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How to Debug Oracle ADF Framework Applications

Steve Muench Oracle ADF Development Team

"My ADF Application's Not Working... Help!"

- "I see an exception stack trace..."
- "I get data, but it's the wrong data..."
- "I expect to see data, but no rows appear..."
- "My application is slow..."





Start by Getting More Contextual Information and Trying to Isolate the Problem

- Enable Debug Diagnostics
 - Verbose trace of what happens before problem occurs
- Try to reproduce using the BC Tester
 - Avoid web app restart delay as you narrow down the problem
- Try to reproduce using a standalone test client
 - No UI interaction required = fastest option of all



HOW TO...

Enable Diagnostic Logging



Enable Diagnostic Logging Increase Log Lines and/or Log to File

Main Menu: { Tools | Preferences... }

Preferences	
	Environment: Log
 Environment Dockable Window: Local History ADF Swing Ant Audit Business Components Code Editor Compare and Merge Compiler CSS Editor Database Data Controls Panel Debugger Deployment Diagrams Extensions File Types Global Ignore List Http Analyzer 	 Save Logs to File Log Directory: C:\temp Browse Maximum Log Lines: 3000 Hyperlink Color: R Program Output Color: R Program Error Color: R Program Input Color: R
Help	OK Cancel



Enable Diagnostic Logging Create New Run Configuration

Main Menu: { Application | Project Properties... }

Project Properties - X:\oov	09\debugging\SimpleApp\ViewController\ViewControl	ler.jpr 🛛 🔀
 Project Properties - X:\oo Search Project Source Paths ADF Model ADF View Ant Business Components Compiler Deployment EJB Module Extension Javadoc Javadoc Java EE Application JSP Tag Libraries JSP Visual Editor Libraries and Classpath Resource Bundle 	v09\debugging\SimpleApp\ViewController\ViewControll Run/Debug/Profile Use Qustom Settings Use Project Settings Run Configurations: Default	Ler.jpr
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Enable Diagnostic LoggingName New Run Configuration

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Ubraries and Classpath Resource Bundle Run/Debug/Profile Technology Scope		K Cancel

Enable Diagnostic LoggingEdit New Run Configuration



Enable Diagnostic Logging

► Add -Djbo.debugoutput=console to Java Options

Sedit Run Configuration	
 Search JavaScript PL/SQL ADF Task Flow XSLT Tool Settings Profiler CPU Memory Debugger Remote 	Launch Settings □efault Run Target:
Help	OK Cancel

Enable Diagnostic Logging Choosing Active Run Configuration





HOW TO

Debug with the Business Components Tester



Debug with the Business Components Tester Right-click Debug to Use Default Configuration

Application Navigator	·	AppModule.×ml		
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Debug with the Business Components Tester Debug Specific Configuration In AM Editor

AppModule.xml		
General		
Data Model	Configurations	
Java	The configurations allow Business Component clients to inter-	act with specific, deployed ap
EJB Session Bean	Configuration	Type
Service Interface	AppModuleLocalPoolingDisabled	LOCAL
Configurations	AppModuleLocal	▶ R <u>u</u> n Ctrl-F11
	AppModuleShared	🕭 De <u>b</u> ug
	Default Configuration: AppModuleLocal 🔹	New
	Configuration File: <u>bc4j.xcfg</u>	Edit
		<u>D</u> elete



Debug with the Business Components Tester Double-click App Module to See Client Methods

📓 Oracle Business Component Browser (AppModuleLocal-Local)
<u>File Vi</u> ew Crea <u>t</u> e D <u>a</u> tabase <u>H</u> elp
i 🖓
Name:AppModule Definition:demo.model.AppModule



Debug with the Business Components Tester Choose Method, Enter Params, and Execute

Oracle Busi	ness Component Browser (App	oModuleLocal-Local)	
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ame:AppModule [Definition:demo.model.AppModule		

Debug with the Business Components Tester Double-click View Instance to See Data

🕌 Oracle Busin	ess Component Browser (AppModu	ıleLocal-Local)	
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Name:AppModule.Fr	npView1 Definition:demo.model.EmpView		

Debug with the Business Components Tester Alternatively, Show Data in Editable Table

🕌 Oracle Busi	ness Component Br	owser (AppMod	uleLocal-Local)	
File View Crea	te Database Help			
i 62				
AppModule	👌 AppModule	EmpView1		
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		Sal	800	
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		Deptno	20	
Name:AppModule.E	EmpView1 Definition:dem	o.model.EmpView		

Debug with the Business Components Tester If Needed, View Object Operations Available

🕌 Oracle Busi	iness Compon	ent Browser	(AppModule	Local-Loca	I)			X
File View Crea	ate Database I	Help						
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	7839	KING	PRESIDENT		1981-11-17	5000		
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Name:AppModule.EmpView1 Definition:demo.model.EmpView



Debug with the Business Components Tester Choose Method, Enter Params, and Execute

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AppModule	appModule	🚰 EmpView 1	EmpView1 - overview	EmpView 1 OPERATIONS	
	AppModule.EmpVie	ew1			
	Method		initializeEmpView		~
	Property		Value		
	criteriaName[jav	a.lang.String]	MyEmpView	/CriteriaName	
	Result		Execute	2	
	Return value				
Name:AppModule.E	mpView1 Definition	:demo.model.Emp	View		

HOW TO

Create a Command-Line Test Client Program



Create a Command-Line Test Client Program Create a New Java Class with main() Method

👌 Test,	java	
🔞 - Fin	d 💦 🕹 🛧 🖓 🌭 🖓 🖓 🖓 🖓 🖓 🖓	Create Java Class
	<pre>package demo.client; public class Test {</pre>	Enter the details of your new class.
?	<pre>public static void main(String[] args) { Test test = new Test(); </pre>	Name: Test
	}	Extends: java.lang.Object
		Optional Attributes
		Access Modifiers
		 ● public ○ package protected ○ abstract ○ final
		Constructors from Superclass Implement Abstract Methods Main Method
		Help OK Cancel
Test →	main(String[])	×
•		ORACLE

Create a Command-Line Test Client Program Use bc4jclient Code Template



Create a Command-Line Test Client Program▶ Replace AM, Config, VO Names Appropriately



Create a Command-Line Test Client Program Write Code to Work with AM and/or VO

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造 Test.java
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👸 🗝 Find
    package demo.client;
   import oracle.jbo.client.Configuration;
    import oracle.jbo.*;
    import oracle.jbo.domain.Number;
    import oracle.jbo.domain.*;
   □public class Test {
         public static void main(String[] args) {
             String amDef = "demo.AppModule";
             String config = "AppModuleLocal";
             ApplicationModule am =
                 Configuration.createRootApplicationModule(amDef, config);
             ViewObject vo = am.findViewObject("EmpView1");
             Row row = vo.first():
             System.out.println(row.getAttribute("Ename"));
              // Work with your appmodule and view object here
             Configuration.releaseRootApplicationModule(am, true);
Test → main(String[])
                                                                                  >
Source Design History 🖆
                                                                                  ORACLE
```

HOW TO

Export Debugger Call Stack and Exact JDev/ADF Version



Export Debugger Call Stack Visit Stack Window Preferences

🖕 Oracle JDeveloper 11g - ExceptionExample.jws : Model.jpr						
<u>File E</u> dit <u>V</u> iew <u>A</u> pplication Refa <u>c</u> tor <u>S</u> earch <u>N</u> avigate <u>B</u> uild <u>R</u> un Versi <u>o</u> ning <u>T</u> ools <u>W</u> indow <u>H</u> elp						
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		Debugg	ing			

Export Debugger Call Stack Enable Line Numbers in Stack Window

🖕 Oracle JDeveloper 11g - ExceptionExample.jws : Model.jpr								
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		Debugging						



Export Debugger Call StackExport the Stack to a Text File

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Projects Projects Application Sources Application Sources O demo.model	<pre>} default: //do nothing. } throw new DMLException(operation, entity }</pre>				
Structure	finally				
Class Method Line Class Method Line Class Context State of the second state of the s	{ if (handle != null)				
EntityImpl postChanges Preferences DBTransactionImpl doPostTransact Preferences DBTransactionImpl commitInterna Go to Source for Me DBTransactionImpl commitInterna Show Bytecode DDJobDataControl commitTransaction 1580 DDDataControl callCommitTransaction 1404	if(handle.getState() != LongRunningSt { handle.setState(LongRunningStateme } trans.removeLongRunningDML0perationHa				
DCDataControl invokeOperation 2120	OracleSOLBuilderImpl → doEntitvDML → catch (SOLException salex)				
JUCtrlActionBinding invoke 693 JULActionBinding actionPerformed 193 JUNavigationBar doAction 411 NavigationBar doAction 111 JUNavigationBar doAction 111 JUNavigationBar actionPerformed 193 AbstractButton fireActionPerformed 195 AbstractButton\$H actionPerformed 2318 DefaultButtonModel ireActionPerformed 387 DefaultButtonModel setPressed 242 BasicButtonListener mouseReleased 236 AVVTEventMulticas mouseReleased 272 Component processMouseEvent 6263 JComponent processMouseEvent 3267	Source Design Source				
	Debugging				

Copying Exact Build Information to the Clipboard





TIP

Having the ADF Source Code Makes a Big Difference



Without ADF Source... Parameter Insight Only Gives Data Types





With ADF Source... Parameter Insight Shows Parameter Names, Too





Without ADF Source... Quick JavaDoc Does Not Work At All





With ADF Source... Quick JavaDoc Gives You Instant Overviews





Without ADF Source...

Only Method Breakpoints in Fwk, and No Stepping

🖕 Create Method Breakpoint	×
Definition Conditions Actions	
Method <u>N</u> ame: oracle.jbo.server.ViewObjectImpl.bindParametersForCollection	┓
Examples: java.io.File. <init> java.util.ArrayList.size</init>	
Breakpoint <u>G</u> roup Name:	•
Help OK Cancel	


With ADF Source... Break Anywhere, Step Into Anything



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Without ADF Source... Go To Declaration Shows Only Decompiled Stub



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}

With ADF Source... Go To Declaration Really Goes There



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With ADF Source, and *Find Usages...* Find Where Exceptions Thrown, Properties Used, **Diagnostics Printed, and More**

📥 Usages o

Help

- PropertyConstants PropertyMetadata (oracle.jbo.common)
 - Configuration Property Definitions
- CSMessageBundle
 - (oracle.jbo.common)
 - ADF Business Components **Runtime Error Messages**
- ADFmMessage (oracle.adf.model)
 - ADF Model Data Binding Runtime Error Messages

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Requesting the ADF Source Code Is Painless

- 1. Open a Service Request on Metalink
 - Indicate exactly the JDev/ADF release you are working with (for example, 11.1.1.3.0)
- 2. Have the Legal Agreement Signed
 - Typically VP or higher but depends on the company
 - Signer's company must be same as the CSI number
- 3. Return the Legal Agreement to Oracle
 - Scan the agreement and email it
- 4. Support Updates the SR with Download Link
 - Download the source



Dev Guide Explains How to Setup Source



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HOW TO DEBUG

Exception with Stack Trace



Symptom: NullPointerException on Navigation

🖆 Oracle Business Component Browser (ExampleModuleLocal-Local)
File View Create Database Help
G2
ImpleModule ImplempView1 ImplempView1 ImplempView1 ImplempView1 ImplempView1
🕌 Error 🔀
(oracle.jbo.JboException) JBO-29000: Unexpected exception caught: java.lang.NullPointerException, msg=null
OK Details Stack
Sal 801 Comm Deptno 20
Name:ExampleModule.EmpView1 Definition:demo.model.EmpView

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Log Window Gives More Info Double-click To Maximize Tabbed Contents

🕹 Oracle JDeveloper 11g - ExceptionExamp	le.jws : Model.jpr 📃 🔲 🔀
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Application Carboner Controls Application Application Sources Application Sources Application Resources Application Resources Application Resources Application Resources Class Method	
	EDeb •=Breakpoints & Smart Data @Data @Watches @ADF Data & Levaluator
	at java.awt.EventQueue.dispatchEvent(EventQueue.java:599) at java.awt.EventDispatchThread.pumpOneEventForFilters(EventDispatchThread.java:2
	at <u>java.awt.EventDispatchThread.pumpEventsForFilter</u> (EventDispatchThread.java:184)
	at <u>java.awt.EventDispatchThread.pumpEventSrorHierarchy</u> (EventDispatchThread.java:1 at <u>java.awt.EventDispatchThread.pumpEvents</u> (EventDispatchThread.java:169)
	at java.awt.EventDispatchThread.pumpEvents(EventDispatchThread.java:161)
	at <u>java.awt.EventDispatchThread.run</u> (EventDispatchThread.java:122) 📑 🗸
	Messages Feedback & Debugging: Model.jpr Running: Model.jpr
	🗘 Debugging



Framework Caught Unexpected Exception Scroll Down to See Original Cause

🖕 Oracle JDeveloper 11g - ExceptionExample.jws : Model.jpr	
<u>File Edit View Application Refactor Search Navigate Build Run Versioning Tools Wind</u>	low <u>H</u> elp
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Debuarina: Model inr - Loa	F
339] Bind params for ViewObject: EmpView1	
340] DBTransactionImpl.mDefaultSparseArrayThreshold is 20	
341] **** refreshControl() for BindingContainer :ExampleModule_EmpView1_OPageDef	
342] *** DCDataControl.sync() called from :DCBindingContainer.refresh	
[343] INFO: No app _def_ in BindingContext for: adfFacesContext	
[344] INFO: mDCRefMap lookup failed. Does the cpx have a dataControlUsages 'dc' entry?	adfFacesContext
[345] INFO: No app _def_ in BindingContext for: adfFacesContext	
[346] INFO: mDCRefMap lookup failed. Does the cpx have a dataControlUsages 'dc' entry?	adfFacesContext
[347] OracleSQLBuilder Executing doEntitySelect on: EMP (true)	
[348] Built select: 'SELECT EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO FROM EM	4P Emp'
[349] Executing LOCKSELECT EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO FROM	EMP Emp WHERE EMPNO=:1 FOR UPDATE NOT
[350] Where binding param 1: 7369	
[351] DCBindingContainer.reportException :oracle.jbo.JboException	
[352] oracle.jbo.JboException: <u>JB0-29000</u> : Unexpected exception caught: java.lang.NullPc	pinterException, msg=null
at <u>oracle.jbo.rules.JboMethodValidator.invokeMethod</u> (JboMethodValidator.java:30)1)
at <u>oracle.jbo.rules.JboMethodValidator.validateValueWithContext</u> (JboMethodValid	lator.java:251)
at <u>oracle.jbo.rules.JboAbstractValidator.callValidateValueWithContext</u> (JboAbstr	ractValidator.java:228)
at <u>oracle.jbo.rules.JboAbstractValidator.validate</u> (JboAbstractValidator.java:37	73)
at <u>oracle.jbo.server.EntityDefImpl.validate</u> (EntityDefImpl.java:2766)	
at <u>oracle.jbo.server.EntityCache.validate</u> (EntityCache.java:2704)	
at <u>oracle.jbo.server.EntityImpl.validateEntity</u> (EntityImpl.java:2052)	
at <u>oracle.jbo.server.EntityImpl.validate</u> (EntityImpl.java:2205)	
at <u>oracle.jbo.server.ViewRowImpl.validate</u> (ViewRowImpl.java:645)	
at <u>oracle.jbo.server.ViewRowSetIteratorImpl.validateCurrentRow</u> (ViewRowSetIters	atorImpl.java:3332)
at <u>oracle.jbo.server.ViewRowSetIteratorImpl.next</u> (ViewRowSetIteratorImpl.java:1	1706)
at <u>oracle.jbo.server.ViewRowSetImpl.next</u> (ViewRowSetImpl.java:3266)	
at <u>oracle.jbo.server.ViewObjectImpl.next</u> (ViewObjectImpl.java:8433)	
at <u>oracle.jbo.uicli.binding.JUCtrlActionBinding.doIt</u> (JUCtrlActionBinding.java:	:971)
at <u>oracle.adf.model.binding.DCDataControl.invokeOperation</u> (DCDataControl.java:2	(120)
at <u>oracle.jbo.uicli.binding.JUCtrlActionBinding.invoke</u> (JUCtrlActionBinding.jav	za:693)
at oracle.jbo.uicli.jui.JUActionBinding.actionPerformed(JUActionBinding.java:1	193)
Messages Feedback & Debugging: Model.jpr P Kunning: Model.jpr	
	🕫 Debugg



NullPointerException in EmpImpl.validateEmp() Click on the Hyperlink to Open Source



ORACLE

If getComm() Returns null, We Have a Problem Verify Your Suspicion Using Exception Breakpoint





In the Breakpoints Tab... Create a New Exception Breakpoint





Use In-Field Classname Insight or Dropdown to Specify Exception Class Name





Debug the Application Again Using the Business Components Browser





Unrelated Code Also Throws NullPointerException! Delay Enabling Breakpoint to Avoid Stopping Here

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	satch (Exception ignore)
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Navigate to Source of ApplicationModuleImpl Using Go to Java Type...

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Type Enough of the Class to Narrow the List Camelcase Matching Saves Keystrokes

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Navigate to prepareSession() Method Using Quick Outline

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Type to Narrow the Method List Use Arrows+[Enter] or Mouse to Navigate





Set a Breakpoint in prepareSession() This Occurs After AM is Checked Out of Pool





Edit Exception Breakpoint to Add Group Name

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Name the Breakpoint Group Anything You Like





Edit the prepareSession() Breakpoint





Visit the Actions Tab





Configure the Action to Enable a Breakpoint Group Choosing Yours from the List





Disable the Breakpoint Group By Default Action Will Enable it at prepareSession() Time

Oracle JDeveloper 11g - ExceptionExample.	.jws : Model.jpr
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Projects Projects Projects Application Sources Application Sources Boundary Boundary Boundary Model Project Application Resources Data Controls Recently Opened Files Structure Stack Structure	<pre>* * The default implementation of this method will store 1 * ApplicationModuleHandle on the ApplicationModule sessi * * @see #getSession() */ protected void prepareSession(Session session) { synchronized(getSyncLock()) </pre>
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Debug Again. Only Stop at NullPointerException After First Hitting the prepareSession() Breakpoint

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Structure Stack	5
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Add a Watch Expression for getComm() to Inspect Value of the Comm Attribute





Suspicion is Confirmed, It's Null





Add Null Protection to Fix the Bug Debug and Test to Verify Your Fix





Symptom: DMLException After Committing Data

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Summary of Techniques Used in the Example

- Exception breakpoints
 - To stop when exception is thrown
 - Use more generic or more specific exception type as needed
- Breakpoint Groups and Actions
 - To avoid stopping at uninteresting occurrences
- Watch Expressions
 - To easily inspect the value of attributes or other expressions
 - getYourAttrName() if you have generated row class
 - getAttribute("YourAttrName") works always



HOW TO DEBUG

"Wrong Data" Problems



Overview of Application to Debug


Symptom: Choose Department "ACCOUNTING" (10) But See Employees for All Departments



Set a Breakpoint in ViewObjectImpI bindParametersForCollection() Method & Debug





Breakpoint Hit: View Object Query is Executing, But Which One?

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Application started in Server Instance.		Debugging



This Query Execution is for VO Instance Named "DepartmentList" (for Dropdown List)

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Application started in Server Instance.						💯 Debugging

Edit the Breakpoint to Make it Break Only For the "EmpView1" View Object We're Interested In

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Edit Breakpoint, Add Conditional Expression to Stop Only For "EmpView1" VO Instance

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Choose a Department, Click Button to Call the Task Flow





Suppress Hiding Null Array Elements Using Debugger Data Window Preferences

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Bind Variable VarDeptno has null value Next, Need to Figure Out Why

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Toggle Breakpoint on TaskFlow Call Activity and Repeat the Test

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At Breakpoint, Use ADF Structure to Inspect the Request Scope: deptno Attribute Set Correctly

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Drilldown to Task Flow, Toggle Breakpoint on Default MethodCall Activitity, then Continue

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At the Breakpoint, Use ADF Structure to Inspect the Task Flow: pageFlowScope.deptno Set OK

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Toggle Breakpoint on ExecuteWithParams Action, Then Continue Execution

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At the Breakpoint, Explore the Value of Method Action's Arguments: VarDeptno is null Incorrectly!

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Explore Action Binding Runtime Metadata in ADF Data Window to See EL Expression Used

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View the Whole EL Expression Value, Copy it to Clipboard

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Use EL Evaluator to Test Pasted Expression It Evaluates to null. Notice Typo deplno

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Fix Typo, Test Expression, Copy to Clipboard

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Edit Action Binding, Paste in Correct Expression Rerun Application to Verify the Fix

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Summary of Techniques Used in the Example

- Breakpoint in bindParametersForCollection()
 - To break whenever a View Object's query executes
- Conditional breakpoint expressions
 - To break only for the EmpView1 VO instance
- Breakpoints on Task Flow Activities
 - To break on task flow call and method call (among others)
- ADF Structure and ADF Data Windows
 - To Inspect ADF context, scopes, task flow artifacts
- Breakpoint on Action Bindings in Page Definition
 - To break just before action occurs
- EL Evaluator Window
 - To test EL expressions in correct runtime context



HOW TO DEBUG

"No Data" Problems



Symptom: No Data Appears





At bindParametersForCollection() Breakpoint, Add Watches for getQuery() and params

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Use View Whole Value... to Copy/Paste Query Into SQL Worksheet, Then Format SQL

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ViewObject FlowChart for "No Data" Problems



createRowFromResultSet() Shows Null Row Points to Discriminator Mismatch Problem

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Query Retrieves JOB Column Values Different From the Defined Discriminator Values!

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	3 7782 CLARK MANAGER 7839 09-JUN-81 2450 10
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	6 7902 FORD ANALYST 7566 03-DEC-81 3000 20
	SQL_Worksheet

Changing the Applied View Criteria to Limit Results to Only Include Clerks and Salesmen Fixes Problem

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Summary of Techniques Used in the Example

- Breakpoint in bindParametersForCollection()
 - To examine query statement and bind variable values
- SQL Worksheet
 - To test query against same database as the application
- Breakpoint in createRowFromResultSet()
 - To test whether database row is retrieved without error



TIP

Show *Id* in Data and Watches Windows to Distinguish Instances



Use *Id* in Data/Watch Windows to Distinguish Objs ► Open Data or Watch Window Preferences

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Use *Id* in Data/Watch Windows to Distinguish Objs ► Enable Id Column

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Use *Id* in Data/Watch Windows to Distinguish Objs ► Jot Down Id of Objects at One Breakpoint

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Use *Id* in Data/Watch Windows to Distinguish Objs ► Compare to Object Id at Other Breakpoint

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HOW TO DEBUG

"Slow Application" Problems



Logging Executed Queries and Fetched Rows

```
package demo;
 ∃import ...;
Impublic class TracingViewObjectImpl extends ViewObjectImpl [
     // Log Ouery Statement and Bind Parameters
     @Override
     protected void bindParametersForCollection(QueryCollection gc,
أ
                                                 Object[] params.
                                                 PreparedStatement stmt)
     throws SQLException {
 \Box
       logQueryStatementAndBindParameters(qc, params);
       super.bindParametersForCollection(qc, params, stmt);
     }
     private void logQueryStatementAndBindParameters(QueryCollection gc,
                                                      Object[] params) {...}
 +
     // Log Row Fetched
     @Override
     protected ViewRowImpl createRowFromResultSet(Object object,
ResultSet resultSet) {
 \Box
       ViewRowImpl ret = super.createRowFromResultSet(object, resultSet);
       if (ret != null) {
         System.out.println("----[V0 "+getName()+" fetched " + ret.getKey() + "]");
       return ret;
```



Logging Executed Queries and Fetched Rows

🖕 Oracle JDeveloper 11g - InstrumentedADFBCBaseClasses.jws : Project.jpr							
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🗉 Running: Project.jpr - Log							
C:\jdk\1.6.0_16\bin\javaw.exe -client -classpath ;D:\jdev\r1.5407\jdeveloper\BC4J\jlib\bc4jtester.jar;D:\jdev\r1.5407\jdevel Oct 6, 2009 5:23:39 PM oracle.adf.share.config.ADFConfigFactory getInstance							
INFO: ADF Config instance implementation in use is : oracle.adf.share.config.MDSConfigFactory							
OCT 6, 2009 5:23:42 PM oracle.adf.share.jndl.MDSBackingStore iskeadonlyMDSStore							
Oct 6. 2009 5:23:44 PM oracle.adf.share.indi.MDSBackingStore isReadOnlyMDSStore							
INFO: Read only backing store							
Diagnostics: (Properties (re)loaded) Routing diagnostics to standard output (use -Djbo.debugoutput=silent to remove)							
Oct 6, 2009 5:23:46 PM oracle.jbo.jbotester.MainFrame main							
INFO: BC4J Tester started.							
[Exec query for VO=DeptView1, RS= <default>]</default>							
VODef =demo.DeptView							
Applied Database VCs = (DeptViewCriteria)							
SELECT Dept.DEPTNO, Dept.DNAME, Dept.LOC FROM DEPT Dept WHERE (((UPPER(Dept.DNAME) LIKE UPPER('%' :VarD							
BindVars: (VarDname=null)							
[VO DeptView1 fetched oracle.jbo.Key[10]]							
[Exec query for VO=DeptView1, RS= <default>]</default>							
VODef =demo.DeptView							
Applied Database VCs = (DeptViewCriteria)							
SELECT DEPT.DEPTNO, Dept.DNAME, Dept.LOC FROM DEPT Dept WHERE (((DPPER(Dept.DNAME) LIKE OPPER('%')) :varD							
[VO DentView1 fetched oragle the Kew[10]]							
[VO DeptView1 fetched oracle the Key[10]]							
Messages Feedback 🕨 Running: Project.jpr 🚳 Find usages for AppModule 🛛 🕸 Debugging: Project.jpr 🖆 💷 💫 🕢 💽							
Opened nodes (46); Saved nodes(1) Editing							



TIP

Customize Debugger Display of Any Object Type



Customize Debugger Display of Any Object Type Select Object Preferences for a Given Entry

Oracle JDeveloper 11g - ExceptionExamp	le.jws : Model.jpr
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Projects Nodel Application Sources ⊕ @ demo.client ⊕ @ demo.client ⊕ @ Emp ⊕ @ EmpView ⊕ @ EmpView ⊕ @ ExampleModule ⊕ @ Model.jpx	<pre>protected void bindParametersForCollection(QueryCollection throws SQLException { if (Diagnostic.isOn() && qc != null && qc.getViewObject { Diagnostic println("Diagnostic for ViewObjects "</pre>
CreateExampleTriggerAndCons	Diagnostic.printing bind params for viewobject:
E EwController	ViewObjectImpl > bindParametersForCollection(OuervCollection, Object[], PreparedStatement)
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DCEvecut refreshiftleeded 334	🕸 🖃 mCompListeners 0 elements 🖉 ArrayList <java.lang.object> 0×194C</java.lang.object>
	Debug



Customize Debugger Display of Any Object Type Decide What Fields/Expressions To Show

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🗁 oracle.jbo.server.ViewObjectImpl 🔹 🔻	🚹 🔁 🌽 🐙 i 👼 🕼 🛱 🛱 📮 📮 i 🔍 🐘 🏠 🖷 👘
These preferences affect the class or interface selected in the type hierarchy above and all of	
What to Display in the Value Column:	d bindParametersForCollection(QueryCollecti
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Evaluate Expression mObiName	stic isOn() && ac L= pull && ac act/iewObje
	stretrison() da de :- nurr da de getvrenobje
What to Show When Expanding the Object:	tic.println("Bind params for ViewObject: "
Expressions mMaxFetchSize;mFetchSize	· · · · · · · · · · · · · · · · · · ·
✓ Heids	rsForCollection(OueryCollection, Object[] PrenaredStatement)
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☐ JUIterator refreshControl 473 2010 mChqAttrindUseCount	االروا 0x1948 0 int
CONTENSION CONTENSIA CONTENSI	0 elements 🖉 ArrayList <java.lang.object> 0x194C 🗸 🗸</java.lang.object>
	Debugging



Customize Debugger Display of Any Object Type Four Changes Are Showing, But Others, Too

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CreateExampleTriggerAndCons				•			
E	ViewObi	iectImpl → bindPar	ametersForColle	ction(Ouer	VCollection. Object	t[]. PreparedStatement)	
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ebugging

Customize Debugger Display of Any Object Type ► Customize Supertype Members, Too, If Needed

🔶 Oracle JDeveloper 11g - ExceptionExample.jws : Model.jpr		
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🖳 🗋 java.lang.Object		son() aa qc != null aa qc.getvlewobje
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Ulterator refreshControl 473 - Suit Suit Control 473 - Static fields of ViewObjectImpl		oracierrepareustatementwirap 0x 1944
DOEVecut referbilitieeded 334		
		Debugging

Other Interesting Info in ADF Structure / ADF Data Lifecycle Breakpoints and Page UI Component Tree

🖕 Oracle JDeveloper 11g - SimpleApp.jws : ViewController.jpr						
<u>File Edit View Application Refactor Sector Sector Sector</u>	earch <u>N</u> avigate <u>B</u> uild <u>R</u> un Versi <u>o</u> ni	ng <u>T</u> ools <u>W</u> indow	ADF Lifecycle Breakp	ooints 🗵		
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Other Interesting Info in ADF Structure / ADF Data ADF Context

🖕 Oracle JDeveloper 11g - SimpleApp.jws : ViewController.jpr						
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n toowoa (debugging tsimpleApp (view controller) public_ntml (vvEB-114F (adic-contig.xm) Debugging (



TIP

Watches Can Evaluate Most Java Expressions



Not Sure What Watch Expression to Use? Find Member in Data Window, Then Watch It

EDebugging: •≣Breakp	oints 📴 Data	Set Evaluator 🕘	Watches	_
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Debugger Watch Expressions Can Do Many Things For Example, At a Breakpoint in ViewRowImpl...

- Navigate Members Regardless of Access Mode
 - mInner.mRows[0].mData.mStorage

ELog	•≡Breakpoints	123Data	≪ªEL E∨aluator	岡.Watches	
Name			Value	Туре	
🖃 🗐 mIn	ner.mRows[0].mD	ata.mStorage		Object[3]	
	0] 1] 2]		10 "ACCOUNTING" "NEW YORK"	Number String String	

- Call Functions
 - getViewObject().findAttributeDef("Dname")
 - .getUIHelper().getLabel(getViewObject()
 - .getApplicationModule().getSession()
 - .getLocaleContext())



Debugger Watch Expression Tricks (Cont'd)

- Call Methods That Produce Log Output
 - xmlNode.print(System.out)





TIP

Breakpoint Expressions Can Reference Watch Expressions



Breakpoint Conditional Expressions

- Basic Expressions
 - Any Expression that Works in a Watch
 - Boolean operators ! (not), || (logical or), && (logical and)
 - Gotcha: Remember to Think About null Values
 - Expr != null && Expr.equals("Foo")
 - "Foo".equals(Expr)
- Advanced Expressions
 - _throw to reference exception object being thrown
 - instanceof fully.qualified.ClassName
 - StringExpr != null && StringExpr.indexof("Something") >= 0
 - StringExpr != null && StringExpr.startsWith("Something")
 - Expr ? IfTrueExpr : IfFalseExpr



When Debugging Does Not Succeed... Create a Great Test Case for Worldwide Support

- Small investment of your time pays dividends
 - Simple testcase \rightarrow faster diagnosis, workaround, fix
- Base the testcase on EMP or HR schema
 - Eliminates any database setup complications
- Otherwise, provide minimal SQL script
 - Insert only enough sample data to reproduce problem
- Create a command-line test client
 - Reduces reproduce instructions to: "Run Test.java"
- Otherwise, give the minimum steps to reproduce
 - Some issues only occur in context of multi-step, web scenario

OTHER ADF DEBUG FEATURES

IN JDEVELOPER 11.1.1.3 RELEASE



ADF Logger▶ Configure Loggers Dynamically

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ADF Logger Improvements ▶ Configure Logger Levels Dynamically

🗟 logging.xml

Oracle Diagnostics Logging Configuration

Control logging behavior for specified loggers. If the server is running, changes take effect immediately. Any transient instance loggers you add exist only in the context of the running server, and are not persisted to the logging.xml file.

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Hide Transient Loggers		🕂 🛪 🔀 🛛 Java Log Levels
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ADF Logger Improvements ► See Class/Method With Every Log Message

Smart Data 123 Data Watches ■≣Breakpoints ADF Data $\langle \rangle$ 📃 Debugaing: Integrated WebLogicServer - Log 🚽 1 <ApplicationPoolImpl><reuseReferencedInstance> [438] Reusing a cached session application module instance <ApplicationPoolMessageHandler><doPoolMessage> [439] **** PoolMessage REQ ATTACH LWS <DCExecutableBinding><refreshIfNeeded> [440] Invoke refresh for :EmpView1Iterator <DCIteratorBinding><refresh> [441] Executing and syncing on IteratorBinding.refresh from :EmpView1Iterat <DCIteratorBinding><getViewObject> [442] Resolving VO:EmpView1 for iterator binding:EmpView1Iterator <DCBindingContainerState><validateToken> [443] Process BindingContainer state token(decompressed state) <DCBindingContainer><validateInputValues> [444] DCBindingContainer:demo view SimplePagePageDef no validate <DebuqDiagnostic><print> [445] DBG: beforeActionPerformed :Next <JUCtrlValueBinding><createAndNotifyDCE> [446] Binding:Empno, DataChangeEvent REFRESHbeing raised. <JUCtrlValueBinding><createAndNotifyDCE> [447] Binding:Ename, DataChangeEvent REFRESHbeing raised. <JUCtrlValueBinding><createAndNotifyDCE> [448] Binding:Job, DataChangeEvent REFRESHbeing raised. <JUCtrlValueBindinq><createAndNotifyDCE> [449] Bindinq:Mqr, DataChanqeEvent REFRESHbeinq raised. <JUCtrlValueBindinq><createAndNotifyDCE> [450] Bindinq:Hiredate, DataChangeEvent REFRESHbeing raised. <JUCtrlValueBinding><createAndNotifyDCE> [451] Binding:Sal, DataChangeEvent REFRESHbeing raised. <JUCtrlValueBindinq><createAndNotifyDCE> [452] Bindinq:Comm, DataChangeEvent REFRESHbeing raised. <JUCtrlValueBinding><createAndNotifyDCE> [453] Binding:Deptno, DataChangeEvent REFRESHbeing raised. <DebuqDiagnostic><print> [454] DBG: afterActionPerformed :Next <DCBindingContainer><internalRefreshControl> [455] **** refreshControl() for BindingContainer :demo viet <DCIteratorBinding><releaseDataInternal> [456] Releasing iterator binding:EmpView1Iterator <ApplicationPoolMessageHandler><doPoolMessage> [457] **** PoolMessage REQ ATTACH LWS <ApplicationPoolMessageHandler><doPoolMessage> [458] **** PoolMessage REQ DETACH LWS

Messages Extensions 🔯 Debu

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Debugging: IntegratedWebLogicServer

ADF Logger Improvements▶ Flexibly Search Log Files





ADF Logger Improvements▶ Flexibly Search Log Files

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ADF Debugger Improvements► Easily See Binding Values

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ADF Debugger Improvements ► Easily Explore ViewRows and Entity Objects

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ADF Debugger Improvements▶ Quick Expand

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ADF Debugger Improvements▶ Quick Expand

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More Information on Oracle JDeveloper

- http://otn.oracle.com/jdev
- Tutorials and How-To's
- Samples
- Demos
- Books and Training
- Discussion forum
- Blogs
- More...





http://blogs.oracle.com/smuenchadf



Appendix Useful ADFM/ADFBC Methods for Debugging

Object	Method	Description
ViewObjectImpl	bindParametersForCollection	Inspect SQL and bind variables just before executing query
	createRowFromResultSet	Study each row as its fetched from the database
ViewRowImpl	populate	Observe row after being populated with fetched data
	setAttributeInternal	Examine attribute value being set
	setAttributeValues	Examine multiple attribute values being set (typically by LOV mechanism)
ApplicationPoolImpl	doCheckout	Watch AM as its checked out of the pool
	doManagedCheckin	See AM as its checked into pool in managed mode
	doUnmanagedCheckin	See AM as its checked into pool in stateless mode
EntityImpl	setAttributeInternal	Examine attribute value being set
ExprEval	doEvaluate	Analyze each Groovy expression being evaluated
JUCtrlActionBinding	doIt	Follow any (method) action binding invocation

QUESTIONS?



