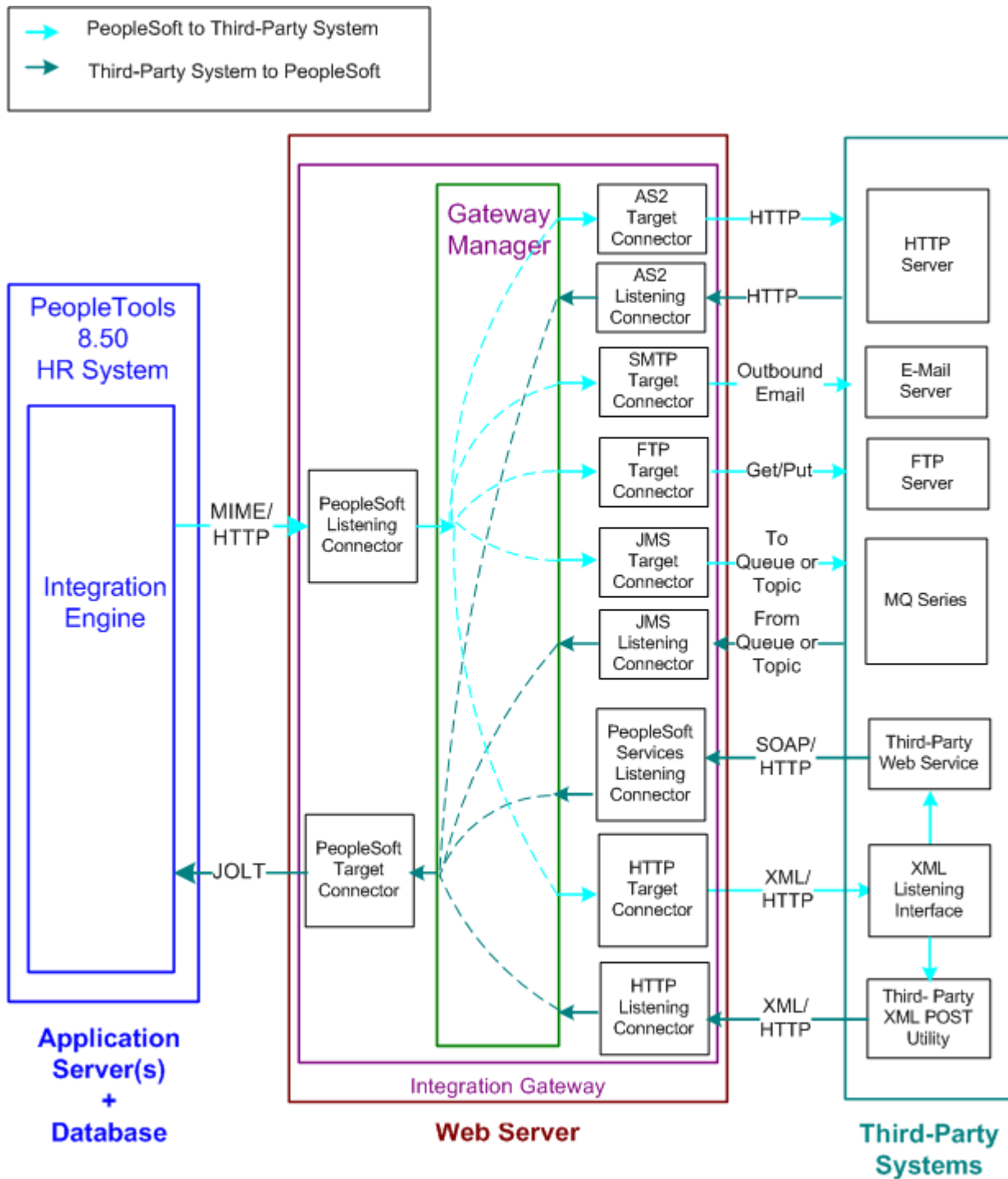
Understanding This Scenario

For communications with third-party systems, messages can go through local or remote gateways.

Sending a message to a third-party system is the same as sending a message to a PeopleSoft Integration Broker node, except that the target connector that you select depends on the third-party system with which you are communicating.

Messages from third-party systems can enter the gateway through any of the listening connectors that are delivered with PeopleSoft Integration Broker or through a listening connector that you build. You cannot use the PeopleSoft listening connector for integrations with third-party systems, because it can accept messages only in the PeopleSoft internal format.

This diagram shows the connectors that a PeopleSoft system can use to communicate with a third-party system and how the PeopleSoft system can communicate with third-party systems over a firewall:



Integrations with third-party systems

Configuring the System for This Scenario

This section discusses how to configure:

- The PeopleSoft Human Resources system.

- The PeopleSoft Human Resources integration gateway.

Configuring the PeopleSoft Human Resources System

On the PeopleSoft Human Resources system:

1. Define a local integration gateway.

Use the Gateways component to set up a local integration gateway for sending messages.

2. Create a service operation.

Use the Service Operations component to create a service operation that contains an inbound point-to-point routing definition where the sending node is the hub system and the receiving node is the PeopleSoft CRM system.

3. Set up a remote node.

Set up a remote node that represents the third-party system. When you define this node, you select the appropriate connector (for example, JMS target connector, SMTP target connector, and so forth) for communicating with the third-party system.

4. Create a service operation with an inbound routing definition where the sending node is the third-party system and the receiving node is the PeopleSoft HR system.
5. In the service operation definition you created in the previous step, create an outbound routing definition where the sending node is the PeopleSoft HR system and the receiving node is the third-party system.

Configuring the PeopleSoft Human Resources Integration Gateway

The only required integration gateway properties for the local integration gateway are the default Oracle Jolt connect string properties that enable communication with integration engines on the PeopleSoft Human Resources system. Set these properties in the integrationGateway.properties file.

See Also

Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216

Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

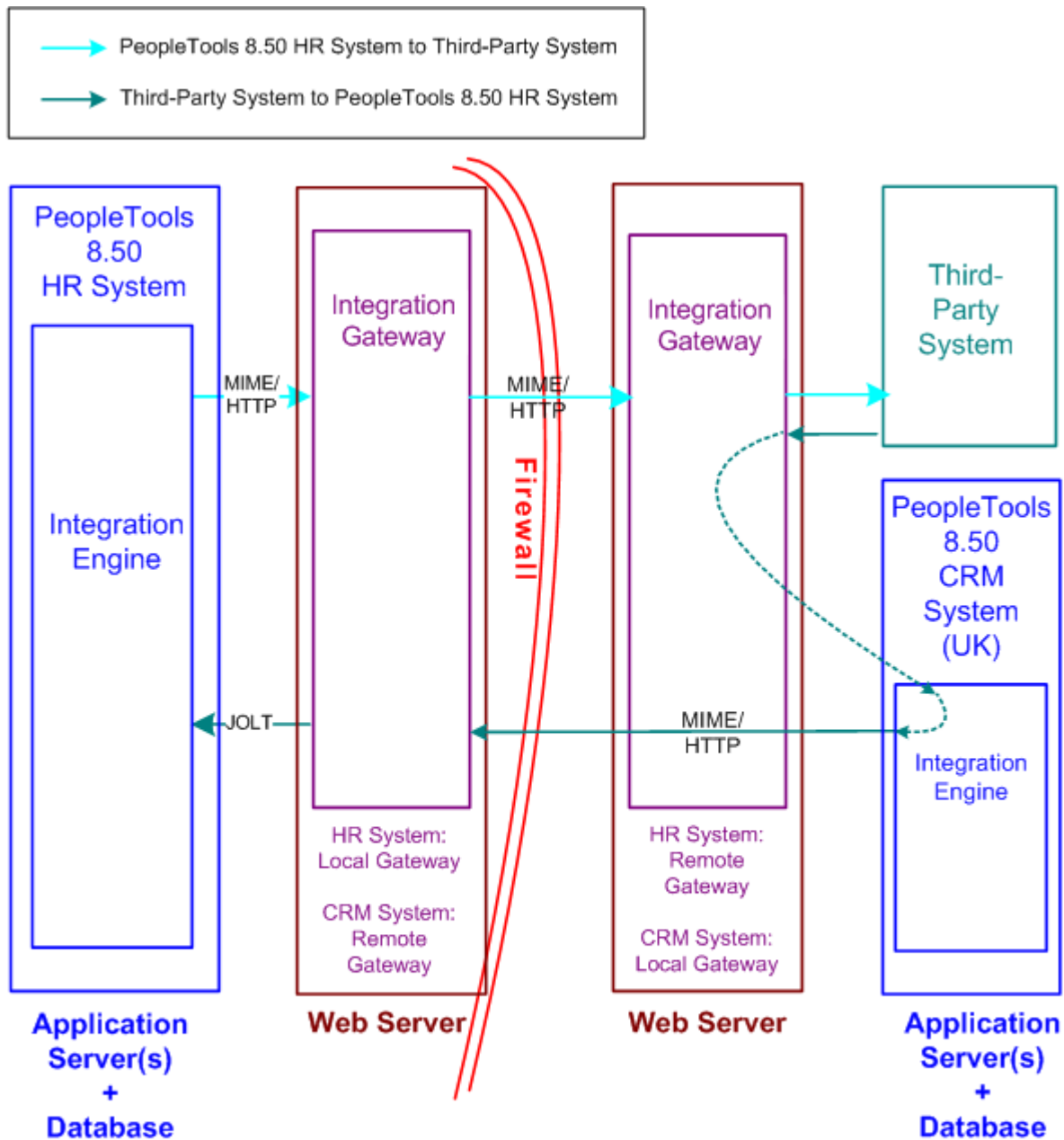
Integrating with Third-Party Systems by Using Remote Gateways

This section provides an overview of this scenario and discusses how to:

- Send messages to third-party systems.
- Receive messages from third-party systems.

Understanding This Scenario

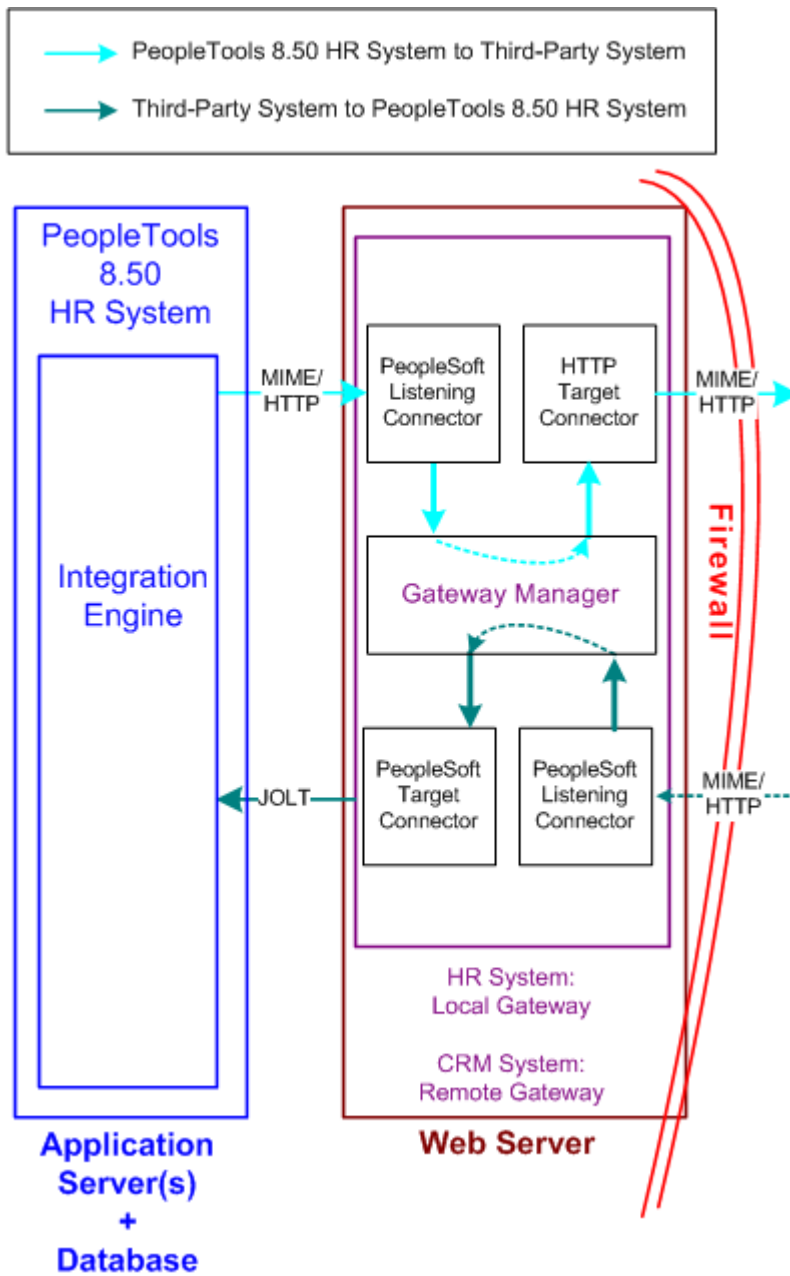
This diagram shows a high level view of how to integrate with third-party systems by using remote gateways:



*Note: Service operations from one integration gateway to another can only be sent when they originate from a PeopleSoft system. The only exception to this is through a custom connector that makes use of the IBRequest methods needed to handle this routing.

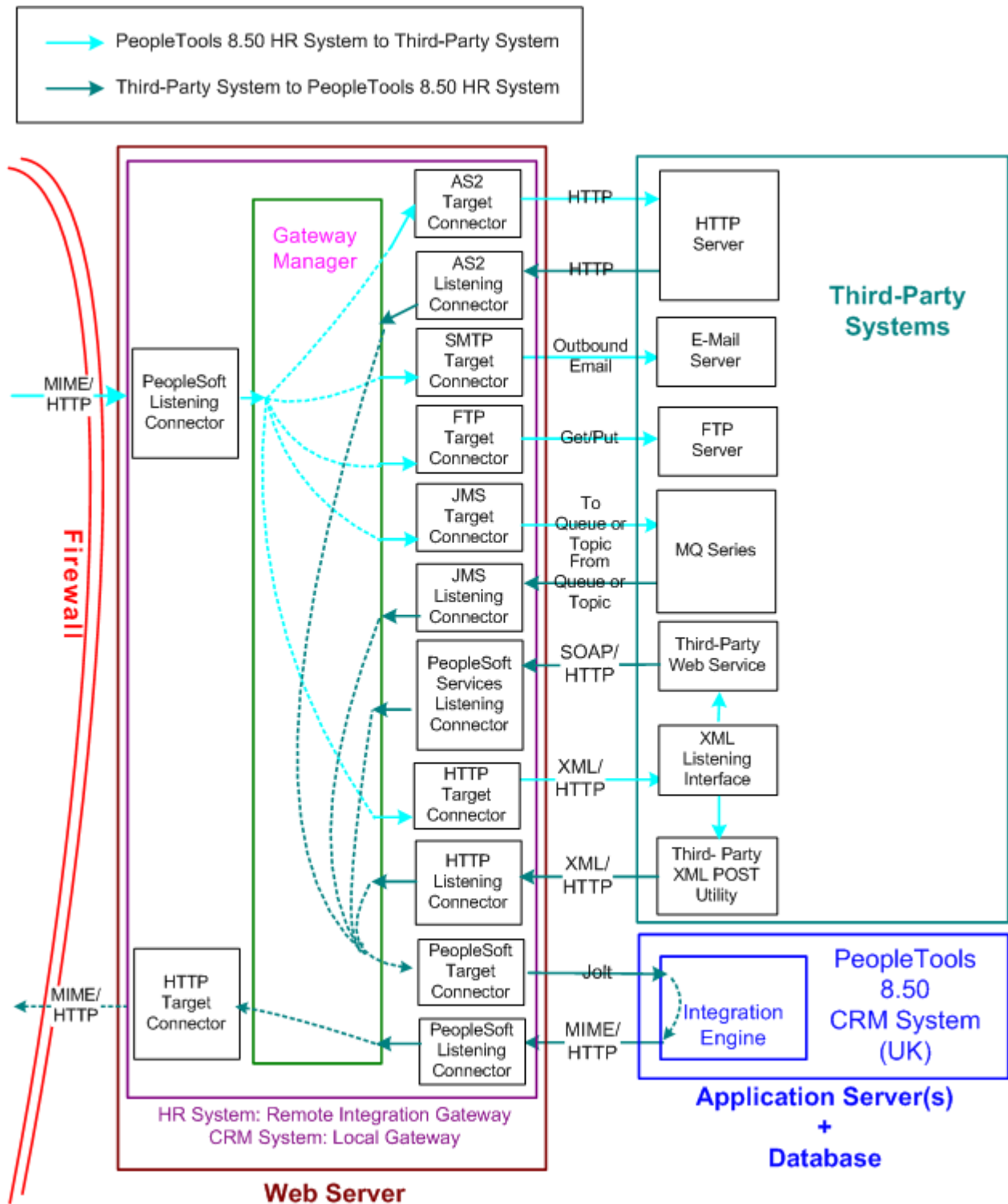
High-level diagram of integrations with third-party systems using remote gateways.

The following diagram provides a more detailed view of the configuration on the PeopleSoft system:



Configuration on the PeopleSoft system for integrations with third-party systems using remote gateways.

The following diagram provides a more detailed view of the configuration on the remote PeopleSoft system and the third-party system.



Configuration on the remote PeopleSoft system and third-party system for integrations using remote gateways.

Sending Messages to Third-Party Systems

This section discusses how to configure:

- The PeopleSoft Human Resources system.
- The PeopleSoft Human Resources integration gateway.

The setup for this scenario is similar to the configuration for integrations with Integration Broker systems. The only difference is the target connector you use.

However, instead of using the PeopleSoft target connector for the remote node you must select the target connector based on the third-party system with which the PeopleSoft system is communicating. The target connector you select must reside on the remote gateway.

In the previous diagram, the PeopleSoft Human Resources system is the source system and the selected target connector is shown on the other side of the firewall, on the remote integration gateway.

As you review the configuration tasks for this scenario, keep in mind the following points:

- PeopleSoft recommends using a single gateway for all applications that reside on one side of a firewall.
- The local gateway for one PeopleSoft application can be the remote gateway for the other PeopleSoft application.

Configuring the PeopleSoft Human Resources System

On the PeopleSoft Human Resources system:

1. Define a local integration gateway.

Use the Gateways component to define the local PeopleSoft Human Resources (USA) gateway.

2. Define a remote integration gateway on the local system.

Use the Gateways component to define the gateway for the PeopleSoft Human Resources (USA) system (which is the PeopleSoft CRM [UK] gateway) and to specify the URL of the PeopleSoft CRM (UK) gateway.

3. Set up a local node.

Use the Nodes component to set up the local node, which represents the PeopleSoft Human Resources (USA) system.

4. Set up a remote node.

Use the Nodes component to set up the remote node, which represents the third-party system. When you define the remote node, use the Node Definitions-Connectors page to specify the gateway ID on the remote integration gateway. In addition, select the appropriate target connector, for example JMS target connector, SMTP target connector, POP 3 target connector, and so forth.

5. Create a service operation that includes an outbound routing definition where the sending node is the PeopleSoft HR system and the receiving node is the third-party system.

Configuring the PeopleSoft Human Resources Integration Gateway

The only required integration gateway properties are the Oracle Jolt connect string properties that enable communication with integration engines on PeopleSoft Integration Broker systems. Set these properties in the `integrationGateway.properties` file.

See Also

Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216

Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Receiving Messages from Third-Party Systems

The previous diagram shows a second configuration scenario where a third-party system is performing an inbound HTTP Post to a PeopleSoft Human Resources/USA system via a UK gateway. In this scenario, the message goes through the PeopleSoft CRM/UK system only to get routing information, before it is sent to the remote integration gateway (the gateway on the USA side of the firewall. Therefore, in this scenario, the PeopleSoft CRM/UK system serves as a hub.

This section discusses how to configure:

- The PeopleSoft Human Resources (USA) system.
- The PeopleSoft Human Resources integration gateway.
- The PeopleSoft CRM (UK) system and hub.
- The PeopleSoft CRM (UK) integration gateway.
- The third-party system and PeopleSoft system.

Message Flow

In this scenario, a message originating from a third-party system is posted to the HTTP listening connector, JMS listening connector or a custom-built listening connector on the PeopleSoft CRM/UK integration gateway. Since the message does not contain the required routing information for the remote gateway, the listening connector hands it off to the PeopleSoft target connector. The PeopleSoft target connector sends the message to the default PeopleSoft node (the PeopleSoft CRM/UK) as determined by the default Jolt settings in the `integrationGateway.properties` file.

When the message reaches Integration Broker on the PeopleSoft CRM/UK system, the system applies transaction information to reroute the message to the remote gateway (the gateway on the USA side of the firewall), and thereby serves as a hub.

Message Processing on the Remote Gateway

Whenever you publish a message bound for a remote gateway, PeopleSoft Integration Broker reads it, determines that the target connector is not on its local gateway, places the remote gateway URL inside the IBInfo message wrapper and posts it to the PeopleSoft listening connector on the local gateway. The local gateway manager finds a remote gateway URL in the message wrapper and routes it to the remote gateway default connector, the HTTP target connector. The HTTP target connector on the local gateway then posts the message to the remote gateway URL (the PeopleSoft listening connector on the remote gateway) in MIME format, and removes the URL from the IBInfo message wrapper. On arrival at the remote gateway, the message is processed like any other incoming PeopleSoft message.

An exception to this message flow is if on the UK integration gateway side you created and loaded a custom listening connector that allows for the required routing information to be populated in the IBInfo message wrapper. The message would no longer need to be sent via the hub.

Keep in mind the following points:

- PeopleSoft recommends that you use a single gateway for all applications that reside on one side of a firewall.
- The local gateway for one PeopleSoft application can be a remote gateway for another PeopleSoft application.
- A message coming from a third-party system (local gateway or remote gateway) system can enter the integration gateway from any of the delivered listening connectors or from a custom-built listening connector. It cannot, however, use the PeopleSoft listening connector. PeopleSoft has designed the PeopleSoft listening connector to accept messages in the PeopleSoft internal message format only. Note that the diagram shows the message entering the integration gateway via the HTTP listening connector.

Configuring the PeopleSoft Human Resources (USA) System

On the PeopleSoft Human Resources system:

1. Set up a local node.

Use the Node Definition component to set up the local node, which represents the Human Resources system.

2. Set up a remote node.

The remote node that you set up represents the PeopleSoft CRM system. When you set up the remote node, specify the PeopleSoft target connector.

3. Create a service operation that contains an outbound routing definition where the sending node is the PeopleSoft CRM system and the receiving node is the PeopleSoft HR system.

Configuring the PeopleSoft Human Resources Integration Gateway

The only required integration gateway properties are the Oracle Jolt connect string properties that enable communication with the PeopleSoft Human Resources system. Set these properties in the integrationGateway.properties file.

Configuring the PeopleSoft CRM (UK) System and Hub

On the PeopleSoft CRM (UK) system:

- Define a local integration gateway.

Use the Gateways component to set up the local gateway for the sending system.

- Define a remote integration gateway.

The remote gateway for the PeopleSoft CRM (UK) system is the PeopleSoft Human Resources (USA) gateway.

- Set up a local node.

Use the Node Definition component to set up the local node, which represents the PeopleSoft CRM system.

- Set up remote nodes.

Use the Node Definition component to define two remote nodes: one remote node that represents the third-party system and another to represent the PeopleSoft Human Resources (USA) system. When you define the remote node that represents the third-party system, you specify the HTTP target connector, HTTPTARGET. When you define the remote node that represents the PeopleSoft Human Resources (USA) system, set it to use the PeopleSoft target connector on the remote (USA) gateway.

- Create a service operation that contains an outbound routing definition where the sending node is the third-party system and the receiving node is the PeopleSoft HR system.
- In the service operation definition that you created in the previous step, create an inbound routing definition if the third-party system will be sending you requests.

Configuring the PeopleSoft CRM (UK) Integration Gateway

The only required properties are the Oracle Jolt connect string properties that enable communication with integration engines on the PeopleSoft CRM systems. Set these properties in the integrationGateway.properties file.

Configuring the Third-Party System and PeopleSoft System

Because the PeopleSoft CRM (UK) system serves as a hub in this scenario, you must set up transactions and relationships for all messages from the third-party system that are routed through it. By using the systems in the diagram as an example, the following table shows the required node, transaction and relationship configurations:

<i>Item to Configure</i>	<i>PeopleSoft Human Resources System</i>	<i>PeopleSoft CRM System (Hub)</i>
Local nodes	Rename the default local node to represent the PeopleSoft Human Resources system.	Rename the default local node to represent the PeopleSoft CRM system.

<i>Item to Configure</i>	<i>PeopleSoft Human Resources System</i>	<i>PeopleSoft CRM System (Hub)</i>
Remote nodes	Define a remote node to represent the PeopleSoft CRM system.	Define remote nodes to represent the third-party system and the PeopleSoft Human Resources system.
Service operations and routing definitions	Define a service operation with an inbound routing definition where the PeopleSoft CRM system is the sending node and the PeopleSoft HR system is the receiving node.	Define a service operation with an outbound routing definition where the sending node is the third-party system and the receiving node is the PeopleSoft HR system.

See Also

Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216

Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216

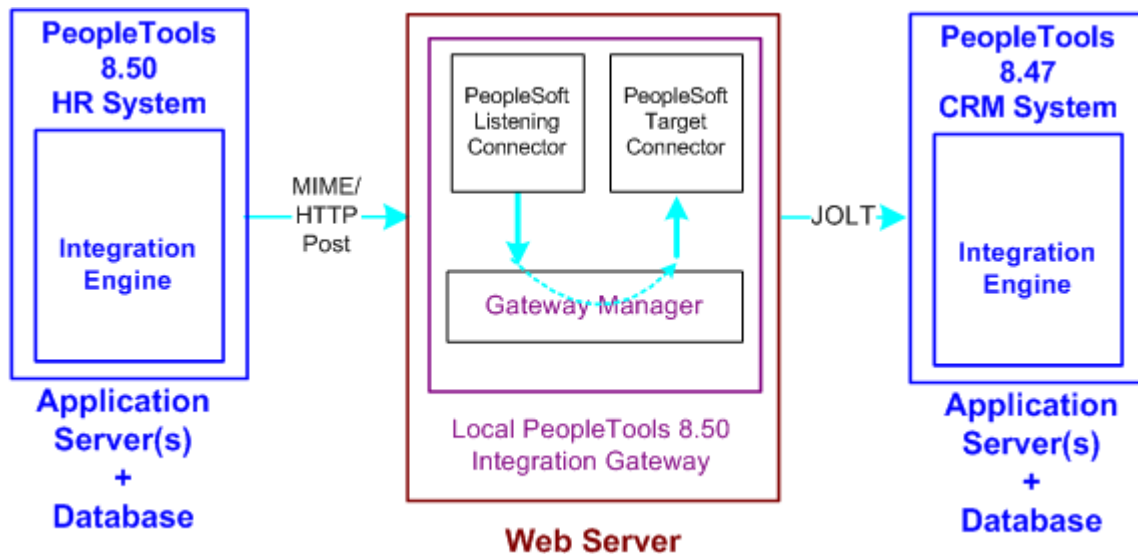
Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Integrating with PeopleTools 8.47 and Earlier PeopleTools 8.4x Systems

This section provides an overview of this scenario and discusses how to configure the system for this scenario.

Understanding This Scenario

This diagram shows the PeopleSoft Integration Broker components and configuration for communications between PeopleSoft Integration Broker system and a PeopleSoft system running on PeopleTools 8.47:



Integrations with PeopleTools 8.47 and earlier systems.

While this diagram depicts a PeopleSoft 8.47 system, the information provided in this section applies to any PeopleTools 8.47 or earlier system.

In this example, the PeopleSoft Human Resources is the sending system and the PeopleSoft CRM system is the receiving system.

The remainder of this section highlights the integration tasks by using the systems and components shown in the diagram as examples.

Configuring the System for This Scenario

This section discusses how to configure:

- The PeopleSoft Human Resources system.
- The PeopleSoft CRM system.

Configuring the PeopleSoft Human Resources System

In this scenario, the PeopleSoft Human Resource system is running on PeopleTools 8.50.

On the PeopleSoft Human Resources system:

- Define a local integration gateway.

Use the Gateways component to set up a local gateway for the PeopleSoft Human Resources system.

The only required properties are the Oracle Jolt connect string properties that enable communication with the PeopleSoft Human Resources systems. Set these properties in the `integrationGateway.properties` file

- Set up a local node.

Use the Node Definition component to set up the local node, which represents the PeopleSoft 8.50 Human Resources system.

- Set up a remote node.

The remote node that you set up represents the PeopleSoft 8.47 or earlier Human Resources system. When you set up the remote node, specify the PeopleSoft target connector (PSFTTARGET) on the Connectors tab.

Note. If you have upgraded from a PeopleSoft system, all nodes that existed for the system have been preserved as remote nodes in the PeopleSoft Integration Broker system. However, you must then associate each of these nodes to the PeopleSoft target connector for the remote node.

- Create a service operation with an inbound routing definition.

Use the Service Operations component to create a service operation that contains an inbound routing definition where the receiving node is the PeopleSoft 8.50 system and the sending node is the PeopleSoft 8.47 or earlier system.

- Set up an outbound routing definition.

In the service operation definition that you created in the previous step, create an outbound routing definition where the sending node is the PeopleSoft 8.50 system and the receiving node is the 8.47 or earlier system.

Configuring the PeopleSoft 8.47 or Earlier Human Resources System

In this scenario, the PeopleSoft CRM system is running on PeopleTools 8.47.

On the PeopleSoft CRM system:

1. Define the local integration gateway for the PeopleSoft CRM system by using the Gateways component. Specify the gateway's PeopleSoft listening connector as the gateway's URL.
2. Set up a local node.

Use the Node Definition component to set up the local node, which represents the PeopleSoft CRM system.

3. Set up a remote node.

The remote node that you set up represents the PeopleSoft 8.50 system. When you set up the remote node, specify the PeopleSoft target connector (PSFTTARGET) on the Connectors tab.

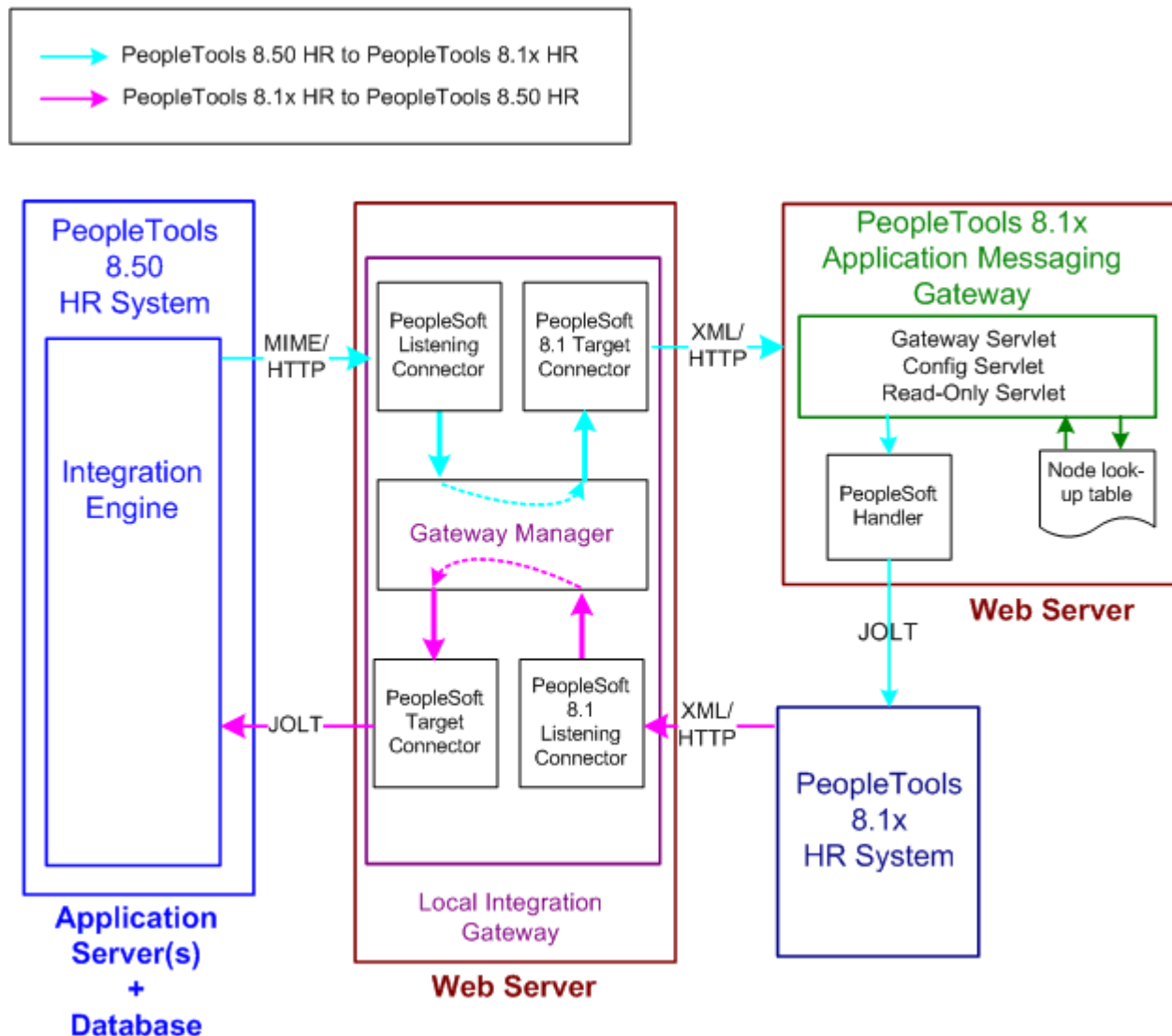
Because the PeopleSoft Human Resources system uses PeopleSoft Integration Broker, specify the local gateway for the PeopleSoft CRM system and its PeopleSoft target connector on the Node Definitions - Connectors page.

Integrating with PeopleTools 8.1x Systems

This section provides an overview of this scenario and discusses how to configure the system for this scenario.

Understanding This Scenario

This diagram shows the PeopleSoft Integration Broker components and configuration for communications between PeopleSoft Integration Broker systems and PeopleSoft systems running on PeopleTools 8.1x:



Integrations with PeopleSoft 8.1x systems

In this scenario, you must configure the PeopleSoft Integration Broker system, the integration gateway, and the PeopleTools 8.1x system. The remainder of this section highlights these tasks by using the systems and components shown in the diagram as examples.

Configuring the System for This Scenario

This section discusses how to configure:

- The PeopleSoft Human Resources system.
- The PeopleSoft Human Resources integration gateway.
- The PeopleTools 8.1x Human Resources system.

Configuring the PeopleSoft Human Resources System

On the PeopleSoft Human Resources system:

- Define a local integration gateway.

Use the Gateways component to set up a local gateway for the PeopleSoft Human Resources system.

- Set up a local node.

Use the Node Definition component to set up the local node, which represents the PeopleSoft Human Resources system.

- Set up a remote node.

The remote node that you set up represents the PeopleSoft 8.1x Human Resources system. When you set up the remote node, specify the PeopleSoft 8.1 target connector (PSFT81TARGET) on the Connectors tab.

Note. If you have upgraded from a PeopleSoft 8.1x system, all nodes that existed for the system have been preserved as remote nodes in the PeopleSoft Integration Broker system. However, you must then associate each of these nodes to the PeopleSoft 8.1 target connector.

- Create a service operation with an inbound routing definition.

Use the Service Operations component to create a service operation that contains an inbound routing definition where the receiving node is the PeopleSoft 8.50 system and the sending node is the PeopleSoft 8.1x system.

- Set up an outbound routing definition.

In the service operation definition that you created in the previous step, create an outbound routing definition where the sending node is the PeopleSoft 8.50 system and the receiving node is the 8.1x system.

Configuring the PeopleSoft Human Resources Integration Gateway

You must set integration gateway properties for the local gateway. The only required properties are the Oracle Jolt connect string properties that enable communication with the PeopleSoft Human Resources systems. Set these properties in the `integrationGateway.properties` file.

Configuring the PeopleSoft 8.1x Human Resources System

On the PeopleSoft 8.1x Human Resources system, locate the PeopleSoft 8.1x Human Resources message node and change the URL (location) to the PeopleSoft listening connector. The format is `http://webserver/PSIGW.war/PS81ListeningConnector`.

See Also

Appendix A, "Integration Scenarios," Understanding Integration Setup, page 491

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Managing Integration Gateways," Administering Integration Gateways

Chapter 10, "Managing Service Operations," Adding Service Operation Definitions, page 216

Chapter 10, "Managing Service Operations," Configuring Service Operation Definitions, page 216

Enterprise PeopleTools 8.50 PeopleBook: PeopleSoft Integration Broker Administration, "Adding and Configuring Nodes"

Appendix B

Transformation Example: Integration Between Two PeopleSoft Nodes

This appendix discusses how to:

- Create message definitions.
- Set up codesets.
- Set up transformations.
- Walk through the generated XSL code.
- Test the transformation.

Understanding This Appendix

This appendix presents an in-depth example of how to use transformations to alter the messages sent between two systems.

Using the Example

The purpose of this appendix is to present a more in depth example of how transformations can be used to alter the messages sent between two systems.

The following example describes an integration between a PeopleSoft Supply Chain Management node (PeopleSoft SCM) and a PeopleSoft Customer Relationship Management node (PeopleSoft CRM). This example demonstrates taking a PeopleSoft SCM purchase order message and transforming it into a similar PeopleSoft CRM purchase order message format.

Two aspects of transformations will be examined in this example:

- How XSL can be used to modify the structure of a message.
- How codesets can be used to map values between messages.

The example will focus on the PeopleSoft SCM system. This is the node where the XSL will be executed to transform the message from the SCM specified format to that of CRM. When the SCM system sends the message to CRM, the message will be in the CRM native format.

Integration Metadata for This Example

The example does not go into detail about setting up the all infrastructure necessary to actually send messages between the two nodes. It assumes that the systems have been configured and the service operations and services have been defined. Please refer to the chapters elsewhere in this PeopleBook for setting up integration metadata.

See Also

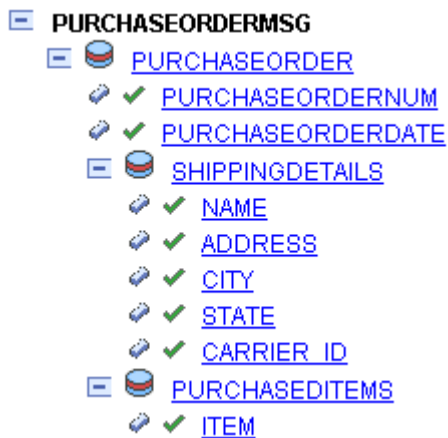
[Chapter 4, "Understanding PeopleSoft Integration Broker Metadata," page 35](#)

Creating Message Definitions

This section discusses the structure of the message definitions used in this example.

Message Definition: PeopleSoft SCM Node

The following example shows the format of the purchase order message on the PeopleSoft SCM node.



PURCHASEORDERMSG message definition.

The following is a sample message that corresponds to the message structure:

```

<?xml version="1.0"?>
<PURCHASEORDERMSG>
  <FieldTypes>
    <PURCHASEORDER class="R">
      <PURCHASEORDERNUM type="CHAR"/>
      <PURCHASEORDERDATE type="DATE"/>
    </PURCHASEORDER>
    <SHIPPINGDETAILS class="R">
      <NAME type="CHAR"/>
      <ADDRESS type="CHAR"/>
      <CITY type="CHAR"/>
      <STATE type="CHAR"/>
      <CARRIER_ID type="CHAR"/>
    </SHIPPINGDETAILS>
    <PURCHASEDITEMS class="R">
      <ITEM type="CHAR"/>
    </PURCHASEDITEMS>
    <PSCAMA class="R">
      <LANGUAGE_CD type="CHAR"/>
      <AUDIT_ACTN type="CHAR"/>
      <BASE_LANGUAGE_CD type="CHAR"/>
      <MSG_SEQ_FLG type="CHAR"/>
      <PROCESS_INSTANCE type="NUMBER"/>
      <PUBLISH_RULE_ID type="CHAR"/>
      <MSGNODENAME type="CHAR"/>
    </PSCAMA>
  </FieldTypes>
  <MsgData>
    <Transaction>
      <PURCHASEORDER class="R">
        <PURCHASEORDERNUM IsChanged="Y">19908</PURCHASEORDERNUM>
        <PURCHASEORDERDATE IsChanged="Y">2006-04-03</PURCHASEORDERDATE>
      <SHIPPINGDETAILS class="R">
        <NAME IsChanged="Y">Smith,Bill</NAME>
        <ADDRESS IsChanged="Y">123 Anywhere St</ADDRESS>
        <CITY IsChanged="Y">Fresno</CITY>
        <STATE IsChanged="Y">CA</STATE>
        <CARRIER_ID IsChanged="Y">USPS</CARRIER_ID>
      </SHIPPINGDETAILS>
      <PURCHASEDITEMS class="R">
        <ITEM IsChanged="Y">AAS5536</ITEM>
      </PURCHASEDITEMS>
      <PURCHASEDITEMS class="R">
        <ITEM IsChanged="Y">POB332Q</ITEM>
      </PURCHASEDITEMS>
    </PURCHASEORDER>
    <PSCAMA class="R">
      <LANGUAGE_CD>ENG</LANGUAGE_CD>
      <AUDIT_ACTN/>
      <BASE_LANGUAGE_CD>ENG</BASE_LANGUAGE_CD>
      <MSG_SEQ_FLG/>
      <PROCESS_INSTANCE>0</PROCESS_INSTANCE>
      <PUBLISH_RULE_ID/>
      <MSGNODENAME/>
    </PSCAMA>
  </Transaction>
</MsgData>
</PURCHASEORDERMSG>

```

Message Definition: PeopleSoft CRM Node

The following example shows the format of the purchase order on the PeopleSoft CRM node.



PO_MSG message definition.

This is a sample message that corresponds to the message structure:

```

<?xml version="1.0"?>
<PO_MSG>
  <FieldTypes>
    <PO_HEADER class="R">
      <PO_NUMBER type="CHAR"/>
      <PO_DATE type="DATE"/>
    </PO_HEADER>
    <PO_ITEM class="R">
      <SKU type="CHAR"/>
      <CUSTNAME type="CHAR"/>
      <SHIPPER type="CHAR"/>
      <DESTADD type="CHAR"/>
      <DESTCITY type="CHAR"/>
      <DESTSTATE type="CHAR"/>
    </PO_ITEM>
    <PSCAMA class="R">
      <LANGUAGE_CD type="CHAR"/>
      <AUDIT_ACTN type="CHAR"/>
      <BASE_LANGUAGE_CD type="CHAR"/>
      <MSG_SEQ_FLG type="CHAR"/>
      <PROCESS_INSTANCE type="NUMBER"/>
      <PUBLISH_RULE_ID type="CHAR"/>
      <MSGNODENAME type="CHAR"/>
    </PSCAMA>
  </FieldTypes>
  <MsgData>
    <Transaction>
      <PO_HEADER class="R">
        <PO_NUMBER IsChanged="Y">BBN7782</PO_NUMBER>
        <PO_DATE IsChanged="Y">2006-04-15</PO_DATE>
      </PO_HEADER>
      <PO_ITEM class="R">
        <SKU IsChanged="Y">JN557BB</SKU>
        <CUSTNAME IsChanged="Y">Jones,Mark</CUSTNAME>
        <SHIPPER IsChanged="Y">Federal Express</SHIPPER>
        <DESTADD IsChanged="Y">66 Availer St</DESTADD>
        <DESTCITY IsChanged="Y">Stockton</DESTCITY>
        <DESTSTATE IsChanged="Y">CA</DESTSTATE>
      </PO_ITEM>
      <PSCAMA class="R">
        <LANGUAGE_CD>ENG</LANGUAGE_CD>
        <AUDIT_ACTN/>
        <BASE_LANGUAGE_CD>ENG</BASE_LANGUAGE_CD>
        <MSG_SEQ_FLG/>
        <PROCESS_INSTANCE>0</PROCESS_INSTANCE>
        <PUBLISH_RULE_ID/>
        <MSGNODENAME/>
      </PSCAMA>
    </Transaction>
  </MsgData>
</PO_MSG>

```

Setting Up the Codesets

Both the PeopleSoft SCM and PeopleSoft CRM messages contain an entry to capture the shipping agent to be used for the purchase order. For the PeopleSoft SCM message, the element used is CARRIER_ID; for the PeopleSoft CRM message it is SHIPPER. For the purposes of this example, the assumption is that the values for these two elements map differently, according to the following table:

<i>CARRIER_ID values on SCM System</i>	<i>SHIPPER Values on CRM System</i>
FEDEX	Federal Express
UPS	United Parcel Service
USPS	United States Postal Service

An SCM message containing the following XML:

```
<CARRIER_ID>UPS</CARRIER_ID>
```

would logically map to

```
<SHIPPER>United Parcel Service</SHIPPER>
```

in the corresponding CRM message.

In order to enable such mapping in this example, you must create codeset metadata.

Create codeset metadata:

1. Create a codeset group called *SCM_GROUP*. Add the following entries:

<i>Match Name</i>	<i>Match Value</i>
CARRIER_ID	FEDEX
CARRIER_ID	UPS
CARRIER_ID	USPS
CARRIER_ID	Blank

Note that the final match value entry is blank: this will be used for the default value.

2. Create a codeset called *SCM_CODESET*, using the codeset group defined in the prior step. Add the following entries to this codeset:

<i>Match Name</i>	<i>Match Value</i>
CARRIER_ID	FEDEX
CARRIER_ID	UPS
CARRIER_ID	USPS
CARRIER_ID	Blank

3. Create a codeset group called *CRM_GROUP*. There is no need to define any entries for this group.

4. Add codeset values from the *SCM_GROUP* to the *CRM_GROUP*, using the *SCM_CODESET*. Four entries will need to be defined:
 - Select *CARRIER_ID* and *<blank>*, and add a return name of *SHIPPER* and the value *Unknown*.
 - Select *CARRIER_ID* and *FEDEX*, and add a return name of *SHIPPER* and the value *Federal Express*.
 - Select *CARRIER_ID* and *UPS*, and add a return name of *SHIPPER* and the value *United Parcel Service*.
 - Select *CARRIER_ID* and *USPS*, and add a return name of *SHIPPER* and the value *United States Postal Service*.
5. Go to the node definition for the SCM node and add the codeset group *SCM_CODESET* to the node.
6. Go to the node definition for the CRM node and add the codeset group *CRM_CODESET* to the node.

Setting Up the Transformation

The PeopleSoft SCM and PeopleSoft CRM purchase order messages share what are essentially the same first two elements: a purchase order number and the purchase order date. However, from there the structures differ. The PeopleSoft SCM message has a small section containing shipping information, followed by the list of items purchased. The PeopleSoft CRM message has the shipping information merged with the list of items purchased.

The following XSL transforms the PeopleSoft SCM purchase order message into the PeopleSoft CRM format:

```

<?xml version="1.0"?>

<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
version="1.0">

  <xsl:template match="PURCHASEORDERMSG">
    <PO_MSG>
      <xsl:apply-templates select="FieldTypes"/>
      <xsl:apply-templates select="MsgData"/>
    </PO_MSG>
  </xsl:template>

  <xsl:template match="MsgData">
    <MsgData>
      <xsl:apply-templates select="Transaction"/>
    </MsgData>
  </xsl:template>

  <xsl:template match="Transaction">
    <Transaction>
      <xsl:apply-templates select="PURCHASEORDER"/>
      <PSCAMA class="R">
        <LANGUAGE_CD>ENG</LANGUAGE_CD>
        <AUDIT_ACTN/>
        <BASE_LANGUAGE_CD>ENG</BASE_LANGUAGE_CD>
        <MSG_SEQ_FLG/>
        <PROCESS_INSTANCE>0</PROCESS_INSTANCE>
        <PUBLISH_RULE_ID/>
        <MSGNODENAME/>
      </PSCAMA>
    </Transaction>
  </xsl:template>

  <xsl:template match="PURCHASEORDER">
    <PO_HEADER class="R">
      <PO_NUMBER IsChanged="Y"><xsl:value-of select="PURCHASEORDERNUM"/>
    </PO_NUMBER>
    <PO_DATE IsChanged="Y"><xsl:value-of select="PURCHASEORDERDATE"/>
    </PO_DATE>
    <xsl:apply-templates select="PURCHASEDITEMS"/>
  </PO_HEADER>
</xsl:template>

  <xsl:template match="PURCHASEDITEMS">
    <PO_ITEM class="R">
      <SKU IsChanged="Y"><xsl:value-of select="ITEM"/></SKU>
      <CUSTNAME IsChanged="Y">
        <xsl:value-of select="../SHIPPINGDETAILS/NAME"/>
      </CUSTNAME>
      <SHIPPER IsChanged="Y">
        <psft_function name="codeset" codesetname="SCM_CODESET">
          <parm name="CARRIER_ID">
            <xsl:value-of select="../SHIPPINGDETAILS/CARRIER_ID"/>
          </parm>
          <value name="SHIPPER" select="."/>
        </psft_function>
      </SHIPPER>
      <DESTADD IsChanged="Y">
        <xsl:value-of select="../SHIPPINGDETAILS/ADDRESS"/>
      </DESTADD>
      <DESTCITY IsChanged="Y">
        <xsl:value-of select="../SHIPPINGDETAILS/CITY"/>
      </DESTCITY>
    </PO_ITEM>
  </xsl:template>

```

```

        <DESTSTATE IsChanged="Y">
          <xsl:value-of select="../SHIPPINGDETAILS/STATE" />
        </DESTSTATE>
      </PO_ITEM>
    </xsl:template>

    <xsl:template match="FieldTypes">
      <FieldTypes>
        <PO_HEADER class="R">
          <PO_NUMBER type="CHAR" />
          <PO_DATE type="DATE" />
        </PO_HEADER>
        <PO_ITEM class="R">
          <SKU type="CHAR" />
          <CUSTNAME type="CHAR" />
          <SHIPPER type="CHAR" />
          <DESTADD type="CHAR" />
          <DESTCITY type="CHAR" />
          <DESTSTATE type="CHAR" />
        </PO_ITEM>
        <PSCAMA class="R">
          <LANGUAGE_CD type="CHAR" />
          <AUDIT_ACTN type="CHAR" />
          <BASE_LANGUAGE_CD type="CHAR" />
          <MSG_SEQ_FLG type="CHAR" />
          <PROCESS_INSTANCE type="NUMBER" />
          <PUBLISH_RULE_ID type="CHAR" />
          <MSGNODENAME type="CHAR" />
        </PSCAMA>
      </FieldTypes>
    </xsl:template>
  </xsl:stylesheet>

```

Note that this XSL contains a reference to the `psft_function`, which will resolve codeset mapping after the transform has been run.

This XSL should be placed into an Application Engine program, and this program associated with the routing definitions for the service operation.

XSL Walkthrough

This section discusses the process flow through the XSL when the PeopleSoft SCM purchase order message is transformed.

XSL is composed of templates. An XSLT template is an instruction of what to do when a particular XML node or condition is encountered. During a transform, the XSL processing engine starts at the root element of the XML message and then attempts to find matching templates in the XSL. When a matching template is found, the instructions in that template are used in the building of the output XML document.

The processing of a transform is actually a two pass process. In the first pass, the XSL is executed against the input XML, and an output XML document is generated. In the second pass, the `psft_function` calls are resolved and the codeset values are placed into the document.

Transformation Processing: First Pass

This section discusses the first pass of transform processing, during which the XSL code runs against the input XML and the system generates an output XML document. The steps listed below mimic the actions taken by the transformation engine in processing the input XML.

1. The first element in the input message is *PURCHASEORDERMESSAGE*. The transformation engine finds the following matching template in the XSL:

```
<xsl:template match="PURCHASEORDERMSG">
  <PO_MSG>
    <xsl:apply-templates select="FieldTypes"/>
    <xsl:apply-templates select="MsgData"/>
  </PO_MSG>
</xsl:template>
```

Here we see the root element of the output document being created. This template instructs the transformation engine to:

- Output the start tag for *PO_MSG*.

It is important to note that template processing is a recursive process. In the sequence above, the transformation engine outputs the start tag, then applies templates to all *FieldType* nodes. This is essentially a callout to the template that handles those nodes (and potentially any children). The output of this call is then placed into the output document. Then the transformation engine selects all the *MsgData* nodes, and applies templates to them. Again, the output from the processing of those nodes is then placed into the output document. Finally, the closing *PO_MSG* tag is written into the output, and the first pass is finished. Of course, documenting a recursive process is not always straightforward. In this example bear in mind that while it is presented as a numbered sequence of steps, the actual process is not sequential.

- Select the *FieldTypes* nodes under the current node in the input document, and process them.
- Select the *MsgData* nodes under the current node in the input document, and process them.
- Output the end tag for *PO_MSG*.

2. The transform engine selects the FieldTypes node, and finds the following template:

```
<xsl:template match="FieldTypes">
<FieldTypes>
  <PO_HEADER class="R">
    <PO_NUMBER type="CHAR"/>
    <PO_DATE type="DATE"/>
  </PO_HEADER>
  <PO_ITEM class="R">
    <SKU type="CHAR"/>
    <CUSTNAME type="CHAR"/>
    <SHIPPER type="CHAR"/>
    <DESTADD type="CHAR"/>
    <DESTCITY type="CHAR"/>
    <DESTSTATE type="CHAR"/>
  </PO_ITEM>
  <PSCAMA class="R">
    <LANGUAGE_CD type="CHAR"/>
    <AUDIT_ACTN type="CHAR"/>
    <BASE_LANGUAGE_CD type="CHAR"/>
    <MSG_SEQ_FLG type="CHAR"/>
    <PROCESS_INSTANCE type="NUMBER"/>
    <PUBLISH_RULE_ID type="CHAR"/>
    <MSGNODENAME type="CHAR"/>
  </PSCAMA>
</FieldTypes>
</xsl:template>
```

The interesting thing about this template is that it is basically an instruction to insert static text into the output document. Of course, this makes sense, as the FieldTypes section is dependant upon the message structure, and not the actual data contained within any particular message instance. Also note that there is no further node selection in this template, so after the XML is emitted this particular path through the XML ends.

3. Now that the FieldTypes nodes have been processed, the transform engine processes the MsgData node using the following matching template:

```
<xsl:template match="MsgData">
  <MsgData>
    <xsl:apply-templates select="Transaction"/>
  </MsgData>
</xsl:template>
```

The template is quite simple. The transformation engine is to put a starting MsgData node in the output document, and then process the Transaction nodes in the input document. Note that the node context has changed: the current node in the input document being processed is the MsgData node. The call to select then implies that all child Transaction nodes under the MsgData are to be selected.

4. The Transaction nodes under MsgData are matched by the following template:

```
<xsl:template match="Transaction">
  <Transaction>
    <xsl:apply-templates select="PURCHASEORDER" />
    <PSCAMA class="R">
      <LANGUAGE_CD>ENG</LANGUAGE_CD>
      <AUDIT_ACTN/>
      <BASE_LANGUAGE_CD>ENG</BASE_LANGUAGE_CD>
      <MSG_SEQ_FLG/>
      <PROCESS_INSTANCE>0</PROCESS_INSTANCE>
      <PUBLISH_RULE_ID/>
      <MSGNODENAME/>
    </PSCAMA>
  </Transaction>
</xsl:template>
```

A Transaction start tag is written to the output document, and then the PURCHASEORDER nodes are to be handled. Once these nodes have been processed, the PSCAMA information will be written out, along with the closing Transaction tag.

5. The call to handle the PURCHASEORDER node invokes:

```
<xsl:template match="PURCHASEORDER">
  <PO_HEADER class="R">
    <PO_NUMBER IsChanged="Y">
      <xsl:value-of select="PURCHASEORDERNUM" />
    </PO_NUMBER>
    <PO_DATE IsChanged="Y">
      <xsl:value-of select="PURCHASEORDERDATE" />
    </PO_DATE>
    <xsl:apply-templates select="PURCHASEDITEMS" />
  </PO_HEADER>
</xsl:template>
```

The PO_HEADER start tag is emitted as well as the child PO_NUMBER and PO_DATE elements. The call out to xs:value-of means that node values from the input message are copied to the output message. In this case, the node PO_NUMBER in the output message is given the value from PURCHASEORDERNUM in the input message. PO_DATE is given the value from PURCHASEORDERDATE. Once these two elements have been written out, the transformation engine is then told to process the PURCHASEDITEMS nodes in the input document.

6. Each PURCHASEDITEMS node in the input message causes the following template to be executed:

```
<xsl:template match="PURCHASEDITEMS">
  <PO_ITEM class="R">
    <SKU IsChanged="Y"><xsl:value-of select="ITEM"/></SKU>
    <CUSTNAME IsChanged="Y">
      <xsl:value-of select="../SHIPPINGDETAILS/NAME"/>
    </CUSTNAME>
    <SHIPPER IsChanged="Y">
      <psft_function name="codeset" codesetname="SCM_CODESET">
        <parm name="CARRIER_ID">
          <xsl:value-of select="../SHIPPINGDETAILS/CARRIER_ID"/>
        </parm>
        <value name="SHIPPER" select="."/>
      </psft_function>
    </SHIPPER>
    <DESTADD IsChanged="Y">
      <xsl:value-of select="../SHIPPINGDETAILS/ADDRESS"/>
    </DESTADD>
    <DESTCITY IsChanged="Y">
      <xsl:value-of select="../SHIPPINGDETAILS/CITY"/>
    </DESTCITY>
    <DESTSTATE IsChanged="Y">
      <xsl:value-of select="../SHIPPINGDETAILS/STATE"/>
    </DESTSTATE>
  </PO_ITEM>
</xsl:template>
```

This is where the bulk of the building of the output message is performed. For each PURCHASEDITEMS node in the input document, this template will be run once. The template is responsible for building out the PO_ITEM element and children in the output message. As in the template for PURCHASEORDER, this template uses the values from the input message and copies them across to the output message. For example, the SKU element in the output is given the value from the ITEM node in the input. Also note that the SHIPPER node contains a reference to psft-function and the SCM_CODESET. At this stage in the transformation, this text is static except for the value-of call to "../SHIPPINGDETAILS/CARRIER_ID", which will be resolved to "USPS". The actual codeset lookup will not be done at this point; this will occur in the second pass.

7. After the PURCHASEDITEMS template completes, the transformation jumps back to step 5, and outputs the closing PO_HEADER template.
8. Once the PURCHASEORDER template in step 5 completes, the transformation jumps back to step 4, and the Transaction template is completed. At this point the PSCAMA section in the template is written to the output message.
9. After the Transaction template in step 4 completes, the transformation jumps back to step 3, and the MsgData template. At this point the closing MsgData tag is written to the output message.
10. After the MsgData template in step 3 completes, the transformation jumps back to step 1. At this point the closing PO_MSG tag is written out, and the first part of the transformation process ends.

Transformation Processing: Second Pass

This section discusses the second pass of transform processing, during which the psft_function calls are resolved and the codeset values are placed into the document.

Assuming that no errors were encountered in the processing in the first pass a complete XML document will be available, containing the formatted PeopleSoft CRM purchase order message. However, this XML will still contain the reference:

```
<SHIPPER IsChanged="Y">
  <psft_function name="codeset" codesetname="SCM_CODESET">
    <parm name="CARRIER_ID">USPS</parm>
    <value name="SHIPPER" select="."/>
  </psft_function>
</SHIPPER>
```

The second pass walks through the message and resolves all calls to psft_function. In this instance the codeset lookup will be run, and the psft_function node will be replaced with the result. The XML in the output message will then look like:

```
<SHIPPER IsChanged="Y">
  United States Postal Service
</SHIPPER>
```

After the second pass completes, the transform is complete.

Testing the Transformation

The Transform Test utility is very useful when creating message transforms, since it allows one to exercise the transform without actually having service operations being invoked.

This section discusses using the utility to verify the example in this appendix.

To test the transformation:

1. Save to file the example message XML from the Message Definition: PeopleSoft SCM Node section presented earlier in this appendix.
2. Put the XSL from the Setting Up The Transformation section of this appendix in an application engine program.
3. Access the Transformation Test utility.

Select PeopleTools, Integration Broker, Service Utilities, Transformation Test.

The Transformation Test Utility page appears.

4. Add a new project.
5. In the *Program Name* field, enter in the name of the application engine program containing the XSL.
6. In the *Source Node Name* field, enter in the node name for the PeopleSoft SCM node.
7. In the *Destination Node Name* field enter in the node name for the CRM node.
8. In the *File Name* field, enter in the fully qualified path name of the file containing the input message.
9. Click the *Transform* button.

The transformed XML appears in the Message Text text box.

Appendix C

Understanding Migrated Integration Metadata

This appendix discusses:

- Migrated integration metadata.
- Migrated integration PeopleCode.
- Correcting integration PeopleCode that did not successfully migrate.

Understanding Migrated Integration Metadata

The following table summarizes how objects are migrated between PeopleTools 8.47 and earlier releases and PeopleTools 8.48 and higher releases:

<i>PeopleTools 8.4x Objects (PeopleTools 8.47 and Earlier)</i>	<i>PeopleTools 8.48 and Higher Objects</i>
Node.	Node.
Channel.	Queue.
Message.	Message.
Node transactions and relationships.	Service, Service Operations, Service Operation Versions, and Routings.
Message and Subscription PeopleCode.	Application classes and service operation handlers.

Note. All objects migrated to PeopleTools 8.48 and higher releases have the Owner ID of the message from which they were created. Any invalid Owner IDs are deleted at the time of upgrade. If no Owner ID exists for an object, you must manually define one in the PeopleTools 8.48 or higher database.

Node Objects

Upgraded node objects are assigned a Default User ID as defined in the upgrade script.

In PeopleTools 8.48 and higher releases security is implemented at the user ID level. The default user ID is used in conjunction with securing service operations.

Channel Objects

Channels have been converted to queues.

The new queue name should be the same as the old channel name.

As part of the upgrade/conversion, any related language data associated with the channel should also be brought over to the newly created queue definition.

Message Objects

Messages are shapes that provide the physical description of the contents of a service operation transaction, and describe the data being sent, including fields, field types, and field lengths.

Unlike PeopleTools 8.47 and earlier releases, beginning with PeopleTools 8.48 messages do not contain any processing logic, such as PeopleCode events or subscriptions. All processing logic is created by extending a set of delivered application classes, and associating those application classes to service operations using service operation handlers.

Node Transaction and Relationship Objects

Node transactions and relationships are migrated to services, service operations and routing definitions.

Service Objects

During the upgrade process, a service definition is created for each distinct message referenced in the node transaction table.

A service inherits most of its properties from the message, including description, long description, Owner ID, language code, and so on.

The service name in PeopleTools 8.48 and higher releases is the same as the message name in the PeopleTools 8.47 or earlier system.

Any related language data associated with the message is inherited by the service.

Service Operation Objects

Service operations have the same name as the service to which they are associated.

Complex transactions like asynchronous or synchronous transactions with transformations, hub transactions or async-to-sync are defined by grouping a set of node transactions and relationships together. As the complex cases are upgraded, the system separates node transactions that were created for these complex cases (for example an asynchronous hub case) from the simple cases (for example, outbound asynchronous requests with no transformation). Asynchronous and synchronous node transactions that do not participate in a relationship (for example, those that are left over after we settled the complex cases) in PeopleTools 8.47 and earlier releases become service operations in PeopleTools 8.48 and higher releases.

Warning! If there is no node transaction on the PeopleTools 8.47 or earlier system, no service operation is created on the PeopleTools 8.48 or higher system during upgrade.

In cases where a PeopleTools 8.47 or earlier node has both synchronous and asynchronous transactions, the first transaction defined on the node is migrated as a service operation; the second message cannot be created and an error is generated to the output log at the time of upgrade.

For asynchronous-to-synchronous transactions on a PeopleTools 8.47 or earlier system, the following occurs during the upgrade process to PeopleTools 8.48 or higher system:

- The service operation is named after the outbound message name.
- The request message is named after the outbound asynchronous message.
- The response message is named after the asynchronous response message specified in the relationship.

In PeopleTools 8.47 and earlier systems `IsActive` was used to check the active property on the message, in PeopleTools 8.48 and higher systems it checks the service operation. In cases where a service operation is not created for a message, `IsActive` returns *False*. Therefore there may be a behavioral change from previous releases. In cases where there is no service operation created, and you want the previous behavior preserved, you must create a service operation and set the operation state to match that which was on the message.

Routing Objects

The upgrade process creates point-to-point routing definitions in the PeopleTools 8.48 or higher system based on node transactions and relationships defined in the PeopleTools 8.47 or earlier system.

Only current relationships in the PeopleTools 8.47 or earlier system are migrated.

The Active/Inactive flag on the transaction in the PeopleTools 8.47 or earlier system determines whether the routing definition is active or inactive in the PeopleTools 8.48 or later system.

The connector information defined on the outbound transaction is used in the routing definition. You must manually update aliases on routing definitions that use custom connectors.

When the system creates routing definitions during the upgrade process, the external message name from the transaction is used as the routing alias, if one was defined. If there is no value in the external message name, messages on nodes that are marked as *External* use the PeopleTools 8.47 or earlier system alias message name. PeopleTools 8.47 and earlier system nodes marked as anything other than *External* use the PeopleTools 8.48 alias format of *serviceoperation.version*.

All routing definitions created during the upgrade process are point-to-point routings, with one exception. In cases where on the PeopleTools 8.47 or earlier system there is an inbound synchronous or asynchronous node transaction on the default local node without a corresponding outbound synchronous or asynchronous node transaction (via relationship) on the default local node, an any-to-local routing definition is created during the upgrade.

Understanding Migrated Integration PeopleCode

The following table summarized how PeopleCode has been migrated between PeopleTools 8.4x releases and PeopleTools 8.48:

<i>PeopleTools 8.4x PeopleCode (PeopleTools 8.47 and Earlier)</i>	<i>PeopleTools 8.48 and Higher PeopleCode</i>
Message and subscription PeopleCode.	Application classes.
PeopleCode events.	Service operation handlers.

All PeopleCode referenced in a message is converted to an application class, which is in turn then referenced by a handler that is created in the service operation generated by the converted message.

Application Classes

PeopleCode defined on messages in PeopleTools 8.47 and earlier releases is migrated into application classes in PeopleTools 8.48 and higher releases.

Application classes have to belong to an application package. The message name becomes the application package name and description. The exception for this naming convention is when an application package already exists on the PeopleTools 8.48 or higher system that matches the message name. In this case the application package is stripped of all underscores and the number *1* is appended to the end of the name.

For every subscription event associated with a message, an application class is created in the PeopleTools 8.48 or higher system with a similar name as the subscription event. Since application class names cannot contain special characters, those found in the subscription event name are simply replaced with an underscore.

Default values for application class names are used for the other message events.

If a PeopleTools 8.47 or earlier message has no PeopleCode defined on it, no application package is generated for it in the PeopleTools 8.48 or higher system.

Application classes that fail to compile are saved and commented out. In these cases, a deprecated handler is created to invoke the old message or subscription event, to behave, runtime-wise, as it did in PeopleTools 8.47 and earlier systems. The user, however, is responsible for correcting any application classes that failed to compile and modifying any service operation definition that makes use of the deprecated handler.

See [Appendix C, "Understanding Migrated Integration Metadata," Correcting Integration PeopleCode That Did Not Migrate, page 545.](#)

PeopleCode Methods

The following table describes how PeopleCode events from PeopleTools 8.47 and earlier releases map to PeopleTools 8.48 and higher methods.

<i>PeopleTools 8.4x Integration PeopleCode Events (PeopleTools 8.47 and Earlier)</i>	<i>PeopleTools 8.48 Integration PeopleCode Base Classes and Methods (PeopleTools 8.48 and Higher)</i>
OnRequest	IRequestHandler:OnRequest
OnAckReceive	IReceiver:OnAckReceive

<i>PeopleTools 8.4x Integration PeopleCode Events (PeopleTools 8.47 and Earlier)</i>	<i>PeopleTools 8.48 Integration PeopleCode Base Classes and Methods (PeopleTools 8.48 and Higher)</i>
OnRouteReceive	IRouter: OnRouteReceive
OnRouteSend	IRouter:OnRouteSend
OnSend	ISend:OnRequestSend
Subscription	INotification:OnNotify

Built-In Functions

Many PeopleCode built-in functions have been deprecated for the new PeopleSoft Integration Broker model. Most of the PeopleTools 8.47 and earlier built-in functions have been internally redirected to work with the PeopleTools 8.48 and later equivalent. When compiling PeopleCode that uses the PeopleTools 8.47 and earlier built-in functions, an informational message appears that explains that the given built-in has been deprecated.

Other Migrated Constructs

The following constructs are also migrated during the upgrade process:

- Import statements.
- Function libraries.
- Variables not explicitly declared.

Special Characters

During the upgrade process, any special characters that used in the name of PeopleCode constructs in the PeopleTools 8.47 or earlier PeopleCode, such as slashes ("/"), single quotation marks "'", and periods (.), are replaced with underscores (_).

Correcting Integration PeopleCode That Did Not Migrate

This section provides an overview of integration PeopleCode that did not migrate and how to correct it.

Understanding Integration PeopleCode That Did Not Migrate

This section discusses the reasons why integration events and subscriptions might not successfully migrate to application classes during the upgrade from PeopleTools 8.47 and earlier systems to PeopleTools 8.48 and higher systems and the *Deprecated* type service operation handler used to manage such PeopleCode.

Reasons Why Integration PeopleCode Does Not Migrate

Integration events and subscriptions might not successfully migrate to application classes for the following reasons:

- Use of global variables.
- Use of component variables.
- Use of constants.
- Use of local functions.
- Inability to determine the return type or the return type is incorrect.

Deprecated PeopleCode Handler

The PeopleSoft system creates a deprecated PeopleCode handler for any integration PeopleCode that cannot be migrated to the PeopleTools 8.48 or higher system.

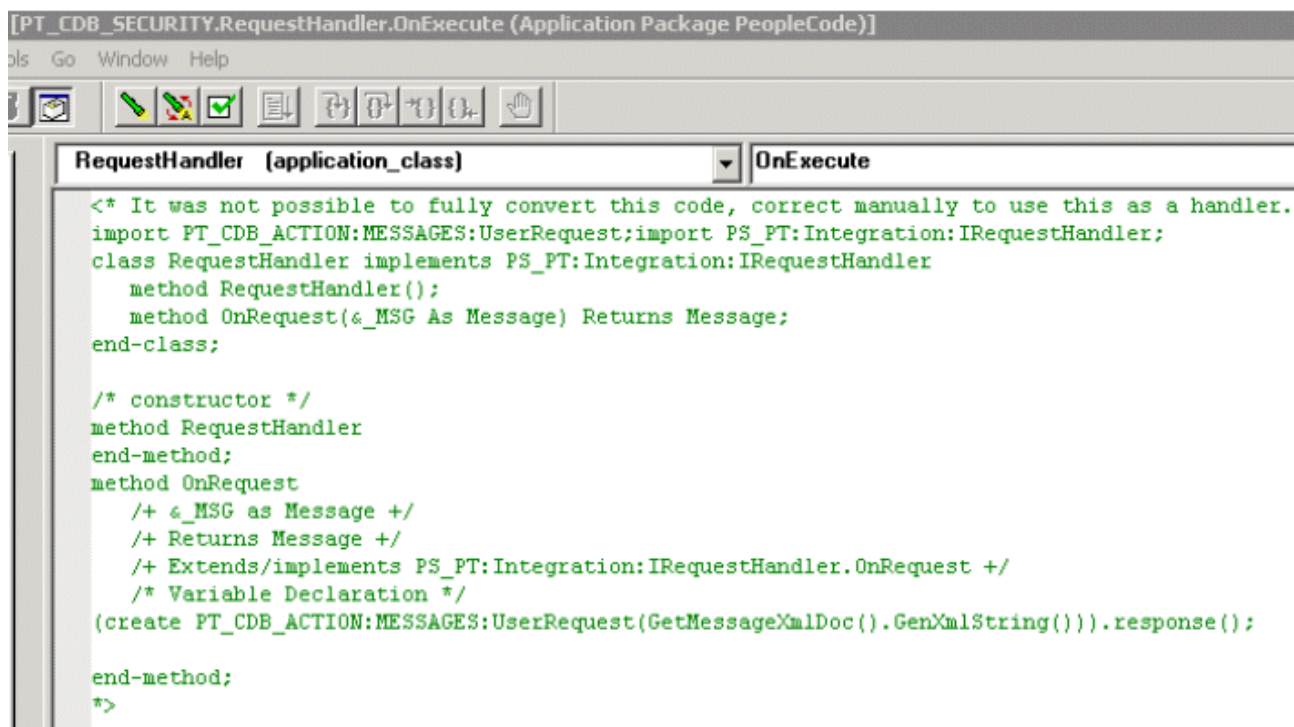
Deprecated handlers enable you to run PeopleTools 8.47 and earlier PeopleCode (subscription or onRequest). However, PeopleSoft recommends that you correct the PeopleCode and migrate the code into an *Application Class* type handler for use in the PeopleTools 8.48 or higher system.

See [Appendix C, "Understanding Migrated Integration Metadata," Correcting Non-Migrated Integration PeopleCode, page 546.](#)

Correcting Non-Migrated Integration PeopleCode

This section discusses correcting non-migrated PeopleCode and creating an *Application Class* type handler.

The following example shows an application class created for the PeopleTools 8.47 or earlier message *PT_CDB_SECURITY*. During the upgrade process, the system was unable to migrate the integration PeopleCode defined on the message.



A PeopleTools 8.48 application class created for the PeopleTools 8.4x message PT_CDB_SECURITY

To correct non-migrated integration PeopleCode:

1. In PeopleSoft Application Designer, open the migrated application package.

The package name is generally the same as the message name in the PeopleTools 8.47 or earlier system.

2. Remove the "<*" and ">*" symbols, as well as the comments from the code.
3. Compile the code.

If the code did not migrate for one of the following reasons, the system displays a meaningful error message to assist you in correcting the problem:

- Use of component scope variables.
- Use of global variables or constant variables
- Incorrect return type for handler.

If the reason for the failure is due to the use of a local function, modify the PeopleCode to ensure that the function is passing appropriate types for the context in the application package.

4. Correct the PeopleCode and save the changes.

5. Delete the deprecated handler.

- a. Select PeopleTools, Integration Broker, Service Utilities, Service Administration.. Click the Deprecated PeopleCode tab.

The Deprecated PeopleCode page appears.

- b. In the Service Operation field, enter the name of the service operation that contains the deprecated handler to delete and click the Search button.
 - c. In the Select column, check the box next to the service operation name that contains the deprecated handler to delete.
 - d. Click the Delete button.
6. Add an *Application Class* type handler to the service operation definition that references the modified PeopleCode.

See [Chapter 10, "Managing Service Operations," Adding Handlers to Service Operations, page 220.](#)

7. In the message definition that was migrated to the PeopleTools 8.48 or higher system, delete the PeopleCode event or Subscription that is defined on the message.

Open the PeopleCode editor for the respective event and null out the program that exists there. Several warnings appear when saving the program, but your changes will be committed.

Index

A

- actions, inserting into transform programs 328
- Add a New Record page 85
- aliases *See Also* external routing aliases
 - fields 82
 - preserving for records and fields 330
 - records 82
 - specifying field name 89
 - specifying record aliases (rowset-based messages) 88
 - understanding 56
- any-to-local routing
 - defined 280
 - generating 285
 - regenerating 287
- any-to-local routing definitions
 - viewing status 284
- Apache Xalan 328
- application classes
 - error-handling methods 135
 - implementing handlers using 264
- Application Designer
 - defining transform programs 324
- application engine programs
 - implementing handlers with 267
 - viewing subscription contract status 269
- Application Engine transform programs
 - See* transformations
- application servers
 - applying transformations 351
 - generating requests 18
 - handling exceptions 379
 - logging 377
 - publication broker
 - See Also* publication broker
 - publication contractor publication contractor
 - receiving requests 16
 - returning responses 16
 - Subscription contractor
 - See Also* subscription contractor
 - tracing 377
- archiving
 - service operations assigned to a queue 234
- AsyncFFsend 432
- asynchronous message transmission
 - handling outbound 138
- asynchronous messaging
 - brokers, contractors, queues 21
 - debugging transformations 379
 - handling cookies 144
 - partitioning channels *See Also* partitioning
 - publishing 24
 - server processes 22
 - simulating receiving messages from external nodes 167
 - understanding compression 53
 - understanding subscription 28
- Asynchronous – One Way 210
- Asynchronous Request/Response 210
- Asynchronous to Synchronous 210

- asynchronous transactions
 - handling inbound 149
- audit action codes 60

B

- BPEL integrations
 - BPEL node 434
 - consuming asynchronous fire-and-forget BPEL operations 441
 - consuming asynchronous one-way BPEL operations 441
 - consuming asynchronous request/response BPEL operations 438
 - consuming BPEL process-based services 435
 - consuming synchronous BPEL operations 436
 - delivered application classes for 431
 - monitoring 432
 - prerequisites 433
 - providing asynchronous PeopleSoft request/response to BPEL processes 448
 - providing PeopleSoft services to BPEL processes 444
 - providing synchronous PeopleSoft operations to BPEL processes 444
- BPEL processes *See Also* BPEL integrations
 - understanding integrating with 431
- BPELUtil 432
- broker dispatchers/handlers
 - asynchronous publishing of instances 24
 - asynchronous subscription of instances 28
 - server processes 23
- built-in functions
 - Exit 169
 - FindCodeSetValues 367, 368
 - PublishXmlDoc 503
 - SetXMLDoc 67
- bulk load handler 272
 - adding data structures for nonrowset-based messages 276
 - and transaction rollback 272
 - enabling transaction rollback 273
 - process overview for implementing 273
 - specifying XML record attribute values 275
 - understanding 272

C

- CDATA
 - generating outbound messages 138
 - handling non-XML data 346
 - sending non-XML files 67
- channels
 - debugging 379
- classes
 - Message 56, 59, 65, 168
 - Rowset 56, 65, 330

- SoapDoc 65, 66, 76, 77, 166, 168
- TransformData 345
- XmlDoc 59, 65, 76, 168, 347
- Codeset Group page 357
- codeset groups
 - defining 357
 - understanding 356
- Codeset page 358
- codeset repositories
 - elements 356
 - translating via 355
- codesets
 - codeset groups *See Also* codeset groups
 - codeset values codeset values
 - defining 358
 - deleting 362
 - exporting/importing 361
 - repository *See Also* codeset repositories
 - understanding 356
- codeset values
 - defining 359
 - deleting 362
 - understanding 356
- Codeset Values page 359
- component interface-based services 247
 - generating 253
 - impact of changing component interfaces 249
 - metadata created 247
 - naming conventions of metadata created 247
 - prerequisites for creating 249
 - selecting component interfaces methods to
 - include as service operations 251
 - selecting component interfaces to expose as
 - services 249
 - user-defined method restrictions 248
 - viewing generated service definitions 255
- component interfaces
 - implementing handlers using 270
- compression
 - applying transformations at gateway 352
 - overriding 53
 - setting the message compression threshold 53
- connectors
 - connector management service 10
 - inbound request flow through the architecture
 - 14
 - listening *See Also* listening connectors
 - outbound request flow through the architecture
 - 14
 - receiving third-party messages 519
 - target *See Also* target connectors
 - understanding 8
 - understanding gateway manager
 - See Also* gateway manager
- connector SDK
 - understanding 8
- Consume Web Service wizard
 - accessing metadata created 428
 - asynchronous request and response operations
 - 414
 - binding style of consumed WSDL documents
 - 414
 - converting asynchronous operations 421
 - features 411
 - metadata created 412
 - multiple fault messages 413
 - multiple root elements 413
 - operation types supported 411

- prerequisites 414
- renaming operation messages 423
- selecting queues for asynchronous operations
 - 425
- selecting receiver nodes 426
- selecting service operations 421
- selecting service ports 420
- selecting services 419
- selecting WSDL sources 417
- sources for consuming WSDL documents 412
- understanding 411
- using 417
- viewing results 427
- consuming services
 - See Also* Consume Web Service wizard
 - prerequisites 414
- container messages
 - adding 78
 - adding attributes 108
 - adding message parts to 105
 - generating schemas 112
 - managing 102
 - understanding 102
- cookies
 - handling in messages 144
 - receiving/returning 144

D

- data *See Also* metadata
- databases
 - importing/exporting codesets between 361
 - understanding record fields 237
- DB2
 - supporting transformations 328
- debugging
 - handler PeopleCode 378
 - handling common issues 379
 - integrations 378
 - managing 371
 - transform programs 331
- deprecated data repository 485
- deprecated PeopleCode handler 277
- developing application classes for implementing
 - 265
- dispatchers
 - asynchronous publishing of publication
 - contracts 26
 - asynchronous publishing of service operation
 - instances 24
 - asynchronous subscription contracts 29
 - asynchronous subscription of instances 28
 - Publication broker
 - See Also* broker dispatchers/handlers
 - publication contractor publication dispatchers
 - subscription contractor
 - subscription dispatchers
 - understanding 23
- Document Object Model (DOM) *See* XML DOM
- DPC handler deprecated PeopleCode handler
- duplicate routings, deleting 318

E

- elements to ignore file configuration file 343
- environment variables
 - %TransformData 345
- error handling 135
- errors
 - asynchronous publishing of publication contracts 26
 - asynchronous subscription contracts 29
 - deleting messages during upgrade 119
 - deleting queues during upgrade 240
 - error handling service 10
 - integration gateways 371
 - listening connectors 372
 - logging methods and parameters 376
 - managing 371
 - managing gateway error logging 376
 - processing for inbound messages 169
 - refreshing gateways 354
 - response message error codes 51
 - runtime transformations 354
 - setting up logging 374
 - target connectors 371
 - transformations 345
 - understanding logging 10, 374
 - validating inbound messages 168
- esb integrations
 - prerequisites 453
 - software components 451
- esb services
 - consuming 454
 - consuming in peoplesoft 457
 - invoking 454
 - invoking asynchronous services in peoplesoft 459
 - invoking synchronous services in peoplesoft 458
 - providing to peoplesoft 457
- events
 - OnRouteReceive 148
- exceptions
 - integration gateways 372
 - Java 373
 - standard 372
- exported wsdl
 - clearing wsdl export status 116
 - resolving inconsistencies 113
- external routing aliases
 - searching for duplicates 315
 - understanding 283

F

- fault message
 - specifying in service operations 219
- fields
 - aliases 56
 - changes to field-level attributes 61
 - database record 237
 - enforcing aliases in WSDL 92
 - excluding descriptions of in schema 90
 - excluding from rowset-based messages 89
 - message header/XML 237
- filtering
 - PeopleCode filtering example 348
 - understanding 321, 347
- firewalls

- communicating with third-party systems 510
- integrating with Integration Broker systems 498
- receiving third-party messages 519
- sending messages to third-party systems 516
- FTP Attachment Upload page 223
- FTP Attachment utility 223
- FTP target connectors
 - working with non-XML files 67

G

- gateway manager
 - gateway services 9
 - integration gateway architecture 7
 - understanding 9
- Gateways component
 - defining gateways 492
- gateway services 9
- generic routing
 - configuring hubs 504
 - understanding 503
- Getting Started With Integration Broker 1

H

- handler PeopleCode
 - debugging 378
- handlers 265
 - adding to service operations 261
 - asynchronous publishing of instances 24
 - asynchronous publishing of publication contracts 26
 - asynchronous subscription contracts 29
 - asynchronous subscription of instances 28
 - copying between databases 482
 - debugging 379
 - implementation, understanding 260
 - implementing using application classes 264
 - implementing using application engine programs 267
 - implementing using component interfaces 270
 - managing 259
 - message types used 260
 - Publication broker
 - See Also* broker dispatchers/handlers
 - publication contractor publication handlers
 - specifying general details 263
 - subscription contractor
 - See Also* subscription handlers
 - types 259
 - understanding 23
- headers
 - header section for request messages 43
 - header section for response messages 50
- hubs
 - configuring generic-routing 504
 - configuring sender-specific routing 507
 - integrating with Integration Broker systems 502
 - understanding routing 503

I

IB_SEGTEST 182

IBInfo

- accessing using PeopleCode 54
- receiving third-party messages 519
- retrieving data 156
- understanding 145
- understanding request messages 40, 44
- understanding response messages 50

IBRequest *See* request messages

IBResponse response messages

IBUtil 432

inbound

- message transmission
 - See Also* inbound message transmission
- messaging inbound messaging

Inbound File Loader Rules page 474

inbound file loader utility

- about 467
- development activities 469
- inbound file processing 467
- inbound file processing testing 479
- initiating flat file processing 478
- initiating processing 477
- prerequisites 474
- setting up processing rules 474

Inbound File Processing page 478

inbound message transmission

- understanding 122

inbound messaging

- handling asynchronous 149
- handling cookies 144
- handling synchronous 164
- invoking error processing 169
- request flow through the architecture 14
- routing methods 125
- understanding 122
- validating data 168

included record fields

- viewing for rowset-based records 82

input message name 325

input root element 325

Integration Broker

- application classes 125
- implementing 1
- understanding xxi, 5

integration engine

- architecture 10
- understanding 6

integration gateway

- applying transformations
 - See Also* transformations
- architecture 7
- connector management service
 - See Also* connectors, 10
- defining 492
- error handling 371
- error handling service 10
- gateway manager *See Also* gateway manager
- gateway services 9
- handling common issues 379
- logging errors/messages 374
- managing error logging 376
- managing message logging 375
- message validation service 10
- messaging objects service 9

remote gateways *See Also* remote gateways

setting up error/message logging 374

understanding 6

understanding exceptions 372

understanding gateway definitions 35

viewing non-English characters in log files 374

XML parsing service 9

integrationGateway.properties

setting up logging 374

transforming messages at gateway 352

understanding 492

integration metadata *See* metadata

activating 313

viewing inactive metadata 313

integrations

- configuration scenarios 491
- debugging 378
- integrating between nodes (example) 527
- integrating through a firewall 498
- integrating via hubs 502
- integrating with Integration Broker systems 496
- integrating with PeopleTools 8.1x 524
- integrating with third-party systems 510, *See Also* remote gateways
- metadata overview 35
- understanding setup 491

integration status

viewing 313

International Organization for Standardization (ISO)

- language codes 60
- PeopleSoft timestamp formats 62

IsChanged

part messages 97

ISO

- language codes 60
- PeopleSoft timestamp formats 62

J

Java

exceptions 373

Jolt

setting connect gateway properties 492

L

languages

- selecting for transformations/translations 323
- understanding message language codes 60
- viewing non-English characters in log files 374

listening connectors

- error handling 372
- integrating with third-party systems 510
- message logging 375
- receiving requests 15, 18
- receiving responses 18
- understanding 8

local-to-local routing

- defined 280
- generating 285
- regenerating 287

local-to-local routing definitions

- viewing status 284
- logging
 - application servers 377
 - error logging methods and parameters 376
 - errors and messages 10
 - gateway refresh errors 354
 - managing 371
 - managing for gateway messages 375
 - managing gateway error logging 376
 - message logging in connectors 375
 - message logging methods and parameters 375
 - runtime transformation errors 354
 - setting up error/message logging 374
 - understanding error/message logging 374
 - viewing non-English characters 374

M

- maximum occurs 103
- maximum unbounded 103
- message aliases
 - about 77
- Message class 136
- message container message format
 - See Also* message containers
 - understanding 72
- Message Definition page 78
- message definitions
 - adding 78
 - understanding 35
- Message Field Properties page 89
- message format
 - example of rowset-based message 63
 - fieldtype sections 57
 - MsgData sections 57
 - PeopleSoft rowset-based message format 55
 - rowset-based message template 56
 - timestamp format 62
- Message Part Default Indicator 97
- message part message format
 - 68, *See Also* message parts
 - nonrowset-based message parts 72
 - rowset-based message parts 69
 - understanding 68
- message parts *See Also* reusing message parts
 - adding 78
 - adding to container messages 105
 - creating 96
 - managing 96
 - understanding 96
- Message Record Properties page 86
- messages *See Also* message definitions
 - choosing types to use 76
 - conditions when they are read-only 77
 - container messages 102
 - converting characters to uppercase 77
 - copying between databases 482
 - deleting 117
 - deleting messages during upgrade 119
 - excluding fields from 89
 - managing 75
 - message definitions defined 75
 - message parts 96
 - naming conventions 76
 - nonrowset-based messages 93
 - non-rowset-based messages 76
 - renaming 117
 - restrictions for modifying 77
 - rowset-based messages 76, 81
 - specifying for service operations 218
 - types of 75
 - understanding 75
 - viewing those referenced in service operations 113
- Message Schema Builder 185
 - selecting data in 186
 - understanding 185
 - viewing 190
 - viewing schema details 188
 - viewing schemas in 186
- message schemas *See Also* schema validation
 - building for rowset-based messages 190
 - choosing level 0 rows to include in 91
 - converting to managed objects 485
 - data mover scripts for copying 484
 - defined 185
 - deleting for nonrowset-based messages 193
 - deleting for rowset-based messages 193
 - excluding empty XML tags in 92
 - excluding record and field descriptions in 90
 - importing for nonrowset-based messages 191
 - including namespaces in 91
 - managing for rowset-based messages 90
 - modifying for nonrowset-based messages 192
 - validating 241
 - viewing 244
 - viewing rowset-based 90
 - viewing schema details 188
- MessageSegmentFromDB 176
- message segments 172
 - accessing with PeopleCode 181
 - configuring nodes to handle 174
 - counting 176
 - creating 174
 - deleting 177
 - ordering for processing 176
 - receiving 178
 - restartable processing 182
 - segment numbers 175
 - sending 178
 - storing for processing 176
 - storing for processing, overriding 176
 - understanding 172
 - viewing segment data 182
- message versions
 - about 77
- messaging
 - controlling message size 155
 - defined 21
 - dispatchers *See Also* dispatchers
 - filtering filtering
 - gateway manager gateway manager
 - generating messages 137
 - generating test messages 172
 - handlers *See Also* handlers
 - handling cookies 144
 - handling non-XML data 346
 - identifying field-level attribute changes 61
 - making working storage data available globally 329
 - managing logging 375
 - messaging services 9

- nonrowset-based messages
 - See Also* nonrowset-based messages
- PeopleSoft rowset-based message format
 - message format
- prerequisites for message delivery/reception 121
- processing messages 148
- processing service operations in parallel 235
- queues *See Also* queues
- receiving messages 148
- request messages *See Also* request messages
- response messages response messages
- routing PeopleCode 125
- rowset-based messages
 - See Also* rowset-based messages
- sending/receiving messages via PeopleCode 35
- sending messages 137
- setting up logging 374
- transformations *See Also* transformations
- translating translations
- understanding logging 10, 374
- understanding message delivery/reception 121
- understanding process flows 122
- understanding SOAP compliance 66
- understanding supported message structures 39
- XML DOM compliance *See Also* XML DOM
- messaging format
 - message parts 68
- messaging part
 - message container 72
- messaging PeopleCode *See* PeopleCode
- messaging servers
 - processes for asynchronous messaging 22
- metadata
 - copying between databases 481
- methods
 - CopyRowsetDelta 60
 - CopyRowsetDeltaOriginal 60
 - CopyToRowset 330
 - CreateNextSegment 173
 - CurrentSegment 173
 - DeleteSegment 173
 - ExecuteEdits 168
 - GetSegment 173
 - GetXmlDoc 163
 - GetXMLDoc 171
 - InboundPublish 167
 - IONRequestSend 131
 - logError 376
 - logMessage 375
 - notification 54
 - OnNotify 134
 - OnRequestSend 144, 145
 - OnResponse 135
 - OnRouteSend 138
 - OnSend 145
 - Publish 138
 - routing PeopleCode 125
 - SetXMLDoc 171
 - SyncRequest 140
 - UpdateSegment 173
 - ValidateSoapDoc 168
- MIME
 - request messages 39
 - response messages 49
- minimum occurs 103
- Multipurpose Internet Mail Extension standard (MIME) *See* MIME

N

- namespaces
 - including in schemas 91
- nodes
 - configuring local/remote 493
 - debugging 379
 - integrating between nodes (example) 527
 - managing during project copy and upgrade 488
 - overriding initial/result nodes 363
 - routing PeopleCode 125
 - setting for transformations 353
 - setting Jolt connect strings 492
 - simulating receiving messages from external nodes 167
 - understanding 322
 - understanding definitions 35
- nonrowset-based message format 65
 - understanding 171
- nonrowset-based messages
 - See* nonrowset-based message format
 - adding 78
 - adding schemas 93
 - deleting schemas 94
 - deleting schemas for 193
 - editing schemas 94
 - importing schemas for 191
 - managing 93
 - modifying schemas for 192
 - understanding 93

O

- objects
 - ConnectorInfo 145
 - IBInfo *See Also* IBInfo
 - Integration Broker 54
 - Message 171
 - messaging objects service 9
 - Rowset 330
 - XmlDoc 66, 330
 - XML parsing 9
- OnRouteReceive 125
- OnRouteSend 125
- operations *See* service operations
- oracle enterprise service bus oracle esb
 - oracle enterprise service bus integrations
 - esb integrations
- oracle enterprise service bus services
 - esb services 451
- oracle esb *See Also* esb integrations, esb services
 - about 451
- Oracle XSL Mapper 331, 332
 - adding code to XSL maps 343
 - deleting record and field maps 341
 - Design view 337
 - development considerations 332
 - documentation 336
 - elements to ignore configuration file 343
 - installing 333
 - launching 335
 - mapping records and fields 340
 - modifying XSL maps 343
 - navigating in 337
 - prerequisites 332

- Source view 339
- specifying path to installation location 333
- testing XSL maps 342
- viewing XSLT code 342
- outbound
 - message transmission
 - See Also* outbound messaging
 - messaging outbound messaging
- outbound message transmission
 - understanding 122
- outbound messaging
 - handling asynchronous 138
 - handling cookies 144
 - handling synchronous 140
 - identifying SOAP faults 139
 - message class outbound PeopleCode 138
 - overriding synchronous timeout interval 143
 - routing methods 125
 - sending non-XML data 138
 - testing 137
 - transforming messages 327
 - understanding 122, 137
 - understanding delivery order 137
- output message name 325
- output root element 325

P

- pages
 - Inbound File Loader Rules page 474
 - inbound file processing 478
- partitioning
 - enabling/disabling fields 235
 - selecting fields 236
 - understanding 235
- PeopleCode
 - accessing message data 345
 - classes *See Also* classes
 - defining PSCAMA records 59
 - error handling 135
 - filtering 323
 - generating to reject transformations 369
 - generating to terminate transformations 369
 - identifying field-level attribute changes 61
 - implementing handlers for deprecated
 - PeopleCode 277
 - making working storage data available
 - globally 329
 - Message class 136
 - methods *See Also* methods
 - routing 125
 - sending/receiving 35
 - sending and receiving 123
 - setting target connector properties 144
 - simulating receiving messages from external
 - nodes 167
 - SOAPDoc class 136
 - translation example 367
 - understanding message filtering 347
 - XMLDoc class 136
- PeopleSoft 8.1 target connectors
 - duplicate message exception 372
- PeopleSoft common application message
 - attributes (PSCAMA) *See* PSCAMA
- PeopleSoft Integration Broker Integration Broker
- PeopleSoft rowset-based message format 55
- PeopleTools 8.1
 - integrating 524
- performance issues
 - applying transformations at integration
 - gateway 351
 - editing XSLT transformations 352
- permissions to service operations, setting 221
- pinging
 - publication contracts 26
- planning
 - architecture 1
 - integrations 2
 - security 3
 - staff skills required 3
 - support 3
- point-to-point routing
 - defined 280
- point-to-point routings, creating 287
- properties
 - SegmentCount 173
 - SegmentsByDatabase 173
 - SegmentsUnOrder 173
- Provide Web Service wizard
 - accessing generated WSDL documents 407
 - complex type tags 384
 - features 383
 - locations for publishing WSDL documents
 - 384
 - multiroot element 384
 - nonrowset-based message schema
 - requirements 384
 - operation types supported 384
 - PartnerLinkType support 395
 - prerequisites 398
 - provided WSDL document sections 386
 - selecting service operations 401
 - selecting services to provide 400
 - specifying publishing options 404
 - target namespace 384
 - UDDI repositories and endpoints 385
 - understanding 383
 - understanding using 400
 - viewing the WSDL generation log 407
 - viewing WSDL documents 402
 - WSDL document versioning 397
 - WSDL URL formats 385
- providing services
 - See Also* Provide Web Service wizard
- PS_FILEDIR, setting for consuming WSDL from
 - files 416
- PSADMIN
 - setting compression 53
- PSCAMA
 - defining records 59
 - understanding language codes 60
 - understanding message XML fields 237
 - understanding MsgData sections for
 - messages 57
 - using audit action codes 60
- publication
 - asynchronous service operation publication
 - 24
 - dispatchers *See Also* publication dispatchers
 - handlers publication handlers
 - publication broker publication broker
 - publication contractor publication contractor
 - publication contracts publication contracts
 - synchronous service operation publication 31

- publication broker
 - understanding 21, 24
- Publication broker
 - server processes 23
- publication contractor
 - asynchronous service operation publication 24
 - server processes 23
 - understanding 21
- publication contracts
 - asynchronous publishing 26
 - understanding 21
- publication dispatchers
 - asynchronous publishing of instances 24
 - asynchronous publishing of publication contracts 26
 - server process 23
- publication handlers
 - asynchronous publishing of publication contracts 26
 - server process 23

Q

- queues
 - adding 233
 - archiving service operations 234
 - copying between databases 482
 - deleting 238
 - deleting during upgrade 240
 - enabling multi-queue processing 227
 - partitioning *See Also* partitioning
 - processing service operations in parallel 235
 - renaming 238
 - selecting status 235
 - understanding 35, 233
 - understanding messaging queues 21

R

- record fields
 - aliases 82
 - creating 82
- records
 - aliases 82
 - changing underlying definitions 77
 - creating 82
 - defining PSCAMA records 59
 - deleting from rowset-based messages 88
 - enforcing aliases in WSDL 92
 - excluding descriptions of in schema 90
 - inserting to rowset-based message definitions 85
 - preserving aliases 330
 - understanding aliases 56
 - understanding message record structure 77
 - viewing for rowset-based messages 82
- referenced message parts
 - deleting 102
 - modifying 102
 - recursion, checking for 99
 - viewing 99
- refreshing
 - gateway refresh errors 354
- remote gateways

- changing the default connector setting 492
- configuring nodes 493
- integrating with Integration Broker systems 498
- integrating with third-party systems 512
- receiving third-party messages 518
- sending messages to third-party systems 516
- request messages
 - content section 40, 49
 - exceptions 373
 - header section 40, 43
 - IBInfo section 40, 44
 - inbound flow through the architecture 14
 - internal format 39
 - transforming 327
- response messages
 - catalog entries 51
 - content section 51
 - error codes 51
 - exceptions 373
 - header section 50
 - IBInfo section 50
 - internal format 49
- reusing message parts
 - See Also* referenced message parts, copied
 - message parts
 - by reference 98
- root records 82
- routing
 - default connector 492
 - generic *See Also* generic routing
 - PeopleCode 125
 - publication broker 22
 - sender-specified
 - See Also* sender-specified routing
- routing actions upon save 285
- routing aliases
 - defining 295
 - viewing routing definitions with the same alias 295
- routing definition
 - overriding connector properties 299
- routing definitions
 - See Also* system-generated routing definitions, user-defined routing definitions, routing introspection, system-generated routing definitions
 - activating 308
 - activating from service operation definitions 221
 - adding 289
 - adding external aliases 295
 - adding to service operation definitions 220
 - creating 287
 - creating using introspection 302
 - defined 279
 - defining 280, 292
 - defining properties 301
 - deleting 316
 - deleting/renaming transform programs 347
 - deleting duplicates 318
 - for rss feeds 290
 - generated during node introspection 281
 - generating, summary 282
 - inactivating 308
 - inactivating from service operation definitions 221
 - integration status 284

- methods for generating 281
- naming conventions 282
- overriding integration gateway 299
- overview 279
- renaming 316
- retrieving properties programmatically 314
- specifying transforms 295
- system-generated at runtime 281
- system-generated during consuming services 281
- system-generated during upgrade 281
- types 279
- user-defined 281
- viewing graphically 283
- viewing in graphical format 311
- routing introspection
 - prerequisites 302
 - selecting nodes to introspect 304
 - selecting routing definitions to generate 305
 - selecting service operations for 303
 - understanding 302
 - viewing introspection results 307
- routing methods
 - OnAckReceive 132
 - OnRequest 133
- routing parameters 288
- routings *See* routing definitions
 - copying between databases 482
- routing status 284
- rowset-based message format 55
 - understanding 171
- rowset-based messages
 - adding 78
 - building schemas for 190
 - deleting records from 88
 - deleting schemas for 193
 - field name aliases 89
 - inserting records 85
 - managing 81
 - record structure 77
 - root records 82
 - specifying record aliases 88
 - underlying record definitions 77
 - understanding 82
 - viewing 82
- rss feeds
 - routing definitions 290
- runtime schema validation, enabling 246

S

- Schema page 93
- schemas
 - adding to nonrowset-based messages 93
 - deleting nonrowset-based 94
 - editing for nonrowset-based messages 94
 - generating for container messages 112
 - restrictions 62
- schema validation
 - enabling runtime schema validation 246
 - prerequisites 242
- security
 - planning for 3
- SegmentCount 176
- SegmentsByDatabase 176
- SegmentsUnOrder 176
- sender-specified routing
 - configuring hubs 507
 - understanding 503
- sending and receiving
 - application classes 125
 - PeopleCode 123
- Service Configuration page 117
- service definitions
 - accessing 197
 - adding and configuring 200
 - deleting 206
 - renaming 206
 - viewing 197
 - viewing component-interface-based service definitions 255
- service operation
 - accessing 212
 - viewing 213
- service operation definitions
 - See Also* service operation versions
 - adding 216
 - adding routing definitions 220
 - attachment information, processing 225
 - attachment information, sending 224
 - configuring 216
 - defining versions 217
 - deleting 229
 - renaming 229
 - specifying fault messages 219
 - specifying messages 218
 - uploading attachments 223
- service operation fanout 228
- service operation handlers *See* handlers
- service operation mapping 283
- service operation queues *See* queues
- service operations
 - See Also* service operation definitions, service operation versions
 - add existing to a service 202
 - adding handlers 261
 - adding to services 202
 - aliases 210
 - choosing component interface methods to include in 251
 - copying between databases 482
 - defined 210
 - invoking in oracle esb 464
 - invoking multiple 228
 - monitoring in the Service Operations Monitor 211
 - monitoring in third-party tools 211
 - monitoring using module and action information 211
 - multi-queue processing 227
 - naming conventions 210
 - providing to oracle esb 464
 - service operation types 210
 - setting permissions 221
 - viewing messages referenced in 113
- service operation types
 - Asynchronous – One Way 210
 - Asynchronous Request/Response 210
 - Asynchronous to Synchronous 210
 - defined 210
 - overview 12
 - Synchronous 210
- service operation versions
 - copying between databases 482

- creating 222
- using non-default versions 223
- services
 - See Also* service definitions, providing services,
 - consuming service
 - consuming 411
 - copying between databases 482
 - generating component interface-based services 253
 - restricting access to 203
 - selecting component interfaces to expose as 249
 - understanding 195
 - viewing WSDL documents for 198
- services, gateway *See* gateway services
- Services page 197
- SOAP
 - defining PSCAMA records 59
 - identifying faults 139
 - understanding error codes 52
 - understanding SOAP-compliant messages 66
- SOAPDoc class 136
- status
 - codes for response messages 51
 - selecting queue status 235
 - setting for transformations 345
- steps, inserting into transform programs 328
- structured messages *See* rowset-based messages
- subqueues
 - applying partitioning 235
- subrecords
 - viewing for rowset-based records 82
- subscription
 - asynchronous subscription of instances 28
 - contracts *See Also* subscription contracts
 - dispatchers subscription dispatchers
 - handlers subscription handlers
 - Subscription contractor subscription contractor
 - synchronous messaging 33
 - understanding 21
- subscription contractor
 - server processes 23
 - understanding 21
- subscription contracts
 - asynchronous subscription of service operations 28
 - understanding 21
 - understanding asynchronous 29
- subscription dispatchers
 - asynchronous subscription contracts 29
 - asynchronous subscription of instances 28
 - server process 23
- subscription handlers
 - asynchronous subscription contracts 29
 - server process 23
- subscription PeopleCode
 - asynchronous subscription contract 29
 - debugging 379
- support, planning for 3
- synchronous messaging
 - applying transformations at gateway 352
 - debugging transformations 379
 - handling cookies 144
 - publishing 31
 - routing methods 125
 - transforming messages 327
 - understanding compression 53
 - understanding subscription 33

- using record/field aliases 56
- Synchronous operation type 210
- synchronous transactions
 - handling inbound 164
 - handling outbound 140
 - SOAP compliance 66
- system-generated routing definitions
 - initiating 285
 - regenerating 287
 - understanding 284
 - viewing status 284

T

- Target Connector Interface (TCI) 371
- target connectors
 - compression 53
 - error handling 371
 - exceptions 372
 - message logging 375
 - overriding properties at runtime 144
 - overriding properties using OnRequestSend 145
 - processing requests 15
 - receiving requests 18
 - receiving responses 17, 18
 - receiving third-party messages 518
 - selecting 493
 - sending messages to third-party systems 516
 - setting properties at runtime 144
 - setting properties using OnRequestSend 145
 - understanding 8
 - using the target connector interface 371
- TCI 371
- templates
 - MsgData 58
 - rowset-based message format, PeopleSoft 56
 - sample XSLT template 535
- testing
 - generating test messages 172
 - outbound messages 137
- third-party
 - products 5
- third-party messaging
 - including FieldTypes sections in messages 57
 - integrating with third-party systems 510
 - receiving messages 518
 - sending messages to third-party systems 516
 - transforming messages 324
- third-party systems
 - configuring for integration with PeopleSoft 520
 - integrating via remote gateways 512
 - integrating with 510
- timeout interval, overriding for synchronous transactions 143
- tracing
 - application servers 377
 - managing 371
 - transform programs 331
- transaction ID
 - instantiating a Message object using 269
 - retrieving from application engine programs 269
- transformation engine
 - sample XSLT template 535

- transformations
 - accessing message data 345
 - applying at integration gateway 351
 - combining with translations
 - See Also* translations
 - debugging 379
 - defined 36
 - defining transform programs 324
 - deleting transform programs 347
 - developing 352
 - handling non-XML data 346
 - including filtering 347
 - input message name 325
 - input root element 325
 - integrating between nodes (example) 527
 - integrating Integration Broker systems via hubs 502
 - invoking 344
 - making working storage data available globally 329
 - output message name 325
 - output root element 325
 - preserving record and field aliases 330
 - rejecting 369
 - renaming transform programs 347
 - setting properties for gateway-based 353
 - setting up (example) 531, 533
 - terminating 369
 - tracing transform programs 331
 - transforming third-party messages 324
 - understanding 321, 327, 349
 - understanding runtime errors 354
 - using PeopleCode 323
 - using TransformData class 345
 - using XSLT 323, 350, 352
- Transform Only 324
- transform programs *See* transformations
 - defining 325
 - developing 327
 - developing using Oracle XSL Mapper 331
 - inserting actions 328
 - properties 325
- transforms
 - adding to routing definitions 295
- translations
 - codeset repository
 - See Also* codeset repositories
 - codesets codesets
 - combining with transformations 328
 - developing 356
 - PeopleCode example 367
 - understanding 321, 355
 - using the parm tag 363
 - using the psft_function tag 363
 - using the value tag 363
 - using XSLT 323, 362
 - XSLT example 365

U

- UDDI interactions 66
- understanding 332
- Universal Description, Discovery, and Integration (UDDI) interactions 66
- unstructured messages
 - See* nonrowset-based messages

- upgrade issues
 - assigning target connectors to nodes 523, 525
 - deleting messages 119
 - deleting queues 240
- URLs
 - debugging 379
 - receiving third-party messages 519
- user-defined routing definitions
 - creating 287
- using
 - Integration Broker application classes 125

V

- validation
 - inbound messages 168
 - understanding message validation 10

W

- W3C
 - XSLT *See Also* XSLT
- warnings, logging 374
- wsdl *See Also* exported wsdl
 - converting to managed objects 485
 - data mover scripts for copying 484
- WSDL
 - copying between databases 482
 - URL formats 385
- WSDL documents
 - consuming from BPEL processes 436
 - deleting 409
 - sources for consuming 412
 - viewing for services 198
- WSDL repository, accessing 407
- WSDL Repository page 198
- WSDL URL formats 385

X

- Xalan 328
- XML
 - messages *See Also* XML DOM
 - message XML fields 237
 - nonrowset-based messages
 - See Also* nonrowset-based messages
 - parsers 9
 - rowset-based messages
 - See Also* rowset-based messages
 - using methods 171
 - using record/field aliases 56
- XMLDoc class 136
- XML DOM
 - handling non-XML data 346
 - SOAP-compliant messages 66
 - understanding 65
 - validating messages 168
- XML message schemas *See* message schemas
- XSLT
 - accessing message data 345
 - sample template 535
 - tags *See Also* XSLT tags

- transformations transformations
- translations translations
- XSLT tags
 - parm 363
 - psft_function 363
 - value 363