Instructions for SAS Private JRE Updates for SAS® 9.4M3 (TS1M3) and Later

This document contains instructions about how to install Java 8 updates for SAS® 9.4M6 (TS1M6) and later releases and Java 7 updates for SAS® 9.4M3 (TS1M3) through SAS® 9.4M5 (TS1M5).

Note: If you are using SAS® 9.3M2 (TS1M2) or SAS® 9.4M0 (TS1M0) – SAS® 9.4M2 (TS1M2), consider upgrading to a later release to leverage enhanced capabilities and a more robust support experience. If you are unable to upgrade at this time, contact SAS Technical Support for the Java 7 update.

This document contains important notes that you should review before beginning the installation process as well as installation and post-installation instructions. The download files are available on the Updates for Java 7 and the Updates for Java 8 downloads pages. To go directly to your release of SAS, click the relevant link below:

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SAS® 9.4M3 (TS1M3), SAS® 9.4M4 (TS1M4), SAS® 9.4M5 (TS1M5), SAS® 9.4M6 (TS1M6), and SAS® 9.4M7 (TS1M7)

To access the download file, find your SAS release on the Updates for Java 7 or the Updates for Java 8 downloads page and click the corresponding link. Then, complete these instructions, which contain the following:

- important notes that *you should review before beginning installation*, such as how to identify your version of the SAS Private Java Runtime Environment (JRE) and extra steps you must take on AIX and HP-UX platforms
- installation instructions
- post-installation instructions

Important Notes

- SAS 9.4M6 and SAS 9.4M7 are the only releases that use Java 8. All the other releases use Java 7.

- You must terminate all currently active SAS sessions, daemons, spawners, and servers before applying this hot fix. If any process is running, attempting to apply this hot fix results in a corrupted system.

- You must have the appropriate SAS Private JRE release (see the table below) installed on your system before applying this hot fix. Refer to SAS Note 35968 for instructions about how to determine which product releases you have installed.

Platform	SAS Private Java Runtime Environment (JRE) Release						
	SAS Release						
	SAS® 9.4M3	SAS® 9.4M4	SAS® 9.4M5	SAS® 9.4M5 Revision 18w08	SAS® 9.4M5 Revision 18w30	SAS® 9.4M6	SAS® 9.4M7
64-bit enabled AIX	9.43	9.4301	9.44	9.44	9.44	9.47	9.48
HP-UX for Itanium	9.43	9.43	9.43	9.43	9.43	9.47	9.48
Linux for x64	9.43	9.4301	9.44	9.45	9.46	9.47	9.48
Windows 32-bit	9.43	9.4301	9.44	9.45	9.46	9.47	9.48
Windows 64-bit	9.43	9.4301	9.44	9.45	9.46	9.47	9.48

- Files delivered in this hot fix are backed up during the installation process. However, it is a good general practice to back up your system before applying updates to software. The backup created by the installation process is located here:

  SASHome/SASPrivateJavaRuntimeEnvironment/9.4/installs/privatejre_host_9.xx _HFhot-fix-id/SASHome/xx/backup.date-time-stamp

  You need to access this backup location as described in the "Post-Installation Instructions" section.

- You must have administrator privileges on your client or server machine.

- If you have a middle tier, you must complete these steps *each time* that you perform an add-on.

- If your SAS software is configured for SSL/TLS, you must install the latest Java 7 or Java 8 update on all hosts and tiers.

- Install the hot fix using the same user ID that you used when you performed the initial software installation.

- When you run SAS® Deployment Manager, ensure that the **Configure SAS hot fix** option is *not* selected. If this option is automatically selected, clear the selection before proceeding with the SAS Deployment Manager wizard. Failure to clear this option could have unintended consequences when you apply the hot fix. No automatic configuration scripting is required for this hot fix.

- (This note applies only to the AIX platform.) You must enter the following two commands when using the SAS Deployment Manager to update AIX platforms from SAS Private JRE 8.0 SR10 FP60 or any SAS Private JRE before 8.0 SR5 FP41:

    ```
    cd SASHome/SASPrivateJavaRuntimeEnvironment/9.4/jre/bin
    rm javaws
    ```

- (This note applies only to HP-UX platforms.) You must enter the following commands in the listed order when using SAS Deployment Manager to update HP-UX platforms from SAS Private JRE 7.0.22 or SAS Private JRE 7.0.23:
    ```
    cd SASHome/SASPrivateJavaRuntimeEnvironment/9.4/jre/bin
    mv java java.bak
    ln -s IA64W/java ./java
    ```

- (This note does not apply to AIX or HP-UX platforms.) The SAS Private JRE is distributed alongside, contains, or uses certain third-party and/or open-source software. See the license and third-party files for more information about applicable third-party and open-source licenses.

Installation Instructions

1. The hot fix for the appropriate SAS Private JRE release (see the table) is installed using the SAS Deployment Manager. By default, the SAS Deployment Manager searches the **SASHome/InstallMisc/HotFixes/New** directory for hot fixes to be applied, but it also prompts for a location if you have downloaded hot fixes to a different directory.

2. Per the important note above concerning configuration, ensure that the **Configure SAS hot fix** option is *not* selected in SAS Deployment Manager.

3. Follow the instructions in the "Finding and Applying Hot Fixes" section in the SAS® Deployment Wizard and SAS® Deployment Manager 9.4: User's Guide.

Note: When you apply the hot fix to the SAS Private JRE, SAS Deployment Manager performs several steps and then prompts you to restart. Click **Yes** to allow this restart. After SAS Deployment Manager restarts, click **Next** to continue with the hot-fix installation. See SAS Note 58174 for assistance if SAS Deployment Manager does not restart.

Post-Installation Instructions

Review all the steps below to determine which are relevant to your system. Exceptions are noted in parentheses before the instruction. Step 3 applies only to UNIX systems.

1. SAS® Environment Manager for SAS 9.4M3, SAS 9.4.M4, or SAS 9.4M5 uses a version of ICU4J that is incompatible with SAS Private JRE versions 1.7.0_262 and later. To address this issue, you must complete these steps.

   UNIX

   A. Download ICU4J 66.1: **https://github.com/unicode-org/icu/releases/download/release-66-1/icu4j-66_1.jar**.

   B. Change directory to the **SASEnvironmentManager** directory:
   ```
    cd
   /export/home/local/install/cfgsas1/config/Lev1/Web/SASEnvironmentMan
   ager
   ```

   C. Search for the locations of all versions of ICU4J JAR files in the **SASEnvironmentManager** directory. Here is an example search: `find . -name *icu4j*.jar`

   D. Rename each instance of the ICU4J JAR file found in step C by adding a .bak extension. Here is an example of changing the name: `mv icu4j-3.8.jar icu4j-3.8.jar.bak`

   E. Copy the new version of the ICU4J that you downloaded in step A into each location that you found in step C.

   Windows

   A. Download ICU4J 66.1: **https://github.com/unicode-org/icu/releases/download/release-66-1/icu4j-66_1.jar**.

   B. Use Windows Explorer to navigate to the **SASEnvironmentManager** directory. Here is an example location: **C:\SAS\Config\Lev1\Web\SASEnvironmentManager**

   C. Search for the locations of any JAR files that contain the string, `icu4j`, in the **SASEnvironmentManager** directory.

   D. Rename each instance of the ICU4J JAR file found in step C by adding a .bak extension. For example, rename icu4j-3.8.jar to icu4j-3.8.jar.bak.

   E. Copy the new version of ICU4J that you downloaded in step A into each location that you found in step C.

2. If you use SAS® Environment Manager in a Microsoft Windows environment, you must install the hot fix in SAS Note 68578 in order for SAS Environment Manager to work as expected with the SAS Private JRE. Make sure that you complete all the instructions included for the hot fix. You can either install the hot fix before you install the SAS Private JRE, or you can install it after.

3. If you experience the following problems with SAS Environment Manager after updating your SAS Private JRE, see the referenced SAS Notes:

- (This instruction applies only to SAS 9.4M5 Revision 18w08.) If you experience a SAS Environment Manager error that reads "This page can't be displayed," see SAS Note 61392.

- (This instruction does not apply to AIX, HP-UX, or Windows 32-bit platforms, or any platforms for SAS 9.4M5 Revision 18w08 and later.) If you experience SAS Environment Manager related configuration failures or problems starting and stopping SAS Environment Manager server, see SAS Note 61529.

4. (UNIX only) SAS 9.4 uses TrueType fonts to provide quality printing and font display across multiple platforms. When updating a SAS Private JRE, you must copy the TrueType fonts that are installed with SAS 9.4 into the new SAS Private JRE by following these instructions:

   a. Navigate to the **SASHome/SASPrivateJavaRuntimeEnvironment/9.4/installs/privatejre_host_9.xx_HFhot-fix-ID/SASHome/xx/backup.date-time-stamp/lib/fonts** directory.

   b. Copy all fonts from your backup directory to your new JRE **SASHome/SASPrivateJavaRuntimeEnvironment/9.4/jre/lib/fonts** directory, using the following commands:
   ```
   > cp -pf *.ttc
   SASHome/SASPrivateJavaRuntimeEnvironment/9.4/jre/lib/fonts

   > cp -pf *.ttf
   SASHome/SASPrivateJavaRuntimeEnvironment/9.4/jre/lib/fonts
   ```

   Warning: You must copy the fonts for all Java functionality to work properly in SAS.

5. Re-importing Certificates into the Updated SAS Private JRE

   SAS uses a collection of trusted certificate authority (CA) certificates provided by Mozilla to authenticate Transport Layer Security (TLS)-certificate chains provided by servers. During the installation and configuration, the Trusted CA Bundle is automatically copied into the required JRE. When updating the SAS Private JRE, you must copy the Trusted CA Bundle into the new SAS Private JRE by following these instructions:

   a. If you have site-signed or third-party signed CA TLS certificates that need to be added to or removed from the SAS Trusted CA Bundle, complete the instructions at the following link and skip step b below: Manage Certificates in the Trusted CA Bundle Using the SAS Deployment Manager.

   b. If you are not using any site-signed or third-party signed CA TLS certificates, or have already added your CA certificates to the Trusted CA Bundle provided by the SAS Security Certificate Framework, execute the following command to copy the Trusted CA Bundle into the new SAS Private JRE:

UNIX:
```
> cp
SASHome/SASSecurityCertificateFramework/1.1/cacerts/trustedcerts.jks
SASHome/SASPrivateJavaRuntimeEnvironment/9.4/jre/lib/security/jssecacer
ts
```

Windows:
```
> copy
SASHome\SASSecurityCertificateFramework\1.1\cacerts\trustedcerts.jks
SASHome\SASPrivateJavaRuntimeEnvironment\9.4\jre\lib\security\jssecacer
ts
```

This completes the installation and configuration.

SAS® 9.3M2 (TS1M2), SAS® 9.4M0 (TS1M0), SAS® 9.4M1 (TS1M1), and SAS® 9.4M2 (TS1M2)

To update Java 7 for these releases, contact SAS Technical Support.