Upgrading Web Application Servers Used With the Third Maintenance Release

Overview

This document provides recommendations and explains the steps that you are required to complete if you want to upgrade your Web application server (JBoss Application Server, Oracle WebLogic Server, or IBM WebSphere Application Server) that is used when upgrading third party software with the third maintenance release for SAS 9.2.

The instructions in this document apply to an upgrade that is being performed on the same machine where the Web application server resided previously.

Requirements

The following requirements and guidelines apply to upgrades of JREs, JDKs, and Web application servers:

- If you are still running a version earlier than WebSphere 6.1.0.21, you need to upgrade in order for the third maintenance release for SAS 9.2 to run properly.

- Upgrades to JREs, JDKs, and Web application servers should conform to the requirements specified in SAS Third Party Software Requirements – Baseline and Higher Support at http://support.sas.com/resources/thirdpartysupport/baseline_plus.html.

- Consult your vendor’s documentation for the specific steps required to upgrade your third-party software.

- Any customizations that you have created in your web application server are lost after you apply the third maintenance release for SAS 9.2. Some examples of customizations that might be lost include application server command line options, jdbc datasource settings, and JMS configuration option changes. Before installing the third maintenance release for SAS 9.2, note any customizations that you have made so that you can restore them after applying the maintenance release. A backup is recommended to your web application server.

- For instructions on upgrading or modifying a JRE or JDK that is compatible with the third maintenance release for SAS 9.2, see Configuring SAS 9.2 to Use an Alternative Java Runtime Environment or Java Development Kit.

- For information about the WebLogic Server patches that are required, see Oracle WebLogic Server Support for SAS 9.2 at http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/weblogicsw.html.
Upgrading WebLogic Server

The third maintenance release for SAS 9.2 is compatible with the following WebLogic versions:

- Oracle WebLogic Server 9.2
- Oracle WebLogic Server 10.0
- Oracle WebLogic Server 10.3

WebLogic Server patches will be required if a minor upgrade (applying a maintenance pack to an existing WebLogic installation) to WebLogic Server 9.2 is completed. For information about the WebLogic Server patches, see Oracle WebLogic Server Support for SAS 9.2 at http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/weblogicsw.html. Patches are required whether you are performing a minor upgrade within a WebLogic 9.2 release or a major upgrade between WebLogic releases. Be sure to see the link above for specific patches.

The major supported upgrade paths are from:

- WebLogic Server 9.2 to WebLogic Server 10.3
- WebLogic Server 10.0 to WebLogic Server 10.3

If a major upgrade to WebLogic Server 10.3 is completed for the third maintenance release for SAS 9.2, WebLogic server patches will be required.

Performing a Minor Upgrade of WebLogic Server

To upgrade WebLogic and apply the third maintenance release of SAS 9.2, complete these steps:

1. Stop the WebLogic Servers (including the Admin Server and the Nodemanager).
3. Remove all patches from the installation.
5. Apply patches if they are required for the version of WebLogic you are upgrading to.
6. Verify that SAS 9.2 Web applications run satisfactorily after the Web application server upgrade is complete.
7. Follow the instructions in the sections “Installing a Maintenance Release” and “Maintenance Configuration” in the Planning for Maintenance Releases and Product Upgrades for SAS 9.2 document, and complete the procedures.
8. If needed, perform site-specific configuration of customizations that apply to Web application servers.
WebLogic Installation Generates DemoIdentity Certificate with a Different Common Name than Expected

If you are upgrading from 10.3.0, 10.3.1, or 10.3.2 to 10.3.3, WebLogic installation/upgrade generates the DemoIdentity certificate with a different CN than expected. This causes the DemoIdentity certificate to have the host name `rn360-a1-20`. The name on the DemoIdentity certificate must match the machine name or the WebLogic Configuration step will fail. This security feature is known as *Host Name Verification*. It is used to avoid "man in the middle" security attacks, which is a rogue program attempt to spoof a server into thinking it is communicating with a different program.

After the WebLogic upgrade installation and before you use the Software Deployment Wizard, you must regenerate the DemoIdentity certificate and the DemoIdentity keystore using these steps:

1. Open a command prompt and run the following command:
   `<WL_HOME>\server\bin\setWLSEnv.cmd` (Windows)
   `. <WL_HOME>/server/bin/setWLSEnv.sh` (Unix) (use the 'dot' command to run the script in the same shell)

2. Execute this command:
   ```
   java utils.CertGen -keyfilepass DemoIdentityPassPhrase -certfile democert -keyfile demokey
   ```

3. Execute this command:
   ```
   java utils.ImportPrivateKey -keystore DemoIdentity.jks -storepass DemoIdentityKeyStorePassPhrase -keyfile demoKey -keyfilepass DemoIdentityKeyStorePassPhrase -certfile democert.pem -keyfilepass demokey.pem -alias demoidentity
   ```

4. Replace `<WL_HOME>\server\lib\DemoIdentity.jks` with the file generated in step 3.

Performing a Major Upgrade of WebLogic Server

The examples in the following steps contain references to `C:\SAS\Config\Lev1\`, which might be different in your environment. To perform an upgrade from WebLogic 9.2 or WebLogic 10.0 to WebLogic 10.3 and apply the third maintenance release of SAS 9.2, complete these steps:

1. Stop the WebLogic Servers (including the Admin Server and the Nodemanager).


3. Follow the instructions in the Oracle WebLogic Server documentation to upgrade to WebLogic Server 10.3 with JDK 1.6.

4. Update the WebLogic Server version and JDK saved in the SAS deployment registry. Here are examples of the command and its usage:
   ```
   java -jar <sashome>/deploymntreg/sas.tools.deplomntreg.jar
   setInstallLoc jdk default <path>
   ```
java -jar <sashome>/deploymntreg/sas.tools.deploymntreg.jar
setInstallLoc weblogic default <path>

Example:
java -jar "C:/Program
Files/SAS/deploymntreg/sas.tools.deploymntreg.jar" setInstallLoc jdk
default "C:/Program Files/Java/java/jdk1.6.0_18"

5. Add -Dweblogic.serverStart.allowQuotes=true to
C:\SAS\Config\Lev1\Web\SASDomain\config\config.xml for the AdminServer-> arguments.
For example:

```xml
<server>
  <name>AdminServer</name>
  <machine>116787.na.sas.com</machine>
  <listen-port>7501</listen-port>
  <listen-address>116787.na.sas.com</listen-address>
  <tunneling-enabled>true</tunneling-enabled>
  <server-start>
    <name>AdminServer</name>
    <java-vendor>Sun</java-vendor>
    <java-home>C:\Java\jdk1.6.0_18</java-home>
    <bea-home>C:\bea\wlserver_10.3</bea-home>
    <arguments>
      -Dcom.sun.xml.namespace.QName.useCompatibleSerialVersionUID=1.0
      -Dweblogic.serverStart.allowQuotes=true
      -Xms256m -Xmx512m
      -XX:PermSize=48m -XX:MaxPermSize=128m
      -XX:CompileThreshold=8000
    </arguments>
  </server-start>
</server>
```

6. Edit the following two files:
   1. C:\SAS\Config\Lev1\Web\SASDomain\bin\setDomainEnv.cmd. Change
      JAVA_HOME and WL_HOME to use a Java 6 JDK and WebLogic 10.3 home directory,
      respectively. (Check other files in the directories for instances of JAVA_HOME and
      WL_HOME and edit them.)
      For example:
        o set JAVA_HOME=C:\Java\jdk1.6.0_18
        o set WL_HOME=C:\bea\wlserver_10.3
   2. C:\SAS\Config\Lev1\Web\SASDomain\bin\setWLSEnv.cmd.
      For example:
        o set WL_HOME=C:\bea\wlserver_10.3

7. Restart the Metadata Server.
8. Run a minimal 9.2M2 SAS Deployment Wizard configuration by selecting WebLogic Server. The WebLogic configuration metadata is updated to reflect the changes only, as shown in this screenshot:


10. If needed, perform site-specific configuration of customizations that apply to Web application servers.

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Upgrading WebSphere Application Server

The third maintenance release of SAS 9.2 supports WebSphere Application Server Version 6.1 at Fix Pack 21 or later and WebSphere Application Server Version 7.0 at Fix Pack 9 or later. Fix Pack maintenance for the IBM WebSphere Application and the Update Installer program used to apply Fix Pack maintenance must be obtained from IBM. For more information, see IBM “WebSphere Application Server Support for SAS 9.2 (TS2M3) for SAS 9.2 Maintenance 3 revision 10w46” at http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/websphere.html.

Performing a Minor Upgrade of IBM WebSphere Application Server

To perform a minor upgrade to WebSphere Application Server 6.1.0 and apply the third maintenance release of SAS 9.2, complete these steps:

1. Follow the instructions provided by the IBM WebSphere upgrade installation document and stop all WebSphere Application Servers.


3. Use the IBM Update Installer to install WebSphere Application Server V6.1.0 Fix Pack 21 or later. If you are using WebSphere Application Server V7.0, use the Update Installer to install Fix Pack 9.

4. Start all SAS servers and the WebSphere dmgr, nodeagent and appservers.

5. Verify that SAS 9.2 Web applications run satisfactorily after the Web application server upgrade is complete.


7. If needed, perform site-specific configuration of customizations that apply to Web application servers.

Performing a Major Upgrade of IBM WebSphere Application Server

To perform a major version upgrade of IBM WebSphere Application Server from version 6.1 to version 7.0 before applying the SAS 9.2 maintenance release, review the:

1. Install IBM WebSphere Application Server Version 7.0 using the IBM WebSphere Application Server Information Center documentation:
   http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp

2. Download IBM WebSphere Application Server Version 7.0 Fix Pack 9 [or later] and using the IBM Update Installer program associated with the Fix Pack, apply the Fix Pack maintenance to the newly installed WebSphere Application Server V7.0 to bring it to a minimum level of 7.0.0.9.
3. Use the IBM WebSphere Application Server Version 7.0 Migration Wizard or Migration Tools to migrate the existing SAS WAS Version 6.1 profiles and deployed SAS web applications to the WAS Version 7.0 environment. See Upgrading IBM WebSphere Application Server Version 6.1 to Version 7.0 for SAS 9.2 Maintenance 3 (TS2M3) document for a detailed discussion of the WebSphere Application Server 7.0 Migration process.

4. Update the WebSphere Application Server version saved in the SAS Deployment Registry. Here is the general form of the SAS command to update the SAS Deployment Registry:

   ```
   java -jar "<sashome>/deploymntreg/sas.tools.deploymntreg.jar"
   setInstallLoc <webspherend-12byte-name> default "<websphere-install-path>"
   ```

   Here is an example of using the SAS command to update the Deployment Registry:

   ```
   java -jar "C:/Program Files/SAS/deploymntreg/sas.tools.deploymntreg.jar" setInstallLoc
   webspherend default "C:\Program Files\IBM\WebSphere_v7.0\AppServer"
   ```


6. If needed, perform site-specific configuration of customizations that apply to Web application servers.

### Upgrading JBoss Application Server

The third maintenance release of SAS 9.2 only supports JBoss 4.2 and 4.3, and does not support any major JBoss upgrades. JBoss 4.3 consists of a set of component JAR files that have unique version numbers. Any upgrades would apply to individual JAR files. If necessary, you can adhere to the SAS Baseline and Higher Policy and upgrade the individual JBoss 4.3 JAR files. Upgrades to JBoss can be performed either before or after completing the SAS maintenance upgrade.

### Performing a Minor Upgrade of JBoss Application Server

#### Minor Upgrade for JBoss EAP Version

To perform an EAP version minor upgrade of the JBoss Application Server 4.2 or 4.3, complete these steps:

1. Stop all JBoss servers.
3. Consult the JBoss documentation, and upgrade to the higher versions of the JBoss JAR files.
5. Verify that SAS 9.2 Web applications run satisfactorily after the Web application server upgrade is complete.


7. If needed, perform site-specific configuration of customizations that apply to Web application servers.

**Minor Upgrade for JBoss - Community Version**

In order to complete a community version minor update (4.2.0 to 4.2.3) of the JBoss application server in an already existing SAS middle tier installation, complete the following steps:

1. Stop JBoss.

2. From the existing JBoss directory, C:\jboss-4.2.0.GA\server, delete the contents of \SASServer1\tmp, \SASServer1\log, and \SASServer1\work\jboss.web\localhost. (This step makes copying the SASServer1 directory much quicker in a later step.)

3. Apply the JBoss upgrade. This *upgrade* means that you will be installing the newer version of JBoss. It does not apply new files to the existing JBoss installation. The default directory will possibly be C:\jboss4.2.3.GA.

4. Once the upgrade is installed, copy the entire SASServer1 directory structure from the C:\jboss-4.2.0.GA\server JBoss directory structure into the upgraded jboss-4.2.3.GA\server directory. This step copies the SAS Web Applications and the specific SAS server to the upgraded JBoss directory structure.

5. Copy the contents of jboss-4.2.3.GA\server\Default\lib to jboss-4.2.3.GA\server\SASServer1\lib and, if prompted, select yes to overwrite existing files. This step needs to occur in case there are updated jar files in the jboss-4.2.3.GA\server\Default\lib directory.

6. Copy the SASServer1.bat file from jboss-4.2.0.GA\bin to the upgraded directory jboss-4.2.3.GA\bin.

7. Edit the SASServer1.bat file in the jboss-4.2.3.GA\bin directory and replace all occurrences of the old path, jboss-4.2.0.GA, with the new path, jboss-4.2.3.GA.

8. Edit the wrapper.conf bat file in the jboss-4.2.3.GA\server\SASServer1 directory and replace all occurrences of the old path, jboss-4.2.0.GA, with the new path, jboss-4.2.3.GA.

9. Copy the service folder from the jboss-4.2.0.GA\ into the upgraded directory jboss-4.2.3.GA\.

10. Delete the JBoss Windows service since it contains references to the 4.2.0 path.

    Example: sc delete "JBoss - SASServer1"

    Add the new JBoss Windows service containing the new 4.2.3 path.

    Example:

    ```
    cd c:\AppServers\jboss-4.2.3.GA\bin
    ```
The following figure shows the steps to delete and reinstall the JBoss Windows service:

11. Change the path of the JDK and JBoss in the SAS Deployment Registry if the paths have changed:

   Example:
   
c:\Java\jdk1.5.0_15\bin\java -jar
   <sashome>/deploymntreg/sas.tools.deploymntreg.jar setInstallLoc jdk
default <path>

c:\Java\jdk1.5.0_15\bin\java -jar
<sashome>/deploymntreg/sas.tools.deploymntreg.jar setInstallLoc jboss
default <path>
12. Restart JBoss from the Services window and verify that it starts successfully.

If problems occur during the upgrade, use the JBoss server.log and boot.log files from \jboss-4.2.3.GA\server\SASServer1\log for debugging purposes.

For a list of the supported versions of JBoss, see Third Party Software Requirements for use with SAS® Products and select the Web Application Servers and HTTP Servers for information about the appropriate SAS release.

**Performing a Major Upgrade of JBoss Application Server**

The instructions for performing a major upgrade from JBoss 4.2 to JBoss EAP 4.3 (which are supported for SAS 9.2 maintenance 3 and 4.3 clients) are similar to the manual instructions to configure JBoss 4.2 for use with SAS. The differences are as follows:

- the JBoss Application Server target directories are for JBoss EAP 4.3, instead of JBoss 4.2
- some of the JBoss EAP 4.3 XML file changes differ from those for JBoss 4.2

Rather than repeat the instructions for manually configuring JBoss 4.2, which are located at http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/jbossunix.html#webappsrv, use the following steps. The manual steps described in the linked document are italicized in the following steps. The differences between configuring JBoss EAP 4.3 and JBoss 4.2 are noted.

1. Install SAS 9.2 (TS2M3) Revision 10w46, using the SAS Deployment Wizard, which means the SAS Deployment Wizard will go into update mode and call SAS Deployment Management.


3. Update the JBoss location saved in the SAS deployment registry. Here are examples of the command and its usage:

   ```
   java -jar <sashome>/deploymntreg/sas.tools.deploymntreg.jar
   setInstallLoc jdk default <path>
   ```

   ```
   java -jar <sashome>/deploymntreg/sas.tools.deploymntreg.jar
   setInstallLoc jboss default <path>
   ```

   **Example:**

   ```
   java -jar "C:/Program Files/SAS/deploymntreg/sas.tools.deploymntreg.jar" setInstallLoc jboss default "C:/JBoss/jboss-eap-4.3/jboss-as"
   ```

4. The following instructions describe how to configure SASServer1. Perform the same steps for SASServer2, SASServer3, etc. if they have been configured for JBoss 4.2.

5. Copy the JBoss EAP 4.3 server/default directory to server/SASServer1.
Perform the following steps. The italicized steps are described in http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/jbossunix.html#webappsrv, but use the JBoss EAP 4.3 jboss-as/server subdirectory instead of the JBoss 4.2 server subdirectory used in the document:

1. Configure ServiceBindingManager.
2. Turn off RMI server class downloads.
3. Set ear classloader policy to isolated.
4. Modify the web container (tomcat in jboss-web) configuration.
5. Create an additional deployment directory called deploy_sas.
6. Configure bin/SASServer1.bat or sh by copying it from the JBoss 4.2 bin directory to the JBoss EAP 4.3 jboss-as/bin directory. Then modify any paths specified in the file so the JBoss EAP 4.3 jboss-as subdirectories are used. This includes changing JBoss directories specified in the JVM options. Copy the modified file to the SAS configuration Lev1/WebCommon/jboss directory.
7. JAAS Configuration.
8. Mail Session.
9. Configure datasources. For example, copy SharedServices-ds.xml from JBoss 4.2 deploy directory to JBoss EAP 4.3 deploy directory.
10. JDBC Datasource.
7. Perform the following italicized steps for each JMS resource described in 
http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/jbossunix.html#webappsrv, using the JBoss EAP 4.3 jboss-as/server subdirectory instead of the JBoss 4.2 server subdirectory and XML like the example given in each step:

1. **JMS Connection Factory.**
   
   Edit \deploy\jboss-messaging.sar\connection-factories-service.xml and add the JNDI name of each required Connection Factory to ConnectionFactory mbean:
   
   ```xml
   <binding>sas/jms/QueueConnectionFactory</binding>
   ```

2. **JMS Queue.**
   
   Edit \deploy\jboss-messaging.sar\destinations-service.xml and add queue mbeans for AlertQueue, WorkflowQueue, WorkflowCommandQueue and WorkflowEventsQueue:
   
   ```xml
   <mbean code="org.jboss.jms.server.destination.QueueService" name="jboss.messaging.destination:service=Queue,name=AlertQueue" xmbean-dd="xmdesc/Queue-xmbean.xml">
     <depends optional-attribute-name="ServerPeer">jboss.messaging:service=ServerPeer</depends>
     <depends>jboss.messaging:service=PostOffice</depends>
     <attribute name="JNDIName">sas/jms/AlertQueue</attribute>
   </mbean>
   ```


9. Perform the following italicized steps, described in 
http://support.sas.com/resources/thirdpartysupport/v92m3/appservers/jbossunix.html#webappsrv, using the JBoss EAP 4.3 jboss-as/server/ subdirectory instead of the JBoss 4.2 server subdirectory that is used in the document:

1. **Starting the WebApplication Server.**

2. **Deploy Web Applications.**

3. If needed, perform site-specific configuration of customizations that apply to Web application servers.