Register Cisco Unified 9971 IP Phone to Cisco Unified Communications Manager Express

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Contents

Introduction

This document provides information on how to register a 9900 series IP Phone with Cisco Unified Communications Manager Express.

Prerequisites

Requirements

Ensure that you meet these requirements before you attempt this configuration:

- CME release 8.5 is installed
- An image of Cisco IOS® Software Release 15.1(3)T or IOS 15.1(4)M is on the router

Components Used

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

- Cisco 3825 Router on Cisco IOS Software Release 15.1(3)T
- Cisco Unified CallManager Express 8.5
- Cisco Unified IP Phone 9971
- Cisco Catalyst 3560 Switch on Cisco IOS Software Release 12.2

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.

Network Diagram

This document uses this network setup:
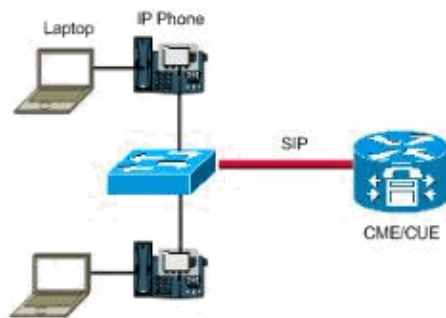
Conventions

Refer to the Cisco Technical Tips Conventions for more information on document conventions.

Register 99xx Phones to CME as SIP

You need to configure 99xx phone with CME 8.5, and 99xx IP phones only support SIP protocol.

You cannot add this phone as an ephone because this is a SIP phone and the ephone command is used for SCCP controlled phones only. In order to resolve this issue on the Cisco Unified Communications Manager Express router, complete these basic configuration steps for SIP phones:

1. Setting Up Cisco Unified CME
2. Creating Directory Numbers
3. Assigning Directory Numbers to Phones

SIP: Setting Up Cisco Unified CME

In order to identify file names and location of phone firmware for phone types to be connected, to specify the port for phone registration, and to specify the number of phones and directory numbers to be supported, complete these steps:

```
Router> enable
Router# configure terminal
Router(config)# voice register global
Router(config-register-global)# mode cme
Router(config-register-global)# source-address ip-address [port port]
Router(config-register-global)# load phone-type firmware-file
Router(config-register-global)# tftp-path {flash: | slot0: | tftp://url}
Router(config-register-global)# max-pool max-phones
Router(config-register-global)# max-dn max-directory-numbers
Router(config-register-global)# authenticate [all] [realm string]
Router(config-register-global)# ip qos dscp {{number | af | cs | default | ef} {media | se:
Router(config-register-global)# end
```

SIP: Creating Directory Numbers

In order to create a directory number in Cisco Unified CME for a SIP phone, intercom line, voice port, or a message−waiting indicator (MWI), complete these steps for each directory number to be created:

```
Router> enable
Router# configure terminal
Router(config)# voice register dn dn-tag
Router(config-register-dn)# number number
Router(config-register-dn)# shared-line [max-calls number-of-calls]
Router(config-register-dn)# huntstop channel number-of-channels
Router(config-register-dn)# end
```

SIP: Assigning Directory Numbers to Phones

This task sets up the extensions that appear on each phone. In order to create and modify phone−specific parameters for individual SIP phones, complete these steps for each SIP phone to be connected in Cisco Unified CME:

```
Router> enable
Router# configure terminal
Router(config)# voice register pool pool-tag
Router(config-register-pool)# id mac address
Router(config-register-pool)# type phone-type
Router(config-register-pool)# number tag dn dn-tag
Router(config-register-pool)# busy-trigger-per-button number-of-calls
Router(config-register-pool)# username name password string
Router(config-register-pool)# dtmf-relay [cisco-rtp] [rtp-nte] [sip-notify]
Router(config-register-pool)# end
```

Sample Configuration

Ensure that you have placed the SIP loads for the phones in flash and have performed tftp−bindings the same way as SCCP Phones. Here is an example, taken from a Cisco 2911 CME Router, that you need to run:

```
tftp-server flash:flash/dkern9971.100609R2-9-1-1SR1.sebn alias
dkern9971.100609R2-9-1-1SR1.sebn
tftp-server flash:flash/kern9971.9-1-1SR1.sebn alias kern9971.9-1-1SR1.sebn
tftp-server flash:flash/rootfs9971.9-1-1SR1.sebn alias rootfs9971.9-1-1SR1.sebn
tftp-server flash:flash/sboot9971.031610R1-9-1-1SR1.sebn alias
sboot9971.031610R1-9-1-1SR1.sebn
tftp-server flash:flash/skern9971.022809R2-9-1-1SR1.sebn alias
skern9971.022809R2-9-1-1SR1.sebn
tftp-server flash:flash/sip9971.9-1-1SR1.loads alias sip9971.9-1-1SR1.loads
```

Here is the sample configuration:

```
!
voice service voip
  sip
    registrar server expires max 3600 min 120
!
voice register global
  mode cme
  source-address<router interface for CME>  port 5060
  max-dn 40
  max-pool 42
  load 9971 sip9971.9-1-1SR1
  timezone 13
  voicemail<VM Pilot>
  create profile
```

```
        !
        voice register dn  2
           number 5001
           name Office
           label 5001
           mwi
        !
        voice register pool  2
           id mac ECC8.82B1.47EE
           type 9971
           number 1 dn 2
           presence call-list
           dtmf-relay rtp-nte
           call-forward b2bua busy 68600
           codec g711ulaw
           no vad
        !
```

When this configuration is complete, you need to enter the create profile command under voice register global to create configuration files for any phones added or any changes made to the phone.

```
        Router(config)#voice register global
        Router(config-register-global)#create profile
```

Note: Because these phones are not Skinny, `telephony-service config` does not apply here. You must use **`voice register global`** .

Video Support

CME 8.5 does not support video on the 9971 IP Phones. Video support is available only for **CME 8.6** and later versions. While 15.1(3)T is the IOS that contains CME 8.5, there is an upcoming release of CME 8.6 which will have a few nice new features, such as support for Cisco Mobile client on iPhone. This will be contained in IOS 15.1(4)M. For more information, refer to Configuring Video Support.

Troubleshoot

Number Keys Does Not Work

Cannot input any keys into the 9971 IP Phone. None of the number keys work. The phone is connected to CME 8.5.

For troubleshooting, capture the results of these commands:

- **show version**
- **show running−config**
- **show voice register global**
- **show sip−ua status**
- **show sip−ua calls**

When the phone resets, collect these debugs:

- **debug tftp**
- **debug ccsip messages**

Solution

The solution is based on the debugs that are captured when you troubleshoot the issue. In one case it appears that the reason the phone's registration is being closed is because it is requesting a REFER to the number 25015718 when the router is configured not to support the REFER message. In order to resolve this issue, use this command:

```
configure terminal
voice service voip
supplementary-service sip refer

!--- Enables REFER method.
```

If the issue still persists, change the DTMF relay method in the phone from **notify** to **rcf2833**.

```
Router(config-register-pool)# dtmf-relay rcf2833
```

For example, use the **show debug** command in order to verify that nothing is blocking port 5060 between the CME and IP phone.

```
#show debug

TFTP:
   TFTP Event debugging is on
CCSIP SPI: SIP Call Message tracing is enabled  (filter is OFF)
```

9971 Key Expansion Module Hangs

Cisco IP Phone 9971 Key Expansion Module hangs all of a sudden and there is no response.

This issue is documented by Cisco bug ID CSCtq06638 (registered customers only) . The only workaround is to reset the Key Expansion Module.

Related Information

- **Cisco Unified IP Phone 8961, 9951, and 9971 (SIP) Release Notes for Firmware Release 9.1(1)**
- **Cisco Unified IP Phone 9971**
- **Voice Technology Support**
- **Voice and Unified Communications Product Support**
- **Troubleshooting Cisco IP Telephony**
- **Technical Support & Documentation – Cisco Systems**