

Perform a Health Check of CUCM Database Replication

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Introduction

This document describes important commands to verify Cisco Unified Communications Manager (CUCM) database replication, and its expected outputs.

Prerequisites

Requirements

Cisco recommends that you have knowledge of this topics:

- Cisco Unified Communications Manager

Components Used

The information in this document is based on this software versions:

- Cisco Unified Communications Manager version 10.5.2.15900-8

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

Database in CUCM is a fully meshed topology which means that the publisher and each subscriber connect logically to every server in the cluster; and all of them have the ability to update the data between them.

In order to verify database status in CUCM, access from Command Line Interface (CLI) must be granted in each of the nodes in the cluster. If Graphic User Interface (GUI) is available, a Database Status Report must be generated.

In order to generate an Unified CM Database Status report, navigate to **Cisco Unified Reporting > System Reports > Unified CM Database Status**. Select **Generate a new report**.

Connectivity Verification

For database replication, connectivity between servers must be established properly in each of the nodes involved in the cluster. These commands allow you to know the status of each of them.

show network cluster

Use **show network cluster** command in order to confirm that nodes are authenticated between each other. The output from the publisher contains processnode table entries. However, all of the nodes must be authenticated (ensure that the security password is same on all of the nodes).

Publisher:

```
<#root>
```

```
admin:show network cluster
10.1.89.30 CUCMv10SUB.alegarc2.lab CUCMv10SUB Subscriber callmanager DBSub
```

```
authenticated
```

```
using TCP since Mon Jul 1 13:44:09 2019
10.1.89.20 CUCM10.alegarc2.lab CUCM10 Publisher callmanager DBPub
```

```
authenticated
```

Server Table (processnode) Entries

```
-----
10.1.89.20
10.1.89.30
```

Subscriber:

```
<#root>
```

```
admin:show network cluster
10.1.89.30 CUCMv10SUB.alegarc2.lab CUCMv10SUB Subscriber callmanager DBSub
```

```
authenticated
```

```
10.1.89.20 CUCM10.alegarc2.lab CUCM10 Publisher callmanager DBPub
```

```
authenticated
```

```
using TCP since Mon Jul 1 13:44:19 2019
```

run sql select * from processnode

Processnode table must list all nodes in the cluster.

<#root>

```
admin:run sql select * from processnode
pkid                                     name                               mac systemnode description isactive nodeid tkno
=====                               =====
00000000-1111-0000-0000-000000000000 EnterpriseWideData                t          t          1          1
68b56caa-d320-4c94-9c5a-43c3ba6cb4b8

10.1.89.20
      f          10.1.89.20 t          2          0          NULL          1
a6a92a62-8e66-cdfc-80fa-56a688d3dd58

10.1.89.30
      f          t          3          1          NULL          1
```

utils network connectivity <IP/hostname>

Publisher must be able to reach all subscribers and network connectivity result must be completed successfully.

<#root>

```
admin:utils network connectivity 10.1.89.30
```

This command can take up to 3 minutes to complete.

Continue (y/n)?y

Running test, please wait ...

.....

Network connectivity test with 10.1.89.30

completed successfully

.

Each subscriber must reach Publisher, and other subscribers included in the cluster network connectivity result must be completed successfully.

<#root>

```
admin:utils network connectivity 10.1.89.20
```

This command can take up to 3 minutes to complete.

Continue (y/n)?y

Running test, please wait ...

.

Network connectivity test with 10.1.89.20

completed successfully

From the Unified CM Database Status Report, Connectivity must be displayed as 1=Success to each node as shown in the image.



utils diagnose test

It checks all the components and returns passed/failed value. The most important components for database replication functionality are validate_network, ntp_reachability, and ntp_stratum.

```
<#root>
```

```
admin:utils diagnose test
```

```
Log file: platform/log/diag1.log
```

```
Starting diagnostic test(s)
```

```
=====
test - disk_space : Passed (available: 1753 MB, used: 12413 MB)
skip - disk_files : This module must be run directly and off hours
test - service_manager : Passed
test - tomcat : Passed
test - tomcat_deadlocks : Passed
test - tomcat_keystore : Passed
test - tomcat_connectors : Passed
test - tomcat_threads : Passed
test - tomcat_memory : Passed
test - tomcat_sessions : Passed
skip - tomcat_heapdump : This module must be run directly and off hours

test - validate_network : Passed

test - raid : Passed
test - system_info : Passed (Collected system information in diagnostic log)

test - ntp_reachability : Passed
```

test - ntp_clock_drift : Passed

test - ntp_stratum : Passed

skip - sdl_fragmentation : This module must be run directly and off hours

skip - sdi_fragmentation : This module must be run directly and off hours

Diagnostics Completed

The final output will be in Log file: platform/log/diag1.log

Please use 'file view active log platform/log/diag1.log' command to see the output

utils ntp status

Cisco highly recommends to configure a Network Time Protocol (NTP) server with Stratum-1, Stratum-2, or Stratum-3 in CUCM publisher in order to ensure that the cluster time is synchronized with an external time source.

<#root>

admin:utils ntp status
ntpd (pid 8609) is running...

remote	refid	st	t	when	poll	reach	delay	offset	jitter
*10.1.89.1	LOCAL(1)	2	u	935	1024	377	0.262	2.591	3.260

synchronised

to NTP server (10.1.89.1)

at stratum 3

time correct to within 32 ms
polling server every 1024 s

Current time in UTC is : Wed Jul 3 12:40:36 UTC 2019
Current time in America/Mexico_City is : Wed Jul 3 07:40:36 CDT 2019

NTP for subscribers is publisher server and must be visible as synchronized.

<#root>

admin:utils ntp status
ntpd (pid 30854) is running...

remote	refid	st	t	when	poll	reach	delay	offset	jitter
--------	-------	----	---	------	------	-------	-------	--------	--------

```
*10.1.89.20      10.1.89.1      3 u 179 1024 377 0.524 -1.793 1.739
```

synchronized

to NTP server (10.1.89.20) at

stratum 4

time correct to within 50 ms
polling server every 1024 s

Current time in UTC is : Wed Jul 3 12:41:46 UTC 2019
Current time in America/Mexico_City is : Wed Jul 3 07:41:46 CDT 2019

Services Verification

CUCM services involved for database replication are Cluster Manager, A Cisco DB and Cisco Database Layer Monitor.

utils service list

Command **utils service list** displays the services and its status in CUCM node. These services must be displayed as STARTED.

- Cluster Manager [STARTED]
- A Cisco DB [STARTED]
- A Cisco DB Replicator [STARTED]
- Cisco Database Layer Monitor [STARTED]

Database Commands

Database replication commands must be run from the publisher.

utils dbreplication status

This command only triggers the check of the database status. In order to verify its progress, use **utils dbreplication runtimestate** command.

```
<#root>
```

```
admin:utils dbreplication status
```

```
Replication status check is now running in background
```

```
.  
Use command 'utils dbreplication runtimestate' to check its progress
```

```
The final output will be in file cm/trace/db1/sdi/ReplicationStatus.2019_07_03_07_54_21.out
```

```
Please use "file view active log cm/trace/db1/sdi/ReplicationStatus.2019_07_03_07_54_21.out " command to
```

utils dbreplication runtimestate

Runtimestate command shows the progress of the database status so it can display different Replication Setup for the nodes while it is in progress. Once that command is COMPLETED, outputs can be verified and it shows the current database status.

<#root>

admin:utils dbreplication runtimestate

Server Time: Wed Jul 3 09:11:03 CDT 2019

Cluster Replication State: Replication status command started at: 2019-07-03-07-54

Replication status command COMPLETED

681 tables checked out of 681

Last Completed Table: devicenumplanmapremdestmap

No Errors or Mismatches found.

Use 'file view active log cm/trace/dbl/sdi/ReplicationStatus.2019_07_03_07_54_21.out' to see the details

DB Version: ccm10_5_2_15900_8

Repltimeout set to: 300s

PROCESS option set to: 1

Cluster Detailed View from CUCM10 (2 Servers):

SERVER-NAME	IP ADDRESS	PING (msec)	DB/RPC/ DbMon?	REPL. QUEUE	Replication Group ID	REPLICATION SETUP (RTMT) & Details
CUCM10	10.1.89.20	0.013	Y/Y/Y	0	(g_2)	
(2) Setup Completed						
CUCMv10SUB	10.1.89.30	0.230	Y/Y/Y	0	(g_3)	
(2) Setup Completed						

Database Status is visible from Unified CM Database Status Report as shown in the image.

- Unified CM Database Status

RTMT Counter Information

- ✓ All servers have a replication count of 681.
- ✓ All servers have a good replication status.

[View Details](#)

Server ▲▼	Number of Replicates Created ▲▼	Replicate_State ▲▼
10.1.89.20	681	2 - good
10.1.89.30	681	2 - good

Hosts/Rhosts/Sqlhosts Files

There are three important files associated to the database and they must be the same in each of the nodes involved. In order to verify them from CLI, root access is required. However, Unified CM Database Status Report also displays this information as shown in the image.

Unified CM Hosts



All servers have equivalent host files

[View Details](#)

Unified CM Rhosts



All servers have equivalent rhosts files.

[View Details](#)

Unified CM Sqlhosts



All servers have equivalent sqlhosts files.

[View Details](#)

System History Log File

Database replication can be damaged due to ungraceful shutdowns and they are visible in System-history log.

Ungraceful shutdown example:

```
<#root>
```

```
09/13/2019 15:29:01 | root:
```

```
Boot
```

```
10.5.2.15900-8 Start
```

```
09/13/2019 16:55:24 | root:
```

```
Boot
```

```
10.5.2.15900-8 Start
```

Graceful shutdown example:

```
<#root>
```

```
09/03/2019 14:51:51 | root:
```

```
Restart
```

```
10.5.2.15900-8 Start
```

```
09/03/2019 14:52:27 | root:
```

```
Boot
```

```
10.5.2.15900-8 Start
```

Rebuild of the server is suggested when system suffered an ungraceful shutdown and it is documented in Cisco bug ID [CSCth53322](#)

Verify

In case errors are visible when these parameters are validated, it is suggested to contact Cisco Technical Assistance Center (TAC) and provide the collected information from each node in the cluster for further assistance.

Related Information

- [Unified CM NTP Time Synchronization](#)
- [Procedure to Shut Down or Restart the System, version 12.5\(1\)](#)
- [Recover from Ungraceful Shutdown](#)