Cisco CallManager Express with the Cisco 7970 Color IP Phone Configuration Example

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Introduction

The Cisco 7970 Color IP Phone is supported on Cisco CallManager Express 3.2.1 and later. The phone requires firmware, which depends on the version of Cisco CallManager Express you use. The firmware version is configured in telephony−service configuration mode. This document explains the steps you must complete in order to ensure that the Cisco 7970 IP Phone registers and works properly with Cisco CallManager Express.

Prerequisites

Requirements

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

 • Knowledge of the Cisco CallManager Express command−line interface (CLI)

Components Used

The information in this document is based on Cisco CallManager Express Release 3.2.1, CallManager Express 4.0, and the Cisco 7970 IP Phone.

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.

Conventions

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

Configure

In this section, you are presented with the information to configure the features described in this document.

Note: Use the Command Lookup Tool (registered customers only) to obtain more information on the commands used in this section.

CallManager Express 3.2.1

Complete these configuration steps for CallManager Express 3.2.1:

1. Ensure that you place these specific Cisco 7970 IP Phone files into the Cisco CallManager Express Flash:

   ```
   cnu70.62-0-1-6.sbn
   jvm70.602ES1R6.sbn
   TERM70.DEFAULT.loads
   TERM70.6-0-2SR1-0-5s.loads
   Jar70.2-8-0-104.sbn
   ```

   Note: In order to obtain these files, you must download the **cme−123−11XL.zip** file from the Voice Software Download (registered customers only) section of the Software Center under **Voice Applications > Cisco CallManager Express/Cisco IOS Telephony Services and SRS Telephony**. The Cisco 7970 IP Phone files are compressed in the **7970−602sr1−5.tar** file.

   Issue the **show flash** command in order to verify that these files are placed on the Flash:

   ```
   CME3.2.1#show flash:

   1   16219864   c1700-ipvoice-mz.123-11.XL.bin
   2   1796886    cnu70.62-0-1-6.sbn
   3   988400     jvm70.602ES1R6.sbn
   4   612        TERM70.DEFAULT.loads
   5   616        TERM70.6-0-2SR1-0-5s.loads
   6   713081     Jar70.2-8-0-104.sbn
   ```

2. Configure these CLIs so that the Cisco 7970 IP Phone can download those files:

   ```
   CME3.2.1#configure terminal

       CME3.2.1#tftp-server flash:cnu70.62-0-1-6.sbn
       CME3.2.1#tftp-server flash:jvm70.602ES1R6.sbn
       CME3.2.1#tftp-server flash:TERM70.DEFAULT.loads
       CME3.2.1#tftp-server flash:TERM70.6-0-2SR1-0-5s.loads
       CME3.2.1#tftp-server flash:Jar70.2-8-0-104.sbn
   ```

3. Ensure that you configure the appropriate load for the Cisco 7970 IP Phone under Telephony−service:

   ```
   CME3.2.1#configure terminal
   CME3.2.1(config)#telephony-service
   CME3.2.1(config-telephony)#load 7970 TERM70.6-0-2SR1-0-5s
   ```

4. The clocks in the Cisco 7970 IP Phone units obtain Greenwich Mean Time (GMT) from the clocks of the Cisco CallManager Express router. In order to display the correct local time, nearly all the time of the Cisco 7970 IP Phone 7970 units must be offset with the **time−zone** command.

   ```
   CME3.2.1#configure terminal
   Enter configuration commands, one per line.  End with CNTL/Z.
   CME3.2.1(config)#telephony-service
   CME3.2.1(config-telephony)#time-zone 5

   !--- 5 for Pacific Standard/Daylight Time -480.
   ```

```
CME3.2.1(config-telephony)#end
```

Note: Ensure that the Cisco CallManager Express router receives the clock from an Network Time Protocol (NTP) server:

```
CME3.2.1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
CME3.2.1(config)#ntp server 129.7.1.66
CME3.2.1(config)#end
```

Issue the **show clock** and **show ntp** commands in order to verify that the Cisco CallManager Express router is synched with an NTP server and has the correct time:

```
CME3.2.1#show ntp status
Clock is unsynchronized, stratum 16, no reference clock
nominal freq is 250.0000 Hz, actual freq is 249.9989 Hz, precision is 2**16
reference time is C546AEE8.4A0E878B (21:17:28.289 PST Wed Nov 17 2004)
clock offset is 1.6617 msec, root delay is 54.09 msec
root dispersion is 3880.97 msec, peer dispersion is 3879.30 msec

CME3.2.1#show clock

15:33:18.214 PST Thu Nov 18 2004
```

Note: In order for changes to the time–zone setting to take effect, you must update the Sep*.conf.xml file by issuing a **no create cnf–files** and then **create cnf–files** command. Also, you must reboot the Cisco 7970 IP Phone units with the **reset** command.

5. In order for Cisco CallManager Express to create the Sep*.conf.xml, the CLI "type 7970" must be configured under the ephone. For example:

```
ephone  1
mac-address 0011.2032.C999
type 7970
button  1:1 2:2 3o23,24 4:27
```

It is then crucial that you issue these commands:

```
CCM3.2.1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
CCM3.2.1(config)#tele
CCM3.2.1(config)#telephony-service

CCM3.2.1(config-telephony)#create cnf-files
CNF file creation is already On
Updating CNF files
CNF files update complete
CCM3.2.1(config-telephony)#end
```

This forces the Cisco CallManager Express router to create a config file with the MAC address 0011.2032.C999 that is specific for the Cisco 7970 IP Phone. Without this CLI (load 7970), Cisco CallManager Express does not create a SEP00112032c999.cnf.xml. This .xml file is needed so that the Cisco 7970 IP Phone can function properly (which includes the correct clock).

CallManager Express 4.0

Complete these configuration steps for CallManager Express 4.0:

1. If you are running CallManager Express 4.0, make sure that these 7970 IP Phone files are placed in

the flash:

```
CME4.0#show flash

System CompactFlash directory:
File   Length    Name/status
   1   31441504  c3825-ipvoicek9-mz.124-9.T.bin
   2   1994898   CVM70.2-0-2-26.sbn
   3   866919    Jar70.2-9-2-26.sbn
   4   591       TERM70.7-0-3-0S.loads
   5   1979692   cnu70.2-7-6-26.sbn
   6   591       term70.default.loads
   7   591       term71.default.loads
```

Note: The phone firmware filenames for each phone type and Cisco CME version are listed in the appropriate Cisco CME Supported Firmware, Platforms, Memory, and Voice Products document.

2. Enable TFTP file sharing for new phone firmware files.

```
CME4.0#conf t
Enter configuration commands, one per line.  End with CNTL/Z.

CME4.0(config)#tftp-server flash:CVM70.2-0-2-26.sbn
CME4.0(config)#tftp-server flash:Jar70.2-9-2-26.sbn
CME4.0(config)#tftp-server flash:TERM70.7-0-3-0S.loads
CME4.0(config)#tftp-server flash:cnu70.2-7-6-26.sbn
CME4.0(config)#tftp-server flash:term70.default.loads
```

3. Associate the phone type with a phone firmware file and **reboot the phone**.

```
CME4.0(config)#telephony-service
CME4.0(config-telephony)#load 7970 TERM70.7-0-3-0S

!--- When configuring the load command, do not include
!--- the .sbin or .loads file extension

CME4.0(config-telephony)#create cnf-files
```

In order to verify which phone firmware is installed on a particular ephone, issue the **show ephone phone−load** command.

```
CME4.0#show ephone phone-load


DeviceName         CurrentPhoneload        PreviousPhoneload         LastReset
================================================================================
!
SEP001759E7492C    7.0(3.0S)                                         Initialized


!--- The DeviceName includes the MAC address for the IP phone
```

Verify

This section provides information you can use in order to confirm your configuration works properly.

In order to verify that Cisco CallManager Express has created a config file for a Cisco 7970 IP Phone, issue the **show telephony−service tftp−binding** command. This command allows you to view the SEP*.cnf.xml files that are associated with individual phones:

```
CCM3.2.1#show telephony-service tftp-bindings
tftp-server system:/its/SEPDEFAULT.cnf
```

```
tftp-server system:/its/SEPDEFAULT.cnf alias SEPDefault.cnf
tftp-server system:/its/XMLDefault.cnf.xml alias XMLDefault.cnf.xml
tftp-server system:/its/ATADefault.cnf.xml
tftp-server system:/its/XMLDefault7970.cnf.xml alias SEP0011211117D0.cnf.xml
tftp-server system:/its/XMLDefault7970.cnf.xml alias SEP00112032C999.cnf.xml
tftp-server system:/its/united_states/7960-tones.xml alias United_States/7960-to
nes.xml
tftp-server system:/its/united_states/7960-font.xml alias English_United_States/
7960-font.xml
tftp-server system:/its/united_states/7960-dictionary.xml alias English_United_S
tates/7960-dictionary.xml
tftp-server system:/its/united_states/7960-kate.xml alias English_United_States/
7960-kate.xml
tftp-server system:/its/united_states/SCCP-dictionary.xml alias English_United_S
tates/SCCP-dictionary.xml
```

In order to verify that the Cisco 7970 registers with Cisco CallManager Express, issue the **show ephone**
command:

```
CCM3.2.1#show ephone
ephone-1 Mac0011.2032.C999 TCP socket[1] activeLine0 REGISTERED
mediaActive0 offhook0 ringing0 reset0 reset_sent0 paging 0 debug0
IP10.10.10.13 3855 7970 keepalive 8908 max_line 8
button 1 dn 1 number 2901500 CH1 IDLE CH2 IDLE shared
button 2 dn 2 number 2901566 auto dial 2901567 CH1 IDLE shared
button 3 dn 23 number 2901555 CH1 IDLE mwi overlay shared
button 4 dn 27 number 2918888 CH1 IDLE shared
button 5 dn 30 number 2909999 CH1 IDLE CH2 IDLE shared
button 6 dn 31 number 2901515 CH1 IDLE CH2 IDLE shared
overlay 3 23(2901555) 24(2901557)
speed dial 12900013 James
speed dial 22900015 Matt
speed dial 315627166448 Albert's Cell
speed dial 42901510 Bill
paging-dn 9
Username Joe Password 12345
after-hour exempt
```

Troubleshoot

How to Troubleshoot a Cisco CME System

In order to troubleshoot the Cisco CallManager Express system, perform these tasks:

1. Issue the **show ephone** command in order to display all registered phones. If no phones are registered,
   then perform these steps:

   a. Check the DHCP configuration, including the default router and the TFTP server address
      (**option 150**).
   b. Issue the **dir** command in order to check that the required files are in the router Flash
      memory.
   c. Check that the **tftp–server** command is set for the required files.
   d. Issue the **debug ephone register** mac–address command in order to display Cisco IP phone
      registration activity.
   e. Issue the **debug ip dhcp** command in order to confirm the DHCP operation.
2. Issue the **show ephone** command in order to display all registered phones. If phones are registered
   and are displayed, then perform these tasks:

   a. Check that the phone button binding to the directory number is correct.

b. Check that the Cisco IP phones show as registered.
c. Use the **Settings** display on the phone in order to verify the IP parameter settings on the Cisco IP phone.
d. Issue the **show phone** command in order to check that the keepalive count is being updated.
e. Issue the **debug ephone register** mac−address command in order to reset the phone and observe the re−registration. This command displays the Cisco IP phones.
f. Issue the **show ephone−dn summary** command in order to check the state of the Cisco IP phone lines.
g. Check the IP address of the phones and attempt to **ping** the addresses.
3. Issue the **debug ephone keepalive** command in order to set keepalive debugging for the Cisco IP phones.
4. Issue the **debug ephone state** command in order to set state debugging for the Cisco IP phones.

Related Information

- **CallManager Express: Create a Customized Background Image for the 7970 IP Phone**
- **Cisco Unified Communications Manager Express System Administrator Guide**
- **Cisco 7900 Series Unified IP Phones FAQ**
- **Cisco IP Phone 7970 Series Administration Guide**
- **Troubleshooting the Cisco IP Phone 7970**
- **Voice Technology Support**
- **Voice and Unified Communications Product Support**
- **Troubleshooting Cisco IP Telephony**
- **Technical Support − Cisco Systems**

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