Oracle ADF Task Flow Beyond the 10-Minute Demo

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Session Objectives

- Learn how JDeveloper may be used to create ADF-based applications
- Use ADF Task Flow to control application execution
- Take advantage of ADF's built-in application control (MVC)

Who Am I?

- John King – Partner. King Training Resources
- Oracle Ace Director
- Member Oak Table Network
- Providing training to Oracle and IT community for over 25 years – http://www.kingtraining.com
- "Techie" who knows Oracle, ADF, SQL, Java, and PL/SQL pretty well (along with many other topics)
- Leader in Service Oriented Architecture (SOA)
- Member of ODTUG (Oracle Development Tools User Group) Board of Directors

Who Are You?

- Oracle ADF JDeveloper
  - New (< 1 yr)
  - 1-2 years
  - Over 2 years
- Oracle ADF Eclipse (OEPE)
- Oracle Forms Developer
- 4GL Developer (.NET, etc…)
- Java Developer
- All of the above
- None of the above

ADF Comes of Age

- Oracle Application Development Framework (ADF) is a Java-based development tool (much like Forms is a PL/SQL-based tool) designed to take full advantage of Java EE
- Java EE is one of the most widespread application environments today
- ADF's 4GL features make application development easier than normal Java "coding"
- Oracle is rewriting their ERP stack as "Fusion Applications" using ADF; the already rich toolset gets richer every day

Oracle JDeveloper

- JDeveloper is a world-class, easy to use IDE
- JDeveloper goes beyond Java to include:
  - Oracle creation of mobile applications via checkbox
  - Oracle ADF modeling, business svcs, and GUI design
  - XML edit including Syntax Checking & Validation
  - SQL development with debugging of stored PL/SQL
  - UML Modeling and MDA (Model Driven Architecture)
  - Web Services development
  - ESB design
  - BPEL design
  - Portlets

Java Server Faces (JSF)

- Java Server Faces (JSF) is a Web-tier framework of JSP technology and JSP Tag libraries to create and use User Interface components
- JSF is extended by components of Oracle ADF Faces
- JSF includes:
  - Runtime architecture
  - Library of JSF components
  - JSF "Life Cycle"
  - Many JSF-Oriented Files

JSF Life Cycle

- JSF (and ADF Faces) perform a predictable cycle:
  1. Restore Components
  2. Apply Request Values
  3. Process Validations
  4. Update Model Values
  5. Invoke Application
  6. Render Response
- This Life Cycle is normally transparent; however, when choosing where to store session variables and debugging it is useful to understand

ADF Faces

- Even though JSF sought to simplify the API; it is often felt to be too complex
- Oracle has extended JSF as "ADF Faces" providing a set of libraries and tags that include enhanced UI components and easier use
- Oracle has presented ADF Faces to the Open Source community where it is part of the Apache Foundation Trinidad MyFaces project

http://myfaces.apache.org/trinidad/index.html

Using ADF

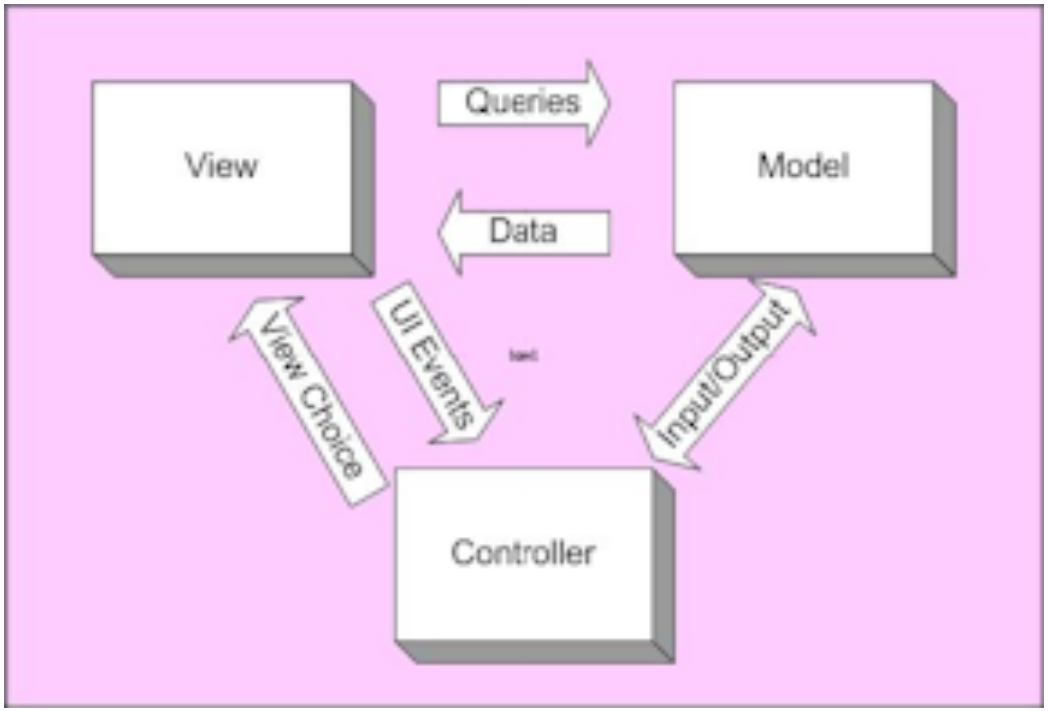
- Using ADF Faces is simple using JDeveloper:
  - Add ADF Faces components to layout containers
  - Add Application layout containers to describe user interface
  - Describe Task Flows
  - All UI is done with ADF Faces; no HTML coding
- Features added by ADF Faces:
  - Pop-ups and Dialog boxes
  - Data Visualization Tools: Charts, graphics, etc...
  - Declarative AJAX support
  - More…

ADF Controller

- The ADF Controller extends the JSF controller and controls ADF's MVC
- ADF Controller features include:
  - Sequence of page displays (may be conditional)
  - Allows partial-page processing in the same way as full page processing; only the necessary part of a page is rendered, the rest is unchanged
  - Allows reuse of page parts
  - Provides conditional control of page flow

What is MVC ?

- The Model-View-Controller (MVC) pattern was first described by Glenn E. Krasner and Stephen T. Pope in the paper titled: “A Description of the Model-View-Controller User Interface Paradigm in the Smalltalk-80 System” (1988)



MVC Pattern

- The MVC pattern separates functionality:
  - Model — Provides data services; changes to data management or business rules do not impact the view
  - View — Provides interface shown and/or delivered to the client; output changes don't impact data
  - Controller — Provides decision making and navigational control

ADF and MVC

- In ADF MVC is implemented via:
  - Model — ADF BC components
  - View — ADF Faces components
  - Controller — ADF/JSF Controller and Task Flows

JSF Task Flow

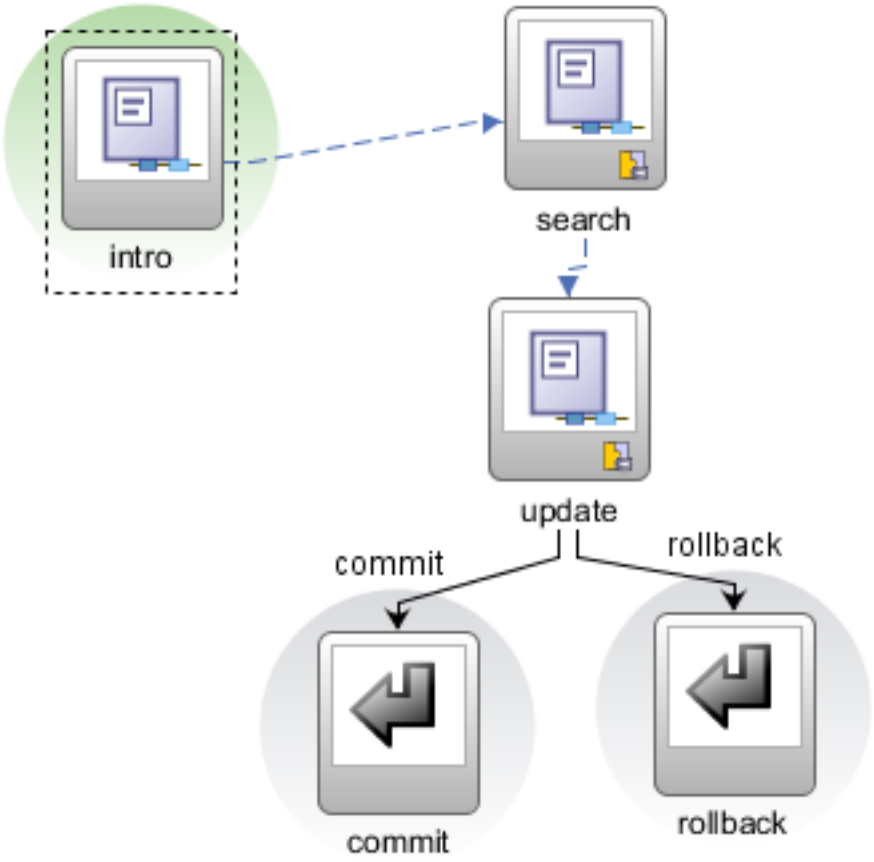
- JSF navigates declaratively (default file named “faces-config.xml”)
  - Navigation may be configured manually using XML
  - JSF Navigation may be configured graphically using JDeveloper's JSF Navigation diagrammer

ADF Task Flow

- ADF Task Flow (pageflow) navigation and transition is specified declaratively (default file named “adfc-config.xml")
  - Navigation may be configured manually using XML
  - ADF Task Flow may be configured graphically using the JDeveloper ADF Task Flow diagrammer

Task Flow Diagrams

- Task Flow diagrams illustrate all or part of an application's navigation



UnBounded vs Bounded

- ADF supports two types of Task Flows
- Unbounded Task Flows
  - Multiple entry points and multiple exit points
  - No input parameters or return values
  - Page-oriented (initial page, help, menus, etc…)
  - Typically one per application; not reusable
- Bounded Task Flows
  - Single entry point and multiple exit points
  - Allows input parameters and return values
  - Process-oriented (checkout, calculate taxes, etc…)
  - Frequently many in an application; reusable objects
  - Allows “modularization” of application processes

Using Task Flows

- Unbounded Task Flows
  - Top-level (bootstrap) flow
  - Navigation may begin anywhere in the flow using URL
- Bounded Task Flows
  - Process flow with defined boundary
  - Navigation must begin at defined point
  - Started via URL, other task flows, or Task Flow binding
  - When called from other task flows may use input parameters to pass data
  - When exiting may return values
  - Generally execute in an area of the parent page called a “Region”

Typical Page Flows

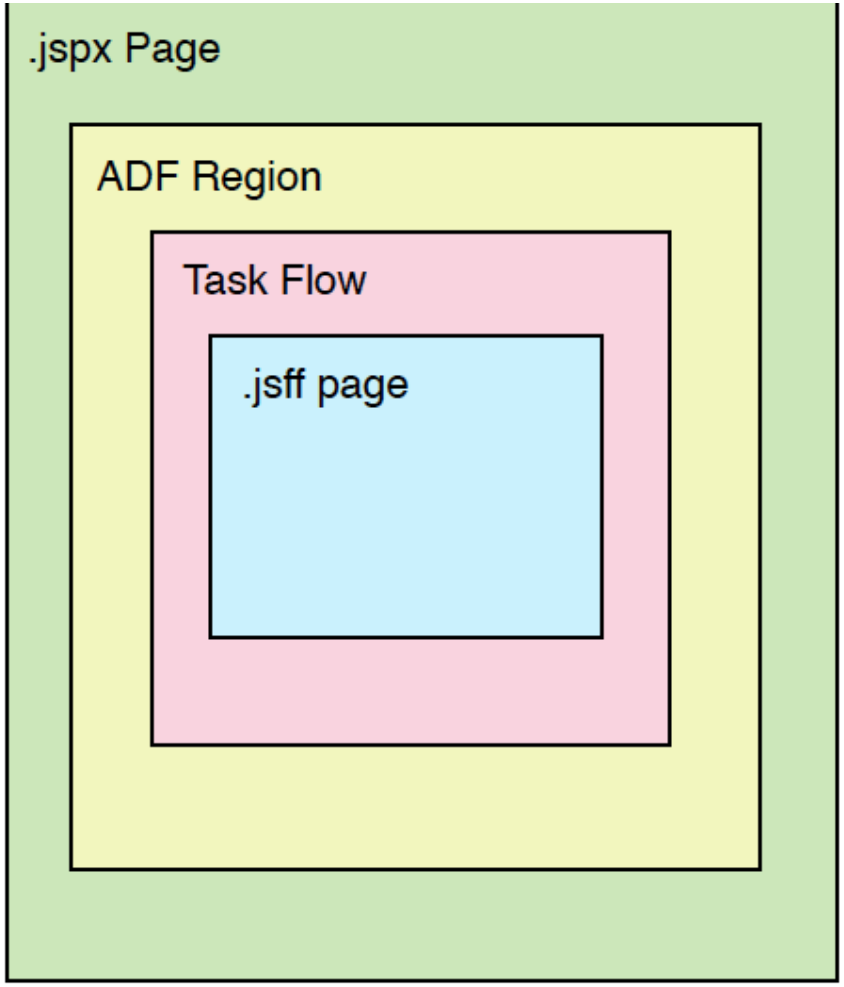
- Unbounded Task Flows
  - Home page
  - Help page
  - Search and Navigation pages
- Bounded Task Flows
  - Create Account
  - Login
  - Subscribe
  - Shopping Cart
  - Checkout

Bounded Task Flow Features

- Allows modularization of processes
- May be combined with other task flows into larger processes
- May be reused in other applications if defined in .jar
- Provides security via:
  - Default Activity
  - URL Invoke property
  - ADF Security features
- Loads upon demand

ADF Region

- ADF Regions contain bounded task flows representing page fragments within a Page

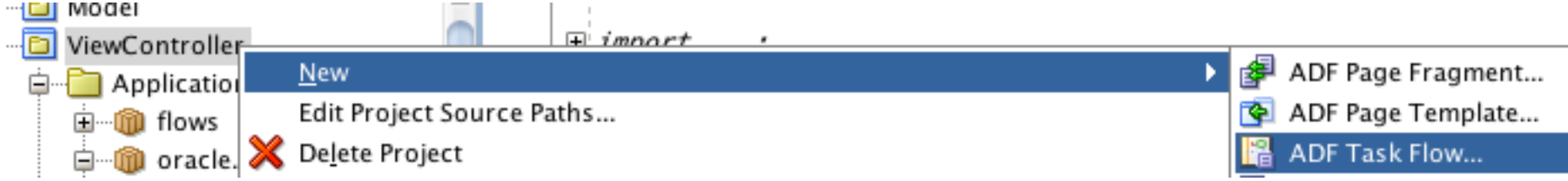


Pages and Page Fragments

- Pages
  - Use .jsf or .jspx file suffix
  - May include many Page Fragments
- Page Fragments
  - Use .jsff suffix
  - Provide content for Pages (above)

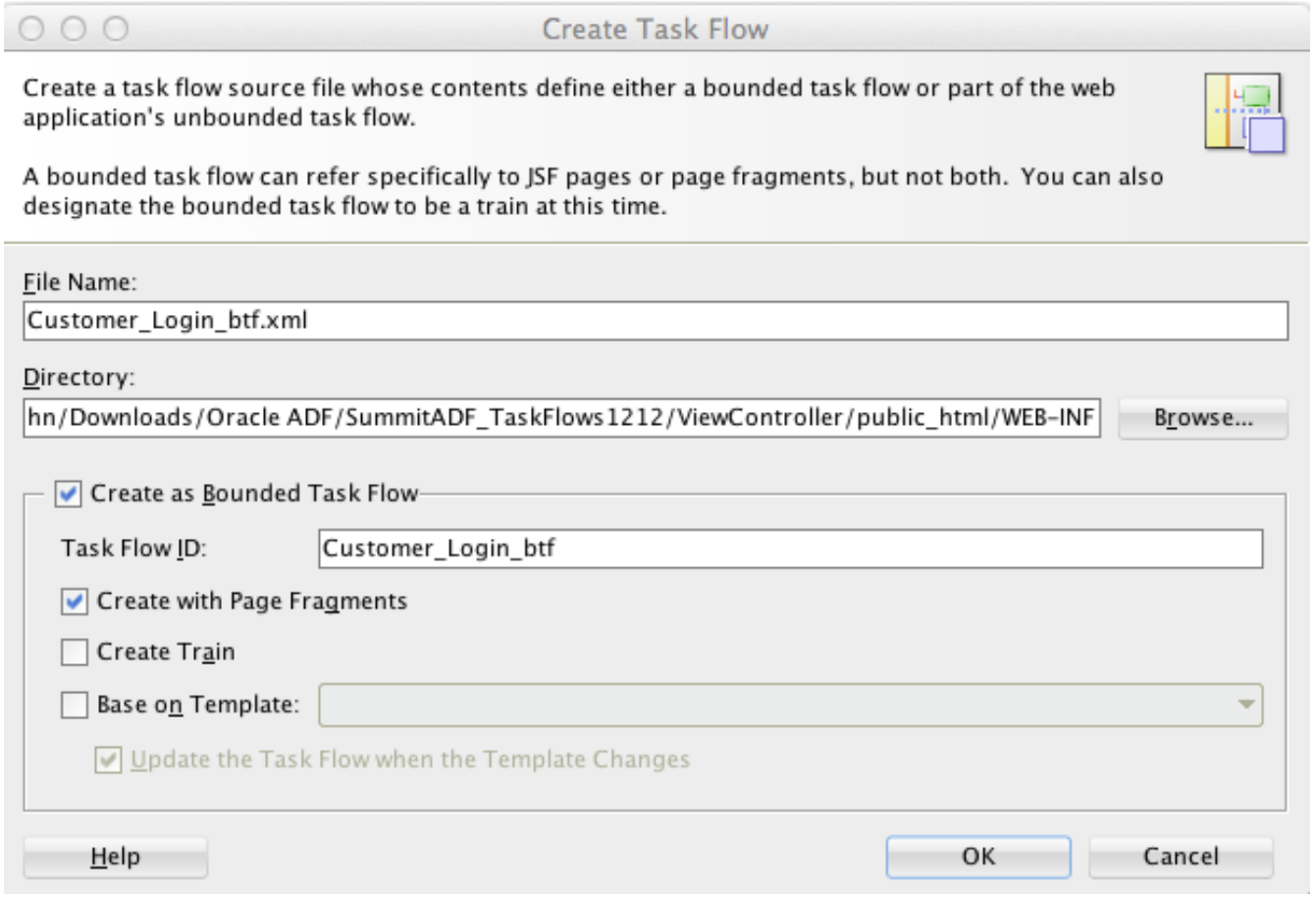
ADF Task Flow Diagram

- Most applications use multiple web pages, the JDeveloper ADF Task Flow diagram is used to diagram movement through an application (sort of an electronic story-board)
- To diagram a “Page Flow”
  - Open “adf-config” or “adfc-config” in an application's ViewController project (look under “Page Flows”)
  - Use “New ADF Task Flow”



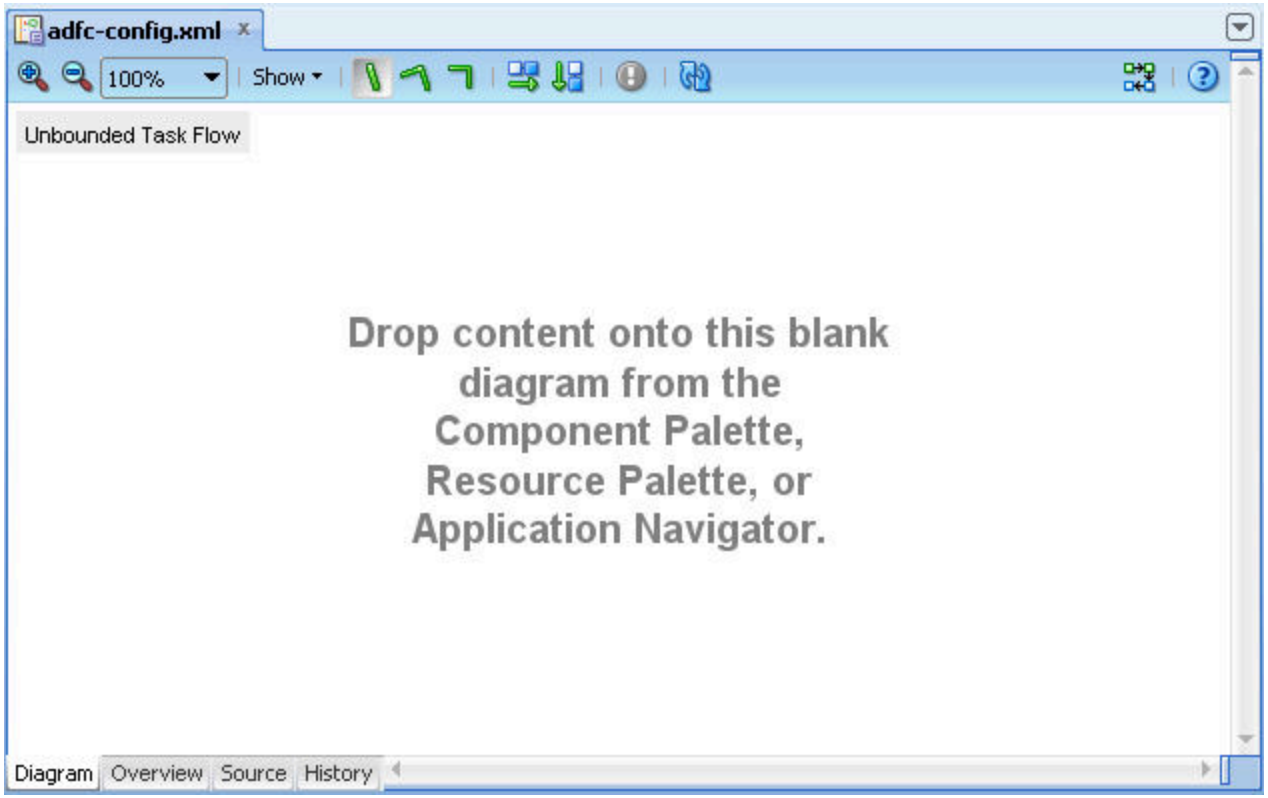
New Task Flow Dialog

- Provide a name, directory, and specific properties for the new task flow



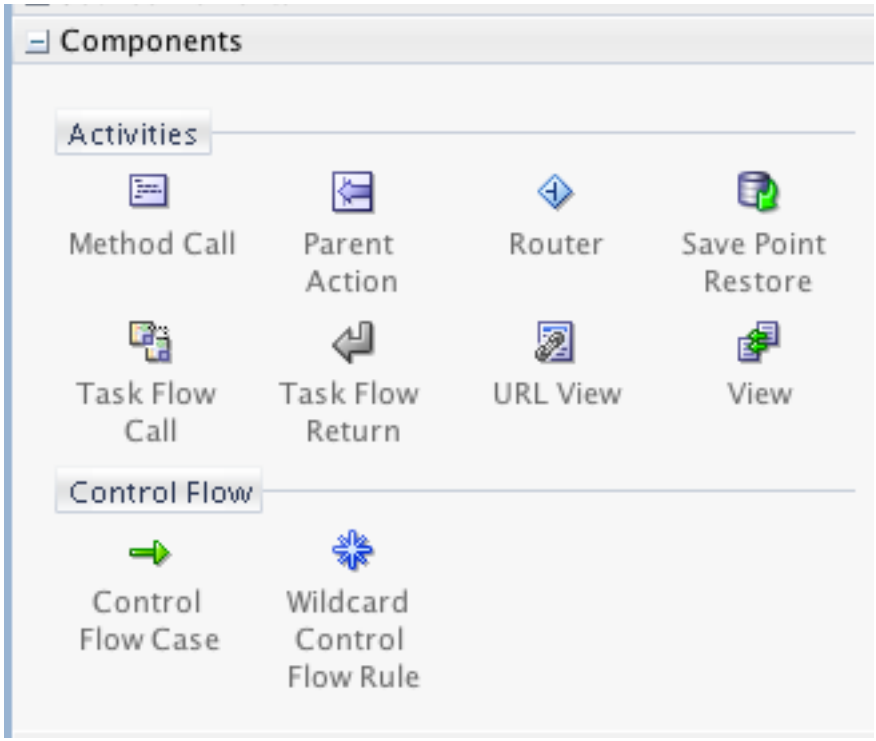
Blank Task Flow

- Use the component palette to build flows by dragging existing pages or new components to diagram



Component Palette

- The ADF Task Flow component palette contains tools used to create a task flow



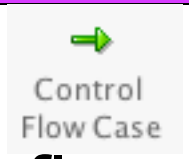
Main Task Flow Components

- View Activity — Task Flow page
- Control Flow Case — Component Navigation
- Parent Action — Parent view
- Method Call Activity — Call to method
- Wildcard Control Flow Rule — Define activity access via known paths
- Router Activity — EL-based branching
- Task Flow Call — Call TaskFlow
- Task Flow Return Activity — Pass control back to calling Task Flow
- URL View Activity — Navigate to any page

View Activity

- View Activity displays pages or page fragments (.jsf, .jspx, or .jsff)
- May have one or more task flow regions

Control Flow Case

- Control Flow Case 

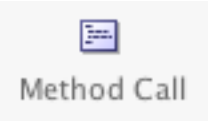
supports navigation between flow activities
- Describes:
  - Flow to activity
  - Flow return from activity

Parent Action

- Parent Action 

provides ability to trigger activities and pass data to the parent task flow

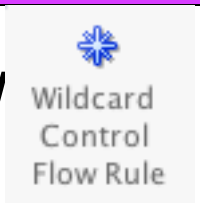
Method Call Activity

- Method Call Activity 

allows invocation of methods allowing
  - Passing of input parameters to method
  - Obtaining return values from method (if method returns one)

Wildcard Control Flow Rule

- Wildcard Control Flow Rule allow flow from any activity with ID matching the wildcard expression

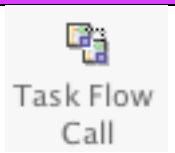


Router Activity

- Router Activity 

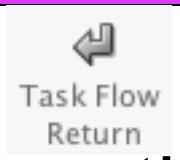
uses EL expression-based branch
  - EL expression(s) evaluate to True/False
  - If expression matches Control Flow Case (true) the outcome flows as directed
  - If no expression matches a Default outcome may be specified

Task Flow Call Activity

- Task Flow Return Activity 

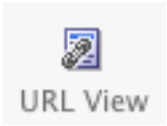
calls a Bounded Task Flow from another task flow (either Bounded or Unbounded)

Task Flow Return Activity

- Task Flow Return Activity 

describes where Bounded Task Flow activity completes and control is passed back to the caller
(Bounded Task Flows only)

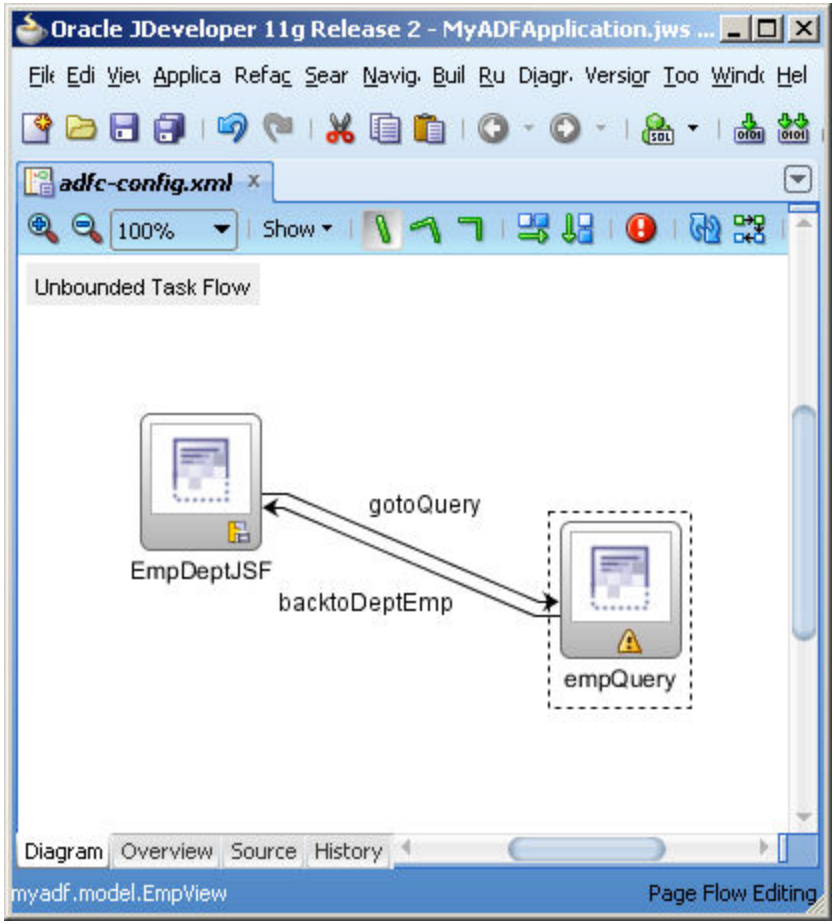
URL View Activity

- URL View Activity 

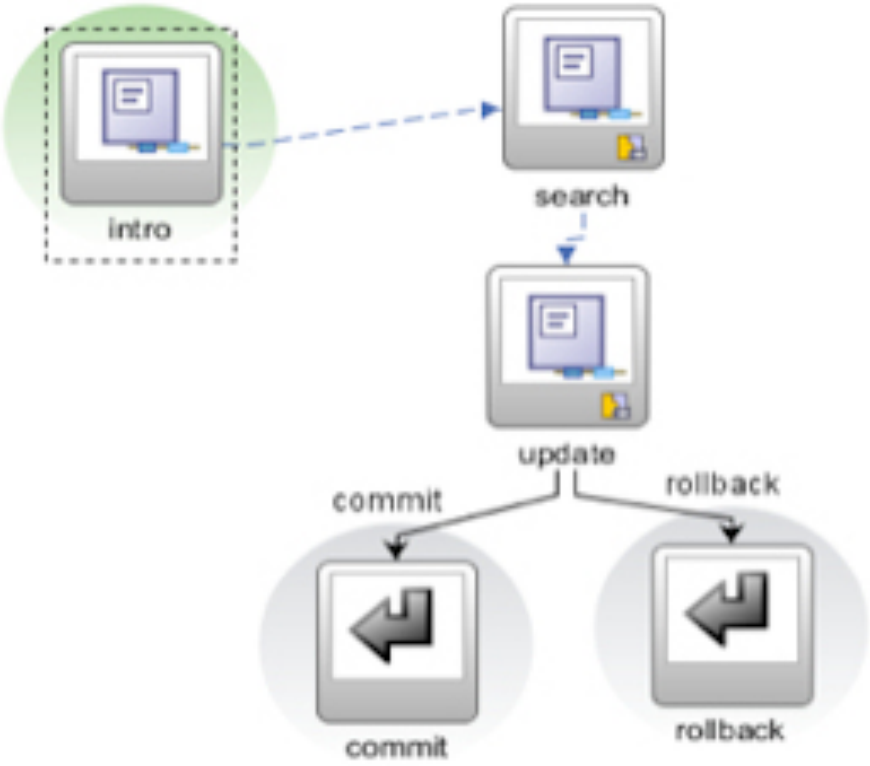
navigate to URL even if it is not part of the current task flow

Creating Task Flow

- Drag “View” components to represent pages
- Drag “Control Flow Rules” from the View where control begins to the View where control is to end

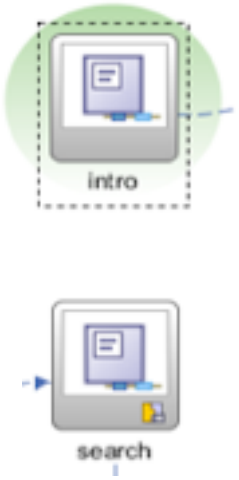


Component Review



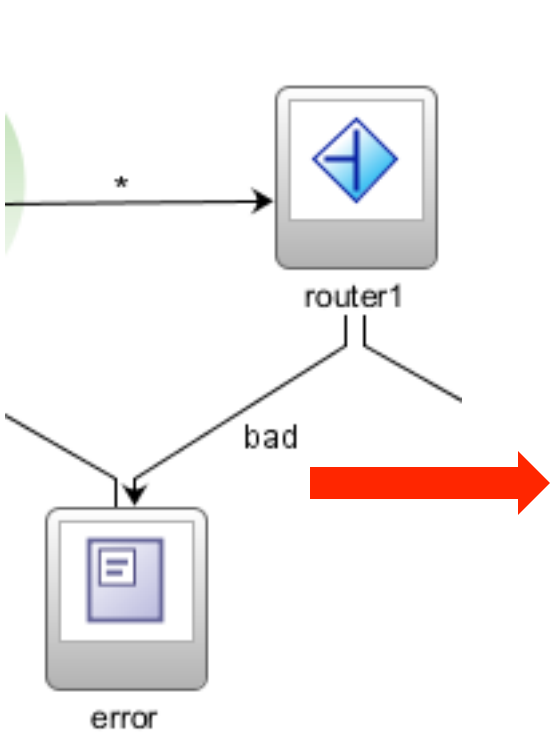
View

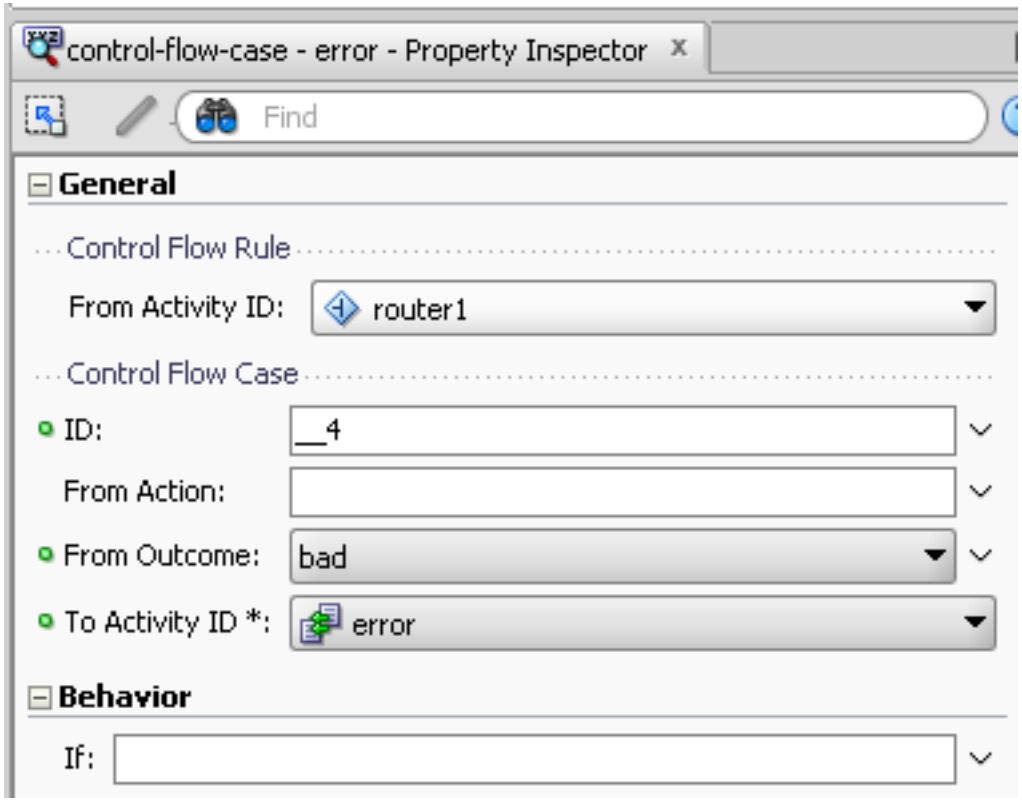
- Displays one page (.jsf, .jspx, .jsff)
  - May have one or more Task Flow regions
  - Default view of Bounded Task Flow shaded



Control Flow

- Control flow describes flow between parts of a task flow
  - Control Flow properties describe actions to be taken





Common Flow Properties

- Default Activity — First BTF activity invoked
- Train — Flow uses train
- Input Parameter Definitions — Passed into BTF from calling task flow or view
- Return Value Definitions — Returned from BTF via Task Flow Call activity
- Exception Handler — Exception activity
- Managed Beans — Beans used by flow
- Initializer — Bean initializing method
- Finalizer — Bean exit method
- Transaction — Set to share/isolate trans.

Passing Data

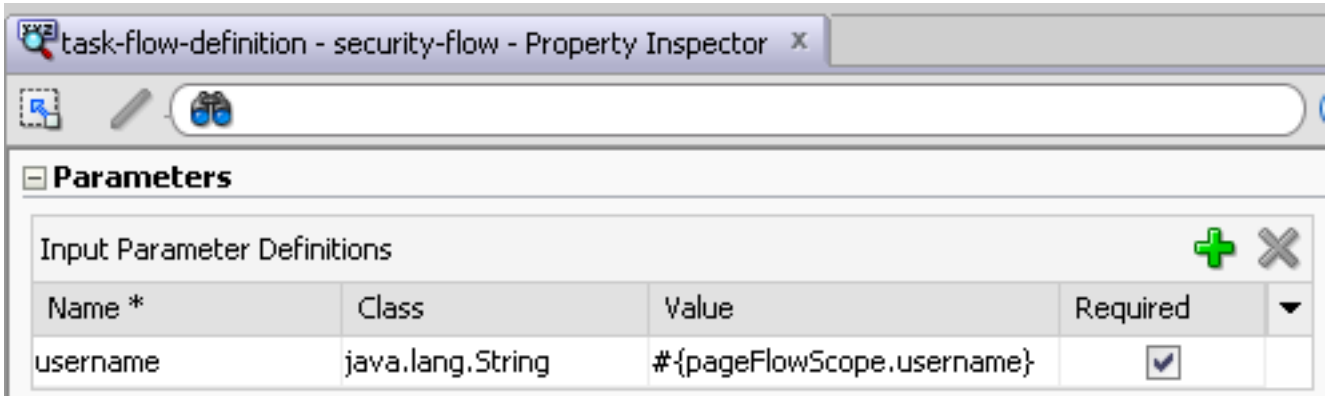
- Parameters and Return Values are generally passed using Expression Language (EL)

```
#{controllerContext.currentViewPort.taskFlowContext.trainModel}
```

- ADF's EL is similar to the JSP EL commonly used in Java
  - ADF's EL usually uses the hash-mark/pound-sign (#) indicating a deferred reference
  - Deferred EL works within the JSF-cycle of ADF; immediate EL ($) may be evaluated prematurely and should be avoided in ADF (usually)

Input Parameter Example

- Here is an input parameter from a control flow
- Note the “pageFlowScope” in user for “username”



Servlet/JSF Memory Scopes

- Application Scope — Attributes/beans available globally to all users for life of application
- Session Scope — Attributes/beans available for life of browser session
- Request Scope — Attributes/beans available until application returns control to user (one page)

ADF Memory Scope

- Some memory scopes are ADF-specific
- View Scope — Attributes/beans for single page for duration user works with page
- PageFlow Scope — Attributes/beans live for duration of Task Flow ("pushed" if new Bounded Task Flow called; "popped" upon return)
- Backing Bean Scope — Attributes/beans specific to specific component

ADF Variable Scope EL

#{applicationScope.varname}

#{sessionScope.varname}

#{requestScope.varname}

#{varname}

#{pageFlowScope.varname}

#{viewScope.varname}

#{backingBeanScope.varname}

Use Scope Wisely

- Use Application Scope for things that should live for the life of the server and that should be global
- Use Session Scope only when values should survive for the entire browser session duration
- Use Request Scope for data that is passed while processing a single page
- Use PageFlow Scope for data to be passed from screen-to-screen during a Task Flow
- Use View scope for value local to a given page
- Use Backing Bean scope for specific field data passed within a single page (like Request Scope)

Common Task Flow Practice

- Build Bounded Task Flows in separate applications to increase portability (store as ADF Library .jar)
- Use Task Flow within page fragments
- Use input parameters to pass data and provide conditional behavior

Task Flow Summary

- Unbounded Task Flows
  - Entry to application or where user might enter flow at any point
  - Menu pages
- Bounded Task Flows
  - Has single entry point
  - Part of a page within a Region
  - Used/Reused by other applications
  - Usually performs commit/rollback on exit

Project Planning

- Identify needed task flows as early as possible in your design/planning process
- Organize complex task flows into main processes/flows and sub-processes/sub-flows
- Look for common task flows that should be (or can be) reused
- Attempt to make bounded task flows independent of others (loosely-coupled) to increase opportunities for reuse

ADF EMG Task Flow Tester

- The ADF EMG (Enterprise Methodology Group) has created a tool for testing ADF Task Flows
  http://java.net/projects/adf-task-flow-tester

ADF Task Flow Tester

The ADF EMG Task Flow Tester is a web-based testing tool for ADF bounded task flows. It supports testing of task flows that use pages as well as task flows using page fragments. A sophisticated mechanism to specify task flow input parameters is provided. A set of task flow input parameters and run options can be saved as a task flow testcase. Task flows and their testcases can be exported to XML and imported from XML.

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Tags: adf, testing, taskflow

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Wrapping it all Up

- Oracle ADF provides a mostly-declarative capability to create applications easily using industry-standard technology “under the covers”
- Oracle ADF Task Flows improve on JSF Task Flows and allow declarative management of MVC application flow via GUI interface and XML files
- Bounded ADF Task Flows may be reused; processes that appear in several applications (e.g. “checkout”) are not repeated (nor maintained) needlessly
- Bounded ADF Task Flows may use input parameters and produce result values; EL is most often used to simplify and increase reusability

Support on the Web

- OTN provides a great deal of support for ADF
  http://www.oracle.com/technetwork/developer-tools/adf/overview/index.html
  - Oracle ADF Architecture Square on “Learn More” tab Architecture Square has links to coding, project layout, and naming guidelines
  - Community tab has links to blogs and other community support
  - Click on JDeveloper tab for JDeveloper specifics
- ODTUG is the non-Oracle home for ADF developers
  http://www.odtug.com
  http://www.kscope14.com
- ADF Enterprise Methodology Group (EMG)
  https://sites.google.com/site/oracleemg/adf
  https://groups.google.com/forum/#!forum/adf-methodology
  https://twitter.com/adf_emg

Available Books

- Quick Start Guide to Oracle Fusion Development
  - Grant Ronald
  - Oracle Press
- Oracle JDeveloper 11g Handbook
  - Duncan Mills, Peter Koletzke, Dr. Avrom Roy-Federman
  - Oracle Press
- Oracle Fusion Developer's Guide
  - Frank Nimphius, Lynn Munsinger
  - Oracle Press
- Oracle JDeveloper 11gR2 Cookbook
  - Nick Haralabidis
  - Packt Publishing

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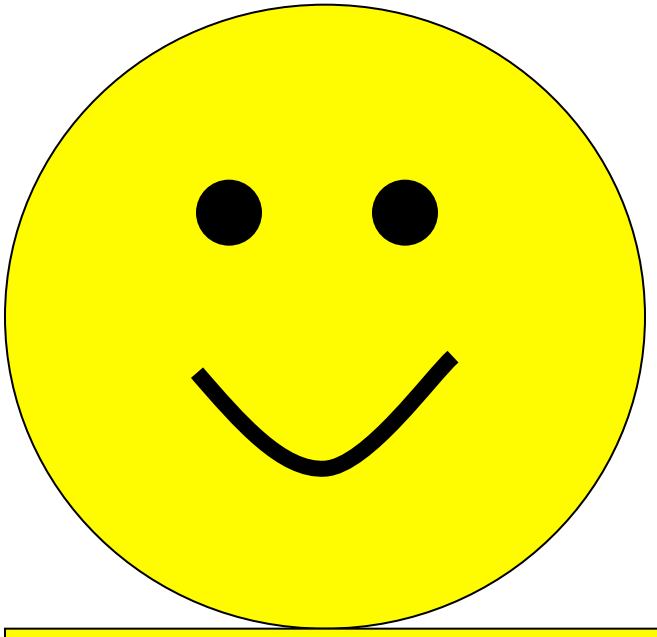

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