SAS® Event Stream Manager 4.3: Deployment Guide

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Introduction

About This Guide

SAS Event Stream Manager is a web-based client that enables you to manage your SAS Event Stream Processing environments. You can use SAS Event Stream Manager to deploy SAS Event Stream Processing flows into selected environments, monitor the health of your SAS Event Stream Processing applications, and administer and manage your streaming environments. The deployment process that is described in this guide installs the software that is required to manage event stream processing applications and data flows. SAS Event Stream Manager uses the same installation tools and processes as other SAS products that are compatible with the SAS Viya platform.

SAS Event Stream Manager 4.3 is optimized to support SAS Event Stream Processing for Edge Computing and SAS Event Stream Processing on Linux. However, SAS Event Stream Manager can also support SAS Event Stream Processing on Windows. In all environments, SAS recommends installing SAS Event Stream Manager as a stand-alone product on a separate machine from the SAS Event Stream Processing server.

Use this guide to deploy SAS Event Stream Manager in your environment. To use this guide successfully, you should have a working knowledge of the Linux operating system and basic commands.

About the Deployment Tools

SAS Event Stream Manager deployment uses standard tools that are designed for deploying and updating software on Linux operating systems. To ensure that you deploy the latest software, SAS provides the software in repository packages that are maintained by SAS. Specifically, the software is packaged in the RPM Package Manager (RPM) format, which simplifies installation, uninstallation, and upgrade tasks. Each time you deploy or update your software, you automatically receive the latest RPM packages that are available.

Ansible is a software orchestration tool that provides a straightforward approach to deploying SAS Event Stream Manager. To deploy using Ansible, you customize files for your environment, and then you run a command to deploy software according to the values in those files. The set of files, known collectively as a "playbook," provides the instructions for how and where SAS Event Stream Manager is deployed. In this guide, "to run the playbook" means to deploy the software.

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.

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System Requirements

Hardware Requirements

SAS recommends installing SAS Event Stream Manager on a separate machine from the SAS Event Stream Processing server.

The supporting SAS Event Stream Manager Agent component is installed along with SAS Event Stream Processing on Linux. This component is optional, but is recommended. It is not available for Windows.

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

Item	Recommended Level*
CPU	2 cores (x86 architecture) Intel Xeon chip set with a minimum speed of 2.6 GHz
Memory	8 GB of RAM Memory clock speed of 1600 MHz
Disk Space and Speed	10 GB 10,000 RPM

*Each machine that is used to access the user interface must have a minimum screen resolution setting of 1280 x 1024.

Operating System Requirements

Supported Operating Systems

For the full list of supported operating systems, see the following website: https://support.sas.com/en/documentation/third-party-software-reference/viya/support-for-operating-systems.html.

The deployment requires the operating system to be registered with the Red Hat Network. Registration enables you to receive periodic software updates. For a SAS software deployment, registration also enables yum to download software from SAS repositories. Verify that the machine where you perform the deployment is registered and that your subscription has been activated. The Ansible controller must be connected to the Red Hat Network with a Server-Optional subscription in addition to the Base (operating-system) subscription.

To check whether the system is registered, run the following command on Red Hat Enterprise Linux:

```
subscription-manager version
```

The command returns information about the subscription service to which the system is registered. To check whether the subscription has been activated, run the following command:

```
subscription-manager list --available
```

A list of active subscriptions is returned.

Linux Prerequisites

The typical Linux installation includes all of the packages and libraries that SAS requires. Problems can occur if default packages were removed from the base operating system (for example, X11 libraries and system utilities). The following libraries are required:

- glibc 2.12
- libpng (on Red Hat Enterprise Linux 6.*x* or the equivalent)

  libpng12 (on Red Hat Enterprise Linux 7.*x* or the equivalent)
- libXp
- libXmu
- net-tools
- the numactl package
- the X11/Xmotif (GUI) packages
- xterm

On Linux 7.*x*, verify that the systemd package on each machine is at version 219-30 or later. Run the following command:

```
rpm -qa | grep systemd
```

If the version that is returned is not at least 219-30, run the following command to retrieve the most recent package from Red Hat:

```
yum update systemd
```

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

Java Requirements

The Java Runtime Environment (JRE) must be installed on each machine where you install SAS Event Stream Manager. 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.

Web Browsers

A web browser is required to access the SAS Event Stream Manager user interface. For information about supported browsers, see https://support.sas.com/en/documentation/third-party-software-reference/viya/support-for-web-browsers.html.

Your browser must have JavaScript and cookies enabled. Cookies are used to maintain session state.

If you cannot install a supported browser, be aware of possible unexpected user interface behavior.

Security Requirements

Verify that the following prerequisites have been met before you start the deployment:

- An LDAP server, for user authentication.

  The SAS Logon Manager component provides logon services for SAS Event Stream Manager. It requires LDAP.

- Administrator privileges for the Linux machine where you are launching the SAS software deployment.

- Super user (sudo) access for the user account that you are using for the deployment. To verify that the user ID is included in the sudoers file, run the following command:

      sudo -v

  To verify your sudoers privileges, run the following command:

      sudo -l

  Note: The ability to start a shell (with the `!SHELL` entry in some sudoers files) as root is not required.

After the installation has completed, administrator privileges are not required in order to run SAS Event Stream Manager. User accounts are managed in LDAP. You can configure the LDAP server before you run the playbook. For more information, see "Configure LDAP Settings" on page 15.

Ansible Controller Requirements

Ansible is required to install SAS Event Stream Manager.

For information about supported Ansible versions, see the following website: https://support.sas.com/en/documentation/third-party-software-reference/viya/support-for-operating-systems.html.

A typical Ansible deployment consists of at least one control machine (the Ansible controller) and one or multiple Ansible managed nodes (the machines where SAS software is installed). In a single-machine deployment, such as SAS Event Stream Manager deployment, Ansible and all SAS software are typically installed on the Ansible controller. For more information, see "Install Ansible" on page 10.

Internet connectivity is required between the Ansible controller and the SAS repositories so that the software can be downloaded. A subscription to the Red Hat Network is also required; for more information, see "Supported Operating Systems" on page 4.

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Pre-Installation Tasks

Prepare for Deployment

Be sure to complete the tasks that are described in this chapter before you run the playbook.

Verify That You Have 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. The SOE directs you to save its attached .tgz file and the license file to a directory on your Ansible controller. The recommended location is `/sas/install`. If you have not already done so, you must save those files before performing any of the steps in this section.

In the same directory where you have saved the .tgz file, uncompress it.

```
tar xf SAS_Event_Stream_Manager_playbook.tgz
```

A sas_viya_playbook subdirectory is added, containing the following files:

- a second copy of the license file

- the entitlement_certificate.pem and SAS_CA_Certificate.pem files

- the files that make up the playbook

Configure SELinux

If you have enabled Security-Enhanced Linux (SELinux) in your environment, you must enable permissive mode on the target machine. You can run the following command to check whether SELinux is enabled on an individual system:

```
sudo sestatus
```

For all Linux distributions, if a mode that is not permissive is returned, run the following commands:

```
sudo setenforce 0
sudo sed -i.bak -e 's/SELINUX=enforcing/SELINUX=permissive/g' /etc/selinux/config
```

Enable Required Ports

The following ports should be available before you begin to deploy your software. The same ports should also be available for any firewalls that are configured on the operating system or the network.

Process	Required Port	Notes
Event Stream Manager service and web interface	80 (external)	
HTTPD	80 (internal) 443 (external) See note below.	
SAS Infrastructure Data Server	5430–5439	For a single server deployment with no failover, ports 5430-5432 must be opened. Additional standby nodes each get the next available port number sequentially up to 5439.
default SAS Messaging Broker AMQP client access port	5672	
SAS Configuration Server	8500	SAS uses HashiCorp Consul as its configuration server.
default SAS Messaging Broker management web console port	15672	
default SAS Messaging Broker clustering port	25672	

Note: To enable the machines in your deployment to communicate, port 80 on the machine where HTTPD is installed must be reachable by any machine where SAS software is installed. However, in order to secure web access to your SAS software, only port 443 (HTTPS) should be open externally.

The Linux operating system defines a specific series of network service ports as an ephemeral port range. These ports are designed for use as short-lived IP communications and are allocated automatically from within this range. If a required port is within the range of the ephemeral ports for a host, another application can attempt to claim it and cause services to fail to start. Therefore, you must exclude the required ports from the ports that can be allocated from within the ephemeral port range.

1 To determine the active ephemeral port range, run the following command on your host:

```
sudo sysctl net.ipv4.ip_local_port_range
```

The results contain two numbers:

```
net.ipv4.ip_local_port_range = inclusive-lower-limit inclusive-upper-limit
```

2 To list any existing reserved ports, run the following command:

```
sudo sysctl net.ipv4.ip_local_reserved_ports
```

Here is an example of the results:

```
net.ipv4.ip_local_reserved_ports = 23, 25, 53
```

If no ports are reserved, no ports are listed in the results:

```
net.ipv4.ip_local_reserved_ports =
```

3   To add any required ports from the ephemeral port range to the list of reserved ports, run the following command: .

Note: Ports can be specified as comma-separated values or as a range of values within quotation marks.

```
sudo sysctl -w net.ipv4.ip_local_reserved_ports="ports-or-port-range"
```

Here is an example:

```
sudo sysctl -w net.ipv4.ip_local_reserved_ports="5672,15672,25672,4369,16060-16069,9200"
```

Note: The sysctl command numerically sorts the port numbers regardless of the order that you specify.

4   Add an entry to the /etc/sysctl.conf file to make your changes permanent. Here is an example:

```
net.ipv4.ip_local_reserved_ports = 4369,5672,9200,15672,16060-16069,25672
```

Configure the Use of a Proxy Server

If your organization uses a proxy server as an intermediary for Internet access, you should configure yum to use it. The steps to configure the `/etc/yum.conf` file vary by operating system. Refer to your vendor documentation for more information.

Enable the Yum Cache

By default, yum deletes downloaded files after a successful operation when they are no longer needed, minimizing the amount of storage space that yum uses. However, you can enable caching so that the files that yum downloads remain in cache directories. By using cached data, you can perform certain operations without a network connection.

In order to enable caching, add the following text to the `[main]` section of `/etc/yum.conf`.

```
keepcache = 1
```

This task should be performed on each machine in the deployment.

Firewall Considerations

The following steps should be performed on the Ansible controller or other machine target:

1   Ensure that your firewall is open in order to allow access to the IP address of the content delivery servers that provide updates from Red Hat. The IP addresses for content delivery services vary by region. For more information about the list of IP addresses, see the following website:

Public CIDR Lists for Red Hat

2   Ensure that the firewall allows access to the following yum repositories that are hosted by SAS so that content can be delivered for deployment:

■   https://ses.sas.download/

■   https://bwp1.ses.sas.download/

- https://bwp2.ses.sas.download/
- https://sesbw.sas.download

3 Determine whether iptables or firewalld is running:

```
sudo service --status-all
```

If you are using a version of Red Hat Enterprise Linux that is earlier than version 7.1, look for the status of iptables. If you are using any other version of Linux, including versions that are later than version 7.1, look for the status of firewalld.

If iptables or firewalld is running, go to step 4.

Note: To identify the version of Linux that you are using, check the **/etc/redhat-release** file.

4 To stop iptables, perform the following commands:

```
sudo service iptables stop
sudo chkconfig iptables off
sudo service ip6tables stop
sudo chkconfig ip6tables off
```

To stop firewalld, perform the following commands:

```
sudo service firewalld stop
sudo chkconfig firewalld off
```

Note: For more information about the service utility, look at the administration documentation available at the Red Hat Customer Portal (https://access.redhat.com/).

Install Ansible

Ansible is third-party software that provides automation and flexibility for deploying software to multiple machines. Ansible is required to deploy SAS Event Stream Manager. You can use the information in this section to install and configure Ansible.

Installation Steps

Follow these steps to install Ansible on a Linux machine that runs SAS Viya. These steps assume that you have sudo access to the machine where you are installing Ansible.

1 Run the following commands:

Note: For improved readability, the third command occupies two lines. However, make sure that you enter the command on a single line.

```
sudo yum install -y epel-release
sudo yum install -y gcc automake openssl-devel python-devel libffi-devel
sudo yum install -y python-crypto python-paramiko python-keyczar python-setuptools python-pip
    python-six python-pip
sudo yum install -y python-virtualenv
mkdir work && cd work
virtualenv deployment
source deployment/bin/activate
pip install ansible==2.2.1
```

2 Confirm that the correct version of Ansible is installed.

```
ansible --version
```

Test Your Ansible Installation

To test that Ansible has been installed correctly, run the following command from the sas_viya_playbook directory:

```
ansible all -m ping
```

If the command runs successfully, Ansible is ready for use.

Perform Linux Tuning

On the machine where you plan to deploy SAS Event Stream Manager, verify that the install user has the following ulimits configured:

- nofile is set to 20480 or higher.
- nproc is set to 65536 or higher.

To set the maximum number of open file descriptors on Linux, use your preferred text editor to open the **/etc/security/limits.conf** file. Add the following line, or verify that it already exists:

```
* - nofile 20480
```

This instruction sets the nofiles parameter for all users on the machine.

To set the maximum number of processes that can be running simultaneously on a Linux machine, use your preferred text editor to open the *-nproc.conf file. Change the value for nproc from the default value of 1024 to a hard limit of 65536. Here is an example:

```
* - nproc 65536
```

This instruction sets the nproc parameter for all users on the machine.

Note: The filename *-nproc.conf uses a wildcard to refer to a unique prefix to the nproc.conf filename, which varies according to the version of Linux that is used. For Red Hat Enterprise Linux 6.7, the file location is **/etc/security/limits.d/90-nproc.conf**. For Red Hat Enterprise Linux 7.1, the file is **/etc/security/limits.d/20-nproc.conf**.

4

Installing SAS Event Stream Manager

Playbook Deployment Overview

Install SAS Event Stream Manager on a separate machine from SAS Event Stream Processing.

When you order SAS software, SAS sends a Software Order Email (SOE) to your business or organization. Your SOE includes information about the software order, including several file attachments. The following files are required for deployment:

- the license file

- certificates that enable access to your software

- a TAR file (SAS_Event_Stream_Manager_playbook.tgz), which is required to install SAS Event Stream Manager. This file contains the SAS Event Stream Manager playbook.

  Be sure to uncompress this file, as instructed in .

About the Inventory File

Ansible uses an inventory file to define the machines to be included in a deployment and the software to be installed on them. SAS strongly recommends installing SAS Event Stream Manager on a single machine, the Ansible machine. An inventory file is included for multi-machine deployments. In these situations, the file named hosts in the playbook archive is used as the inventory file. If you used the recommended location for

uncompressing your playbook, the file is located at **/sas/install/sas_viya_playbook/hosts**. For a single-machine deployment, the **sas_viya_playbook/host_local** file is used. The hosts and host_local files are generated for a specific software order. Do not copy these files from one playbook and attempt to use them in another playbook.

Edit the host_local File

The first line of the host_local file is a deployment target reference. It defines the machine on which the SAS Viya software is being deployed. In a typical SAS Event Stream Manager deployment, Ansible is used locally (on the same machine where you are deploying SAS Event Stream Manager software), and the host_local file should be used without modification.

Note: If you are instead using Ansible remotely from a separate machine, modify the first line in the host_local file to include the location of the machine where SAS Event Stream Manager is being deployed. Use the following format:

```
deployTarget ansible_ssh_host=host1.example.com
```

Modify the vars.yml File

As its name suggests, the vars.yml file contains deployment variables that enable you to customize your deployment to meet your requirements. If you used the recommended location for uncompressing your playbook, the file is located at **/sas/install/sas_viya_playbook/vars.yml**.

Set the Deployment Label

The DEPLOYMENT_LABEL is a unique name used to identify the deployment. A default value for DEPLOYMENT_LABEL is set by the playbook.

If you want to use a customized DEPLOYMENT_LABEL, replace the default entry with another name, within double quotation marks, that is appropriate for your deployment. The name can contain only lowercase alphabetic characters, numbers, and hyphens. Nonalphanumeric characters, including a space, are not allowed. Here is an example of a valid name:

```
DEPLOYMENT_LABEL: "esm-2017"
```

Set the Pre-deployment Validation Parameters

The setting of the VERIFY_DEPLOYMENT variable determines the extent of the pre-deployment validation that the playbook performs. If the variable is set to true (the default), all of the following actions take place. If the variable is set to false, only the Ansible version check is performed. Use the following command to run the validation check without running the entire playbook: `ansible-playbook -i` *inventory-file-name* `system-assessment.yml`.

Check the Ansible Version

The playbook checks the installed Ansible version to determine whether it is at least the minimum supported version. If not, the playbook stops with a message.

Verify Machine Properties

The playbook checks each machine in the deployment to ensure that the necessary conditions for deployment are met. If any of these conditions is not met, a warning is given and the playbook stops the deployment.

1   Use your preferred text editor to open the vars.yml file. If you uncompressed your playbook in the recommended location, the file is in **/sas/install/sas_viya_playbook/**.

2   Verify that the DEPLOYMENT_LABEL variable has content and contains only lowercase alphabetic characters, numbers, and hyphens.

3   Verify that the target machine's fully qualified domain name contains less than or equal to 64 characters.

Verify Pre-installation Requirements

The playbook ensures that some system and environment requirements are met. If any of these requirements checks fails, a warning is given and the playbook stops.

1   Verify that the target machine's SELinux mode is either disabled or, if enabled, is set to "permissive".

2   On the target machine, verify that the install user has the following limits:

- nofile is set to 20480 or higher.

- nproc is set to a hard limit of 65536 or higher.

   For more information, see "Perform Linux Tuning" on page 11.

(Optional) Specify JRE

The Java Runtime Environment (JRE) must be installed on the target machine to enable SAS Event Stream Manager. By default, the playbook attempts to install a recent version of OpenJDK and to set the path in a system configuration file. You can instead supply the path to an existing JRE before you run the playbook. To use a preinstalled version of the JRE:

1   Use your preferred text editor to open the vars.yml file.

2   Set the value of sas_install_java to false. For example:

```
sas_install_java: false
```

3   Add the file path to the JRE as the value of sasenv_java_home. Be sure to include "jre" in the file path. For example:

```
sasenv_java_home: /usr/lib/jvm/java-1.8.0-openjdk-1.8.0.101-3.b13.el6_8.x86_64/jre
```

4   Save and close the vars.yml file.

Configure LDAP Settings

SAS Event Stream Manager uses the SAS Logon Manager component to enable authorized users to log on to the user interface. SAS Logon Manager uses LDAP for user authentication. The playbook can configure the LDAP server to enable SAS Logon Manager if you supply the required parameters.

1   On the Ansible controller machine, locate the sitedefault_sample.yml file. If you used the recommended location for uncompressing your playbook, the file is located at **/sas/install/sas_viya_playbook/ roles/consul/files/sitedefault_sample.yml**.

2   Make a copy of sitedefault_sample.yml and name the copy sitedefault.yml.

3   Use your preferred text editor to open sitedefault.yml.

4   Add values that are valid for your site, and save the file.

When you run your Ansible playbook using the site.yml option, as instructed in , the updated sitedefault.yml file is used.

Deploy the Software

Commands

Ensure that you are at the top level of the playbook in the `sas_viya_playbook` directory.

Use the appropriate command to run the playbook, according to the password requirements for the user ID that performs the deployment:

All software (including Ansible) is installed on a single machine:

Does not require a sudo password	`ansible-playbook -i host_local site.yml`
Requires a sudo password	`ansible-playbook -i host_local site.yml --ask-become-pass`

The Ansible controller is separate from the single machine on which the software is to be deployed:

Does not require passwords	`ansible-playbook -i host_local site.yml`
Requires a sudo password only	`ansible-playbook -i host_local site.yml --ask-become-pass`
Requires an SSH password only	`ansible-playbook -i host_local site.yml --ask-pass`
Requires both a sudo and an SSH password	`ansible-playbook -i host_local site.yml --ask-pass --ask-become-pass`

Run from a Directory Other Than the Default

The Ansible playbook runs the commands from the top-level sas_viya_playbook directory, by default. If you want to run the playbook from another directory, modify the ansible.cfg configuration file with the appropriate options. Refer to the Ansible documentation to find the appropriate ansible.cfg file and add those options.

Successful Playbook Execution

Here is an example of the output from a successful playbook execution:

```
PLAY RECAP ********************************************************************
deployTarget              : ok=81   changed=65   unreachable=0    failed=0
```

The most important indicator of success from this message is failed=0, indicating zero failures.

Retry a Failed Deployment

If your deployment fails, and you are able to respond to the error message and can recover from the error, you must restart the deployment. Use the deployment commands and options that were described previously to run the playbook again.

Apply the License

A valid license file is required in order to run SAS Event Stream Manager.

Your SOE contained a license file that you were instructed to save. Now you must apply the license file to the local machine by saving it to the default license directory.

1   Locate the license file that you previously saved.

2   Copy the license file into the default license directory, and rename it to license.txt.

For *license-filename*, substitute the filename of the license file that you saved to your computer in the following command:

```
sudo cp license-filename /opt/sas/viya/config/etc/sysconfig/sas-esm-service/default/license.txt
```

3   Restart the SAS Event Stream Manager service. Run the following command:

```
sudo service sas-viya-esm-service-default restart
```

The service takes a few seconds to restart.

Log On to SAS Event Stream Manager

SAS Event Stream Manager uses SAS Logon Manager for logon functionality. SAS Logon Manager uses LDAP for user authentication. A few steps are required to configure an LDAP server during the installation. For more information, see "Configure LDAP Settings" on page 15.

1   Open the following URL:

```
http://host:port/SASEventStreamManager
```

The host is the system on which SAS Event Stream Manager is installed. The port is the port number used by the system that hosts SAS Event Stream Manager. The default port is 80.

The Sign In to SAS window is displayed.

2   Enter your user ID and password, and click **Sign In**.

If you are a member of the SASAdministrators group or the CASAdministrators group, the Assumable Groups window is displayed. Group membership is not required.

Successful logon to the SAS Event Stream Manager user interface indicates that the software has been installed correctly. To validate that services have been installed and started successfully, see "Validating the Deployment" on page 19.

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Validating the Deployment

Validate the Installation

As soon as the playbook completes, verify that the required services are running and that the software was installed correctly.

Check Service Status

To verify that the deployment has completed successfully, check that the required SAS services are available. You can check the status of all of the SAS Event Stream Manager services by running the following command:

```
sudo service sas-viya-all-services status
```

Here is typical command output to indicate that the software is running normally:

```
Getting service info from consul...
  Service                                              Status   Host          Port    PID
  sas-viya-consul-default                              up       N/A            N/A    20048
  sas-viya-sasdatasvrc-postgres-node0-ct-pg_hba        up       N/A            N/A    22919
  sas-viya-sasdatasvrc-postgres-node0-ct-postgresql    up       N/A            N/A    22803
  sas-viya-sasdatasvrc-postgres-pgpool0-ct-pcp         up       N/A            N/A    24161
  sas-viya-sasdatasvrc-postgres-pgpool0-ct-pgpool      up       N/A            N/A    23932
  sas-viya-sasdatasvrc-postgres-pgpool0-ct-pool_hba    up       N/A            N/A    24047
  sas-viya-sasdatasvrc-postgres                        up       N/A            N/A    24511
  sas-viya-httpproxy-default                           up       N/A            N/A    20941
  sas-viya-rabbitmq-server-default                     up       N/A            N/A    21773
  sas-viya-sasdatasvrc-postgres-node0                  up       N/A            N/A    24450
  sas-viya-authorization-default                       up       10.21.15.95   41299   25437
  sas-viya-geodelocator-default                        up       10.21.15.95   57551   20792
  sas-viya-identities-default                          up       10.21.15.95   43235   25540
  sas-viya-saslogon-default                            up       10.21.15.95   50678   25645
  sas-viya-esm-service-default                         up       10.21.15.95   51413   31682
  sas-viya-esm-webui-default                           up       10.21.15.95   38130   26298
```

Troubleshoot Service Status

If the output from the `service sas-viya-all-services status` command indicates that one or more services is not up, you can restart an individual service using its script. All of the SAS Event Stream Manager service scripts are installed in the **/etc/init.d** directory. Service names match the corresponding script names.

Here is an example of the commands to check the status of the web client service and restart it:

Command	Description
`sudo service sas-viya-esm-webui-default status`	Check the service status.
`sudo service sas-viya-esm-webui-default start`	Start the service if it is not running.

Access Log Files

If you encounter difficulties during the deployment, log files that include information about installation and service status are written to the following directory:

/opt/sas/viya/config/var/log/

If the deployment fails, check the logs in this location first.

6

Next Steps

(Optional) SAS Event Stream Manager Agent Configuration

The SAS Event Stream Manager Agent is a small executable program that is installed along with SAS Event Stream Processing. Agents relay operational metrics from engines to SAS Event Stream Manager and perform actions on the engines in response to commands that they receive from SAS Event Stream Manager. Agents are optional, but configuring agents is a recommended best practice for SAS Event Stream Manager users, and they are required to support a few features, such as starting and stopping adapters.

Agent Restrictions

The installation of a SAS Event Stream Manager agent is restricted to one agent per machine. If you are running multiple SAS Event Stream Processing engines on a single machine, install a single agent on that machine. You can then select one engine instance to manage on that machine.

You can also change the agent configuration to select another engine instance at a later time. Perform the steps that are listed in "Configure and Start an Agent" on page 22. For the ESM_ESP_HTTP_PUBSUB and ESM_ESP_HTTP_ADMIN variables, substitute values that correspond to the engine that you want to manage.

Install an Agent

The typical SAS Event Stream Processing installation on Linux includes a prompt to install an agent. The agent must be installed on the same machine where SAS Event Stream Processing has been installed. First, determine whether the agent has been installed on the target machine.

The agent is contained in an RPM called sas-esmagent. You can verify that the RPM is installed by running the following command:

```
sudo service sas-viya-esmagent-default status
```

If the agent is already installed, a message is displayed stating that `sas-viya-esmagent-default is stopped` or `sas-viya-esmagent-default is started`.

If the agent is not installed, a `Not found` error message is displayed. Take the following steps to install it:

1 Using an account with sudoers privileges, log on to the Linux machine where you have installed SAS Event Stream Processing.

2 Start the installation again by running the following command:

```
sudo ./customized_deployment_script.sh
```

3 When prompted, enter y to install the SAS Event Stream Manager agent component (with filename sas-esm-agent).

When the script completes, a message states that the software has been installed.

Configure and Start an Agent

Take the following steps to modify agent parameters:

1 Stop the agent. Run the following command:

```
sudo service sas-viya-esmagent-default stop
```

2 Edit the start-up script to set the correct values for some environment variables. Use your preferred text editor to open the following file for editing: **/opt/sas/viya/home/bin/sas-esmagent**.

3 Locate the following environment variables within the start-up script. Set their values to environment-specific values, as specified in the following table:

Variable	Environment-Specific Value
ESM_DISCOVERY_HOST	Host name of the machine where you have installed SAS Event Stream Manager.
ESM_DISCOVERY_PORT	The port where SAS Event Stream Manager is listening for communications from the agent. The default is Port 80.
ESM_HOSTNAME	The host name of the machine where you have installed SAS Event Stream Manager Agent and SAS Event Stream Processing server. (These components must be installed on the same machine.)
ESM_PORT	The port where the agent listens. The default setting is Port 2552.
ESM_FRIENDLY_NAME	The name of the agent that appears in the user interface of SAS Event Stream Manager. The default setting is "ESM Agent."
ESM_ESP_HTTP_PUBSUB	The HTTP port that has been configured for publish and subscribe actions by the Event Stream Processing XML server.
ESM_ESP_HTTP_ADMIN	The HTTP port that has been configured for HTTP administration requests to the Event Stream Processing XML server.

For more information about XML server parameters, see *SAS Event Stream Processing: Using the XML Layer*.

4 Save your changes to the start-up script.

5 Verify that SAS Event Stream Processing is running. Run the following command:

```
ps -fu$USER | grep dfexp_xml_server
```

The status that is returned indicates whether the server process is running.

6 Start the agent. Run the following command:

```
sudo service sas-viya-esmagent-default start
```

The following message indicates success: `sas-viya-esmagent-default is running.`

Example Templates

Code examples to help you load and start projects are provided to help you learn to use SAS Event Stream Manager. You can find the example job templates in the SAS Event Stream Manager examples package, which you can download from the SAS Support Knowledge Base.

The package includes the resources that are required to create a deployment and deploy a job. A full set of instructions for using example job templates is included in the *SAS Event Stream Manager: User's Guide*, which is available on the SAS Event Stream Manager product page.

Product Documentation

After you install, configure, and verify the deployment, you are ready to begin using SAS Event Stream Manager to manage SAS Event Stream Processing applications and analyze streaming event data in real time.

The next step is to consult the product documentation. The *SAS Event Stream Manager: User's Guide* explains how to work with the projects that you create in SAS Event Stream Processing Studio and how to manage SAS Event Stream Processing deployments. You can find this guide on the SAS Event Stream Manager product page.

The SAS Event Stream Processing documentation is available on the separate SAS Event Stream Processing product page. If you are a new user, SAS recommends starting with *SAS Event Stream Processing 4.3: Overview*, which provides an introduction to product features and explains how to proceed with creating event stream processing models and incorporating them into applications.

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Uninstalling SAS Event Stream Manager

Uninstall from a Single Machine

To uninstall your software from a single-machine deployment, run the following command:

```
ansible-playbook -i host_local deploy-cleanup.yml
```

If the environment requires one or more passwords, the command must include additional parameters as specified here:

Password Requirements	Additional Parameters
Password for sudo only	`--ask-become-pass`
Password for SSH only (applies only if the Ansible controller is on a different machine than your SAS software)	`--ask-pass`
Password for both sudo and SSH (applies only if the Ansible controller is on a different machine than your SAS software)	`--ask-become-pass --ask-pass`

When the appropriate command is executed, Ansible performs a group uninstallation, which removes your SAS software, including both certificates. It also renames the `/opt/sas/viya` directory to `/opt/sas/viya_<epoch>`, where `<epoch>` specifies the UNIX epoch (the number of seconds that have elapsed since 00:00:00 Coordinated Universal Time (UTC), Thursday, 1 January 1970).

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