# *JVM Cutover for Oracle Forms*

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# Agenda

- **Forms Strategy in the SOA-BPEL-AIA era**
- **Forms upgrades and Sun generic JRE landscape outlook**
- **Quick Start Guide**
- **Definitions**
- **Why is Oracle moving away from Jinit?**
- **Forms-based Apps Review**
- **The JRE's used by Oracle Forms product stack.**
- **Usable Sun JRE versions**
- **JAR file considerations**
- **XML File considerations**
- **Third-party app considerations**
- **FRM-92160 "Web Client Version Too Old" Error**
- **Windows Vista issues**
- **How to configure for Sun JRE**
- **Useful References and Links**
- **Questions, Answers, Comments**

# Strategy Suggestion

1. *Set your sights on upgrading your Oracle Forms to Forms 11. This version of Forms is <u>currently slated</u> to be the more fully "SOA-enabled" version of Forms (more on that shortly).*

   **"Forms cannot yet (as of version 10.1.2) easily register an interest in a BPEL event and automatically be notified if input is needed from it. In version 11 of Forms we intend to have functionality in place that will make this much easier."**

   **- Oracle (Jan Carlin and Duncan Mills)**

   **<u>References</u>**
   **Oracle Forms 10*g* Release 2 (10.1.2.x) Statement of Directions (May 22, 2008)**
   <u>http://www.oracle.com/technology/products/forms/htdocs/10gR2/clientsod_forms10gR2.html</u>

   **Oracle Forms in the SOA World by Robin Zimmermann**
   <u>http://www.oracle.com/technology/oramag/oracle/05-mar/o25forms.html</u>

   **Oracle Forms & a Service Oriented Architecture (SOA)**
   **A Whitepaper from Oracle Inc. June 2007**
   <u>http://www.oracle.com/technology/products/forms/pdf/10gR2/forms-soa-wp.pdf</u>

# XP Worldwide "Downgrades"

| | | | | | |
|---|---|---|---|---|---|
| 🇺🇸 The United States | 101 | 30.8 % | | | +9% |
| 🇧🇷 Brazil | 19 | 5.8 % | | | +90% |
| 🇵🇱 Poland | 17 | 5.2 % | | | +31% |
| 🇦🇺 Australia | 15 | 4.6 % | | | −40% |
| 🇲🇽 Mexico | 12 | 3.7 % | | | +9% |
| 🇨🇦 Canada | 9 | 2.7 % | | | −47% |
| 🇻🇳 Viet Nam | 8 | 2.4 % | | | +167% |
| 🇮🇷 Iran | 7 | 2.1 % | | | +133% |
| 🇵🇹 Portugal | 7 | 2.1 % | | | +75% |
| 🇳🇱 The Netherlands | 6 | 1.8 % | | | +200% |
| 🇮🇩 Indonesia | 5 | 1.5 % | | | +150% |
| 🇪🇸 Spain | 5 | 1.5 % | | | +67% |
| 🇵🇭 The Philippines | 5 | 1.5 % | | | 0% |
| 🇹🇷 Turkey | 5 | 1.5 % | | | −37% |
| 🇷🇴 Romania | 4 | 1.2 % | | | +100% |
| 🇮🇳 India | 4 | 1.2 % | | | +33% |
| 🇸🇰 Slovakia | 4 | 1.2 % | | | +33% |
| 🇦🇪 The United Arab Emirates | 4 | 1.2 % | | | +300% |
| 🇩🇪 Germany | 4 | 1.2 % | | | 0% |
| 🇺🇦 Ukraine | 4 | 1.2 % | | | 0% |
| 🇸🇦 Saudi Arabia | 4 | 1.2 % | | | −33% |
| 🇻🇪 Venezuela | 4 | 1.2 % | | | +100% |
| 🇦🇴 Angola | 4 | 1.2 % | | | 0% |
| 🇵🇪 Peru | 3 | 0.9 % | | | +50% |

# Recent OS Stats

Leopard drubs Vista in corporate satisfaction survey. Mac business users 5x more likely to say they're 'very satisfied' than Vista users.(1)



Intended business OS purchase rate, Q2 '08

Corporate user satisfaction rate, Feb '08

(1) http://en.wikipedia.org/wiki/Windows_vista#cite_note-computerworld-changewave-5

# JRE Cutover Decisions and how Forms Upgrade Shapes those Decisions

- Since cutover from Jinitiator to Sun JRE on the client machines is potentially a huge task in terms of number of clients...

- Your strategy can be to only do this when you make the step to "more-fully SOA-enabled" Forms. This is the main driver.

- It appears this shall be Forms 11 and consequently you will then deploy J2EE version 6 to your client machines (Sun JRE 1.6.x_x) at that point, and at which time Jinitiator must be decommissioned and can (optionally) be deinstalled from clients.

# Key Forms Features

- **A Forms which has Java Importer capability (PL/SQL wrappers for Java).**

- **A Forms which can register an interest in BPEL-compliant services and can receive notifications from those services.**

- **Just being at 3-tier architecture really won't' cut it. Need to be on Forms 11 at a minimum in order to "not miss the bpel". & should be at 10gAS not 9iAS.**

- **Management wishing to leverage their existing Oracle Forms into the future are recommended to be sure to keep up with _SOA-BPEL related_ Forms patches and upgrades thereafter.**

# Upgrade Improvements from Oracle to Make Things Easier

- Smoother version-to-version upgrade commitment from Oracle should make this easier:

- "Oracle will allow compatibility changes between Database Required Support Files (RSF's) and PL/SQL versions to occur ONLY across major releases of the database"

- Example: 10g DB to 11g DB .

# A Suggested Strategy Option

- This suggests that for those enterprises for which Forms major release upgrades are a major planning and implementation challenge, a possible strategy would be to _start planning ahead now_  to do one sweeping, major upgrade event:

  Proposed "Leveraged Strategy" Upgrade Plan Steps

  (1)        Upgrade Forms to version 11
  (2)        Upgrade Database(s) to 11g
  (3)        Recompile all Forms applications (RSF-Pl/Sql)
  (4)        Reconfigure Forms to push J2EE 6 on clients
             (this presentation details how to do this)
  (5)        Decommission and Uninstall Jinitiator from clients
  (6)        _Optionally_ can now upgrade clients to Win Vista.

# Ideas of Leveraged Strategy Codename: "Oceans 11"

1. Positions your existing Forms to be SOA-BPEL compatible, enabled and "compliant".
2. Positions your existing Forms to be using J2EE version 6 of the client JRE (JRE 1.6.x_x) which is the generic Sun JRE version *certified* for Forms 11.
3. Implements the REQUIRED Jinitiator retirement.
4. Requires your organization to only deal ONCE with the re-compiling of all Forms applications due to the Database RSF – PL/SQL compatibility requirement across major database releases (e.g. 10g →11g).
5. Leverages new Oracle 11g RDBMS features.
6. Positions you to be able to go to Windows Vista on clients (*very* optional).

# The Forms "Java Importer"

- **The functionality that makes it possible to call out to Java on the file system is called the Java Importer. It is incorporated into the Forms Builder and takes a java class as an input and creates a PL/SQL package that acts as a wrapper around the Java class making it possible to call Java code from a PL/SQL trigger or function/procedure.**

# Java Importer is Key

- **Develop subject matter experts in this area on your teams.  Existing forms dev't staff are an excellent choice for this new task.**

- **Subject matter experts in your org who understand how to use Java Importer to create PL/SQL wrappers for Java will help to ensure that existing Forms investments can be integrated into new parts of the enterprise which are SOA-BPEL.**

# There is a Quick Start Guide
## (if you've a competing priority)

- **Reconfiguring Oracle Forms for generic Sun JRE is easy.**
- **Only a few edits to formsweb.cfg file – no worries!**
- **Instructions can be downloaded from:**

  **http://www.consultingcommandos.com/smf3**

  **then go to the "JVM Cutover for Oracle Forms" Board and find most recent version (use logon: "nyoug" and password "nyoug2008").**

- **Or can email author for copies/info of all powerpoint + extra e-goodies at any or all of:**

  **mail@consultingcommandos.com**
  **standeng@tusc.com**
  **gilstanden@hotmail.com**

# Definitions

- "BPEL" Business Process Execution Language. BPEL is an emerging standard for orchestrating disparate and heterogenous business services into a process flow."

  BPEL also facilitates making those reusable unique services available to a wide range of process flows from different applications.

# Definitions

- **"More-fully BPEL-enabled"  This phrase is used in this presentation to refer to a Forms functionality (not yet available) which will allow Forms to poll the BPEL server with the help of a Forms timer.  Will enable Forms to register an interest in a BPEL-compliant service (a "BPEL event") and would allow Forms to be automatically notified if input was needed from the Form by that service.**

- "SOA" An architecture for an IT computing environment in which common business services such as returning an address, or returning a supplier name, or any other information service common to one or more applications are handled by a SINGLE common service which communicates the information to multiple applications using BPEL.  SOA replaces the architecture in which multiple applications were calling out to the RDBMS for redundant information.

# Definitions

- **"JVM"**

  **Java Virtual Machine.  The java class loader together with the java execution engine.**

- **"JRE"**

  **Java Runtime Environment.  The JVM together with the Java API Classes ("Class Files")**

- **"OHS"**

  **Oracle HTTP Server (aka "Apache HTTP Server").**

# Definitions (continued)

- **"MOD_OC4J"**

  **Routes requests from OHS to OC4J via AJP 1.3 protocol. Replaced MOD_JSERV.**

- **"OC4J"**

  **Oracle Containers for J2EE. Each OC4J instance has it's own JRE.**

- **"AJP 1.3"**

  **Apache jserv protocol. Communication protocol between OHS and OC4J**
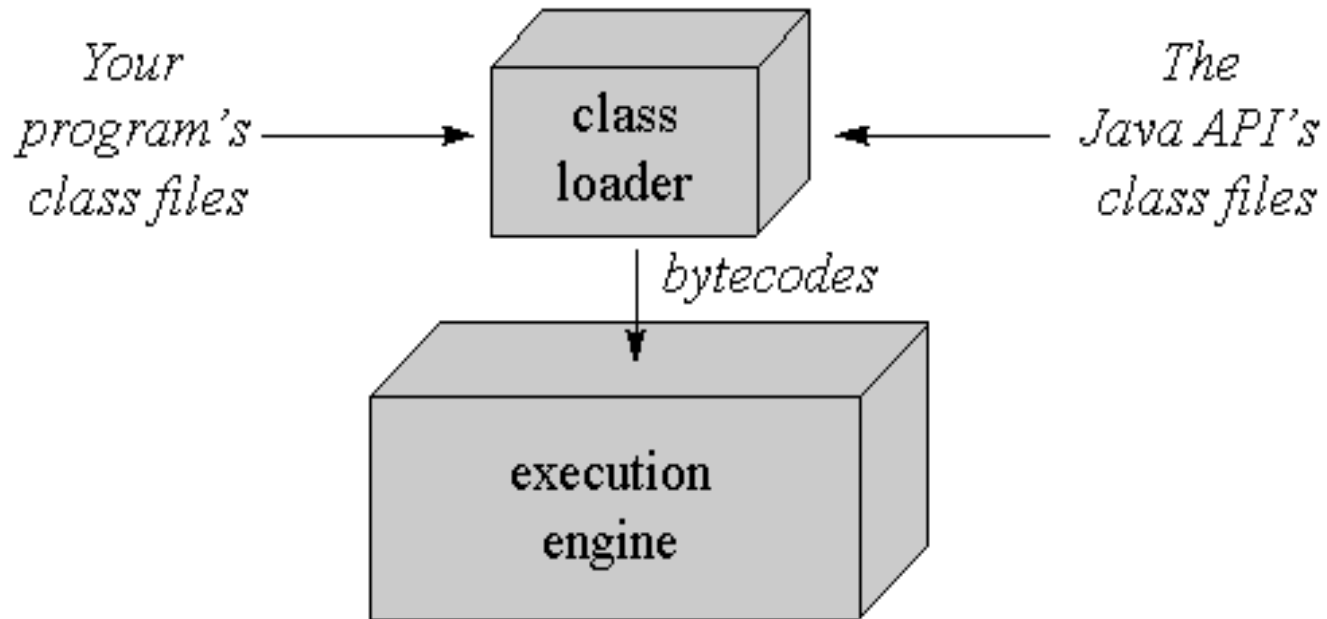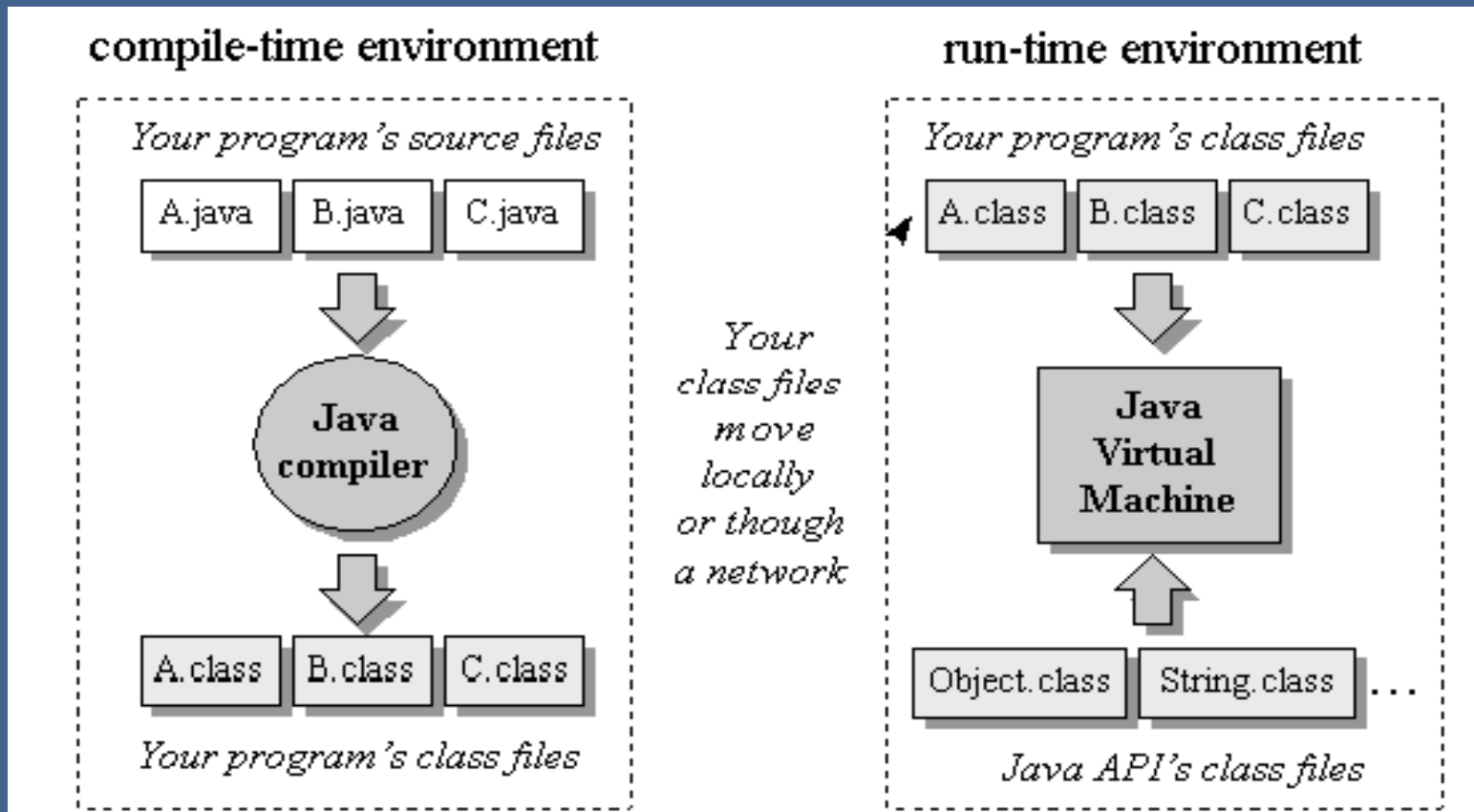
# Diagram Definition of JVM



Figure 1-3. A basic block diagram of the Java virtual machine.

**The JVM = the "Java Class Loader" + the "Java Execution Engine".**

# Diagram Definition of JRE



compile-time environment

Your program's source files

| A.java | B.java | C.java |

Java compiler

A.class | B.class | C.class

Your program's class files

Your class files move locally or though a network

run-time environment

Your program's class files

| A.class | B.class | C.class |

Java Virtual Machine

Object.class | String.class | ...

Java API's class files

**The "JRE" = the "JVM" + the "Java API classes".**

# Why Java in the 1ˢᵗ Place?

- Java is an "OS"-like layer of it's own.

- There are physical java "chips", but uncommon.

- Java was designed for networks.

- Java typically runs as "virtual machine" (software).

- Java is plaform-independent.

- Java has customizable degrees of security.

- Programs are delivered on-demand to clients.

# Why Jinitiator in the 1st Place?

- **Oracle licensed Sun technology so they could control the Jinitiator product line completely in the early Forms releases.**

- **Oracle Jinitiator delivered an Oracle-owned and certified JRE.**

# What's Wrong with Jinitiator?

- **Not certified with Oracle Apps 12i !**

- **Will _NOT BE_ certified with Apps 12i !**

- **No longer part of Oracle Forms SOD.**

- **Will not be certified with Forms.**

- **Doesn't work with Windows Vista.**

# Currently Certified Sun JRE's

- **Native Sun JRE plug-in version 1.5.0_12 (and also 1.5.0_10-erdist) are now certified and generally available for use with Release 11i and 12i of e-biz; BUT**

- **Proceed carefully when using client Sun JRE with other 3rd party apps which rely on Forms (e.g. SungardHE, et.al.).**

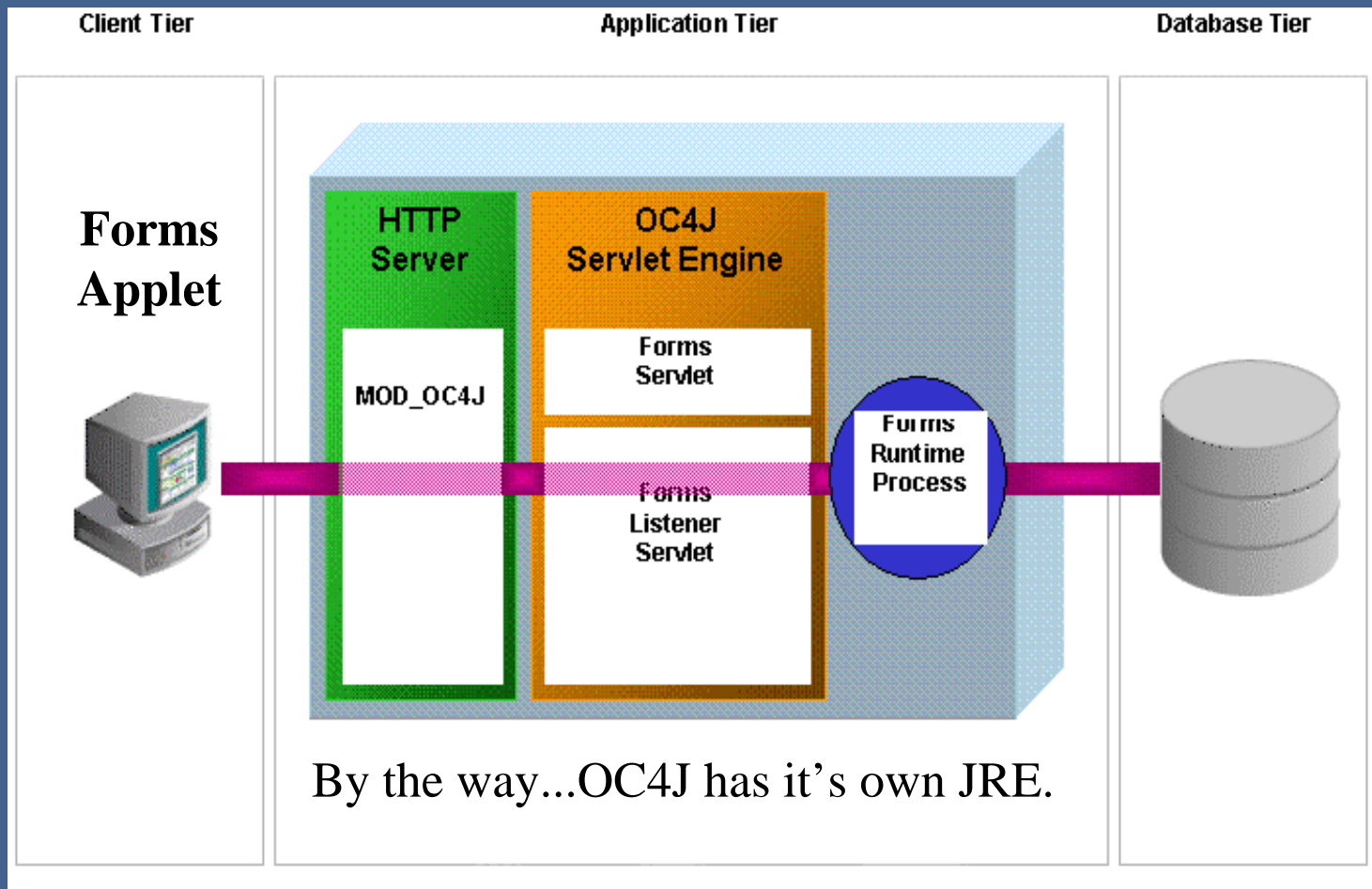- **Test 3rd party forms-based apps before deployment with a validation plan !**

# Available Versions

- **Oracle made available a special version of Sun JVM called 1.5.0_10-erdist; can be downloaded from Oracle.**

- **Generally it is recommended now to use 1.5.0_12 generic Sun JVM if deploying with current Forms infrastructure (but see cert matrix – 1.**

- **You can try out both and do extensive testing and see what results you get.  If you find a bug, you can try the other and see how it works under the same form.**

- **But may want to wait for the SOA-BPEL Forms upgrades and just go with J2EE 6.**

# Oracle Forms Applications Basics.

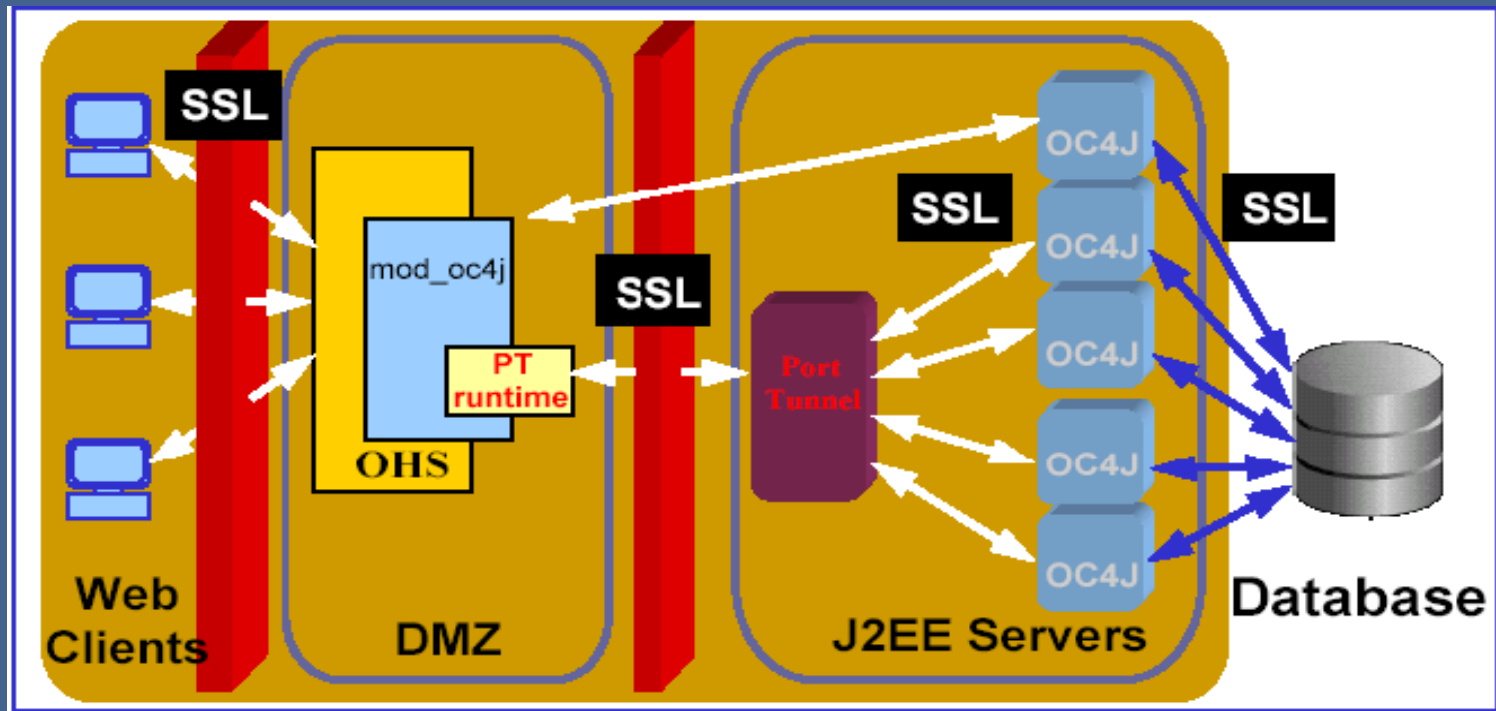https://myapp.mycompany.com:7777/forms/frmservlet?config=myapp&form=hrapp

# OHS and OC4J

- **Note: The communication between OHS and OracleAS Port Tunnel can be encrypted using SSL.**

# OC4J Server-Side JVM

- **OC4J JRE is supplied with the standard JDK provided by the mid-tier OS vendor (or 3ʳᵈ party) . It's a different JRE "flavor" than the client JRE.**

- **The Forms Applet talks via the Forms Listener Servlet at the Java level via the OC4J JRE.**

- **Because both the client and OC4J have JRE's, a client can establish a persistent DB connection and session just like traditional Forms6i client/server.**

- **There are no changes here fortunately and nothing to worry about.  This OC4J JRE stays the same.**

# RDBMS OracleJVM

- **Incidentally, there is yet another JVM which is supported by Oracle: "OracleJVM" which is rdbms server-side.**

- ***"The Oracle database embeds a Java VM, which lets you run Java directly in the database."***

- **This JVM does not require a client-side JVM.  All Java processing takes place in the database and data is returned to the client. No worries here. This JVM is not changing over as the Jinit client is.**

# Forms Servlet Process

- **Forms Servlet reads formsweb.cfg file.**

- **For example, looks for [myapp] section.**

- **Servlet finds [myapp] in formsweb.cfg!**

  **...config=myapp&form=hrapp**

- **Uses $OH/forms/server/formsweb.cfg file !**

- **Formsweb.cfg is where JRE type is set.**

# Forms Servlet

https://myapp.mycompany.com:7777/forms/frmservlet?config=myapp&form=hrapp

- Once the Oracle Application Server Forms Services applet is running, it starts up a Forms session by contacting Forms Listener Servlet: http://mycomputer.com:7777/forms/lservlet.

- The Oracle HTTP Server listener receives the request. It forwards the request to OC4J.

- Forms Listener Servlet starts up a Forms runtime process (frmweb) for the forms session.

**baseHTMLie**
**baseHTMLjinitiator**
**baseHTMLjpi**
**baseHTML**
**IE**

# Also must change 4 more...

- **There are 4 more formsweb.cfg settings relevant to Sun JVM configuration:**

- **jpi_classid – The ClassID of the Sun JVM to use (Internet Explorer specific)**

- **jpi_codebase – Download location of the CAB file for the Sun JVM (IE specific)**

- **jpi_mimetype – Used primarily for Netscape/Firefox but also passed on to IE**

- **jpi_download_page – Download location of the JRE installer for Netscape/Firefox**

# BaseHTML

- OC4J determines baseHTML file to use.
- OC4J uses the following criteria:
- (a) Browser which made the request.
- (b) Platform on which browser runs.

# AND...

- (c) Parameters in formsweb.cfg file!

# Editing formsweb.cfg

- **The formsweb.cfg file can be edited directly, or**

- **The formsweb.cfg file can be edited using OEM Application Server Control Console ("AS Grid Lite").**

- **Using OEM is the preferred and way!**

- **If you do it manually, make a backup copy of it first, of course!!**

In this section you can create, edit and delete configuration settings in three different configuration files: the formsweb.cfg which is the main configuration file for a Forms installation, the ftrace.cfg which is the trace facility configuration file and the Registry.dat file which governs the font mapping.

ORACLE Enterprise Manager 10*g*
Application Server Control

Logs   Topology   Preferences   Help

Farm  >  Application Server: midl.jcarlin-lap2.us.oracle.com  >

**Forms**

| Overview | User Sessions | Configuration | Environment | JVM Controllers | Forms Utility |

Forms Configuration provides the ability to modify the files formsweb.cfg, ftrace.cfg and Registry.dat in use for this Forms instance.

Page Refreshed **Mar 21, 2005 9:22:31 AM**

View   Forms Web Configuration (formsweb.cfg)

( Create New Section )  ( Revert )  ( Apply )

( Duplicate )  ( Edit )  ( Delete )

| Select | Section | Description |
|---|---|---|
| ⦿ | default | formsweb.cfg defines parameter values used by the FormsServlet (frmservlet) This section defines the Default settings. Any of them may be overridden in the following Named Configuration sections. If they are not overridden, then the values here will be used. The default settings comprise two types of parameters: System parameters, |
| ◯ | sepwin | Example Named Configuration Section Example 1: configuration to run forms in a separate browser window with "generic" look and feel (include "config=sepwin" in the URL) You may define your own specific, named configurations (sets of parameters) by adding special sections as illustrated in the following examples. |
| ◯ | jpi | Example Named Configuration Section Example 2: configuration forcing use of the Java Plugin in all cases (even if the client browser is on Windows) |

**Figure 14: EM Configurations page**

# Reason to Edit formsweb.cfg

- **Choose to use Sun JRE or Jinit.**

- **Choose version of JRE to use.**

- **Set JRE download source.**

- **Set JAR file download selection.**

| baseHTMLie | basejpi.htm |
|---|---|
| baseHTMLjpi | basejpi.htm |
| baseHTMLjinitiator | basejpi.htm |
| baseHTML | basejpi.htm |
| IE (irrelevant) | "native" or "jinitiator" |

# Changes to formsweb.cfg for Sun JVM – (Step 2)

| | |
|---|---|
| **jpi_classid**<br>**(IE specific)** | **clsid:CAFEEFAC-0015-0000-0012-ABCDEFFEDCBA** |
| **jpi_codebase**<br>**(download location – can be local svr on your LAN)** | **http://java.sun.com/update/1.5.0/jinstall-1_5_0_12-windows-i586.cab** |
| **jpi_mimetype**<br>**(Netscape & Firefox)** | **"application/x-java-applet;version=1.5.0_12"** |
| **jpi_download_page**<br>**(Netscape/Firefox download location)** | **https://java.sun.com/j2se/1.5.0/download.html** |

# Also should set Jar File Parameter…

- "Oracle provides two Jar files (f90all.jar and f90all_jinit.jar). f90all.jar is a standard Jar file, and f90all_jinit.jar is a Jar file with extra compression that can 'only' be used with Oracle JInitiator."

- You may wish to experiment when switching to Sun JVM with using f90all.jar vs. f90all_jinit.jar.  You may see performance improvement.

  Reference:  Application Server Forms Services Deployment Guide 10g (9.0.4) Part Number B10470-01

# File web.xml

Advanced users might want to also edit the web.xml file to:

- Use a Forms Servlet config file other than the std. one in <ORACLE_HOME>/forms90/server/formsweb.cfg); uncomment and change the f90servlet "configFileName" servlet parameter.

- Run Oracle Forms using static HTML (instead of Forms Servlet).

- When Oracle Forms applications are run using a method other than the Forms Servlet (for example, static HTML pages, or JSPs), parameter settings in the formsweb.cfg file are NOT used.

- You may need to define servlet parameters for the Listener Servlet, such as workingDirectory and envFile (specifying the current working directory for the Forms runtime processes, and the file containing environment settings to be used).

- **Location:**
  j2ee/OC4J_BI_FORMS/applications/forms90app/forms90web/WEB-INF underneath <ORACLE_HOME>

## Additional Tuning Steps for JRE Plugin Ref. E-trng. Sess. 3 MEL AUSOUG 2007 "Tuning Oracle e-business Suite" Ahmed Alomari

1. Set plugin min/max heap sizes (mx512m, mx256m). Can be important with forms "CRM", "Dispatch Center", "Contact Center", "UWQ", etc.

2. Tune JRE options: Set "jar cache size" at 45Mb for each environment client will access regularly (e.g. if accessing DEV,TST,PRD set to 150Mb). Otherwise, each access will "wipe out" previous environment JAR cache.

3. Enable the java console on client. It adds only low overhead, but gives useful info and helps for local or remote debugging of client problems.

4. In java console, can look at exceptions such as "null pointer", and "out-of-memory" and can ensure JAR files are being cached by client.

5. Use JRE 1.5 or greater. Will see improved performance for java-bean based clients such as "CRM", "Dispatch Center", "Contact Center" etc. Any form which has added java processing should see 20-25% performance improvement. See also Metalink doc. 290807.1

# App-Specific Value Variants

- Some applications will use variants.

- e.g. Banner from SungardHE.

- Banner has app-specific parameters.

- Check your app docs for more info.  Note the "3" in the certification matrix for Sun Plugin 1.6 !

- Other apps may use variants as well!

- App-specific areas in formsweb.cfg [appname]

# Multiple JVM Client Versions

- **Note: It is very typical for client user machines to have multiple versions of Sun JRE as well as one or more Jinit versions already on them. When cutting over to Sun JRE you may have to clear the cache by going to the control panel and running a clearing procedure.  You may also wish to uninstall older versions but use caution with that. More on that later.**

# Multiple Client Java Versions

- **Here is an example of a workstation (mine).**
- **It has several versions of Java already installed.**
- **Note that many clients may already have J2EE 6**
- **Older versions may be needed for other java apps.**

| | |
|---|---|
| ☕ | **J2SE Development Kit 5.0 Update 12** <br><br> Click here for support information. |
| ☕ | J2SE Runtime Environment 5.0 Update 11 |
| ☕ | J2SE Runtime Environment 5.0 Update 12 |
| ☕ | J2SE Runtime Environment 5.0 Update 6 |
| ☕ | Java(TM) 6 Update 2 |

- **Novell Zen-works (big step to install if not already using Zen)**

# FRM-92160 Cache Clear Procedure

- When changing over to JVM from Jinit for the first time, clients may get the FRM-92160 Error.

- Try the following fix for this error:  On client:

1. Exit Browser
2. Start => Control Panel
3. Open Jinit (or JVM) console
4. Click "Cache" Tab
5. Click button to "Clear JAR Cache"
6. Restart browser and login to Forms app again.

- This will often clear the FRM-92160 error on client machines.

# Windows Vista

- "JInitiator is known to not work with Vista...Oracle therefore has no plans to certify JInitiator with Vista and Vista users should be steered towards Sun's plug-in ...once it is certified. That is planned for 10.1.2.3."

- Ref: (Client Platform Statement of Direction) http://www.oracle.com/technology/products/forms/htdocs/10gR2/clientsod_forms10gR2.html

- Ref was last updated March 13, 2007.

# Useful Comparisons

| Component | Apps11i | Apps12i |
|---|---|---|
| App Server | iAS 1.0.2.2.x. | Fusion midwr |
| Forms & Rpts | F&R 8.0.6 | 10g F&R |
| Apache Ver. | 1.3.19 | 1.3.34 |
| Forms | Forms 6i | Forms 10.1.2.x |
| Reports | Reports 6i | Reports 10.1.2.x |
| JDK (JVM) | 1.3.x, 1.4.x | 1.5.0_x,1.6.0_x |
| Servlet | mod_jserv | mod_oc4j |

# Oracle Forms SOD (November 2007)

- "Oracle is fully committed to support Oracle Forms, Reports and Designer for a very long period of time."

- "Oracle Forms and Oracle Reports will continue to evolve to allow customers to easily upgrade their applications to the web and benefit from the centralized deployment and shared services that the the application server provides.

- "With this strategy, Oracle allows customers to continue to leverage their existing investments for many years while offering a path to incrementally move to J2EE, at their own pace, using a productive and familiar development environment (Jdeveloper and ADF).

   Reference:
   www.oracle.com/technology/products/forms/pdf/10g/ToolsSOD.pdf

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# Credits

- **AUSOUG**
- **NYOUG**
- **TUSC – A Rolta Company**
- **Duncan Mills (Oracle Corp.)**
- **Grant Ronald and Steve Chen (Oracle Corp.)**
- **Notre Dame University**
- **USGS**
- **Ahmed Alomari**
- **Sten Vesterli**
- **Oratransplant blog**
- **Yelena Belyaeva-Standen**
- **Mary Standen**

# References

- http://download.oracle.com/docs/cd/B28196_01/core.1014/b28184/j2ee.htm
  **Section 3 Installing-Configuring myJ2EECompany App Infrastructure**

- http://practicalappsdba.wordpress.com/tag/1-beginners-guide/5-apps-architecture
  **Section 5 Apps Archiecture « Practical Apps DBA**

- http://technology.amis.nl/blog/index.php?p=169
  **Eating your own dogfood - use of Oracle Dev tools within Oracle Apps**

- http://download.oracle.com/docs/cd/B14099_12/web.1012/b14032/basics.htm
  **Basics of Deploying Oracle Forms Applications**

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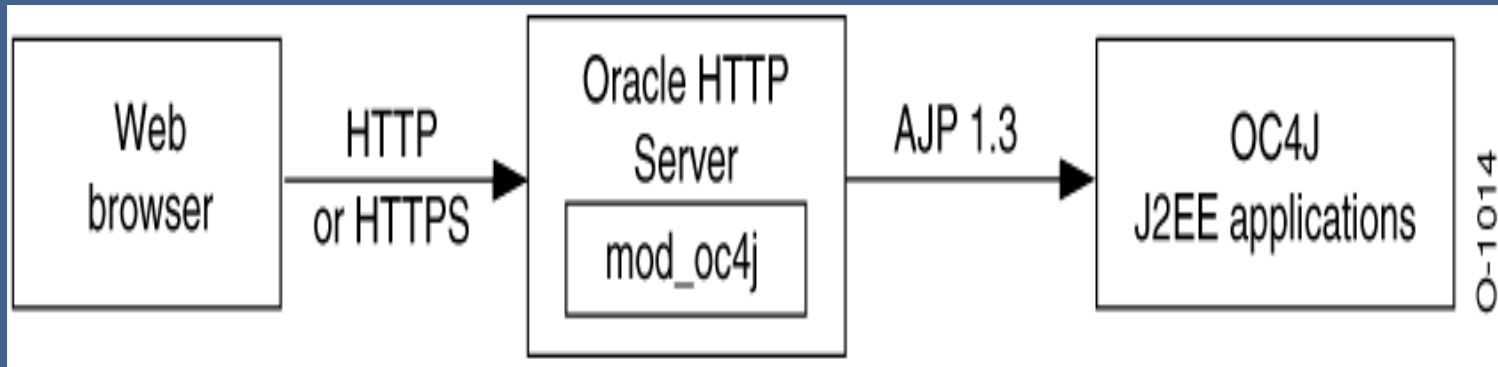  **OraTransplant » Setting dynamic version for Sun JPI for Oracle Forms**

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**All of these are available on the internet ! Or send me an email and I will send you copies and/or links to these documents.**