

Cisco CallManager Release 4.0-PBX Interoperability: Nortel Option 11 to a Cisco 2611XM Gateway with MFT T1/E1 Digital Voice Network Module with VIC2 Analog Interfaces

Introduction

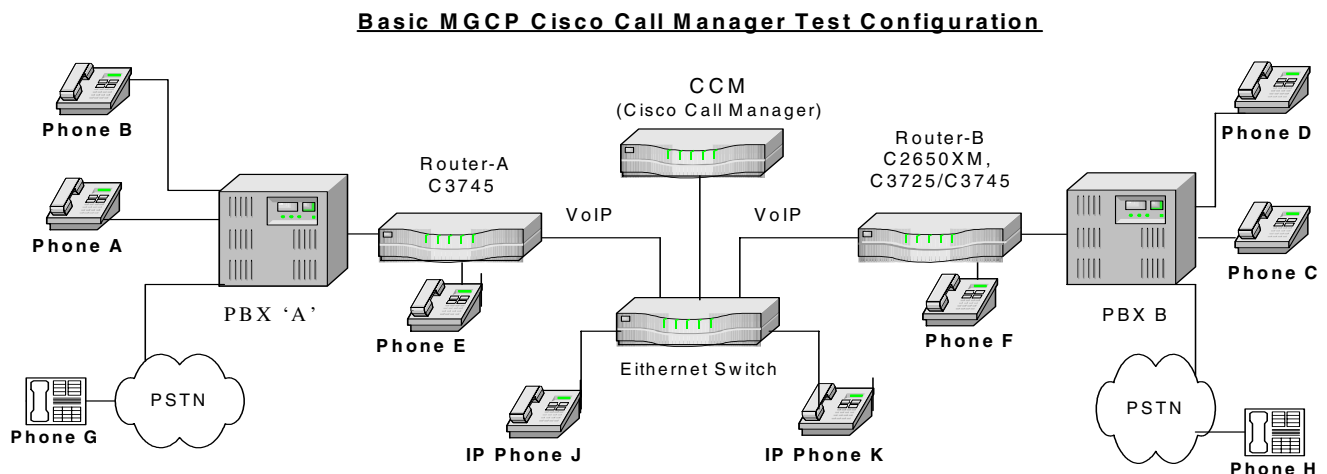
This application note contains the test results of PBX interoperability testing from a PBX via analog interfaces under test to a Cisco voice router via IP communications high-density digital voice/fax network module (NM-HDV2) with 2-port voice interface card (VIC2) Analog interfaces installed in Cisco Voice Gateways.

This application note is directed toward testing interoperability of the Soprano T1/E1 Voice Interface Module with a Nortel Meridian as the PBX.

The application note is for Connectivity/Interoperability testing of the selected PBX connected via Soprano T1/E1 and analog interfaces to a Cisco 2611XM Multiservice Router (C2611XM). The PBX / Router under test are connected via Ethernet to an Ethernet switch which also has a Cisco CallManager and IP Phones in the Network Topology.

Network Topology

Figure 1. Network Topology or Test Setup



The above diagram is representative of the various configurations used for testing. As shown in the diagram above, a PBX is connected via an interface to a Cisco router, which in turn, is connected to an Ethernet switch which also has the CCM (cisco call manager) IP Phones and a second Cisco router. The second Cisco router is connected to a second PBX. The interoperability testing involved signaling and audio path confirmation on the voice interfaces under test between each Cisco router and it's associated PBX.



Limitations

When the Meridian phone is disconnected from a call, it returns to dial-tone.

Due to the CO Trunk connection to the PBX, the incoming calls are directed to a digital phone and Blind Transferred to the PSTN Phone.

When an incoming call is answered and the Blind Transferred to the PSTN phone, the Meridian does not drop the PSTN call, though the CO Trunk call has disconnected.

System Components

Hardware Requirements

Cisco Hardware

Cisco C2611XM

PBX Hardware including Interface Card

Nortel Meridian

Special Cards, Blades, or Cables Required

NM-HDV2-2T1/E1 (2-port T1/E1 IP communications high-density digital voice/fax network module)

PVDM2-8 (8-channel packet fax/voice digital signal processor module)

PVDM2-16 (16-channel packet fax/voice digital signal processor module)

PVDM2-32 (32-channel packet fax/voice digital signal processor module)

PVDM2-48 (48-channel packet fax/voice digital signal processor module)

PVDM2-64 (64-channel packet fax/voice digital signal processor module)

VIC2-2 FXS (two-port voice interface card – Foreign Exchange Station)

VIC2-4 FXS (four-port voice interface card – Foreign Exchange Station)

Software Requirements

Cisco CallManager Release

Release 4.0

PBX software release

Nortel Meridian - RELEASE 24 ISSUE 24

Cisco IOS Release or Cisco CatOS Release (for the gateway)

Cisco IOS Software, C2600 Software (C2600-ADVENTERPRISEK9-M), Version 12.3(7)T, RELEASE SOFTWARE (fc1)



Configuration

Configuration Sequence and Tasks

List the configuration sequence for software or hardware.

Configuration Menus and Commands

Show configuration menus, configuration commands or screen captures.

Configuring the Nortel Meridian

Switch Configuration

```
REQ prtTYPE parmPARM
```

```
LPIB 192
```

```
HPIB 32
```

```
500B 16
```

```
NCR 200
```

```
MGCR NULL
```

```
CFWS YES
```

```
PCML MU
```

```
ALRM YES
```

```
ERRM ERR BUG AUD
```

```
DTRB 50
```

```
TMRK 128
```

```
FCDR OLD
```

```
PCDR NO
```

```
TPO NO
```

```
TSO NO
```

```
CLID YES
```

```
DUR5 NO
```

```
MLDN YES
```

```
MARP NO
```

```
FRPT NEFR
```

```
DCUS NULL
```

```
MSCL 255
```

```
PMSI
```



MANU PMS1
PMCR 20
PORT NONE
NDIS 20
OCAC NO
MTRO MR
SBA_ADM_INS 001
SBA_USER 010
BCAP SPEECH
NORTEL_BRAND NO

Trunk Configuration

REQ: prt
TYPE: tnb
TN 10
CDEN
CUST
DATE
PAGE
DES

TN 010 0 00 00
TYPE COT
CDEN 8D
CUST 0
XTRK XUT
TIMP 600
BIMP 3COM
TRK ANLG
NCOS 0



RTMB 110 1
ATDN 2603
SIGL LOP
SUPN YES
STYP PIP
AST NO
IAPG 0
CLS UNR DTN CND WTA LPR APN THFD
P10 NTC LOL
TKID
DATE 8 JAN 2004

REQ: prt
TYPE: rdb
CUST 0
ROUT 110

TYPE RDB
CUST 00
DMOD
ROUT 110
DES LS_CO
TKTP COT
PRIV NO
SAT NO
RCLS EXT
DTRK NO
ISDN NO
PTYP ACO
AUTO YES
ICOG IAO
RANX NO



SRCH RRB
TRMB YES
STEP
ACOD 710
CPP NO
TARG 01
CLEN 1
BILN NO
OABS
TIMR ICF 512
 OGF 512
 EOD 13952
 DSI 34944
 NRD 10112
 DDL 70
 ODT 4096
 RGV 640
 FLH 510
 GRD 896
 SFB 3
 CRD 512
 TFD 0
 LEXT 100
SST 3 0
NEDC ETH
FEDC ETH
CPDC NO
SPCT IMM
HOLD 02 02 40
SEIZ 02 02
RGFL 02 02
RVSD 08 31



ILLR 02 02

DRNG NO

CDR NO

MUS NO

MR NO

MANO NO

EQAR NO

OHQ NO

OHQT 00

TTBL 0

OHTD NO

PLEV 2

MCTS NO

ALRM NO

ART 0

SGRP 0

AACR NO

Common Equipment Configuration

REQ PRT

TYPE CEQU

CEQU

MPED 8D

SUPL 000 004 008 012

016 032 036 040

044 048 064 068

072

XCT 000

CONF 029 030 031 062

094 095

DLOP NUM DCH FRM LCMT YALM T1TE TRSH



```
PRI 003 24 ESF B8S FDL - 00
      004 24 ESF B8S FDL - 00
      005 24 ESF B8S FDL - 00

PRI2 06 07

DTI2

MISP
```

Digital Station Phone 2603 Configuration

```
MEM AVAIL: (U/P): 1272407   USED U P: 106347 95805   TOT: 1474559
```

```
DISK RECS AVAIL: 476
```

```
TNS   AVAIL:    47   USED:   153   TOT:    200
```

```
ACD AGENTS AVAIL:   300   USED:     0   TOT:   300
```

```
AST   AVAIL:   100   USED:     0   TOT:   100
```

```
DIGITAL TELEPHONES AVAIL: 2494   USED:     6   TOT:  2500
```

```
REQ: prtTYPE: 2616
```

```
MARP NOT ACTIVATED
```

```
TN 001 0 0 ODATE PAGE DES
```

```
DES TEST1
```

```
TN 001 0 00 00
```

```
TYPE 2616
```

```
CDEN 8D
```

```
CUST 0
```

```
AOM 0
```

```
FDN
```

```
TGAR 0
```

```
LDN NO
```

```
NCOS 0
```




SGRP 0
RNPG 0
SCI 0
SSU XLST
CLS CTD FBD WTA LPR MTD FND HTD ADD HFD
MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD DSX VMD CMSD CCSD SWD LND CNDA
CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
ICDD CDMD LLCN MCTD CLBD AUTU
GPUD DPUD DNDA CFXA ARHD CLTD ASCD
CPFA CPTA ABDD CFHD FICD NAID BUZZ AHD
DDGA NAMA
DRDD EXR0
USMD USRD ULAD RTDA RBDD RBHD PGND FLXD FTTC DNDY DNO3
CPND_LANG ENG
HUNT
PLEV 02
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
ARTO 0
AFD
AHNT
KEY 00 SCR 2601 0 MARP
CPND
NAME BERT
XPLN 27
DISPLAY_FMT FIRST, LAST



01 SCR 3510 0 MARP

02

03 CFW 12 2002

04 AO6

05 TRN

06 DSP

07

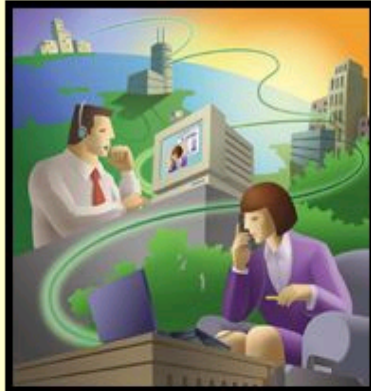
08 ADL 16 7055573500

09 ADL 16

10 ADL 16



Configuring Cisco CallManager



Cisco CallManager 4.0 Administration

Details

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A summary of U.S. laws governing Cisco cryptographic products may be found at:

<http://www.cisco.com/www/export/crypto/tool/stqrg.html>.

If you require further assistance please contact us by sending email to export@cisco.com.





Cisco CallManager Component Versions

[Latest Installed Version](#)
[Out Of Sync](#)

Servers

172.20.43.253

Component Versions for all servers:

Page

Component	Version	Installation ID
ace.dll	5.2.5.0	CCM4.0(1)
aced.dll	5.2.5.0	CCM4.0(1)
Apache Tomcat	4.1	CCM4.0(1)
ASTIsapi.dll	3.3.2.0	CCM4.0(1)
AudioTranslator.exe	4.0.0.1	CCM4.0(1)
Aupair.exe	4.0.0.37	CCM4.0(1)
AupairChangeNotify.dll	4.0.0.37	CCM4.0(1)
Aupairps.dll	3.4.0.33	CCM4.0(1)
AuthFilt.dll	4.0.0.0	CCM4.0(1)
AVVIDCustomerDirectoryConfigurationPlugin.exe	4.0.0.31(0)	CCM4.0(1)
bootp.exe	2.0.2.2	CCM4.0(1)
ccm.exe	4.0.0.0	CCM4.0(1)
CcmPerfMon.dll	4.0.0.0	CCM4.0(1)
CCNTEST.EXE	4.0.0.0	CCM4.0(1)
cdpintf.dll	4.0.0.0	CCM4.0(1)
Cisco CallManager	4.0(1)	CCM4.0(1)
Cisco CallManager Administration	4.0(0.333)	CCM4.0(1)
Cisco CallManager Serviceability	4.0(0.1)	CCM4.0(1)



Find and List Phones

[Add a New Phone](#)





2 matching record(s) for Device Name begins with ""

Find phones where begins with

and show items per page. Allow wildcards.

To list all items, click Find without entering any search text, or use "Device Name is not empty" as the search.

Real-time Information Service returned information for 2 of 2 devices listed below.

<input type="checkbox"/>	Device Name	Description	Device Pool	Status	IP Address	Copy
<input type="checkbox"/>	 SEP000A8A2C8601	Auto 5001	Default	172.20.43.253	172.20.43.100	
<input type="checkbox"/>	 SEP000A8A48FA59	Auto 5000	Default	172.20.43.253	172.20.43.101	

Delete Selected

Reset Selected

First Previous Next Last

Page of 1



Gateway Configuration

[Back to Find/List Gateways](#)

Product: Cisco 3745

Gateway : A-3745

Status: Ready

Domain Name*

Description

Cisco CallManager Group*

Installed Voice Interface Cards Endpoint Identifiers

Mainboard Slot

Module in Slot 1

Module in Slot 2

Module in Slot 3

Module in Slot 4

Subunit 0	<input type="text" value="VIC2-2FXS"/>	Begin Port 0	(4/0/0) POTS	(4/0/1) POTS
Subunit 1	<input type="text" value="VIC2-2MFT-E1"/>	Begin Port 0	(4/0) ?	(4/1) ?

Product Specific Configuration

Global ISDN Switch Type

Switchback Timing*

Switchback uptime-delay (min)

Switchback schedule (hh:mm)

* indicates required item



Gateway Configuration

[Back to main Gateway Configuration](#)
[Back to Find/List Gateways](#)
[Dependency Records](#)

Slot 4/ Sub-Unit 0

	4/0/0	5400
	4/0/1	5401

Slot 4

	4/0
	4/1

Product : Cisco 3745

Gateway : AALN/S4/SU0/0@A-3745

Registration: Registered with Cisco CallManager 172.20.43.253

IP Address: [172.20.43.151](#)

Status: Ready

Gateway Information

Description	<input type="text" value="AALN/S4/SU0/0@172.20.43.151"/>
Device Pool*	<input type="text" value="Default"/>
Calling Search Space	<input type="text" value="< None >"/>
AAR Calling Search Space	<input type="text" value="< None >"/>
Media Resource Group List	<input type="text" value="< None >"/>
Network Hold Audio Source	<input type="text" value="< None >"/>
Location	<input type="text" value="< None >"/>
AAR Group	<input type="text" value="< None >"/>
Network Locale	<input type="text" value="United States"/>

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain	<input type="text" value=""/> (e.g., "0000FF")
MLPP Indication	Not available on this device
MLPP Preemption	Not available on this device

Port Information

Prefix DN	<input type="text" value=""/>
Num Digits*	<input type="text" value="4"/>
Expected Digits*	<input type="text" value="0"/>
SMDI Port Number(0-4096)*	<input type="text" value="0"/>



Directory Number Configuration [Configure Device \(AALN/S4/SU0/0@A-3745\)](#) [Dependency Records](#)

Associated With

FXS AALN/S4/SU0/0@A-
MGCP 3745 (Port 1)

Directory Number: 5400

Status: Ready

Note: Any update to this Directory Number automatically resets the associated devices

Directory Number

Directory Number*

Partition

Directory Number Settings

Voice Mail Profile
(Choose <None> to use default)

Calling Search Space

AAR Group

Network Hold Audio Source

Auto Answer Not available on this device.

Call Forward and Pickup Settings

	Voice Mail Destination	Calling Search Space
Forward All <input type="checkbox"/>	<input type="text"/>	<input type="text" value=" < None >"/>
Forward Busy <input type="checkbox"/>	<input type="text"/>	<input type="text" value=" < None >"/>
Forward No Answer <input type="checkbox"/>	<input type="text"/>	<input type="text" value=" < None >"/>
No Answer Ring Duration <input type="text"/>	(seconds)	
Call Pickup Group <input type="text"/>	<input type="text" value=" < None >"/>	

MLPP Alternate Party Settings

Target (Destination)

Calling Search Space

No Answer Ring Duration (seconds)

Line Settings for this Device

Display (Internal Caller ID)

Line Text Label Not available on this device.

External Phone Number Mask

Message Waiting Lamp Policy Not available on this device.

Ring Setting (Phone Idle) Not available on this device.

Ring Setting (Phone Active)** Not available on this device.



Multiple Call / Call Waiting Settings

Maximum Number of Calls* (1 - 2)

Busy Trigger* (<= Max. Calls)

Forwarded Call Information Display

Caller Name

Caller Number

Redirected Number

Dialed Number

* indicates required item; changes to Line or Directory Number settings require restart.

Note:

If you are using a language other than English for Display (Internal Caller ID) or Line Text Label text, make sure the correct character set (shown below) is selected. Text displays incorrectly if the wrong character set is selected. (English characters are included in all character sets.)

Character Set



Gateway Configuration

[Back to Find/List Gateways](#)

Product: Cisco 26XX
Gateway : B-2611XM

Status: Ready

Domain Name*

Description

Cisco CallManager Group*

Installed Voice Interface Cards

Endpoint Identifiers

Module in slot 0

Module in slot 1

Subunit 0	<input type="text" value="VIC-4FXS"/>	Begin Port <input type="text" value="0"/>	(1/0/0) POTS	(1/0/1) POTS	(1/0/2) POTS
			(1/0/3) POTS		
Subunit 1	<input type="text" value="VVIC-2MFT-E1"/>	Begin Port <input type="text" value="0"/>	(1/0) POTS	(1/1) POTS	

Product Specific Configuration



Switchback Timing*

Switchback uptime-delay (min)

Switchback schedule (hh:mm)

* indicates required item

[Back to Find/List Gateways](#)



Gateway Configuration

[Back to main Gateway Configuration](#)
[Back to Find/List Gateways](#)
[Dependency Records](#)

Slot 1/ Sub-Unit 0		
	1/0/0	5100
	1/0/1	5101
	1/0/2	5102
	1/0/3	5104

Product : Cisco 26XX
Gateway : AALN/S1/SU0/0@B-2611XM
Registration: Registered with Cisco CallManager 172.20.43.253
IP Address: [172.20.43.155](#)

Status: Ready

Slot 1	
	1/0
	1/1

Gateway Information

Description	<input type="text" value="AALN/S1/SU0/0@B-2611XM"/>
Device Pool*	<input type="text" value="Default"/>
Calling Search Space	<input type="text" value="< None >"/>
AAR Calling Search Space	<input type="text" value="< None >"/>
Media Resource Group List	<input type="text" value="< None >"/>
Network Hold Audio Source	<input type="text" value="< None >"/>
Location	<input type="text" value="< None >"/>
AAR Group	<input type="text" value="< None >"/>
Network Locale	<input type="text" value="< None >"/>

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain	<input type="text" value=""/> (e.g., "0000FF")
MLPP Indication	Not available on this device
MLPP Preemption	Not available on this device

Port Information

Prefix DN	<input type="text"/>
Num Digits*	<input type="text" value="0"/>
Expected Digits*	<input type="text" value="0"/>
SMDI Port Number(0-4096)*	<input type="text" value="0"/>



Directory Number Configuration

[Configure Device \(AALN/S1/SU0/0@B-2611XM\)](#)
[Dependency Records](#)

Associated With

AALN/S1/SU0/0@B-2... (Port 1)

Directory Number: 5100

Status: Ready

Note: Any update to this Directory Number automatically resets the associated devices

Directory Number

Directory Number*

Partition

Directory Number Settings

Voice Mail Profile
(Choose <None> to use default)

Calling Search Space

AAR Group

Network Hold Audio Source

Auto Answer Not available on this device.

Call Forward and Pickup Settings

	Voice Mail Destination	Calling Search Space
Forward All	<input type="checkbox"/> <input type="text"/>	<input type="text" value=" < None >"/>
Forward Busy	<input type="checkbox"/> <input type="text"/>	<input type="text" value=" < None >"/>
Forward No Answer	<input type="checkbox"/> <input type="text"/>	<input type="text" value=" < None >"/>
No Answer Ring Duration	<input type="text"/> (seconds)	
Call Pickup Group	<input type="text" value=" < None >"/>	

MLPP Alternate Party Settings

Target (Destination)

Calling Search Space

No Answer Ring Duration (seconds)



Line Settings for this Device	
Display (Internal Caller ID)	<input type="text" value="2600-fxs1/0/0"/>
Line Text Label	Not available on this device.
External Phone Number Mask	<input type="text"/>
Message Waiting Lamp Policy	Not available on this device.
Ring Setting (Phone Idle)	Not available on this device.
Ring Setting (Phone Active)**	Not available on this device.
Multiple Call / Call Waiting Settings	
Maximum Number of Calls*	<input type="text" value="2"/> (1 - 2)
Busy Trigger*	<input type="text" value="1"/> (<= Max. Calls)
Forwarded Call Information Display	
<input checked="" type="checkbox"/> Caller Name	<input checked="" type="checkbox"/> Caller Number
<input checked="" type="checkbox"/> Redirected Number	<input checked="" type="checkbox"/> Dialed Number
<small>* indicates required item; changes to Line or Directory Number settings require restart.</small>	
Note: If you are using a language other than English for Display (Internal Caller ID) or Line Text Label text, make sure the correct character set (shown below) is selected. Text displays incorrectly if the wrong characterset is selected. (English characters are included in all character sets.)	
Character Set	<input type="text" value="Western European (Latin 1)"/>

Configuring the Cisco 2611XM

```
B-2611XM#sho running
```

```
Building configuration...
```

```
Current configuration : 2009 bytes
```

```
!
```

```
version 12.3
```

```
service timestamps debug uptime
```

```
service timestamps log uptime
```

```
no service password-encryption
```

```
!
```

```
hostname B-2611XM
```

```
!
```

```
boot-start-marker
```

```
boot-end-marker
```

```
!
```



```
card type e1 1 1
enable secret 5 $1$11Io$rrTZbWb3xci/uuEvYELWI.
enable password cisco
!
no network-clock-participate slot 1
no network-clock-participate wic 0
ip subnet-zero
!
ip cef
no ip domain lookup
ip host B9 172.20.43.253
ip audit po max-events 100
no aaa new-model
no ftp-server write-enable
voice-card 1
!
fax interface-type fax-mail
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 172.20.43.253
ccm-manager config
!
controller E1 1/0
!
controller E1 1/1
!
no crypto isakmp enable
!
interface FastEthernet0/0
ip address 172.20.43.155 255.255.255.0
no ip mroute-cache
speed auto
```



```
full-duplex
no mop enabled
!
interface FastEthernet0/1
no ip address
no ip mroute-cache
shutdown
duplex auto
speed auto
!
ip classless
!
no ip http server
no ip http secure-server
!
control-plane
!
voice-port 1/0/0
no battery-reversal
!
voice-port 1/0/1
!
voice-port 1/0/2
!
voice-port 1/0/3
!
mgcp
mgcp call-agent 172.20.43.253 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
mgcp modem passthrough voip mode nse
mgcp package-capability rtp-package
```




```
no mgcp package-capability res-package
mgcp package-capability sst-package
no mgcp package-capability fxr-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
dial-peer cor custom
!
dial-peer voice 999100 pots
  application mgcpapp
  port 1/0/0
!
dial-peer voice 999101 pots
  application mgcpapp
  port 1/0/1
!
dial-peer voice 999102 pots
  application mgcpapp
  port 1/0/2
!
dial-peer voice 999103 pots
  application mgcpapp
  port 1/0/3
!
line con 0
line aux 0
line vty 0 4
  password cisco
```



```
login
line vty 5 15
  password cisco
  login
!
end
```

Samples of Paragraph Styles

This is Subhead1

This is Body.

This is Subhead2

This is Body.

This is Subhead3.

This is Body.

This is Subhead4.

This is Body.

This is Subhead5.

This is Body.

- This is Bullet. This is Bullet. This is Bullet. This is Bullet. This is Bullet. This is Bullet. This is Bullet. This is Bullet. This is Bullet. This is Bullet.
 - This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2. This is Bullet2.

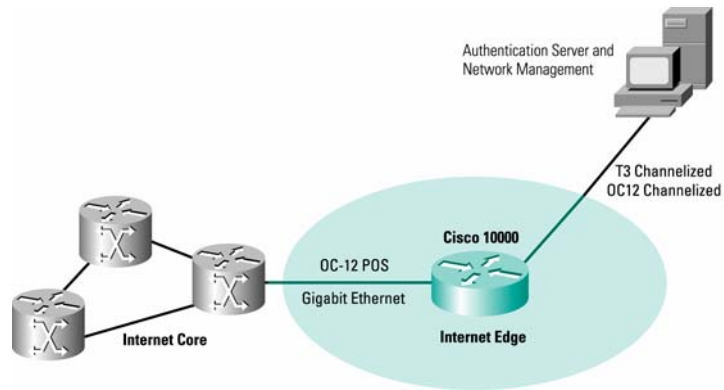
This is Example.

This is Example.

This is Example.

Use the Caption_head Style Sheet for Caption Head

Use the Caption Style Sheet for caption body text. This is a caption for photos, diagrams and charts.This is a caption for photos, diagrams and charts.



Use the Caption_head Style Sheet for Caption Head

Use the Caption Style Sheet for caption body text. This is a caption for photos, diagrams and charts. This is a caption for photos, diagrams and charts.

Chart_head Style Sheet Text	Chart_head Style Sheet Text	Chart_head Style Sheet Text
Chart_subhead Style Sheet	Chart_subhead Style Sheet	Chart_subhead Style Sheet
Chart_body Style Sheet	Chart_body Style Sheet	Chart_body Style Sheet
Chart_body Style Sheet	Chart_body Style Sheet	Chart_body Style Sheet

Acronyms

Acronym	Definitions



Important Information

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