

Spectrum Enterprise SIP Trunking Service Cisco CME/CUBE IP PBX Configuration Guide

About Spectrum Enterprise:

Spectrum Enterprise is a division of Charter Communications following a merger with Time Warner Cable and acquisition of Bright House Networks. Spectrum Enterprise is a national provider of scalable, fiber technology solutions. The Spectrum Enterprise portfolio includes networking and managed services solutions, including Internet access, Ethernet and Managed Network Services, Voice, TV and Cloud solutions. Our industry-leading team of experts works closely with clients to achieve greater business success.

About this document:

Spectrum Enterprise assures IP PBX compatibility by conducting interoperability testing to ensure any potential compatibility issues have been resolved prior to installation. Please review the IP PBX configuration instructions in this guide prior to your installation date.

Be advised that this document may contain references to Charter or Charter Business. All references to Charter should be read as Spectrum Enterprise.

Thank you,

Spectrum Enterprise

Cisco CME/CUBE IP PBX Configuration Guide



1 Introduction

The document describes how to configure the Cisco Unified Communications Express (CME)/ Cisco Unified Border Element (CUBE) IP PBX to interoperate within the Charter network. It does not provide any information how to provision, configure or use the features of the IP PBX. Please refer to the documentation provided with the IP PBX or contact the vendor.

2 CME Configuration

Copy and paste the following configuration into the CME:

```
version 15.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname CharterCME
!
boot-start-marker
boot system flash c2900-universalk9-mz.SPA.153-3.M1.bin
boot-end-marker
!
aqm-register-fnf
!
logging buffered 51200 warnings
!
no aaa new-model
clock timezone CST -6 0
!
!
!
!
!
!
!
ip cef
no ipv6 cef
multilink bundle-name authenticated
!
!
!
!
```

```

!
!
crypto pki trustpoint TP-self-signed-3690608021
enrollment selfsigned
subject-name cn=IOS-Self-Signed-Certificate-3690608021
revocation-check none
  rsakeypair TP-self-signed-3690608021
!
!
crypto pki certificate chain TP-self-signed-3690608021
certificate self-signed 01
  3082022B 30820194 A0030201 02020101 300D0609 2A864886 F70D0101 05050030
  31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D 43657274
  69666963 6174652D 33363930 36303830 3231301E 170D3134 30313038 30303236
  35375A17 0D323030 31303130 30303030 305A3031 312F302D 06035504 03132649
  4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D33 36393036
  30383032 3130819F 300D0609 2A864886 F70D0101 01050003 818D0030 81890281
  81008CC1 308B5D7D 736C3A2F FE0DEF4D A0AEEDB6 B5755148 8CEF1F2D 4BC575EF
  DD00183A 10902D4F A647A3E2 B5E87A77 DB5A1721 DE7633CE D5D35A0A A48EC7BE
  ABBA6FB9 8F10A203 AAFE9A3F 4436B8AF 5556FA79 94AC3853 5B1CD9F8 D505FA2F
  56ED38E4 6C4B8F5E 810137FF DDED832F AC8CEC4B 7092CCA9 B22F73AC 8D90906A
  69BF0203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF 301F0603
  551D2304 18301680 144C60DF 878847B7 FCB4602A 430D4FFD D2DBECD0 27301D06
  03551D0E 04160414 4C60DF87 8847B7FC B4602A43 0D4FFDD2 DBECD027 300D0609
  2A864886 F70D0101 05050003 81810039 6345DEB7 DAA6A4C0 B48691E8 E1D933C3
  0E851B47 D5478293 044E308B B7B8CCDE 143BE0E0 E7E2D50C 38C5C42B FC520DFC
  7DDFEB09 39CC6006 2F7E6585 F40A15E8 960E2E84 E6915EC3 968F4927 1FD32F26
  628B9414 501E1876 62368FC8 B076EECF F0946BD9 4FB289D6 8A0BD87B 6A71823C
  30702184 F4B11C44 A096AC04 E9B51D
  quit
voice-card 0
  dspfarm
  dsp services dspfarm
!

```

```
!  
!
```



Voice Services for Telephony

```
voice service voip  
ip address trusted list  
  ipv4 0.0.0.0 0.0.0.0  
allow-connections h323 to h323  
allow-connections h323 to sip  
allow-connections sip to h323  
allow-connections sip to sip  
no supplementary-service sip moved-temporarily  
no supplementary-service sip refer  
fax protocol pass-through g711ulaw  
sip  
rellxx disable  
registrar server expires max 3600 min 180  
asserted-id pai  
privacy pstn  
early-offer forced  
privacy-policy send-always  
!
```

List for Media Codecs

```
voice class media 1  
media flow-around  
!
```



List for Voice Class Codecs

```
voice class codec 1
codec preference 1 g711ulaw
!
!
!
```

Voice Class SIP Rule for SIP Diversion

(Important for call forwarding)

```
voice class sip-profiles 1
request INVITE sip-header Diversion modify "<sip:(60..)|(10.70.55.2)>"
"<sip:3038356006@10.70.55.2>"
!
!
voice register global
mode cme
source-address 10.70.55.2 port 5060
max-dn 15
max-pool 5
load 7975 SIP75.9-3-1SR1-1S
mwi stutter
mwi reg-e164
voicemail 5000
tftp-path flash:
file text
create profile sync 0453982435140249
!
voice register dn 1
number 6048
name Test 6048
huntstop channel 2
huntstop
label Test 6048
mwi
!
voice register pool 1
id mac FCFB.FBCA.22FE
type 7975
number 1 dn 1
voice-class codec 1
!
!
!
voice translation-rule 1
rule 1 /^60/ /30383560/
!
voice translation-rule 2
```

```

rule 1 /^303835\((6...\)\)$/ /\1/
rule 2 /9\((.....)\)/ /\1/
rule 3 /9\((.....)\)/ /1\1/
rule 4 /9\((.....)\)/ /\1/
rule 5 /^9\((011.*\)\)/ /\1/
!
!
voice translation-profile 10-digit-incoming-numbers
  translate calling 1
  translate called 2
!
voice translation-profile Outgoing-to-CUBE
  translate calling 1
  translate called 2
!
!
!
license udi pid CISCO2921/K9 sn FTX1744AJ82
hw-module ism 0
!
hw-module pvdm 0/0
!
!
!
username cisco privilege 15 password 0
!
redundancy
!
!
!
!
!
!
interface Embedded-Service-Engine0/0
  no ip address
  shutdown
!
interface GigabitEthernet0/0
  description CME LAN to CUBE LAN

```



LAN IP Address for CME

```
ip address 10.70.55.2 255.255.255.0
duplex auto
speed auto
!
interface ISM0/0
no ip address
shutdown
service-module fail-open
!
interface GigabitEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface GigabitEthernet0/2
no ip address
shutdown
duplex auto
speed auto
!
interface ISM0/1
description Internal switch interface connected to Internal Service Module
no ip address
!
interface Vlan1
no ip address
!
ip default-gateway 10.70.55.1
ip forward-protocol nd
!
ip http server
ip http access-class 23
ip http authentication local
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip route 0.0.0.0 0.0.0.0 10.70.55.1
!
!
!
```

```
tftp-server flash:apps75.9-3-1ES8.sbn
tftp-server flash:cnu75.9-3-1ES8.sbn
tftp-server flash:cvm75sip.9-3-1ES8.sbn
tftp-server flash:dsp75.9-3-1ES8.sbn
tftp-server flash:jar75sip.9-3-1ES8.sbn
tftp-server flash:SIP75.9-3-1SR1-1S.loads
tftp-server flash:term75.default.loads
tftp-server flash:apps41.9-3-1ES19.sbn
tftp-server flash:cnu41.9-3-1ES19.sbn
tftp-server flash:cvm41sccp.9-3-1ES19.sbn
tftp-server flash:dsp41.9-3-1ES19.sbn
tftp-server flash:jar41sccp.9-3-1ES19.sbn
tftp-server flash:SCCP41.9-3-1SR3-1S.loads
tftp-server flash:term41.default.loads
!
control-plane
!
!
voice-port 0/0/0
  no comfort-noise
  station-id name fax test
  station-id number 3038356047
  caller-id enable
!
voice-port 0/0/1
!
voice-port 0/0/2
!
voice-port 0/0/3
!
!
!
!
!
!
!
mgcp behavior rsip-range tgcp-only
mgcp behavior comedia-role none
mgcp behavior comedia-check-media-src disable
mgcp behavior comedia-sdp-force disable
!
```



```
mgcp profile default
!  
!
```



Outgoing Dial Peer

(for all dialed dial digits)

```
dial-peer voice 100 voip
translation-profile outgoing Outgoing-to-CUBE
destination-pattern 9T
session protocol sipv2
session target ipv4:10.70.55.3
voice-class sip profiles 1
dtmf-relay rtp-nte
codec g711ulaw
fax protocol pass-through g711ulaw
no vad
!
```

Incoming Dial Peer

(from CUBE)

```
dial-peer voice 200 voip
translation-profile incoming 10-digit-incoming-numbers
incoming called-number 30383560..
voice-class codec 1
dtmf-relay rtp-nte
fax protocol pass-through g711ulaw
no vad
!
```



Outgoing Dial Peer

(for international calls)

```
dial-peer voice 300 voip
```

```

translation-profile outgoing Outgoing-to-CUBE
destination-pattern 9011T
session protocol sipv2
session target ipv4:10.70.55.3
voice-class sip profiles 1
dtmf-relay rtp-nte
codec g711ulaw
fax protocol pass-through g711ulaw
no vad
!
dial-peer voice 400 pots
  preference 1
  service session
  destination-pattern 6047
  port 0/0/0
!
!
!
!
gatekeeper
  shutdown
!
!
telephony-service
  max-ephones 10
  max-dn 15
  ip source-address 10.70.55.2 port 2000
  caller-id block code *67
  load 7941 SCCP41.9-3-1SR3-1S.loads
  voicemail 5000
  mwi relay
  max-conferences 12 gain -6
  moh "flash:Red_Hot_Chili_Peppers.wav"
  web admin system name admin password admin
  dn-webedit
  time-webedit
  transfer-system full-consult
  transfer-pattern .T blind
  create cnf-files version-stamp 7960 Jan 16 2014 17:53:54
!
!
ephone-dn 1 dual-line
  number 6006
  name Test 6006
  call-forward busy 912142425957
  call-forward noan 914693636864 timeout 15
!
!
ephone 1
  no multicast-moh
  mac-address FCFB.FBCA.5322
  type 7941
  mwi-line 1

```

```
button 1:1
!  
!  
!  
Omitted...  
!
```



3 CUBE Configuration

Copy and paste the following configuration into the CUBE:

```
version 15.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!  
!  
boot-start-marker
boot system flash c3900e-universalk9-mz.SPA.154-1.T.bin
boot-end-marker
!  
aqm-register-fnf
!  
! card type command needed for slot/vwic-slot 0/0
logging buffered 51200 warnings
!  
no aaa new-model
!  
!  
ip cef
no ipv6 cef
!  
!  
multilink bundle-name authenticated
!  
!  
voice-card 0
!  
!
```



Voice Service Trusted IP Address List for CME

```
voice service voip
ip address trusted list
  ipv4 0.0.0.0
rtcp keepalive
address-hiding
mode border-element
allow-connections h323 to sip
allow-connections sip to h323
allow-connections sip to sip
no supplementary-service sip moved-temporarily
no supplementary-service sip refer
fax protocol pass-through g711ulaw
modem passthrough nse codec g711ulaw
sip
  asserted-id pai
  privacy-policy passthru
  privacy-policy send-always
!
```



List Codecs in Order of Preference

```
voice class codec 1
codec preference 1 g711ulaw
!
!
!
!
!
license udi pid C3900-SPE200/K9 sn FOC174142TF
!
!
hw-module pvdm 0/0
!
hw-module pvdm 0/1
!
!
redundancy
!
!
!
!
!
translation-rule 1
Rule 1 3038356006 6006
!
!
!
!
!
!
!
!
!
!
interface GigabitEthernet0/0
description LAN side of CME to CUBE
```



LAN IP Address of the CUBE

```
ip address 10.70.55.3 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/1
description WAN side of CUBE to Adtran #1
```



WAN IP Address of the CME

```
ip address 10.70.58.2 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/2
no ip address
shutdown
duplex auto
speed auto
!
interface GigabitEthernet0/3
no ip address
shutdown
duplex auto
speed auto
!
ip default-gateway 10.70.55.1
ip forward-protocol nd
!
ip http server
ip http access-class 23
ip http authentication local
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
ip route 0.0.0.0 0.0.0.0 10.70.55.1
!
!
nls resp-timeout 1
cpd cr-id 1
!
!
control-plane
!
!
voice-port 0/1/0
```

```
!  
voice-port 0/1/1  
!  
voice-port 0/1/2  
!  
voice-port 0/1/3  
!  
!  
!  
!  
!  
mgcp behavior rsip-range tgcp-only  
mgcp behavior comedia-role none  
mgcp behavior comedia-check-media-src disable  
mgcp behavior comedia-sdp-force disable  
!  
mgcp profile default  
!
```

```
!  
!  
!
```



Outgoing Dial Peer (1+10 digit dialing) to PSTN

```
dial-peer voice 100 voip  
description outgoing NANP (1+10 digits) to Charter  
destination-pattern ^1[2-9]..[2-9].....  
session protocol sipv2  
session target sip-server  
voice-class codec 1  
dtmf-relay rtp-nte  
no vad  
!
```



Outgoing Dial Peer to CME

```
dial-peer voice 300 voip  
description Outgoing 303835XXXX calls to CME  
destination-pattern 303835....  
session protocol sipv2  
session target ipv4:10.70.55.2  
voice-class codec 1  
dtmf-relay rtp-nte  
fax protocol pass-through g711ulaw  
no vad  
!
```



Outgoing Dial Peer for International Calls


```
dial-peer voice 102 voip
description Outgoing International to Charter
destination-pattern 011T
session protocol sipv2
session target sip-server
voice-class codec 1
dtmf-relay rtp-nte
no vad
!
```



Outgoing Dial Peer (7-digit dialing) to PSTN

```
dial-peer voice 400 voip
description outgoing NANP (7 digits) to Charter
destination-pattern ^[2-9].....$
translate-outgoing calling 1
session protocol sipv2
session target sip-server
voice-class codec 1
dtmf-relay rtp-nte
no vad
!
```



Outgoing Dial Peer (10-digit dialing) to PSTN

```
dial-peer voice 200 voip
description Incoming dialpeer and outgoing NANP (10 digits) to Charter
destination-pattern ^[2-9]..[2-9].....
session protocol sipv2
session target sip-server
voice-class codec 1
dtmf-relay rtp-nte
no vad
!
```



Incoming Dial Peer from PSTN

```
dial-peer voice 401 voip
description Incoming from Charter
session target ipv4:10.70.58.3
incoming called-number .%
voice-class codec 1
dtmf-relay rtp-nte
fax protocol pass-through g711ulaw
no vad
!
!
```



User Agent IP Address for e-SBC

```
sip-ua
no remote-party-id
retry invite 3
timers trying 100
mwi-server ipv4:10.64.1.42 expires 3600 port 5060 transport tcp
unsolicited
sip-server ipv4:10.70.58.3
!
!
!
Omitted...
!
!
end
```



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