SAS® Viya® 3.4 Administration: Licensing

Licensing: Overview

SAS Viya provides a license in two file formats: a traditional text file and a new JSON web token file. The JSON file includes the same information as the text file, and enables additional licensing information to be provided. Some SAS Viya products use the text file format. Other products use the JSON file format. Both SAS Cloud Analytic Services (CAS) and the SAS programming run-time environment use the same license.

During installation, a license is applied to both the CAS in-memory compute engine and the SAS programming run-time environment. You apply a new license to enable new products or to extend expiration dates on existing products.

The following diagram identifies where the license file resides in SAS Viya.

For more information, see How To on page 2.

Figure 1   *Where the SAS License File Resides*
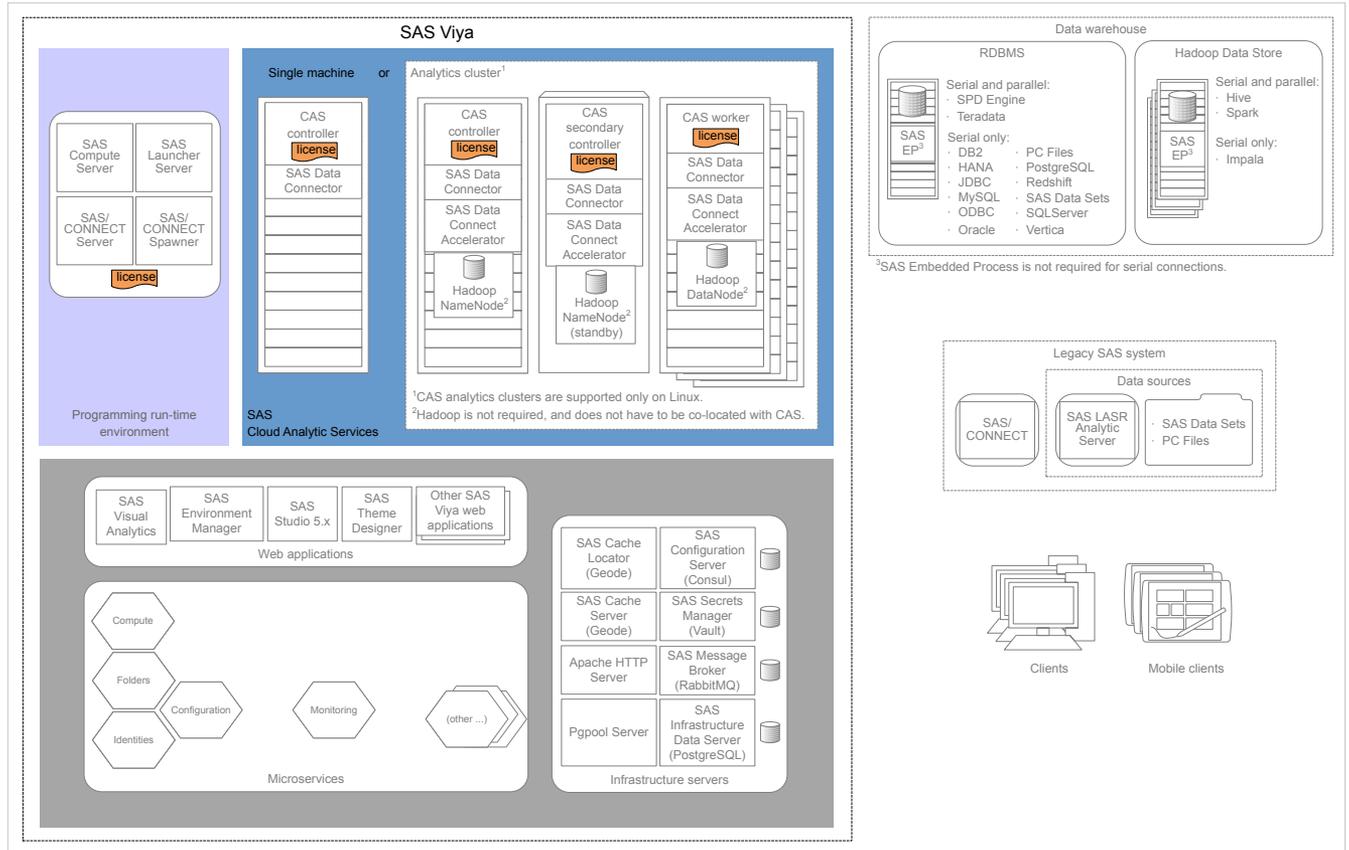
Licensing: How To

Apply New Licenses (Linux)

Apply New Licenses Using Ansible

You apply a new SAS license when your current license has expired, or when you are adding new SAS products to your deployment. If your deployment was performed using Ansible, you can use

Ansible to apply a new license. Ansible applies your new license to the CAS controllers—primary and backup—and also to the SAS programming run-time environment.

Note: To add a new license without using Ansible, see "Apply New Licenses Manually" on page 4.

1 Log on to your Ansible controller machine with a user that meets the requirements in "Set Up the User Account that Deploys the Software" in *SAS Viya for Linux: Deployment Guide*.

2 Move the current license files into a backup location.

   Copies of your current license files should reside in your Ansible playbook directory (`sas_viya_playbook/`, by default).

   The license files are named, SASViyaV0300_*order-number_site-number*_Linux_x86-64.jwt and SASViyaV0300_*order-number*_Linux_x86-64.txt.

3 SAS distributes renewal licenses to customers as file attachments in a renewal order email (ROE). Make sure that your new license files (a .txt file and a .jwt file) reside in your Ansible playbook directory.

   Note: Some SAS Viya products use the text file (.txt). Other products use the JSON web token file (.jwt). Both SAS Cloud Analytic Services (CAS) and the SAS programming run-time environment use the same license.

4 Modify your Ansible playbook to point to the new license files.

   Open `sas_viya_playbook/vars.yml`, locate `LICENSE_FILENAME` and `LICENSE_COMPOSITE_FILENAME`, and replace the current license filename with the corresponding new license filename.

   Note: The JSON web token license file (.jwt) is also referred to as a composite license.

   Here is an example:

```
# The name of the license file on the Ansible machine.
 LICENSE_FILENAME: "SASViyaV0300_09MMMV_Linux_x86-64.txt"

# The name of the composite license file on the Ansible machine.
# If both files are present, the playbook will use the
# composite license file.
 LICENSE_COMPOSITE_FILENAME: "SASViyaV0300_09MMMV_70180938_Linux_x86-64.jwt"
```

5 Run the following Ansible command for the default inventory file:

```
ansible-playbook apply-license.yml
```

> **IMPORTANT** If you deployed additional CAS servers, run the `ansible-playbook` command with the `-i` option using the appropriate inventory file.

   CAS sessions created after you apply the new license automatically update with license information from the new license.

6 Verify that your SAS Cloud Analytic Services license has been renewed by following the steps in "View SAS Cloud Analytic Services License Information" on page 10.

7 Verify that your SAS programming run-time license has been renewed by following the steps in "View SAS Programming Run-Time License Information" on page 9.

8 If you deployed additional CAS servers, then perform Step 5 – Step 6 on your additional controller and your additional backup controller machines.

9 If you deployed CAS servers in a multi-tenant environment, then use the following command for each tenant that you want to license:

```
ansible-playbook -i inventory.ini -e "@<tenantID>_vars.yml" utility/apply-cas-tenant-
license.yml
```

....

Note: The inventory.ini file is the inventory file that you specified in Step 5 on page 3.

....

Apply New Licenses Manually

You apply a new SAS license when your current license is about to expire, or when you are adding new SAS products to your deployment. You must apply your license to all CAS controllers—primary and secondary—and also to the SAS programming run-time environment.

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Note: To add a new license using Ansible, see "Apply New Licenses (Linux)" on page 2.

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1 On the machine where the SAS programming run-time environment is deployed, log on as a user that meets the requirements in "Set Up the User Account that Deploys the Software" in *SAS Viya for Linux: Deployment Guide*.

2 Move the current license files into a backup location.

Your current license files reside in **/opt/sas/spre/home/SASFoundation/**.

The license file is named license.

3 SAS distributes renewal licenses to customers as file attachments in a renewal order email (ROE). Make sure that your new license files (a .txt file and a .jwt file) reside in location that is accessible from your SAS programming run-time machine.

....

Note: Some SAS Viya products use the text file (.txt). Other products use the JSON web token file (.jwt). Both SAS Cloud Analytic Services (CAS) and the SAS programming run-time environment use the same license.

....

4 Run the following command to apply the license to your SAS programming run-time environment:

```
sudo su -s "/bin/sh" -c
"/opt/sas/spre/home/SASFoundation/utilities/bin/apply_license
/path/SASViyaVrelease-number_order-number_site-number_Linux_x86-64.jwt" sas
```

where *path* is the location where the new license file resides.

Here is an example:

```
sudo su -s "/bin/sh" -c
"/opt/sas/spre/home/SASFoundation/utilities/bin/apply_license
/opt/sas/installfiles/SASViyaV0300_09MMMV_70180938_Linux_x86-64.jwt" sas
```

You receive a message that your license has been applied.

5   Verify that your SAS programming run-time license has been renewed by following the steps in "View SAS Programming Run-Time License Information" on page 9.

6   On the machine where the CAS controller is deployed, log on as a user that meets the requirements in "Set Up the User Account that Deploys the Software" in *SAS Viya for Linux: Deployment Guide*.

7   Make sure that your new license files (a .txt file and a .jwt file) reside on your CAS controller machine in the following directory: `/opt/sas/viya/config/etc/cas/default/`.

> **IMPORTANT**   On machines that contain additional CAS servers, the path for the license file is `/opt/sas/viya/config/etc/cas/`*`cas-instance-name`*.

8   Update the symbolic link for sas_license.txt to point to the new CAS license file. (This should be the .jwt file.)

Here is an example:

```
cd /opt/sas/viya/config/etc/cas/default
ln -sf SASViyaV0300_09MMMV_70180938_Linux_x86-64.jwt sas_license.txt
```

Here is an example for an additional CAS server:

```
cd /opt/sas/viya/config/etc/cas/casserver2
ln -sf SASViyaV0300_09MMMV_70180938_Linux_x86-64.jwt sas_license.txt
```

CAS sessions created after you apply the new license automatically update with information from the new license file.

9   If you are running a multi-tenant deployment and have multiple CAS servers on a single machine, repeat Step 7 – Step 8 for each tenant instance of the CAS server (for example, `/opt/sas/tenant-1/config/etc/cas/default`, `/opt/sas/tenant-2/config/etc/cas/default`, and so on).

10   If you have a distributed CAS server, repeat Step 6 – Step 8 for each CAS worker node machine.

11   Verify that your SAS Cloud Analytic Services license has been renewed by following the steps in "View SAS Cloud Analytic Services License Information" on page 10.

12   If you deployed a CAS backup controller (also referred to as a secondary controller), then perform Step 7 – Step 11 on your backup controller machine.

13   If you deployed additional CAS servers, then perform Step 7 – Step 11 on your additional controller and your additional backup controller machines.

14   Check the administration documentation for your SAS Viya product in case there are additional steps required for applying a license.

Apply New Licenses (Windows)

You apply a new SAS license when your current license is about to expire, or when you are adding new SAS products to your deployment. The license file is used by both SAS Foundation and SAS Cloud Analytic Services (CAS).

1   Log on to the SAS Viya machine as a user that is a member of the Windows Administrators group.

2 Move the current license files into a backup location.

Copies of your current license files should reside in the directory where your SAS Viya deployment scripts were created.

> **TIP** If you followed the recommendation in the *SAS Viya for Windows: Deployment Guide*, your deployment scripts and license files reside underneath `\sas\install`.

The license files are named, SASViyaV0300_*order-number*_Win_x64_Wrkstn_Srv.jwt and SASViyaV0300_*order-number*_Win_x64_Wrkstn_Srv.txt.

3 SAS distributes renewal licenses to customers as file attachments in a renewal order email (ROE). Make sure that your new license files (a TXT file and a JWT file) reside in the same directory as your SAS Viya deployment scripts.

....

Note: Some SAS Viya products use the text file (TXT). Other products use the JSON web token file (JWT). Both SAS Cloud Analytic Services (CAS) and SAS Foundation use the same license.

....

4 Change to the deployment scripts directory, open the file, vars.psd1, and modify the license file names to match the new license file name.

Here is an example:

```
COMPOSITE_LICENSE_FILENAME = "SASViyaV0300_09ML1N_70196364_Win_x64_Wrkstn_Srv.jwt"
LICENSE_FILENAME = "SASViyaV0300_09ML1N_Win_x64_Wrkstn_Srv.txt"
```

5 Run the following command to apply your new SAS license:

```
setup.bat -apply-license
```

CAS sessions created after you apply the new license are not automatically updated with the new license information. You must restart CAS for the new license to take effect. Note that this behavior is different on Windows and Linux.

6 Verify that your SAS Foundation license has been renewed by following the steps in "View SAS Programming Run-Time License Information" on page 9.

7 Verify that your SAS Cloud Analytic Services license has been renewed by following the steps in "View SAS Cloud Analytic Services License Information" on page 10.

Set Up Metered Billing (Linux)

Overview

Metered billing is a pricing model where the fees that you pay SAS are based on your usage.

> **IMPORTANT** If you have contracted with SAS for one or more metered products, your contract requires that you set up metered billing. If you have questions, contact your SAS Sales representative.

If metered billing is part of your SAS contract, then the **License** section of your Software Order Email (SOE) indicates that **Your order has a metered offering**. In this release of SAS Viya, metered billing is available only on full deployments running on Linux.

Here is an overview of the steps that must be performed to set up metered billing:

1 Open the HTTPS port for the SAS Viya Metered Billing agent service to connect to edge-metering.sas.com.

2 Set the cas.MAXCORES option on the primary CAS controller for all CAS servers in the deployment.

Set Up Metered Billing

1 On the machine on which the SAS Viya Metered Billing agent runs, make sure that the agent can connect externally to edge-metering.sas.com over the HTTPS port (TCP port 443, by default).

> **TIP**   You can identify the machine that hosts the Metered Billing agent by examining inventory.ini in your Ansible playbook (`/sas/install/sas_viya_playbook/`) and locating the machine name mapped to the `[Operations]` host group.

From a Linux prompt, enter the following command:

`curl -I https://edge-metering.sas.com/ --insecure`

You should see a response similar to the following:

```
HTTP/1.1 302 Found
Location: https://support.sas.com/
Date: Fri, 01 Feb 2019 17:05:21 GMT
Content-Type: text/plain; charset=utf-8
```

Note: The HTTPS port must be opened for outgoing traffic. The Metered Billing agent does not listen to the port.

2 If you want to ensure that your site stays within your SAS license threshold, then go to Step 3. Otherwise, you are finished setting up metered billing.

3 Configure your CAS server with the limit for the total number of physical cores.

Log on to your Ansible controller machine as an administrator, and open the vars.yml file. Under `CAS_CONFIGURATION: cfg:`, add the following line, and then re-run your playbook:

`maxcores='number-of-cores'`

where *number-of-cores* specifies the limit for the total number of physical cores that are available to a CAS server.

Here is an example:

```
CAS_CONFIGURATION:
   env:
      CAS_DISK_CACHE: /mydisk/mydiskcache
      CAS_VIRTUAL_HOST: 'loadbalancer.example.com'
      CAS_VIRTUAL_PROTO: 'https'
```

```
    CAS_VIRTUAL_PORT: 443
  cfg:
    gcport: 0
    httpport: 8777
    port: 5570
    colocation: 'none'
    SERVICESBASEURL: 'https://loadbalancer.company.com'
    maxcores: '36'
```

> **IMPORTANT**   Pay attention to indentions when you add content to vars.yml. For information about the vars.yml file, see "Modify the vars.yml File" in *SAS Viya for Linux: Deployment Guide*.

The core count limit is server-wide, and for distributed CAS servers the value should be at least the same as the total number of machines. The total number of machines includes the primary controller and workers. (The backup controller is not included in this total.) For example, if a distributed CAS server has one controller and one worker, and `maxcores: '4'`, the maximum number of cores that the worker can use is two. If you set `maxcores` too low, CAS writes a licensing error.

In this example, we want to ensure that exactly 128 hyperthreads per worker are run. (Hyperthreads equal two times the number of cores.)

- For a single-machine CAS server, you enter `maxcores: '64'`.

- For a distributed CAS server, use the formula, `(Number of workers + 1) * 64`. For example, to ensure that 128 hyperthreads per worker are run for a distributed CAS server that has a controller plus eight workers, you enter `maxcores: '576'`.

4   If you have more than one CAS server, repeat Step 3 for each primary CAS controller in your SAS Viya deployment.

Licensing: How to (SAS Environment Manager)

Introduction

These instructions explain how to view product license information using SAS Environment Manager.

Navigation

In the applications menu (≡), under **Administration**, select **Manage Environment**. In the navigation bar, click ⬚.

The Licensed Products page is an advanced interface. It is available to only SAS Administrators.

Licensed Products Page

Use the Licensed Products page to view and filter license status for one or more SAS products.

For each product, the following icons depict the effective license status:

⊘	The SAS license is current.
⊘⚠	The SAS license is due for renewal (grace period). The grace period is a predetermined range of days immediately after the license expiration date. For example, if the expiration date is 30 June, the grace period might extend 45 days: from 1 July - 14 August.
⚠	The SAS license is about to expire (warning period). The warning period is a predetermined range of days that follows the grace period. For example, if the expiration date is 30 June, the warning period might extend 56 days: from 15 August - 09 October.
⊗	The SAS license has expired. License expiration occurs immediately after the warning period ends. An expired license means that SAS does not run. For example, if the warning period ends on 09 October, SAS stops running at 12:00 a.m. on 10 October.

Licensing: How To (SAS Studio)

View SAS Programming Run-Time License Information

1 Open a web browser and sign in to SAS Studio with administrator privileges.

   Here is an example:

   `https://mysasserver.example.com/SASStudioV`

   Note: If your site uses a programming-only deployment, or your site uses SAS Studio 4.x, then in the preceding example, replace `SASStudioV` with `SASStudio`.

2 In the **Code** tab, enter the following command:

```
proc setinit; run;
```

3 Click 🏃.

You should see output similar to the following:

```
56          proc setinit;
57
58
59          OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
Original site validation data
Current version: V.03.03M0P040416
Site name:    'smp statistics, ml, data connectors pkg chg 3.30'.
Site number:  70068118.
Expiration:   22MAY2018.
Grace Period:  45 days (ending 06JUL2018).
Warning Period: 56 days (ending 31AUG2018).
System birthday:   24MAR2016.
Operating System:   LIN X64 .
Product expiration dates:
---Base SAS Software          22MAY2018
---SAS/CONNECT                22MAY2018
.
.
.
```

View SAS Cloud Analytic Services License Information

1 Open a web browser and sign in to SAS Studio with administrator privileges.

Here is an example:

https://mysasserver.example.com/SASStudioV

....

Note: If your site uses a programming-only deployment, or your site uses SAS Studio 4.x, then in the preceding example, replace `SASStudioV` with `SASStudio`.

....

> **TIP**
>
> To obtain license information without running SAS Studio, run the getLicenseInfo Action from any CAS programming language client. For more information, see getLicenseInfo Action in the *SAS Viya: System Programming Guide*.

2 In the **Code** tab, enter the following commands:

cas casauto;

cas casauto listabout;

3 Click 🏃.

You should see output similar to the following:

```
1           OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
72
73           cas casauto;
NOTE: The session CASAUTO connected successfully to Cloud Analytic Services d2-18w30.uda.sashq-
r.openstack.sas.com using port 5570.
       The UUID is 0c5e49b1-730f-7144-a119-4a363fd3ca00. The user is grraka and the active caslib is
CASUSER(myuser).
NOTE: The SAS option SESSREF was updated with the value CASAUTO.
NOTE: The SAS macro _SESSREF_ was updated with the value CASAUTO.
NOTE: The session is using 0 workers.
74           cas casauto listabout;
       Section: About
       CAS = Cloud Analytic Services
       Version = 3.04
       VersionLong = V.03.04M0P05282018
       Copyright = Copyright © 2014-2018 SAS Institute Inc. All Rights Reserved.
       ServerTime = 2018-06-01T16:40:32Z
       Section: System
       Hostname = my_host
       OS Name = Linux
       OS Family = LIN X64
       OS Release = 3.10.0-327.10.1.el7.x86_64
       OS Version = #1 SMP Sat Jan 23 04:54:55 EST 2016
       Model Number = x86_64
       Linux Distribution = Red Hat Enterprise Linux Server release 7.2 (Maipo)
                   Section: license
       site = ZZ-ZZZ-18w30-lax-ML
       siteNum = 12345678
       expires = 01Sep2018:00:00:00
       gracePeriod = 45
       warningPeriod = 47
       maxCPUs = 9999
NOTE: Request to LISTABOUT completed for session CASAUTO.
75
76           OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
89
```

Licensing: Troubleshooting

Licensed Products page cannot be viewed.

Explanation:

Users without SAS administrator privileges and intra-tenant administrators do not have access to the Licensed Products page.

Resolution:

Contact your SAS administrator.

Licensing: Interfaces

There are several interfaces that you can use to manage and to view SAS license information. The following table lists these interfaces, and the shading indicates the relative amount of SAS license administration that each covers:

Table 1   *Interfaces to SAS Viya Licensing*

◖	Ansible	A software orchestration tool that provides the only interface for renewing a license.
◖	Command-line interface	(Read-Only) A command-line interface that enables you to query SAS license information.
◖	SAS Environment Manager	(Read-Only) A graphical enterprise web application used to view SAS license information.
◑	CAS Server Monitor	(Read-Only) A graphical web application that is embedded in the CAS server. Used to view CAS license information.

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