Application Note

Cisco 2621 Router-PBX Interoperability: Alcatel 4400 with Cisco CallManager Using E1 Q.931 PRI for a MGCP Gateway

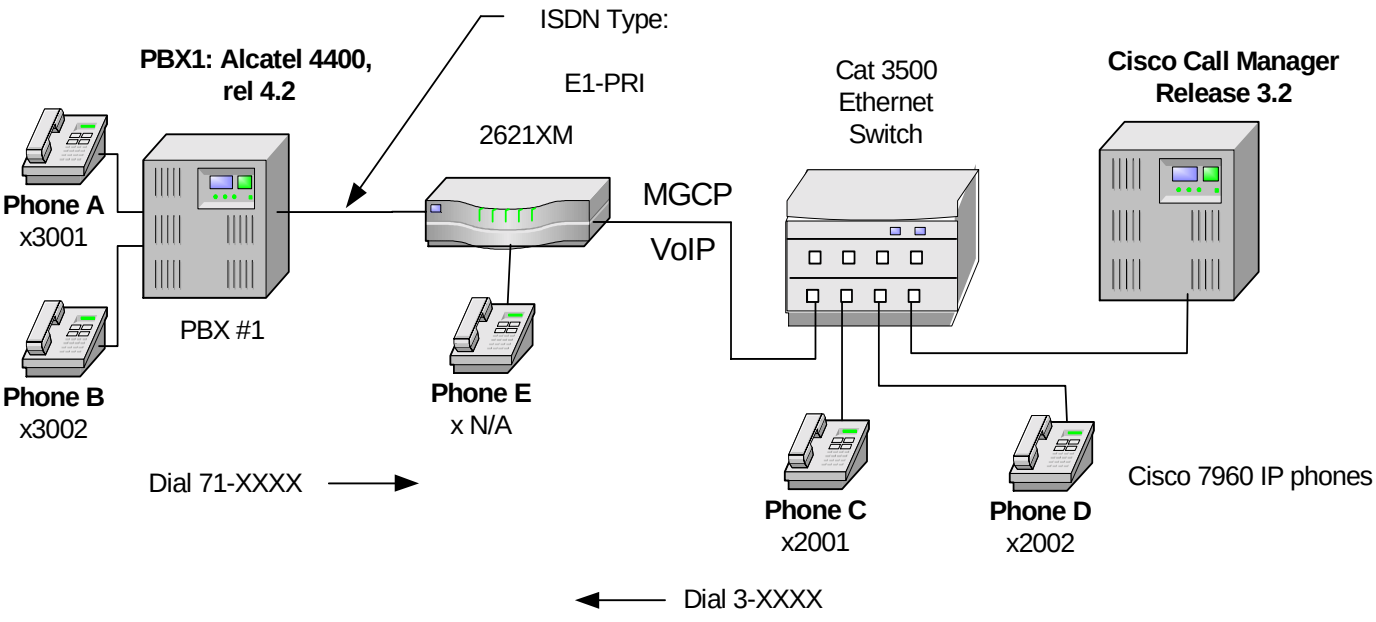
Introduction

- This note describes the connectivity of the Alcatel 4400 Release 4.2 PBX with the Cisco CallManager using the Cisco 2621XM series router with E1 Q.931 PRI type signaling protocol links, as an MGCP gateway.
- The Network Topology diagram shows the test set-up for end-to-end interoperability with the Cisco CallManager connected to the PBX using the Cisco 2621XM series router with E1 Q.931 PRI type signaling protocol links, as an MGCP gateway.
- Connectivity is achieved by using the E1 Q.931 PRI protocol type links on the MGCP gateway and Cisco Catalyst 3500 series XL switch on the Alcatel 4400 PBX.

Note: Cisco CallManager (CCM) does not send connected number information in the CONNECT message back to the PBX.

Network Topology

Basic Call Setup End-to-End Configuration



Limitations

Calling Name and Number features.

- When calling from the Cisco 7960 IP phone to the Alcatel digital phone, both phones display the number after the call is answered.
- When calling from the Alcatel digital phone to the Cisco 7960 IP phone, the Cisco IP phone displays the calling number when the call is answered. The Alcatel phone however does **not** get updated when the call is answered. It displays the numbers being dialed instead (i.e. Access Code + extension number).
- When calling from the Cisco 7960 IP phone to the Alcatel digital station and the local forwarding is initiated, the forwarding number is displayed until the Alcatel phone is answered. Then just the calling number is displayed.

System Components

Hardware Requirements

- Cisco Hardware
  - Cisco 2621XM series router with dual multiflex trunk E1 (2MFT-E1) type signaling protocol links
  - Cisco Catalyst 3500 series XL switch
  - Cisco CallManager Release 3.2
- Alcatel 4400 PBX
  Hardware: BPRA 2

Software Requirements

- Cisco IOS Software Release 12.2(12.9)T
- PBX Software Release 4.2
- Cisco CallManager Release 3.2

Configuration

Configuring the Alcatel-4400 ISDN PRI

Board Configuration

Board
Board Address 9
Interface Type BPRA2
Administrative status Enabled
Usage State Busy
Operational State Enabled
Main/Standby State Main (Master)
Number Of Sets Being Connect. 4
Remote Shelf Address 255
Remote Board Address 255
Synchronisation Priority 255
IO2 With SPB NO
AUXU Parameters 1 None
AUXU Parameters 2 None
AUXU Parameters 3 None
AUXU Parameters 4 None
CRC4 YES

Country Protocol Type Default
Time Slots\0 0
Time Slots\1 1
Time Slots\2 1
Time Slots\3 1
Time Slots\4 1
Time Slots\5 1
Time Slots\6 1
Time Slots\7 1
Time Slots\8 1
Time Slots\9 1
Time Slots\10 1
Time Slots\11 1
Time Slots\12 1
Time Slots\13 1
Time Slots\14 1
Time Slots\15 1
Time Slots\16 0
Time Slots\17 1
Time Slots\18 1
Time Slots\19 1
Time Slots\20 1
Time Slots\21 1
Time Slots\22 1
Time Slots\23 1
Time Slots\24 1
Time Slots\25 1
Time Slots\26 1
Time Slots\27 1
Time Slots\28 1
Time Slots\29 1
Time Slots\30 1
Time Slots\31 1
Voice-->Data TS YES
SU shelf Type 2 PCM Shelf
DECT Location area number 255
Send Init Dynamic Msg False
Param By Default True
Clock Mode Internal
CPU with Optimized B Channel Access NO
Board with DTM False
Incidents Teleservice YES
VG Recording Max.Duration 0
DASS2 Simulate Network NO
DPNSS Layer 2 Address A
ISDN Board Layer 2 Parameters\Retransmission Timer 100
ISDN Board Layer 2 Parameters\TEI Identity Check Timer 100
ISDN Board Layer 2 Parameters\Polling Timer 1000
ISDN Board Layer 2 Parameters\Nb_Of_Retransmission 3
ISDN Board Layer 2 Parameters\Max Frame Size (Bytes) 260
ISDN Board Layer 2 Parameters\Window Size In Frames SAPI S T0 1
ISDN Board Layer 2 Parameters\Window Size In Frames SAPI P T0 3
ISDN Board Layer 2 Parameters\Window Size In Frames SAPI S T2 7
ISDN Board Layer 2 Parameters\Window Size In Frames SAPI P T2 7

Number of configurated ports 4
Associated CPU 255
Number of configurated E1 ports 8
Synchronisation mode Adaptative
In Band Signalling NO
Passive board NO
SS7 signalling NO
PRA7 TS signalling 16
ISDN T2 on PRA7 board NO
Use Data Compression NO
Mutual Aid YES
LIO Daughter Board COMP6
INTIP Daughter Board GIP6x1
Tone on Board R2 Tone
Number of Used Compressors 0
GNISC in Rack 255
GNISC in position 255
Usage State Slave
Atm address
TS used on PCM 0 0
TS used on PCM 1 0
TS used on PCM 2 0
TS used on PCM 3 0
TS used on PCM 4 0
TS used on PCM 5 0
TS used on PCM 6 0
TS used on PCM 7 0
Daughter board equipped NO
Nb of Compressors for Gateway 0
Nb of Compressors for IP Devices 0
Mode Gateway IP
Voice Guide Language Index 1
CLIP Signalization No CLIP
IVR ProtocolNo IVR Protocol
4615 Present NO
LIOE coupler 1 address 255
LIOE coupler 2 address 255
Associated BBC2 coupler 255
Associated BBC2 access 255
Board IP Version IP Default
Use of volume in system YES
Local volume (dB) 0
Network recording use False
Remote node number 255

Digital Configuration

Digital Access
T0/T2 Access No. 0
Access Type T2
Used Access YES
Synchronisation Priority 255
Network Mode YES
Max Nb Of Used B Channels 30
Max_Nb_Of_Compressed_B_Channels 0
Nb Of Signalization TS 1
TieLine Mode YES
With Alarm NO
Access Type S0 NO
Reserved1 NO
Reserved2 NO
Network Date Time Update NO
CRC4 YES
Port Class NOT SIG
Multiframe Type SF
Line Type Short Haul 0 to 35 meters
Pulses Encoding AMI
Retransmission Timer 100
TEI Identity Check Timer 100
Polling Timer 1000
Nb_Of_Retransmission 3
Max Frame Size (Bytes) 260
Window Size In Frames SAPI S 7
Window Size In SAPI P 7
B Channel Rate 64K

Trunk Configuration

Trunk Groups
Trunk Group Id 4
Trunk Group Type T2
Trunk Group Name PRI-ISDN
Node number 1
Transcom Trunk Group False
Auto.reserv.by Attendant False
Overflow trunk group No. -1
Tone on seizure True
Private Trunk Group False
Paging Trunk Group False
Paging Table Id -1
Paging Signalization NDDI
Security Patrol False
Q931 signal variant ISDN all countries
Operator Id ANSI
SS7 signal variant No variant
Number Compatible With -1
Prefix Sending False
Number Of Digits To Send 4

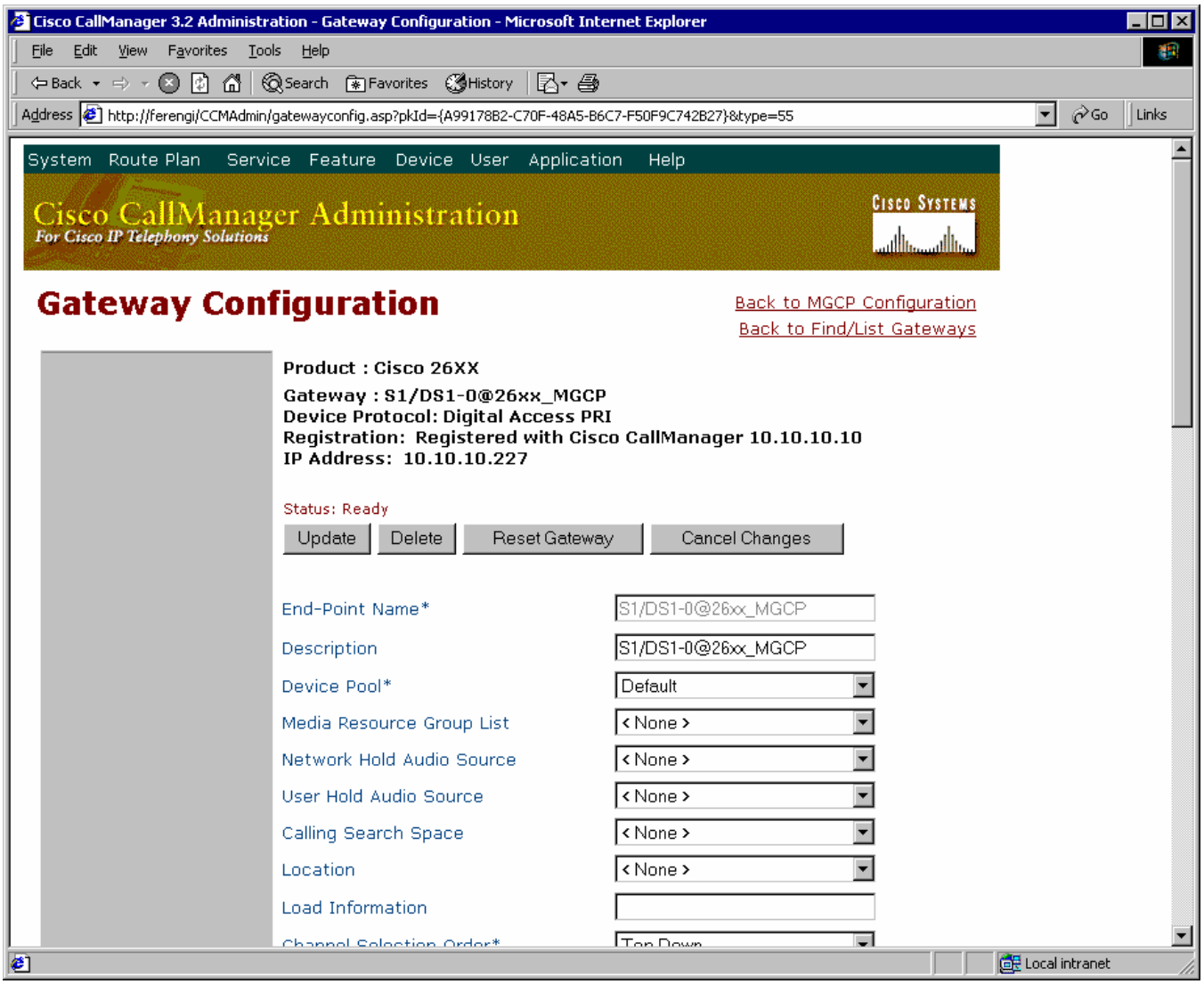
Channel selection type Quantum
Remote Network 15
Shared Trunk Group False
T.line Calling last dig.length 0
auto.DTMF dialing on outgoing call NO
T2 Specificity None
Public Network Category 0
DDI transcoding False
Special Services Nothing
Can support UUS in SETUP True
Register Signalling Decadic/MF Q23
Implicit Priority\Activation mode 0
Implicit Priority\Priority Level 0
Preempter NO
Incoming calls Restriction categ. 10
Outgoing calls Restriction categ. 10
mpt1343 callee number NO

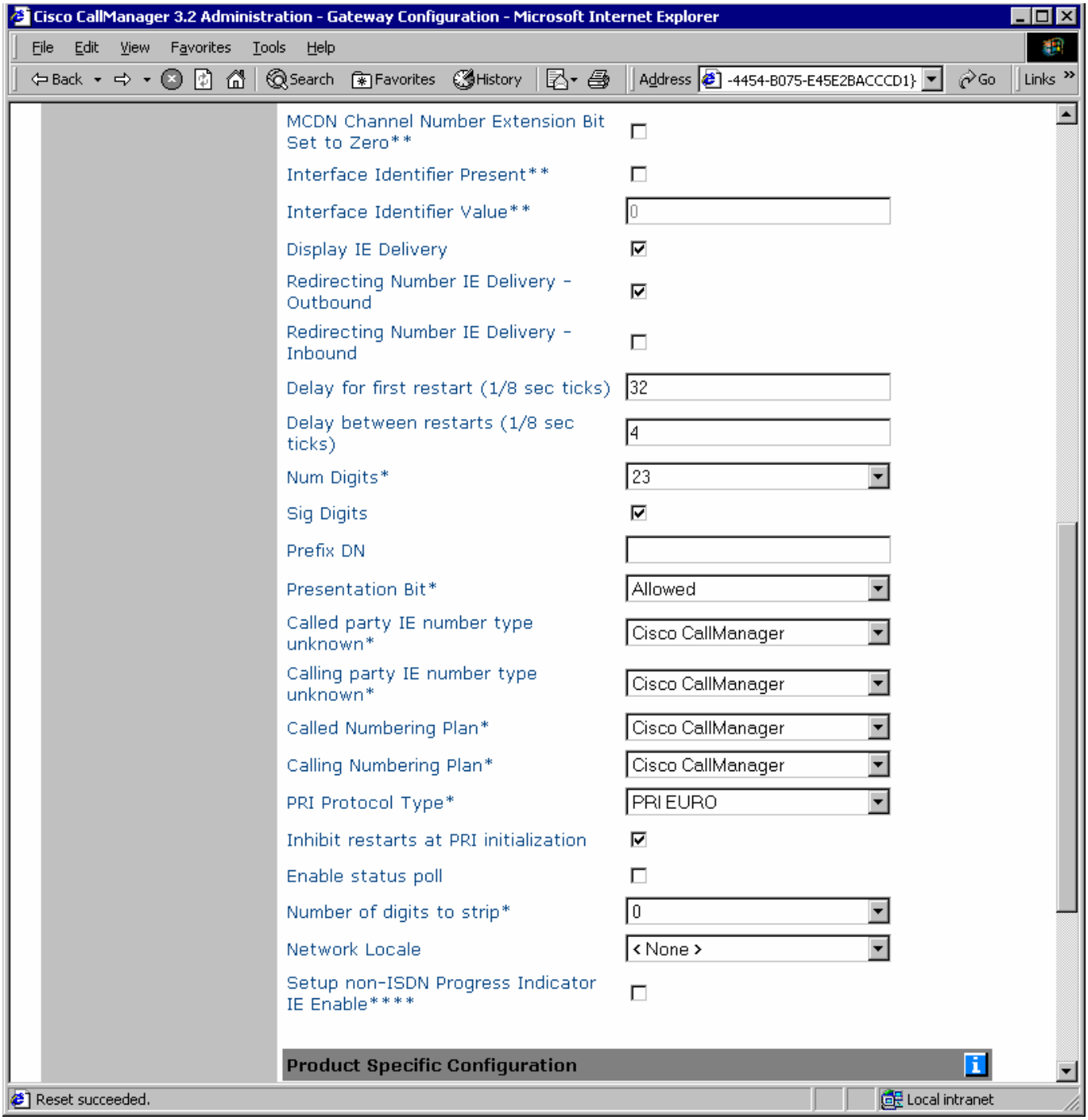
Trunk Group
Instance (reserved) 1
Trunk Group Type T2
Public Network Ref.
Dialling end to end NO
DTMF end to end signal. NO
Paying Incoming Calls NO
TS Permanently assigned NO
Min. Nb.of digits on seize 0
Signal.with access code NO
Trunk group used in DISA NO
DISA Secret Code
VG for non-existent No. YES
Routing To Executive NO
Trunk Category Id 16
Nb of digits unused (ISDN) 0
B Channel Choice YES
Channels Reserved By Attend. 0
Dissuasion For ACD NO
DTO joining NO
Enquiry Call On B Channel NO
DDI Mode NO
Automated Attendant NO
Calling party Rights category 0
Entity Number 0
TS Overflow YES
Number To Be Added
Supervised by Routing NO
Access Cluster Id -1
VPN Cost Limit for Incom.Calls 0
Immediat Trk Listening For VPN Call YES
VPN TS % 50
Csta Monitored NO
Max.% of trunks 0
Charge Calling And ADN Creation NO

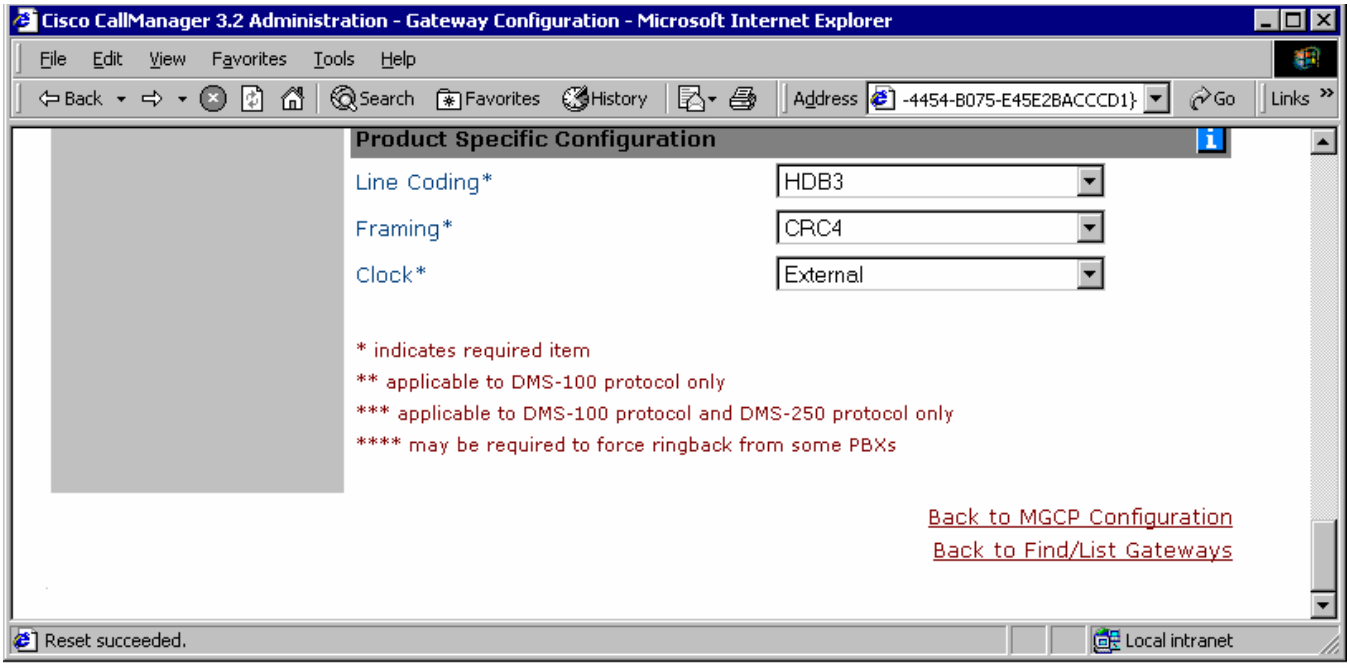
Ratio analog.to ISDN tax
Collect Calls Allowed YES
Priority of Call NO
PCM Network Mode NO
LogicalChannel 1__15 & 17__31
TS Distribution on Accesses YES
Use Split Acces NO
Heterogeneous Remote Network NO
Barring mode Not barred
ARS class of service 31
Megacom Service NO
SDN Service NO
Quality profile for voice on IP Profile #1
IP compression type Default
Use of volume in system YES
Local volume (dB) 0
External Access Server NO
Mcdu Trk MonitCsta
Announcement for Dialtone NO
Announcement for Ringtone NO
Private to Public Overflow YES

Configuring Cisco CallManager

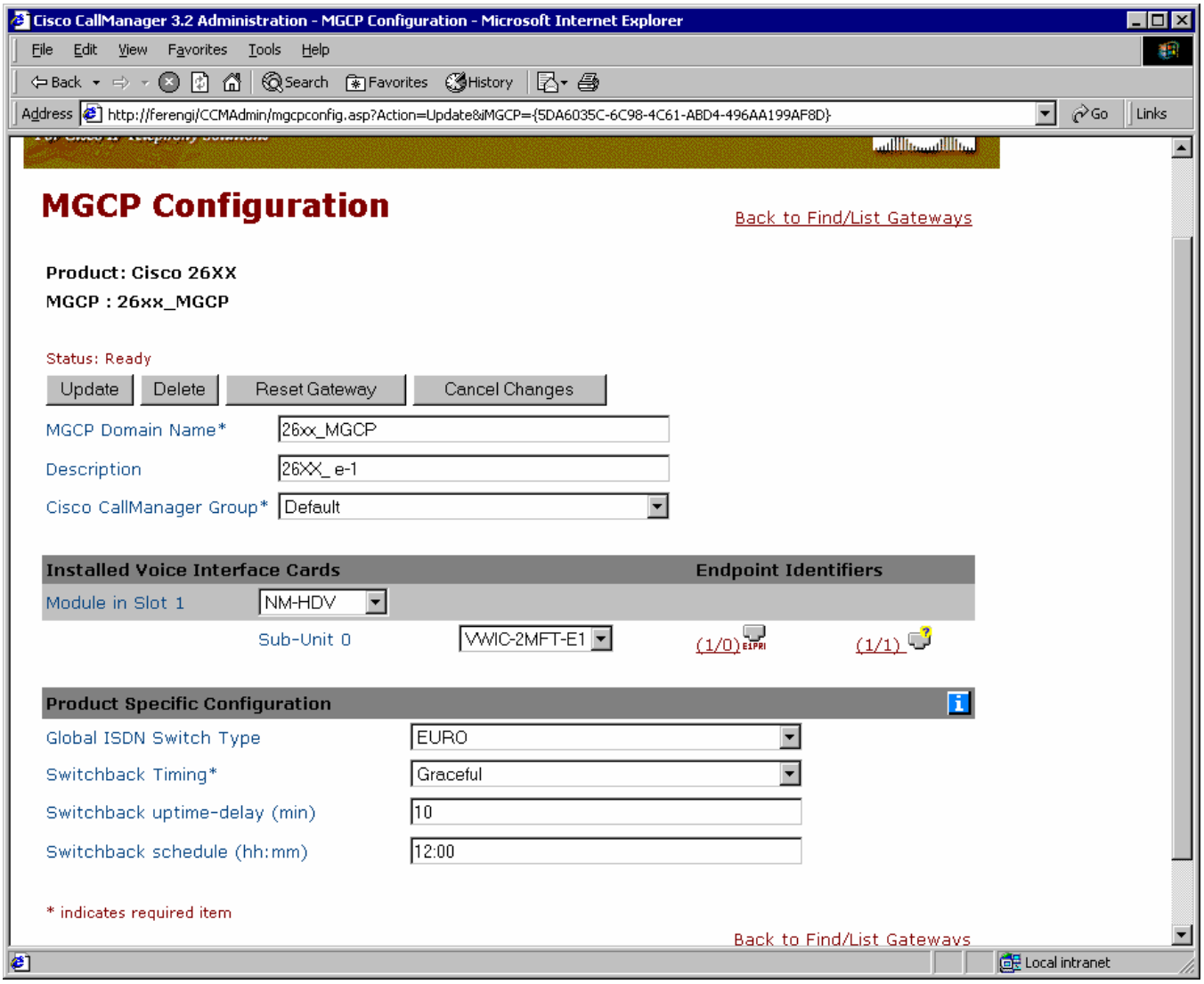
Gateway Configuration



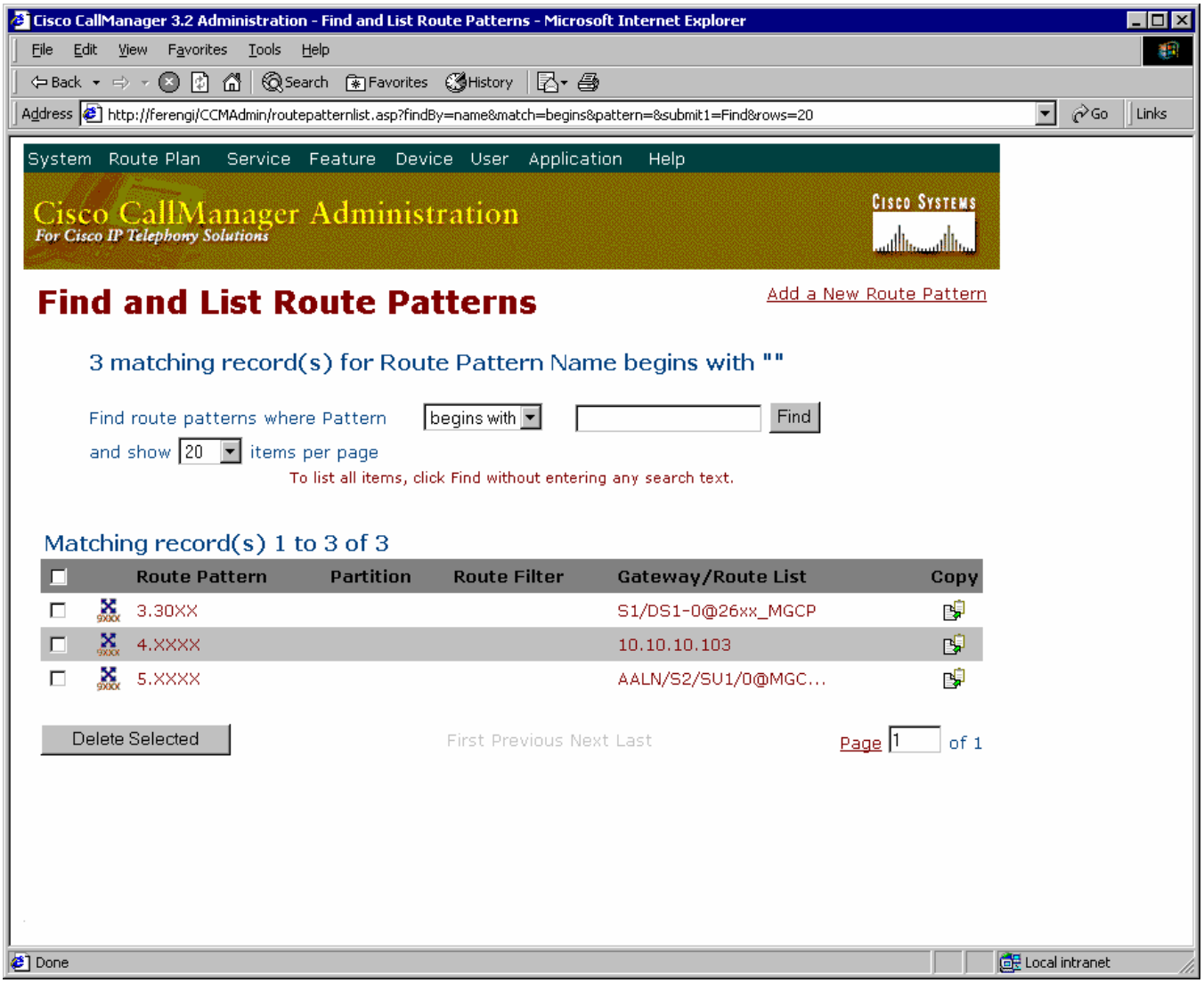




MGCP Configuration



List Route Patterns



Cisco 2621XM Gateway Configuration

```
26xx_MGCP#sh run
Building configuration...

Current configuration : 1519 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 26xx_MGCP
!
enable password cisco
!
voice-card 1
!
ip subnet-zero
!
!
no ip domain lookup
!
isdn switch-type primary-net5
!
!
voice call carrier capacity active
!
!
!
!
!
!
!
!
!
ccm-manager mgcp
ccm-manager config server 10.10.10.10
ccm-manager config
mta receive maximum-recipients 0
!
controller E1 1/0
 pri-group timeslots 1-31 service mgcp
!
controller E1 1/1
!
!
!
!
interface FastEthernet0/0
 ip address 10.10.10.227 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
```

```
 shutdown
 duplex auto
 speed auto
!
interface Serial1/0:15
 no ip address
 no logging event link-status
 isdn switch-type primary-net5
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 FastEthernet0/0
no ip http server
!
!
snmp-server engineID local 000000090200000196983000
snmp-server community public RO
snmp-server enable traps tty
call rsvp-sync
!
voice-port 1/0:15
!
mgcp
mgcp call-agent 10.10.10.10 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp package-capability rtp-package
mgcp default-package gm-package
no mgcp timer receive-rtcp
mgcp sdp simple
!
mgcp profile default
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
 application mgcpapp
!
dial-peer voice 1015 pots
 application mgcpapp
 port 1/0:15
!
line con 0
line aux 0
line vty 0 4
 login
line vty 5 15
 login
!
!
end

26xx_MGCP#
```

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Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

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