

SSM On-Prem 8.X High Availability Cluster Working

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Introduction

This document describes how the Smart Software Manager (SSM) On-Prem Account synchronization and Product Instance registration works on the SSM On-Prem server deployed as a High Availability (HA) Cluster, at the time of Failover and Fallback scenarios.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- SSM On-Prem
- HA

Components Used

The information in this document is based on SSM On-Prem 8 and above.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

These are the reference documents that provide information on HA.

- https://www.cisco.com/web/software/286285517/151968/Smart_Software_Manager_On-Prem_8_Console_Guide.pdf
- https://www.cisco.com/web/software/286285517/152313/Smart_Software_Manager_On-Prem_8-202006_Installation_Guide.pdf

SSM On-Prem Account Synchronization during Failover and Fallback

HA between two SSM On-Prem servers should be configured with the help of this guide:

Deploy the HA

cluster: https://www.cisco.com/web/software/286285517/152313/Smart_Software_Manager_On-Prem_8-202006_Installation_Guide.pdf

In this demonstration, use:

.5 - Primary Server's IP Address

.10 - Secondary Server's IP Address

.12 - Virtual IP Address

High Availability

1. Successful configuration of HA shows Primary server (.5) as Active, Secondary server (.10) as Standby and VIP (.12) sd shown in the image.

High Availability

Host

Event Logs

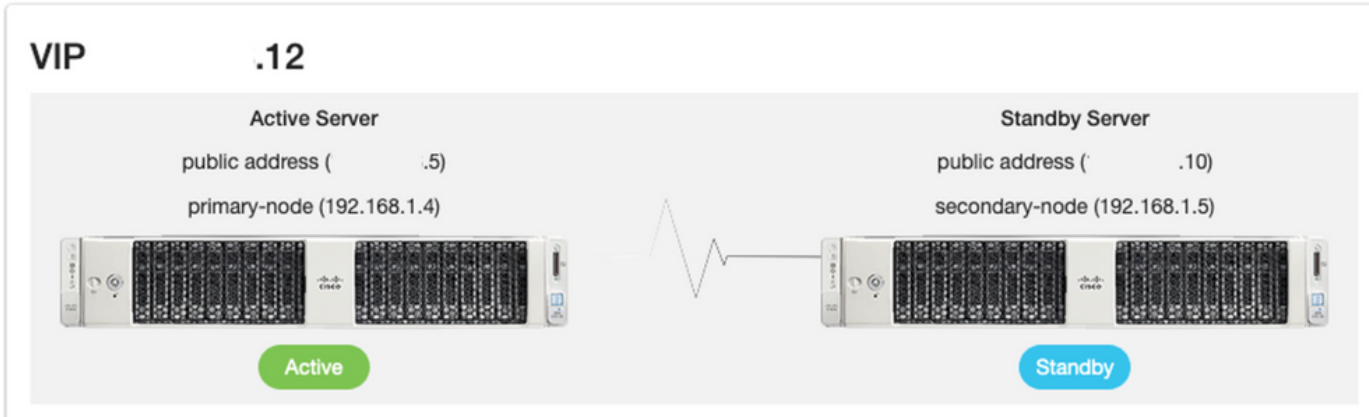


Normal

The status of the high availability cluster is normal.

Heartbeat

Connection status: **Connected**



2. Synchronization of SSM On-Prem with Cisco Software Central has been completed successfully from the Primary/Active server as shown in the image.

Smart Software Manager On-Prem

Synchronization

Name	Satellite Name	Last Synchronization	Synchron...
annanr-ssm-on-prem-8-202006	annanr-ssm-on-...	2020-Sep-01 14:13:44	2020-C

Accounts

Account	Requested By	Cisco Smart Account	Cisco Virtual Account	Account Status	Actions
annanr-ssm-on-prem-8-202006	annanr@cisco.com	.com	annanr-SSM-On-Prem-8-202006	Active	Actions

Network

ens192
Connected
IPv4 Address: .5
IPv6 Address

System Health
Good
Your machine is working well
Server Name: CentOS
Version: 8-202006
Uptime: 1 day

Resource Monitor Percentage
CPU |
RAM |
DISK |

Recent Alerts

Connected Users
admin 00:06:1

3. Cluster HA status show that the primary server's database (Replication Master) on the left replicates to the secondary server's database (Replication Slave) on the right as expected as shown in the image.

```
psql: annanr@annanr:
Last login: Tue Sep 1 14:48:57 UTC 2020 on pts/0

Database Replication Status:
=====
Database is currently the replication master - Replicating to secondary-node (192.168.1.10)

Replication to slave:
 client_addr | backend_start | state | write_lag | flush_lag |
+-----+-----+-----+-----+-----+
 192.168.1.5 | 2020-09-01 07:50:45.628722+00 | streaming | 0 | 0 |
(1 row)

Replication from master:
 pg_last_xlog_replay_location
+-----+
0/53CDB68
(1 row)

psql: annanr@annanr:
Last login: Tue Sep 1 14:48:57 UTC 2020 on pts/0

Database Replication Status:
=====
Database is currently the replication slave - Replicating from primary-node (192.168.1.5)

Replication to slave:
 client_addr | backend_start | state | write_lag | flush_lag | replay_lag |
+-----+-----+-----+-----+-----+-----+
(0 rows)

Replication from master:
 pg_last_xlog_replay_location
+-----+
0/53CDB68
(1 row)

>>
>>
>>
>>
```

Failover

1. Stopping HA cluster on Primary Server as shown in the image.

```
[>>
[>> ha_cluster_stop
Last login: Tue Sep  1 14:45:59 UTC 2020 on pts/0
Stopping Cluster (pacemaker)...

Stopping Cluster (corosync)...
```

2. Primary|Secondary as shown in the image.

```
pcsd: active/enabled
Last login: Tue Sep  1 14:45:57 UTC 2020 on pts/0

=====
Database Replication Status:
=====
Database is currently the replication master - Replicating to secondary-node (.10)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----|-----|-----|-----|-----|-----
192.168.1.5 | 2020-09-01 07:58:45.628722+00 | streaming | 0 | 0 | 0
(1 row)

Replication from master:
pg_last_xlog_replay_location
-----
(1 row)

>>
>> ha_cluster_stop
Last login: Tue Sep  1 14:45:59 UTC 2020 on pts/0
Stopping Cluster (pacemaker)...

Stopping Cluster (corosync)...
>>
```

```
Failed Actions:
* db_monitor_30000 on secondary-node 'not running' (7): call=50, status=complete, exitreason='',
last-rc-changed='Tue Sep  1 08:01:46 2020', queued=0ms, exec=0ms

PCSD Status:
secondary-node: Online
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Tue Sep  1 15:10:40 UTC 2020 on pts/0

=====
Database Replication Status:
=====
Database is currently the replication slave - Replicating from primary-node (.5)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----|-----|-----|-----|-----|-----
(0 rows)

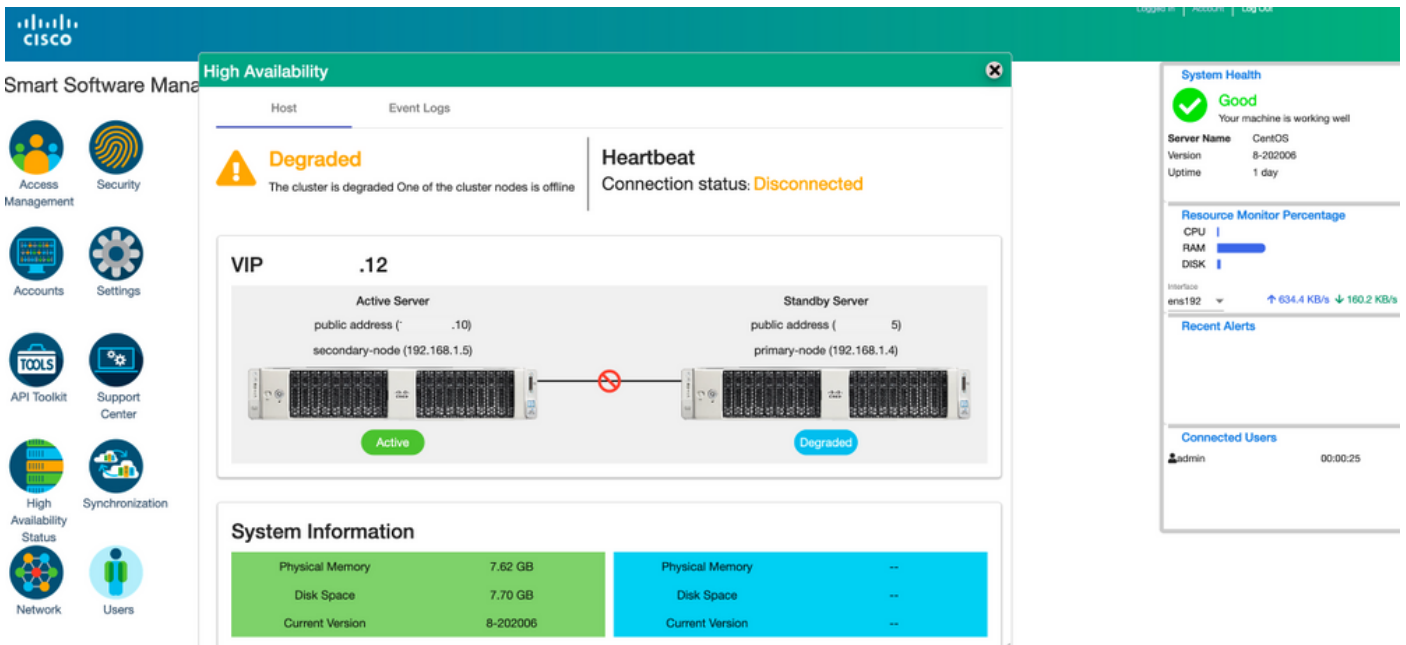
Replication from master:
pg_last_xlog_replay_location
-----
0/53C0C60
(1 row)
```

3. Logged into the SSM On-Prem GUI with the use of VIP and the Primary GUI is down.

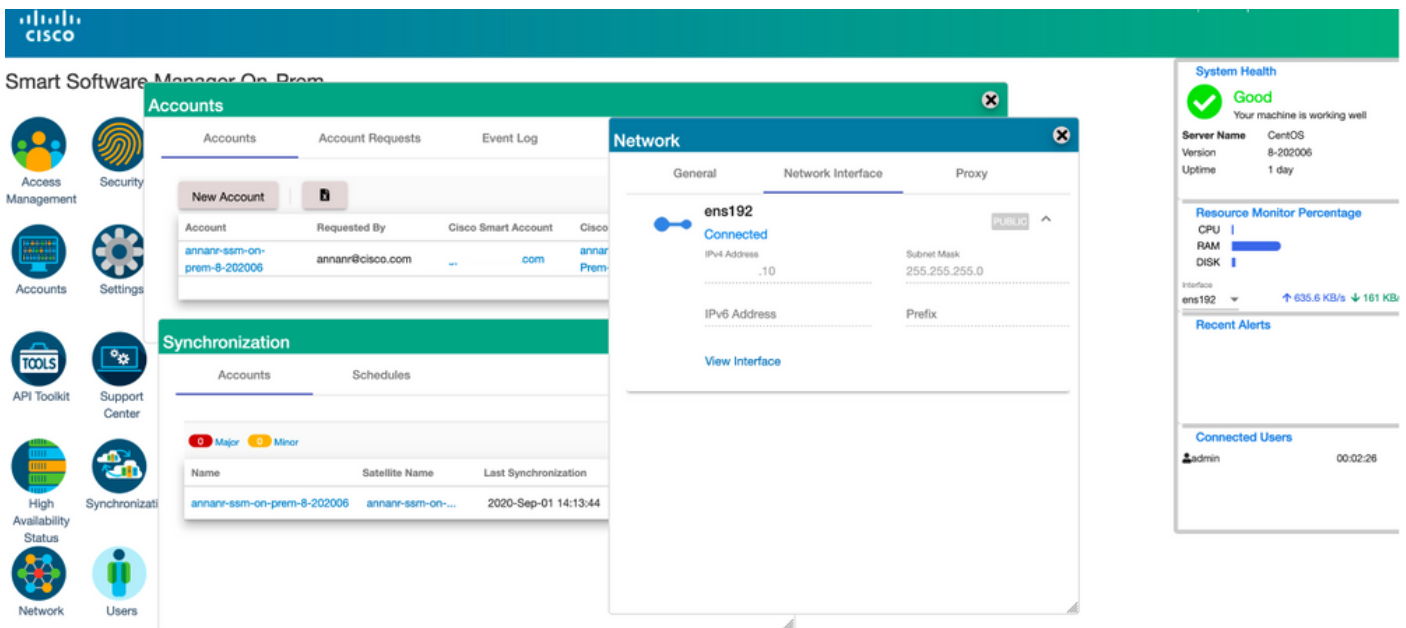
4. The secondary server (.10) is shown as an Active server.

5. Heartbeat is disconnected.

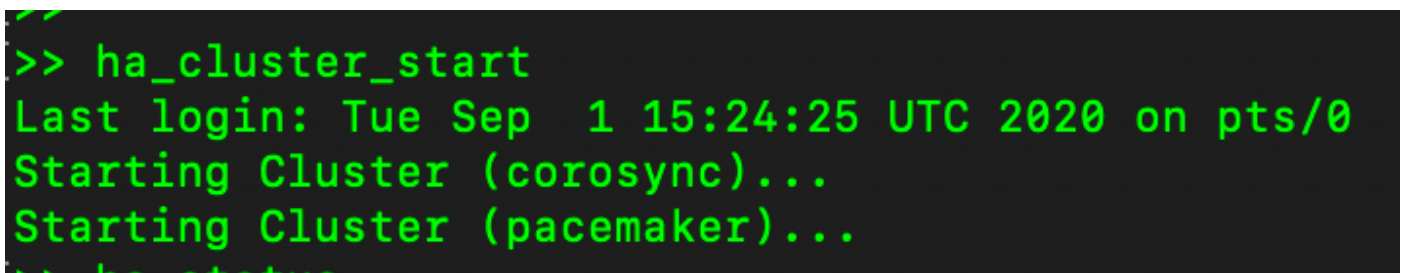
6. Primary server (.5) moved to Standby state.



7. Synchronization of SSM On-Prem Account with Cisco Software Central can be seen successfully from the Secondary/Active server GUI as shown in the image.



8. Starting the HA cluster on the Primary server as shown in the image.



9. HA Cluster status shows that the Primary database is replicated from the Secondary database.

10. Primary|Secondary as shown in the image.

```

last-rc-change: Tue Sep  1 18:26:24 2020; questions, execute

PCSD Status:
primary-node: Online
secondary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Wed Sep  2 08:52:24 UTC 2020 on pts/0

Database Replication Status:
=====
Database is currently the replication slave - Replicating from secondary-node (.10)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----
(0 rows)

Replication from master:
pg_last_xlog_replay_location
-----
0/7879718
(1 row)

secondary-node: Offline
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Wed Sep  2 09:03:23 UTC 2020 on pts/0

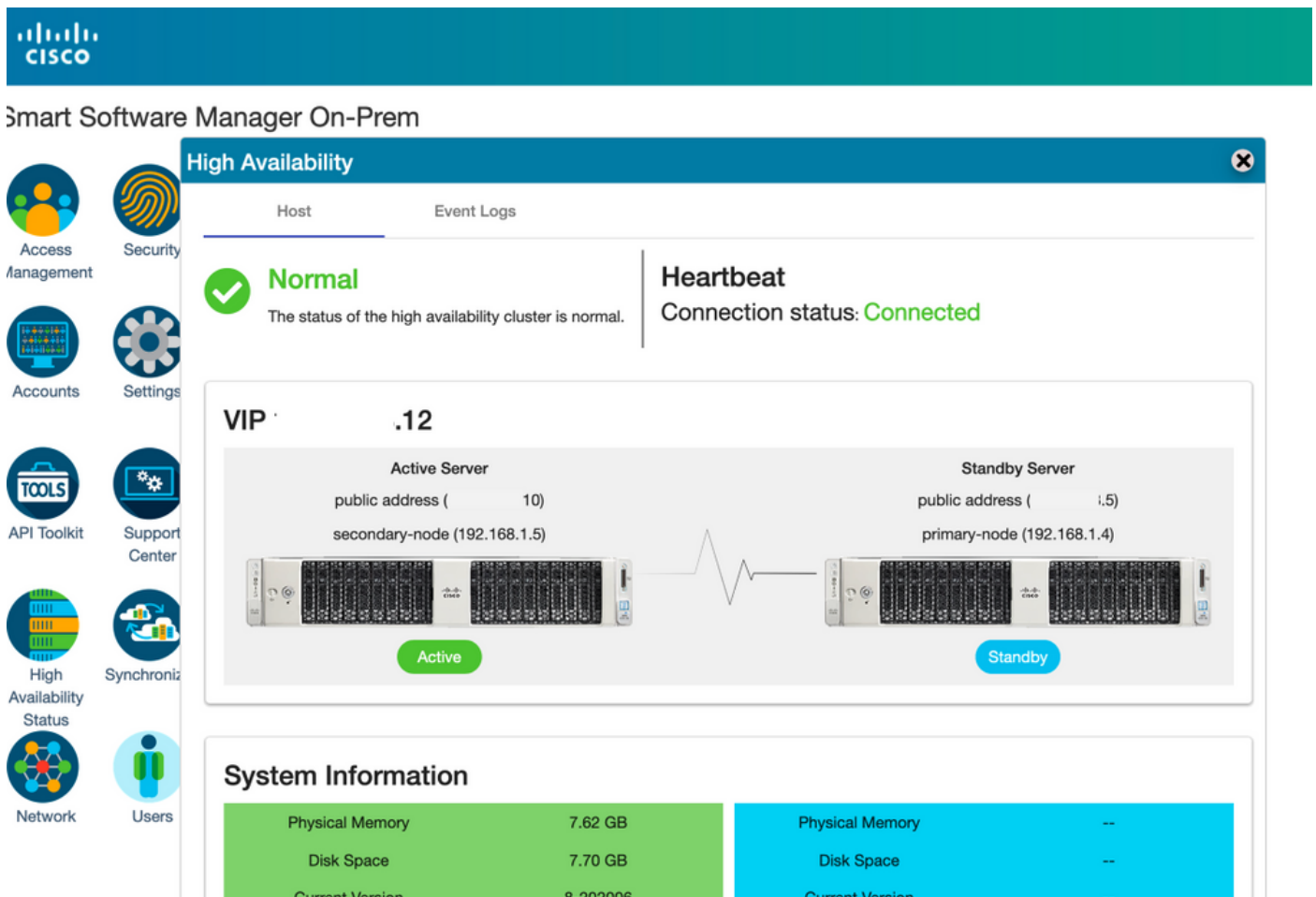
Database Replication Status:
=====
Database is currently the replication master - Replicating to primary-node (.5)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag
-----
192.168.1.4 | 2020-09-01 15:36:33.502635+00 | streaming | 0 | 0
(1 row)

Replication from master:
pg_last_xlog_replay_location
-----
0/53C0C48
(1 row)

```

11. GUI shows heartbeat as connected, Secondary in Active state and Primary in Standby state as shown in the image.



12. Create a new TEST account and activate it on Active standby. (.10) server.

13. Primary (.5) GUI will not be accessible at this stage.

Accounts

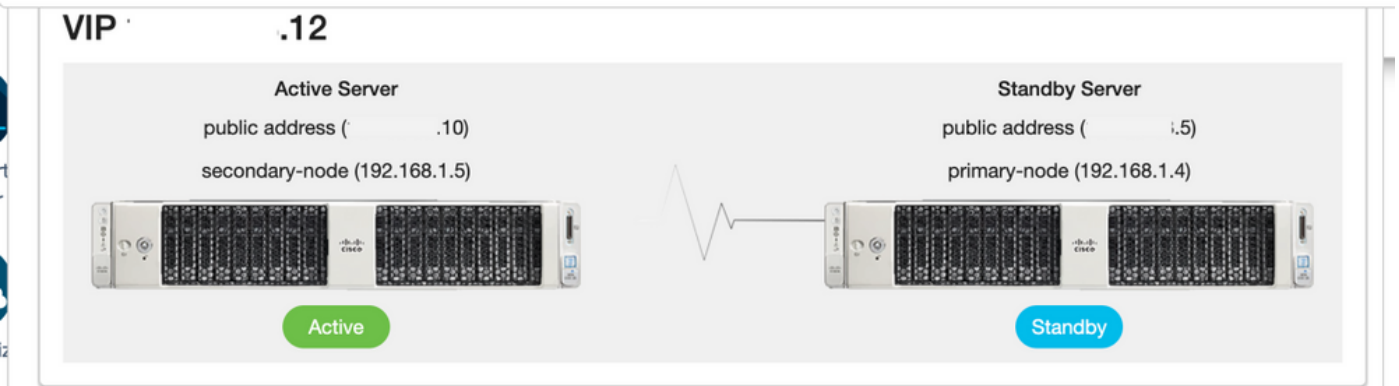
Accounts

Account Requests

Event Log

Account	Requested By	Cisco Smart Account	Cisco Virtual Account	Account Status	Actions
annanr-ssm-on-prem-8-202006	annanr@cisco.com	.com	annanr-SSM-On-Prem-8-202006	Active	Actions
TEST	annanr@cisco.com	.com	TEST123	Active	Actions

Showing All 2 Records



Fallback

1. Stopping Ha_cluster in Secondary as shown in the image.

```
[>> ha_cluster_stop
Last login: Wed Sep  2 09:03:25 UTC 2020 on pts/0
Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...
[>>
```

2. The current status of the Primary server's database and Secondary server's database can be seen here.

```
Database Replication Status:
=====
Database is currently the replication slave - Replicating from secondary-node ( .10)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----
(0 rows)

Replication from master:
pg_last_xlog_replay_location
-----
0/7079810
(1 row)
[>>

ha_cluster_start ha_deploy ha_provision_standby ha_teardown
ha_cluster_stop ha_generatekeys ha_status
[>> ha_cluster_stop
Last login: Wed Sep  2 09:03:25 UTC 2020 on pts/0
Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...
[>>
[>>
[>> ha_status
Last login: Wed Sep  2 09:04:44 UTC 2020 on pts/0
Error: cluster is not currently running on this node
Last login: Wed Sep  2 09:10:52 UTC 2020 on pts/0
Database Replication Status:
=====
DB service not currently running.
[>>
```

3. Logged into the SSM On-Prem GUI with the use of VIP and the Secondary GUI is down.

4. The Primary server (.5) is shown as an Active server.

5. Heartbeat is disconnected.

6. Secondary server (.5) moved to Standby state.

Host

Event Logs

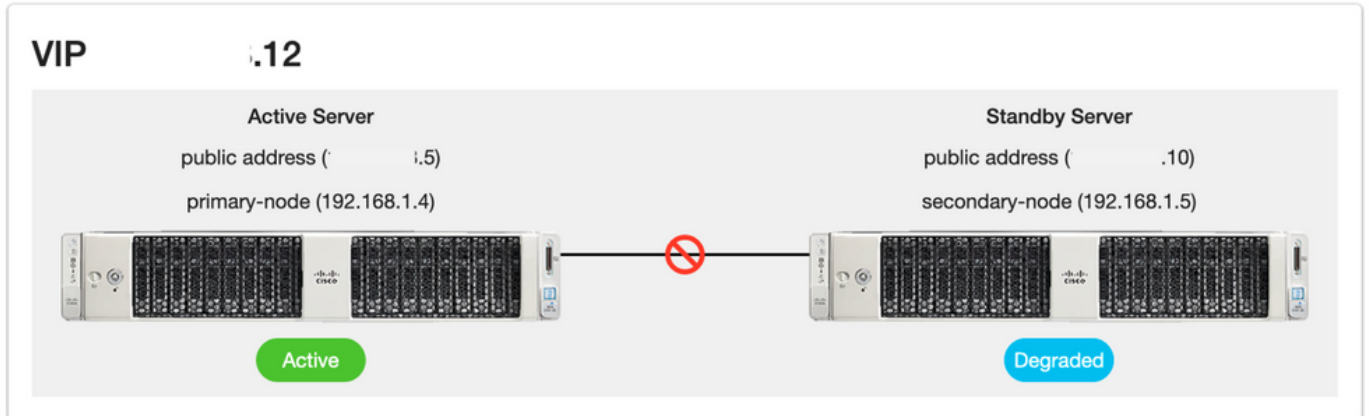


Degraded

The cluster is degraded One of the cluster nodes is offline

Heartbeat

Connection status: **Disconnected**



7. The newly created TEST Account can be seen in synced state as the replication happened from Secondary to Primary database as shown in the image.

High Availability

Host | Event Logs

Degraded
The cluster is degraded One of the cluster nodes is offline

Heartbeat
Connection status: **Disconnected**

VIP .12

Active Server
public address (.12)
primary-node (192.168.1.4)
Active

Standby Server
public address (.10)
secondary-node (192.168.1.5)
Degraded

Accounts

Accounts | Account Requests | Event Log

New Account | Search by Account Name

Account	Requested By	Cisco Smart Account	Cisco Virtual Account	Account Status	Actions
annan-ssm-on-prem-8-202006	annan@cisco.com	com	annan-SSM-On-Prem-8-202006	Active	Actions
TEST	annan@cisco.com	com	TEST123	Active	Actions

Showing All 2 Records

Synchronization

Accounts | Synchronization

Name	Satellite Name	Last Synchronization	Synchronization Due	Alerts	Ac
annan-ssm-on-prem-8-202006	annan-ssm-on-...	2020-Sep-02 07:33:32	2020-Oct-02 07:33:32	Synchronization Successful	Acti
TEST	TEST	2020-Sep-02 07:35:42	2020-Oct-02 07:35:42	Synchronization Successful	Acti

8. GUI will be accessible from the VIP address (.12) at this stage and not the secondary IP address.

9. Starting HA Cluster on the Secondary server as shown in the image.


```
>> ha_cluster_start
Last login: Wed Sep  2 09:10:52 UTC 2020 on pts/0
Starting Cluster (corosync)...
Starting Cluster (pacemaker)...
```

10. The cluster HA status shows that the Primary server's database (Replication Master) on the left is replicating to the secondary server's database (Replication Slave) on the right as expected as shown in the image.

```
PCSD Status:
secondary-node: Online
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Wed Sep  2 09:09:35 UTC 2020 on pts/0

Database Replication Status:
Database is currently the replication master - Replicating to secondary-node (192.168.1.10)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----|-----|-----|-----|-----|-----
192.168.1.5 | 2020-09-02 09:08:39.358506+00 | streaming | 0 | 0 | 0
(1 row)

Replication from master:
pg_last_xlog_replay_location
-----
0/7079810
(1 row)

PCSD Status:
secondary-node: Online
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Wed Sep  2 09:20:43 UTC 2020 on pts/0

Database Replication Status:
Database is currently the replication slave - Replicating from primary-node (192.168.1.5)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----|-----|-----|-----|-----|-----
(0 rows)

Replication from master:
pg_last_xlog_replay_location
-----
0/7079810
(1 row)

>>
>>
>>
>>
```

11. The GUI shows Heartbeat connected between Active Primary server and Standby Secondary server.

12. The TEST account synchronizes successfully with Cisco Software Central.

The screenshot displays the Cisco Smart Software Manager On-Prem interface. The main window shows 'High Availability' status as 'Normal' with a green checkmark. Below this, a 'Heartbeat' section indicates 'Connection status: Connected'. A diagram shows two servers: 'Active Server' (primary-node 192.168.1.4) and 'Standby Server' (secondary-node 192.168.1.5), both with their respective public addresses (192.168.1.5 and 192.168.1.10). A 'Synchronization' window is open, showing a table of accounts and their synchronization status.

Name	Satellite Name	Last Synchronization	Synchronization Due	Alerts	Actions
annanr-ssm-on-prem-8-202006	annanr-ssm-on-...	2020-Sep-02 07:33:32	2020-Oct-02 07:33:32	Synchronization Successful	Actions
TEST	TEST	2020-Sep-02 07:35:42	2020-Oct-02 07:35:42	Synchronization Successful	Actions

Product Instance Registration with SSM On-Prem VIP during Failover and Fallback

High Availability between two SSM On-Prem servers should be configured using this guide:

Deploying the HA

cluster: [https://www.cisco.com/web/software/286285517/152313/Smart Software Manager On-Prem 8-202006 Installation Guide.pdf](https://www.cisco.com/web/software/286285517/152313/Smart_Software_Manager_On-Prem_8-202006_Installation_Guide.pdf)

In this demonstration, use:

.11 - Primary Server's IP Address

.9 - Secondary Server's IP Address

.14 - Virtual IP Address

High Availability

1. Successful configuration of HA that shows Primary server (.11) as Active, Secondary server (.9) as Standby and VIP (.14).

The screenshot displays the Cisco Smart Software Manager On-Prem Administration Workspace. The main window is titled "High Availability" and shows a "Normal" status with a green checkmark. Below this, a "Heartbeat" section indicates the connection status is "Connected". A "VIP" section shows the Virtual IP Address (.14) and identifies the "Active Server" (primary-node 169.254.0.1) and the "Standby Server" (secondary-node 169.254.0.2). A "System Information" table compares the Active and Standby servers:

Active Server		Standby Server	
Physical Memory	7.62 GB	Physical Memory	--
Disk Space	7.83 GB	Disk Space	--
Current Version	8-202105	Current Version	--

On the right side, the "System Health" widget shows a "Good" status with a green checkmark, indicating the machine is working well. It also displays server name, version, and uptime. Below this, the "Resource Monitor Percentage" shows CPU, RAM, and DISK usage. The "Recent Alerts" section shows an alert for "Insufficient Licenses". The "Connected Users" section shows the user "admin" is logged in at 00:07:26.

2. Cluster HA status shows that the primary server's database (Replication Master) on the left replicates to the secondary server's database (Replication Slave) on the right as expected as shown in the image.

The screenshot shows two terminal windows displaying PostgreSQL replication status. The left window shows the primary node's status, and the right window shows the secondary node's status. Both windows indicate that the database is currently the replication master (left) and replication slave (right), respectively. The replication status is shown as follows:

```
Database Replication Status:
=====
Database is currently the replication master - Replicating to secondary-node (.9)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----
169.254.0.2 | 2021-06-18 15:08:57.211221+00 | streaming | 0 | 0
(1 row)

Replication from master:
pg_last_xlog_replay_location
-----
9/C763AF8
(1 row)
```

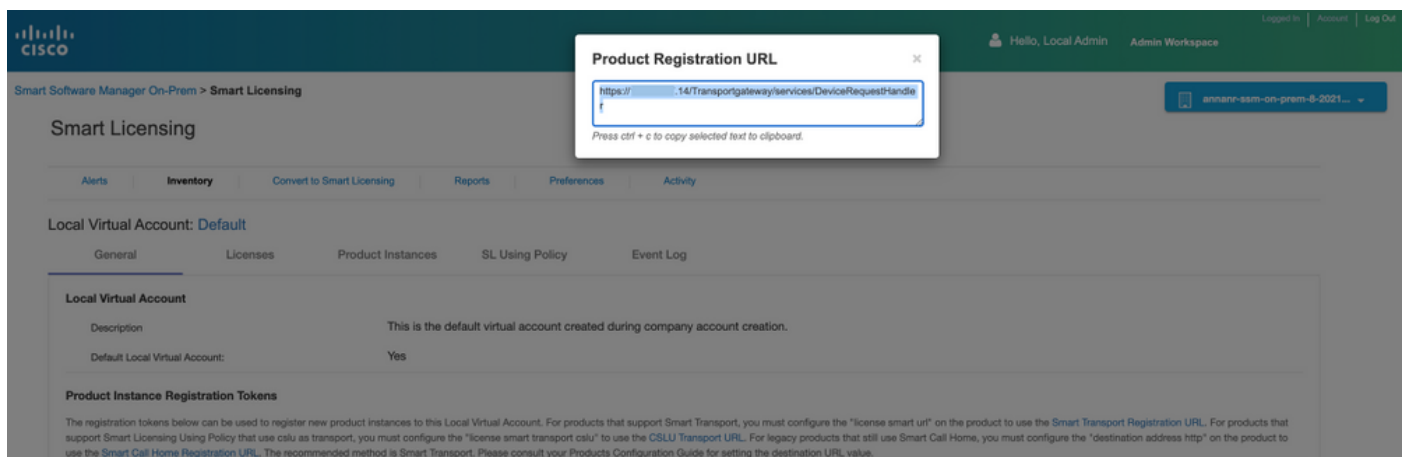
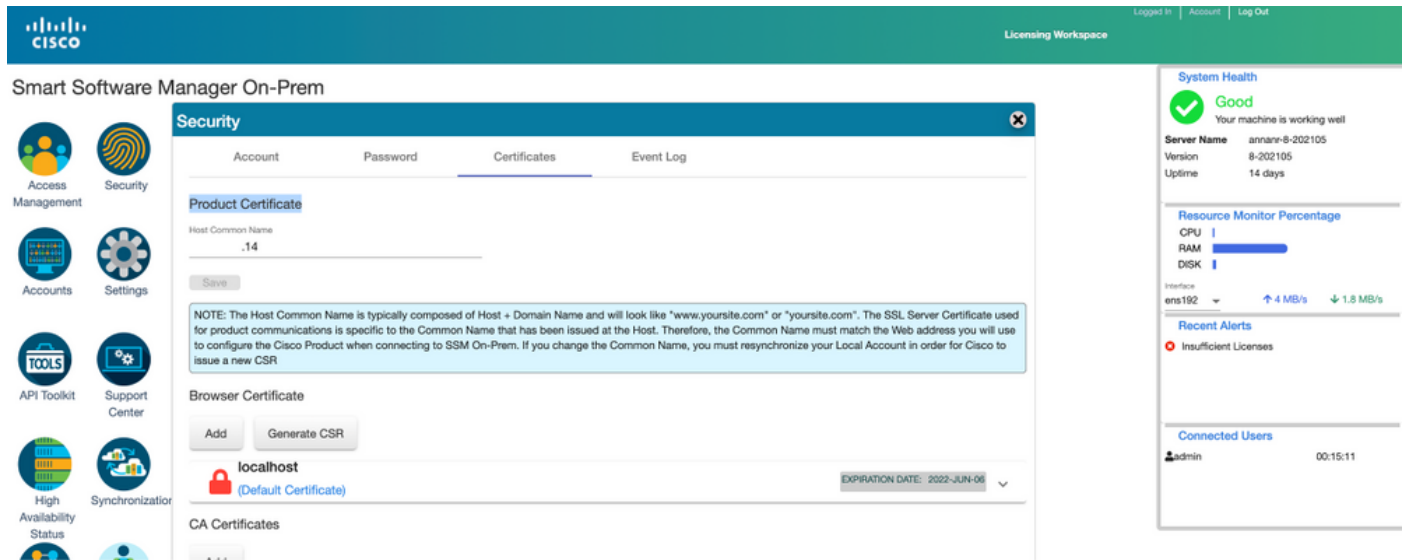
3. When SSM On-Prem is deployed as a HA Cluster, login to SSM On-Prem **Administration Workspace**, navigate to the **Security > Certificates** and use the Virtual IP Address on the Host Common Name.

4. This value must match the value you plan to use for the product destination URL. If deploying dual-stack (both IPv4 and IPv6) this value must be an FQDN and not an IP address.

5. After you have updated the Host Common Name, ensure that your certificates are regenerated with the new Common Name by synchronizing your Local Accounts with Cisco Smart Software Manager.

6. You must synchronize before attempting to re-register the products with the new Common Name in the destination URL configuration.

7. Not synchronizing can result in the products failing to register with the new Host Common Name.



8. Two product instances, (annanr-39) and (cucmpub) are registered to SSM On-Prem's VIP address as seen on the **Product Instances** tab.

9. License consumed/requested by these product instances are reflecting on the **License** tab.

Smart Software Manager On-Prem > Smart Licensing

Smart Licensing

Alerts | Inventory | Convert to Smart Licensing | Reports | Preferences | Activity

Local Virtual Account: Default

General | Licenses | Product Instances | SL Using Policy | Event Log

Name	Product Type	Last Contact	Alerts	Actions
UDI_PID-PI-SOFTWARE;UDI_SN:annam-39	SDNMGMT	2021-Jun-20 18:39:00		Actions
cucompub	UCL	2021-Jun-20 18:36:56		Actions

Showing Page 1 of 12 Records

Smart Software Manager On-Prem > Smart Licensing

Smart Licensing

Alerts | Inventory | Convert to Smart Licensing | Reports | Preferences | Activity

Local Virtual Account: Default

General | Licenses | Product Instances | SL Using Policy | Event Log

License	Billing	Purchased	In Use	Substitution	Balance	Alerts	Actions
Prime Infrastructure 3.x, BASE Lic.	Prepaid	0	1		-1	Insufficient Licenses	Actions
Prime Infrastructure 3.x, Lifecycle Lic.	Prepaid	0	34		-34	Insufficient Licenses	Actions
UC Manager Enhanced License (12.x)	Prepaid	0	3		-3	Insufficient Licenses	Actions
UC Manager Enhanced Plus License (12.x)	Prepaid	0	1		-1	Insufficient Licenses	Actions
UC Manager Telepresence Room License (12.x)	Prepaid	0	1		-1	Insufficient Licenses	Actions

Showing All 6 Records

Failover

1. Stopping HA cluster on Primary Server as shown in the image.

```

PCSD Status:
primary-node: Online
secondary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Sun Jun 20 18:12:43 UTC 2021 on pts/0

Database Replication Status:
Database is currently the replication master - Replicating to secondary-node (.9)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----
169.254.0.2 | 2021-06-18 15:58:57.211121+00 | streaming | 0 | 0
(1 row)

Replication from master:
pg_last_xlog_replay_location

(1 row)

>> ha_cluster_stop
Last login: Sun Jun 20 18:12:45 UTC 2021 on pts/0
Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...

```

```

PCSD Status:
secondary-node: Online
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Sun Jun 20 18:11:42 UTC 2021 on pts/0

Database Replication Status:
Database is currently the replication slave - Replicating from primary-node (.11)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----
(0 rows)

Replication from master:
pg_last_xlog_replay_location

0/C763AF8
(1 row)

>>
>>
>>
>>
>>
>>
>>
>>
>>
>>

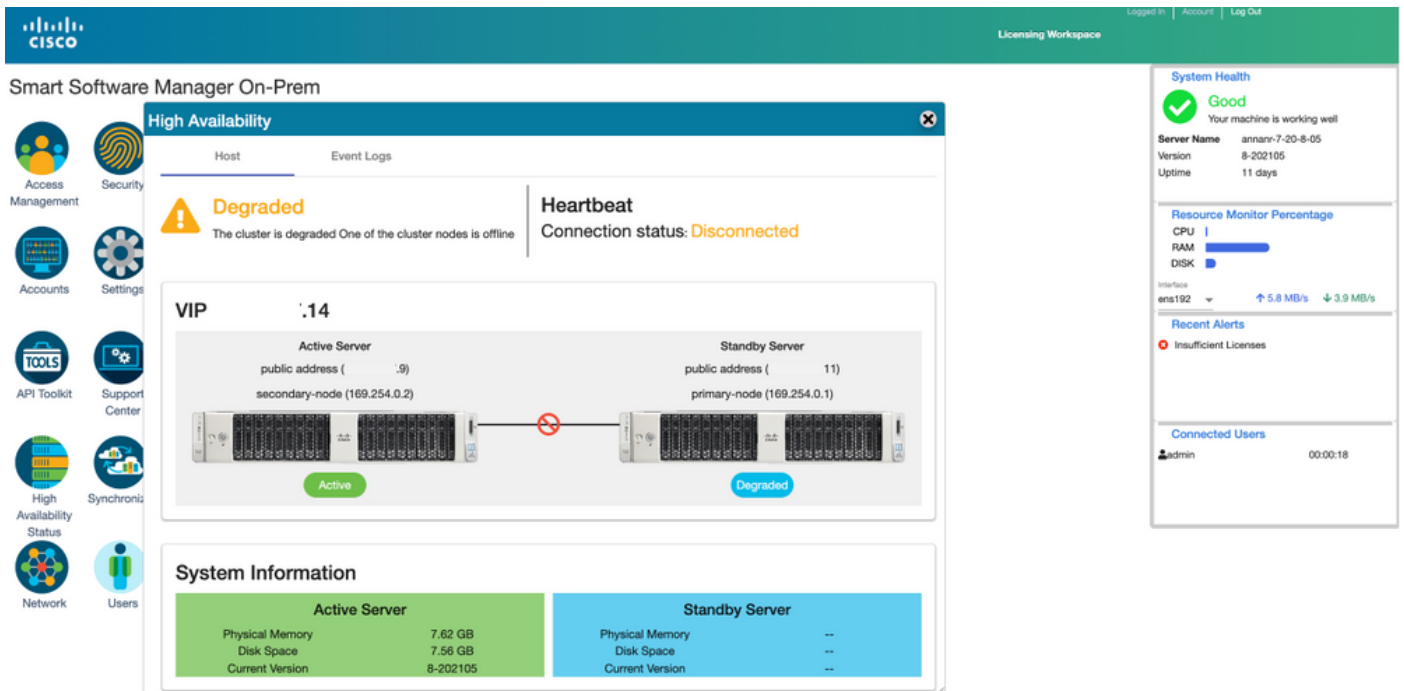
```

2. Logged into the SSM On-Prem GUI with the use of VIP (.14) and the Primary GUI is down.

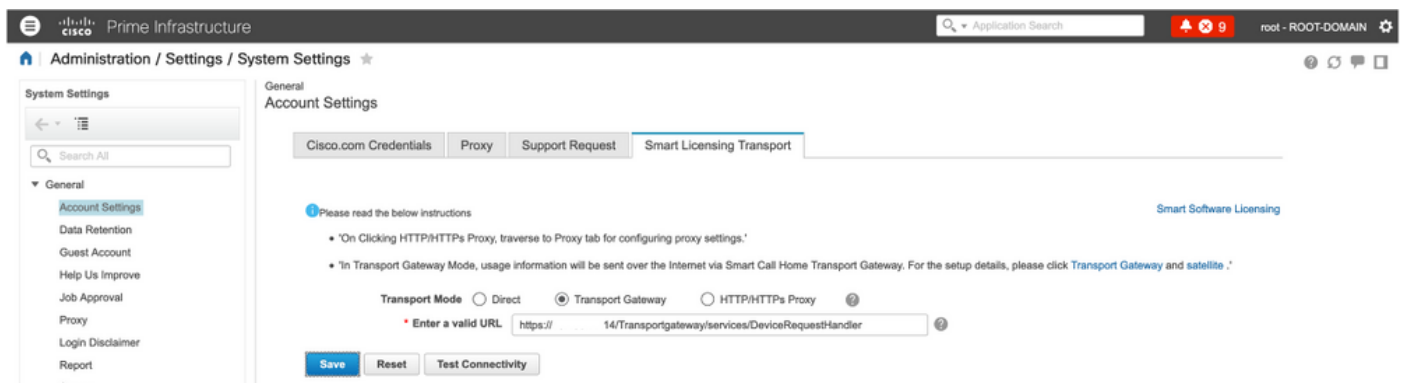
3. Secondary server (.9) is shown as an Active server.

4. Heartbeat is disconnected.

5. The Primary server (.11) is moved to the Standby state.



6. Registering product instances with the use of SSM On-Prem VIP in product registration URL at Transport Gateway setting as shown in the image.



7. Product Instance Name: pi37 has been successfully registered with SSM On-Prem with the use of a VIP address as shown in the image.

Prime Infrastructure Administration / Licenses and Software Updates / Smart Software Licensing

Smart Software Licensing

Smart Software Licensing Status

Licensing Mode: Smart Software Licensing
 Product Name: Prime Infrastructure
 Registration Status: Registered (Jun 20, 2021)
 License Authorization Status: Out of Compliance (Jun 20, 2021)
 Smart Account: anranr-sam-on-prem-8-202105
 Virtual Account: Default
 Product Instance Name: p37
 Transport Settings: Transport Gateway [View / Edit](#)

Smart License Usage

License	Description	Count	Status
Prime Infrastructure 3.x, Assurance Lic.	The Assurance license	2	Out of Compliance
Prime Infrastructure 3.x, BASE Lic.	The Base license	1	Out of Compliance
Prime Infrastructure 3.x, Lifecycle Lic.	The Lifecycle license	14	Out of Compliance
Prime Infrastructure 3.x, UCS Server MGMT Lic.	The Data Center license	0	No Licenses In Use
Prime Infrastructure 3.x, UCS VM	The Data Center Hypervisor license	0	No Licenses In Use

Success: Smart agent registered successfully

8. Registering other product instances with the use of SSM On-Prem VIP in product registration URL at Transport Gateway setting.

Status: Transport settings saved successfully.

Configure how the product instance will communicate with Cisco.

Direct - product communicates directly with Cisco licensing servers.
 URL : https://tools.cisco.com/its/service/oddce/services/DDCEService

Transport Gateway - proxy data via Transport Gateway or Smart Software Manager satellite.
 URL : https://[VIP].14/Transportgateway/services/De

HTTP/HTTPS Proxy - send data via an intermediate HTTP or HTTPS Proxy.

Authentication needed on HTTP or HTTPS proxy

IP Address/Host Name :
 Port :
 User Name :
 Password :

Do not share my hostname or IP address with Cisco.

9. Product registration successfully completed with SSM On-Prem using a VIP address as shown in the image.

Status: Registration completed successfully

Smart Software Licensing Product Registration

To register the product for Smart Software Licensing:

Paste the Product Instance Registration Token you generated from [Smart Software Manager](#) or your Smart Software Manager satellite

10. Product Instance Name: cucm-pub-30 has been successfully registered with SSM On-Prem with the use of a VIP address as shown in the image.

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

License Management

Status

Smart Software Licensing: The system is operating with an insufficient number of licenses. Configure additional licenses in [Smart Software Manager](#) within 72 days to avoid losing the ability to provision users and devices.

Smart Software Licensing

Registration Status	Registered
License Authorization Status	Out of Compliance (Sunday, June 20, 2021 10:29:53 PM EEST)
Smart Account	annmr-ssm-on-prem-8-202105
Virtual Account	Default
Product Instance Name	cucm-pub-30
Export-Controlled Functionality	Allowed
Transport Settings	Transport Gateway View/Edit the Licensing Smart Call Home settings
Licensing Mode	Enterprise

License Usage Report

Below is a summary of current license usage on the system. Current usage details for each type are available by pressing "Update Usage Details". Note that collecting these data is a resource intensive process and may take several deployment.

[View All License Type Descriptions And Device Classifications](#)

[Update Usage Details](#) Usage Details Last Updated: 2021-06-20 22:30:09

License Type	Current Usage	Status	Report
CUWL	0	No Licenses in Use	Users(0) Unassigned Devices(0)
Enhanced Plus	0	No Licenses in Use	Users(0)
Enhanced	44	Out of Compliance	Users(8) Unassigned Devices(36)
Basic	2	Out of Compliance	Users(1) Unassigned Devices(1)
Essential	4	Out of Compliance	Users(0) Unassigned Devices(4)
TelePresence Room	0	No Licenses in Use	Users(0) Unassigned Devices(0)

Users and Unassigned devices

Users	9	View Usage Report
Unassigned Devices	41	View Usage Report

11. Two new product instances, (pi37) and (cucm-pub-30) are registered to SSM On-Prem's VIP address as seen on the **Product Instances** tab.

12. License consumed/requested by these product instances are reflecting on the **License** tab.

Smart Software Manager On-Prem > Smart Licensing

Smart Licensing

Alerts | **Inventory** | Convert to Smart Licensing | Reports | Preferences | Activity

Local Virtual Account: Default

General | **Licenses** | Product Instances | SL Using Policy | Event Log

Name	Product Type	Last Contact	Alerts	Actions
UDI_PID-PI-SOFTWARE;UDI_SN:annmr-39	SDNMGMT	2021-Jun-20 18:39:00		Actions
UDI_PID-PI-SOFTWARE;UDI_SN:pi37:	SDNMGMT	2021-Jun-20 19:26:47		Actions
cucmpub	UCL	2021-Jun-20 18:36:56		Actions
cucm-pub-30	UCL	2021-Jun-20 19:28:51		Actions

Showing Page 1 of 14 Records

Smart Software Manager On-Prem > Smart Licensing

Smart Licensing

Alerts | **Inventory** | Convert to Smart Licensing | Reports | Preferences | Activity

Local Virtual Account: Default

General | **Licenses** | Product Instances | SL Using Policy | Event Log

Available Actions | Manage License Tags... | Search by License

License	Billing	Purchased	In Use	Substitution	Balance	Alerts	Actions
<input type="checkbox"/> Prime Infrastructure 3.x, Assurance Lic.	Prepaid	0	2		-2	Insufficient Licenses	Actions
<input type="checkbox"/> Prime Infrastructure 3.x, BASE Lic.	Prepaid	0	2		-2	Insufficient Licenses	Actions
<input type="checkbox"/> Prime Infrastructure 3.x, Lifecycle Lic.	Prepaid	0	48		-48	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Basic License (12.x)	Prepaid	0	2		-2	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Enhanced License (12.x)	Prepaid	0	47		-47	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Enhanced Plus License (12.x)	Prepaid	0	1		-1	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Essential License (12.x)	Prepaid	0	4		-4	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Telepresence Room License (12.x)	Prepaid	0	1		-1	Insufficient Licenses	Actions

Showing All 8 Records

13. Starting the HA cluster on the Primary server.

```
>> ha_cluster_start
Last login: Sun Jun 20 19:36:49 UTC 2021 on pts/0
Starting Cluster (corosync)...
Starting Cluster (pacemaker)...
```

14. HA Cluster status shows that the Primary database is replicated from the Secondary database.

15. Primary|Secondary as shown in the image.

```
PCSD Status:
primary-node: Online
secondary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Sun Jun 20 18:44:08 UTC 2021 on pts/0

=====
Database Replication Status:
=====
Database is currently the replication slave - Replicating from secondary-node (.....9)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
(0 rows)

Replication from master:
pg_last_xlog_replay_location
(1 row)

PCSD Status:
secondary-node: Online
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Sun Jun 20 18:42:18 UTC 2021 on pts/0

=====
Database Replication Status:
=====
Database is currently the replication slave - Replicating from primary-node (.....13)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
(0 rows)

Replication from master:
pg_last_xlog_replay_location
8/0743028
(1 row)
```

16. GUI shows heartbeat as connected, Secondary in Active state and Primary in Standby state as shown in the image.

Fallback

1. Stopping Ha_cluster in secondary.
2. Current status of the Primary server's database and the Secondary server's database down can be seen.

```

Last login: Sun Jun 20 18:58:34 UTC 2021 on pts/0
-----
Database Replication Status:
-----
Database is currently the replication slave - Replicating from secondary-node ( .9)

Replication to slave:
 client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----
(0 rows)

Replication from master:
 pg_last_xlog_replay_location
-----
0/1017F30
(1 row)
>>

[>>]
[>>]
[>> ha_cluster_stop
Last login: Sun Jun 20 18:45:56 UTC 2021
Stopping Cluster (pacemaker)...

Stopping Cluster (corosync)...
>>
>>
[>> ha_status
Last login: Sun Jun 20 18:47:20 UTC 2021 on pts/0
Error: cluster is not currently running on this node
Last login: Sun Jun 20 18:57:24 UTC 2021 on pts/0
-----
Database Replication Status:
-----
DB service not currently running.
>>

```

3. Logged into the SSM On-Prem GUI using VIP (.14) and the Secondary GUI is down.
4. Primary server (.11) is shown as an Active server.
5. Heartbeat is disconnected.
6. Secondary server (.9) moved to Standby state.

7. GUI will be accessible from the VIP address (.14) at this stage and not the Secondary IP address.

8. Starting HA Cluster on the Secondary server.

```
>> ha_cluster_start
Last login: Sun Jun 20 18:57:24 UTC 2021 on pts/0
Starting Cluster (corosync)...
Starting Cluster (pacemaker)...
>>
```

9. Cluster HA status shows that the primary server's database (Replication Master) on the left replicates to the secondary server's database (Replication Slave) on the right as expected.

```
PCSD Status:
primary-node: Online
secondary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Sun Jun 20 19:05:59 UTC 2021 on pts/0

=====
Database Replication Status:
=====
Database is currently the replication master - Replicating to secondary-node (.9)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag
| replay_lag
-----
169.254.0.2 | 2021-06-20 19:01:56.610211+00 | streaming | 0 | 0
|
(1 row)

Replication from master:
pg_last_xlog_replay_location
-----
0/8012F38
(1 row)

=====
PCSD Status:
secondary-node: Online
primary-node: Online

Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Last login: Sun Jun 20 19:04:47 UTC 2021 on pts/0

=====
Database Replication Status:
=====
Database is currently the replication slave - Replicating from primary-node (.11)

Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
|
(0 rows)

Replication from master:
pg_last_xlog_replay_location
-----
0/1000000
(1 row)

>>
>>
```

10. The GUI shows Heartbeat connected between Active Primary server and Standby Secondary server.

High Availability

Host | Event Logs

Normal
The status of the high availability cluster is normal.

Heartbeat
Connection status: **Connected**

VIP .14

Active Server	Standby Server
public address (.11)	public address (.9)
primary-node (169.254.0.1)	secondary-node (169.254.0.2)
Active	Standby

System Information

Active Server	Standby Server
Physical Memory: 7.62 GB	Physical Memory: --
Disk Space: 7.83 GB	Disk Space: --
Current Version: 8-202105	Current Version: --

System Health
Good
Your machine is working well

Server Name: annanr-8-202105
Version: 8-202105
Uptime: 14 days

Resource Monitor Percentage
CPU |
RAM |
DISK |

Interface: ens192 | ↑ 4.1 MB/s | ↓ 1.9 MB/s

Recent Alerts
Insufficient Licenses

Connected Users
admin | 00:07:26

11. All four product instances registered to SSM On-Prem's VIP address as seen on the **Product Instances** tab.

12. License consumed/requested by these product instances are reflecting on the **License** tab.

Smart Software Manager On-Prem > Smart Licensing

Alerts | **Inventory** | Convert to Smart Licensing | Reports | Preferences | Activity

Local Virtual Account: **Default**

General | **Licenses** | Product Instances | SL Using Policy | Event Log

Name	Product Type	Last Contact	Alerts	Actions
UDI_PID-PI-SOFTWARE:UDI_SN:annanr-09	SDNMGMT	2021-Jun-20 18:39:00		Actions
UDI_PID-PI-SOFTWARE:UDI_SN:p37-	SDNMGMT	2021-Jun-20 19:26:47		Actions
cucompub	UCL	2021-Jun-20 18:36:56		Actions
cuom-pub-30	UCL	2021-Jun-20 19:28:51		Actions

Showing Page 1 of 1 (4 Records)

Smart Licensing

Alerts | Inventory | Convert to Smart Licensing | Reports | Preferences | Activity

Local Virtual Account: Default

General | Licenses | Product Instances | SL Using Policy | Event Log

Available Actions | Manage License Tags... | Search by License

License	Billing	Purchased	In Use	Substitution	Balance	Alerts	Actions
<input type="checkbox"/> Prime Infrastructure 3.x, Assurance Lic.	Prepaid	0	2		-2	Insufficient Licenses	Actions
<input type="checkbox"/> Prime Infrastructure 3.x, BASE Lic.	Prepaid	0	2		-9	Insufficient Licenses	Actions
<input type="checkbox"/> Prime Infrastructure 3.x, Lifecycle Lic.	Prepaid	0	48		-48	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Basic License (12.x)	Prepaid	0	2		-2	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Enhanced License (12.x)	Prepaid	0	47		-47	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Enhanced Plus License (12.x)	Prepaid	0	1		-1	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Essential License (12.x)	Prepaid	0	4		-4	Insufficient Licenses	Actions
<input type="checkbox"/> UC Manager Telepresence Room License (12.x)	Prepaid	0	1		-1	Insufficient Licenses	Actions

Showing All 8 Records

Downgrade a High Availability Cluster

1. A Cisco Smart Manager On-Prem cluster can be directly downgraded to a single node standalone.
2. Use the On-Prem Console to connect to the Primary/Active SSM On-Prem with the use of the <ha_tear_down> command.
3. After you verify the SSM On-Prem's operation, the Secondary/Standby server must be discarded and cannot be reused.
4. You will now have a standalone system instead of a cluster.
5. The teardown has been initiated as shown in the image.

```

Database Replication Status:
Database is currently the replication master - Replicating to secondary-node (192.168.1.5)
Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
192.168.1.5 | 2020-09-02 09:08:59.358586+00 | streaming | 0 | 0
(1 row)
Replication from master:
pg_last_xlog_replay_location
0/7079010
(1 row)
>> ha_tear_down
Last login: Wed Sep 2 11:03:58 UTC 2020
WARNING: You are about to destroy the HA cluster configuration
and convert this service node into stand-alone mode without a cluster.
This script operates on the local service node and will not
effect the remote service node.
Destroy HA cluster and convert to stand-alone? Enter 'yes' to continue: yes
Adjusting firewall...
success
The interface is under control of NetworkManager, setting zone to default.
success
Destroying HA cluster...
Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...
Shutting down pacemaker/corosync services...
Killing any remaining services...
Removing all cluster configuration files...
Disabling HA services...
Removed symlink /etc/systemd/system/multi-user.target.wants/pcsd.service.
Stopping SSH tunnel...
ssh tunnels service
added activating auto-restart SSH tunnel device forwarding service
Removed symlink /etc/systemd/system/multi-user.target.wants/ssh tunnels.service.
Removed symlink /etc/systemd/system/multi-user.target.wants/tunha.service.
Cleaning up...
atlantis_default
Enabling SSM stand-alone mode...
Created symlink from /etc/systemd/system/multi-user.target.wants/satellite.service to /etc/systemd/system/satellite.service.
Deleting SSH tunnel user...
HA cluster has been destroyed. SSM is now in stand-alone mode.
>>
>> ha_status
Last login: Wed Sep 2 11:11:39 UTC 2020
Error: cluster is not currently running on this node
Last login: Wed Sep 2 11:15:21 UTC 2020 on pts/0
HA is not enabled.
Database Replication Status:
Database is currently the replication slave - Replicating from primary-node (192.168.1.5)
Replication to slave:
client_addr | backend_start | state | write_lag | flush_lag | replay_lag
(0 rows)
Replication from master:
pg_last_xlog_replay_location
0/9080030
(1 row)
>> ha_tear_down
Last login: Wed Sep 2 11:12:42 UTC 2020 on pts/0
WARNING: You are about to destroy the HA cluster configuration
and convert this service node into stand-alone mode without a cluster.
This script operates on the local service node and will not
effect the remote service node.
Destroy HA cluster and convert to stand-alone? Enter 'yes' to continue: yes
Adjusting firewall...
success
The interface is under control of NetworkManager, setting zone to default.
success
Destroying HA cluster...
Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...
Shutting down pacemaker/corosync services...
Killing any remaining services...
Removing all cluster configuration files...
Disabling HA services...
Removed symlink /etc/systemd/system/multi-user.target.wants/pcsd.service.
Stopping SSH tunnel...
ssh tunnels service
added activating auto-restart SSH tunnel device forwarding service
Removed symlink /etc/systemd/system/multi-user.target.wants/ssh tunnels.service.
Removed symlink /etc/systemd/system/multi-user.target.wants/tunha.service.
Cleaning up...
atlantis_default
Enabling SSM stand-alone mode...
Created symlink from /etc/systemd/system/multi-user.target.wants/satellite.service to /etc/systemd/system/satellite.service.
Deleting SSH tunnel user...
HA cluster has been destroyed. SSM is now in stand-alone mode.
>>
>> ha_status
Last login: Wed Sep 2 11:18:55 UTC 2020
Error: cluster is not currently running on this node
Last login: Wed Sep 2 11:19:02 UTC 2020 on pts/0
HA is not enabled.
    
```

6. Triggering teardown on the Secondary server as shown in the image.

```

=====
Database Replication Status:
=====
Database is currently the replication slave - Replicating from primary-node ( .5)

Replication to slave:
 client_addr | backend_start | state | write_lag | flush_lag | replay_lag
-----+-----+-----+-----+-----+-----
(0 rows)

Replication from master:
 pg_last_xlog_replay_location
-----
 0/9000D30
(1 row)

[>> ha_teardown
Last login: Wed Sep  2 11:12:42 UTC 2020 on pts/0

WARNING: You are about to destroy the HA cluster configuration
and convert this service node into stand-alone mode without a cluster.

This script operates on the local service node and will not
affect the remote service node.

[Destroy HA cluster and convert to stand-alone? Enter 'yes' to continue: yes
Adjusting firewall...
success
success
The interface is under control of NetworkManager, setting zone to default.
success
success
Destroying HA cluster...
Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...
Shutting down pacemaker/corosync services...
Killing any remaining services...
Removing all cluster configuration files...
Disabling HA services...
Removed symlink /etc/systemd/system/multi-user.target.wants/pcsd.service.
Stopping SSH tunnel...
Removed symlink /etc/systemd/system/multi-user.target.wants/tunha.service.
Cleaning up...
atlantis_default
Enabling SSMS stand-alone mode...
Created symlink from /etc/systemd/system/multi-user.target.wants/satellite.service to /etc/systemd/system/satellite.service.
Deleting SSH tunnel user...

HA cluster has been destroyed.  SSMS is now in stand-alone mode.

>> ]

```

7. HA cluster has been destroyed. SSMS is now in a stand-alone mode.

```

HA cluster has been destroyed.  SSMS is now in stand-alone mode.

[>> ha_status
Last login: Wed Sep  2 11:18:33 UTC 2020
Error: cluster is not currently running on this node
Last login: Wed Sep  2 11:19:02 UTC 2020 on pts/0
HA is not enabled.

>> ]

```

8. GUI accessed with the use of the Secondary server IP address does not show the High availability widget anymore.

Smart Software Manager On-Prem

System Health: **Good**
Your machine is working well
Server Name: CentOS
Version: 8-202006
Uptime: 1 day

Resource Monitor Percentage
CPU: |
RAM: |

Network: ens192
Connected
IPv4 Address: .10
Subnet Mask: 255.255.255.0
IPv6 Address:
Prefix:
Edit Interface

Name	Satellite Name	Last Synchronization	Synchroniz
annanr-ssm-on-prem-8-202006	annanr-ssm-on-...	2020-Sep-02 07:33:32	2020-Oct-
TEST	TEST	2020-Sep-02 07:35:42	2020-Oct-

9. Triggering teardown on the Primary server as shown in the image.

```
[>> ha_teardown
Last login: Wed Sep  2 11:03:55 UTC 2020

WARNING: You are about to destroy the HA cluster configuration
and convert this service node into stand-alone mode without a cluster.

This script operates on the local service node and will not
affect the remote service node.

[Destroy HA cluster and convert to stand-alone? Enter 'yes' to continue: yes
Adjusting firewall...
success
success
The interface is under control of NetworkManager, setting zone to default.
success
success
Destroying HA cluster...

Stopping Cluster (pacemaker)...
Stopping Cluster (corosync)...
Shutting down pacemaker/corosync services...
Killing any remaining services...
Removing all cluster configuration files...
Disabling HA services...
Removed symlink /etc/systemd/system/multi-user.target.wants/pcsd.service.
Stopping SSH tunnel...
  sstunha.service
aded  activating auto-restart SSH tunnel device forwarding service
Removed symlink /etc/systemd/system/multi-user.target.wants/sstunha.service.
Removed symlink /etc/systemd/system/multi-user.target.wants/tunha.service.
Cleaning up...
atlantis_default
Enabling SSMS stand-alone mode...
Created symlink from /etc/systemd/system/multi-user.target.wants/satellite.service to /etc/systemd/system/satellite
.service.
Deleting SSH tunnel user...

HA cluster has been destroyed.  SSMS is now in stand-alone mode.
```

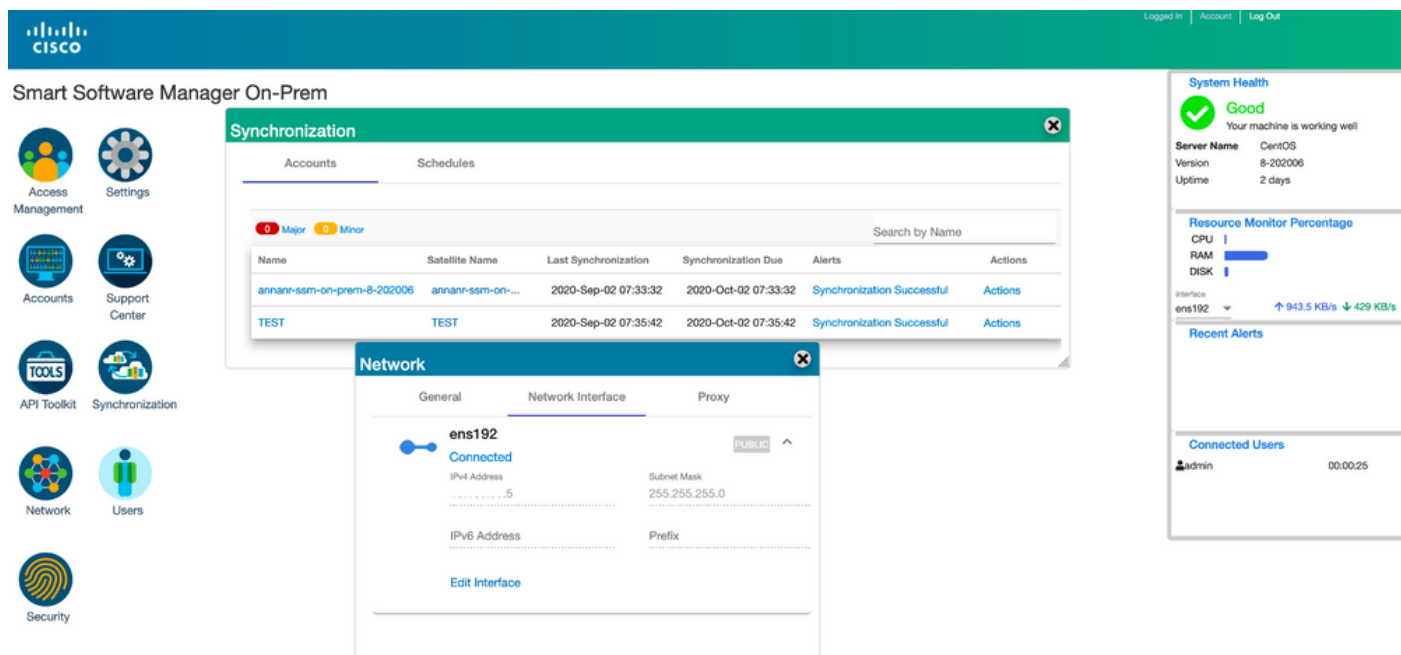
10. HA has been disabled successfully.

```

>>
>> ha_status
Last login: Wed Sep  2 11:11:39 UTC 2020
Error: cluster is not currently running on this node
Last login: Wed Sep  2 11:15:21 UTC 2020 on pts/0
HA is not enabled.
>>

```

11. GUI accessed with the use of the Primary server IP address does not show the High availability widget anymore.



What Next?!

1. Log in to SSM On-Prem Primary **Administration Workspace**, navigate to the **Security > Certificates** and use the Primary server's (IP address/Hostname/FQDN) on the Host Common Name.
2. After you have updated the Host Common Name, ensure that your certificates are regenerated with the new Common Name by synchronizing your Local Accounts with Cisco SSM.
3. You must synchronize before you attempt to re-register the products with the new Common Name in the destination URL configuration.
4. Not synchronizing can result in the products failing to register with the new Host Common Name.

Related Information

- Console Guide: https://www.cisco.com/web/software/286285517/151968/Smart_Software_Manager_On-Prem_8_Console_Guide.pdf

- User Guide:
https://www.cisco.com/web/software/286285517/151968/Smart_Software_Manager_On-Prem_8_User_Guide.pdf
- Installation Guide:
https://www.cisco.com/web/software/286285517/152313/Smart_Software_Manager_On-Prem_8-202006_Installation_Guide.pdf
- **[Technical Support & Documentation - Cisco Systems](#)**