

Deploying Applications to WebLogic Server Using JDeveloper and WLS Console

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quovera



Moral

Don't get it right,
just get it written.

—James Thurber,
The Sheep in Wolf's Clothing;
Fables for our Time

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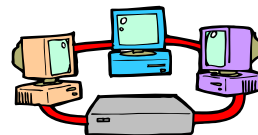
2

Agenda

- Deployment concepts
- JDeveloper support
- Deploying from WLS Console

Slides and white paper will be on the NoCOUG and Quovera websites.

The white paper contains hands-on practices.



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Deployment Concepts

- Deployment: copying and installing application files to a runtime environment
 - Development, testing, QA, production
 - Occurs multiple times for an app
 - Bug fixes, enhancements, software updates
- You may be responsible
 - So you, as a developer, need to know this
- Someone else may be responsible
 - So you need to provide the right files to deploy
 - Testing those files beforehand is useful



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Preparation for Deployment

- Development and testing complete
- Required libraries and supporting files are identified
- Application server is available
 - Has an appropriate web container (JVM) process
 - For example, WebLogic Server
 - You know the server administration password
 - Or know someone who knows
 - Needed to copy files to the server



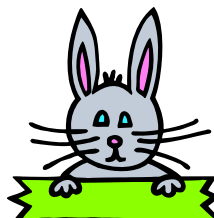
Deployment Objectives

- Ensure that all required libraries are available
 - Development and deployment library versions should match
- All necessary JDeveloper projects must be deployed
 - Model
 - ViewController
 - ADF Libraries (usually bundled into the EAR)
- Files must be archived into specially formatted Java EE JAR files
 - WAR or
 - EAR (if more than one application)
 - ADF Library JARs



Enterprise Application Archive (EAR)

- Contains one or more WAR (application) files and other libraries that are required
- A file you deploy
- Copies to the app server directory:
FMW_HOME>\user_projects\domains
 - App server processes new EAR files when restarting
 - Can also process EAR files without restarting
- The app server expands this into its component WAR files
 - Each WAR file goes into a directory corresponding to its name
 - Then it expands the WAR files

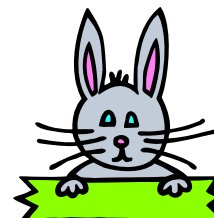


Sample EAR File

| Path | Size | Compressed |
|---|---------|------------|
| tuhra2_ViewController_webapp1.war | 4.96 MB | 4.96 MB |
| lib/adf-loc.jar | 273 | 273 |
| adf/tuhra/model/services/common/bc4j.xcfg | 979 | 979 |
| adf/META-INF/connections.xml | 1.19 KB | 1.19 KB |
| adf/META-INF/adf-config.xml | 745 | 745 |
| META-INF/weblogic-application.xml | 1.66 KB | 1.66 KB |
| META-INF/jps-config.xml | 947 | 947 |
| META-INF/cwallet.sso | 3.83 KB | 3.83 KB |
| META-INF/application.xml | 492 | 492 |
| META-INF/adfm.xml | 236 | 236 |

JDeveloper
Archive
Viewer

- One app (WAR) file in this case
- Several XML configuration files



Web Application Archive (WAR)

- Also called, *Web Archive*
- Can alternatively be deployed without an EAR
- Contains all files required for an application
- Contains files or directories inside WEB-INF (the main runtime directory)
- Copied to server and expanded into separate files by the server
 - Inside a directory named the same as the WAR file



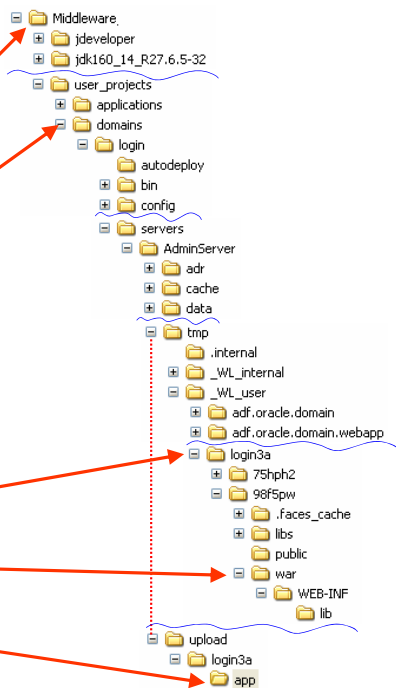
Sample WAR File

- App server extracts files into the `./<app>/` directory
 - `<app>` is the name of the WAR file

| Path | Size | Compressed |
|--|----------|------------|
| WEB-INF/adfc-config.xml | 778 | 778 |
| WEB-INF/classes/META-INF/adfm.xml | 361 | 361 |
| WEB-INF/classes/META-INF/pagetable-metadata.xml | 241 | 241 |
| WEB-INF/classes/fragments/departmentTreePageDef.xml | 1.87 KB | 1.87 KB |
| WEB-INF/classes/fragments/editEmployeePageDef.xml | 3.63 KB | 3.63 KB |
| WEB-INF/classes/fragments/searchUIPageDef.xml | 2.37 KB | 2.37 KB |
| WEB-INF/classes/templates/tuhraTemplatePageDef.xml | 332 | 332 |
| WEB-INF/classes/tester.properties | 73 | 73 |
| WEB-INF/classes/tuhra/model/Model.jpx | 1.13 KB | 1.13 KB |
| WEB-INF/classes/tuhra/model/entities/Departments.xml | 4.09 KB | 4.09 KB |
| WEB-INF/classes/tuhra/model/entities/DeptMgrFkAssoc.xml | 1.34 KB | 1.34 KB |
| WEB-INF/classes/tuhra/model/entities/EmpDeptFkAssoc.xml | 1.35 KB | 1.35 KB |
| WEB-INF/classes/tuhra/model/entities/EmpJobFkAssoc.xml | 1.32 KB | 1.32 KB |
| WEB-INF/classes/tuhra/model/entities/EmpManagerFkAssoc.xml | 1.36 KB | 1.36 KB |
| WEB-INF/classes/tuhra/model/entities/Employees.xml | 11.97 KB | 11.97 KB |
| WEB-INF/classes/tuhra/model/entities/ImageUsages.xml | 4.41 KB | 4.41 KB |
| WEB-INF/classes/tuhra/model/entities/ImageUsagesImagesFkAssoc.xml | 1.38 KB | 1.38 KB |
| WEB-INF/classes/tuhra/model/entities/Images.xml | 2.41 KB | 2.41 KB |
| WEB-INF/classes/tuhra/model/entities/Jobs.xml | 2.88 KB | 2.88 KB |
| WEB-INF/classes/tuhra/model/framework/TuhraApplicationModuleImpl.class | 303 | 303 |
| WEB-INF/classes/tuhra/model/framework/TuhraEntityImpl.class | 270 | 270 |
| WEB-INF/classes/tuhra/model/framework/TuhraViewObjectImpl.class | 282 | 282 |
| WEB-INF/classes/tuhra/model/framework/TuhraViewRowImpl.class | 273 | 273 |
| WEB-INF/classes/tuhra/model/queries/AllDepartmentsWithManagers.xml | 3.20 KB | 3.20 KB |

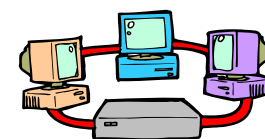
Deployed Directory Structures

- FMW_Home
 - Fusion Middleware
- Domain
 - Created using the Configuration Wizard
- WAR file and app files under this level
 - App root here
- EAR file here



Agenda

- Deployment concepts
- JDeveloper support
- Deploying from WLS Console



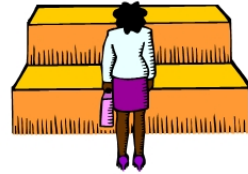
Yes, Let's

However beautiful the strategy,
you should occasionally
look at the results.

—Winston Churchill (1874-1965)

Two Big Steps

1. Prepare the deployment profiles for the WAR and EAR files
 - Specify what to deploy
 - Application and ADF BC projects
 - Required libraries
2. Deploy using the deployment profile
 - This creates the WAR and EAR
 - It also copies the EAR to the server



Testing in Standalone WebLogic

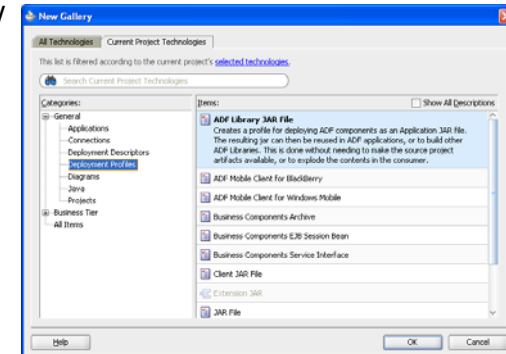
- Between running the app in JDeveloper and deploying to the server run this test
- You need to set up the WLS standalone instance
 - WLS is part of Oracle Fusion Middleware
 - Included with JDeveloper for standalone
- Ensure that the versions are compatible
 - WLS version
 - Application development runtime



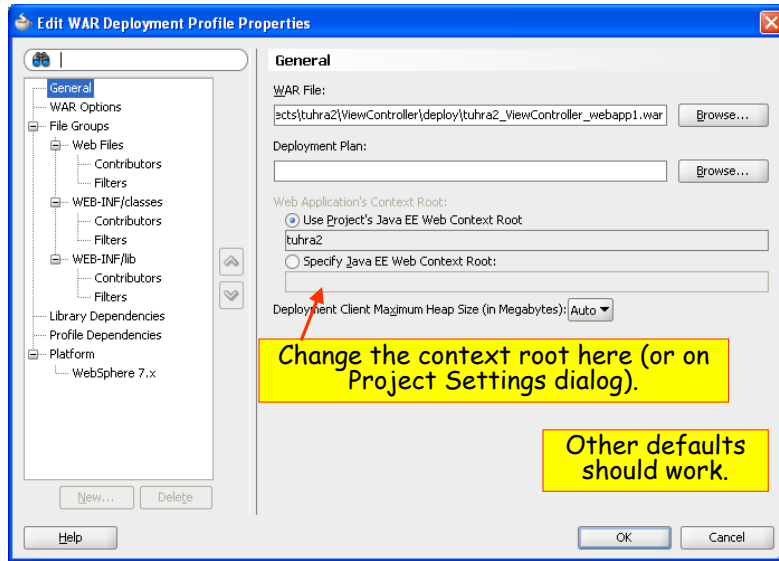
Demo

Deployment Profiles

- Embedded in the .jws and .jpr files
- Access from Application / Project properties, or from the New Gallery (context sensitive)
- Default EAR and WAR profiles are pre-created with the Fusion App template
- Create separate deployment profiles for separate purposes – multiple targets, etc.

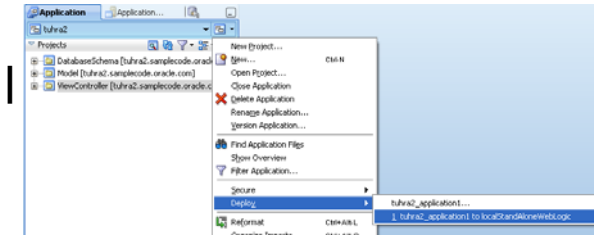


Deployment Profile Wizard



Deploying From JDeveloper

- Assumes WLS standalone has been set up and is running and the JDeveloper app server connection is set up
 - See hands-on practice for those steps
- **Application menu | Application Properties | Edit**
 - Application Assembly
 - Check Model
- **Application menu | Deploy | <app>**
 - Local App Server

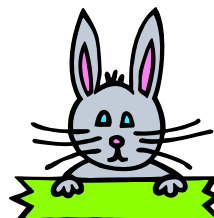


What Next?

- Wait and watch
 - JDeveloper builds the WAR and EAR files in the project directory

```
[02:42:45 PM] Wrote Web Application Module to C:\projects\tuhra2\ViewController\deploy\tuhra2_ViewController_webapp1.war
[02:42:47 PM] Uploading jazn-data users.
[02:42:47 PM] Uploading jazn-data roles.
[02:42:48 PM] Wrote Enterprise Application Module to C:\projects\tuhra2\deploy\tuhra2_application1.ear
[02:42:48 PM] Deploying Application...
```

- Then it copies the EAR file to the server instance
- Message log window will show progress



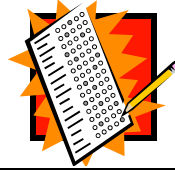
Deployment Log Window

```
Deployment - Log
[02:42:14 PM] ---- Deployment started. ----
[02:42:14 PM] Target platform is (Weblogic 10.3).
[02:42:14 PM] Retrieving existing application information
[02:42:16 PM] Running dependency analysis...
[02:42:16 PM] Building...
[02:42:38 PM] Deploying 2 profiles...
[02:42:45 PM] Wrote Web Application Module to C:\projects\tuhra2\ViewController\deploy\tuhra2_ViewController_webapp1.war
[02:42:47 PM] Uploading jazn-data users.
[02:42:47 PM] Uploading jazn-data roles.
[02:42:48 PM] Wrote Enterprise Application Module to C:\projects\tuhra2\deploy\tuhra2_application1.ear
[02:42:48 PM] Deploying Application...
[02:43:04 PM] [Deployer:149192]Operation 'deploy' on application 'tuhra2_application1 [Version=V2.0]' is in progress on 'AdminServer'
[02:43:04 PM] [Deployer:149192]Operation 'deploy' on application 'tuhra2_application1 [Version=V2.0]' is in progress on 'AdminServer'
[02:43:09 PM] [Deployer:149194]Operation 'deploy' on application 'tuhra2_application1 [Version=V2.0]' has succeeded on 'AdminServer'
[02:43:09 PM] [Deployer:149194]Operation 'deploy' on application 'tuhra2_application1 [Version=V2.0]' has succeeded on 'AdminServer'
[02:43:09 PM] Application Deployed Successfully.
[02:43:09 PM] Elapsed time for deployment: 56 seconds
[02:43:09 PM] ---- Deployment finished. ----
```

- The Log window usually appears in the bottom of the JDeveloper IDE window

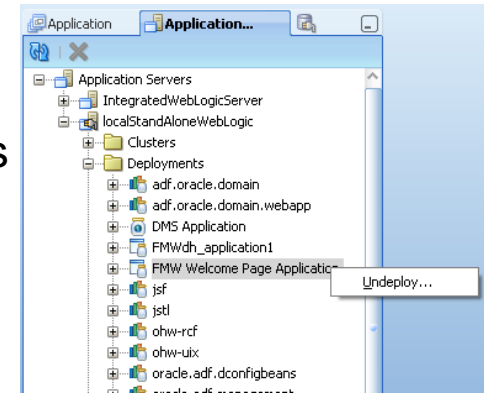
Test the Application

- Close JDeveloper if you are skeptical
- In browser, run the application URL
 - In this case:
`http://localhost:7001/tuhra2`
 - This opens the default page
“welcome file” defined in web.xml
- Test the app
- Close the browser



Application Server Navigator

- Lists available servers
- Shows deployed apps
- Allows new server creation
- You can act on these using JDeveloper
 - Undeploy
 - Start Admin Console for server



Demo

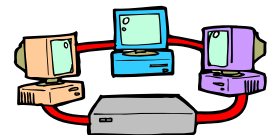
The Best of Both Worlds

- OJDeploy
 - ‘Headless’ JDeveloper
 - Command line utility
 - Packaged with JDeveloper 11g
 - Search for ojdeploy in the JDeveloper Help Center
 - Allows automation of the pre-defined deployment profiles
 - Also runnable from ANT
- Manages
 - Packaging and deployment
 - JDBC data sources
 - Security permissions propagation
 - Deploying users and roles for testing



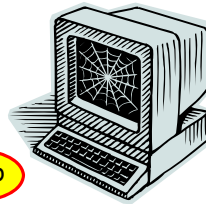
Agenda

- Deployment concepts
- JDeveloper support
- **Deploying from WLS Console**



Deploying From WLS Console

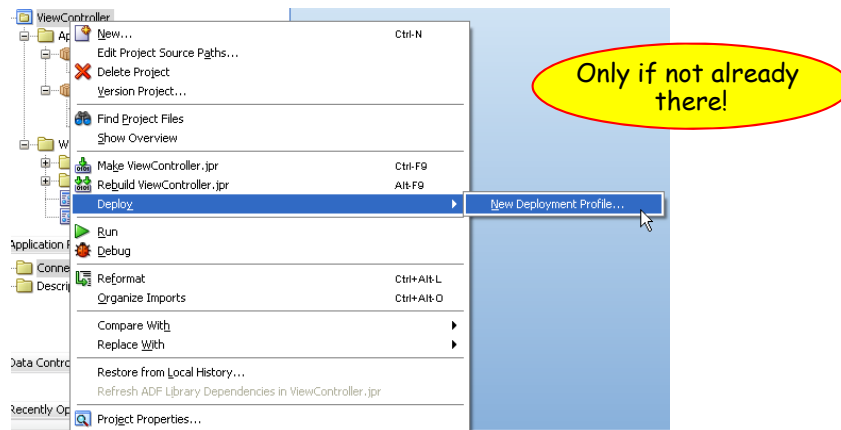
- The app server is usually under the control of the app server administrator
 - (Be kind to your app server administrator)
- You need to package the EAR file and let them know where it is
 - Select “Deploy to <app name>” from the Application menu in the navigator
- The administrator will deploy the EAR file to a new or existing application node
 - Setting up the application is a one-time task
 - Deploying the app after the setup is easier than before the setup



Configure the App Server

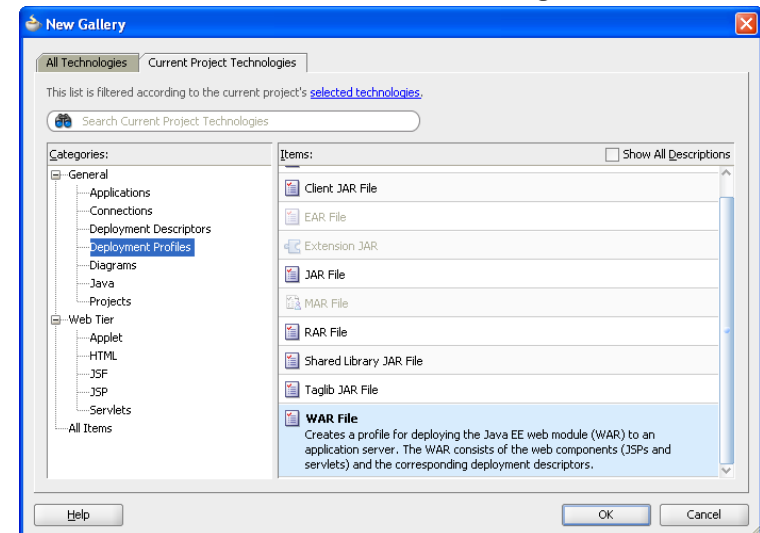
- Results in a standalone WLS server
- Windows Start menu
 - Start | Programs | Oracle Fusion Middleware 11.1.1.x | WebLogic Server 11g | Tools | Configuration Wizard
- Follow the steps in the white paper
 - The following assumes this is complete and the app server is started
- Note: Use the following as a guide for deploying with JDev after 11.1.1.1

Create a Deployment Profile on the ViewController Project



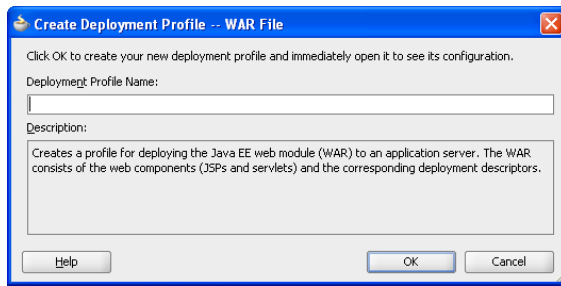
- Also accessible in the Deployment page of Project Properties

New Gallery



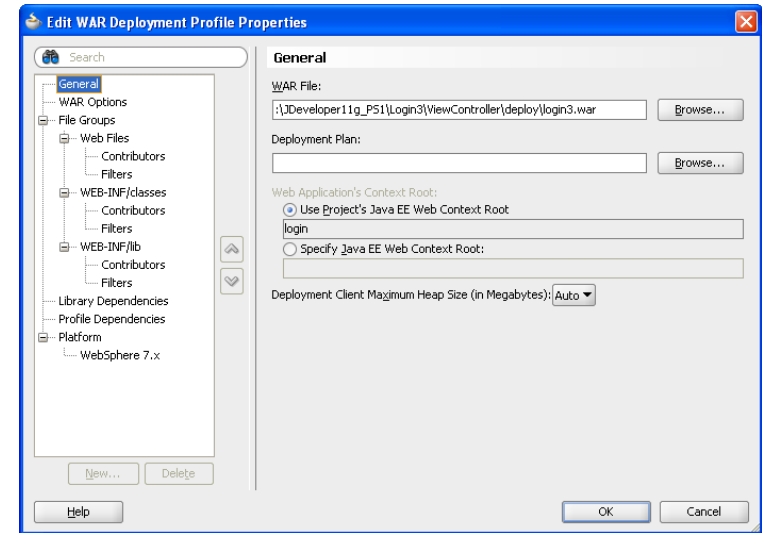
- Double click “WAR File”

Create WAR Deployment Profile



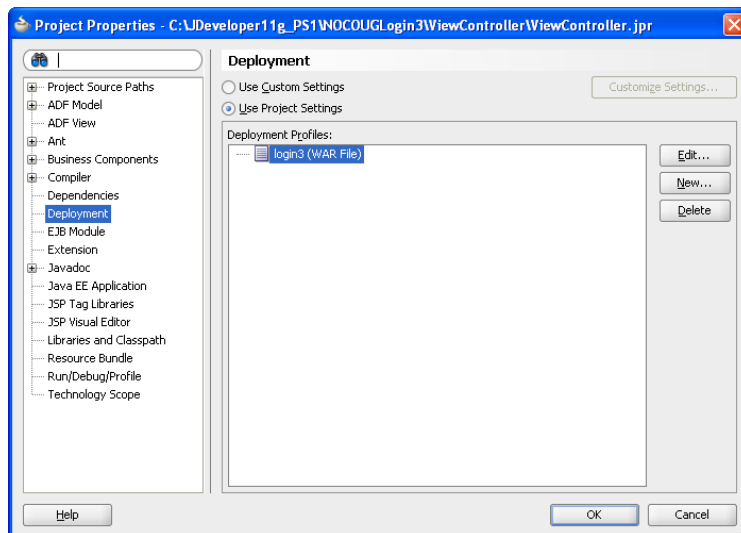
- Enter a name and click OK

Deployment Profile Properties



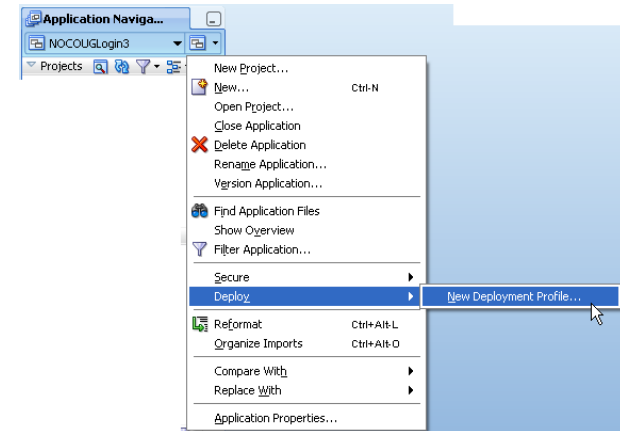
- Defaults are OK

Project Deployment Page



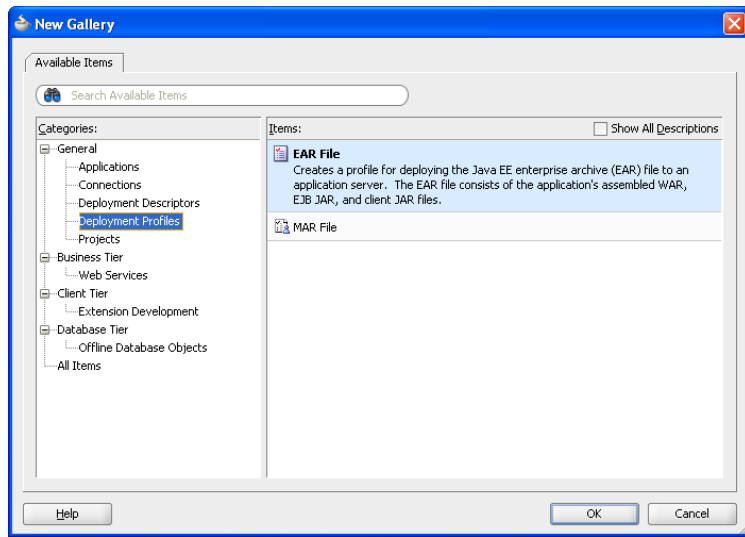
- Defaults are OK

Application Menu - Deploy



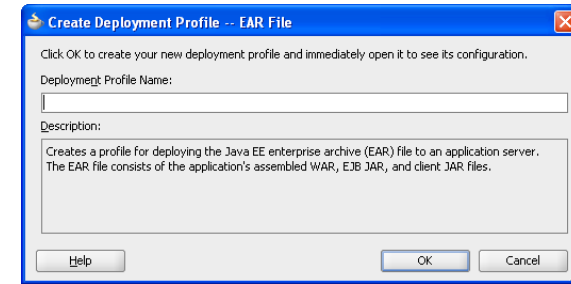
- First time in app, no deployment profile

New Gallery – EAR File



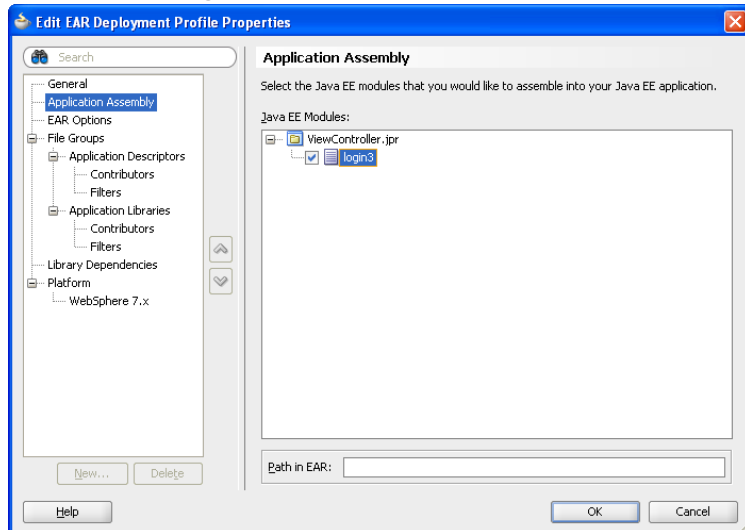
- Double click “EAR File”

Create EAR Deployment Profile



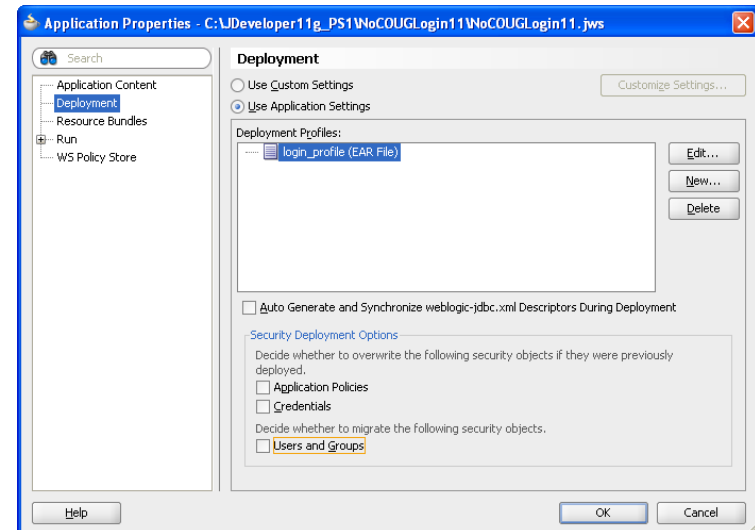
- Enter the name and click OK

EAR Deployment Profile Properties



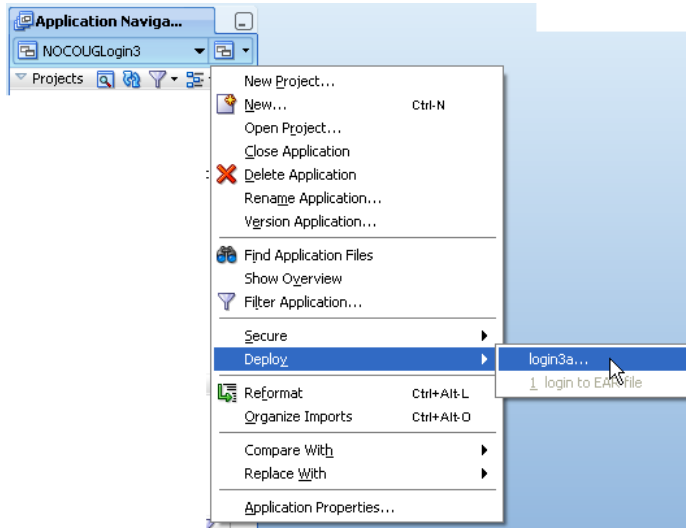
- Application Assembly Page
 - Select WAR deployment profile

Application Deployment Properties

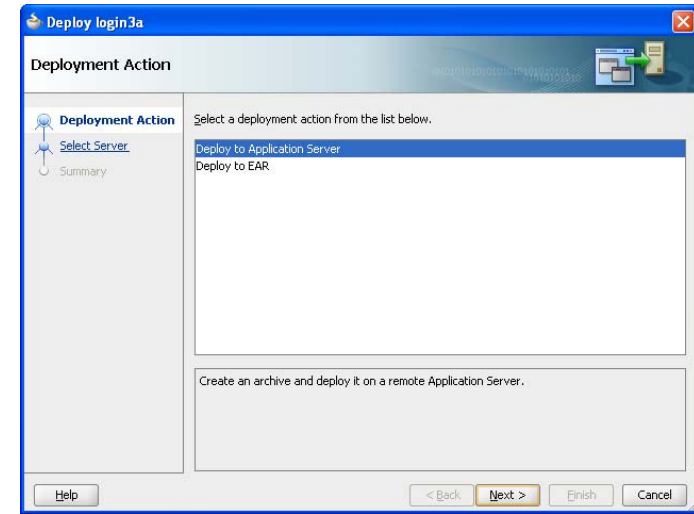


- You can visit the Deployment page later in the Application menu (Application Properties)

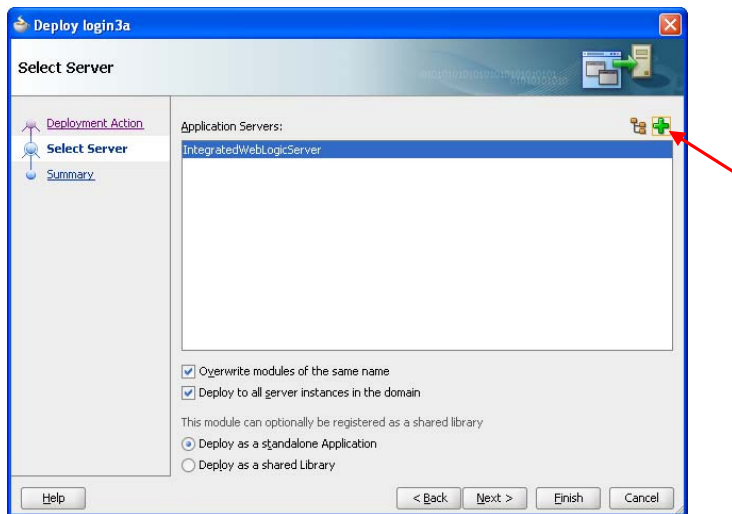
Application Menu - Deploy EAR



Deploy Application - Action

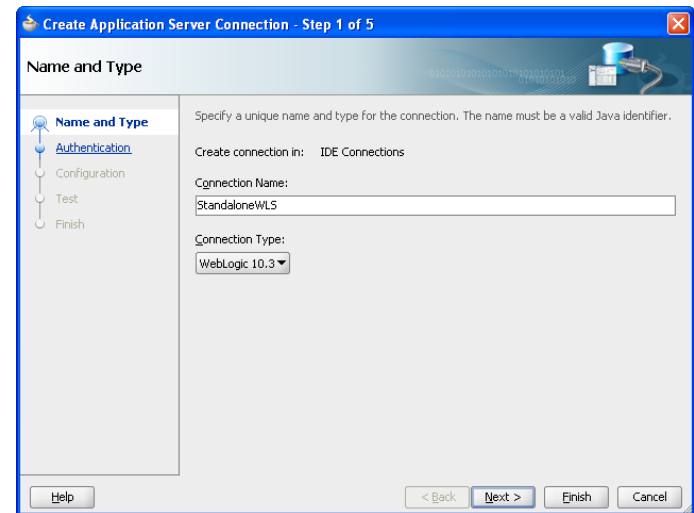


Deploy to Server



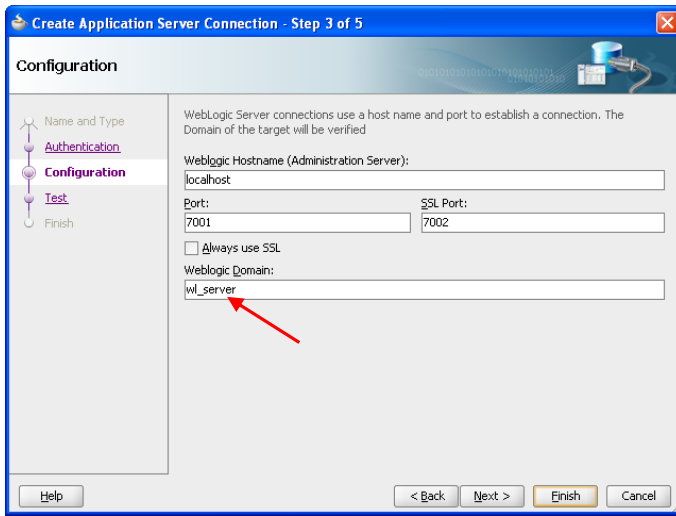
- Click "+" (green plus) to add a connection

Define the Server Connection



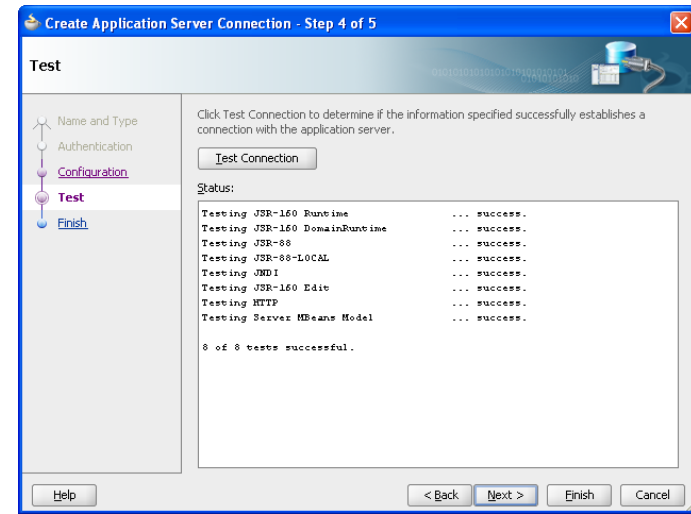
- Step 2 - password
– From the Configuration Wizard

Server Details



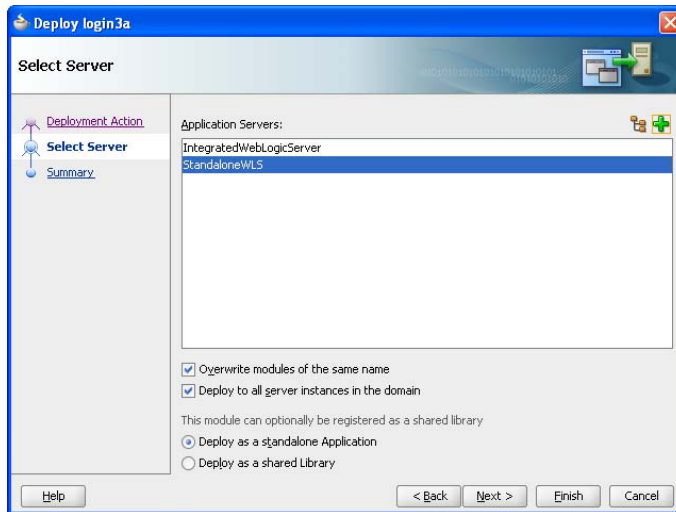
- Weblogic Domain from the Configuration Wizard

Test



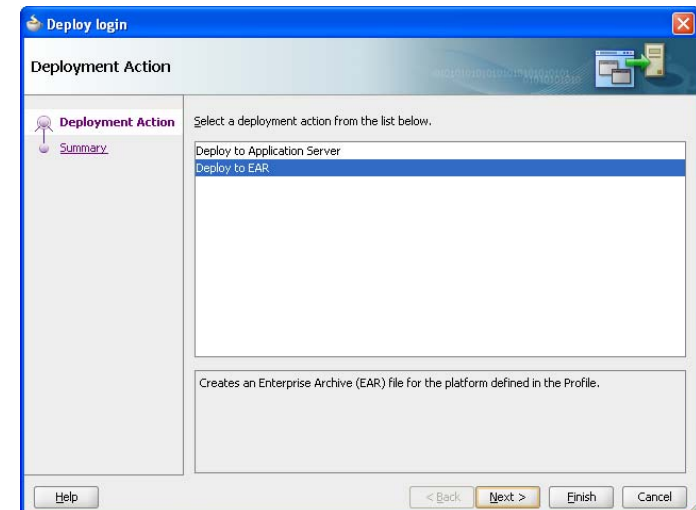
- Be sure the server is running
- Finish

Select the New Connection



- Finish & Test

Deploy Application - Action

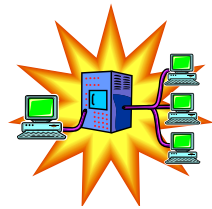


Log Window

```
Deployment - Log
[07:02:48 PM] >>>> Warning: Unable to determine the target platform from the Profile. Using default...
[07:02:48 PM] ---- Deployment started. ----
[07:02:48 PM] Target platform is (WebLogic 10.3).
[07:02:48 PM] Running dependency analysis...
[07:02:48 PM] Building...
[07:02:55 PM] Deploying 2 profiles...
[07:02:56 PM] Wrote Web Application Module to C:\JDeveloper11g_PSI\login3\ViewController\deploy\login3.war
[07:02:56 PM] Wrote Enterprise Application Module to C:\JDeveloper11g_PSI\login3\deploy\login3a.ear
[07:02:56 PM] Elapsed time for deployment: 8 seconds
[07:02:56 PM] ---- Deployment finished. ----
```

Then Deploy in the App Server

- You can invoke the console from
 - A URL: `http://localhost:7001/console`
 - Or the Application Server Navigator
- Basic steps:
 - Drill into “Deployments”
 - Click the “Install” button
 - Find EAR file in file system and go!
- Additional common tasks
 - Define data sources
 - Deploy permissions



WLS Console - Home Page

ORACLE WebLogic Server Administration Console

Home Page

Information and Resources

- Helpful Tools
 - Configure applications
 - Recent Task Status
 - Get your console preferences
- Domain Configurations
 - Domains
 - Domain
 - Environment
 - Servers
 - Clusters
 - Virtual Hosts
 - Migratable Targets
 - Machines
 - Work Managers
 - Startup And Shutdown Classes
 - Monitor servers
 - Services
 - Messaging
 - JMS Servers
 - Store-and-Forward Agents
 - JMS Modules
 - Path Services
 - Bridges
 - JobC
 - Data Sources
 - MUS Data Sources
 - Data Source Factories
 - Persistent Stores
 - XML Registries
 - XML Entity Caches
 - Foreign JNDI Providers
 - Work Contexts
 - JCOM
 - Mail Sessions
 - FileT3
 - JTA
 - Interoperability
 - WTC Servers
 - Jolt Connection Pools
 - Diagnostics
 - Log Files
 - Diagnostic Modules
 - Diagnostic Images
 - Archives
 - Content
 - SNMP

Your Deployed Resources

- Deployments

Your Application's Security Settings

- Security Realms

Deployments Page

Summary of Deployments

Messages

- All changes have been activated. No restarts are necessary.
- Selected Deployments were deleted.

Summary of Deployments

Control Monitoring

This page displays a list of Java EE applications and stand-alone application modules that have been installed to this domain. Installed applications and modules can be started, stopped, updated (redeployed), or deleted from the domain by first selecting the application name and using the controls on this page.

To install a new application or module for deployment to targets in this domain, click the Install button.

Customize this table

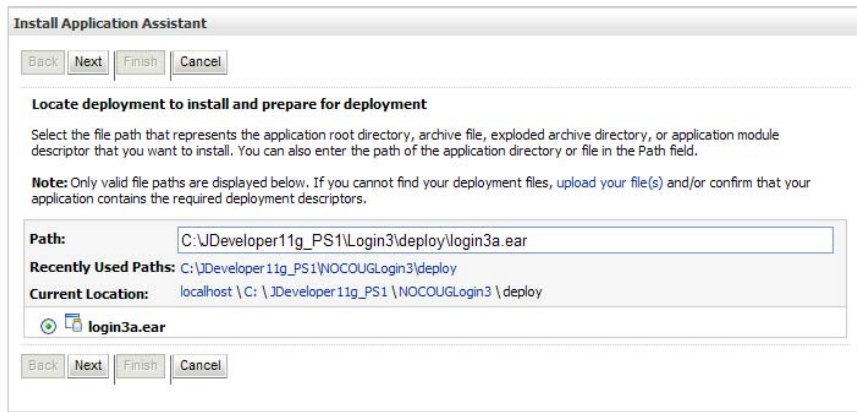
Deployments

| Name | State | Health | Type | Deployment Order |
|---|--------|--------|------------------------|------------------|
| adf.oracle.domain(1.0.11.1.1.2.0) | Active | | Library | 100 |
| adf.oracle.domain.webapp(1.0.11.1.1.2.0) | Active | | Library | 100 |
| OMS Application (11.1.1.1.0) | Active | OK | Web Application | 5 |
| PMW Welcome Page Application (11.1.0.0.0) | Active | OK | Enterprise Application | 5 |
| adf(1.2.1.2.9.0) | Active | | Library | 100 |
| adf(1.2.1.2.0.1) | Active | | Library | 100 |
| ohw-cdf(1.0.0) | Active | | Library | 100 |

Health of Running Servers

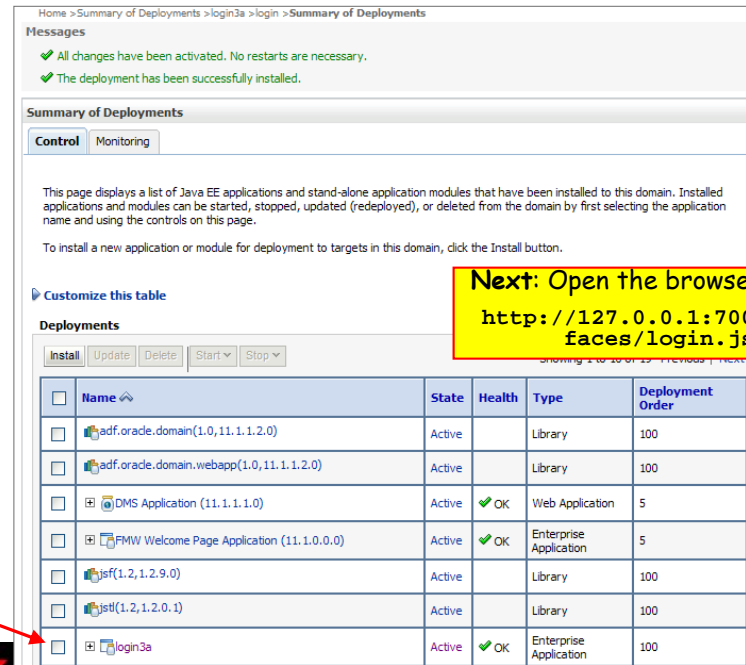
- Failed (0)

Follow the Screens



- Find the file in the file system
 - Select it. Click Next

Success!



Next: Open the browser and test.
<http://127.0.0.1:7001/login/faces/login.jspx>

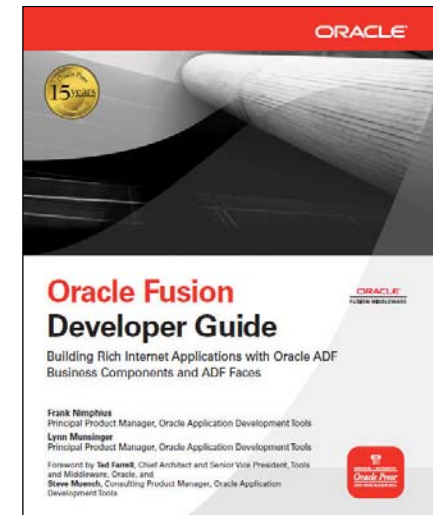
We're Not Done Yet?

This is not the end.
It is not even the beginning
of the end.
But it is, perhaps,
the end of the beginning.

— Winston Churchill (1874-1965)

Other Resources

- White paper
- *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework 11g Release 1 (11.1.1)*
 - PDF at OTN, online in JDev
 - Chapter 32
- *Oracle Fusion Middleware Security Guide 11g Release 1*
 - PDF at OTN
- *Oracle Fusion Developer Guide*
 - Nimphius and Munsinger, McGraw-Hill Professional, Oracle Press (2010)
 - Brief mention in Chapter 21



Summary

- Java EE web applications are deployed to the app server using EAR files
- EAR files contain WAR files
- WAR files contain application files and all required libraries
- JDeveloper's deployment profiles help gather the files (project level and application level)
- Run a utility to create the EAR file and deploy to the app server
- Alternatively, use WLS Console
- Testing deployments is a best practice



- Please fill out the evals
- Books co-authored with Dr. Paul Dorsey, Avrom Roy-Faderman, & Duncan Mills



<http://www.quovera.com>

- Founded in 1995 as Millennia Vision Corp.
- Profitable without outside funding
- Consultants each have 10+ years industry experience
- Strong High-Tech industry background
- 200+ clients/300+ projects
- JDeveloper Partner
- More technical white papers and presentations on the web site