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Development Framework
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Next Generation Controller for JSF

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Agenda

- • The Traditional JSF Controller
 - Extending the Controller Functionality
 - Adding Reusability to the Controller

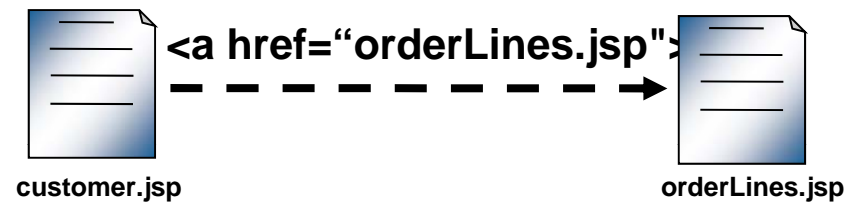


What is a Controller in a Java EE web application?

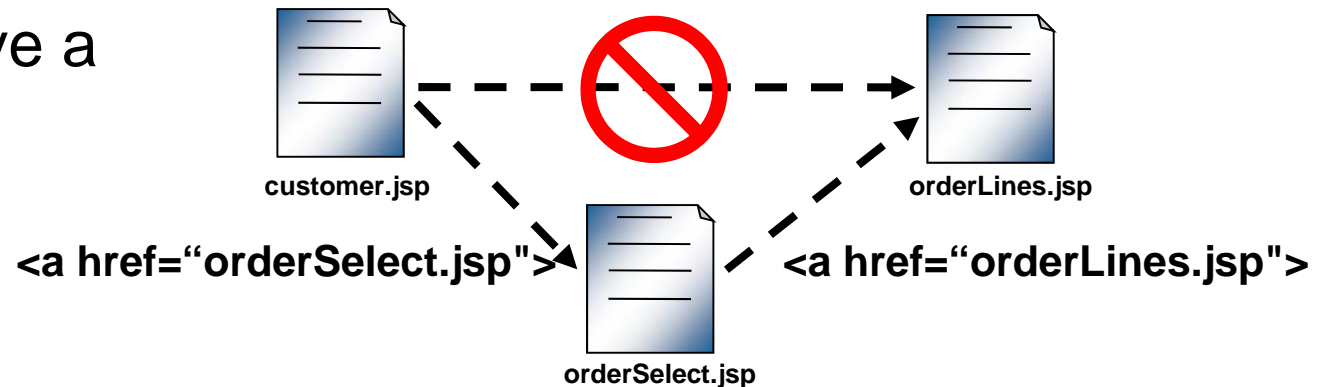
- Inherent in the Model-View-Controller architecture
- Decouples the view from the navigation logic
- Orchestrates interaction application view and model
- Connects pages to a logical flow that defines the application's business process
- A map of navigation targets and the paths between them

It's all about maintenance...

- Without a web controller page links are hardcoded
- For example:



- Then we have a change:

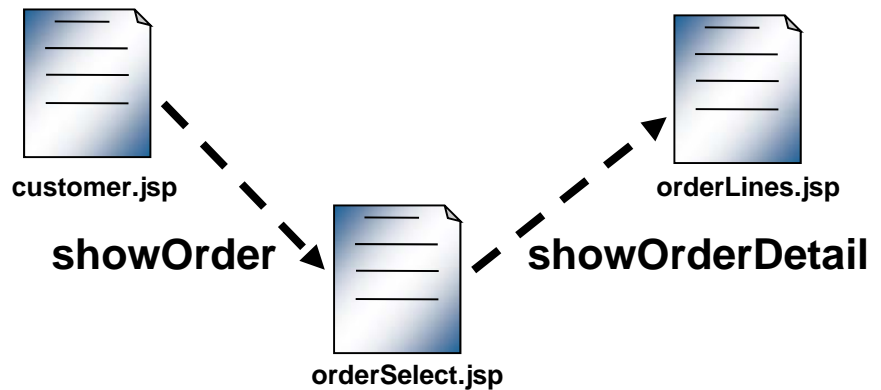
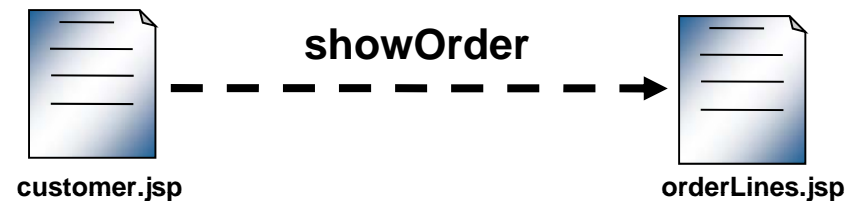


Web Controllers provide an Abstraction

- We deal with named targets or *events*

- Changing flow no longer requires page changes

- Controller metadata defines how to handle the event





The JSF Controller

- Part of the Java EE Standard
- But it has some shortcomings for larger applications
 - Applications are one large flow where everything is visible, no logical application partitioning
 - Limited object scoping (in JSF 1.2)
 - Nothing that spans several pages but less than session
 - Nothing partitioned by browser window / frame
 - Everything is a page
 - the only way to invoke application logic is to tie it to a UI component the user activates



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ADF Controller's Mission

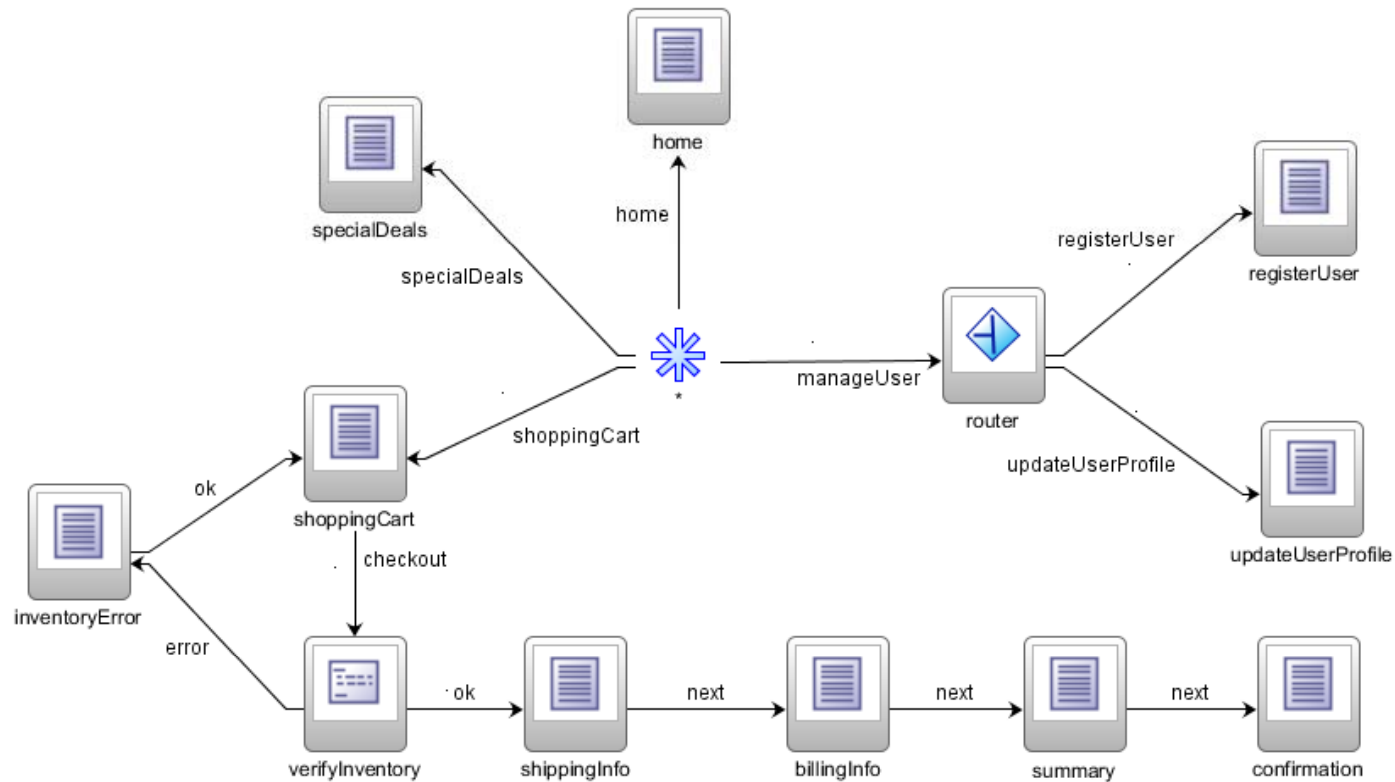
- Extend the controller functionality
 - Taskflow (mini-process flow)
 - Granular memory scopes
 - Reusability
- Build on top of existing Java EE standards
- Facilitate building modular & easy to maintain web applications
- Fully declarative development
 - Draw & drag-n-drop components on a diagram



ADF Controller Model

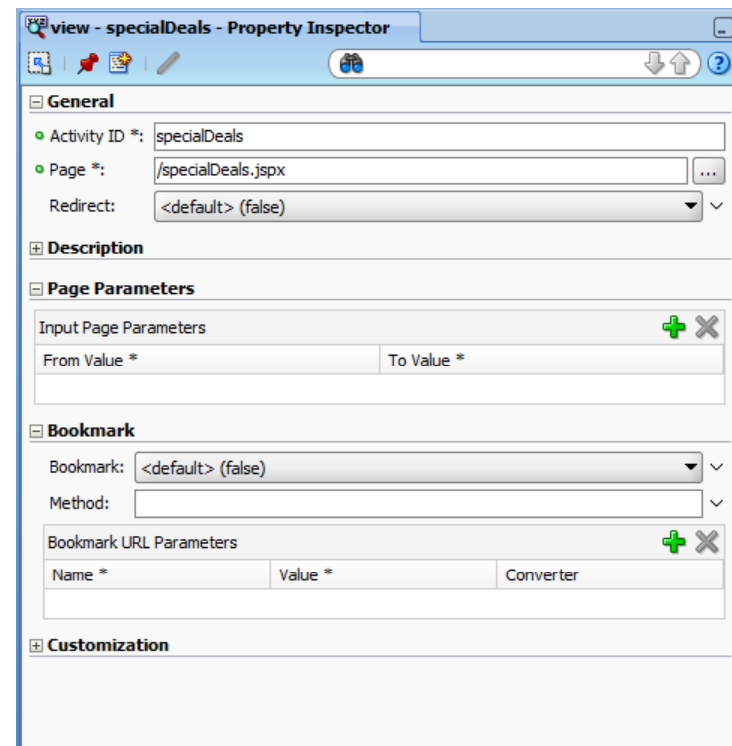
- Built from standard JSF extension points
 - e.g. `NavigationHandler`, `PhaseListener`, etc.
- Applications consist of “page flows”
- Control flow targets are called “activities”
- Basic ADF activity types
 - View
 - Router
 - Method-call
- Control Flow Rules
 - Source and destination activity
 - Matching “outcome” name

Example ADF Page Flow



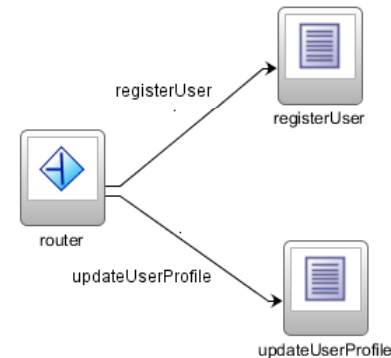
View Activity

- Used to display a page
- Attributes:
 - Page file (e.g. specialDeals.jspx)
 - Redirect behavior
 - Input parameters
 - Bookmark behavior



Router Activity

- Conditional Control Flow
- Similar to `switch` statement
- Series of EL expressions
 - First to evaluate to `true` wins
- Default outcome if no expressions are `true`



The screenshot shows the 'router - router - Property Inspector' window. The 'General' tab is active, showing the following configuration:

- Activity ID *: router
- Default Outcome *: doDefault

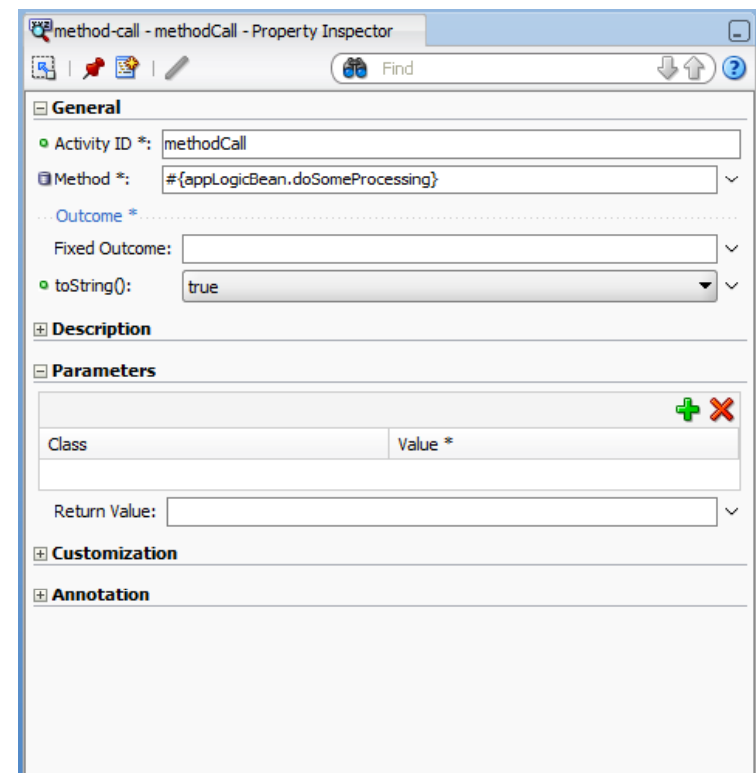
The 'Cases' section contains a table with the following data:

Expression *	Outcome *
<code>#{decisionBean.conditionOne}</code>	doOption1
<code>#{decisionBean.conditionTwo}</code>	doOption2
<code>#{decisionBean.conditionThree}</code>	doOption3

Below the table are sections for 'Description' and 'Customization', both of which are currently empty.

Method-Call Activity

- Invokes application logic via an EL expression
- May generate a fixed outcome or use method return value





ADF Memory Scopes

- PageFlowScope
 - Spans multiple pages
 - Can have lifespan shorter than session (more later)
- ViewScope
 - Lifespan equal to the current viewId
 - Very similar to JSF2's view scope
- BackingBeanScope (advanced topic)
 - Essentially a portioned request scope
 - one instance per view source document
 - Useful for avoiding conflicts in composite pages



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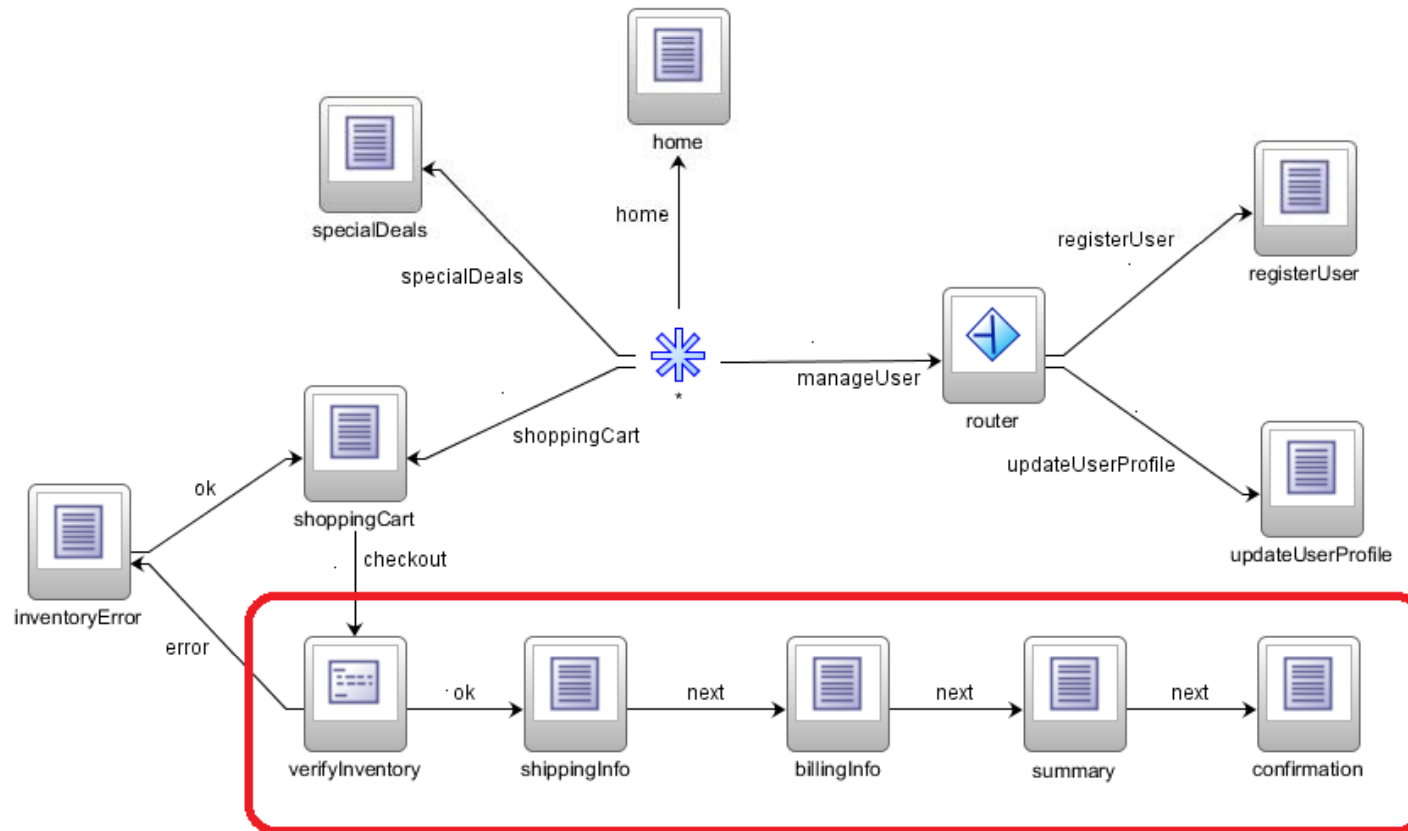


Reusable Units: Bounded Task Flow

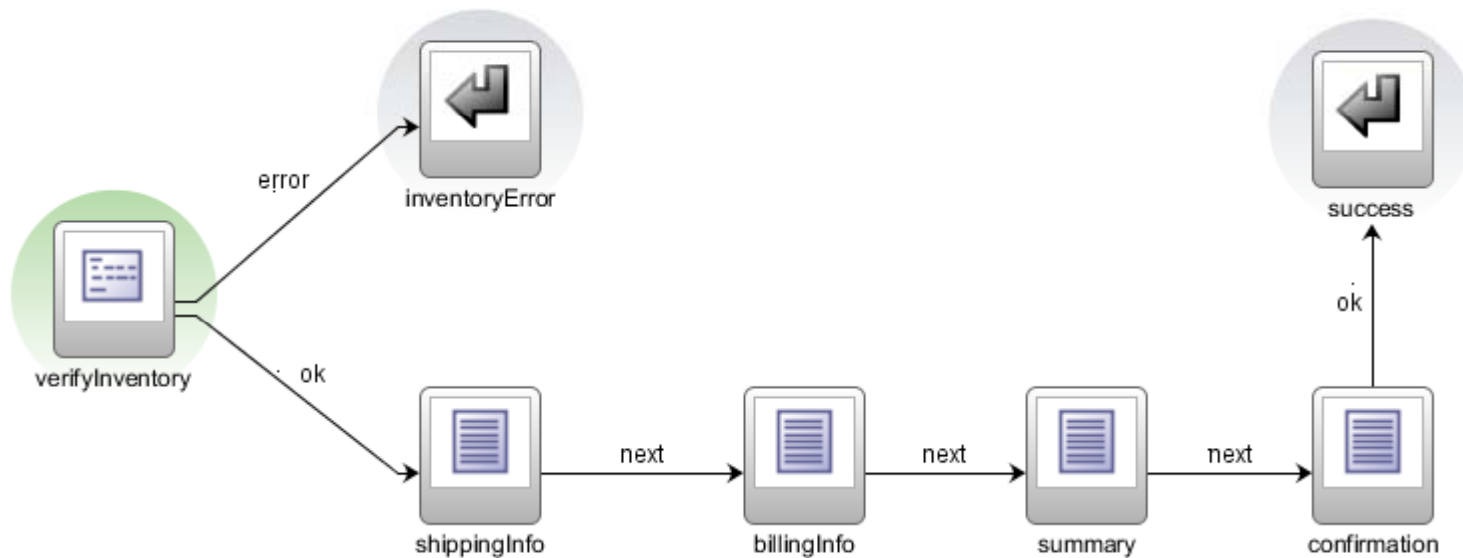
A web application's equivalent of a method

- A logical grouping of activities and control flow rules
- Single entry point – the default activity
- Multiple end points – return activities
- Input parameters and return values
- Optional initializer and finalizer methods
- Has its own pageFlowScope instance
 - “local” variables
- Localized managed bean definitions

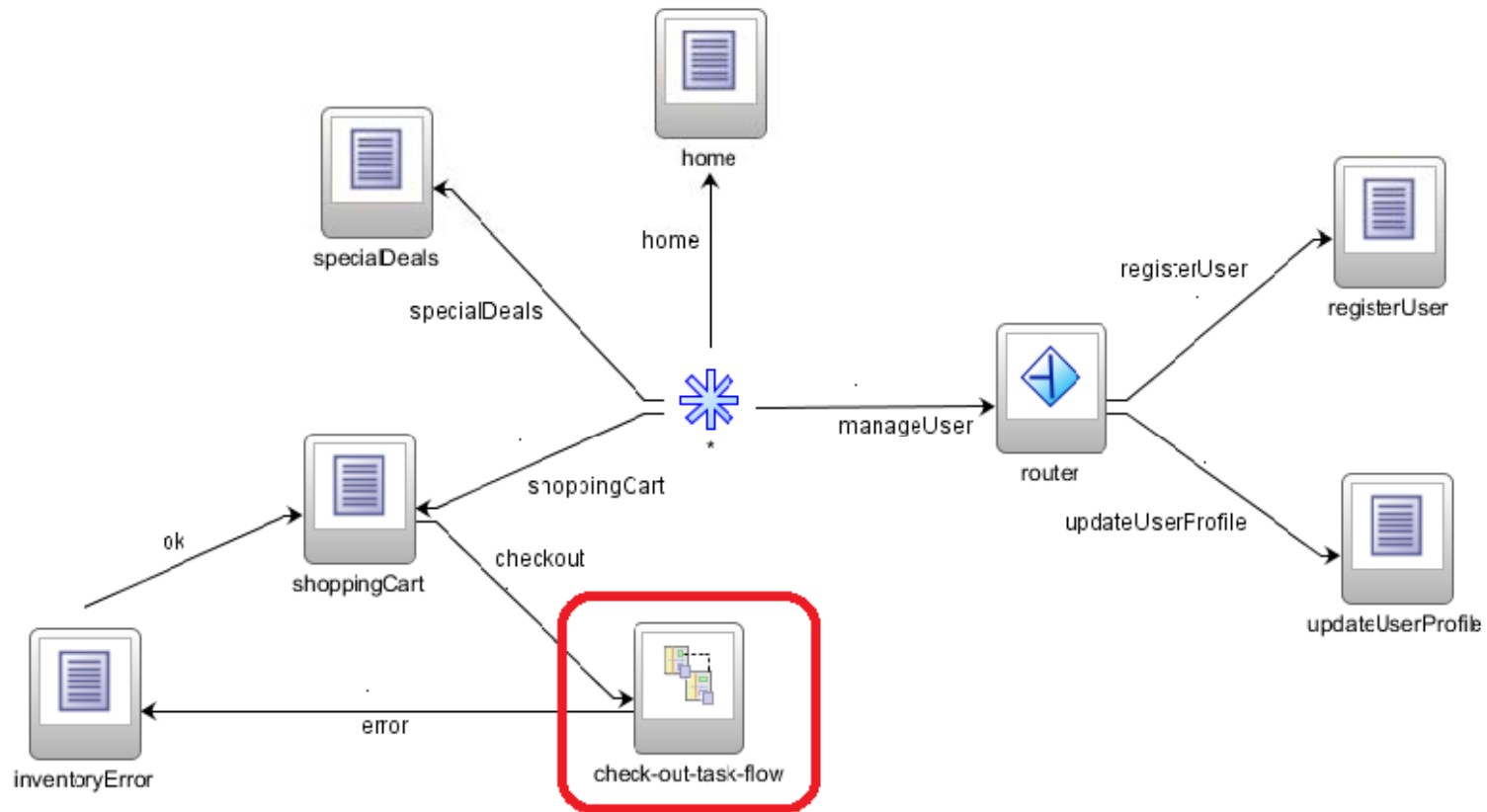
Example: Checkout Flow



Example: Checkout Bounded Task Flow



Example: Call to Checkout Task Flow





Bounded Task Flow Definition

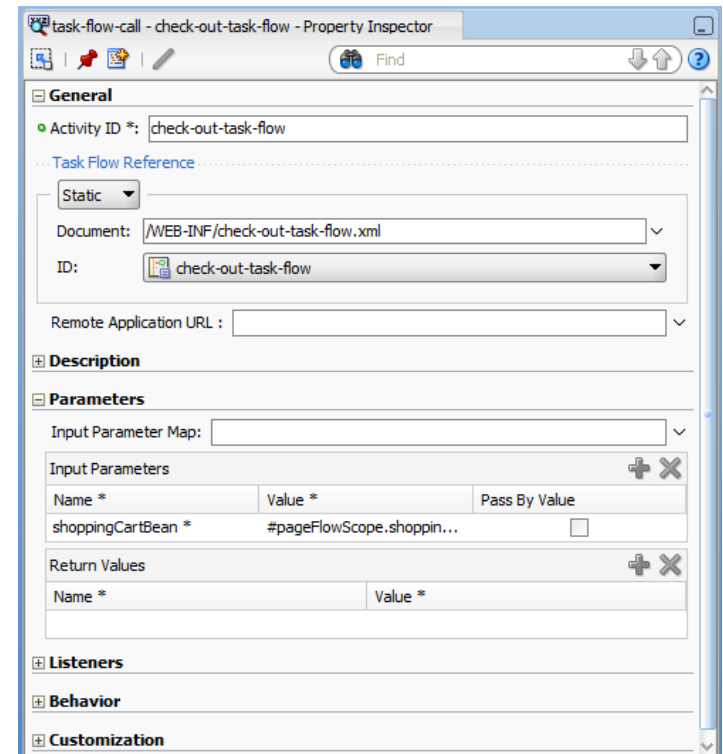
- Separate XML metadata file
 - Can be version controlled independently
 - Loaded on demand – reducing memory footprint
- Defines input parameters (e.g. shoppingCartBean)
- Defines return values
- Defines local activities and control flow rules
- Defines local beans

Task Flow Call Activity

- Which bounded task flow to invoke
- Where to get input parameter values from
- Where to store returned values
- Advanced Options:
 - Invoke in a remote web app via URL
 - Launch in a separate dialog window



check-out-task-flow



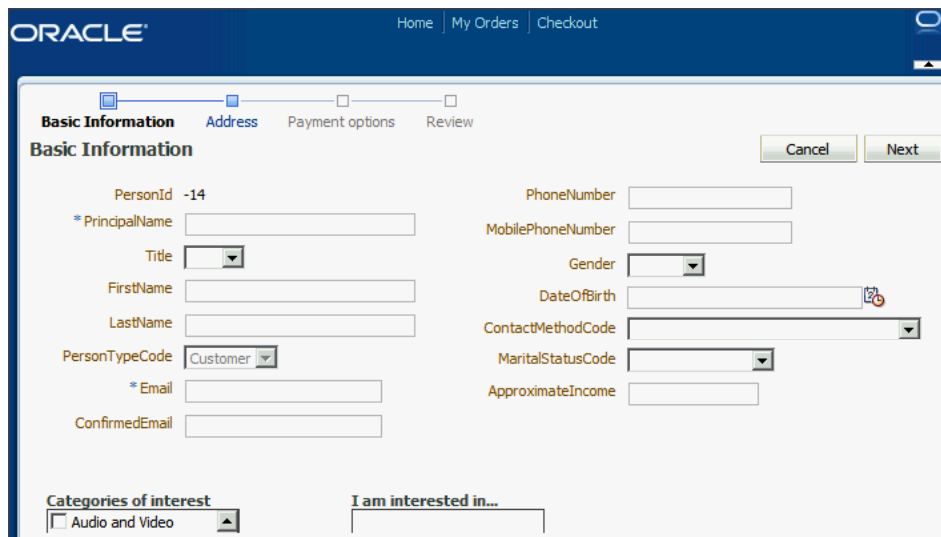


Bounded Task Flow – Advanced Features

- Transaction semantics
 - Begin / commit / rollback on task flow entry / exit
- Re-entry behavior
 - e.g. browser back-button
- Exception handling
- Authorization
 - Which users & groups can invoke a task flow?
- ADF Model DataControl sharing

Train Flow

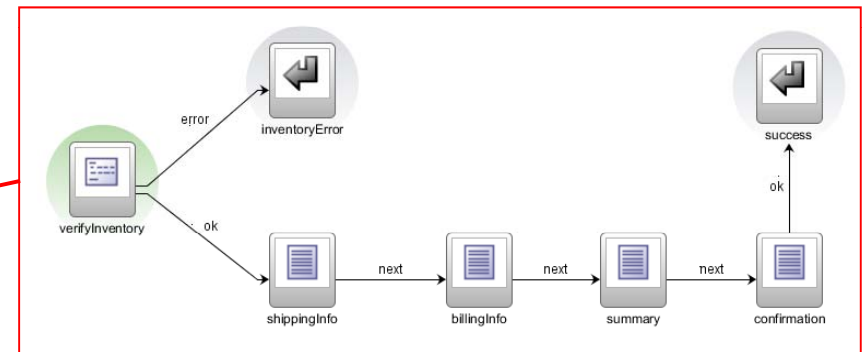
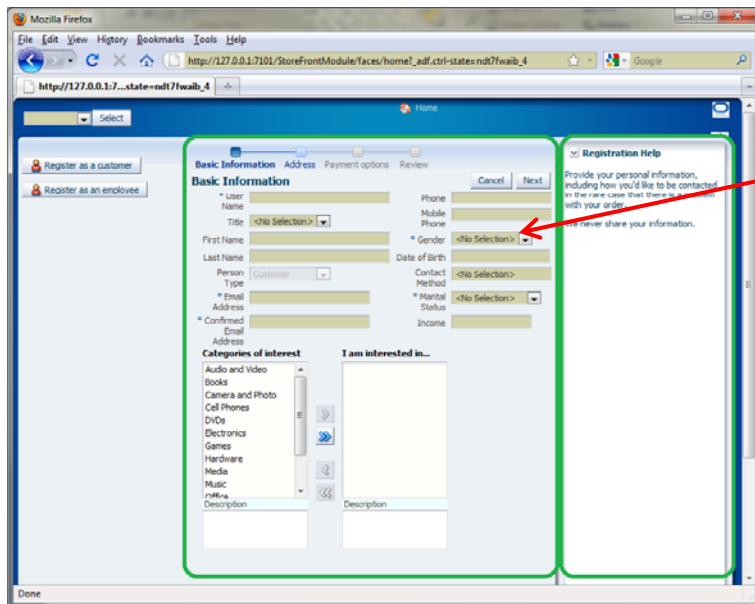
- Multi-step flows (wizards)
- Built in train model
- Built in train navigation components
- Can dynamically enable/skip stations



The screenshot displays the Oracle checkout process, specifically the 'Basic Information' step. The interface features a blue header with the Oracle logo and navigation links for 'Home', 'My Orders', and 'Checkout'. Below the header, a progress bar indicates the current step is 'Basic Information', with other steps being 'Address', 'Payment options', and 'Review'. The form contains various input fields and dropdown menus for personal information, including 'PersonId' (set to -14), 'PrincipalName', 'Title', 'FirstName', 'LastName', 'PersonTypeCode' (set to Customer), 'Email', 'ConfirmedEmail', 'PhoneNumber', 'MobilePhoneNumber', 'Gender', 'DateOfBirth', 'ContactMethodCode', 'MaritalStatusCode', and 'ApproximateIncome'. At the bottom, there is a section for 'Categories of interest' with a checkbox for 'Audio and Video' and a text input field for 'I am interested in...'. 'Cancel' and 'Next' buttons are visible in the top right corner of the form area.

Reuse TaskFlows In Pages - Regions

- Build portions of a page from task flows
- Page constructed from regions
- Regions are independent





Dynamic Regions

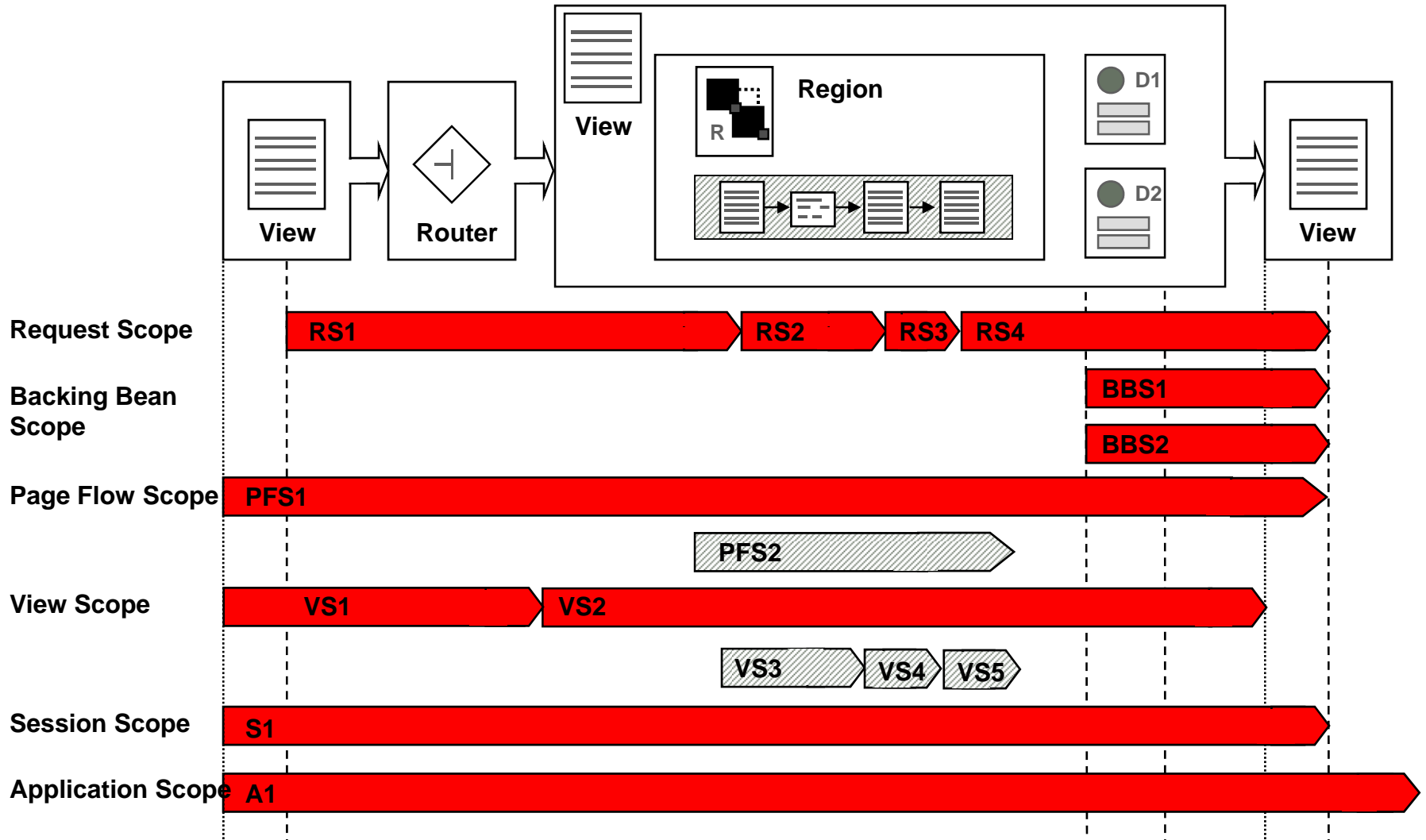
- Enables single page interface design
- Switch content shown in region at runtime
- Drop bounded taskflow on a page as dynamic region
- Creates a managed bean holding information on which task to display
- Create links to switch content



Contextual Events

- Communicate events between regions on page
- Enables one region to influence another
- Publish/Subscribe events
- Managed at the containing page level

Memory Scopes Example





Demo

- House buying application
- Demands:
 - Bookmarkable house info page
 - Reusable in other parts of the application
 - Make and offer guided flow
 - Single page to see a house and make an offer



Demo Recap

- HouseInfoFlow Task Flow
 - Find a house -> Show it in page
 - TaskFlow input parameter
 - Make it bookmarkable
- Reusing the HouseInfoFlow
 - JSF page calls the taskflow using taskFlowActivity
- Reusable Train TaskFlow offerFlow
 - Bounded, page fragments, train, transaction management
- Dynamic Region
 - Add two taskflows to the HouseInfo page



Summary

- ADF Controller extends the JSF controller functionality
- Transition from page flows to task flows
- Increases your application's reusability
- Enables more dynamic user interface



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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