

Rich Enterprise Applications

Powered by Oracle Application
Development Framework
(Oracle ADF)



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ADF Binding Internals

Shaun O'Brien

Principal Product Manager – Oracle Development Tools



Agenda

- - ADF Model Overview
 - Understanding data controls
 - Bindings at Design Time
 - Bindings at RunTime



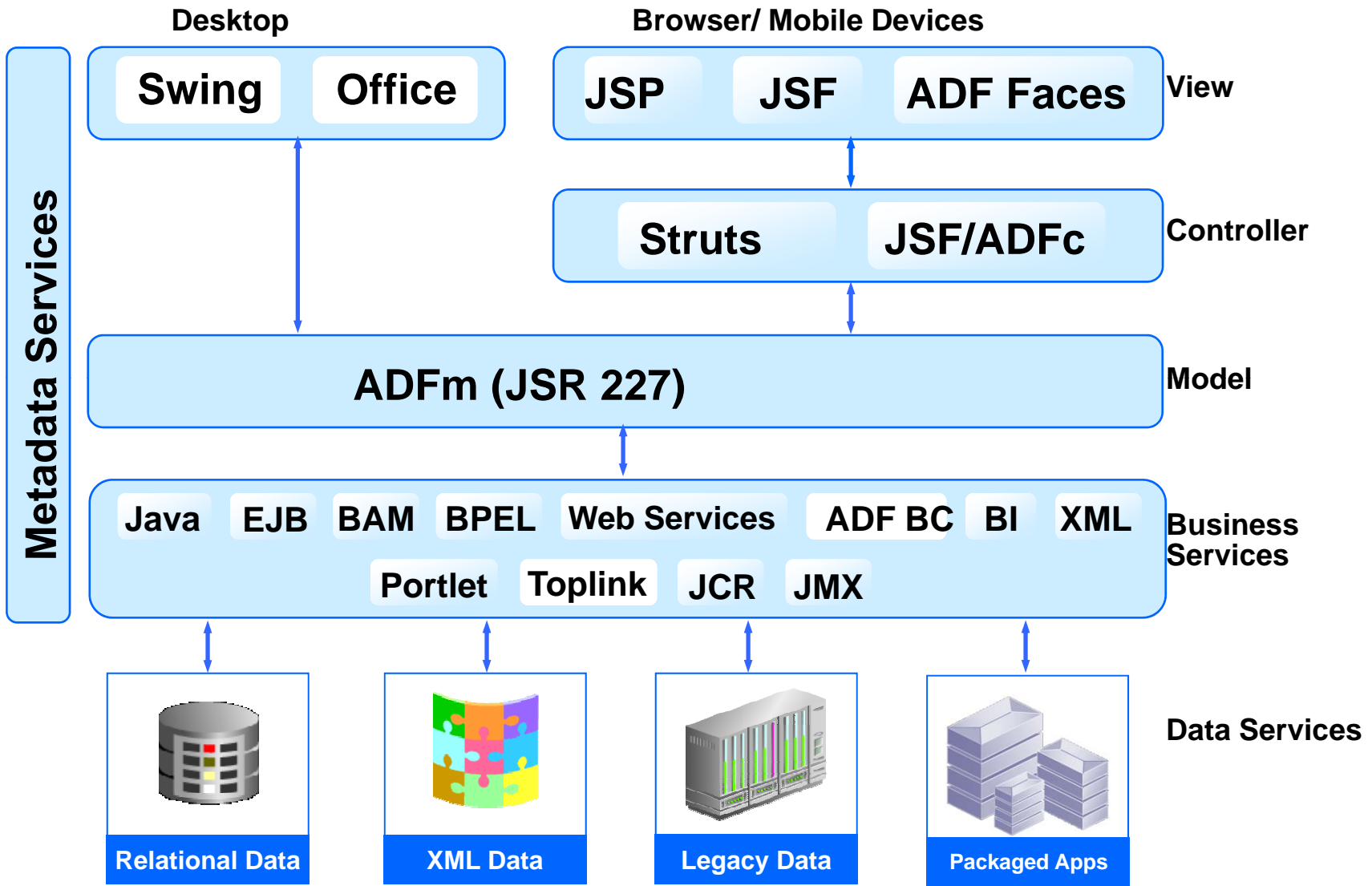
ADF Model Overview

Virtual Developer Day: Rich Enterprise Applications

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Oracle ADF 11g Architecture



Overview of ADF Model



JDBC

Database



SOAP

Web Services



Java/RMI

POJO

Marital Status

- single
- married
- widowed
- divorced

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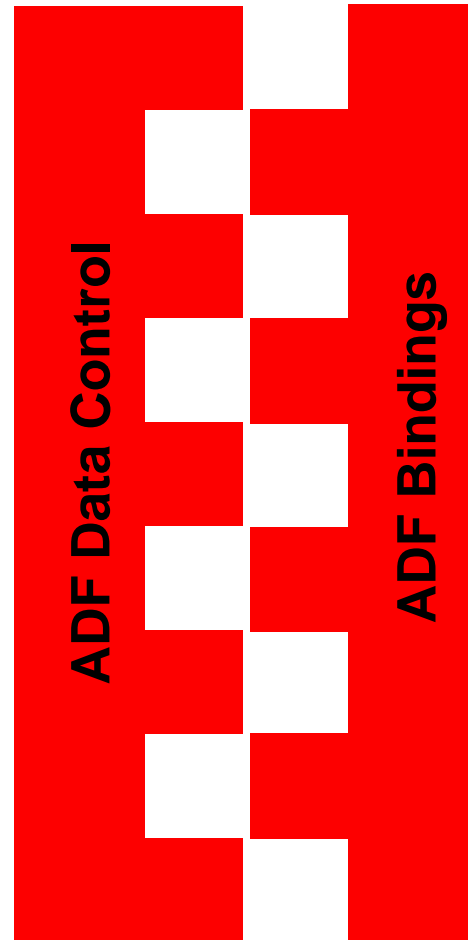
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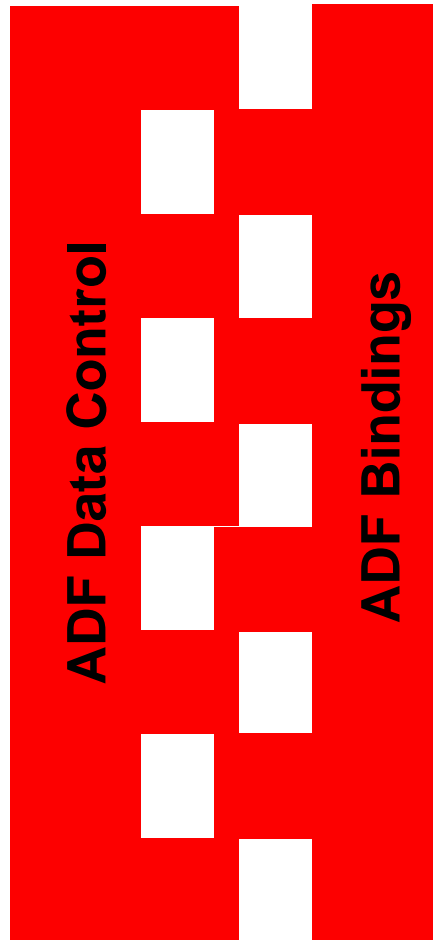
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Understanding Data Controls

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Data Control Concepts

- Uses standard metadata interface to describe the services' operations and data collection
- At design time, simplifies binding components to data control operation or data collection
- At run time, wires business service data controls to UI bindings from XML files
- Has the following benefits:
 - You write less code.
 - You work the same way with any UI and Business Service technology.
 - You gain useful run-time features because you do not have to code them yourself.



ADF 11g Built-in Data Controls

- ADF Business Components
- Java class
- EJB
- URL (XML or CSV)
- Web service
- Placeholder
- Add your own

ADF BC Data Control

Application Module

View Object

Client Method

Operation

Nested Application Module

The screenshot displays the Oracle ADF BC IDE interface for configuring an application module. The left pane shows a tree view of the application module structure, including a Data Control (HRAppModuleDataControl) with various view objects (e.g., DepartmentsView1, EmployeesView3) and operations (e.g., Create, Delete, Find). The right pane shows the Data Model Components configuration, including available view objects and application module instances.

Data Model Components

Select a view object from the tree of available view objects, select the instance or application module to be its parent in the data model tree, and click '>' to create a named instance of the view object in the data model.

Available View Objects:

- adf.interactiv.model.Model
- adf.interactiv.model.queries
- adf.interactiv.model.queries.links

Data Model:

- HRAppModule
 - DepartmentsView1
 - EmployeesView3
 - EmployeesView1

Application Module Instances

The application module may access the objects and code from each of the application module instances.

Available:

- adf.interactiv.model.Model
- adf.interactiv.model.service
- HRAppModule
- SalesAppModule

Selected:

- SalesAppModule1



Demo

ADF Data Controls





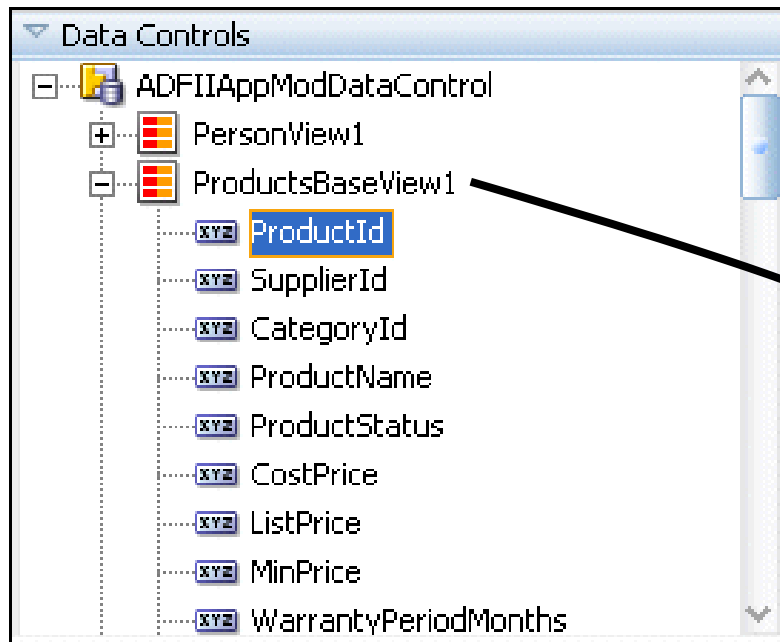
Binding at Design Time

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What happens ?



| | | | |
|-----------------------|-------------------------|-----------------------|-----------------------|
| #{...ProductId.label} | #{...ProductName.label} | #{...CostPrice.label} | #{...ListPrice.label} |
| #{...ProductId} | #{...ProductName} # | #{...CostPrice} | #{...ListPrice} |
| #{...ProductId} | #{...ProductName}#{ | #{...CostPrice} | #{...ListPrice} |
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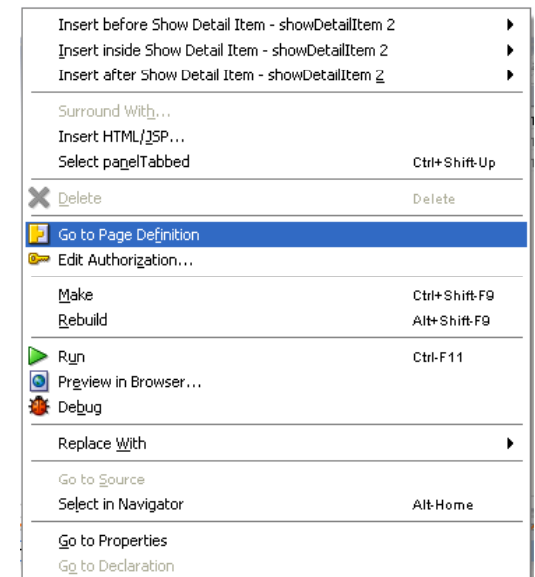


ADF Data Bindings Concepts

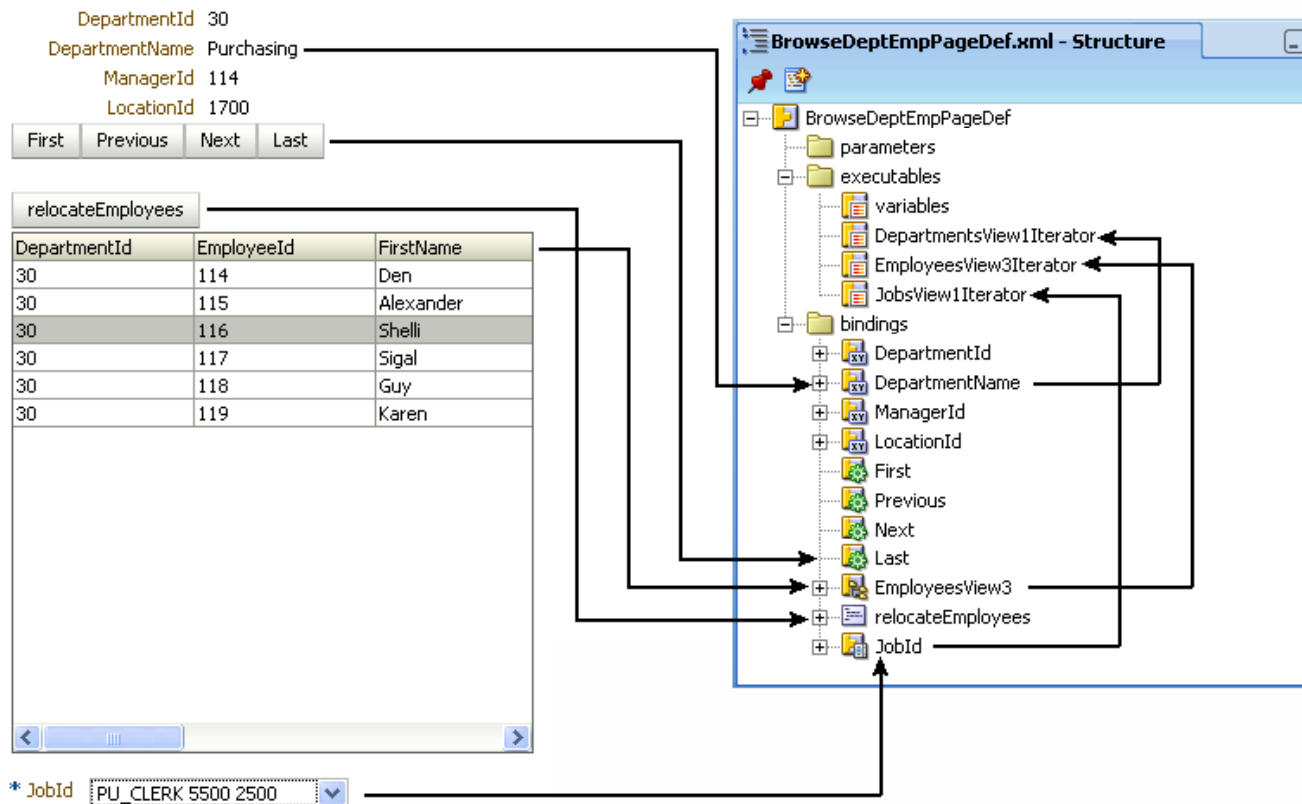
- Bindings abstract the details of accessing data from the data collections and of invoking its operations
- Three kinds of declarative bindings objects:
 - Iterator bindings
 - Tracks current row in a data collection
 - Value bindings
 - Binds UI components to attributes values in a data collection
 - Action bindings
 - Used to invoke customer or built-in operations on data collections

PageDef.xml File

- The key data binding artifact
 - Accessable via Bindings tab in visual editor or context menu on a page
 - Describes service usage of a particular page
- XML content
 - Default location controlled by ADFm Settings
 - Runtime location determined by DataBindings.cpx



ADF Binding in the ADF Faces UI



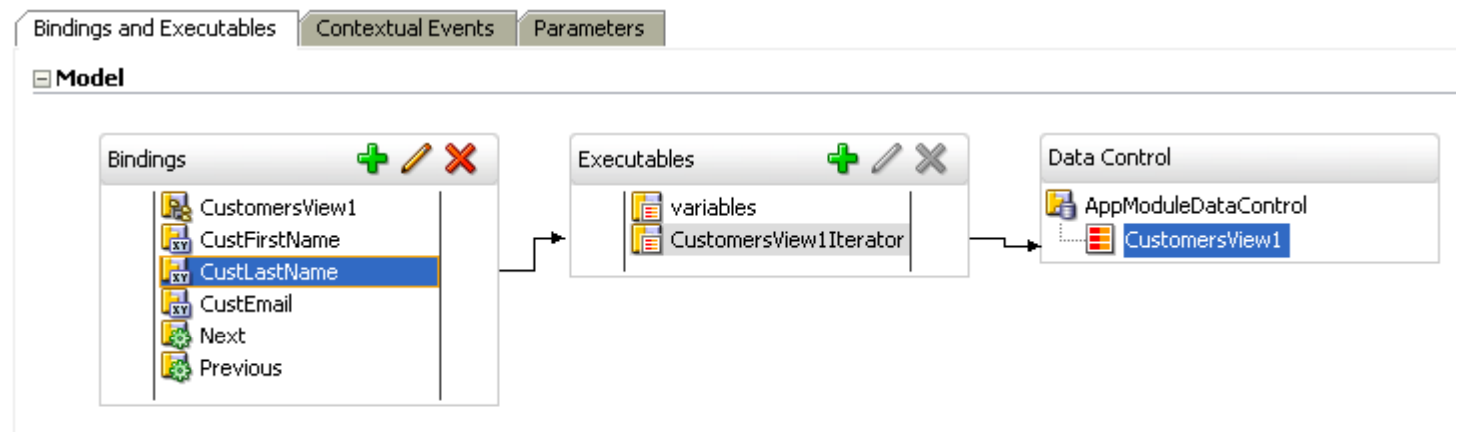


Types of Bindings

- Attribute binding
 - Input text tem to a String value
- Tree binding
 - Table or tree to a data collection
- List binding
 - Exports a list of legal values, enabling the user to select one
- Action binding
 - Built in operation or custom method

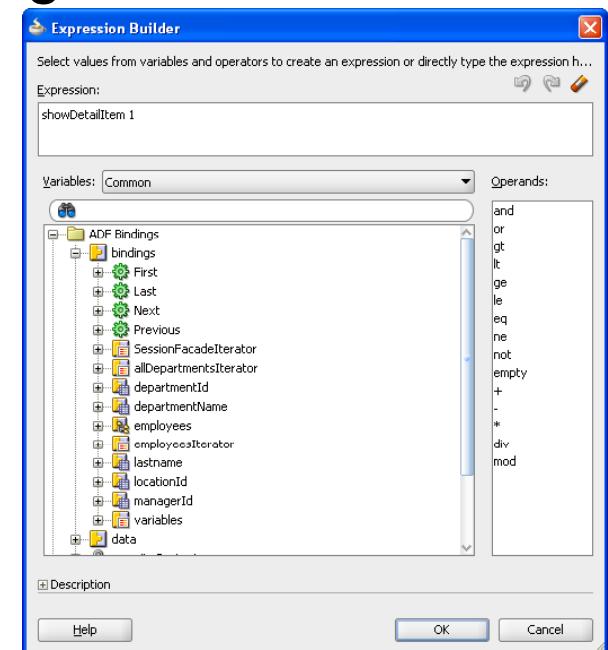
Executables

- Link bindings to Data Controls
 - Iterator
 - Method iterator
 - Access iterator
 - Variable iterator



What You Need to Know About Bindings

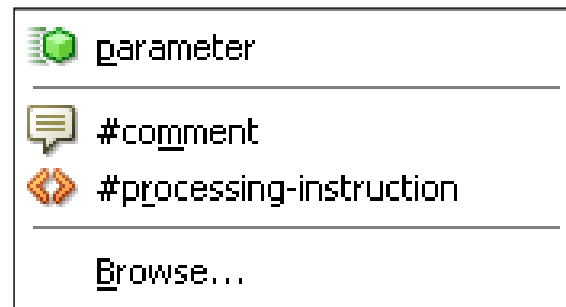
- The may or may not be used by the UI
- Accessed via the “bindings” object on the HTTP request
 - Conventionally via Expression Language
`#{bindings.EmpNo}`
 - `#{bindings}` provides access to everything defined in the binding container/PageDef
 - Attributes other than Value
 - `#{bindings.Emps.rangesize}`



Binding Objects in the Parameters Section

The parameters element of the page definition file defines the parameters for the page.

- Parameter binding objects declare the parameters that the page evaluates at the beginning of a request.
- Page parameters are evaluated once during the Prepare Model phase.
- Define the value of a parameter in the page definition file using:
 - Static values
 - Binding expressions
 - EL expressions that assigns a static value



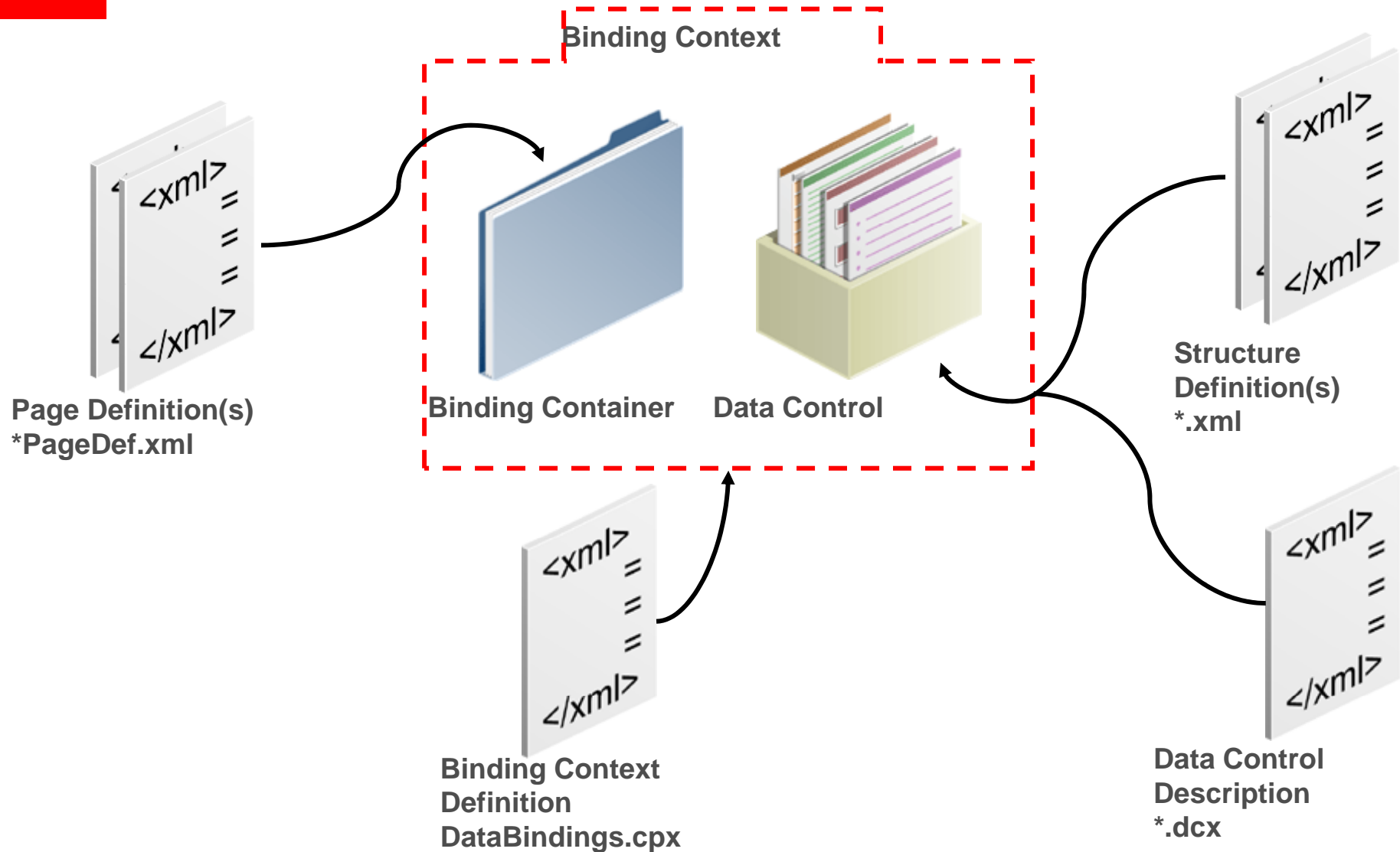


Demo

ADF Binding

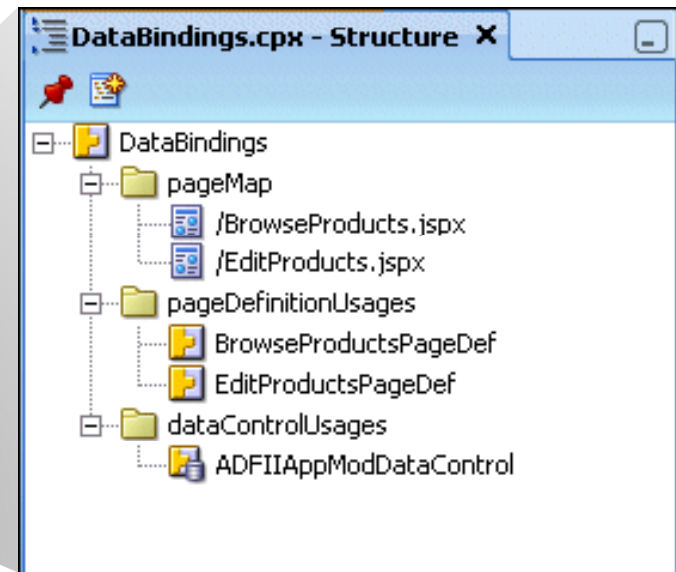
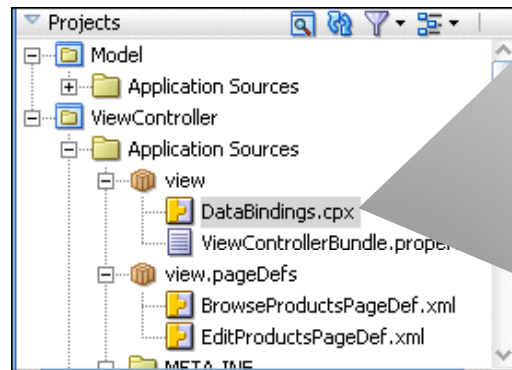


Bindings MetaData Summary



DataBindings.cpx File

- Provides the metadata from which the Oracle ADF binding objects are created at run time
- Uses XML syntax
 - `<pageMap>`
 - `<dataControlUsages>`
 - `<pageDefinitionUsages>`



DataBindings.cpx

```
<?xml version="1.0" encoding="UTF-8" ?>
  <Application xmlns="http://xmlns.oracle.com/adfm/application"
    version="..." id="DataBindings" SeparateXMLFiles="false"
    Package="oracle.demo.view" ClientType="Generic">
    <pageMap>
      <page path="/home.jspx" usageId="homePageDef"/>
      <page path="..." />
    </pageMap>
    <pageDefinitionUsages>
      <page id="homePageDef" path="oracle.demo.view.pageDefs.homePageDef"/>
      <page id="..." />
    </pageDefinitionUsages>
    <dataControlUsages>
      <BC4JDataControl id="AppModuleDataControl" Package="oracle.demo.model"
FactoryClass="oracle.adf.model.bc4j.DataControlFactoryImpl"
      SupportsTransactions="true" SupportsFindMode="true"
      SupportsRangesize="true" SupportsResetState="true"
      SupportsSortCollection="true"
      Configuration="AppModuleLocal" syncMode="Immediate"
      xmlns="http://xmlns.oracle.com/adfm/datacontrol"/>
    </dataControlUsages>
  </Application>
```



Product Demonstration

Exploring ADF Data Controls and Binding



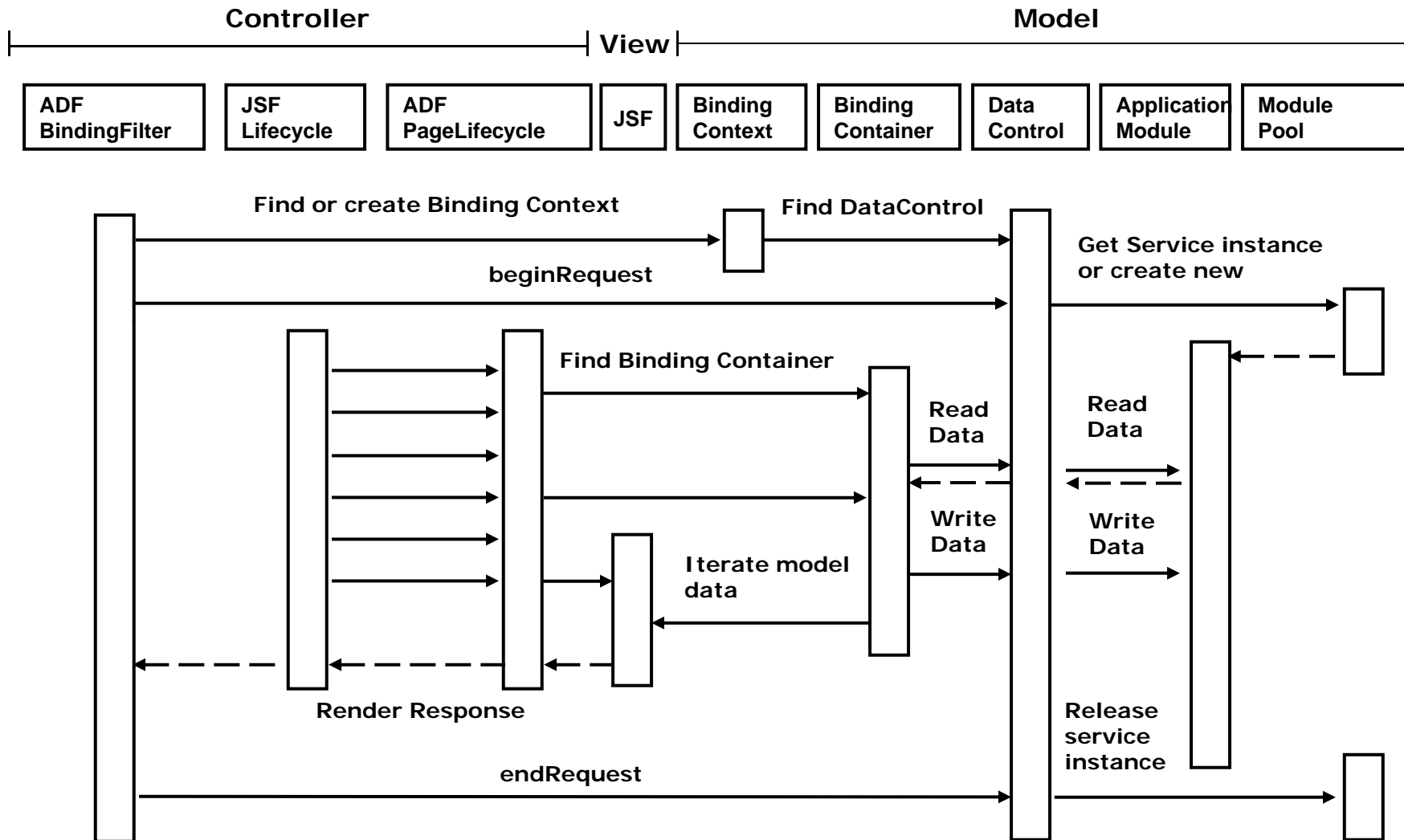
Bindings at Runtime



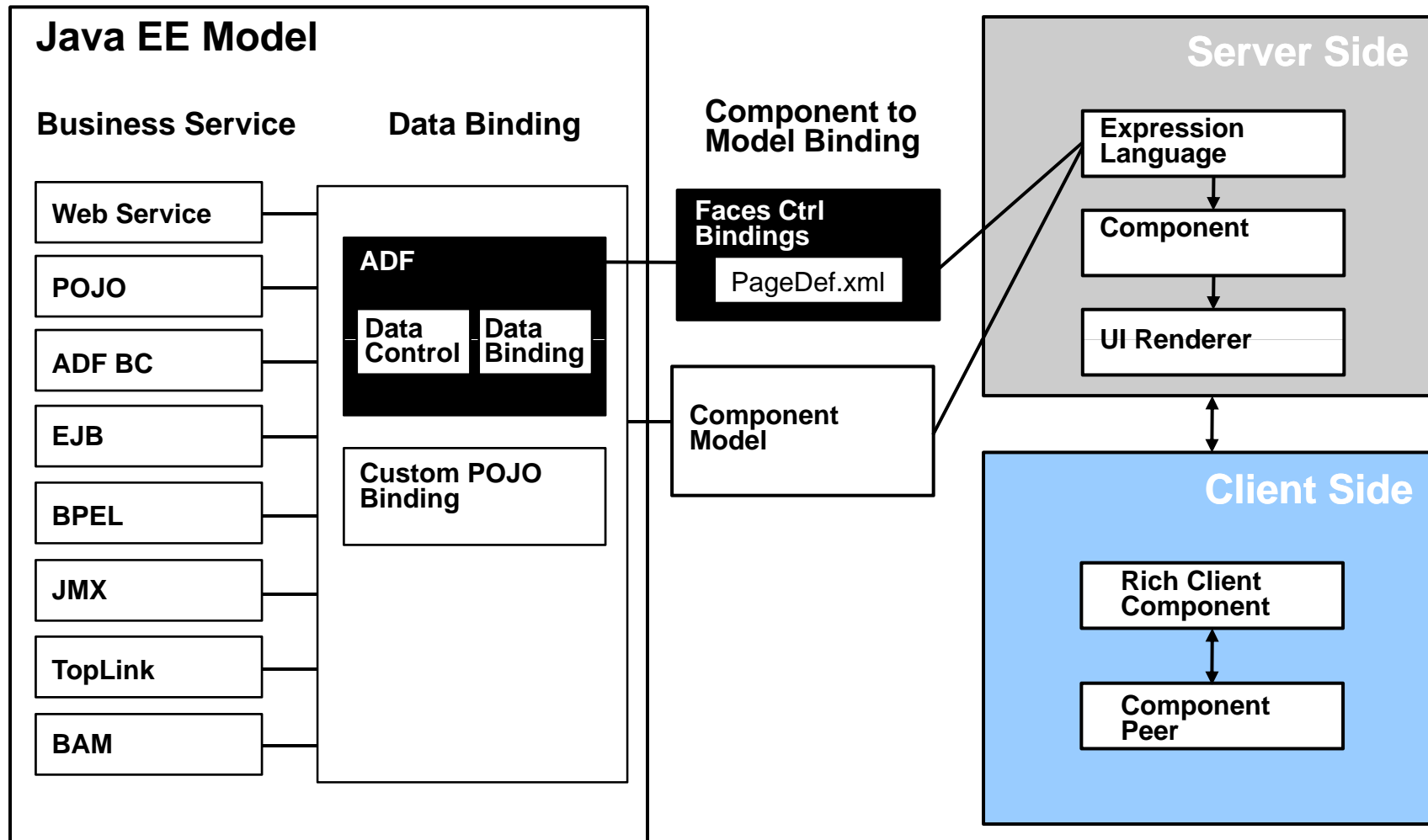
ADF binding responsibility


- Prepare model for page request
- Query data
- Insert – Update – Delete
- Execute operations and methods
- Manage row currencies
- Simplify business service access through consistent programming APIs

ADF Request Lifecycle



ADF Faces ADF Model Integration









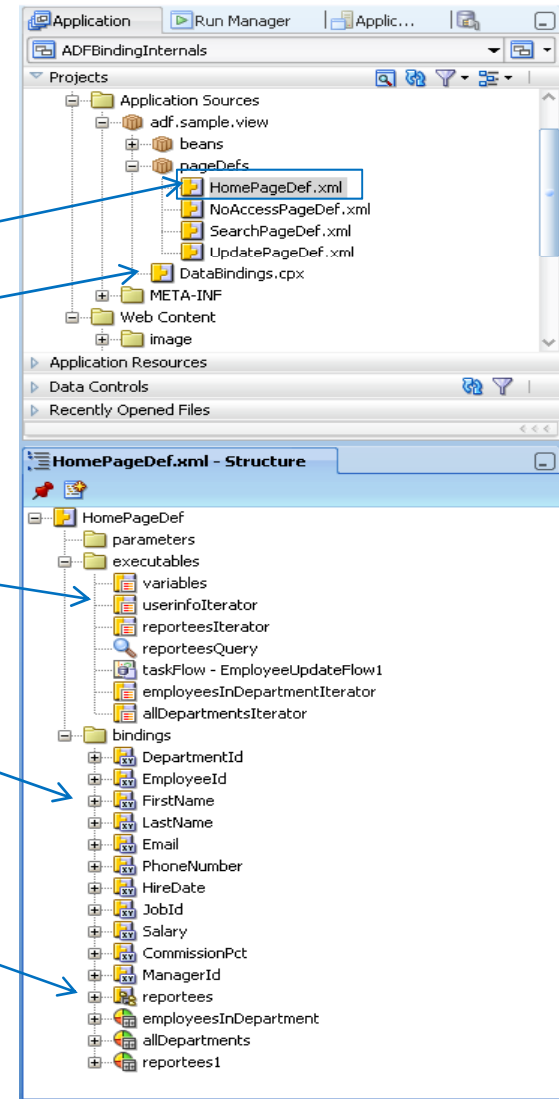


Binding Classes – The Java in ADF

- Bindings are defined in XML at designtime
- Binding objects are created at Runtime
- Generic Binding classes start with "JUCtrl"
- Specific ADF Faces binding classes start with "FacesCtrl"
 - Adapt the generic binding layer to component model requirements
 - Expose extra methods to be used in action listeners
 - makeCurrent
 - Labels
- Developers usually work with a subset of classes

Commonly used binding classes

- ADFContext
-  • DCBindingContainer
- BindingContext
-  • DCIteratorBinding
-  • JUCtrlAttrsBinding
-  • JUCtrlListBinding
-  • JUCtrlHierBinding
- JUCtrlHierNodeBinding
-  • OperationBinding





BindingContainer

- Contains objects for the bindings used in a given view
 - Page
 - Page fragment
 - Defined in <view>Pagedef.xml
- EL accessible `#{bindings}`



Accessing the Binding Container from Java

```
import oracle.adf.model.BindingContext;  
import oracle.binding.BindingContainer;  
...  
BindingContext bctx = BindingContext.getCurrent();  
BindingContainer bindings = null;  
bindings = bctx.getCurrentBindingsEntry();
```



For more information

- <http://www.oracle.com/technetwork/jdev>
- Downloads on Oracle Technology Network (OTN)
- Product Documentation
- Data Sheets and Whitepapers
- Blogs
- OTN Discussion Forums
- Books

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