



SAS[®] Event Stream Processing 5.1 on Windows: Deployment Guide

The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2017. *SAS® Event Stream Processing 5.1 on Windows: Deployment Guide*. Cary, NC: SAS Institute Inc.

SAS® Event Stream Processing 5.1 on Windows: Deployment Guide

Copyright © 2017, SAS Institute Inc., Cary, NC, USA

All Rights Reserved. Produced in the United States of America.

For a hard copy book: No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior written permission of the publisher, SAS Institute Inc.

For a web download or e-book: Your use of this publication shall be governed by the terms established by the vendor at the time you acquire this publication.

The scanning, uploading, and distribution of this book via the Internet or any other means without the permission of the publisher is illegal and punishable by law. Please purchase only authorized electronic editions and do not participate in or encourage electronic piracy of copyrighted materials. Your support of others' rights is appreciated.

U.S. Government License Rights; Restricted Rights: The Software and its documentation is commercial computer software developed at private expense and is provided with RESTRICTED RIGHTS to the United States Government. Use, duplication, or disclosure of the Software by the United States Government is subject to the license terms of this Agreement pursuant to, as applicable, FAR 12.212, DFAR 227.7202-1(a), DFAR 227.7202-3(a), and DFAR 227.7202-4, and, to the extent required under U.S. federal law, the minimum restricted rights as set out in FAR 52.227-19 (DEC 2007). If FAR 52.227-19 is applicable, this provision serves as notice under clause (c) thereof and no other notice is required to be affixed to the Software or documentation. The Government's rights in Software and documentation shall be only those set forth in this Agreement.

SAS Institute Inc., SAS Campus Drive, Cary, NC 27513-2414

July 2018

SAS® and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are trademarks of their respective companies.

5.1-P1:dplyesp0phy0win

Contents

Chapter 1 / Introduction	1
About This Guide	1
What's New in SAS Deployment	1
Support for Upgrades	2
Contact SAS Technical Support	3
Chapter 2 / System Requirements	5
General Hardware Considerations	5
Operating System Requirements	6
Software Requirements	6
User Accounts and Security	7
Chapter 3 / Pre-installation Tasks	9
Obtain the Required Files	9
Set the Environment Variables	9
Chapter 4 / Installing SAS Viya	11
Deploy the Software on Windows	11
Install All of the Software	11
Selectively Install Software Components	12
Chapter 5 / Post-installation Tasks	17
Enable Metering for ESP Servers	17
(Optional) Enable Encryption for SAS Event Stream Processing Studio	17
(Optional) Change the Default Port for SAS Event Stream Processing Studio	18
Preparing the Windows Environment for Migration of Your XML Models	19
Directory Structure and Permissions	19
Code Examples	20
Chapter 6 / Uninstalling SAS Viya	21
Uninstall SAS Event Stream Processing	21
Chapter 7 / Updating SAS Event Stream Processing	23
About Updates	23
Update SAS Event Stream Processing on Windows	23

Introduction

<i>About This Guide</i>	1
<i>What's New in SAS Deployment</i>	1
SAS Software Delivery	1
Industry Standard Tools	1
<i>Support for Upgrades</i>	2
<i>Contact SAS Technical Support</i>	3

About This Guide

SAS Event Stream Processing enables developers to build applications that can quickly process and analyze a large number of continuously flowing events in real time. The deployment installs the programming tools that are required to build and execute event stream processing applications.

SAS Event Stream Processing 5.1 is compatible with both SAS 9.4 and with the SAS Viya platform. It uses the same deployment tools and process as SAS Viya. However, SAS Event Stream Processing can still be installed as a stand-alone product without additional SAS Viya components.

Use this guide to deploy SAS Event Stream Processing in your Windows environment. To install on Linux, a separate order that specifies the Linux platform is required.

To use this guide successfully, you should have a working knowledge of the Windows operating system and basic commands.

What's New in SAS Deployment

SAS Software Delivery

To ensure that you deploy the latest software, SAS provides the SAS Event Stream Processing software in repository packages that are maintained by SAS. Specifically, the software is packaged in the Microsoft Installer (MSI) format for Windows, which simplifies installation, uninstallation, and upgrade tasks. Each time you deploy or update your software, you automatically receive the latest MSI files that are available.

Note: The MSI-based deployment model does not require a SAS Software Depot in your environment.

Industry Standard Tools

A simplified, industry-standard deployment model is one of the innovations that SAS Viya offers. You can deploy SAS Viya and SAS Event Stream Processing with robust tools that are designed for deploying and updating

software on Windows operating systems. SAS Viya deployment takes advantage of Windows PowerShell, a software deployment tool for Windows operating systems. Windows PowerShell handles downloads of SAS software from secure repositories and performs the installation of downloaded software in your environment. Native Windows installers perform the installation from MSI files.

Note: SAS Deployment Wizard and SAS Deployment Manager that supported SAS 9.4 are not used to install and configure SAS Event Stream Processing 5.1.

Support for Upgrades

Upgrading SAS Event Stream Processing software is not supported. Instead, you must uninstall the older version of the software and then install the newer version.

Note: The term *upgrade* is used to refer to a type of software update that introduces new functionality. At SAS, an upgrade generally involves a new release number. By contrast, an *update* refers to minor changes to the software such as fixes. For more information about updating, see [“Updating SAS Event Stream Processing” on page 23](#).

Migrating models and data that you generated from a previous release of SAS Event Stream Processing is supported on a limited basis. You can import files from SAS Event Stream Processing 3.2, 4.1, 4.2, or 4.3. However, if you plan to import files that you created with SAS Event Stream Processing 3.2, be aware of the following issues:

- Multiple XML elements in SAS Event Stream Processing 5.x have changed since 3.2. You must replace the elements that differ. Opening a legacy project in SAS Event Stream Processing Studio does not automatically upgrade your XML code to a valid format.
- Review your C++ code that was used with SAS Event Stream Processing 3.2. You must replace the `registerMethod_ds2` function with the `registerMethod_DS2TS` function.
- The default date format of `%Y-%m-%d %H:%M:%S` for CSV timestamp and datetime fields is no longer valid. The new `ESP_DATETIME` fields contain a 64-bit integer that represents seconds since UNIX epoch. The new `ESP_TIMESTAMP` fields contain a 64-bit integer that represents microseconds since UNIX epoch.
- In addition, you can no longer specify an alternative date format when initializing a SAS Event Stream Processing engine. To pass CSV events using an alternative date format, that format must now be specified on the connector or adapter that is the source or sink of CSV data. All connectors and adapters that support CSV include an optional `DateFormat` parameter for this purpose.

To upgrade models that you created in SAS Event Stream Processing 4.3 to version 5.1, take the following steps:

- 1 In SAS Event Stream Processing Studio 4.3, export the 4.3 models that you want to use in the newer version of SAS Event Stream Processing.
- 2 Install SAS Event Stream Processing 5.1.
- 3 Use SAS Event Stream Processing Studio to import the 4.3 models that you previously exported. For more information, see *SAS Event Stream Processing: Using SAS Event Stream Processing Studio*.

To import models that you created in SAS Event Stream Processing Studio 3.2, a separate migration step is required. As noted above, you must run the `dfesp_xml_migrate` script to migrate your XML code to the 5.x XML schema. Some advance preparation is required to install the script on Windows, but you can run it on Linux without installing any prerequisites. For more information, see [“Preparing the Windows Environment for Migration of Your XML Models” on page 19](#). For information about the migration script, contact SAS Technical Support.

Contact SAS Technical Support

Technical support is available to all customers who license SAS software. However, we encourage you to engage your designated on-site SAS support personnel as your first support contact. If your on-site SAS support personnel cannot resolve your issue, have them contact SAS Technical Support to report your problem.

Before you call, explore the SAS Support website at support.sas.com/techsup/. This site offers access to the SAS Knowledge Base, as well as SAS communities, Technical Support contact options, and other support materials that might answer your questions.

When you contact SAS Technical Support, you are required to provide information, such as your SAS site number, company name, email address, and phone number, that identifies you as a licensed SAS software customer.

System Requirements

General Hardware Considerations	5
Hardware Requirements	5
Operating System Requirements	6
Supported Operating Systems	6
SAS Support for Alternative Operating Systems	6
Software Requirements	6
Windows PowerShell	6
Additional Microsoft Requirements	7
Java Requirements	7
Web Browsers	7
User Accounts and Security	7
(Optional) Enable Encryption and Authentication for SAS Event Stream Processing	7

General Hardware Considerations

SAS Event Stream Processing has a flexible architecture and a base set of features that have no dependencies on SAS Foundation or on SAS Viya. The SAS Event Stream Processing software is licensed per event, so you can install the software on multiple machines without violating the license agreement.

To use SAS Foundation in SAS Event Stream Processing deployments, as when, for example, you want to run SAS in a procedural window, SAS Event Stream Processing must be installed on the same machine as SAS Foundation. Depending on your version of SAS, a SAS/ACCESS engine might also be required. The following hardware requirements do not attempt to account for all usage scenarios.

Hardware Requirements

SAS Event Stream Processing can be installed as a stand-alone product. It can also coexist with either SAS Viya or with SAS 9.4.

A single machine for the SAS Event Stream Processing components (SAS Event Stream Processing, the web application server, and SAS Event Stream Processing Studio) is the minimum requirement. SAS Event Stream Processing can be deployed on a redundant machine for failover, or it can be distributed across multiple machines. On-premises deployments as well as cloud deployments are supported. You can also deploy the software on the compute layer of a Hadoop cluster, or even at the edge (on a gateway node) of a Hadoop cluster.

The following table describes a standard set of specifications for a machine where SAS Event Stream Processing is deployed:

Item	Recommended Level*
CPU	4 cores (x86 architecture) Intel Xeon chip set with a minimum speed of 2.6 GHz
Memory	8 - 16 GB of RAM Memory clock speed of 1600 MHz
Disk Space and Speed	5 GB or more 10,000 RPM

*The bare minimum requirements for an installation of SAS Event Stream Processing are 4 cores, 4 GB of memory, and 2 GB of disk space. However, a minimum configuration is not recommended.

An additional machine can be used as a thin client from which end users can access the user interface for SAS Event Stream Processing Studio. This machine requires minimal processing power and storage space and can run on Windows or UNIX.

Operating System Requirements

Supported Operating Systems

For a list of supported operating systems, see <https://support.sas.com/en/documentation/third-party-software-reference/viya/support-for-operating-systems.html>.

Note: SAS Event Stream Processing can also be installed on Red Hat Enterprise Linux, but a separate package, based on your software order, is required.

SAS Support for Alternative Operating Systems

SAS provides support on a limited basis for alternative operating system distributions that customers might select. For more information, see the official support policy statement at <http://support.sas.com/techsup/pcn/altopsys.html>.

Software Requirements

Windows PowerShell

Microsoft Windows PowerShell version 5.0.10586.117 or later is required in order to install SAS Event Stream Processing on Windows. PowerShell is a framework that supports a scripting language and configuration management capabilities on Windows. To determine the current version of PowerShell on the local machine, follow these steps:

- 1 Start PowerShell from the Windows **Start** menu. Enter `powershell` at the **Search** prompt and launch it from the search results.
- 2 At the PowerShell command prompt, enter the following command to find out the PowerShell version:

```
$PSVersionTable.PSVersion
```

If required, install a newer version of PowerShell by installing Windows Management Framework 5.0. For more information, see the following website: <https://www.microsoft.com/en-us/download/details.aspx?id=50395>

Additional Microsoft Requirements

The Microsoft Visual C++ Redistributable Package for Visual Studio 2013 is required to install and run SAS Event Stream Processing on Windows.

You can download the package from the following Microsoft website:

<https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads>.

Java Requirements

The Java Runtime Environment (JRE) must be installed on each machine where you install SAS Event Stream Processing components. Only the JRE is required; the full JDK is not required. For a list of supported JRE distributions, see

<https://support.sas.com/en/documentation/third-party-software-reference/viya/support-for-jre.html>.

To determine the version of Java that is installed on the local machine, follow these steps:

- 1 From the **Start** menu, open the Control Panel.
- 2 Select **Programs**, and then click **Programs and Features**.

One or more installed Java versions are listed in the **Programs and Features** panel.

You can also navigate to java.com to automatically detect the Java version on your machine and to update your version.

Web Browsers

SAS Event Stream Processing Studio and Streamviewer include some advanced user interface features, which require a newer web browser. For information about supported browsers, see the following website:

<https://support.sas.com/en/documentation/third-party-software-reference/viya/support-for-web-browsers.html>

If you cannot install one of the supported web browsers for use with SAS Event Stream Processing, be aware of possible unexpected user interface behavior. Because session cookies are required in order to maintain session state, be sure to enable cookies in your browser.

User Accounts and Security

The user account that is used to perform the deployment requires Administrator privileges. Administrator privileges are not required after the installation in order to run an instance of an ESP server. The installation directory path enables Write access per user group, and it is owned by the user account that is used to perform the installation. To enable users to edit the product configuration files, the administrator can use a Group policy to grant Write access to these files to any user.

The Event Stream Processing XML server does not support Kerberos authentication on Windows.

(Optional) Enable Encryption and Authentication for SAS Event Stream Processing

SAS Event Stream Processing provides optional encryption and authentication features. The required OpenSSL encryption libraries are installed automatically when you install SAS Event Stream Processing. You can then enable encryption with OpenSSL on TCP/IP connections within an event stream processing engine. You can

also configure ESP servers to require client authentication for SAS TCP/IP clients. Authentication and encryption apply to the following ESP server APIs:

- The ESP Server (XML Server) HTTPS API
 - Connections that are created by the XML Client (dfesp_xml_client) to communicate with an ESP server using the HTTPS protocol
 - Connections that are created by the Streamviewer component (streamviewer.html) to communicate with the ESP server using the HTTPS protocol
- C or Java Publish/Subscribe API
 - Connections that are created by a client that uses the C or Java Publish/Subscribe API to communicate with an ESP server
 - Connections that are created by an adapter to communicate with an ESP server

If you enable authentication for an ESP server, you must then provide authentication tokens or credentials in Streamviewer. You can copy and paste the token directly into an appropriate dialog box in Streamviewer. Alternatively, you can specify a URL that supplies the token. Authentication tokens and credentials are cached for the duration of a Streamviewer session.

For more information about enabling security for an ESP server or for Streamviewer, see [SAS Event Stream Processing: Security](#).

Pre-installation Tasks

<i>Obtain the Required Files</i>	9
<i>Set the Environment Variables</i>	9

Obtain the Required Files

When you order SAS software, SAS sends a Software Order Email (SOE) to your business or organization that includes information about the software order. Follow the steps in this section to save the attached ZIP file and to download the additional file that is required.

- 1 Save the SAS_Viya_deployment_data.zip file that was attached to your SOE to a directory on the machine where you intend to deploy your software.

This file contains entitlement certificates that will enable you to download the SAS software.

Note: This ZIP file will be uncompressed automatically by the installation script.

- 2 Your SOE also provided a link to a website where you could download an additional ZIP file, sas-viya-deployment-script.zip . If you have not already done so, save this ZIP file in the same directory where you saved the SAS_Viya_deployment_data.zip file.
- 3 In the directory where you saved sas-viya-deployment-script.zip, uncompress it. This creates two new subdirectories, \config and \library. It also adds some files to the directory, including a setup file, setup.bat.
- 4 Move the SAS_Viya_deployment_data.zip file into the same directory as the setup.bat file.

You will be directed to use the setup script after completing the rest of the pre-installation tasks.

Set the Environment Variables

You must set several environment variables before you install SAS Event Stream Processing. Some variables are required to support core product features. Others are required only to support optional components and features.

- 1 Open the Control Panel from the **Start** menu. Navigate to **System and Security**.
- 2 Click **System** ⇒ **Advanced System Settings** in the left pane.
The System Properties dialog box appears. Click **Environment Variables**.
- 3 Click **New** to add the following variable definitions. Or select the variable from the list and click **Edit** to modify an existing variable definition:

Variable	Value
DFESP_HOME	<p>C:\PROGRA~1\SAS\Viya \SASEventStreamProcessingEngine\5.1.0</p> <p>The setting for this variable does not affect the default installation location, which is C:\Program Files\SAS\Viya.</p> <p>If you installed in a location other than the default, update the path to match the installation directory.</p>
PATH	<p>%DFESP_HOME%\bin;C:\PROGRA~1\SAS\Viya \SASFoundation\sasexe;%PATH%</p> <p>If you installed in a location other than the default, update the path to match the installation directory.</p>
<p>(Optional) DFESP_SSLPATH</p> <p>Setting this variable is required to enable SSL on connections between SAS Event Stream Processing Studio and a SAS Event Stream Processing engine. Enabling SSL encryption is optional. For instructions, see “(Optional) Enable Encryption for SAS Event Stream Processing Studio” on page 17.</p> <p>This setting assumes that you installed the OpenSSL libraries on all computer systems that run the client and server. When you install the SAS Event Stream Processing Encryption and Authentication Overlay, OpenSSL is automatically installed.</p>	<p><i>Drive:\path-to-OpenSSL-shared-object</i></p> <p>By default, when the Encryption and Authentication Overlay package is installed, the path is %DFESP_HOME%\bin.</p>
<p>(Optional) PYTHONPATH or PYTHONHOME</p> <p>Enables you to use the Anaconda Python support in SAS Micro Analytic Service.</p>	<p>Add the Python Lib directory to PYTHONPATH. Or set PYTHONHOME to the top-level Python directory:</p> <ul style="list-style-type: none"> ■ PYTHONPATH=C:\Program Files \Miniconda3\envs\pythonversion\Lib ■ PYTHONHOME=C:\Program Files \Miniconda3\envs\pythonversion

4 Click **OK** to save your variable settings.

SAS Event Stream Processing includes the internal component SAS Micro Analytic Service. To use the Anaconda Python support in SAS Micro Analytic Service, you must set one of the optional variables listed in the table for your version of Python. For more information, see *SAS Micro Analytic Service: Programming and Administration Guide*, which is available on the [SAS Event Stream Processing product page](#).

Installing SAS Viya

<i>Deploy the Software on Windows</i>	11
<i>Install All of the Software</i>	11
<i>Selectively Install Software Components</i>	12
Install SAS Event Stream Processing	12
(Optional) Install SAS Event Stream Processing Studio	13
(Optional) Install the Streamviewer Component	14
Install SAS Text Analytics	14
Apply the License	15

Deploy the Software on Windows

Use the procedures in this section to deploy your SAS software. You have two options for downloading and installing the software:

- [Install All of the Software on page 11](#)
- [“Selectively Install Software Components” on page 12](#)

The user account that performs the deployment requires Administrator privileges for the Windows machine where the software is installed.

Install All of the Software

The steps in this section assume that you have downloaded the files that are required to install your SAS software. For more information, see [“Obtain the Required Files” on page 9](#). Run the script without options to download all of the software and install it on a single machine.

- 1 On the computer where you want to install SAS Event Stream Processing, navigate to the directory where you uncompressed the ZIP file that you downloaded.
- 2 Locate the setup.bat file. Right-click the file, and select **Run as Administrator** from the menu.

As the batch job runs, a `\Downloads` folder is created in the directory where you are running the batch script. The software is downloaded from secure repositories to this new folder on your computer.

The script always installs the software in `C:\Program Files\SAS\Viya`. If you want to select a different location, follow the instructions in [“Selectively Install Software Components” on page 12](#).

Note: Messages from the setup script indicate that software packages that are labeled with version 5.3.0 are downloaded. These messages actually correspond to the current version of the software (5.1.0) and should not cause concern.

3 You can also run the setup file from a command prompt if you want to supply optional flags. Open a command prompt from the Windows Start menu.

4 Run the following command:

```
setup.bat options
```

In addition to downloading and installing the software on the local machine, when it is run without options, the script also configures and starts any necessary services. The optional flags are described below.

5 Launch the SAS Event Stream Processing Studio user interface from a browser window using the following URL: `http://server-host-name:8080/SASEventStreamProcessingStudio/index.html`

For *server-host-name*, substitute the host name or IP address of the server where you installed the SAS Event Stream Processing Studio software.

6 You must start the Event Stream Processing XML server (the ESP server) in order to enable model creation. Open a command prompt by clicking **Start** and entering *cmd* in the **Search** box.

7 Change directories to the default installation directory or to its equivalent in your deployment:

```
cd c:\Program Files\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\bin
```

8 Run the following command:

```
dfesp_xml_server -pubsub n -http port
```

The `-pubsub` argument specifies a port for publish and subscribe actions. Replace *n* with the appropriate port number.

The `-http` argument specifies the port for the HTTP REST API. The value of *port* cannot exceed 65535.

For more information about the ESP server, see [SAS Event Stream Processing: Using the ESP Server](#).

The setup script has the following command-line options:

-download

Downloads the software packages to which your order entitles you. If you use this option, you will have to install and configure the software using the separate options that are specific to those tasks.

-install

Only installs the software and services. If you use this option, the software and services will not be configured and the services will not be started.

-config

Configures the installed software, and configures and starts the services. This option fails if you run the command before the software and services have been installed.

If you prefer to install some SAS Event Stream Processing components on separate machines, follow the steps in [“Selectively Install Software Components” on page 12](#) to perform an interactive installation.

Selectively Install Software Components

Some components that support SAS Event Stream Processing are optional to install. Follow the steps in this section if you want to selectively install components, or if you want to install SAS Event Stream Processing components on separate machines.

Install SAS Event Stream Processing

1 On the computer where you want to install SAS Event Stream Processing, navigate to the directory where you uncompressed the ZIP file that you downloaded.

- 2 Locate the download.bat file. Right-click the file, and select **Run as Administrator** from the menu.

As the batch job runs, a `\Downloads` folder is created in the directory where you are running the batch script. The software is downloaded from secure repositories to this new folder on your computer.

Note: Messages from the setup script indicate that software packages that are labeled with version 5.3.0 are downloaded. These messages actually correspond to the current version of the software (5.1.0) and should not cause concern.

- 3 When the script has completed, navigate to the Downloads folder.
- 4 Locate the MSI files that the batch job has downloaded from SAS repositories. Double-click the MSI file named `msiesp-5.x.x.build-ID.msi` to launch the program that installs the software.
- 5 The installer prompts you for a location where you want to install SAS Event Stream Processing. By default, it is installed in `C:\Program Files\SAS\`, but the installer enables you to select another location.

The installation creates a *Viya* subfolder and adds files to it. When the software installation has completed successfully, a message is displayed that indicates success. You can then install the optional components, SAS Event Stream Processing Studio, Streamviewer, and SAS Text Analytics, as appropriate. The steps are provided below.

(Optional) Install SAS Event Stream Processing Studio

When you have installed the contents of the `msiesp-version-number.msi` file that you downloaded, you can install the user interface component, SAS Event Stream Processing Studio. You must manually start the Event Stream Processing XML Server to enable model creation.

Take the following steps:

- 1 Navigate to the directory where you downloaded the MSI files from SAS repositories.
- 2 Double-click the MSI file that installs SAS Event Stream Processing Studio. It has a filename in the format `msiespstudio-5.x.x.build-ID.msi`.
- 3 The installer prompts you for a location where you want to install SAS Event Stream Processing Studio. By default, it is installed in `C:\Program Files\SAS\`, but the installer enables you to select another location.
- 4 Click **OK** to launch the Windows installer. When it has completed, a message is displayed that indicates success.
- 5 Start the SAS ESP Studio service. Click **Start**, and enter `services.msc` in the **Search** box. Select **services.msc** from the search results.

The **Services** panel is displayed.

- 6 Scroll through the list of services and locate the **SAS ESP Studio** service. Click the **Start** link to start the service.
- 7 Launch the SAS Event Stream Processing Studio user interface from a browser window using the following URL: `http://server-host-name:8080/SASEventStreamProcessingStudio/index.html`
For *server-host-name*, substitute the host name or IP address of the server where you installed the SAS Event Stream Processing Studio software.
- 8 You must start the Event Stream Processing XML server (the ESP server) in order to enable model creation. Open a command prompt by clicking **Start** and entering `cmd` in the **Search** box.
- 9 Change directories to the default installation directory or to its equivalent in your deployment:

```
cd c:\"Program Files"\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\bin
```

10 Run the following command:

```
dfesp_xml_server -pubsub n -http port
```

The `-pubsub` argument specifies a port for publish and subscribe actions. Replace *n* with the appropriate port number.

The `-http` argument specifies the port for the HTTP REST API. The value of *port* cannot exceed 65535.

For more information about the ESP server, see [SAS Event Stream Processing: Using the ESP Server](#).

11 The following message is displayed:

```
Access control disabled (could not open permissions.yml: file not found)
```

The file that is referenced is required only to enable access control on the ESP server. You can ignore this message.

Port 8080 is used by default. However, you can set a different port for SAS Event Stream Processing Studio, as necessary. For more information, see [“\(Optional\) Change the Default Port for SAS Event Stream Processing Studio” on page 18](#).

(Optional) Install the Streamviewer Component

You can install the optional SAS Event Stream Processing Streamviewer user interface on a separate machine from the other SAS Event Stream Processing software. Take the following steps to install it on Windows:

- 1 Navigate to the directory where you downloaded the MSI files from SAS repositories.
- 2 Double-click the MSI file that installs Streamviewer. It has a filename in the format `msiespstvwr-5.x.x.build-ID.msi`.
- 3 The installer prompts you for a location where you want to install Streamviewer. By default, it is installed in `C:\Program Files\SAS\`, but the installer enables you to select another location.
- 4 Click **OK** to launch the Windows installer.

Additional steps are required to configure Streamviewer. For more information, see [Setting Up and Running Streamviewer](#).

Install SAS Text Analytics

Install the SAS Text Analytics component on the same machine as the “base” SAS Event Stream Processing software. In other words, install it along with the msiesp software. This component is automatically included with your order, but is optional to install.

Perform the following steps to install SAS Text Analytics on Windows:

- 1 On the computer where you installed SAS Event Stream Processing, navigate to the directory where you saved the SAS MSI files.
- 2 Double-click the MSI file that installs SAS Text Analytics. The filename is specified in the format `msitxtmineng-5.x.x.build-ID.msi`.
- 3 The installer prompts you for a location in which to install SAS Text Analytics. Install it in the same directory as SAS Event Stream Processing, which is installed by default in `C:\Program Files\SAS\`.
- 4 Click **OK** to launch the Windows installer.

The Windows installer completes the installation.

Apply the License

A valid license is required in order to run any applications that use SAS Event Stream Processing. If you used the setup.bat file to install all of the SAS Event Stream Processing software on a single machine, the license has been copied automatically, and you can skip this section.

If you did not run setup.bat, your SOE delivered a license file that you must apply to the local machine by saving it to the license directory. This directory is created automatically during MSI execution.

Note: The license file is required only for SAS ESP servers. If you installed the user interface components (SAS Event Stream Processing Studio and Streamviewer) on separate machines, copying the license to those machines is not required.

- 1 Locate the license file (in TXT format) that you previously saved. It should be in the directory where you uncompressed the ZIP file.
- 2 Copy (**Ctrl+C**) the license file to the Windows Clipboard.
- 3 Navigate to the default license directory:
`C:\Program Files\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\etc\license`
- 4 Use **Ctrl+V** to paste the license file into the license directory.

Post-installation Tasks

<i>Enable Metering for ESP Servers</i>	17
<i>(Optional) Enable Encryption for SAS Event Stream Processing Studio</i>	17
<i>(Optional) Change the Default Port for SAS Event Stream Processing Studio</i>	18
<i>Preparing the Windows Environment for Migration of Your XML Models</i>	19
<i>Directory Structure and Permissions</i>	19
<i>Code Examples</i>	20

Enable Metering for ESP Servers

Additional steps are required in order to enable the product license. The setup script applies the product license on each machine where you have deployed SAS Event Stream Processing. However, you must set up and run at least one metering server to track the number of incoming events and to maintain event counts.

The metering server aggregates counts that are based on the license, the source window, and the hour of day. It stores aggregated results so that a client can query and track the total volume of messages that are processed. Enabling the metering server ensures that your ESP server is in compliance with the terms of its license. Event metering is not required on development servers because they do not contribute to the event volume that is assigned to a license.

For more information about enabling metering, see [Using the Metering Server](#) in the SAS Event Stream Processing user documentation.

(Optional) Enable Encryption for SAS Event Stream Processing Studio

An Encryption and Authentication Overlay package is installed automatically with SAS Event Stream Processing. With this software, you can enable encryption with OpenSSL. Secure Sockets Layer (SSL) encryption can be applied to the connections that are made between SAS Event Stream Processing Studio and SAS ESP servers.

To enable SSL for SAS Event Stream Processing Studio and the clients that access it, you must generate a pair of certificates, copy them to the required locations, and add the client certificate to your browser and to the Java keystore.

- 1 Verify that the OpenSSL libraries are present on all machines where SAS Event Stream Processing components or clients will run.

Locate the DLLs, libeay32.dll and ssleay32.dll. They are installed by default in `c:\Program Files\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\bin`. Obtain them from OpenSSL if required.

- 2 Verify that the `DFESP_SSLPATH` environment variable is defined with the path to the OpenSSL shared library.
- 3 Obtain SSL certificates for the machine where SAS Event Stream Processing Studio is installed and for the clients that will access it. Use OpenSSL or your preferred method to generate site-signed or third-party-signed certificates.
- 4 On the machines from which end users will access SAS Event Stream Processing Studio, import the client certificate into the certificates store of your preferred web browser.
- 5 On the machine where SAS Event Stream Processing Studio is running, import the client certificate into the Java keystore by running the following command from a command prompt:

```
%JAVA_HOME%\bin\keytool -importcert -keystore keystore-location -file path-to-file
-storepass password -noprompt -alias alias
```

Here is an example:

```
%JAVA_HOME%\bin\keytool -importcert -keystore %JAVA_HOME%\lib\security\cacerts
-file %DFESP_HOME\etc\ca.pem -storepass P4ssw0rd -noprompt -alias myalias
```

Note: Specify the command on a single line. Multiple lines are used here to improve readability.

- 6 Set the `JAVA_HOME8` environment variable to the location of your Java installation. For example, set it to `c:\Program Files (x86)\Java\filename-of-JRE`.
- 7 Import the client certificate (`ca.pem`) into the certificates store, which is located in the following directory on your client machines: `\SAS\Viya\SASEventStreamProcessingEngine\default`.
- 8 Restart the SAS ESP Studio service. Click **Start**, and enter `services.msc` in the Search box. Select **Services** from the search results. The Services panel is displayed.
- 9 Scroll through the list of services and locate the **SAS ESP Studio** service. Right-click, and select **Restart** to restart the service.

(Optional) Change the Default Port for SAS Event Stream Processing Studio

By default, SAS Event Stream Processing Studio uses Port 8080. To change the default port, perform the following steps:

- 1 Stop the SAS ESP Studio service. Click **Start**, and type `services.msc` in the **Search** box. Select **services.msc** from the search results.
The Services panel appears.
- 2 In the list of services, locate the SAS ESP Studio service and select it. Click the **Stop** link to stop the service.
- 3 Navigate to `C:\Program Files\SAS\Viya\bin`. If you selected an alternative location for the installation, navigate to the appropriate subfolder in that location.
- 4 Create a backup copy of the file named `sasespvm.xml` by saving the file with a different filename.
Note: You must have administrator privileges to the installation directories.
- 5 Use your preferred text editor to open `sasespvm.xml`, and to locate the following line in the file:

Note: Multiple lines are shown here to improve readability.

```
"<arguments>-jar "%ProgramFiles%\SAS\Viya\SASEventStreamProcessingStudio\5.1.0
\sas-esp-visualmodeler-5.1.x.jar"</arguments>"
```

- 6 Insert an instruction to use a port other than the default (8080). In the following example, the port is changed to 8181:

```
"<arguments> -Dserver.port=8181 -jar "%ProgramFiles%\SAS\Viya
\SASEventStreamProcessingStudio\5.1.0\sas-esp-visualmodeler-5.1.x.jar"</arguments>"
```

- 7 Restart the service. Click **Start**, and enter *services.msc* in the **Search** box. Select **services.msc** from the search results.

The Services panel appears.

- 8 In the list of services, locate and select the SAS ESP Studio service. Click the **Start** link to start the service.

Note: The Event Stream Processing XML Server is already running and does not require a restart.

- 9 Launch the SAS Event Stream Processing Studio user interface from a browser window. Specify the following URL, substituting the new port number that you configured:

```
http://server-host-name:port-number/SASEventStreamProcessingStudio/index.html
```

For *server-host-name*, substitute the host name or the IP address of the server where you installed the SAS Event Stream Processing Studio software.

Preparing the Windows Environment for Migration of Your XML Models

SAS Technical Support maintains a migration script that enables you to upgrade the XML models that you previously created using SAS Event Stream Processing 3.x so that they are compatible with SAS Event Stream Processing 5.1.

Before you can run the migration script, you must prepare your Windows environment by installing the XSLT libraries.

- 1 Download the XSLT files from the following FTP site:

```
ftp://ftp.zlatkovic.com/libxml/
```

SAS recommends selecting the 32-bit package. Be sure to install the libxml, libxslt, zlib, and iconv libraries.

- 2 Add the `\bin` folder of each downloaded library to the PATH environment variable.
- 3 Validate the installation by running the following command from a prompt:

```
xsltproc -version
```

For more information about the migration script, contact SAS Technical Support.

Directory Structure and Permissions

After you install SAS Event Stream Processing, the files for the engine and files to support optional authentication are located in the following directory:

C:\Program Files\SAS\Viya\SASEventStreamProcessingEngine\5.1.0

Configuration files are located in the following directory:

%PUBLIC%\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\default

The basic directory path enables Write access per user group, and it is owned by the user who performed the installation. To grant permission to users to edit the configuration files, the administrator can set up Group permissions.

Later, if you update your deployment, the configuration files are not altered.

If you access the list of installed programs from the Windows Control Panel, the software packages that are labeled with version 5.3.0 are displayed. These messages actually correspond to the current version of the software (5.1.0). For more information, see the following SAS Note: <http://support.sas.com/kb/61/666.html>.

Code Examples

The SAS Event Stream Processing code examples are automatically installed along with the software in the following location:

C:\Program Files\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\examples

The examples directory includes files for C++, XML, Python, and Java. It also includes a readme.examples file, which briefly describes each example and its usage.

SAS recommends that you copy the examples that you require to a writable directory on the local computer so that you can run them.

For help with understanding the examples, see the following documents on the [SAS Event Stream Processing product page](#).

- *DataFlux Expression Language Reference Guide*
- *SAS Micro Analytic Service: Programming and Administration Guide*

Uninstalling SAS Viya

<i>Uninstall SAS Event Stream Processing</i>	21
--	----

Uninstall SAS Event Stream Processing

You can use the native Windows installation features to uninstall SAS Event Stream Processing software:

- 1 Create a backup copy of the SAS Event Stream Processing Studio database in order to preserve project files. Follow these steps:
 - a Stop the SAS Event Stream Processing Studio service by accessing the Windows **Services** panel.
 - b Scroll through the list of services and locate the **SAS Event Stream Processing Studio** service. Click **Stop** to stop the service.
 - c Create a backup copy of the database, which is a single binary file (studio.mv.db). You can copy it to any directory location outside the SAS Event Stream Processing installation directory structure.
 The location and filename of the database are determined by the environment variable `ESP_STUDIO_DB`. By default, it is stored in `drive-letter:\Users\Public\SAS\Viya\SASEventStreamProcessingStudio\`
- 2 Access **Control Panel** from the **Start** menu.
- 3 Click **Programs** or, in some versions of Windows, **Add/Remove Programs**.
- 4 Click **Uninstall a Program**.
 The list of programs that are installed on the computer is displayed.
- 5 Locate **SAS Event Stream Processing** in the list.
- 6 Right-click, and select **Uninstall**.
 The uninstallation removes files and directories that are associated with SAS Event Stream Processing.
- 7 Locate **SAS Event Stream Processing Studio** in the list of installed programs.
- 8 Right-click, and select **Uninstall**.
 The uninstallation removes files and directories that are associated with SAS Event Stream Processing Studio.
- 9 (Optional) If you installed the optional Streamviewer component, locate **SAS Event Stream Processing Streamviewer** in the list of installed programs.
- 10 Right-click, and select **Uninstall**.

The uninstallation removes files and directories that are associated with Streamviewer.

- 11 (Optional) If you installed the optional SAS Text Analytics component, locate **SAS Text Analytics** in the list of installed programs.
- 12 Right-click, and select **Uninstall**.

The uninstallation removes SAS Text Analytics.
- 13 Manually remove the environment variable settings that you changed for SAS Event Stream Processing.

Note: If you installed SAS Event Stream Processing on a drive other than the default (C:\), the uninstallation procedure is now complete; all files and directories have been removed.
- 14 Manually remove the license file, which is saved in `C:\Program Files\SAS\Viya\SASEventStreamProcessingEngine\5.1.0\etc\license`.
- 15 Manually remove the Utilities directory, which is located at `C:\Program Files\SAS\Viya\Utilities`.
- 16 Manually remove the logs directory, which is located at `C:\Users\Public\SAS\Viya\logs\install folders`.
- 17 Manually remove the SAS Event Stream Processing Studio logs directory, which is located at `C:\Users\Public\SAS\Viya\SASEventStreamProcessingStudio\5.1.0\logs`.
- 18 When the uninstallation completes, restart the computer.

Updating SAS Event Stream Processing

About Updates	23
Applying Updates	23
Update SAS Event Stream Processing on Windows	23
Update All SAS Event Stream Processing Components	23
Selectively Update SAS Event Stream Processing Components	24

About Updates

A software update makes your deployed software up-to-date with the latest software. Updates are performed by running the same tools that you ran during the initial deployment. You might determine that your software needs to be updated, or you might be notified by SAS that updates are available.

The term *upgrade* is used to refer to a type of software update that introduces new functionality. At SAS, an upgrade generally involves a new release number. By contrast, an *update* refers to minor changes to the software such as fixes. A new Software Order Email (SOE) is not required in order to retrieve the updated software packages. Upgrading SAS Event Stream Processing software is not supported on Windows. Instead, you must uninstall the older version of the software and then install the newer version.

Applying Updates

You apply updates to the deployed software environment in order to bring the software to the latest version. For SAS Event Stream Processing, you can perform the update using Windows installation tools along with MSI files.

After an update has completed, any user-modified configuration values are maintained.

Update SAS Event Stream Processing on Windows

Update All SAS Event Stream Processing Components

You can use Windows installation tools that work with MSI files to apply all available updates to SAS Viya software on a selected machine.

- 1 (Optional) Create a backup copy of SAS Event Stream Processing configuration by saving copies of any files that are located in `C:\Users\Public\SAS\Viya\SASEventStreamProcessing`. Save them in a directory outside of the installation directory, which is `C:\Program Files\SAS\` by default.

- 2 On the computer where you installed SAS Event Stream Processing, navigate to the directory where you uncompressed the ZIP file that you downloaded.

Note: The SOE that enabled you to install the SAS software provided a link to the ZIP file to be downloaded.

- 3 Locate the setup.bat file. Right-click the file, and select **Run as Administrator** from the menu.

The update proceeds automatically. Repeat the preceding steps on each Windows machine where you installed SAS Event Stream Processing.

When the software update has completed successfully, a message is displayed that indicates success.

Selectively Update SAS Event Stream Processing Components

You can also update selected components of SAS Event Stream Processing.

- 1 (Optional) Create a backup copy of SAS Event Stream Processing configuration by saving copies of any files that are located in `C:\Users\Public\SAS\Viya\SASEventStreamProcessing`. Save them in a directory outside of the installation directory, which is `C:\Program Files\SAS\` by default.
- 2 Follow the procedure described at [“Selectively Install Software Components” on page 12](#).