



# Applying SAS Security Updates and Hot Fixes

Use this document to ensure that you have applied the latest security updates and hot fixes to your current version of SAS 9.4. To directly download and apply security updates and hot fixes, click the links in each applicable step.

**Note for z/OS:** If you run SAS on z/OS, do not use this document. Instead, see <https://support.sas.com/kb/69/144.html> to apply security updates to z/OS.

To ensure full coverage, start at Step 1 and continue through to the last step. As you will see, Step 1 applies to all versions of SAS 9.4. Step 2 applies to all versions except one. Steps 3-6 apply to individual versions. Steps 7-9 apply to all versions.

When you apply SAS security updates and hot fixes updates, you will update the SASHOME and SAS Configuration directories.

Before you apply security updates and hot fixes, it is strongly recommended that you back up your SAS deployment. This is the only way that you can restore the SASHOME and SAS Configuration directories. For instructions, refer to [SAS 9.4 Upgrade in Place: System Level Backup and Recovery Best Practice](#).

## **Important**

If product-specific hot fixes require you to reapply SAS security updates that you have already applied, be sure to reapply those updates. Follow the instructions in this document to reapply, then rebuild and redeploy web applications (see Step 8 and Step 9.) If you do not reapply security updates, your deployment will retain vulnerabilities.

## **Step 1 — Apply Product-Specific Hot Fixes**

*All deployments must perform this step.*

Apply product-specific hot fixes using the following steps:

1. Run the [SASHFADD](#) tool to generate a report of hot fixes that you might want to apply to your deployment.
2. When you have determined which hot fixes to apply to your deployment, use the SASHFADD instructions to download and apply your hot fixes.

## **Important**

The SASHFADD report does not list security updates or Hot Fix Y09009. All deployments must apply all security updates and Hot Fix Y09009 as directed in this document. After you apply Hot Fix Y09009 (see Step 7), rebuild and redeploy web applications (see Step 8 and Step 9.)

3. Perform any pre-installation tasks for each hot fix.
4. Apply the hot fixes.

5. Perform any post-installation tasks for each hot fix. If the post-installation tasks include rebuilding and redeploying web applications, delay these tasks until you reach Step 8.

## Step 2 — Apply Java Deserialization Update

### ***Determine Whether Java Deserialization Update Is Needed***

*Perform Step 2 for all maintenance levels of SAS 9.4 except for SAS 9.4M8, even if other security updates have been applied.*

#### **Important**

If you are using SAS 9.4M8, then proceed no further with this step. Skip ahead to [Step 6 — Apply SAS Security Update 2023-09-M8](#).

To determine whether you have applied the most recent Java Deserialization Update, review the contents of this file:

```
SASHome\InstallMisc\utilities\installqual\9.4\serialization_hotfix.properties
```

If this file does not exist, or if, in the file, the version of the SAS security update is less than 4.0, then you do not have the latest version of the Java Deserialization Update. Continue with these steps to apply the Java Deserialization Update.

If the correct version is listed and you have applied a hot fix, you might be directed to reapply the Java Deserialization Update. If so, please re-apply it to ensure continued system security.

### ***Apply the Java Deserialization Update***

Use the following steps to apply the update. These steps should be performed for every machine in your deployment by applying the update on each installed and configured machine.

1. Before beginning, ensure that all active SAS sessions, daemons, spawners, servers, and agents are terminated. In addition, SAS strongly recommends that you back up your system before applying the update.
2. Download the [Java Deserialization Update](#). If this link does not resolve, see Appendix 1: Alternate Links for Downloads.
3. Unzip `sas-security-update-2020-08.zip` into a directory of your choice. On UNIX, using the `unzip` command is the best option. If you use WinZip or the `jar xvf` command, you must also use the following command to preserve the appropriate permissions:

```
chmod a+x install.sh
```

If the installer ID differs from the update directory owner, make the directory writable by all IDs in the same group with the following command:

```
chmod -R g+w /security directory/sas-security-update-2020-08
```

4. From the directory into which you unzipped, go to the `sas-security-update-2020-08` directory.

5. In that directory, run the appropriate script using the same user ID that was used to install (installer ID). The script requires one argument — the full path to the SASHOME directory where the update is going to be applied.

#### Windows

```
install.bat "SASHOME"
```

#### Windows Example

```
install.bat "C:\ProgramFiles\SASHome"
```

*Note: Depending on your settings, you might have to use the **Run as administrator** option.*

#### UNIX

```
./install.sh "SASHOME"
```

#### UNIX Example

```
./install.sh "/usr/lpp/SAS"
```

6. The script applies the update to all files in the SASHOME and SAS Configuration directories that need to be updated. When the script finishes, a message states that the update is complete and the script exits.
7. If you plan to deploy other hot fixes or updates from the location where you placed this ZIP file, you need to remove it from this location. The SAS Deployment Manager, which is used for deploying other hot fixes, does not recognize this file and will issue an error.
8. Continue to the next step.

## Step 3 — Apply SAS Security Update 2018-09

### **Determine Whether SAS Security Update 2018-09 Is Needed**

*If you are not using SAS 9.4M5, skip ahead to [Step 4 — Apply SAS Security Update 2022-03-M6](#).*

To determine whether you have applied SAS Security Update 2018-09, review the contents of this file:

```
SASHome\InstallMisc\utilities\installqual\9.4\security_hotfix.properties
```

If this file does not exist, or it does not list the version as 1.0, then you do not have the latest version of the update. Continue with these steps to apply SAS Security Update 2018-09.

If the correct version is listed and you have applied a hot fix, you might be directed to re-apply the update. If so, please re-apply it to ensure continued system security.

### **Apply SAS Security Update 2018-09**

Use the following steps to apply the update. These steps should be performed for every machine in your deployment by applying the update on each installed and configured machine.

1. Before beginning, ensure that all active SAS sessions, daemons, spawners, servers, and agents are terminated. In addition, SAS strongly recommends that you back up your system before applying the update.
2. Download [SAS Security Update 2018-09](#). If this link does not resolve, see Appendix 1: Alternate Links for Downloads.

3. Unzip `sas-security-update-2018-09.zip` into a directory of your choice. On UNIX, using the `unzip` command is the best option. If you use WinZip or the `jar xvf` command, you must also use the following command to preserve the appropriate permissions:

```
chmod a+x install.sh
```

If the installer ID differs from the update directory owner, make the directory writable by all IDs in the same group with the following command:

```
chmod -R g+w /security directory/sas-security-update-2018-09
```

4. From the directory into which you unzipped, go to the `sas-security-update-2018-09` directory.
5. In that directory, run the appropriate script using the same user ID that was used to install (installer ID). The script requires one argument— the full path to the SASHOME directory where the update is going to be applied.

#### Windows

```
install.bat "SASHOME"
```

#### Windows Example

```
install.bat "C:\Program Files\SASHome"
```

*Note: Depending on your settings, you might have to use the **Run as administrator** option.*

#### UNIX

```
./install.sh "SASHOME"
```

#### UNIX Example

```
./install.sh "/usr/lpp/SAS"
```

6. The script applies the update to all files in the SASHOME and SAS Configuration directories that need to be updated. When the script finishes, a message states that the update is complete and the script exits.
7. If you plan to deploy other hot fixes or updates from the location where you placed this ZIP file, you need to remove it from this location. The SAS Deployment Manager, which is used for deploying other hot fixes, does not recognize this file and will issue an error.
8. Continue to the next step.

## Step 4 — Apply SAS Security Update 2022-03-M6

### Determine Whether SAS Security Update 2022-03-M6 Is Needed

*If you are not using SAS 9.4M6, skip ahead to [Step 5 — Apply SAS Security Update 2023-09-M7](#).*

To determine whether you have applied SAS Security Update 2022-03-M6, review the contents of this file:

```
SASHome\InstallMisc\utilities\installqual\9.4\security_hotfix.properties
```

If this file does not exist, or it does not list the version as 5.2, then you do not have the latest version of the update. Continue with these steps to apply SAS Security Update 2022-03-M6.

If the correct version is listed and you have applied a hot fix, then you might be directed to reapply the update. If so, please re-apply it to ensure continued system security.

## Apply SAS Security Update 2022-03-M6

Use the following steps to apply the update. These steps should be performed for every machine in your deployment by applying the update on each installed and configured machine.

1. Before beginning, ensure that all active SAS sessions, daemons, spawners, servers, and agents are terminated. In addition, SAS strongly recommends that you back up your system before applying the update.
2. Download [SAS Security Update 2022-03-M6](#). If this link does not resolve, see Appendix 1: Alternate Links for Downloads.
3. Unzip `sas-security-update-2022-03-M6.zip` into a directory of your choice. On UNIX, using the `unzip` command is the best option. If you use WinZip or the `jar xvf` command, you must also use the following command to preserve the appropriate permissions:

```
chmod a+x install.sh
```

If the installer ID differs from the update directory owner, make the directory writable by all IDs in the same group with the following command:

```
chmod -R g+w /security_directory/sas-security-update-2022-03-M6
```

4. From the directory into which you unzipped, go to the `sas-security-update-2022-03-M6` directory.
5. In that directory, run the appropriate script using the same user ID that was used to install (installer ID). The script requires one argument — the full path to the SASHOME directory where the update is going to be applied.

### Windows

```
install.bat "SASHOME"
```

### Windows Example

```
install.bat "C:\Program Files\SASHome"
```

*Note: Depending on your settings, you might have to use the **Run as administrator** option.*

### UNIX

```
./install.sh "SASHOME"
```

### UNIX Example

```
./install.sh "/usr/lpp/SAS"
```

6. The script applies the update to all files in the SASHOME and SAS Configuration directories that need to be updated. When the script finishes, a message states that the update is complete and the script exits.
7. If you plan to deploy other hot fixes or updates from the location where you placed this ZIP file, you need to remove it from this location. The SAS Deployment Manager, which is used for deploying other hot fixes, does not recognize this file and will issue an error.

8. Continue to the next step.

## Step 5 — Apply SAS Security Update 2023-09-M7

### ***Determine Whether SAS Security Update 2023-09-M7 Is Needed***

*If you are not using SAS 9.4M7*, skip ahead to [Step 6 — Apply SAS Security Update 2023-09-M8](#).

To determine whether you have applied SAS Security Update 2023-09-M7, review the contents of this file:

```
SASHome\InstallMisc\utilities\installqual\9.4\security_hotfix.properties
```

If the file does not exist, or it does not list the version as 12.3, then you do not have the latest version of the update. Continue with these steps to apply SAS Security Update 2023-09-M7.

If the correct version is listed and you have applied a hot fix, you might be directed to re-apply the update. If so, please re-apply it to ensure continued system security.

### ***Apply SAS Security Update 2023-09-M7***

Use the following steps to apply the update. These steps should be performed for every machine in your deployment by applying the update on each installed and configured machine.

1. Before beginning, ensure that all active SAS sessions, daemons, spawners, servers, and agents are terminated. In addition, SAS strongly recommends that you back up your system before applying the update.
2. Download [SAS Security Update 2023-09-M7](#). If this link does not resolve, see Appendix 1: Alternate Links for Downloads.
3. Unzip `sas-security-update-2023-09-M7.zip` into a directory of your choice. On UNIX, using the `unzip` command is the best option. If you use WinZip or the `jar xvf` command, you must also use the following command to preserve the appropriate permissions:

```
chmod a+x install.sh
```

If the installer ID differs from the update directory owner, make the directory writable by all IDs in the same group with the following command:

```
chmod -R g+w /security directory/sas-security-update-2023-09-M7
```

4. From the directory into which you unzipped, go to the `sas-security-update-2023-09-M7` directory.
5. In that directory, run the appropriate script using the same user ID that was used to install (installer ID). The script requires one argument— the full path to the SASHOME directory where the update is going to be applied.

#### **Windows**

```
install.bat "SASHOME"
```

#### **Windows Example**

```
install.bat "C:\Program Files\SASHome"
```

*Note: Depending on your settings, you might have to use the **Run as administrator** option.*

## UNIX

```
./install.sh "SASHOME"
```

### UNIX Example

```
./install.sh "/usr/lpp/SAS"
```

6. The script applies the update to all files in the SASHOME and SAS Configuration directories that need to be updated. When the script finishes, a message states that the update is complete, and the script exits.
7. If you plan to deploy other hot fixes or updates from the location where you placed this ZIP file, you need to remove it from this location. The SAS Deployment Manager, which is used for deploying other hot fixes, does not recognize this file and will issue an error.
8. Continue to the next step.

## Step 6 — Apply SAS Security Update 2023-09-M8

### Determine Whether SAS Security Update 2023-09-M8 Is Needed

If you are not using SAS 9.4M8, skip ahead to [Step 7 — Apply Hot Fix Y09009 – Supplemental Hot Fix for SAS Security Updates](#).

To determine whether you have applied SAS Security Update 2023-09-M8, review the contents of this file:

```
SASHome\InstallMisc\utilities\installqual\9.4\security_hotfix.properties
```

If the file does not exist, or it does not list the version as 13.1, then you do not have the latest version of the update. Continue with these steps to apply SAS Security Update 2023-09-M8.

If the correct version is listed and you have applied a hot fix, you might be directed to re-apply the update. If so, please re-apply it to ensure system security.

### Apply SAS Security Update 2023-09-M8

Use the following steps to apply the update. These steps should be performed for every machine in your deployment by applying the update on each installed and configured machine.

1. Before beginning, ensure that all active SAS sessions, daemons, spawners, servers, and agents are terminated. In addition, SAS strongly recommends that you back up your system before applying the update.
2. Download [SAS Security Update 2023-09-M8](#). If this link does not resolve, see Appendix 1: Alternate Links for Downloads.
3. Unzip `sas-security-update-2023-09-M8.zip` into a directory of your choice. On UNIX, using the `unzip` command is the best option. If you use WinZip or the `jar xvf` command, you must also use the following command to preserve the appropriate permissions:

```
chmod a+x install.sh
```

If the installer ID differs from the update directory owner, make the directory writable by all IDs in the same group with the following command:

```
chmod -R g+w /security directory/sas-security-update-2023-09-M8
```

4. From the directory into which you unzipped, go to the `sas-security-update-2023-09-M8` directory.
5. In that directory, run the appropriate script using the same user ID that was used to install (installer ID). The script requires one argument— the full path to the SASHOME directory where the update is going to be applied.

#### Windows

```
install.bat "SASHOME"
```

#### Windows Example

```
install.bat "C:\Program Files\SASHome"
```

*Note:* Depending on your settings, you might have to use the **Run as administrator** option.

#### UNIX

```
./install.sh "SASHOME"
```

#### UNIX Example

```
./install.sh "/usr/lpp/SAS"
```

6. The script applies the update to all files in the SASHOME and SAS Configuration directories that need to be updated. When the script finishes, a message states that the update is complete, and the script exits.
7. If you plan to deploy other hot fixes or updates from the location where you placed this ZIP file, you need to remove it from this location. The SAS Deployment Manager, which is used for deploying other hot fixes, does not recognize this file and will issue an error.
8. Continue to the next step.

## Step 7 — Apply Hot Fix Y09009 – Supplemental Hot Fix for SAS Security Updates

*All deployments must perform this step.*

Hot fix Y09009 is a container hot fix that includes hot fixes for several products. Your deployment might not include any product or all products affected by this hot fix container. If so, hot fixes are skipped and not applied to your deployment. These hot fixes are packaged together to make it simpler.

1. Review [Y09009pt.pdf](#) to see the list of SAS products that will be updated by Y09009. See [SAS Note 35968](#) for information about how to determine whether you have any of the products installed on your SAS deployment. If you have one or more of the products, you must install Hot Fix Y09009. If you do not have any of the products, skip to [Step 8 — Rebuild](#) and Redeploy Web Applications.
2. Download [Hot Fix Y09009](#). If this link does not resolve, see Appendix 1: Alternate Links for Downloads.
3. Use the instructions in [Y09009pt.pdf](#) to apply Hot Fix Y09009 to every machine in your deployment. You might receive an informational message if hot fix Y09009 is applied but does not update any product on a machine.



4. Continue to the next step.

## Step 8 — Rebuild and Redeploy Web Applications

*Perform this step on all primary middle-tier machines.*

After all updates and hot fixes have been applied, you must rebuild and redeploy every web application on each middle-tier machine to ensure that the updates and hot fixes take effect. The instructions for rebuilding and redeploying can be found in the following locations:

### **Rebuilding**

See “Rebuild the SAS Web Applications” in [SAS 9.4 Administration: Middle-Tier Administration Guide](#)

### **Redeploying**

See “Redeploy the SAS Web Applications” in [SAS 9.4 Administration: Middle-Tier Administration Guide](#)

When web applications are rebuilt, each web application’s content is backed up in a backup directory. This backup is explained in the section “Backups of Previous Web Application Versions” in the [SAS 9.4 Administration: Middle-Tier Administration Guide](#).

*Note:* JAR files with security vulnerabilities might be placed in the backup directory when rebuilding a web application. You should delete the backup directory once the web application has been successfully rebuilt, redeployed, and tested.

## Step 9 — Apply the SAS Security Update to a Horizontal Middle-Tier Cluster Node

*Perform this step on all horizontal cluster node middle-tier machines.*

Product-specific hot fixes might require additional manual steps for configuration on horizontal middle-tier cluster nodes. If you have clustered any of the products horizontally, see “Steps to Perform on Each Horizontal Cluster Node” in “Maintain a Horizontal Cluster Member” in [SAS 9.4 Administration: Middle-Tier Administration Guide](#).

## Contact SAS Technical Support

If you need assistance with the software or with the instructions in this guide, contact [SAS Technical Support](#).

## Appendix 1: Alternate Links for Downloads

If you are using a local copy of this document, rather than the recommended online version, then you can use the following links to download hot fixes and security updates.

### **Important**

Be sure to follow through this entire document to ensure that you receive all applicable hot fixes and security updates. Applying a security package not intended for the SAS release installed on your system can jeopardize the integrity of your SAS installation.

#### **Java Deserialization Update**

<https://tshf.sas.com/techsup/download/hotfix/HF2/security/sas-security-update-2020-08/sas-security-update-2020-08.zip>

#### **SAS Security Update 2018-09**

<https://tshf.sas.com/techsup/download/hotfix/HF2/security/sas-security-update-2018-09/sas-security-update-2018-09.zip>

#### **Security Update 2022-03-M6**

<https://tshf.sas.com/techsup/download/hotfix/HF2/security/sas-security-update-2022-03-M6/sas-security-update-2022-03-M6.zip>

#### **Security Update 2023-09-M7**

<https://tshf.sas.com/techsup/download/hotfix/HF2/security/sas-security-update-2023-09-M7/sas-security-update-2023-09-M7.zip>

#### **SAS Security Update 2023-09-M8**

<https://tshf.sas.com/techsup/download/hotfix/HF2/security/sas-security-update-2023-09-M8/sas-security-update-2023-09-M8.zip>

#### **Hot Fix Y09009 – Supplemental Hot Fix for SAS Security Updates**

<https://tshf.sas.com/techsup/download/hotfix/HF2/Y/Y09/Y09009/xx/prt/Y09009pt.zip>