Enable UC servers for Extension Mobility Cross Cluster (EMCC)

Contents

Introduction

This document describes extension mobility cross cluster feature which is being introduced in Cisco Unified Communications Manager (CUCM) 8.0 and higher releases.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions

- CUCM 9.X and higher

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, make sure that you understand the potential impact of any command.

Background Information

EMCC Solution

EMCC addresses the problem of extension mobility cross clusters specifies cross-registration. Cross-registration implies these characteristics:

- User from home cluster logs in to a phone at visiting cluster.
- Login procedure conveys the device information into the home cluster database.
- Home cluster database builds a temporary device with user device profile.
- Home cluster TFTP server builds the phone configuration file.
- After login, visiting cluster directs the phone to home cluster TFTP server.
- Phone downloads its TFTP configuration from home cluster (HC) TFTP server and then cross-registers with home cluster Cisco Unified Communications Manager.

Configure

1. Service Activation

Navigate to **Cisco Unified Serviceability > Tools > Service Activation**.

Choose a server, and activate these services by checking the check box next to each service:

- Cisco CallManager
- Cisco TFTP
- Cisco Extension Mobility
- Cisco Bulk Provisioning Service (can activate only on the publisher)

☑	Cisco CallManager	Activated
☑	Cisco Unified Mobile Voice Access Service	Activated
☑	Cisco IP Voice Media Streaming App	Activated
☑	Cisco CTIManager	Activated
☑	Cisco Extension Mobility	Activated
☑	Cisco Extended Functions	Activated
☑	Cisco DHCP Monitor Service	Activated
☑	Cisco Intercluster Lookup Service	Activated
☑	Cisco Location Bandwidth Manager	Activated
☑	Cisco Directory Number Alias Sync	Activated
☑	Cisco Directory Number Alias Lookup	Activated
☑	Cisco Dialed Number Analyzer Server	Activated
☑	Cisco Dialed Number Analyzer	Activated
☑	Cisco Tftp	Activated

2. EM Phone Service

1. Navigate to **CUCM Administration > Device > Device Settings > Phone Services**.
2. Create an Extension Mobility phone service.
3. In CUCM Administration, navigate to **Device > Device Settings > Phone Services**.

Click **Add New**, and fill in the fields in the IP Phone Services Configuration window as:

4. Service Name: Extension Mobility.
5. ASCII Service Name: Extension Mobility.
6. Service Description: Extension Mobility.
7. Service
   URL: http://10.89.80.19:8080/emapp/EMAppServlet?device=#DEVICENAME#&EMCC=#EMCC#

8. Secure-Service
   URL:https://10.89.80.19:8443/emapp/EMAppServlet?device=#DEVICENAME#&EMCC=#EMCC#
9. Check the **Enable** check box.
10. Click **Save** to save the Extension Mobility phone service.

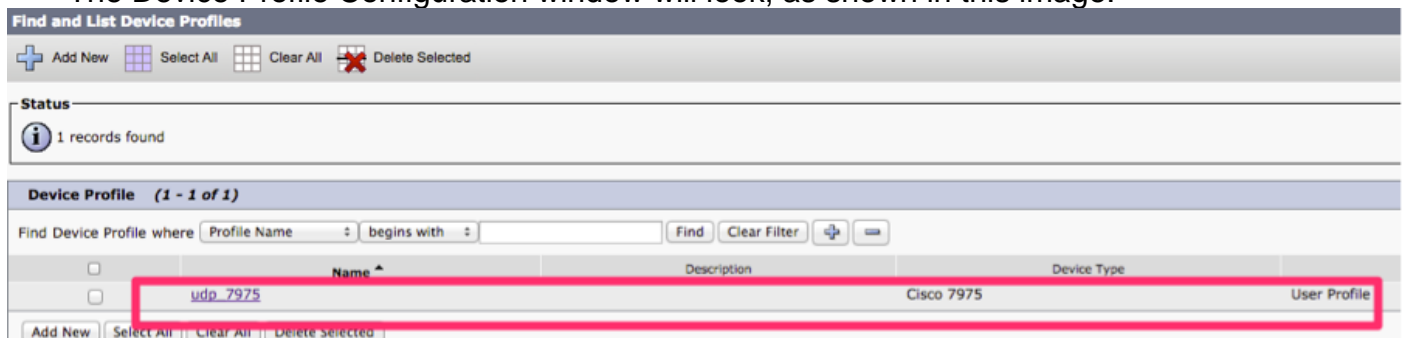## 3. Add Device Profile for Users who needs EM

Navigate to **CUCM Administration > Device > Device Settings > Device Profile**

- Add a device profile for users who need Extension Mobility. The device profile gets used to overlay with a real device when the user logs in (both for Extension Mobility and EMCC). Perform these steps:

1. In CUCM Administration, navigate to **Device > Device Settings > Device Profile.**

2. Add a new device profile for a specific device type with a specific protocol, assigning a meaningful name to the new device profile. Example:7971 SCCP Device Profile.

3. In the new device profile, configure the **EMCC CSS** field.

4. This calling search space (CSS) gets applied to the real device configuration when the user travels and uses an IP phone of a different (visiting) cluster.

5. Configure this field as if setting the CSS field in the Phone Configuration window of a local IP phone.

- Refer to [EMCC Call Routing section](#) for more details about the EMCC CSS field.
- Add a directory number (DN) to the new device profile. Example:4001

- In the Directory Number Configuration window, choose the **Configure Device** (<your new device profile name>) option in the **Related Links** drop-down list box.
- You return to the **Device Profile Configuration** window.
- In the Device Profile Configuration window, choose the **Subscribe/Unsubscribe Services** option in the **Related Links** drop-down list box.
- In the popup window that displays, choose the Extension Mobility service in the Select a Service drop-down list box.
- Click **Next**.
- Click **Save** and close the popup window.
- The Device Profile Configuration window will look, as shown in this image.

4. Configure End User

- Add users for Cisco EMCC:
- In Cisco Unified Communications Manager Administration, choose **User Management > End User**.
- Click **Add New** to add a new end user.
- In the End User Configuration window that displays, configure at least these fields: User ID, Password, PIN, Last name, First name.

- In the Extension Mobility pane, check the **Enable EMCC** check box.
- Choose the device profile that you configured in Step 3 from the Available Profiles list pane in

the Extension Mobility pane.
- Use the down arrow to move the device profile to the Controlled Profiles list pane.
- Click **Save** to save the end user configuration.

End User Configuration

💾 Save ❌ Delete ➕ Add New

Status

ⓘ Update successful

User Information

User Status	Enabled Local User

User ID*	a
Password	••
Confirm Password	••
Self-Service User ID	1000
PIN	••
Confirm PIN	••
Last name	a
Middle name	

Extension Mobility

Available Profiles

⌄ ⌃

Controlled Profiles   udp_7975

☑ Enable Extension Mobility Cross Cluster

5. Enable EM on the devices

- Check the EM on the Phone page.
- Subscribe EMCC Phone Service .
- Navigate to **CUCM Administration > Device > Phone**.

Extension Information

☑ Enable Extension Mobility

Log Out Profile -- Use Current Device Settings --

Log in Time   < None >
Log out Time   < None >

- Subscribe/unsubscribe services

Service Information

Service Subscription: New
Select a Service*   -- Not Selected --
Service Description

Subscribed Services

🌐 EMCC

- Till now this configuration has to be done on both Home and Visiting Clusters.

6. Configure Bulk Certificate Management

Navigate to **CUCM OS Administration > Security > Bulk Certificate Management.**

SFTP Details

IP Address* 192.168.172.5

Port* 22

User ID* cisco

Password* •••••

Directory* /

Save

7. Export

- Certificate Type: All, then export, as shown in this image.

File Name	Certificate Type	Server Source
192.168.172.5_bulk_capf.pkcs12	BULK	192.168.172.5
192.168.172.5_bulk_tftp.pkcs12	BULK	192.168.172.5
192.168.172.5_bulk_tomcat.pkcs12	BULK	192.168.172.5
EMCCCCM1_capf.pkcs12	STORE	EMCCCCM1
EMCCCCM11_capf.pkcs12	STORE	EMCCCCM11
EMCCCCM1_tftp.pkcs12	STORE	EMCCCCM1
EMCCCCM11_tftp.pkcs12	STORE	EMCCCCM11
EMCCCCM1_tomcat.pkcs12	STORE	EMCCCCM1
EMCCCCM11_tomcat.pkcs12	STORE	EMCCCCM11

Save Export Consolidate Import

ⓘ *- indicates required item.

8. Consollidate

- Certificate Type: All, consolidate.

File Name	
192.168.172.5_bulk_capf.pkcs12	BULK
192.168.172.5_bulk_tftp.pkcs12	BULK
192.168.172.5_bulk_tomcat.pkcs12	BULK
EMCCCCM1_capf.pkcs12	STORE
EMCCCCM11_capf.pkcs12	STORE
EMCCCCM1_tftp.pkcs12	STORE
EMCCCCM11_tftp.pkcs12	STORE
EMCCCCM1_tomcat.pkcs12	STORE
EMCCCCM11_tomcat.pkcs12	STORE

Save Export **Consolidate** Import

9. Import

- Certificate Type: All, import.

  Note: After you import all the certificates on each cluster, for each cluster, you need to restart CUCM

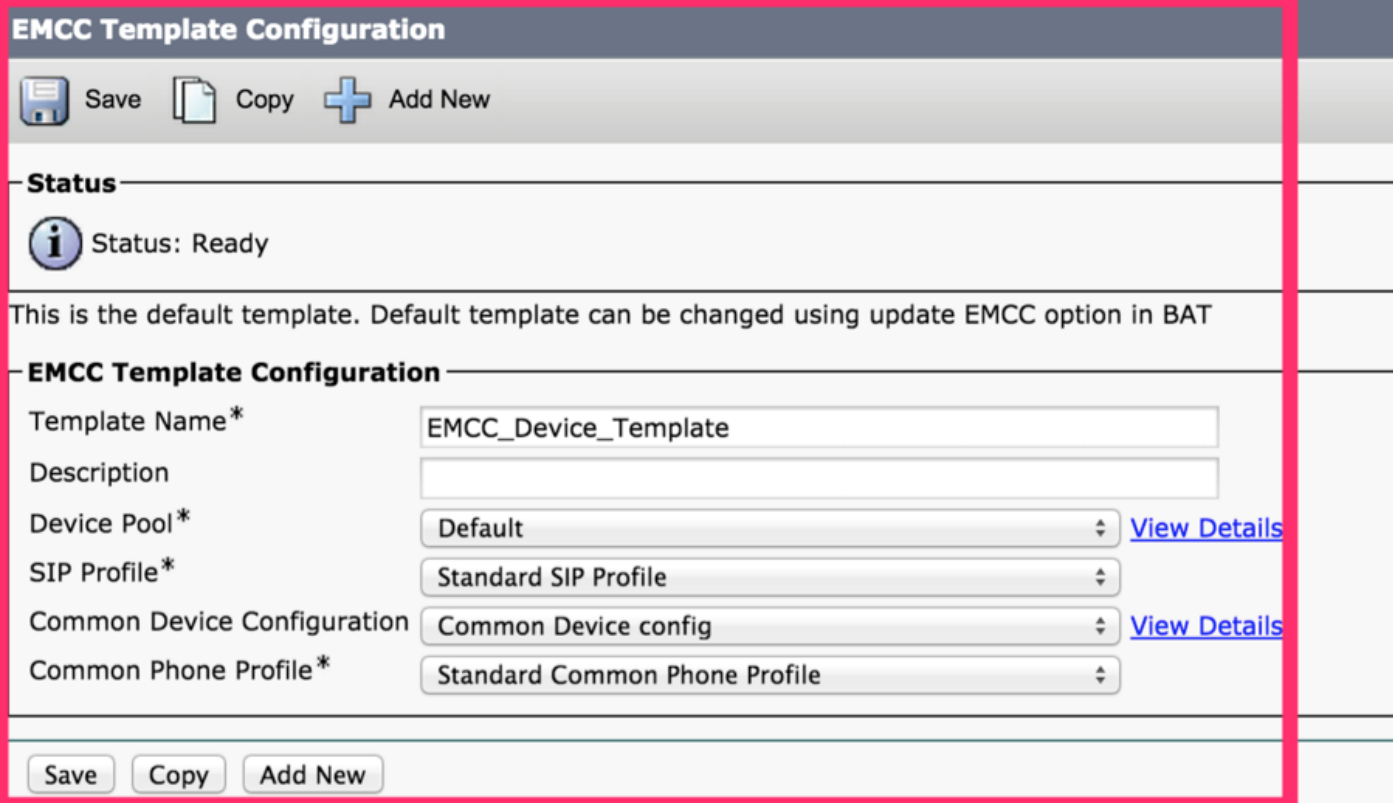| File Name	
192.168.172.5_bulk_capf.pkcs12	BULK
192.168.172.5_bulk_tftp.pkcs12	BULK
192.168.172.5_bulk_tomcat.pkcs12	BULK
EMCCCCM1_capf.pkcs12	STORE
EMCCCCM11_capf.pkcs12	STORE
EMCCCCM1_tftp.pkcs12	STORE
EMCCCCM11_tftp.pkcs12	STORE
EMCCCCM1_tomcat.pkcs12	STORE
EMCCCCM11_tomcat.pkcs12	STORE

Save Export Consolidate **Import**

10. Enable Video calls

- In order to enable EMCC for video calls, configure Common Phone Profile (**Device > Device Settings > Common Phone Profile**) or configure Enterprise Phone Configuration (**System > Enterprise Phone Configuration**) to enable video calls.
- In either window, set the **Video Capabilities** drop-down list box as Enabled. (This setting may be enabled by default per cluster.)

11. Configure EMCC template

- Add EMCC devices—Add EMCC Templates:
- CUCM Administration, **Bulk Administration > EMCC > EMCC Template > Click Add New.**

EMCC Template Configuration

💾 Save   📄 Copy   ➕ Add New

Status

ⓘ Status: Ready

This is the default template. Default template can be changed using update EMCC option in BAT

EMCC Template Configuration

Template Name*	EMCC_Device_Template
Description	
Device Pool*	Default ⇕ View Details
SIP Profile*	Standard SIP Profile ⇕
Common Device Configuration	Common Device config ⇕ View Details
Common Phone Profile*	Standard Common Phone Profile ⇕

[Save] [Copy] [Add New]

12. Insert/Update EMCC Configuration

- Add EMCC devices—Set default EMCC template.
- In CUCM Administration, choose **Bulk Administration > EMCC > Insert/Update EMCC**.
- Click **Update EMCC Devices**.
- In the Default EMCC Template drop-down list box, choose the EMCC Device Template that you configured in Step 11.
- Click **Run Immediately**.
- In order to verify whether the job ran successfully, choose **Bulk Administration > Job Scheduler** and look for the Job ID of your job. Check that your job ran successfully.

13. Insert/Update EMCC Configuration

- Add EMCC devices > Insert the EMCC Devices.
- In CUCM Administration, navigate **Bulk Administration > EMCC > Insert/Update EMCC**.
- Click **Insert EMCC Devices**.
- Change the value in the Number of EMCC Devices to be added field.
- Click **Run Immediately**.
- Refresh this window and check that the Number of EMCC Devices already in database value now displays the number of devices that you added (for example, 5).
- Alternately, navigate **Bulk Administration > Job Scheduler** to check on whether the job completed successfully.
- Maximum Number of EMCC Base Devices To Add.
- Include EMCC in the total number of devices that get supported in the cluster, using this calculation: phones + (2 x EMCC devices) <= MaxPhones.

- CUCM systems specify a MaxPhones value of 60,000.
- EMCC login does not affect the number of licenses that get used in the home cluster.

nsert/Update EMCC Configuration

⮕ Submit

Status

ⓘ Status: Ready

Insert/Update EMCC

Number of EMCC Devices already in database:5
Default EMCC Template:EMCC_Device_Template

🔘 Insert EMCC Devices

Number of EMCC Devices to be added* [0]

⚪ Update EMCC Devices

Default EMCC Template* [-- Not Selected -- ⬍]

🔘 Don't Reset   ⚪ Reset

Job Information

Job Description   [Insert EMCC Devices]

⚪ Run Immediately   🔘 Run Later (To schedule and activate this job, use Job Scheduler page.)

[Submit]

14.Configure Geolocation Filter

- Configure enterprise parameters and add a geolocation filter:
- In CUCM Administration, choose **System > Enterprise Parameters**.
- For the Cluster ID enterprise parameter, configure a unique cluster ID for every participating cluster.
- In CUCM Administration, navigate **System > Geolocation Filter**.
- Click **Add New**.
- Create a new geolocation filter.
- Example name: EMCC Geolocation Filter.
- Specify criteria for matching, such as Country, State, and City.

Geolocation Filter Configuration

💾 Save   ❌ Delete   📄 Copy   ➕ Add New

Status

ⓘ Status: Ready

Geolocation Filter Configuration

Name* `EMCC_filter`

Description `[                    ]`

Match Geolocations using the following criteria:
- ☑ Country using the two-letter abbreviation
- ☑ State, Region, or Province (A1)
- ☐ County or Parish (A2)
- ☑ City or Township (A3)
- ☐ Borough or City District (A4)

15.Configure EMCC Feature

- Configure EMCC feature parameters:
- In Cisco Unified Communications Manager Administration, navigate **Advanced Features > EMCC > EMCC Feature Configuration**.
- In the EMCC Feature Configuration window that displays, configure these feature parameters: Default TFTP Server for EMCC Login Device, EMCC Geolocation Filter, Default Server for Remote Cluster Update.

  Note: Each feature parameter must be previously configured before you can choose them in the drop-down list box that associates with each feature parameter.

  Note: You can keep the default values for other EMCC feature parameters or you can change as needed.

EMCC Feature Configuration

💾 Save   🛠️ Set to Default

Status

ⓘ Status: Ready

EMCC Parameters

Parameter Name	Parameter Value
Default TFTP Server for EMCC Login Device	192.168.172.3
Backup TFTP Server for EMCC Login Device	< None >
Default Interval for Expired EMCC Device Maintenance *	1440
Enable All Remote Cluster Services When Adding A New Remote Cluster *	False
CSS for PSTN Access SIP Trunk *	Use trunk CSS
EMCC Geolocation Filter	EMCC_filter
EMCC Region Max Audio Bit Rate *	8 kbps (G.729)
EMCC Region Max Video Call Bit Rate (Includes Audio) *	384
EMCC Region Audio Codec Preference List *	Factory Default low loss
RSVP SIP Trunk Keep-Alive Timer *	15
Default Server For Remote Cluster Update	192.168.172.3
Backup Server for Remote Cluster Update	< None >
Remote Cluster Update Interval *	30

[Save]   [Set to Default]

16.Configure SIP Trunk

- Configure one or two intercluster SIP trunks for EMCC.

  Note: You may configure one trunk for both PSTN Access and RSVP Agent services
  (in Step 17) or one trunk for each service. You need no more than two EMCC SIP trunks.

- In CUCM Administration, choose **Device > Trunk**.
- Click **Add New**.
- Specify these settings: Trunk Type: SIP Trunk, Trunk Service Type: Extension Mobility Cross
  Clusters

- Click **Next**.
- In the Trunk Configuration window that displays, specify the settings in the Device Information
  pane. These values show example values. Name: EMCC-ICT-SIP-Trunk-1 and Device Pool:
  Default

- In the SIP Information pane, specify these example settings: SIP Trunk Security Profile: Non
  Secure SIP Trunk Profile and SIP Profile: Standard SIP Profile

- In the Geolocation Configuration pane, specify this setting: Send Geolocation Information:
  Check this check box.

- Click **Save** to save the intercluster SIP trunk for EMCC.

17. Configure Service Profile

- Configure EMCC intercluster service profile:
- In CUCM Administration, choose **Advance Features > EMCC > EMCC Intercluster Service Profile**.
- Check the Active check box in the EMCC pane.
- Check the Active check box in the PSTN Access pane.
- In the PSTN Access SIP Trunk drop-down list box, choose a SIP trunk that you configured in Step 16.
- Check the Active check box in the RSVP Agent pane.
- In the RSVP Agent SIP Trunk drop-down list box, choose another SIP trunk that you configured in Step 16.
- Click **Validate** to validate your settings.
- If no failure messages display in the popup window, click **Save**.

18.Configure Remote Cluster Service

- Configure EMCC remote cluster services:
- Navigate to **CUCM Administration > Features > Remote Cluster.**
- Click **Add New.**
- In the Remote Cluster Configuration window that displays, configure these settings: Cluster ID: Ensure that this cluster ID matches the enterprise parameter value of the cluster ID of the other cluster(s) and Fully Qualified Name: Use the IP address of the remote cluster or a domain name that can resolve to any node on the remote cluster.

Note: TFTP is intentionally disabled as Proxy TFTP is not supported with EMCC. The **Configure Remote Cluster Services** section of the **Feature Configuration Guide for Cisco Unified Communications Manager** states the following:

For extension mobility cross cluster, the TFTP check box should always be disabled.

19.Configure Service Paramter

- Configure service parameters:
- Navigate to **CUCM >System > Service Parameters.**
- From the **Server** drop-down list box, choose a server.
- From the **Service** drop-down list box, choose the Cisco Extension Mobility service.
- Click the **Advanced** button at the top of the window.
- As needed, configure these service parameters in the Clusterwide Parameters (Parameters that apply to all servers) pane: Inter-cluster Maximum Login Time and EMCC Allow Proxy: Set this value asTrue.

- Note For EMCC, the call logs always get cleared.
- Note For EMCC, multiple logins are always allowed.

Verify

Navigate to **Device > Phone > Verify**, as shown in this image.

Troubleshoot

For troubleshooting EMCC related issues please refer to the following article. Troubleshoot Extension Mobility Cross Cluster (EMCC)

Known Defects while configuring EMCC

CSCuy43181 Error Bulk cert import from 10.5.2.13900-2, or higher, to lower versions.

CSCvd78861 Issue with vendorConfigHelp for Fallback feature configuration and EMCC feature

CSCvn19301 : Expansion Modules don't power on with SCCP phones using EMCC

CSCvn30046 : EMCC SIP trunk calls fail when connecting to CUCM 12.x Cluster

CSCvw78247 "&EMCC=#EMCC#" appended to Extension Mobility Service URL

CSCvw50430 12.5 SU3 EM API returns only one server for EMCC

CSCvn52593 EMCC is failing with Login is Unavailable(0)

CSCvn57656 ALL-LANG: ccmadmin: Corrupted characters in EMCC Intercluster Service Profile

CSCvt97890 EMCC calls routed through EMCC sip trunk will not present the original device calling name

CSCvs39175 CM 12.0(1) Feature Configuration Guide doesn't mention ITLRecovery certificate is needed for EMCC