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# PeopleTools 8.53: Data Migration Workbench

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PeopleTools 8.53: Data Migration Workbench  
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# Preface

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## Understanding the PeopleSoft Online Help and PeopleBooks

The PeopleSoft Online Help is a website that enables you to view all help content for PeopleSoft Applications and PeopleTools. The help provides standard navigation and full-text searching, as well as context-sensitive online help for PeopleSoft users.

### PeopleSoft Hosted Documentation

You access the PeopleSoft Online Help on Oracle's PeopleSoft Hosted Documentation website, which enables you to access the full help website and context-sensitive help directly from an Oracle hosted server. The hosted documentation is updated on a regular schedule, ensuring that you have access to the most current documentation. This reduces the need to view separate documentation posts for application maintenance on My Oracle Support, because that documentation is now incorporated into the hosted website content. The Hosted Documentation website is available in English only.

### Locally Installed Help

If your organization has firewall restrictions that prevent you from using the Hosted Documentation website, you can install the PeopleSoft Online Help locally. If you install the help locally, you have more control over which documents users can access and you can include links to your organization's custom documentation on help pages.

In addition, if you locally install the PeopleSoft Online Help, you can use any search engine for full-text searching. Your installation documentation includes instructions about how to set up Oracle Secure Enterprise Search for full-text searching.

See *PeopleTools 8.53 Installation* for your database platform, "Installing PeopleSoft Online Help." If you do not use Secure Enterprise Search, see the documentation for your chosen search engine.

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**Note:** Before users can access the search engine on a locally installed help website, you must enable the Search portlet and link. Click the Help link on any page in the PeopleSoft Online Help for instructions.

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### Downloadable PeopleBook PDF Files

You can access downloadable PDF versions of the help content in the traditional PeopleBook format. The content in the PeopleBook PDFs is the same as the content in the PeopleSoft Online Help, but it has a different structure and it does not include the interactive navigation features that are available in the online help.

### Common Help Documentation

Common help documentation contains information that applies to multiple applications. The two main types of common help are:

- Application Fundamentals

- Using PeopleSoft Applications

Most product lines provide a set of application fundamentals help topics that discuss essential information about the setup and design of your system. This information applies to many or all applications in the PeopleSoft product line. Whether you are implementing a single application, some combination of applications within the product line, or the entire product line, you should be familiar with the contents of the appropriate application fundamentals help. They provide the starting points for fundamental implementation tasks.

In addition, the *PeopleTools: PeopleSoft Applications User's Guide* introduces you to the various elements of the PeopleSoft Pure Internet Architecture. It also explains how to use the navigational hierarchy, components, and pages to perform basic functions as you navigate through the system. While your application or implementation may differ, the topics in this user's guide provide general information about using PeopleSoft Applications.

## Typographical Conventions

The following table describes the typographical conventions that are used in the online help.

<b><i>Typographical Convention</i></b>	<b><i>Description</i></b>
<b>Bold</b>	Highlights PeopleCode function names, business function names, event names, system function names, method names, language constructs, and PeopleCode reserved words that must be included literally in the function call.
<i>Italics</i>	Highlights field values, emphasis, and PeopleSoft or other book-length publication titles. In PeopleCode syntax, italic items are placeholders for arguments that your program must supply.  Italics also highlight references to words or letters, as in the following example: Enter the letter <i>O</i> .
Key+Key	Indicates a key combination action. For example, a plus sign (+) between keys means that you must hold down the first key while you press the second key. For Alt+W, hold down the Alt key while you press the W key.
Monospace font	Highlights a PeopleCode program or other code example.
. . . (ellipses)	Indicate that the preceding item or series can be repeated any number of times in PeopleCode syntax.
{ } (curly braces)	Indicate a choice between two options in PeopleCode syntax. Options are separated by a pipe ( ).
[ ] (square brackets)	Indicate optional items in PeopleCode syntax.

<b><i>Typographical Convention</i></b>	<b><i>Description</i></b>
& (ampersand)	When placed before a parameter in PeopleCode syntax, an ampersand indicates that the parameter is an already instantiated object.  Ampersands also precede all PeopleCode variables.
⇒	This continuation character has been inserted at the end of a line of code that has been wrapped at the page margin. The code should be viewed or entered as a single, continuous line of code without the continuation character.

## ISO Country and Currency Codes

PeopleSoft Online Help topics use International Organization for Standardization (ISO) country and currency codes to identify country-specific information and monetary amounts.

ISO country codes may appear as country identifiers, and ISO currency codes may appear as currency identifiers in your PeopleSoft documentation. Reference to an ISO country code in your documentation does not imply that your application includes every ISO country code. The following example is a country-specific heading: "(FRA) Hiring an Employee."

The PeopleSoft Currency Code table (CURRENCY\_CD\_TBL) contains sample currency code data. The Currency Code table is based on ISO Standard 4217, "Codes for the representation of currencies," and also relies on ISO country codes in the Country table (COUNTRY\_TBL). The navigation to the pages where you maintain currency code and country information depends on which PeopleSoft applications you are using. To access the pages for maintaining the Currency Code and Country tables, consult the online help for your applications for more information.

## Region and Industry Identifiers

Information that applies only to a specific region or industry is preceded by a standard identifier in parentheses. This identifier typically appears at the beginning of a section heading, but it may also appear at the beginning of a note or other text.

Example of a region-specific heading: "(Latin America) Setting Up Depreciation"

### Region Identifiers

Regions are identified by the region name. The following region identifiers may appear in the PeopleSoft Online Help:

- Asia Pacific
- Europe
- Latin America
- North America

## Industry Identifiers

Industries are identified by the industry name or by an abbreviation for that industry. The following industry identifiers may appear in the PeopleSoft Online Help:

- USF (U.S. Federal)
- E&G (Education and Government)

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## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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## Using and Managing the PeopleSoft Online Help

Click the Help link in the universal navigation header of any page in the PeopleSoft Online Help to see information on the following topics:

- What's new in the PeopleSoft Online Help.
- PeopleSoft Online Help accessibility.
- Accessing, navigating, and searching the PeopleSoft Online Help.
- Managing a locally installed PeopleSoft Online Help website.

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## PeopleTools Related Links

[Oracle's PeopleSoft PeopleTools 8.53 Documentation Home Page \[ID 1494462.1\]](#)

[PeopleSoft Information Portal on Oracle.com](#)

[My Oracle Support](#)

[PeopleSoft Training from Oracle University](#)

[PeopleSoft Video Feature Overviews on YouTube](#)



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Send us your suggestions Please include release numbers for the PeopleTools and applications that you are using.

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# Getting Started with Data Migration Workbench

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## Data Migration Workbench Overview

Data Migration Workbench facilitates the Configuration Management process using Application Data Sets as its underlying transport technology. The Data Migration Workbench is designed to manage the complexity of migrating configuration data across multiple PeopleSoft systems. It is very common to have four or more databases in a PeopleSoft environment, including one or more for development, another for quality assurance, as well as the primary production system. PeopleTools migrates managed objects between environments in PeopleSoft projects that are extracted from one database and imported into another, which works well for PeopleTools metadata however it does not handle application configuration data.

The Data Migration Workbench provides the ability for any authorized developer to easily define application data sets and to compare and copy the data similar to the way managed objects have been copied and compared for many years.

Application Data Sets:

- Enable developers to use PeopleSoft Pure Internet Architecture (PIA) to define data set definitions as a hierarchy of records with some collective properties. A data set definition defines the *shape* of data set instances. It consists of a hierarchy of one or more record definitions and some properties. Each child record has all the keys of its parent record and optional additional keys. A data set instance has a single root row defined by the unique keys of the root record.

Data set definitions are like record definitions: record definitions define a group of fields that constitute a record; data set definitions define a group of records that constitute a data set. Both record definitions and data set definitions are metadata that define the *shape* of data.

- Enable developers or administrators using PIA to insert data sets instances ( data content) into projects to represent a unit of work as a data migration project. Data migration projects are like managed object projects: a collection of data set instances having various data set definitions.
- Enable developers or administrators using PIA or Change Assistant to copy and compare projects containing data sets.
- Enable PIA-based copy and compare to use powerful servers rather than the Windows workstations required for PeopleSoft Integrated Development Environment (PSIDE)-based copy and compare.

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**Note:** Copy and Compare can also be run from Change Assistant using Application Engine, which is independent of PIA. Change Assistant requires a Windows client.

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- Integrate with the Enterprise Components Approval Framework to provide administrative control of the project copy from file process.

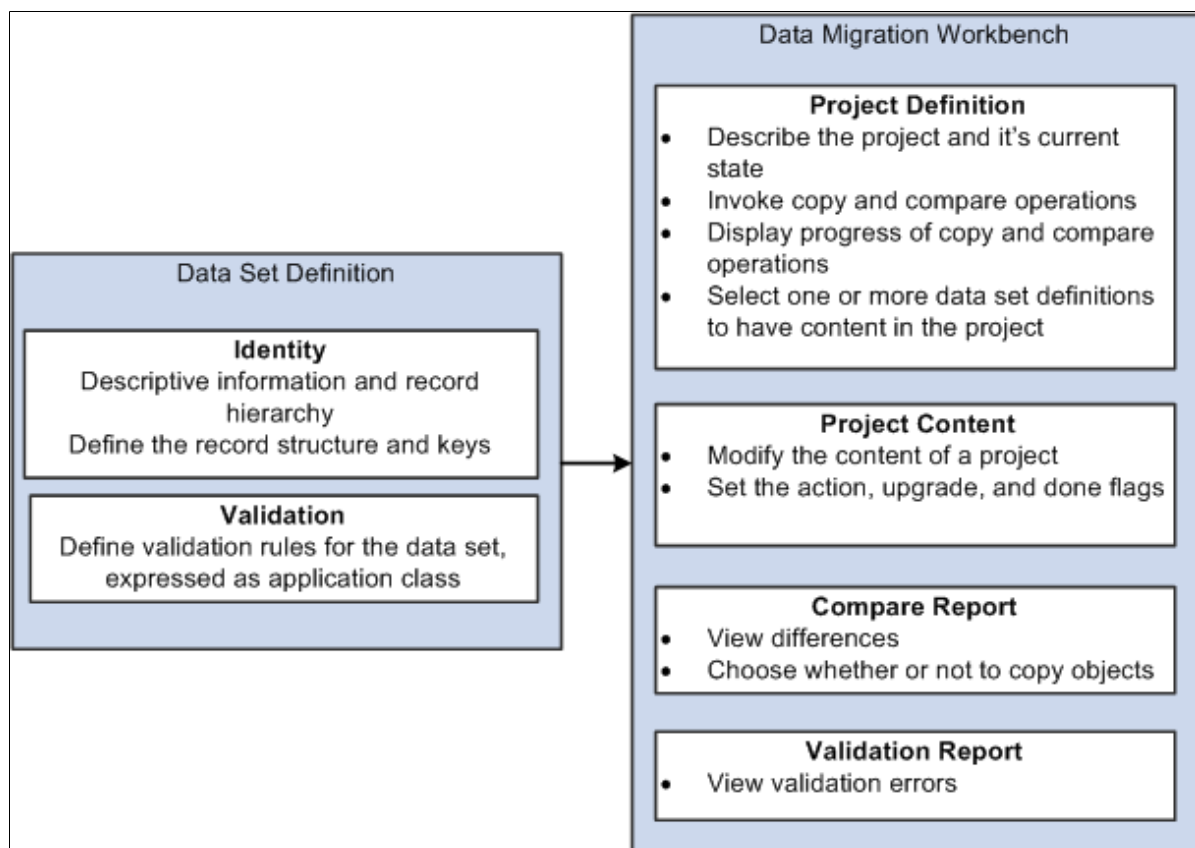
- Provide enhanced security to assure that the data set definitions are suitable for copying data, that the user has access to the PIA data set pages, and that user has the right to copy and compare the data.
- Provide an alternative to Data Mover that offers greater visibility and control for managed changes of a customer's environment.

The two main components in data sets are the Data Set Designer used to define the structure of the data set and the Data Migration Workbench, used to define the data migration project content and to orchestrate copy and compare. Data Migration Workbench shows the current status of a project and prevents inconsistent actions. Once you have defined the data migration project, you can copy the data to a file that can later be compared or copied from file on another PeopleSoft database.

The Data Migration Workbench uses a Project Repository as a place in the file system where project files can be copied to and from. The Project Repository is defined in the data base as a repository name, an associated file path, and one or more *areas* (sub folders) that can contain project files. The purpose of Project Repository is to avoid manually copying project files from one system to another by promoting common definition of shared file locations and providing better security for administrative control of the places that project files can be copied to.

### Image: Data Set Components

This diagram illustrates the main components for Data Sets: Data Set Definition and Data Migration Workbench



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## Deployment of Application Data Using Data Sets

In previous releases, Data Mover scripts were the only option available to load application data. There was no way to compare the data that is copied by Data Mover. Data sets provide the ability to compare and copy the content data.

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**Note:** Data Mover scripts are still being used to load application data, however you now have another alternative using data sets.

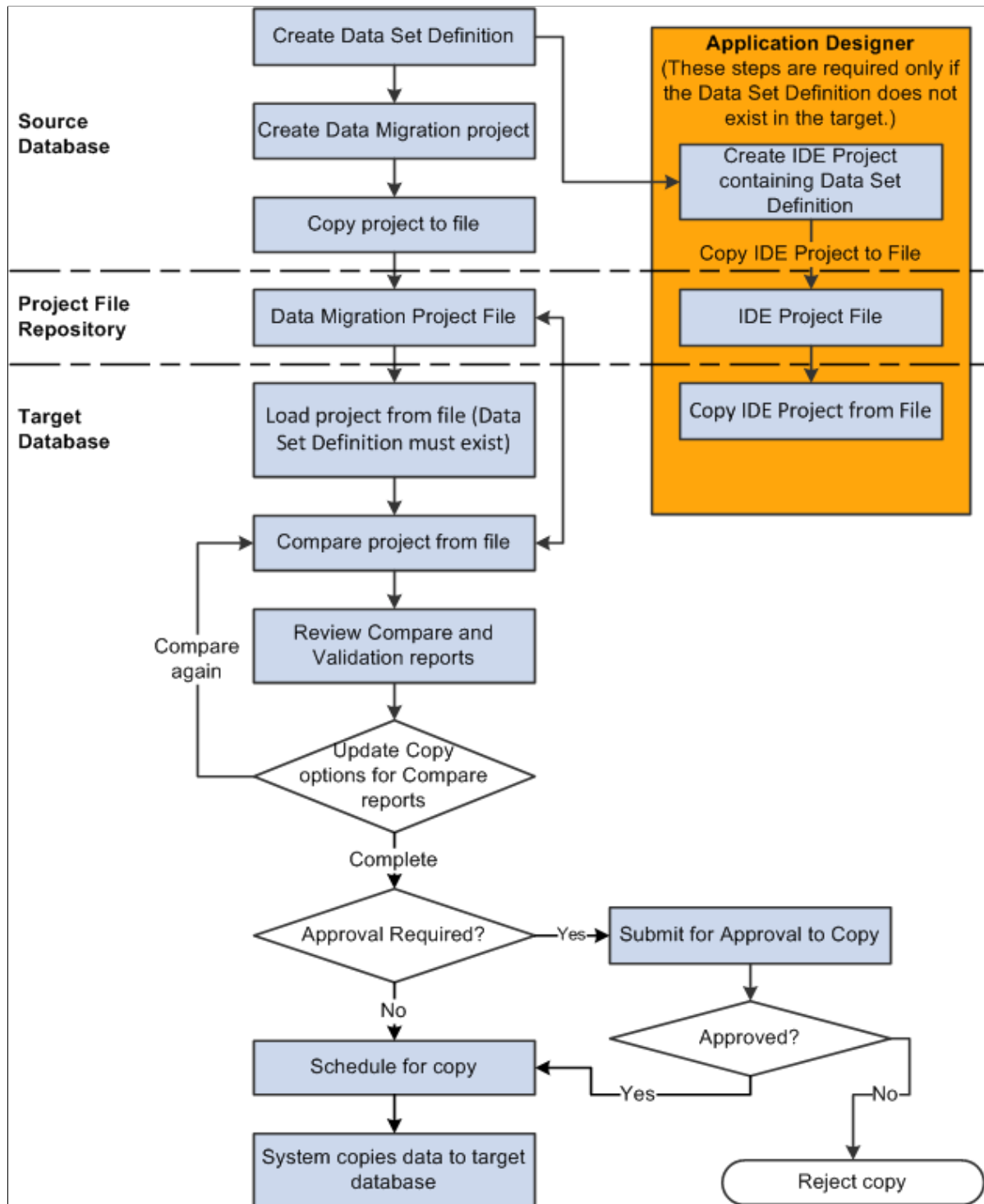
---

This diagram shows the overall flow for creating and copying Data Set Migration projects.

**Image: Data Set Flow**

This diagram shows the flow for creating and copying data sets. On the source database, you create a data set definition in PIA just once. The data set definition is a traditional managed object, so it can be copied and compared using the IDE (Integrated Development Environment). You can then include data defined by the data set definition into data migration projects. Each project can contain data from multiple data set definitions. Once the data migration project contains data content it can be copied to a file. The file will be located in one of the Project Repositories defined for your environment. Before you can copy the data migration project to a PeopleSoft target database, the data set definition must exist on the target database. To copy the data set definition, you will need to create an IDE project in Application Designer that contains the data set definition. You can then copy the IDE project to a file and copy it from the file to the target database. A restriction in 8.53 is that the data set definitions on the source and target must be the same – that constraint will be relaxed in a future release. On the target database, you will load the data migration project from the Project File repository location, this step copies the project definition from the file to the target, but none of the project content is copied. You can then compare the project and update the copy options, or, if approvals are not enabled on the target or the approval rules do not require a compare, you may copy the project without doing a compare. When you are ready to copy the project, you will submit for copy. If approvals are enabled on the target database, it will enter the approval

process; otherwise the copy will be initiated. If the approval process is enabled, then only approved projects are scheduled for copy, if the project is rejected there is no copy.



## Application Data Set Implementation

This section discusses the steps used to implement and migrate data using data sets:

<b>Steps</b>	<b>Reference</b>
1. Create Data Set Definition.	See <a href="#">Creating and Editing Data Set Definition</a> .
2. Create or select then populate Data Migration Project.	See <a href="#">Defining Data Migration Project</a> .
3. Copy to file.	See <a href="#">Copying Project to File</a> .
4. Compare Data Migration Project from file.	See <a href="#">Comparing Data Set Projects</a> .
5. Review compare and validation reports.	See <a href="#">Viewing Compare Reports</a> .
6. Copy Data Migration Project from file.	See <a href="#">Submitting for Copy</a> .

## Data Migration Workbench Limitations and Recommendations

This section lists some limitations and recommendations for Data Migration Workbench.

### Limitations

Keep in mind the following limitations for Data Migration Workbench:

- The Application Server and Process Scheduler used must both be able to access the project files using the same path. This will require that both are running on Operating Systems that use compatible file access conventions. For example, Microsoft Windows and UNIX-derived operating systems do not have compatible native file access conventions.
- The Application Data Set framework is not sufficiently secure in 8.53 to use for sensitive data.
- The data set definition must exist on the target database before you load a data set project to the target database.
- The data set definition must have the same shape on both the source and target database. Shape is defined by the records and fields included in the data set. Shape equality can usually be achieved most easily by copying a managed object project containing the data set definitions from source to target prior to copying the Data Migration Project. But if the constituent records and fields are different between source and target matching shape may involve executing database CREATE or ALTER steps to attain equivalence.
- Application Data Set definitions containing views or derived records are not copyable or comparable.
- In 8.53, the language selections available in Copy from File do not include COMMON, thus COMMON cannot be excluded during copy. For traditional managed objects COMMON can be excluded, making it possible to copy only the language specific data, leaving the language-independent data (COMMON) unchanged if the object exists on the target.

### Recommendations

The following practices are strongly recommended:

- Data set projects are meant for relatively small data sets of static data.



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**Note:** Data Set projects are not recommended for large data sets.

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- Do not change the source Data Migration Project file after the compare been performed.

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**Note:** The decision of which objects to copy is based on the compare report. If the data set project is changed after the compare, you may not get the desired results. Changing the target database may be necessary to fix validation errors, but caution is required to avoid changes to the target database that might create validation errors during copy that were not seen in compare.

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- Setting up the Project Repositories and areas is a one time activity. The directories should first be created by a system administrator with read/write access permissions for the users who will start the application and process schedule servers.



## Chapter 2

# Using Data Set Designer

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## Using Data Set Designer

This topic provides an overview of the Data Set Designer and discusses how to:

- Create and edit data set definitions.
  - Define validation application class and PeopleCode.
- 

## Understanding Data Set Designer

The Data Set Designer defines a data set as a hierarchy of strongly related records and their collective properties. In the Data Set Designer, you will build the record hierarchy structure of the data set. You can manually build the data set structure or generate the data set structure from a component. This data set is stored as the Data Set Definition.

The same data set definition must exist in any PeopleSoft database that participates in a data set copy or compare. Once the data set definition is created, you can use the project copy in Application Designer to migrate the data set definition to other PeopleSoft databases.

---

## Creating and Editing Data Set Definition

This section describes how to:

- Search for and create data sets.
- Manually define a data set.
- Generate a data set from a component.

## Searching For and Creating Data Sets

Use the Data Set Designer search page (PTADSDEFNSEARCH) to search for, add, generate, or delete a data set.

## Navigation

PeopleTools, Lifecycle Tools, Migrate Data, Dataset Designer

### Image: Data Set Designer Search page

This example illustrates the fields and controls on the Data Set Designer Search page. You can find definitions for the fields and controls later on this page.

**Search** **Add** **Generate**

---

### Data Set Search

Enter any information you have and click Search. Leave fields blank for a list of all values.

---

**▼ Search Criteria**

**\*Search By** Data Set Name  [Add a New Value](#)

**Search**

Data Set Name  
Data Set Name  
Description  
Owner Id

The Data Set Search page has three tabs Search, Add and Generate.

## Search

Search is the default action for Data Set Designer. Users can search for existing data sets and open an existing data set for modification. Users can also delete one or more data sets from the search result set.

You can search for an existing data set using:

- Data Set Name
- Description
- Owner ID

Basic and advance search is provided so users can search based on one or multiple search keys. The search result produces a grid. Users can select one or multiple data sets in the grid to delete. Users can open the data set for modification using the link for the data set name.

### Image: Data Set Search Results

This example illustrates the fields and controls on the Data Set Search Results.

**Data Set Search**

Enter any information you have and click Search. Leave fields blank for a list of all values.

**Search Criteria**

'Search By' Data Set Name begins with  [Add a New Value](#)

[Search](#) [Advanced Search](#)

**Search Results** [Personalize](#) [Find](#) [1-9 of 9](#) [First](#) [Last](#)

	Data Set Definition Name	Description	Object Owner ID
<input type="checkbox"/>	<a href="#">ACSGRPS</a>	Access Groups	
<input type="checkbox"/>	<a href="#">ACTIVITY_GUIDE_ITEM</a>	Activity Guide Item	
<input type="checkbox"/>	<a href="#">ACTIVITY_GUIDE_LIST</a>	Activity Guide List	
<input type="checkbox"/>	<a href="#">MSG</a>	Message Catalog Entries	
<input type="checkbox"/>	<a href="#">PIVOTGRID_DATASOURCETYPE</a>	Pivot Grid Data Source Type	PeopleTools
<input type="checkbox"/>	<a href="#">PIVOTGRID_DEFINITION</a>	Pivot Grid Definition	PeopleTools
<input type="checkbox"/>	<a href="#">PTDM</a>	Data Masking	PeopleTools
<input type="checkbox"/>	<a href="#">ROLM</a>	Roles	
<input type="checkbox"/>	<a href="#">TDM</a>	Tree Definition Manager	

[Select All](#) [Un-select All](#) [Delete Selected Rows](#)

### Create New Data Set

Select the Add tab to create a new data set.

Enter a Data Set Name and a description for the new data set. Data Set Name and Description are mandatory fields. When you click the Add button, the identity page is displayed.

See [Manually Defining the Data Set](#).

### Generate

Generate is used to create a new data set implicitly from a component.

See [Generating Data Set From a Component](#).

## Manually Defining the Data Set

Use the Identity page (PSADSDEFNPAGE) to identify the top-level properties of the data set.

## Navigation

PeopleTools, Lifecycle Tools, Migrate Data, Dataset Designer

### Image: Identity page

This example illustrates the fields and controls on the Identity page. You can find definitions for the fields and controls later on this page.

#### Data Set Name

Uniquely identifies the data set definition. Each data set definition describes a distinct shape, and there can be many instances of that type.

#### Description

A description of the data set instance. Instances are distinguished by having distinct bindings.

#### Long Description

A long description providing additional information such as guidance, limitations or cautions regarding this data set.

#### Owner ID

Identifies the product that will own the data set definition and content.

#### Is Copyable

Selecting this check box indicates that the data included in the data set definition is suitable for copy from one database to another. Data is suitable for copy only if doing so will produce a valid object on the target and not corrupt any other data on the target. This field is only editable if *Allow setting Copy Compare attributes on ADS definitions* is selected for the users Data Migration security profile.

See [Setting Data Migration Permissions](#).

**Derivation Type**

This indicates if the data set definition was created manually or generated from a component using the Generate tab on the Data Set Search page.

**Add Record to Root**

Select the parent record, which will become the root record and is placed in the Record Hierarchy section.

**Record Hierarchy**

This section shows the record hierarchy for the data set. Use the Insert Record icon to add additional child records.

There is at least one row for every record in the data set definition. Related language tables are automatically added by the system and should not be deleted.

---

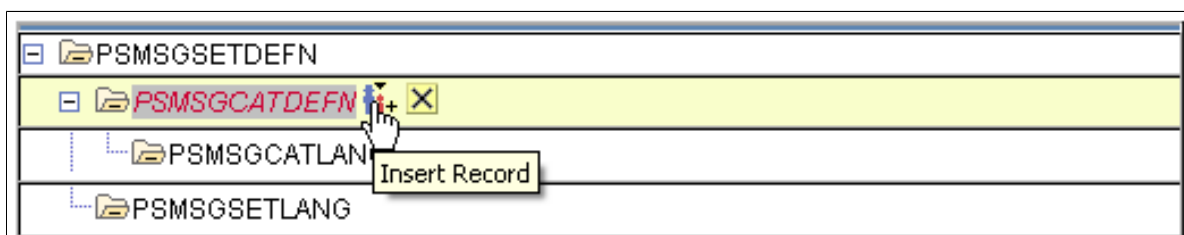
**Note:** If you delete a related language record, you can not add it back. You will need to delete the parent of the related language record and add the parent back.

---

Use the Insert Record icon to build the record hierarchy.

**Image: Icon to insert record**

Icon to insert record



When you insert records, the list will be restricted to records that include all keys (and possibly additional keys) of the corresponding parent record and have not already been selected for the current parent record name.

When you select the Insert Record icon, a child record insertion dialog will open with child record lookup. A child record is a record having the same keys as parent record. The child record may also contain additional keys. The lookup shows only those records which qualify to be the child record of the original record.

In record hierarchy, the related language record plays a significant role. When a record added to a data set definition (either as root record or as a child record) has a related language record, it is implicitly included in the data set as a child record.

**Show Key(s)**

When a user adds records to the data set, the keys are pre-populated from the keys of the root record. Up to 14 keys can be specified in a data set. The keys of the data set will be the same as the keys of the root record. When you select the data content in the Project Designer, these keys must be explicitly bound to one or more values. Clicking the Show Keys button brings up a modal dialog that shows the key fields.

---

**Note:** All records in the data set definition must have at least these selected keys

---

### Image: Data Set Key Map page

This example illustrates the fields and controls on the Data Set Key Map page. You can find definitions for the fields and controls later on this page.

**Data Set Key Map**

**Data Set Name:** MSG

This page shows the keys of the root record. Select the keys to identify data set instances.

Personalize   Find		First 1 of 1 Last
	Field Name	
1	MESSAGE_SET_NBR	

### Record Restrictions

The records in data set definitions have the following restrictions:

- Application Data Set definitions containing views or derived records are not copyable or comparable – they can be used only for documentation purposes.
- The 8.53 data set designer allows a record to appear only once in the record hierarchy, whether the data set was manually created or generated from components.
- All records in a data set must have unique keys as defined in the key view of the record in Application Designer.
- The keys of the parent record must also be keys of the child record, though a child record may have some keys that are not in the parent record.
- The keys of the child record should be in the same order as the parent record keys.
- There is a limit of 32 records in a data set definition in 8.53.
- The root record cannot be deleted from the data set hierarchy.

### Generating Data Set From a Component

Use the Generate page (PTADSDEFNSEARCH\_GC) to generate a data set implicitly from a PeopleSoft component structure.



## Navigation

PeopleTools, Lifecycle Tools, Migrate Data, Dataset Designer, select the Generate tab

### Image: Generate Data Set from Component page

This example illustrates the fields and controls on the Generate Data Set from Component page. You can find definitions for the fields and controls later on this page.

#### Component

The component look up allows the user to select an existing component to generate the data set definition.

#### Market

Market look up allows user to select a particular market for that component.

#### Data Set Name

The data set name is generated based on the component. The data set name is the component and market prefixed with COMP\_.

#### Description

Enter a description for the data set.

When you click the Generate button, the Data Set Identity page is displayed, with the following:

- Record hierarchy tree is generated according to the record level of the component.
- Derivation type is *Loaded from Component*.

You can make any necessary modifications to the data set and then save it.

---

**Note:** Only the physical records in a component will become part of the data set definition. It is the responsibility of the user to verify that the generated data set definition reliably copies data.

---

## Defining Validation

Use the Validation page (PSADSVALIDATION) to define the extension application class that will be used to validate the data in the data set definition.

### Navigation

From the Identity page, select the Validation tab.

### Image: Data Set Validation page

This example illustrates the fields and controls on the Data Set Validation page. You can find definitions for the fields and controls later on this page.

The screenshot shows the 'Validation' tab of the Data Set Designer. The 'Data Set Name' is 'ACTIVITY\_GUIDE\_LIST'. Under the 'Extension App Class' section, there are three input fields: 'Package Name', 'App Package Path', and 'Application Class ID'. Each field has a magnifying glass icon to its right, indicating a search function.

There are 2 types of validations that are supported for data sets:

- Basic Validation

Basic validation refers to static prompt table validation at the record field level. Prompt validations will be run for the entire project before a copy or compare. If errors are found, the copy or compare will not run. This process is triggered automatically for any copy and compare operation and does not require any additional PeopleCode.

The DoADSValidations method provided in the AdsValidationBase base class validates for static prompts, translates, Y/N values, and required fields. If a validation error is detected, information about the error is written to a target database table and DoADSValidations returns false to the C++ layer. Thus even if no application class has been associated with the ADS definition, this method will perform the default validations.

- Application Class Extension

Developers can extend the PTADSDEFN:AdsValidationBase base class to define specific validation logic. AdsValidationBase provides an empty implementation of the methods of the Application Class that a data set definition may be associated with. To provide validation or transformation logic in PeopleCode, a developer will override the appropriate base class methods and provide additional methods and properties as necessary. The following AdsValidationBase class methods that can be implemented:

- OnPreCopyCompare
- OnPreUpdate
- OnPostCopy

```

method AdsValidationBase(&ProjectName As string);
method OnPreCopyCompare(&ADSRowSet As Rowset, &ADSName As string) Returns boo⇒
lean;
method OnPreUpdate(&ADSRowSet As Rowset out, &ADSName As string) Returns bool⇒
ean;
method OnPostCopy(&AdsName As string, &ContentList As array of integer) Retur⇒
ns boolean;

```

---

**Note:** The other methods in the AdsValidationBase base class are used only internally.

---

The OnPreCopyCompare, OnPreUpdate, and OnPostCopy methods provided in the ADSValidationBase base class do nothing as delivered. They are available for developers who want to perform custom validation or transformation rules. These functions are intended to have the same usage pattern as DoADSValidations. These methods are invoked as follows.

This table list the methods and description.

<b>Method</b>	<b>Description</b>
DoADSValidations	<p>This method is implemented in the AdsValidationBase base class and is always called. If the base class's DoADSValidations method behavior is not desired, then a custom application class that overrides the DoADSValidations method can be registered with the a data set definition.</p> <p>This method validates for static prompts, translates, Y/N values, and required fields. If a validation error is detected, information about the error is written to a target database table for later viewing in the Validation tab and DoADSValidations returns false.</p>

<b>Method</b>	<b>Description</b>
OnPreCopyCompare	<p>This method is run during compare and prior to copy. If there are errors found in OnPreCopyCompare or DoADSValidation prior to copy, the copy will not be run. It will be invoked for each instance of the Data Set. The complete content of the data set instance is passed as an argument to the OnPreCopyCompare method in the form of a rowset allowing a wide range of validation checks to be implemented using custom PeopleCode</p> <p>If any validation error occurs, the ReportError method should be called in the PeopleCode to store the error in the database, this error will be shown to the user in the validation tab. Multiple errors may be returned. The implementation of this method may determine the maximum number of errors returns per execution.</p> <p>Return should be indicated if any errors/warnings are encountered. This application class method should not perform any updates.</p>
OnPreUpdate	<p>This method will be invoked for an Application Data Set instance inside a Data Migration project during compare and copy processing. This method can be also used to transform data values prior to their insertion or update into the target database so long as the transformation does not change the shape or key values and adheres to other constraints required of the data set.</p> <p>If any validation error occurs, the ReportError method should be called in the PeopleCode to store the error in the database, this error will be shown to the user in the validation tab. Multiple errors may be returned. The implementation of this method may determine the maximum number of errors returns per execution.</p> <p>Like the other validation methods, the OnPreUpdate method should return the Boolean value FALSE if there is an error or TRUE if not.</p> <p>The OnPreUpdate method may perform database updates. If severe errors are detected in this method the data set will not be copied and other data sets will not be copied, but the data sets already copied will not be rolled back.</p>

<b>Method</b>	<b>Description</b>
OnPostCopy	<p>The OnPostCopy method is invoked once for each distinct data set type after all the data has been copied and is used for validations and adjustments requiring SQL access to all the data that was in the project and the target database. It is recommended that validations be placed in the OnPreCopyCompare or OnPreUpdate methods if possible.</p> <p>If any error occurs, the ReportError method should be used to populate the error into the class instance property arrays. Multiple errors may be returned. The implementation of this method may determine the maximum number of errors returned per execution.</p> <p>Return should be indicated if any errors/warnings are encountered. If clean up is needed as a result of the errors, it may also be performed in the method.</p>

See "AdsValidationBase Class Methods (*PeopleTools 8.53: PeopleCode API Reference*)"

This table describes when class methods are called.

<b>Method</b>	<b>When Called</b>
DoADSValidations	<ul style="list-style-type: none"> <li>Compare from file</li> <li>First pass of copy from file</li> </ul>
OnPreCopyCompare	<ul style="list-style-type: none"> <li>Compare from file</li> <li>First pass of copy from file, prior to copy</li> </ul>
OnPreUpdate	<ul style="list-style-type: none"> <li>Compare from file</li> <li>Second pass of copy from file, immediately prior to copying to the data base</li> </ul>
OnPostCopy	After copy from file

## Validation Flow for the Copy From File Process

The following steps are performed:

1. DoADSValidations method is invoked.
2. OnPreCopyCompare method is invoked.
3. OnPreUpdate method is invoked.

Copy from file makes two passes through the data set instances in the file. The first pass calls the DoADSValidations and OnPreCopyCompare validation methods for each instance but does not copy any data to the database. If and only if the first pass has no errors, the second pass calls the OnPreUpdate

validation method for each instance then copies the instance to the target database. If an error is detected in the second pass the copy is terminated but the transaction is not rolled back. As each object is copied, the Done flag for the project item is set to true, so the copy can be restarted without recopying the objects already copied

For additional details, see [Submitting for Copy](#)

## Pass 1

1. DoADSValidations method is invoked.
2. OnPreCopyCompare method is invoked if there were no validation errors found in DoADSValidations.

---

**Note:** No data is copied in Pass 1.

---

## Pass 2 (performed only if no validation errors were found in DoADSValidations or OnPreCopyCompare)

1. OnPreUpdate method is called for each data set instance.
2. If validation passes, the data set instance is copied to the target database. If the validation fails the current object is not copied and no additional objects are copied, however previously copied objects will still be copied.
3. After all data set instances for each data set name have been copied, the OnPostCopy method is called passing the data set name and an array of item identifiers of the data set instances that were copied. The item identifiers are integers stored in the PSPROJBINDITEM project table for the current project and can be used to get the data keys set instances. The OnPostCopy method can be used to perform validations that require data from multiple tables that may not be present until the entire project has been copied. Any validation errors detected in this method would have already been copied to the data base, so it is best practice to use this method only in cases when necessary.

When OnPreCopyCompare and OnPreUpdate are invoked from the C++ layer they are passed the data set name and the current in-memory rowset representation of the data set instance currently being processed. The developer can use the PeopleCode rowset API to examine the content of the rowset.

These two methods are invoked once prior to compare and twice prior to copy. The OnPreCopyCompare method is intended to not change values of the rowset, but the OnPreUpdate can also transform data set values. It should not change the shape of the data: it should not add new fields or records or delete fields.

## Chapter 3

# Using Data Migration Workbench

## Using Data Migration Workbench

This topic provides an overview of deployment and discusses how to:

- Search for, add and delete data set projects.
- Define Data Migration project.
- Define data set content.
- Insert data content.

## Searching for, Adding and Deleting Projects

Use the Project Search page (PTADSDMWSEARCH) to search for or create new data migration projects.

### Navigation

PeopleTools, Lifecycle Tools, Data Migration Workbench

### Image: Project Search page

This example illustrates the fields and controls on the Project Search page. You can find definitions for the fields and controls later on this page.

**Project Search**

Enter any information you have and click Search. Leave fields blank for a list of all values.

**Search Criteria**

Project Name  [Add a New Value](#)

Description  [Load Project From File](#)

**Search Results**

	Project Name	Project Description	Project State
<input type="checkbox"/>	<a href="#">MSG_PROJECT1</a>	All message sets	Created
<input type="checkbox"/>	<a href="#">MSG_PROJECT2</a>	Msgset >=30000	Created

When you click the Search button on the Project Search page, a grid displaying projects matching the criteria is displayed.

Click the Project Name link to open the data set project for modification.

## Deleting Projects

To delete projects:

1. Select PeopleTools, Lifecycle Tools, Data Migration Workbench
2. Click Search.
3. Select the projects to delete.
4. Click the Delete Selected Rows link.

## Adding Projects

To add a project:

1. Select PeopleTools, Lifecycle Tools, Data Migration Workbench
2. Click the Add a New Value link.
3. Enter a Project Name and Description.
4. Click Add.

## Loading Project from File

To load a project from file:

1. Select PeopleTools, Lifecycle Tools, Data Migration Workbench
2. Click the Load Project from File link.
3. Select the file location and area.
4. Click Add.

---

**Note:** The data set definition must exist on the target database before you can load the project. Only the project definition and data set bindings are copied, no data content is copied.

---

---

## Defining Data Migration Project

Use the Project Definition page (PTADSMDWPRJDEFN) to define the data migration project.



## Navigation

PeopleTools, Lifecycle Tools, Data Migration Workbench

### Image: Project Definition page

This example illustrates the fields and controls on the Project Definition page. You can find definitions for the fields and controls later on this page.

Project Definition		Data Set Content
<b>Project Name</b>	MSG_PROJECT3	
<b>Description</b>	Message Sets for PeopleCode	<a href="#">Copy Project To File</a>
<b>Comments</b>	This project contains all message sets where the description starts with PeopleCode	<a href="#">Compare</a>
<b>Project State</b>	Created	<a href="#">Submit for Copy</a>
<b>Progress</b>	Currently processed 0 out of 4 ADS objects.	

Project Content			View All	First	1 of 1	Last
	*Data Set Name	Description	Search			
1	MSG	Message Catalog Entries		<a href="#">+</a>	<a href="#">-</a>	

#### Description

Enter a description for the project. The description should include information about the project.

#### Comments

Optionally you can add comments to the project.

#### Project State

Display only field that shows the current state of the project. You can use the Refresh button to obtain the most recent state.

Progress state on the source will show:

- New project
- Created
- Scheduled for copy to file
- Copying to file
- Copy to file succeeded

Progress state on the target will show:

- Loaded from file
- Scheduled for file compare
- Comparing from file

- Copying from file
- Compare from file succeeded
- Scheduled for copy from file
- Copy from file succeeded

Validation errors, if any, are also shown.

**Progress**

Display only field that shows the progress of the project copy or compare.

**Data Set Name**

Select one or more existing data sets from the lookup. Look up will show all the existing data sets that have *Is Copyable* selected in the data set definition.

**Content Description**

This is description associated with the data set content.

**Search**

Use this link to search for a data set that was generated based on a component, using PeopleSoft folder navigation.

**Add a new row (+)**

Click to add another data set to the project.

**Delete a row (-)**

Click to delete a data set from the project.

---

**Note:** Data Migration projects are not shown in Application Designer project search and cannot be opened in Application Designer.

---

## Using Data Set Tree Search

Use the Data Set Tree Search page to insert a data set definition into the Data Migration project, by selecting the component from the tree. This tree uses the PIA menu tree to find data set definitions that have been generated from components.

1. Click the Search icon in the project Content grid on the Project Definition page.
2. Navigate through the tree until you find the component.

---

**Note:** All components that have a data set definition will contain an asterisk.

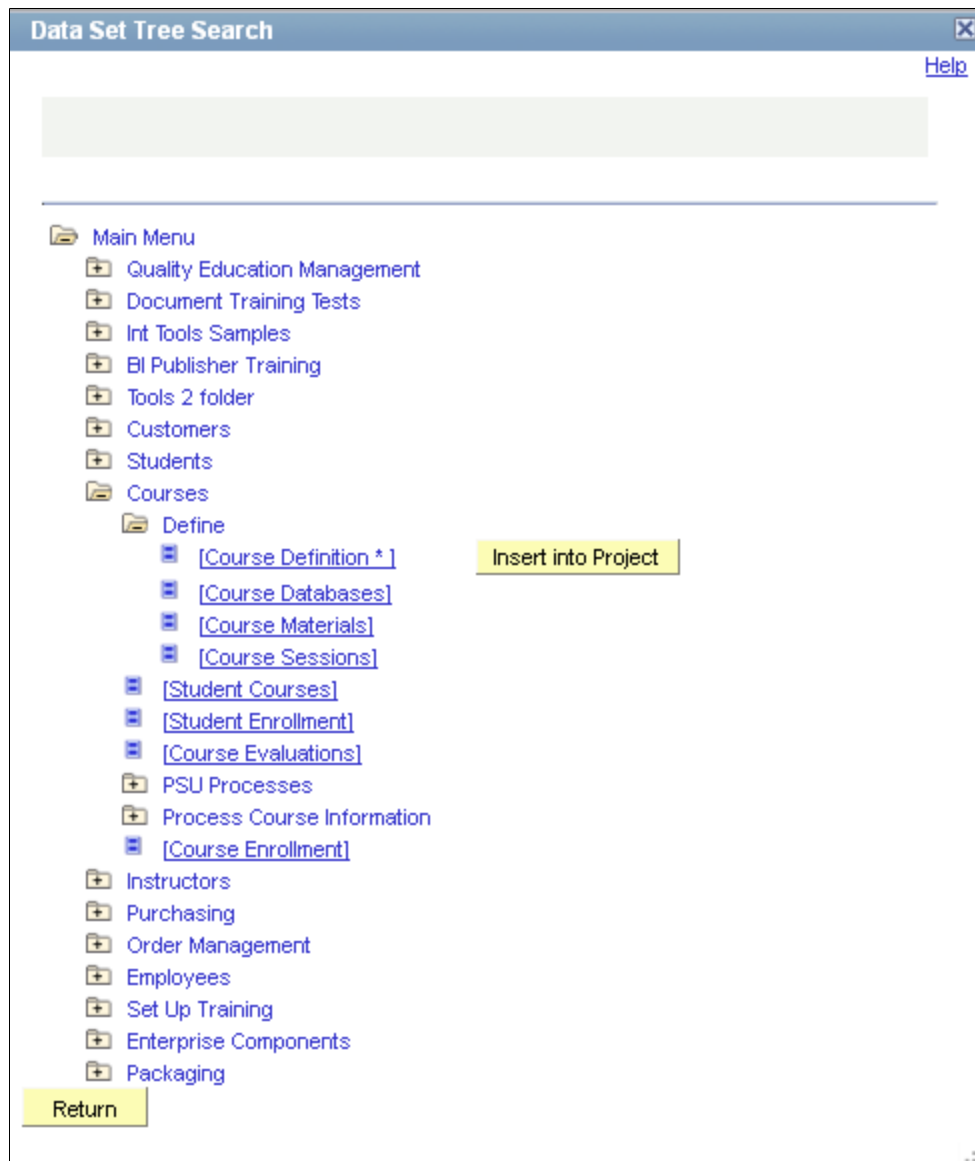
---

3. Highlight the component and an Insert into Project button will appear.

- Click the Insert into Project button.

**Image: Data Set Tree Search page**

This example illustrates the fields and controls on the Data Set Tree Search page.



## Defining Data Set Content

Use the Data Set Content page (PTADSDMWCONTENT) to define the data content for the project.

## Navigation

From the Project Definition page, select the Data Set Content tab

### Image: Data Set Content Page

This example illustrates the fields and controls on the Data Set Content page. You can find definitions for the fields and controls later on this page.

The screenshot shows the 'Data Set Content' tab selected. At the top, there are two tabs: 'Project Definition' and 'Data Set Content'. Below the tabs, the project details are displayed: 'Project Name' is 'MSG\_PROJECT3' and 'Project State' is 'New project'. The description 'Message Sets for PeopleCode' is shown to the right. Below this, there is a section for 'Data Set Name' with a dropdown menu showing 'MSG' and a button 'Insert Content'. The table below has a header row with columns: 'Select', 'Message Set Number', 'Description', 'Action', 'Upgrade', and 'Done'. The table is currently empty.

Select	Message Set Number	Description	Action	Upgrade	Done
--------	--------------------	-------------	--------	---------	------

Use the Insert Content button to define the data content for the project.

See [Inserting Data Content](#)

After data has been inserted into the project, you can select which rows of data you want to process.

### Image: Data Set Content page with data

This example illustrates the fields and controls on the Data Set Content page where data has been added.

The screenshot shows the 'Data Set Content' tab selected. At the top, there are two tabs: 'Project Definition' and 'Data Set Content'. Below the tabs, the project details are displayed: 'Project Name' is 'MSG\_PROJECT3' and 'Project State' is 'New project'. The description 'Message Sets for PeopleCode' is shown to the right. Below this, there is a section for 'Data Set Name' with a dropdown menu showing 'MSG' and a button 'Insert Content'. The table below has a header row with columns: 'Select', 'Message Set Number', 'Description', 'Action', 'Upgrade', and 'Done'. The table contains four rows of data.

Select	Message Set Number	Description	Action	Upgrade	Done
<input checked="" type="checkbox"/>	2	PeopleCode	Copy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	8	PeopleCode Editor	Copy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	143	PeopleCode Debugger	Copy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	180	PeopleCode Mobile Edition	Copy	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### Select

Use this check box to select the rows to include in the data content.

#### Action

By default, the action type is Copy. You can change the action type to Delete.

<b>Upgrade</b>	Users can select/unselect the Upgrade flag. If it is selected, the Data Set object will be copied, otherwise it will be ignored by Copy from file.
<b>Done</b>	The process updates this flag when the copy is done. Users can reset this flag to repeat the copy for the associated data set object.
<b>Search Results Grid</b>	Use the Search Results grid to select the rows of data to include in the data set content.
<b>Select All</b>	Use the Select All button to select all rows.
<b>Un-select All</b>	Use the Un-select All button to unselect all rows.
<b>Delete</b>	Use to delete select rows.
<b>Reset Project Done Flag</b>	Use to reset the Done flags for all rows.

---

## Inserting Data Content

Use the Insert Data Content page (PTADSDMWCONTENTSCH) to insert data content into the Data Migration project.

## Navigation

Click the Insert Content button on the Data Set Content page

### Image: Insert Data Set Content page

This example illustrates the fields and controls on the Insert Data Set Content page. You can find definitions for the fields and controls later on this page.

**Insert Data Set Content**

This page allows users to identify and insert instances of data into the project. Users can limit the scope of the result set by entering and refining search criteria.

**Project Name** MSG\_PROJECT3  
**Data Set Name** MSG

**Search Values** View All | 1-2 of 2 | First | Last

*Field Name	*Operation	Values		
MESSAGE_SET_NBR	All		+	-
DESCR	Like	PeopleCode	+	-

**Search**

**Search Results**

	Message Set Number	Description
<input type="checkbox"/>	2	PeopleCode
<input type="checkbox"/>	8	PeopleCode Editor
<input type="checkbox"/>	143	PeopleCode Debugger
<input type="checkbox"/>	180	PeopleCode Mobile Edition

### Field Name

There are two types of fields in the grid.

- **Read-only:** These are the key fields of the record selected while defining the data set definition. These fields can not be removed.

See [Creating and Editing Data Set Definition](#).

- **Non Key:** You can add any other non key fields of root record of the data set definition. This addition is not in the data set definition, it is specific to this data set content in this specific data migration project .

### Operation

Select the operation to use for this field. Valid operations are:

- != (not equal)
- < (less than)
- <= (less than or equal)
- = (equal)

- > (greater than)
- >= (greater than or equal)
- All
- Between
- In
- Like (Value contains specified text)

**Values**

Enter the value for the SQL.

For every operation other than *All* you need to supply one or more values in this text box. Based on the operator and value, the system will build the actual WHERE clause for the filter condition on the root record of the data set definition.

See [Using Operators to Build the WHERE Clause](#).

**Search button**

Click the Search button to display the rows meeting the filter criteria and display them on the Search Results grid.

**Search Results Grid**

Use the Search Results grid to select the rows of data to include in the data set content.

**Select All**

Use the Select All button to select all rows.

**Un-select All**

Use the Un-select All button to unselect all rows.

**Insert button**

Click the Insert button to insert the selected rows into the data set content and remain on the page.

**Insert and Return**

Click the Insert button to insert the selected rows into the data set content and return to the Data Set Content page.

## Using Operators to Build the WHERE Clause

This section provides examples for building WHERE Clauses.

## Numeric Operators

For any of the numeric operators, select the operator and provide a value.

### Image: Example Equal criteria

This example illustrates using the Equal operation.

Search Values			View All	First	1 of 1	Last
*Field Name	*Operation	Values				
MESSAGE_SET_NBR	=	257				

**Search**

Search Results		
	Message Set Number	Description
<input type="checkbox"/>	257	Application Data Set

## Between

The Between operator expects an *AND* keyword in the values field.

### Image: Example Between criteria

This example illustrates using the Between operation.

Search Values			View All	First	1 of 1	Last
*Field Name	*Operation	Values				
MESSAGE_SET_NBR	Between	257 and 260				

**Search**

Search Results		
	Message Set Number	Description
<input type="checkbox"/>	257	Application Data Set
<input type="checkbox"/>	258	Test Manager
<input type="checkbox"/>	259	Reserved
<input type="checkbox"/>	260	Test Case Manager



## In

In interprets the , (comma) as the separator for the literals.

### Image: Example In criteria

This example illustrates using the In operation.

Search Values			View All	First	1 of 1	Last
*Field Name	*Operation	Values				
MESSAGE_SET_NBR	In	257,260,262				

**Search**

Search Results		
	Message Set Number	Description
<input type="checkbox"/>	257	Application Data Set
<input type="checkbox"/>	260	Test Case Manager
<input type="checkbox"/>	262	PeopleTools Search Framework

## Like

Like will implicitly add % (percent sign) with the string.

### Image: Example Like criteria

This example illustrates using the Like operation.

Search Values			View All	First	1-2 of 2	Last
*Field Name	*Operation	Values				
MESSAGE_SET_NBR	All					
DESCR	Like	Integration%				

**Search**

Search Results		
	Message Set Number	Description
<input type="checkbox"/>	129	Merchant Integration Component
<input type="checkbox"/>	155	Integration Server
<input type="checkbox"/>	158	Integration Broker
<input type="checkbox"/>	229	Dashboard Integration Framewrk
<input type="checkbox"/>	273	Integration Group Manager



## Chapter 4

# Copying and Comparing Projects

---

## Copying and Comparing Projects

This topic provides an overview of the copy and compare process and discusses how to:

- Manage data migration project file locations
- Copy project to file
- Compare data set projects
- View compare reports
- View validation reports
- Submit for copy

---

## Copy Compare Overview

The Data Migration Workbench is used to copy and compare projects.

The ability to compare or copy a project is determined by the data set definition parameter *Is Copyable*. The user initiating the copy or compare must also have permission to the data contained in the Data Migration Project.

Data Migration Workbench provides the ability to:

- Copy a data migration project to a file.
- Compare a data migration project from file.
- Copy a data migration project from file.

### Related Links

[Setting Data Migration Permissions](#)

## Copy to File

Once the Data Migration project is defined it can be copied to file. The system will prompt you to select the file location from the available file locations defined on the Manage File Locations page. When the copy to file has succeeded, the Project State will be updated to *Copy to file succeeded*.

## Compare

Before you can do a compare, the data set definition in for the source and the target must be same. If there is difference in shape of any data set definition referenced in the project then the Compare will be aborted. *Shape* refers to the metadata describing the data migration project, including the data set definition itself, the record definitions that are part of the data set definition, and the fields that are part of the records that are part of the data set definitions.

Compare looks for the following type of differences:

- Row Difference – Based on the record keys compares if the row exists in both the source and target databases. All differences will be captured and shown as Absent on the database where the key is not present.
- Field Difference – The value of a field differs between source and target.

### Comparing From File

When you select to compare, the system performs the following:

1. An application engine program is executed that copies each data set instance in the Data Migration Project from XML to memory as a PeopleSoft rowset (not to the database) and the corresponding object is copied from SQL to memory as a different PeopleSoft rowset.
2. The two in-memory rowsets are then compared record-by-record, row-by-row, and field-by-field

In this case the file is the source and the local node is the target.

3. Any differences found in compare are stored in a table on the target database.

---

**Note:** It is stored in the same table used for managed object compare.

---

4. The differences found can be seen by running the compare viewer, which reads the compare output table.

## Using Compare Viewer

Once the compare is completed, you can use the viewer to view differences and determine which data set instances you want to include in the copy.

## Copy from File

Once you have reviewed the compare reports on the target database and selected which data set instances in the project should be copied, you can submit the data migration project for copy. If approval workflow has been configured for the Data Migration Workbench, you will receive a message that the project has entered the approval workflow. If approvals are not required for the project or when all approvals have been obtained, the copy will be scheduled to run through the Process Scheduler.

## Managing Data Migration Project File Locations

The project file locations are managed by a system administrator in the Project Repository to restrict the places where Data Migration Project files can be placed. Before you can copy a Data Migration Project to a file, you must set up the Project Repository to use. Typically, this task will be performed by a system administrator.

There are two parts to the Project Repository setup process:

1. Creating the file system folders for a specified path and the *areas* under that path. These folders should be manually created by a system administrator with appropriate access permissions for those users who will be starting the application and process scheduler servers or running Change Assistant. The system administrator should manually create both the *path* folders and the *area* folders.

---

**Note:** On non-Windows operating systems, folder names are case sensitive. At run-time *area* names are upper cased, so the names of *area* folders should also be upper cased.

---

2. Registering the path and area folders in the database as locations for holding project files. These database locations are the Project Repository.

This section describes the page to registration the path and area folders of the Project Repository.

Use the Manage File Locations page (PTPRJREPOSDEFN) to register the path and area folders of the Project Repository.

### Navigation

PeopleTools, Lifecycle Tools, Data Migration Workbench, Manage File Locations

### Image: Manage File Locations page

This example illustrates the fields and controls on the Manage File Locations page. You can find definitions for the fields and controls later on this page.

The screenshot shows the 'Manage File Locations' page. It has three input fields: 'Location Name' with the value 'MYADSPROJECTS', 'Description' with the value 'ADS Projects', and 'Path' with the value '\\denid002\ads'. A 'Delete' button is located to the right of the 'Location Name' field. Below these fields is a table titled 'Area' with a header 'Area Name'. The table contains two rows: '1 AREA1' and '2 AREA2'. Navigation controls for the table include 'First', '1-2 of 2', and 'Last'.

#### Location Name

Assign a name for your file location.

#### Description

Optionally add a description for the file location.

#### Path

The specified path must be accessible from both the application server and the

process scheduler server. Absolute network paths are less prone to issues in this respect as all servers are not likely to be running on the same machine, thus may not have access to a local or relative path.

If the application server is on Windows and the process scheduler server is on non-Windows or conversely, your system administrator will need to provide special setup to share files across machine boundaries.

---

**Note:** On Windows, you must use a UNC naming convention, such as \\<servername>\<sharename>. On UNIX based platforms, you must use absolute path, such as /<rootdir>/<subdir>/.../<subdir>.

---

#### Area

The area grid is populated with the sub directories in the path.

---

## Copying Project to File

To copy a data migration project to a file:

1. Select PeopleTools, Lifecycle Tools, Migrate Data, Data Migration Workbench
2. Select the Copy button.
3. Select the file location and area to copy the file.
4. Click the Run button.

---

**Note:** If the file already exists, you will be prompted whether or not to replace it.

---

5. On the Process Scheduler Request page, click OK.

The copy will run in the Process Scheduler.

6. Click OK to return to the Project Definition page.

The Project State is displayed. Use the Refresh button to check the progress of the copy.

### Image: Copy to File page

This example illustrates the fields and controls on the Copy to File page. You can find definitions for the fields and controls later on this page.

## Comparing Data Set Projects

The compare is always executed from the target database. First you must load the data migration project file and then execute the compare.

To load a project from file:

1. Select PeopleTools, Lifecycle Tools, Data Migration Workbench
2. Click the Load Project from File link.
3. Select the file location and area.
4. Click Add.

**Note:** The data set definition must exist on the target database before you can load the project. Only the project definition and data set bindings are copied, no data content is copied.

Use the Compare button on the Project Definition page to compare a project from a file.

To compare a data migration project:

1. On the target database, select PeopleTools , Lifecycle Tools, Migrate Data, Data Migration Workbench
2. Click the Compare button.
3. Select the languages to compare.
4. Click the Run button.
5. Click OK.

The process will be scheduled to run in the Process Scheduler.

6. Click OK again to return to the Project Definition page.
7. Click the Refresh icon on the Project Definition page to see the new status for the project.

**Image: Project Definition with project state Compare from File succeeded**

This example illustrates the Project Definition page with Project State: Compare from file succeeded

Project Definition		Data Set Content	Compare Report	Validation Report
<b>Project Name</b>	PROJECT3			
<b>Description</b>	Messages Sets for PeopleCode		Copy Project To File	
<b>Comments</b>			Compare	
			Submit for Copy	
<b>Project State</b>	Compare from file succeeded			
<b>Progress</b>	Currently processed 4 out of 4 ADS objects.			
<b>Project Content</b> <span style="float: right;">View All   First 1 of 1 Last</span>				
	*Data Set Name	Description	Search	
1	MSG	Message Catalog Entries		

The compare reports will be available on the Compare Reports tab. If there are validation issues on the compare, the Validation Report tab will show the validation report.

## Viewing Compare Reports

Use the Compare reports page (PTADSCMPRPT2) to review the reports and update the Upgrade actions.

The compare data is stored in two tables, PSSESSION stores the information about the compare session and PSSESSION stores the comparison data for each particular instance.



## Navigation

PeopleTools, Lifecycle Tools, Migrate Data, Data Migration Workbench, select the Compare Reports tab

### Image: Compare Report page

This example illustrates the fields and controls on the Compare Report page. You can find definitions for the fields and controls later on this page.

The screenshot displays the 'Compare Report' tab in the PeopleTools interface. At the top, there are tabs for 'Project Definition', 'Data Set Content', 'Compare Report' (selected), and 'Validation Report'. Below the tabs, project information is shown: 'Project Name' is 'TRAINING\_MSGS' (Training Messages) and 'Project State' is 'Compare from file succeeded'. The 'Datetime Compared' is '12/05/2012 2:20:23.747000PM'. A summary indicates '29 differences in 1 Data Sets'.

The 'Project Navigator' section shows a tree structure for 'Comparing FILE (Source) to T1C85301 (Target)'. The tree includes 'TRAINING\_MSGS', 'MSG', 'MESSAGE\_SET\_NBR=30001', 'PSMSGSETDEFN', 'PSMSGCATDEFN', 'MESSAGE\_SET\_NBR=30500', and another 'PSMSGSETDEFN' and 'PSMSGCATDEFN'.

The 'Filter By' section has dropdowns for 'Data Set Name' (MSG) and 'Record Name' (PSMSGCATDEFN), with a 'Filter' button. It also shows 'Message Catalog Entries' and 'Message Catalog'.

The 'Compare Report' table at the bottom shows the following data:

	Data Set Name	Data Set Instance	Record Name	Field Name	Source	Target	Source Value
1	MSG	MESSAGE_SET_NBR=30001	PSMSGCATDEFN	LAST_UPDATE_DTTM	Changed	Changed	2002-05-08-1
2	MSG	MESSAGE_SET_NBR=30001	PSMSGCATDEFN	DESCRLONG	Changed	Changed	

The Compare Report page displays the current project state, the last datetime that a compare was run and a summary of the differences found between the source and target.

## Project Navigator Section

The Project Navigator section displays the data migration project content in a tree structure for each of the records in the record hierarchy of the data set definition.

When you click on one of the nodes in the tree, the corresponding report information is displayed at the bottom of the page in a Compare Report section.

## Filter By

The Filter By section allows you to select the Data Set Name and record to display in the Compare Report section.

## Compare Reports

Use the Compare Report section to review the differences and update or change the Upgrade action.

The compare reports are displayed in a grid. You can adjust the column width like any other grid.

### Image: Compare Report Section 1

This example illustrates the fields and controls on the left hand side of the Compare Report. You can find definitions for the fields and controls later on this page.

Compare Report							
	Data Set Name	Data Set Instance	Record Name	Field Name	Source	Target	Source Value
1	MSG	MESSAGE_SET_NBR=30001	PSMSGCATDEFN	DESCRLONG	Changed	Changed	
2	MSG	MESSAGE_SET_NBR=30500	PSMSGCATDEFN	DESCRLONG	Changed	Absent	
3	MSG	MESSAGE_SET_NBR=30500	PSMSGCATDEFN		Changed	Absent	
4	MSG	MESSAGE_SET_NBR=30500	PSMSGCATDEFN		Changed	Absent	

### Image: Compare Report Section 2

This example illustrates the fields and controls on the right hand side of the Compare Report. You can find definitions for the fields and controls later on this page.

Compare Report						
		Source Value	Target Value	Action	Upgrade	Done
1		%1 is the student, %2 is customer %3 is the session number		Copy	<input type="checkbox"/>	<input type="checkbox"/>
2		2012-06-14 19.03.16.125000	2002-05-08-16.54.49.000000	Copy	<input type="checkbox"/>	<input type="checkbox"/>
3		Workcenter created in training course		Copy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4		2012-06-14 19.01.15.219000	2012-01-02-16.16.38.531000	Copy	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The report has 9 columns.

#### Data Set Name

The name of the data set definition.

#### Data Set Instance

Specifies the specific row of data in the data migration project.

#### Record Name

The name of the record for the data instance.

#### Field Name

The name of the field.

#### Source Value

The value on the source system. The source is the system that initiated the compare.

#### Target Value

The value on the target system.

#### Action

Possible actions are:

- Copy
- Delete

#### Upgrade

The value depends on the value of the PTMERGESTATUS of the compare table. This check box is editable. When you change the selection (clear or select) on the report, it is saved to the database.

#### Done

The value depends on the value of the PTMERGESTATUS of the compare table. This check box is partially editable, it can be change from checked to unchecked, but not from unchecked to

checked. When you change the selection (clear or select) on the report, it is saved to the database.

This table describes the meaning of the various combinations of the Upgrade and Done flags:

<b><i>Upgrade</i></b>	<b><i>Done</i></b>	<b><i>Meaning</i></b>
Unchecked	Unchecked	The row is not to be upgraded and upgrade action (is or is not, as the case may be) completed.
Unchecked	Checked	The row is not to be upgraded and upgrade completed.
Checked	Unchecked	The row is to be upgraded and upgrade not completed
Checked	Checked	The row is already upgraded. A second run of copy will ignore this row.

---

## Viewing Validation Reports

When you compare a project to a file, basic validation will be performed for static prompts based on records and fields and any additional validation set up using an application package defined in the data set definition. If validation errors occur, the Project Status on the Project Definition page will indicate: *Validation errors on compare* and a validation report will be generated.

Use the Validation Report page (PTADSCMPRPT3) to view the Validation Report.

## Navigation

Select the Validation Report tab

### Image: Validation Report page

This example illustrates the fields and controls on the Validation Report page. You can find definitions for the fields and controls later on this page.

**Project Definition** | **Data Set Content** | **Compare Report** | **Validation Report**

**Project Name** INSTRUCTOR\_NE Instructor NE  
**Project State** Validation errors on compare

**Datetime Validated** 06/15/2012 1:53:16.580414PM  
**Summary** 3 errors or warnings in 1 Data Sets

**Project Navigator**

Comparing FILE(local) to T1C85301(remote)

- INSTRUCTOR\_NE
  - INSTRUCTOR\_ONLY
    - EFFDT=2006-05-01 AND INSTRUCTOR=MGD
      - PSU\_INSTR\_TBL
    - EFFDT=2006-10-06 AND INSTRUCTOR=EXR
      - PSU\_INSTR\_TBL
    - EFFDT=2007-03-01 AND INSTRUCTOR=DAP
      - PSU\_INSTR\_TBL

**Filter By**

**Validation Report** Personalize | Find | First 1 of 1 Last

Record Name	Validation Type	Message Severity	Message Text	Explanation
1 PSU_INSTR_TBL	Static Prompt Validation	Error	Value: PHX specified for field: FACILITY on record: PSU_INSTR_TBL is not found in the prompt table: PSU_TRNLOC_TBL (257,501)	While perform value does n table. Please validations a

When you click on a row in the Project Navigator section, the validation report for that row is displayed.

You can also use the Filter By section to display the report based on filters for Data Set Name, Record Name, Severity or any combination of those filters.

The report has 4 columns:

<b>Record Name</b>	The name of the record.
<b>Validation Type</b>	The type of validation error.
<b>Message Severity</b>	Indicates the severity of the error.
<b>Message Text</b>	The message text.
<b>Explanation</b>	An explanation of the message.

## Submitting for Copy

To copy the project from file:

1. Select Select PeopleTools, Lifecycle Tools, Migrate Data, Data Migration Workbench
2. Select the *Submit for Copy* button.
3. Select the languages to copy.
4. Click the Run button.
5. Click OK.

If Approval Framework has been configured, the request will enter the approval workflow, otherwise the process is scheduled in the Process Scheduler.

Refer to Scheduling and Approving Copy from File for approving the request.



# Implementing Data Set Security

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## Implementing Data Set Security

This topic provides an overview of security for application data sets and discusses how to:

- Assign data set security permission to users.
  - Set data migration permissions.
  - Set up Approval Framework for data migration.
- 

## Understanding Data Set Security

The Data Migration framework allows users to:

1. Define the shape of business objects as data set definitions.
2. Define the contents of a data migration project.
3. Copy or compare the data migration projects to and from files.

Data sets may contain sensitive data, therefore it is critical to define security for data set functions and services. Security for data migration includes security to:

- Create data sets and data migration projects.
  - Copy data migration projects to file.
  - Compare data migration projects from file.
  - View compare reports.
  - Copy data migration projects from file.
- 

## Assigning Data Set Permissions to Users

PeopleSoft delivers the role *ADS Designer* that grants access to the Data Migration Workbench components. Assign this role to any user that needs access to create and use data sets.

The permission list PTPT3500 provides access to the Migrate Data pages. This permission list is included in the role ADS Designer.

<b>Component Reference</b>	<b>Page</b>
Dataset Designer	PTADSDEFNSEARCH PTADSDEFNSEARCH_AD PTADSDEFNSEARCH_GC
Data Migration Workbench	PTADSDMWSEARCH PTADSDMWPRJDEFN PTADSDMWCONTENT
Copy Project to file	RUN_PTADSAEPRCS
Compare Project	RUN_PTADSAEPRCS
Manage File Locations	PTPRJREPOSDEFN PTPRJREPOSDEFN

## Setting Data Migration Permissions

Use the Data Migration permissions page ( (PERMLIST\_ADS) to set the security for migrating data.

### Navigation

1. PeopleTools> Security> Permissions and Roles> Permission Lists
2. Select the permission list to update.
3. Select the Data Migration tab.

### Image: Data Migration Permissions page

This example illustrates the fields and controls on the Data Migration Permissions page. You can find definitions for the fields and controls later on this page.

Query Mass Change Links Audit **Data Migration** Search Groups

Permission List: PTPT3500  
Description: ADS Designer

**Copy Compare Permissions**

[Access Group Permissions](#)  
[Copy Compare Permissions](#)



The Data Migration page has links to the Access Group Permissions page, where you can define the records to which the user can have access in the Data Migration Workbench, and the Copy Compare Permissions page, where you can define the copy and compare operations that the user can perform.

## Defining Access Group Permissions

Use the Permission List Access Groups page (SCRTY\_ADS\_ACC\_GRP) to define the query tree and access groups, as well as the read and write privileges.

**Note:** If the permission list grants full access to Upgrade, it is not necessary to include all of the access groups for a Copy from File. The access group security is always used when creating a data migration project.

### Navigation

Click the Access Group Permission link on the Data Migration page.

### Image: Permission List Access Groups Page

This example illustrates the fields and controls on the Permission List Access Groups Page. You can find definitions for the fields and controls later on this page.

*Tree Name	*Access Group	Read	Write		
QUERY_TREE_PSU	TRAINING ACCESS GRP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	+	-
QUERY_TREE_PT	PT_ACCESS_GROUP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	+	-

Access groups are nodes in a query tree, which you build with Query Access Manager. After you build a query tree, you give users access to one or more of its access groups. Then, they can generate queries on any tables in the access groups accessible to them.

Data Migration Workbench uses the query trees defined in Query Access Manager (PeopleTools, Security, Query Access Manager).

Users who have access to Data Set Designer can create data set definitions for any records in the database, however in order to copy or compare the data set, the user must have permission to an access group that contains the records to be copied or compared.

To add an access group to a permission list:

1. Open the permission list and select the Data Migration tab, Access Group Permissions
2. Select a tree name.
3. Select the highest access group that the user can access.

The system displays access groups in the selected query tree only.

The access group that you select should be the highest-level tree group to which this permission list needs access.

4. Select the Read check box to grant the user access to the compare reports for this access group.

---

**Note:** Read access is enough for Copy to file and Compare operations.

---

5. Select the Write check box to grant the user access copy data for this access group from a file.

---

**Note:** Write access is required for Copy from file.

---

6. Save your changes.

## Read Write Privileges

<i>Operation</i>	<i>Permission Required</i>
Copy to file	Read
Copy from file	Write
Compare from file	Read

## Defining Copy Compare Permissions

Use the Copy Compare Permissions page (SCRTY\_ADS\_PROFILES) to define the access permission for copying and comparing data migration projects.

### Navigation

Click the Copy Compare Permissions link on the Data Migration page


### Image: Copy Compare Permissions page

Copy Compare Permissions Page

Permission List: PTPT3500  
 Description: ADS Designer

### Copy Compare Permissions

Assign access permissions for copying and comparing data set content

Full Access 

☒ Allow setting Copy Compare attributes on data set definitions

Use this page to specify the copy and compare options available.

### Access

Select the appropriate access level. Options are:

- Full Access: Enables user to copy and compare the data set.
- No Access: User can not copy or compare the data set.
- Read-Only: User can compare the data set.

### Allow setting Copy Compare attributes on data set definitions

The user can set the copy and compare options on the data set definition.

This privilege should only be given to architects with a thorough knowledge of the data set definition and its associated data content who would certify data set definitions to be copyable and comparable. A flawed data set definition could corrupt a data base. A partial list of considerations for the architect includes the following items to assess:

- The validation rules expressed in the application class must be accurate and complete.
- Records in the data set should represent a tightly coupled set of data.
- Copying the data set must preserve dependency relationships.
- No orphan rows should be created in copy or delete.
- Consideration should be made of validation dependencies: if a dependent object is being copied from the source, it must be copied before the objects that depends on it.

### Access

<b>Copy Compare Access</b>	<b>Copy to File</b>	<b>Copy from File</b>	<b>Compare from File</b>
No Access	No	No	No
Read-Only Access	Yes	No	Yes
Full Access	Yes	Yes	Yes

## Setting Upgrade Permissions

In order to copy from file, the user must have all of the appropriate permissions to the records in the file. To simplify this process, you can create a permission list that includes Full Access to Upgrade.

Full access to upgrade allows the user to copy any record without checking the specific authority to that record. Once you create a permission list with this access and assign it to a role, you should limit the number of users who are granted the role.

To assign Full Access to Upgrade:

1. Select PeopleTools, Security, Permissions and Roles, Permission Lists
2. Select the PeopleTools tab.
3. Select the Application Designer check box.
4. Select the Tools Permission link.
5. Select Full Access for Upgrade.
6. Click OK and then save the page.

**Image: Tools Permissions page**

This example illustrates the Tools Permissions page with Upgrade set to full access.

**Tools Permission**

Permission List: UPGRADE  
Description: Upgrade

Tool	*Access Code
Build / Data Admin.	No access
Change Control	Supervisor access
Language Translations	No access
Peoplecode Debugger	No access
SQL Editor	No access
Upgrade	Full access

Full Access (All)  
Read Only (All)  
No Access (All)

**Related Links**

"Defining Permissions (*PeopleTools 8.53: Security Administration*)"

## Setting Up Approval Framework for Data Migration

Approval Framework is included in PeopleSoft applications as part of Enterprise Components. A set of approvals is included for Data Migration Workbench. If activated and configured, this approval process is triggered when the user clicks the Submit for Copy button.

The ProcessID *MigrateData* contains all of the information necessary to route approvals to the appropriate approvers and take the necessary action when a transaction is approved, denied, or pushed back.

To configure and activate the Approval Framework process for MigrateData:

1. Assign the appropriate role in the user profile for the approvers.
2. Define workflow for user profile.
3. Create and maintain user list definition.
4. Set up the Approval Process for Data Migration.

## Assigning Data Migration Roles

Two roles are delivered for Data Migration approvals:

- EOMW\_REVIEWER
- EOMW\_APPROVER

You can use these roles or create new roles as needed for your approvers.

To assign data migration roles to a user profile:

1. Select PeopleTools, Security, User Profiles, User Profiles, Roles (USER\_ROLES).
2. Insert the role or roles.
3. Save the page.

### Related Links

"Defining Role Options (*PeopleTools 8.53: Security Administration*)"

## Defining Workflow for User Profile

In order to receive approval notifications, the user must have the worklist option selected in the user profile.

To set up a workflow user:

1. Select PeopleTools, Security, User Profiles, User Profiles
2. Select the user profile, or create a new one.
3. Access the Workflow (USER\_WORKFLOW) page.
4. Select the Worklist check box.

### Related Links

"Specifying Workflow Settings (*PeopleTools 8.53: Security Administration*)"

## Creating and Maintaining User List Definition

A *user list* is a collection of users (PeopleSoft User IDs) expressed as the result of a SQL statement, PeopleSoft role, or PeopleSoft Application Class. User lists are used to represent the business process of your approval hierarchy on a transaction-by-transaction basis. PeopleSoft delivers pre-defined user lists. If none of the delivered user lists apply to your organization's hierarchy, then you can define your own using the User List Setup component (Enterprise Components, Approvals, Approvals, User List Setup).

There are two delivered User Lists for Data Migration Workbench, however you can use any of the user lists that apply for your applications.

<b>User List</b>	<b>Description</b>
MigrateData_Reviewer	Based on the role EOMW_REVIEWER. The transaction will be routed to any user that has the role EOMW_REVIEWER defined in the user profile.
MigrateData_Approver	Based on the role EOMW_APPROVER. The transaction will be routed to any user that has the role EOMW_APPROVER defined in the user profile.

For more information on setting up user lists see *Approval Framework*, Defining Notification Templates and Users for Approval Framework.

## Setting up the Approval Process for Data Migration

To set up approval process definitions, use the Setup Process Definitions (EOAW\_PRCs) component.

Business analysts use this component to define an approval process definition. The process is made up of stages and their paths and steps. The approval steps that you place on the approval path represent the approval levels that are required for a transaction.

<b>Approval Flow</b>	<b>Description</b>
Stage	A stage is one part of an approval process that can contain multiple paths. The system executes stages in sequence where one must complete the stage before the next one begins. A stage can be at the header or line level. For Data Migration only the header level is used.
Path	A path contains a sequence of steps. Within a stage, paths execute in parallel. Path entry criteria determines whether or not a path executes for a given transaction.
Step	A step represents one or more approvers or reviewers. Steps within a path execute in sequence. Separate criteria for each step determines whether or not that step executes. Each step can also have a set of reviewers.

Typical approval processes for Data Migration might include:

- Supervisor or Manager to review data that will be copied to the database.

- Manager to approve the data migration before it is copied to the database.
- Two different approvers for each step, where both approvers at a step must approve the request for it to advance to the next step.

### **Example Approval Process Definition**

This section provides an example of how to set up an approval process definition for a transaction that is specific to MigrateData.

To set up the approval process definition:

1. Select Enterprise Components, Approvals, Approvals, Setup Process Definitions.

## 2. Select ProcessID *MigrateData*.

### Image: Set Up Process Definition page

This example illustrates the fields and controls on the Set Up Process Definition page. You can find definitions for the fields and controls later on this page.

**Setup Process Definitions**

Clone Approval Process | Approval Process Viewer | Preview Approval Process

**Process ID** MigrateData  
**Definition ID** Default  
**Effective Date** 01/01/1900  
**Description**

**Definition Options**

Definition Criteria | Alert Criteria | Definition Notifications | Timeout Options

\*Admin Role    
 \*Status    
 Priority

☒ **Default Process Definition**  
☐ **User Auto Approval**  
☒ **Route to Requester**  
☐ **Include Requester**

**Stages** Find | View 1 First 1-2 of 2 Last

\*Stage Number  **Description**  **Level** Header

**Paths** Find | View All First 1 of 2 Last

**Description**  \*Source

**Steps** Personalize | Find | View All First 1 of 1 Last

Description	Approver User List	Details	Criteria		
1 Supervisor Approval	Supervisor by UserId	<input type="button" value="Details"/>	<input type="button" value="Criteria"/>	<input type="button" value="Up"/>	<input type="button" value="Down"/>

**Stages** Find | View All First 1 of 1 Last

\*Stage Number  **Description**  **Level** Header

**Paths** Find | View All First 1 of 1 Last

**Description**  \*Source

**Steps** Personalize | Find | View All First 1 of 1 Last

Description	Approver User List	Details	Criteria		
1 Copy Scheduler	MigrateData_Reviewer	<input type="button" value="Details"/>	<input type="button" value="Criteria"/>	<input type="button" value="Up"/>	<input type="button" value="Down"/>

[Expand/Collapse All](#)

In the Definition Options section, the process definition needs to be set to Active.

In this example the approval process contains two stages – Supervisor and Copy Scheduler. Each stage has one path and one step. The first stage requires supervisor approval before the data migration project can be routed to the Copy Scheduler. When the copy scheduler approves the request (final approval), the data migration project will be scheduled for copy in the Process Scheduler.

You can define multiple stages, paths, and steps for an approval process definition. For example, perhaps you require administrator approval for the copy request. In this case, you would create an additional path within the existing stage that contains one step requiring administrator approval.



The Approval Framework processes multiple stages and steps sequentially. The engine cannot advance to the next step until you complete the preceding step in the given path. Likewise, the engine cannot advance to the next stage until you complete all paths within a given stage. For paths, however, you can define them as static (processed sequential) or dynamic (processed in parallel).

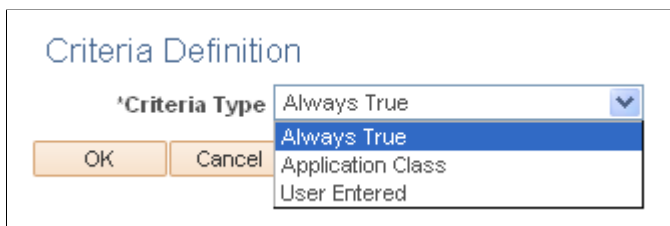
## Criteria

By default, the criteria will be Always True, which means if the process definition for MigrateData is active, Approval Framework will always be invoked.

You can add logic that the Approval Framework evaluates at runtime for a Boolean result. You can define criteria at the definition, path, or step level. To set up criteria, click the Definition Criteria link at the top of the Setup Process Definitions page for the definition, for path and step criteria, click the associated criteria icon for that path or step.

### Image: Criteria Definition page

This example illustrates the fields and controls on the Criteria Definition page.



Refer to the *Approval Framework PeopleBook*, Setting Up Approval Framework Process Definitions, Defining Criteria for Approval Framework Processes for details on how to define the criteria.

---

## Scheduling and Approving Copy from File

This section discusses how to:

- Submit for Copy using Approval Framework.
- Approve the copy request.

### Submitting for Copy using Approval Framework

When the MigrateData approval process is active, all approvals must be completed before the Copy from file will be scheduled in the Process Scheduler.

To request the copy from file:

1. In the Process Definition component (PeopleTools, Lifecycle Tools, Migrate Data, Data Migration Workbench) select the Submit for Copy button.
2. Select the languages to copy.
3. Click Run.

You will receive a message that the project has been submitted for approval and the status will be updated to Evaluating Approval.

4. Click OK to return to the Project Definition page.
5. To view the approvals required, click the Work Approvals link.

### Image: Example ADS Approval View

This example illustrates the fields and controls on the ADS Approval View. You can find definitions for the fields and controls later on this page.

The screenshot displays the 'ADS Approval View' interface. It is divided into two main sections: 'Supervisor Approval' and 'Copy Scheduler'.

**Supervisor Approval:** This section shows a dropdown menu with the selected item 'PROJECTNAME=MSG\_257,:Pending'. Below this, there is a 'Supervisor' field with a 'Pending' status. A clock icon and the text 'Director 2' are visible, with a note 'Supervisor by UserId' below it.

**Copy Scheduler:** This section shows a dropdown menu with the selected item 'PROJECTNAME=MSG\_257,:Awaiting Further Approvals'. Below this, there is a 'Copy Scheduler' field with a 'Not Routed' status. A printer icon and the text 'Multiple Approvers' are visible, with a note 'Migrate Data Scheduler' below it.

This example shows the two paths. First the Supervisor must approve the project and then the copy scheduler. Note in this example that for Copy Scheduler there are multiple approvers. If you want to see who the approvers are, click on Multiple Approvers for a list of possible approvers. Only one approval is needed, so once one of the copy scheduler approvers approves the copy, the transaction will be deleted from the other copy schedulers worklist.

## Approving a Copy Request

The approval request is added to the approvers worklist. To approve a request:

1. Sign on as the approver.
2. Select Worklist from the menu bar or select Worklist, Worklist.
3. In the Link column, click the link.

4. The Data Migration Approval page is displayed.

### Image: Data Migration Approval page

This example illustrates the fields and controls on the Data Migration Approval page. You can find definitions for the fields and controls later on this page.

**Data Migration Approval**

**Project Name** DEM02 demo2  
[View Compare Report](#)

**Project State** Evaluating Approval

**Schedule Date/Time**  **Time**  ☒ **Schedule Immediately**

**Approval Comment**

[Approve](#) [Deny](#) [Pushback](#) [Request Information](#) [Save Comment](#)

[ADS Approval View](#)

#### Approve

Click to approve the transaction.

#### Deny

Enter a comment in the Approval Comment edit box and click to deny the transaction.

#### Pushback

Click to push back the transaction.

Pushback is an optional feature that can be implemented in the Approval Monitor. If implemented, push back takes a currently pending step out of pending status and requeues the previous step to its approvers. The meaning of push back is that the approver is questioning the prior step's approval and is requesting clarification. Push back is only possible within a path, therefore, the first step of a path cannot push back.

#### Request Information

Click this button to request additional information from the originator. The approval will be placed on hold.

#### Save Comment

Enter a comment in the Approval Comment edit box and select Save Comment.

Requesters can add comments to transactions, and approvers can associate their comments with the approval process rather than the request transaction directly. The Approval Framework Monitor provides a mechanism for associating comments with a particular approval process instance, which is tied to a particular application transaction. Approvers can view comments added by another approver, but they cannot change previous comments.

Expand the ADS Approval View to view the current progress of the request.

### Image: ADS Approval View

This example illustrates the fields and controls on the ADS Approval View.

The screenshot displays the 'ADS Approval View' interface. It is divided into two main sections: 'Supervisor Approval' and 'Copy Scheduler'. Each section has a header bar with a dropdown arrow, the project name 'PROJECTNAME=DEM02', and the status 'Approved' or 'Pending', along with a 'View/Hide Comments' link.

**Supervisor Approval**

Supervisor

**Approved**

✓ Director 2  
Supervisor by UserId  
10/02/12 - 11:42 AM

**Comment History**

**Copy Scheduler**

Copy Scheduler

**Pending**

⌚ Multiple Approvers  
Migrate Data Scheduler

**Comment History**