

Cisco Unified CallManager Release 5.0-PBX Interoperability: Avaya Definity G3 MV1.3 to a Cisco Catalyst 6000 using CMM-T1 QSIG with MGCP

Initial version, August 14, 2006

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Introduction

This is an application note for connectivity of Avaya Definity G3 MV1.3 PBX with Cisco Unified CallManager Release 5.0 using Cisco Communication Media Module (CMM)-T1 QSIG as MGCP gateway.

The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco Unified CallManager connected to the PBX via Cisco Communication Media Module CMM-T1 QSIG link as MGCP gateway.

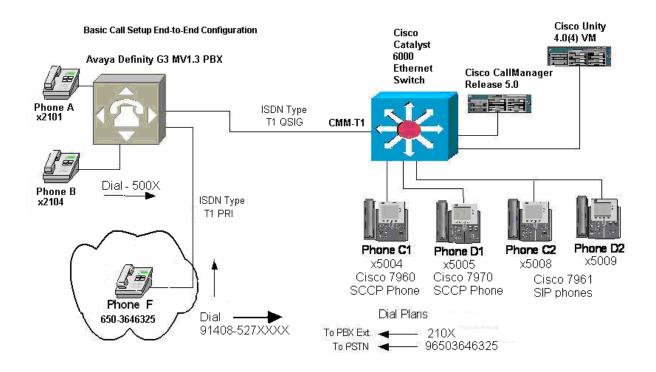
Connectivity is achieved by using the PRI QSIG T1 protocol type on the MGCP gateway and ISO QSIG switch type on the of Avaya Definity G3 MV1.3 PBX.

This Application Note uses the Cisco CMM-T1 voice gateway; however, other Cisco voice gateways are also an option to use since Cisco Unified CallManager QSIG implementation does not depend on the physical interface.



Network Topology

Figure 1. Network Topology or Test Setup





Limitations

Call Forward by Join External

As of this round of testing, Avaya Definity G3 MV1.3 PBX does not do External Call Forward By Join (Unconditional, Busy or No Reply) since it automatically performs Call Diversion by Reroute to complete the call. Thus, Call diversion by Reroute happens instead of External Call Forward By Join when a phone on the Avaya Definity G3 MV1.3 PBX is the forwarding station and Cisco Unified CallManager phones are the originating and final destination phones respectively

As of publication of this Application Note, Rerouting cannot be turned off on the Avaya Definity G3 MV1.3 PBX

System Components

Hardware Requirements

Cisco Catalyst 6000 switch with CMM-T1 Gateway

Cisco Unified CallManager Server

Avaya Definity G3 MV1.3 PBX

Software Requirements

Avaya MV1.3

Cisco Unified CallManager 5.0

Features

Features Supported

CLIP-Calling Line (Number) Identification Presentation

CLIR-Calling Line (Number) Identification Restriction

CNIP-Calling Name Identification Presentation

CNIR-Calling Name Identification Restriction

COLP-Connected Line (Number) Identification Presentation

COLR- Connected Line (Number) Identification Restriction

CONP-Connected Name Identification Presentation

CONR- Connected Name Identification Restriction

Sending Alerting Name

CT-Call Transfer

CFU-Call Forwarding Unconditional (by join) – see Limitations Section

CFB-Call Forwarding Busy (by join) - see Limitations Section

CFNR-Call Forwarding No Reply (by join) - see Limitations Section

CFU-Call Forwarding Unconditional (by Reroute)

CFB-Call Forwarding Busy (by Reroute)

CFNR-Call Forwarding No Reply (by Reroute)

CCBS-Call Completion to Busy Subscriber

CCNR-Call Completion No Reply



ANF-PR-Additional Network Feature Path Replacement (for Call Transfer by join)

ANF-PR-Additional Network Feature Path Replacement (for Call Diversion by forward switching)

ANF-PR-Additional Network Feature Path Replacement (for Trombone connection)

MWI- Message Waiting Indication (lamp ON, lamp OFF)

Configuration

Configuration Sequence and Tasks

Configuring the Avaya Definity G3 MV1.3 PBX

Configure in the following sequence:

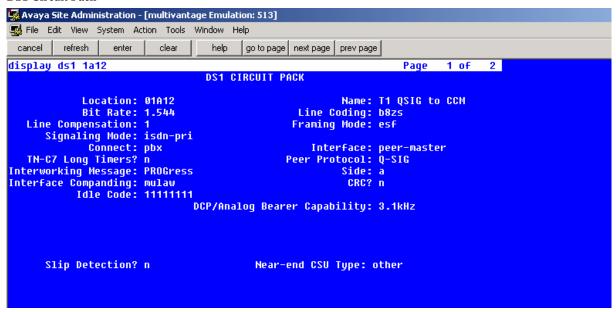
- 1. Add the new circuit pack.
- 2. Add the new signaling group.
- 3. Add the new trunk group.
- 4. Add Uniform Dialing Plan.



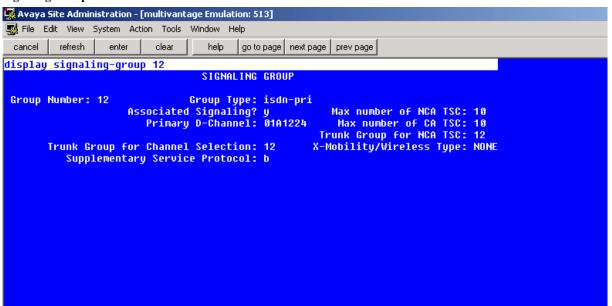
Configuration Menus and Commands

Avaya Configuration

DS1 Circuit Pack



Signaling Group

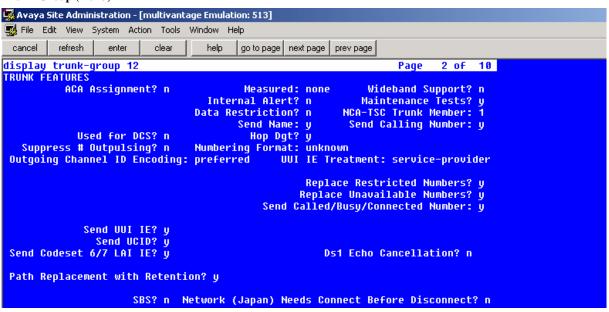




Trunk Group (1 of 3)

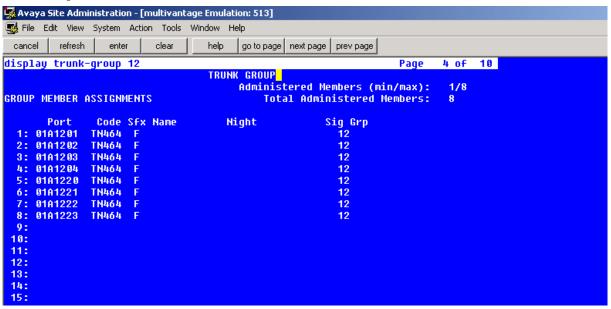
```
🧖 Avaya Site Administration - [multivantage Emulation: 513]
🕵 File Edit View System Action Tools Window Help
 cancel
          refresh.
                   enter
                           clear
                                    help go to page next page prev page
display trunk-group 12
                                                                       Page 1 of 10
                                    TRUNK GROUP
Group Number: 12
                                       Group Type: isdn
                                                                    CDR Reports: y
  Group Name: QSIG to CM-POLARIS
                                                              TN: 1
                                                                            TAC: 612
                                              COR: 1
   Direction: two-way
                                                               Carrier Medium: PRI/BRI
                                Outgoing Display? n
Dial Access? y
Queue Length: 0
                                                               Night Service:
                                  Busy Threshold: 99
Service Type: tie
                                        Auth Code? n
                                                                   TestCall ITC: rest
                            Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
         Codeset to Send Display: 0
Max Message Size to Send: 260
                                            Codeset to Send National IEs: 6
                                            Charge Advice: none
  Supplementary Service Protocol: b
                                            Digit Handling (in/out): enbloc/enbloc
             Trunk Hunt: ascend
                                                           QSIG Value-Added? y
                                                        Digital Loss Group: 13
Calling Number - Delete:
Bit Rate: 1200
                                                           Numbering Format: unk-unk
                                Insert:
                                         Synchronization: async
                                                                      Duplex: full
 Disconnect Supervision - In? y Out? y
```

Trunk Group (2 of 3)

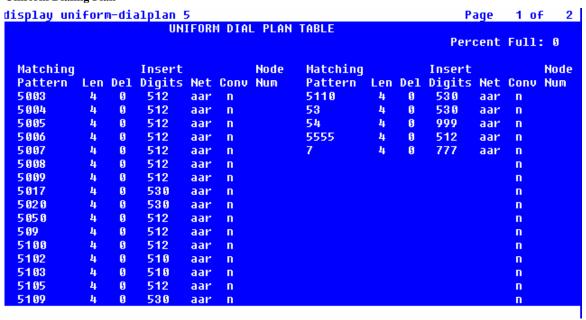




Trunk Group (3 of 3)



Uniform Dialing Plan

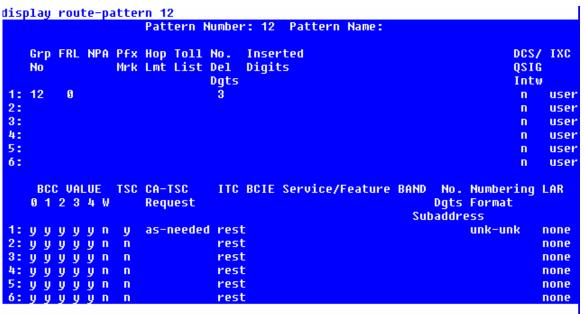




AAR Digit Analysis

display aar analysis 512						Page 1 of	2
	A	AR DI	GIT ANALYS	SIS TABI	.E		
						Percent Full:	3
Dialed	Tot	al	Route	Call	Node	ANI	
String	Min	Max	Pattern	Type	Num	Reqd	
512	7	7	12	aar	3	n in	
515	7	7	15	aar		n	
530	7	7	13	aar	4	n	
531	7	7	13	aar	6	n	
555	7	7	105	aar		n	
611	7	7	13	aar		n	
613	7	7	13	aar		n	
614	7	7	14	aar	2	n	
777	7	7	13	aar		n	
888	7	7	15	aar		n	
998	7	7	11	aar		n	
999	7	7	98	aar		n	
						n	
						n	
						n	

Route Patterns





Station Configuration (1 of 2)

display station 2101		Page	1	of	L
	STATION				
Extension: 2101	Lock Messages? n		BCC:	9	
Type: 6408D+	Security Code:		TN:	1	
Port: 01A0407	Coverage Path 1:		con:	1	
Name: John Adams	Coverage Path 2:		cos:	1	
	Hunt-to Station:				
STATION OPTIONS					
Loss Group: 2	Personalized Ringing Pattern: 1				
Data Module? n	Message Lai			91	
Speakerphone: 2-way	Mute Button E				
Display Language: english					
	Media Compl	ex Ext			
	IP Sof	tPhone'	? n		
	Remote Office	Phone	? n		

Station Configuration (2 of 2)

8 \ /	
display station 2101	Page 2 of 4
	STATION
FEATURE OPTIONS	
LWC Reception: spe	Auto Select Any Idle Appearance? n
LWC Activation? y	Coverage Msg Retrieval? y
LWC Log External Calls? n	Auto Answer: none
CDR Privacy? n	Data Restriction? n
Redirect Notification? y	Idle Appearance Preference? n
Per Button Ring Control? n	
Bridged Call Alerting? n	Restrict Last Appearance? y
Active Station Ringing: single	
H.320 Conversion? n	Per Station CPN - Send Calling Number?
Service Link Mode: as-needed	rei scacion orn - sena balling number:
Multimedia Mode: basic	Audible Message Waiting? n
MWI Served User Type:	Display Client Redirection? n
	Select Last Used Appearance? n
	Coverage After Forwarding? s
	Multimedia Early Answer? n
	Direct IP-IP Audio Connections? y
Emergency Location Ext: 2101	IP Audio Hairpinning? y



System Parameters and Customer Options

```
QSIG OPTIONAL FEATURES

Basic Call Setup? y
Basic Supplementary Services? y
Centralized Attendant? y
Interworking with DCS? y
Supplementary Services with Rerouting? y
Transfer into QSIG Voice Mail? y
Value-Added (VALU)? y

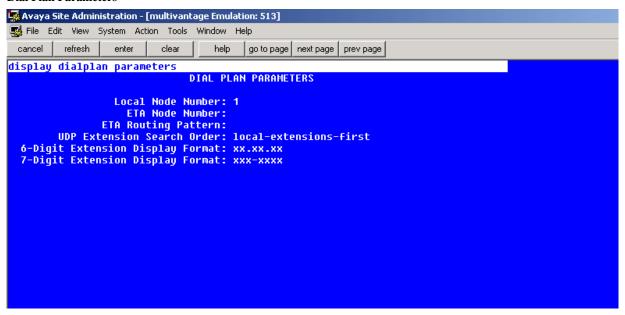
(NOTE: You must logoff & login to effect the permission changes.)
```

System Parameters Features

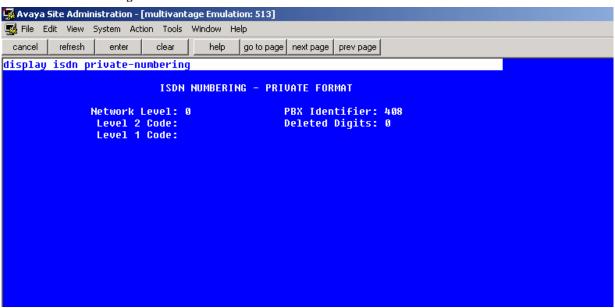
```
display system-parameters features
                                                                Page 7 of 12
                        FEATURE-RELATED SYSTEM PARAMETERS
ISDN PARAMETERS
 Send Non-ISDN Trunk Group Name as Connected Name? n
 Display Connected Name/Number for ISDN DCS Calls? n
       Send ISDN Trunk Group Name on Tandem Calls? n
                               QSIG TSC Extension: 2099
 MWI - Number of Digits Per Voice Mail Subscriber: 4
                                 Feature Plus Ext: 2098
                              National CPN Prefix:
                         International CPN Prefix:
                        Pass Prefixed CPN to ASAI? n
    Unknown Numbers Considered Internal for AUDIX? y
                                                            Maximum Length: 4
             USNI Calling Name for Outgoing Calls? y
               Path Replacement with Measurements? y
                  QSIG Path Replacement Extension: 2097
            Path Replace While in Queue/Vectoring? y
```



Dial Plan Parameters



ISDN Private Numbering

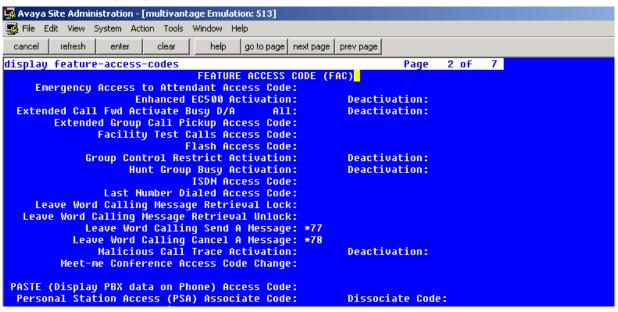




Feature Access Code (1 of 3)

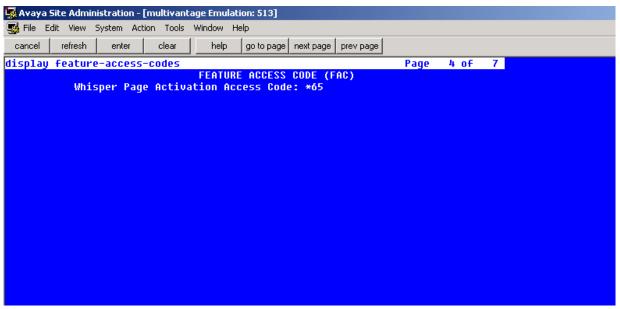
```
🧖 Avaya Site Administration - [multivantage Emulation: 513]
🕵 File Edit View System Action Tools Window Help
 cancel
           refresh.
                     enter
                              clear
                                        help
                                               go to page | next page | prev page
display feature-access-codes
                                                                               Page 1 of 7
                                      FEATURE ACCESS CODE (FAC)
           Abbreviated Dialing List1 Access Code:
           Abbreviated Dialing List2 Access Code:
Abbreviated Dialing List3 Access Code:
Abbreviated Dial - Prgm Group List Access Code:
                           Announcement Access Code:
       Answer Back Access Code:
Auto Alternate Routing (AAR) Access Code: 8
     Auto Route Selection (ARS) - Access Code 1: 9
Automatic Callback Activation:
                                                                   Access Code 2:
                                                                    Deactivation:
Call Forwarding Activation Busy/DA: *66
                                                    A11:
                                                           *67
                                                                    Deactivation: *69
                            Call Park Access Code:
Call Pickup Access Code:
CAS Remote Hold/Answer Hold-Unhold Access Code:
                      CDR Account Code Access Code:
                             Change COR Access Code:
                       Change Coverage Access Code:
                      Data Origination Access Code:
                           Data Privacy Access Code:
```

Feature Access Code (2 of 3)

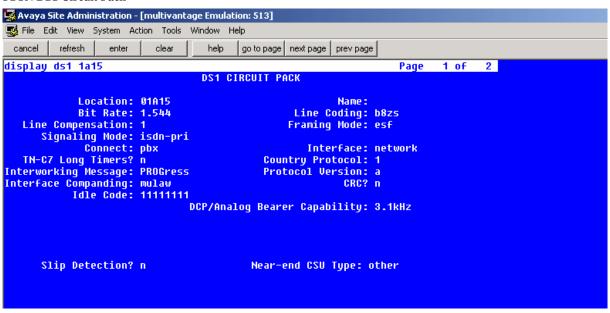




Feature Access Code (3 of 3)

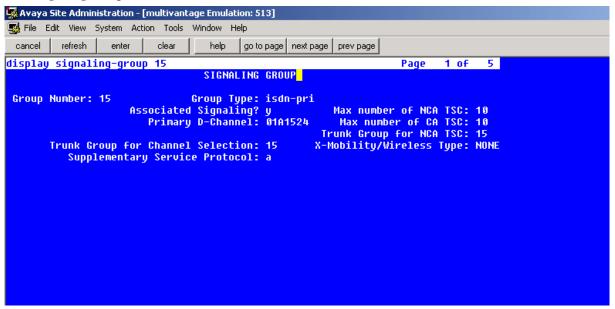


PSTN DS1 Circuit Pack

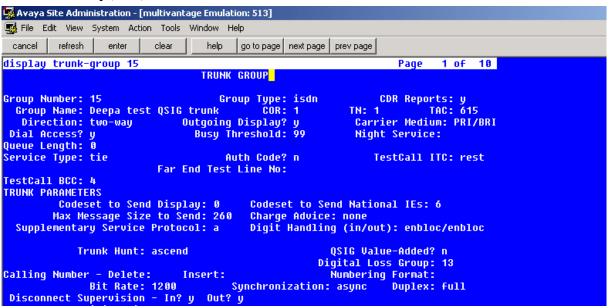




PSTN Signaling Group

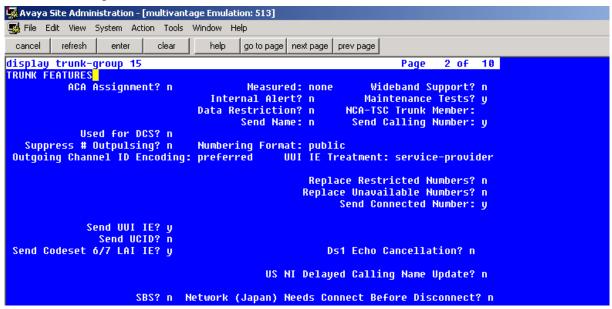


PSTN Trunk Group (1 of 3)

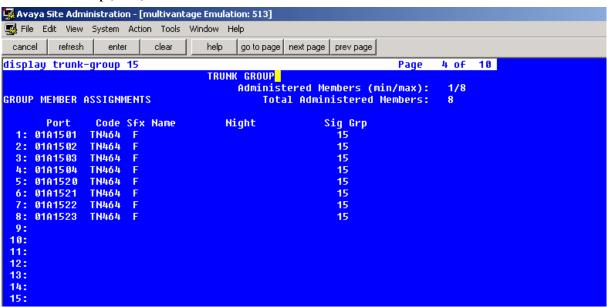




PSTN Trunk Group (2 of 3)

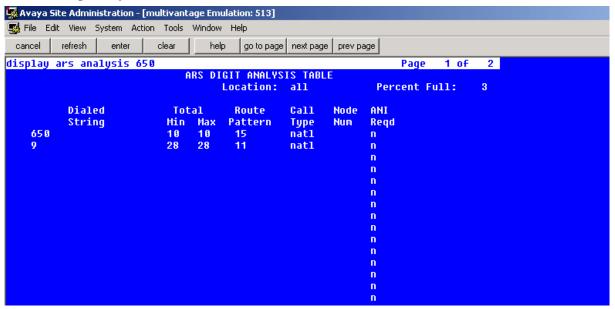


PSTN Trunk Group (3 of 3)

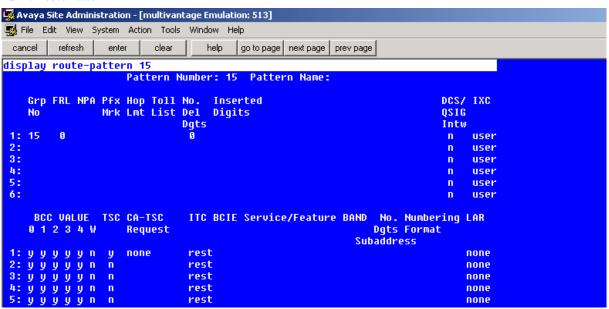




PSTN ARS Digit Analysis Table

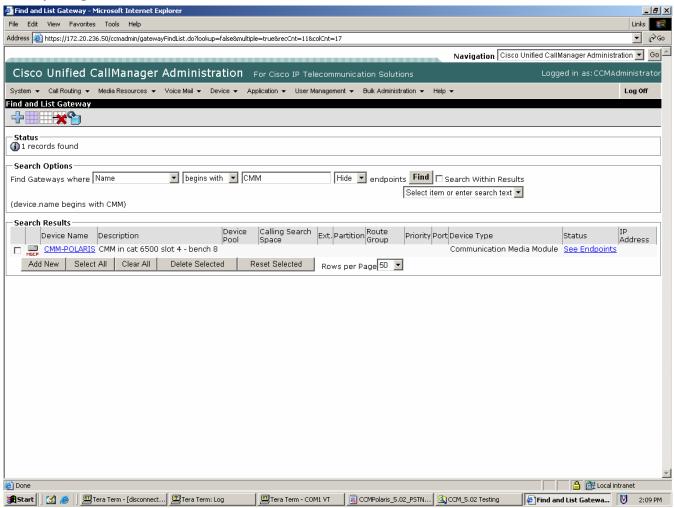


PSTN Route Pattern

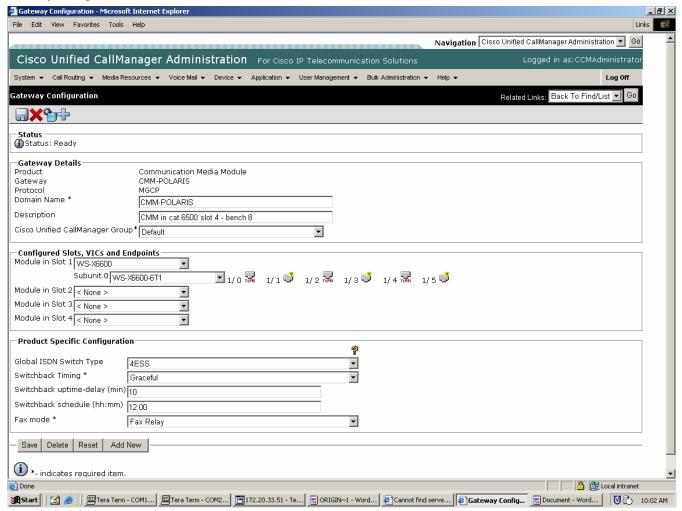




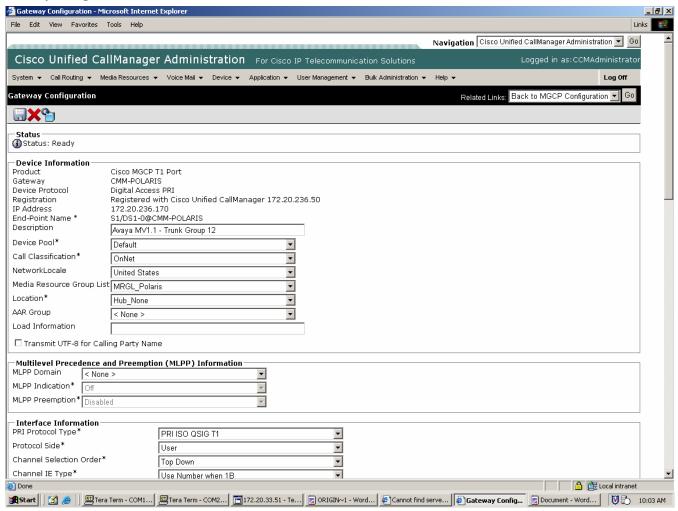
Cisco Unified CallManager Configuration



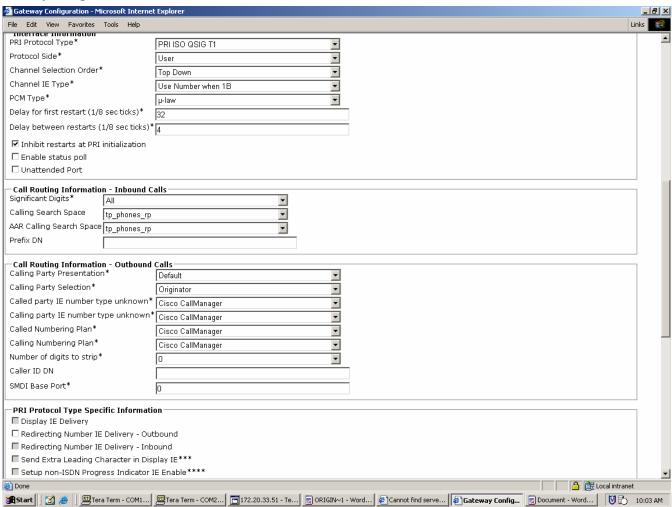




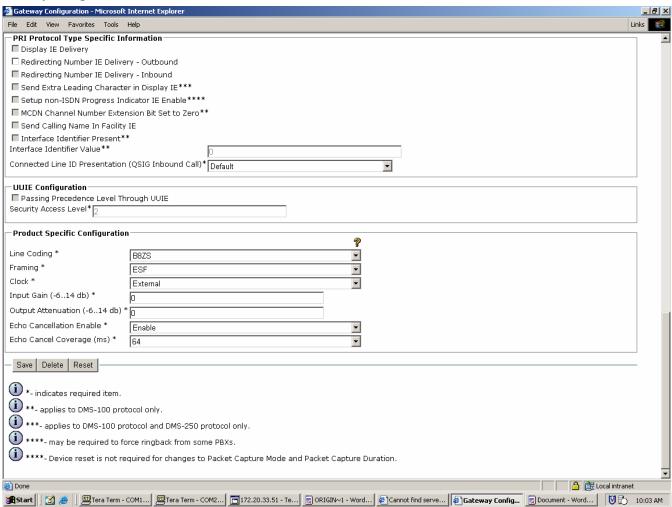




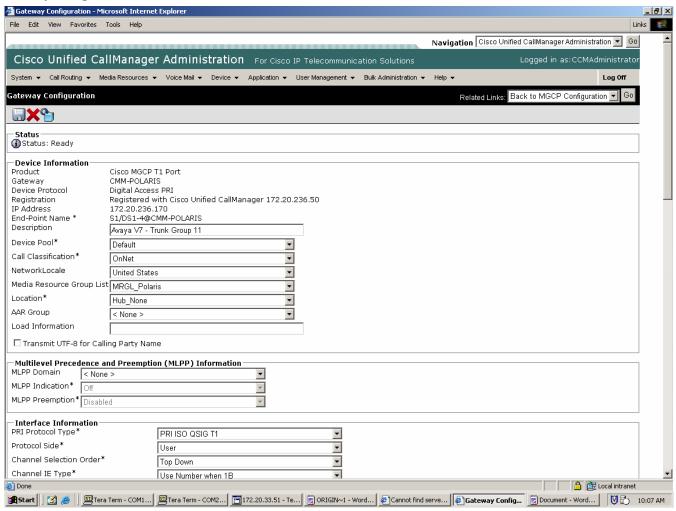




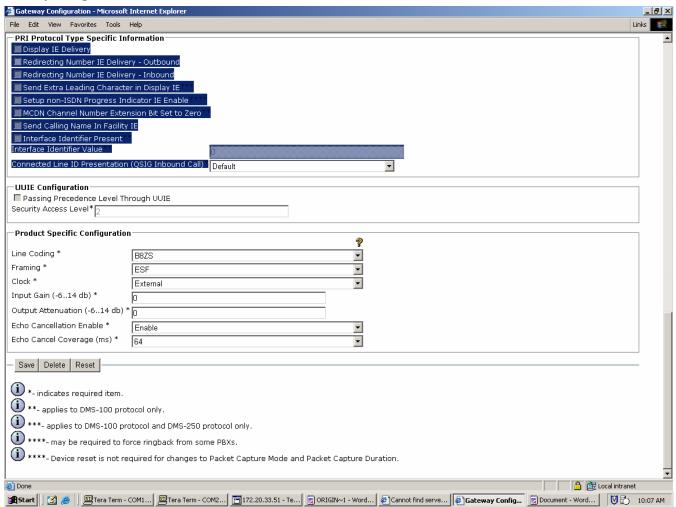




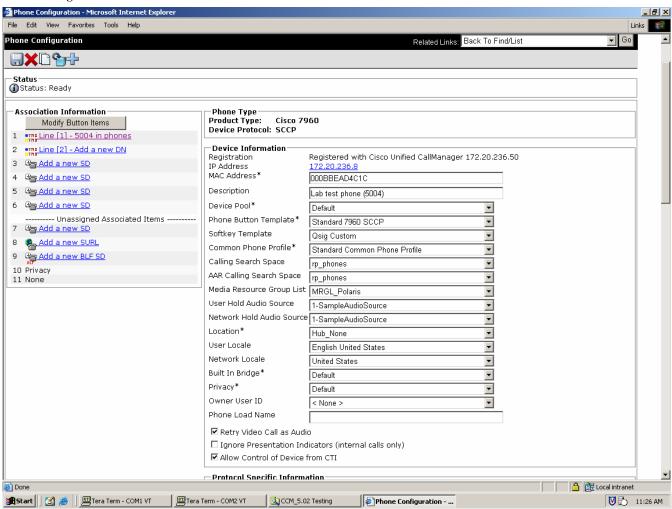




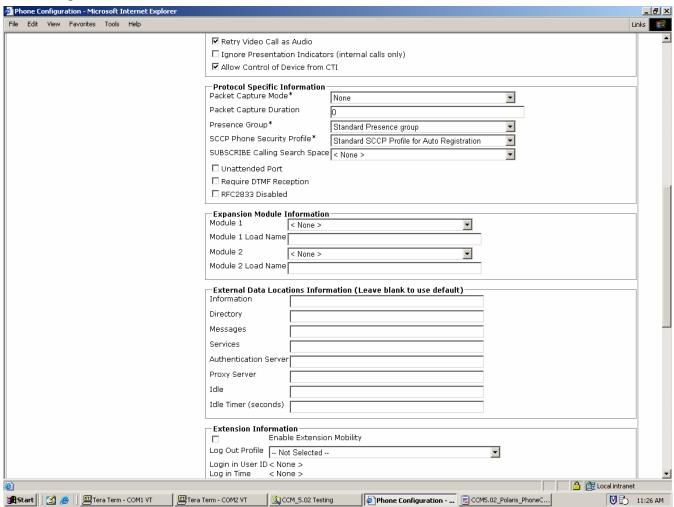




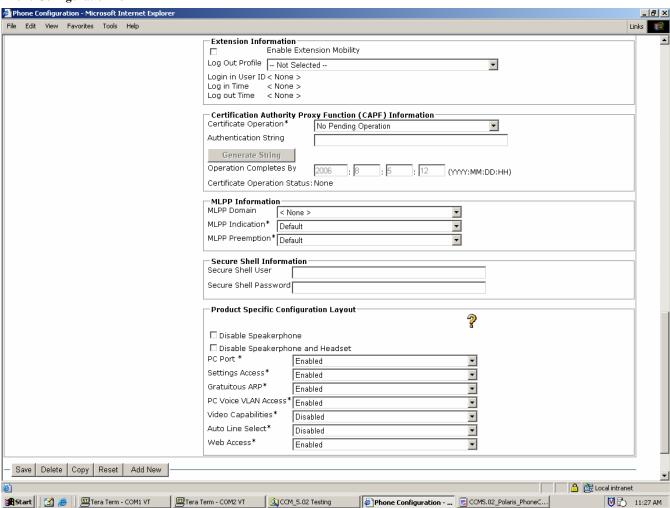




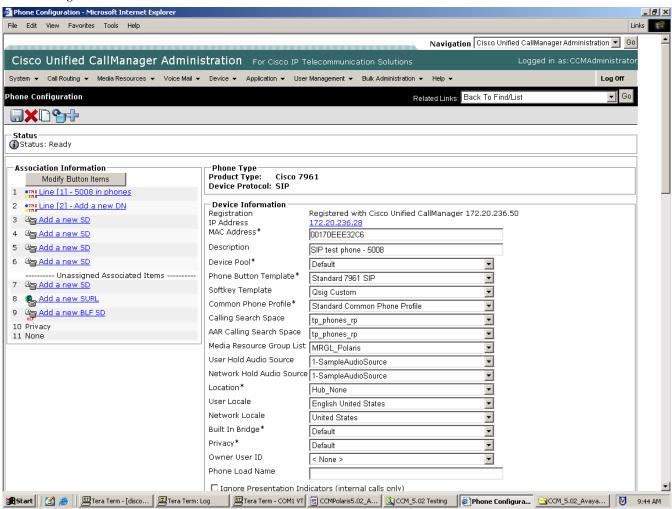




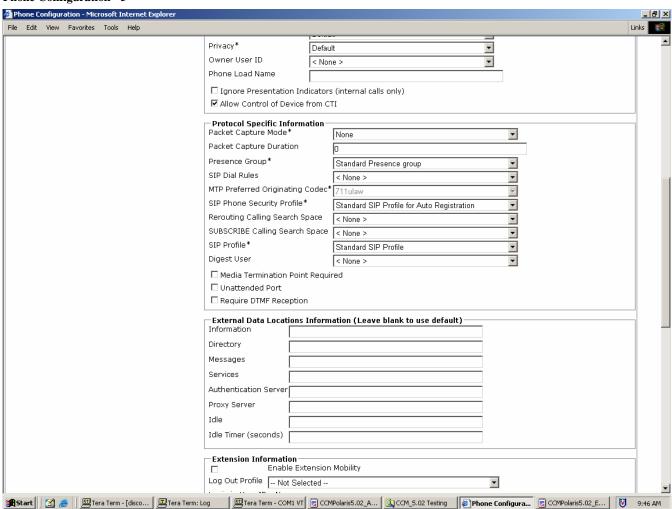




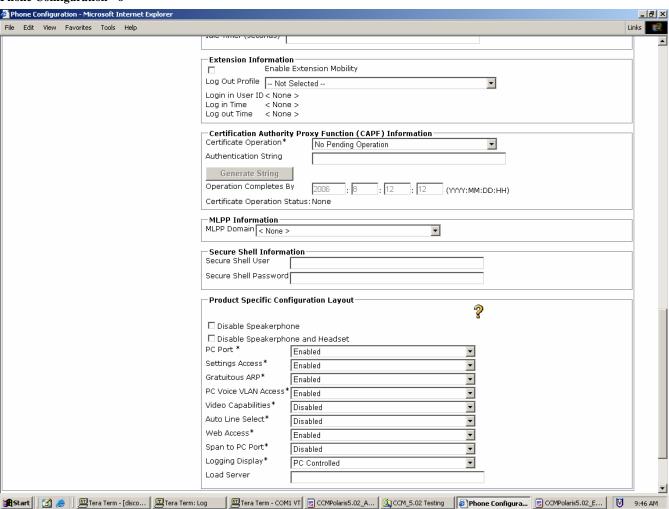




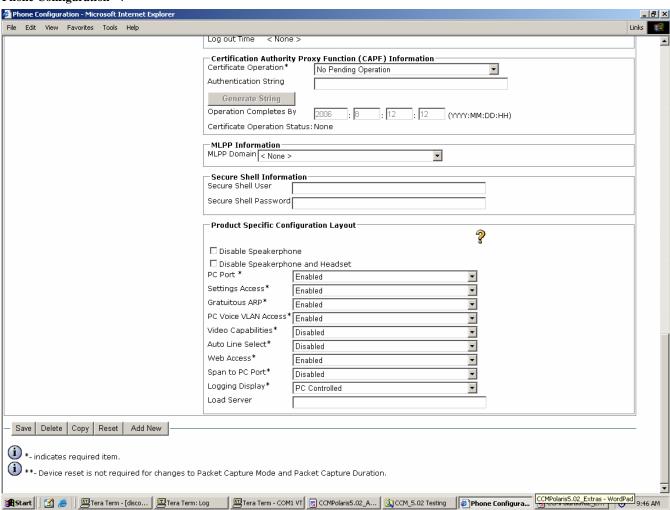




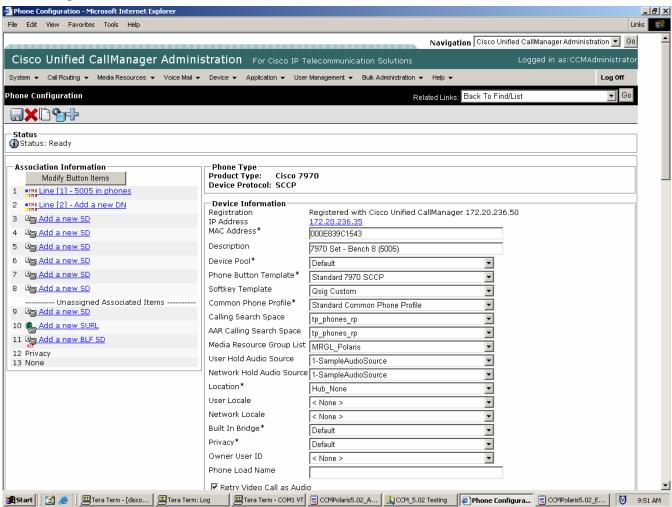




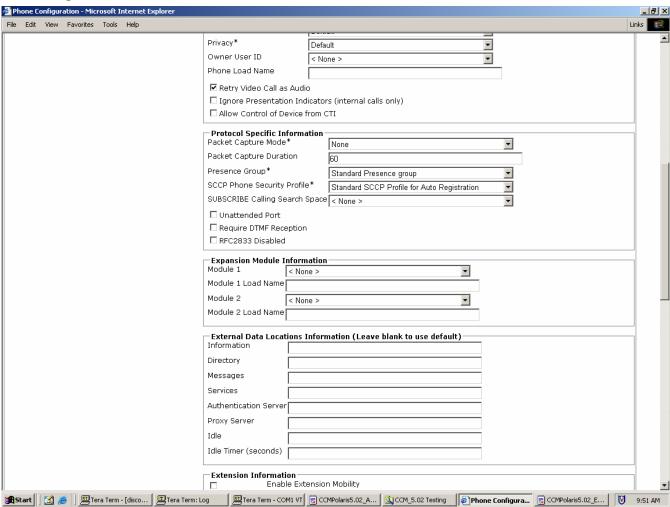




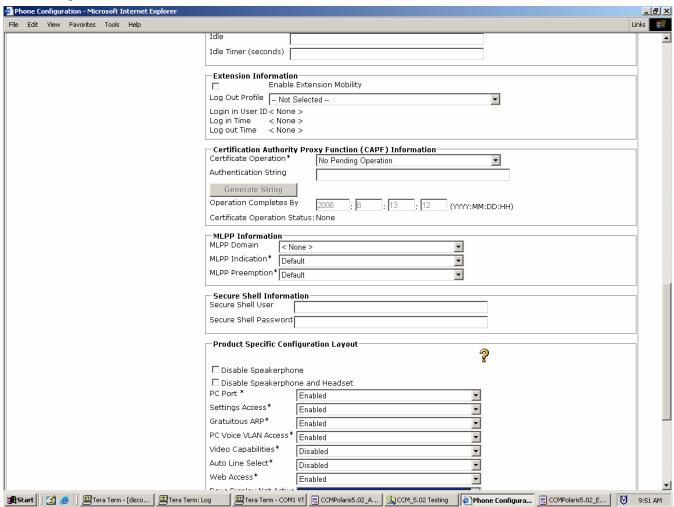




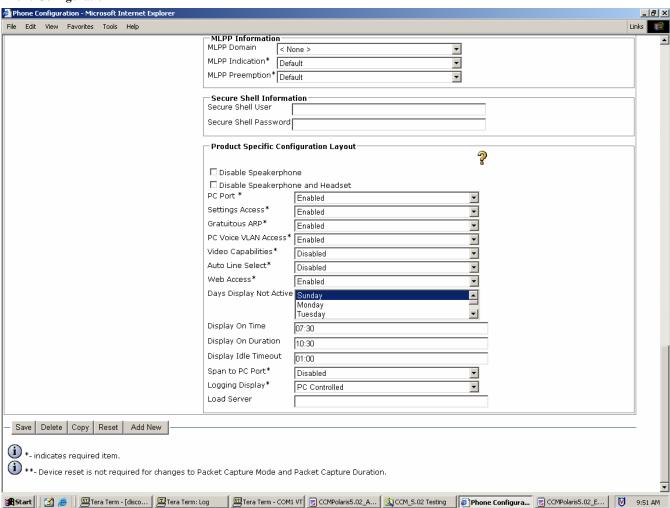






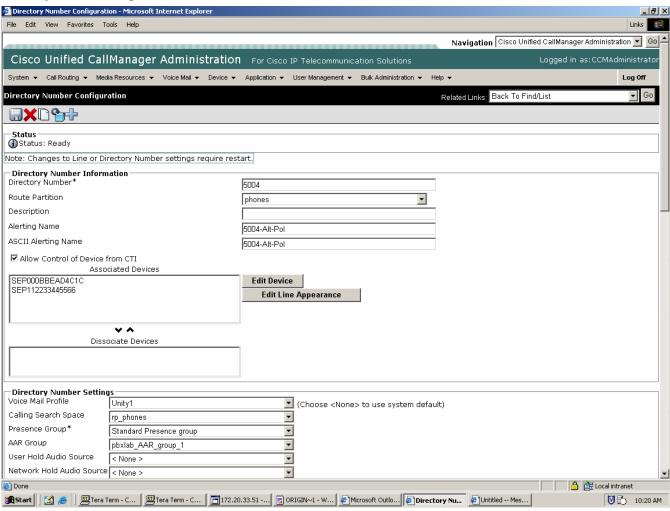






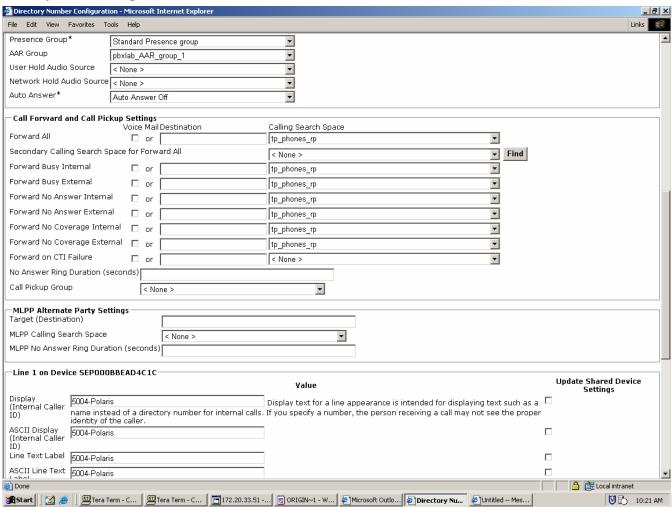


Directory Number Configuration - 1

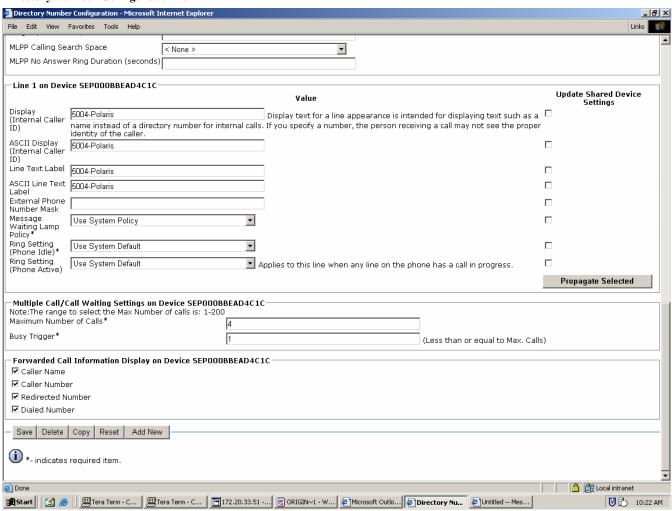




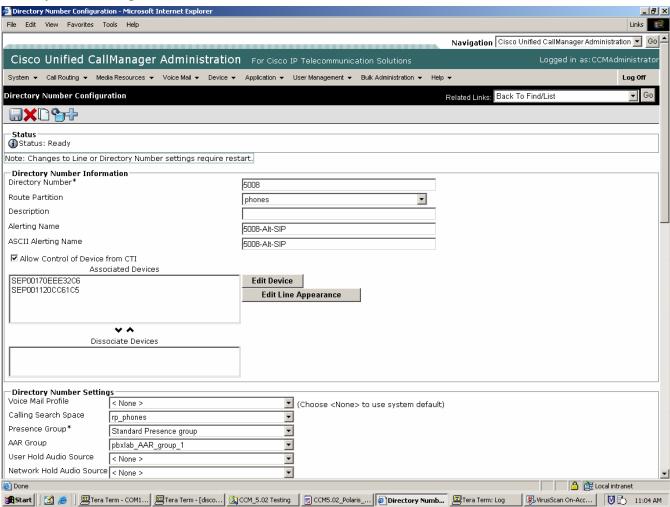
Directory Number Configuration - 2



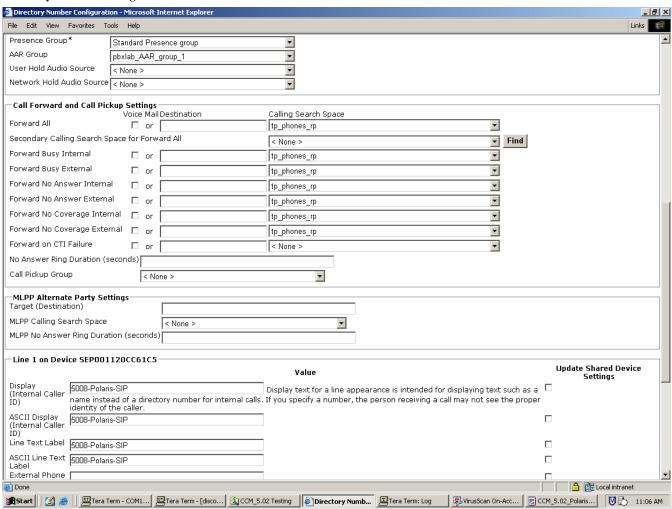




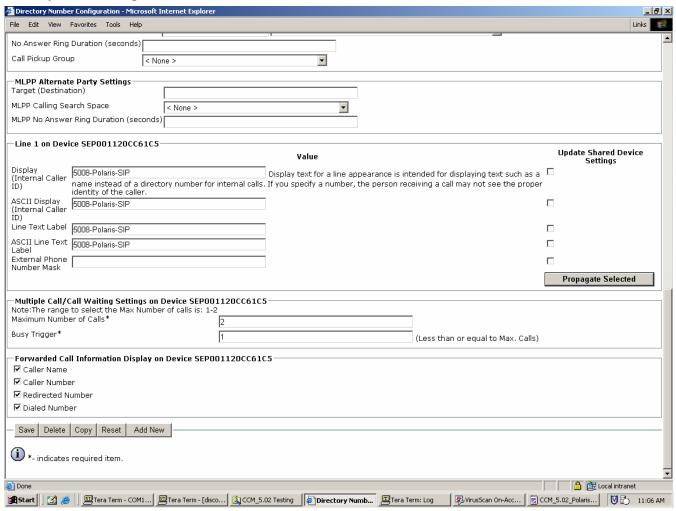




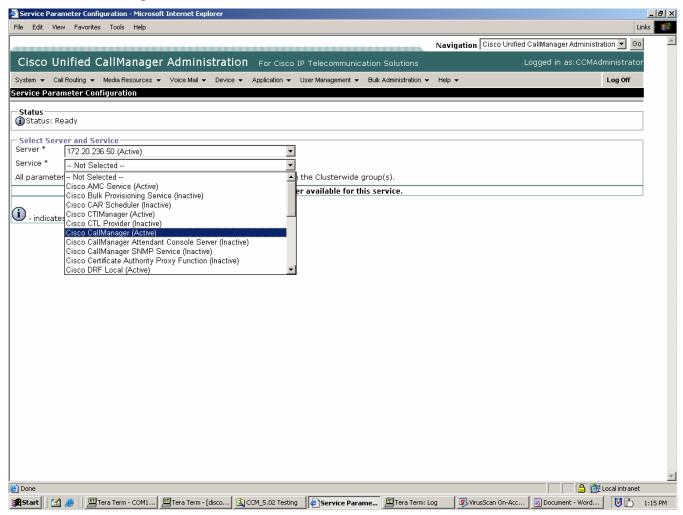




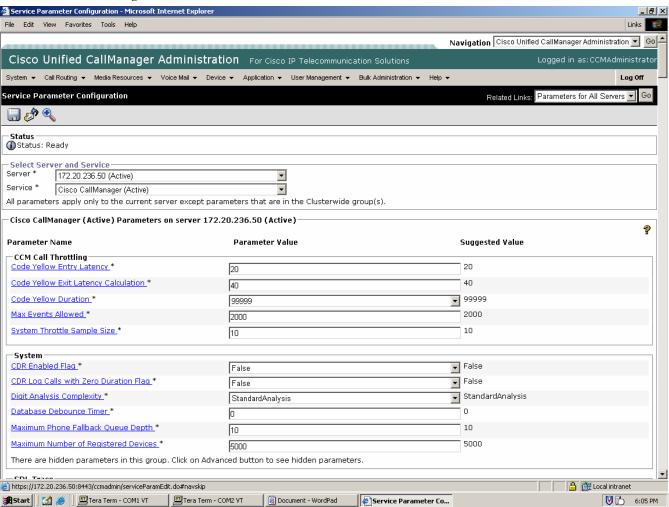




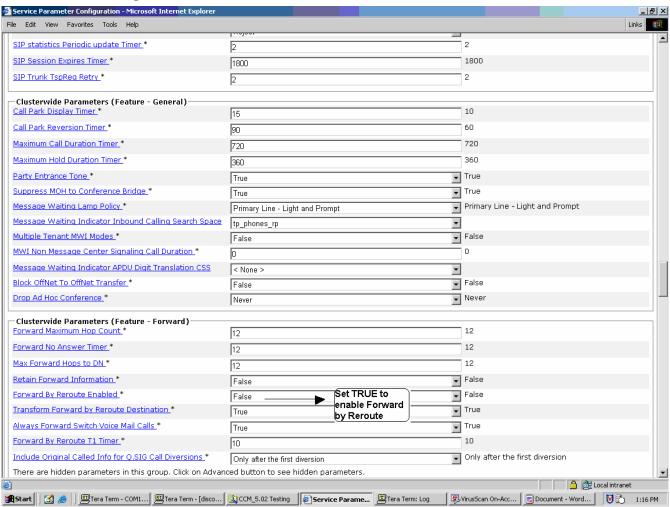




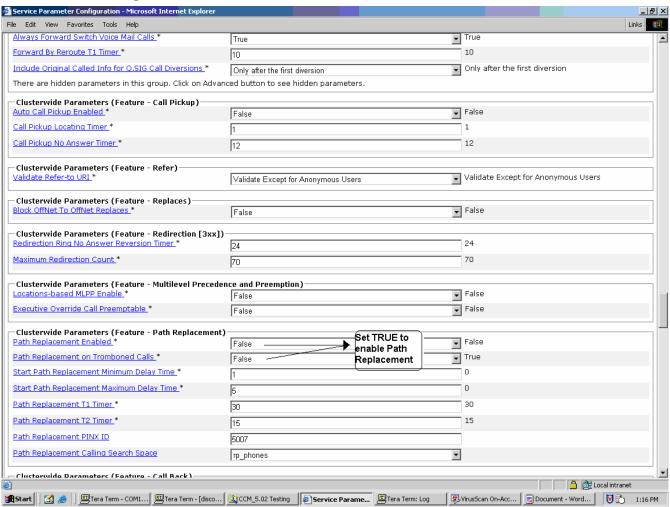




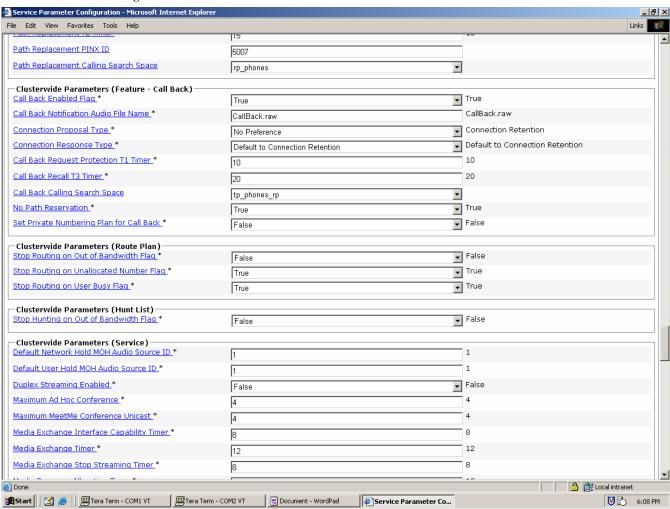




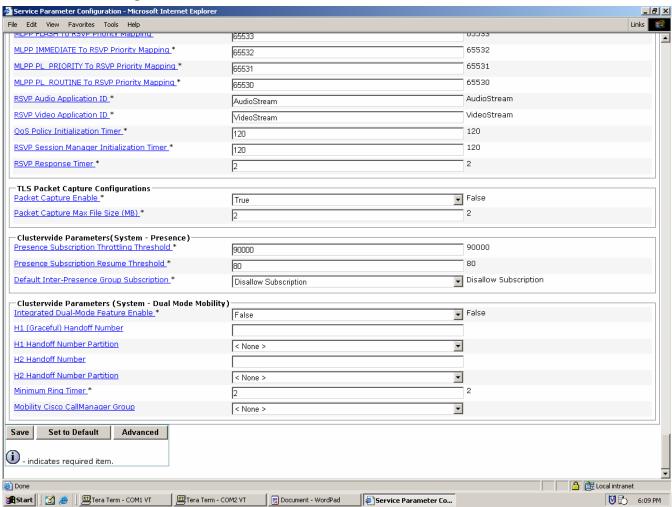






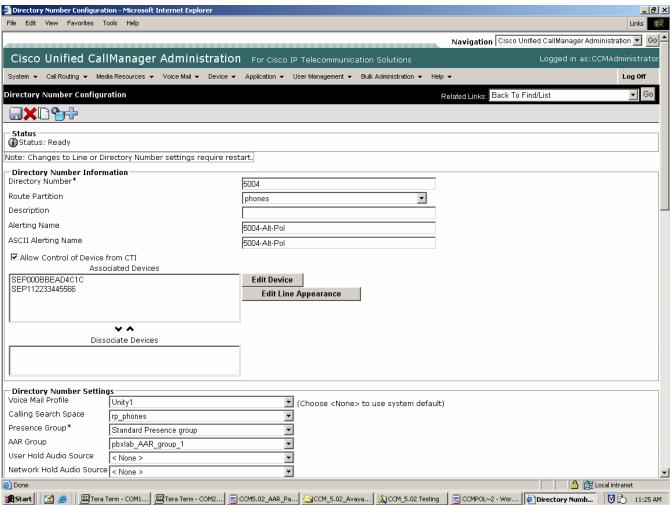






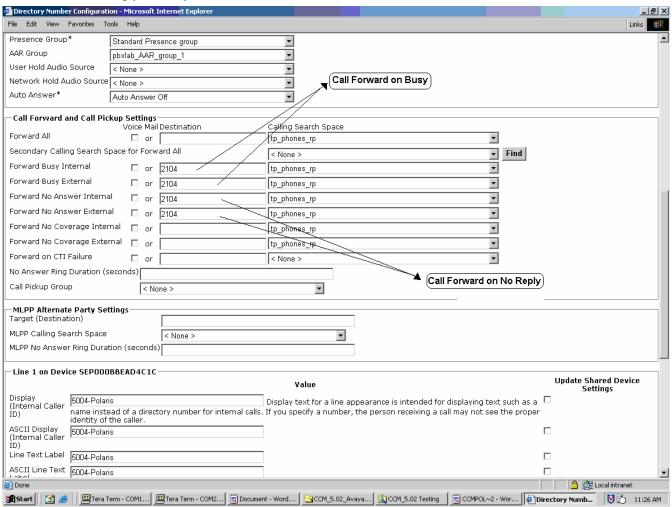


Call Forward on No Reply and Busy - 1



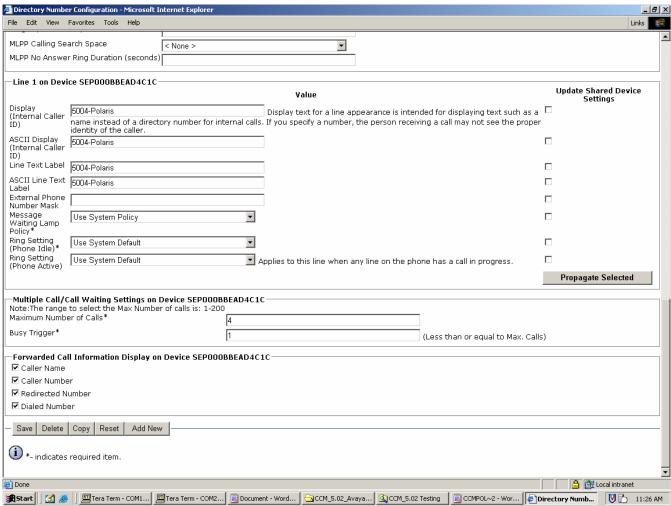


Call Forward on No Reply and Busy - 2



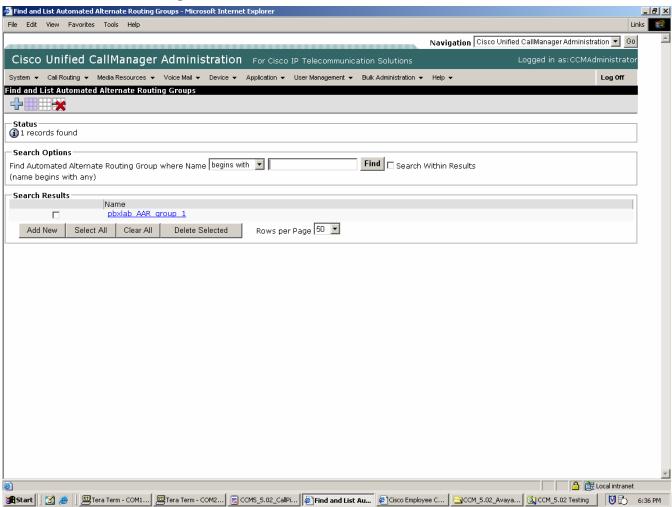


Call Forward on No Reply and Busy - 3



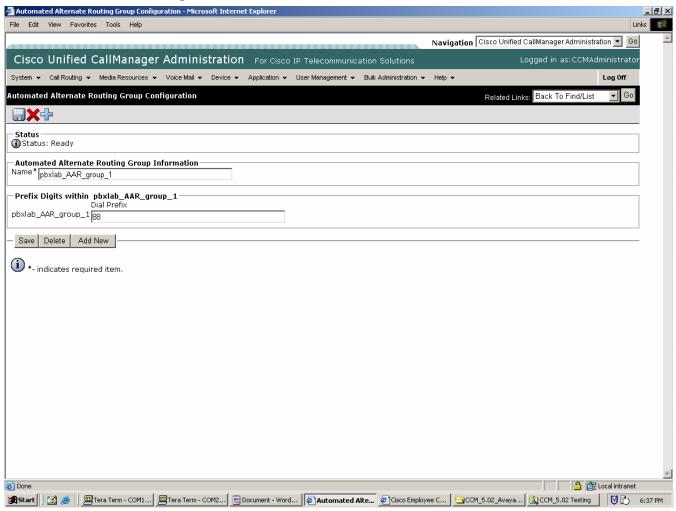


Automated Alternate Route Configuration - 1

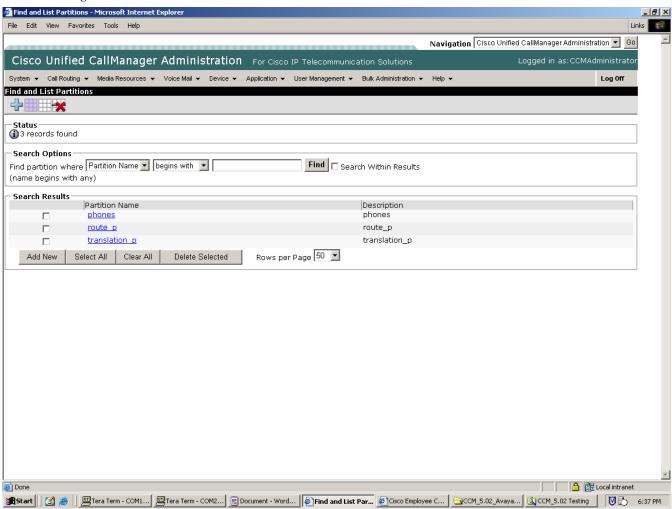




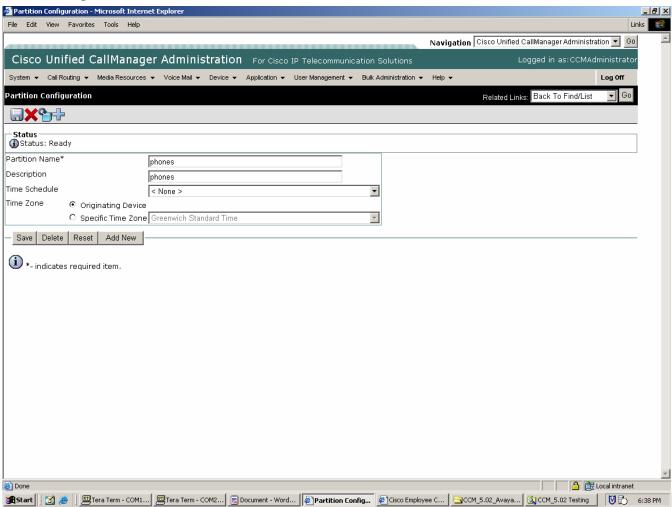
Automated Alternate Route Configuration - 2



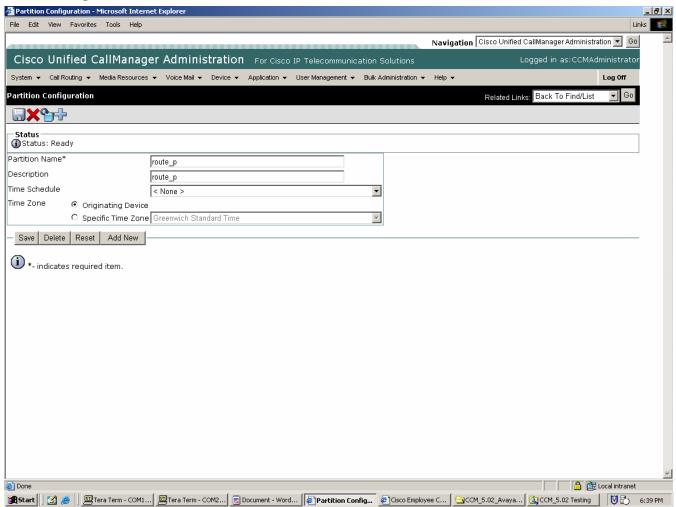




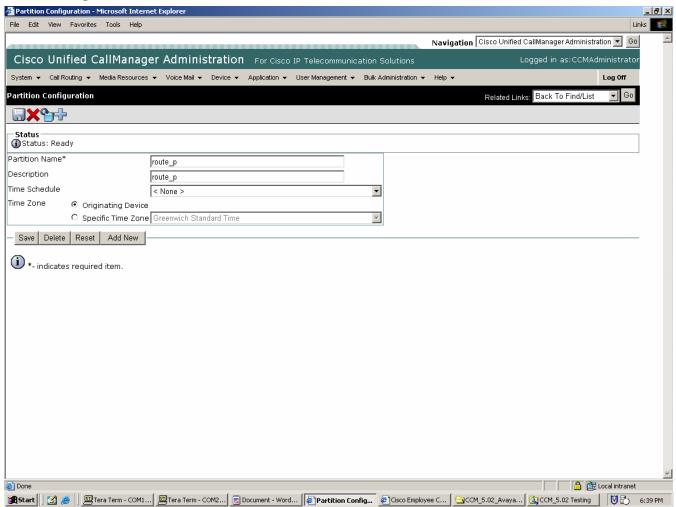




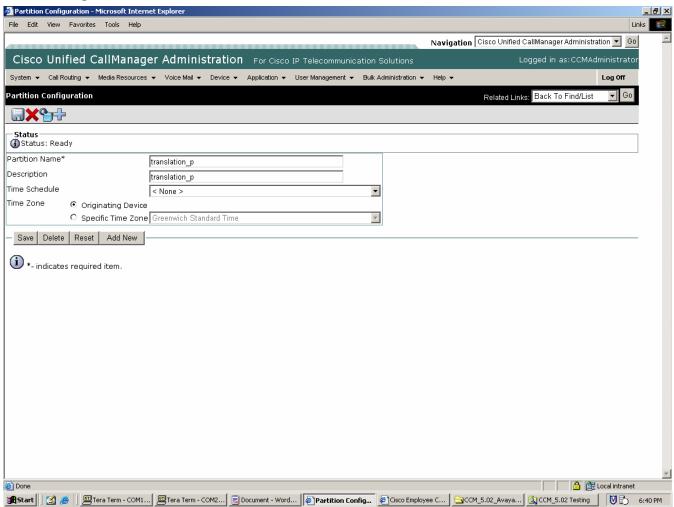






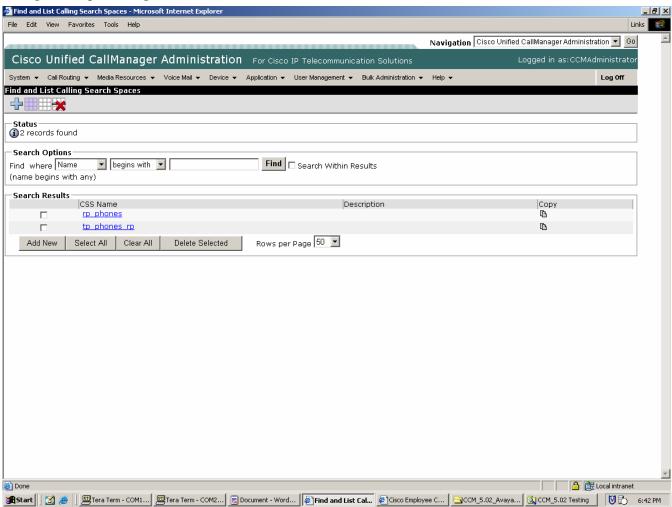






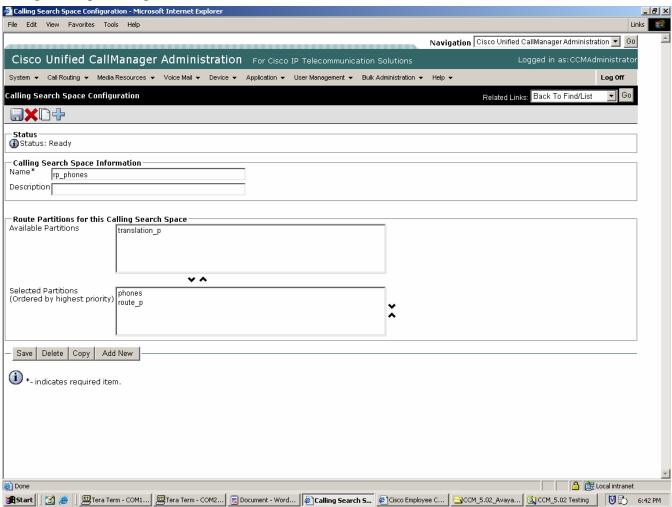


Calling Search Space Configuration - 1



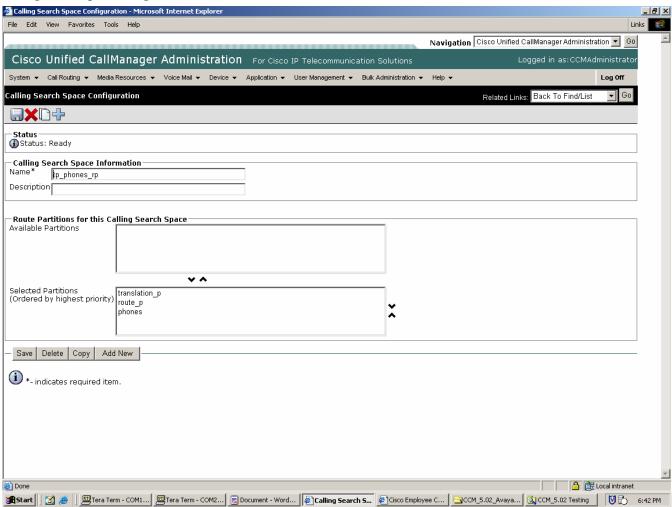


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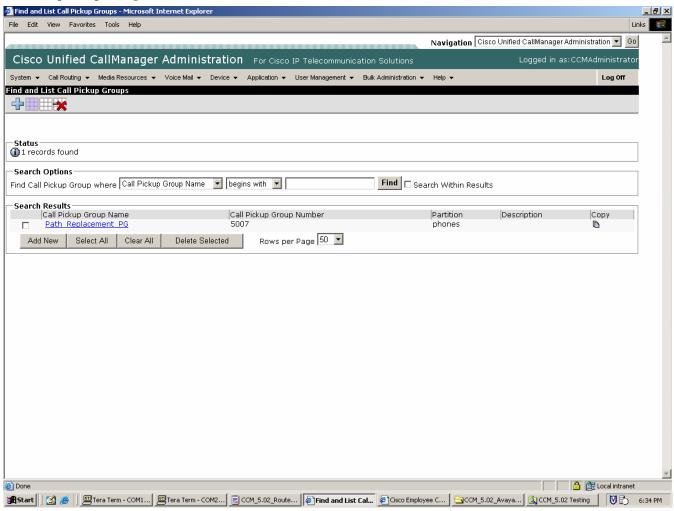


Calling Search Space Configuration - 3



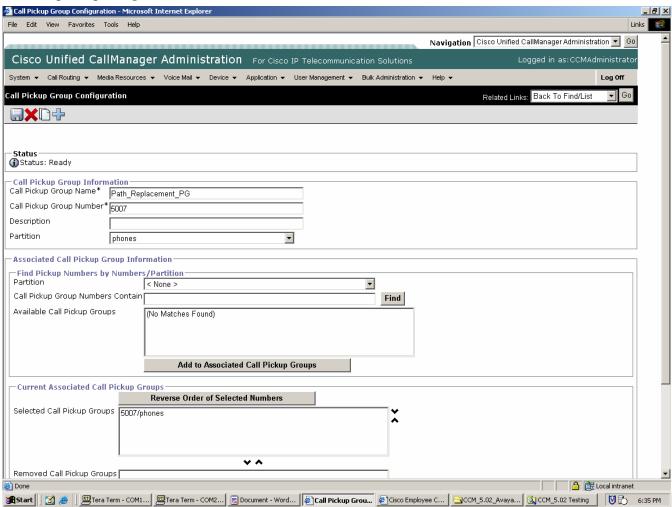


Call Pickup Group Configuration - 1



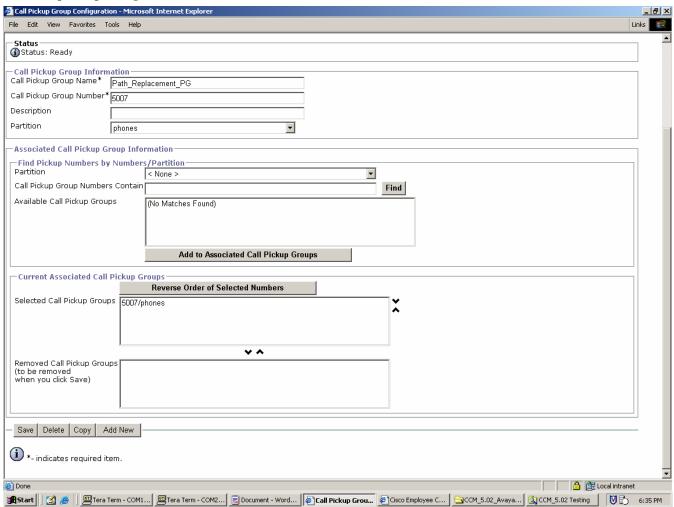


Call Pickup Group Configuration - 2

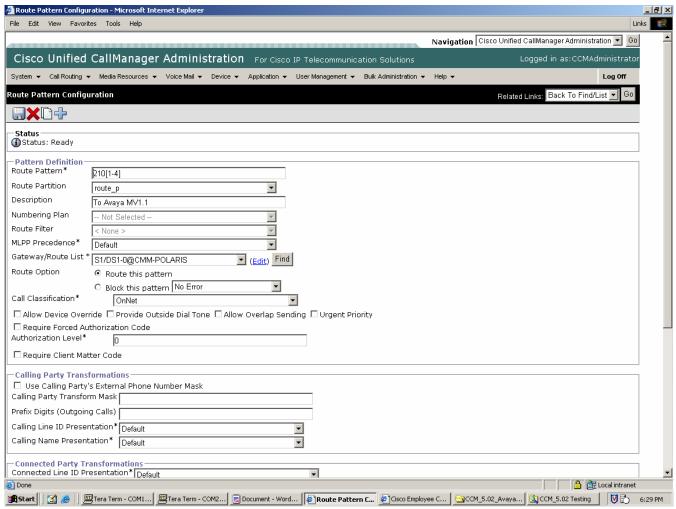




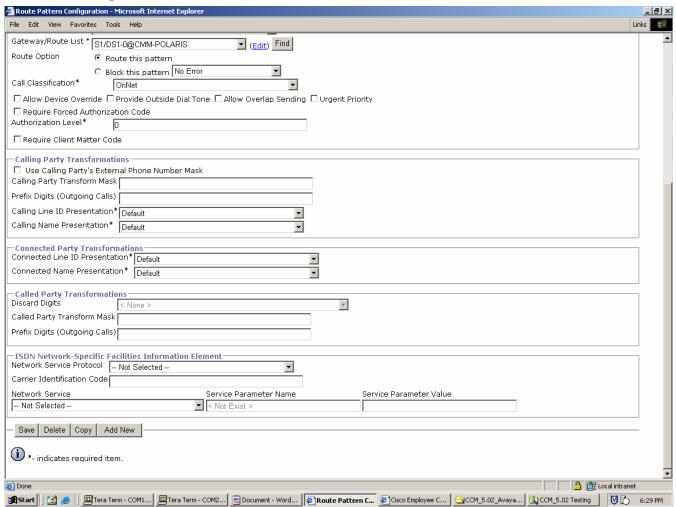
Call Pickup Group Configuration - 3



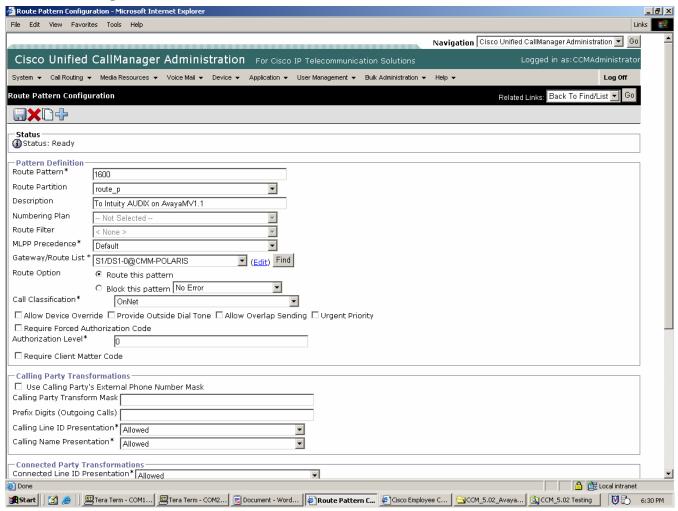




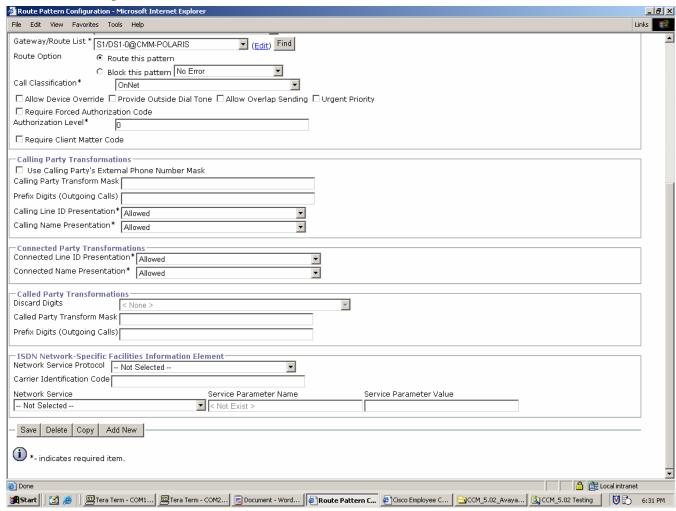






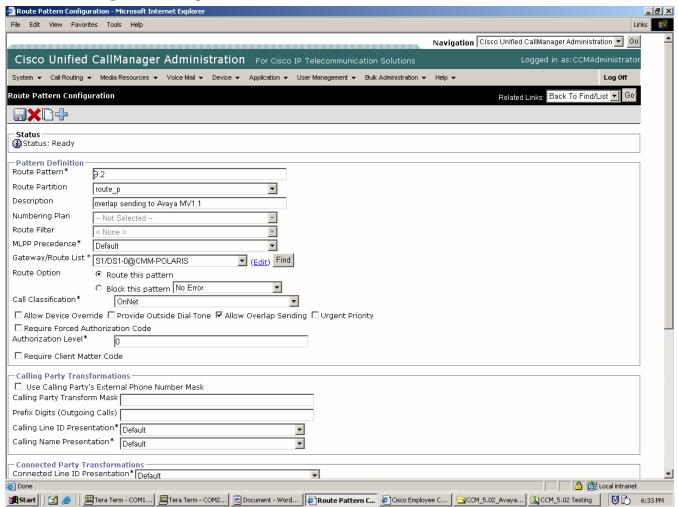






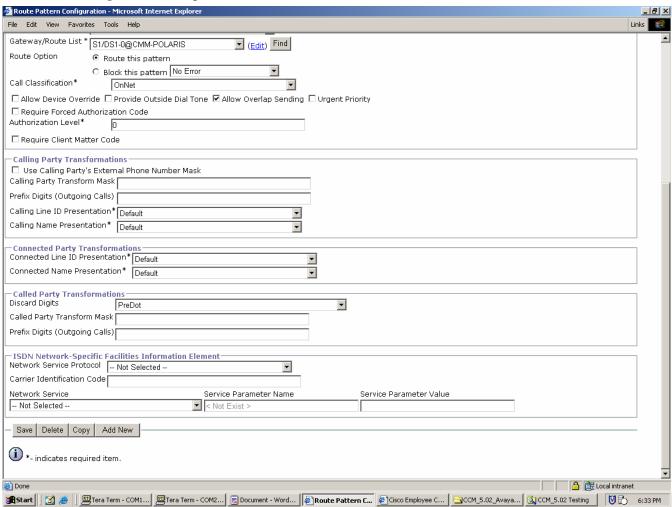


Route Pattern Configuration (Overlap) - 1





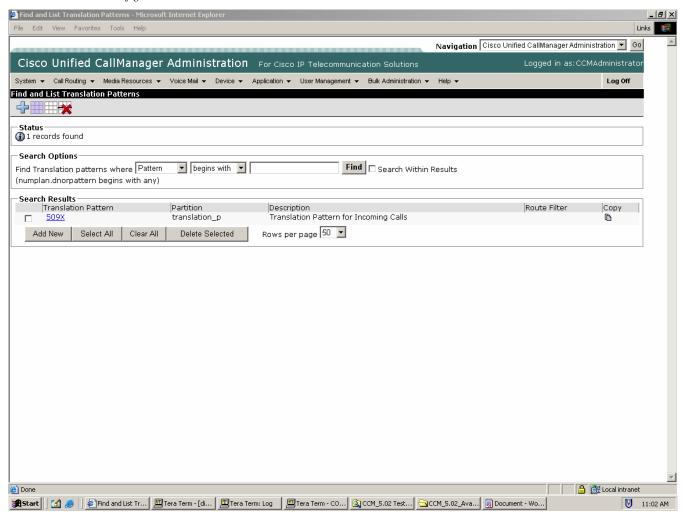
Route Pattern Configuration (Overlap) - 2





Connected Name and Number Restriction (CONR, COLR) - 1

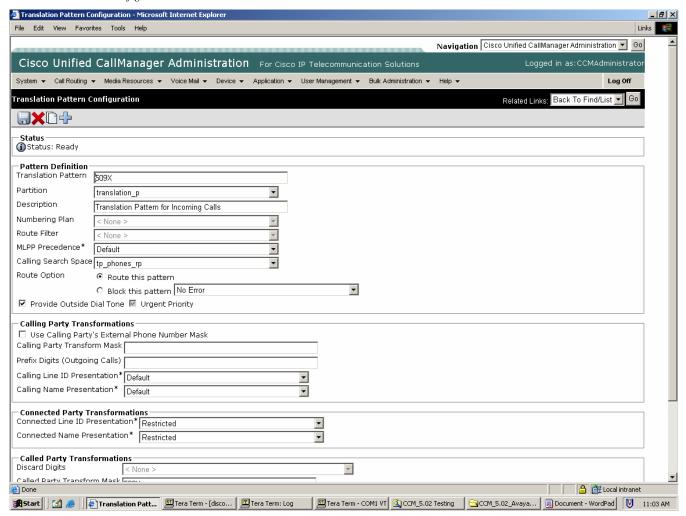
Translation Pattern Configuration





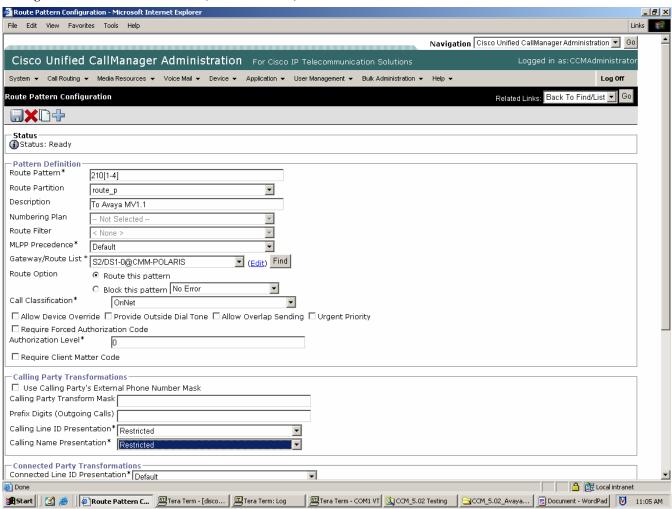
Connected Name and Number Restriction (CONR, COLR) - 2

Translation Pattern Configuration



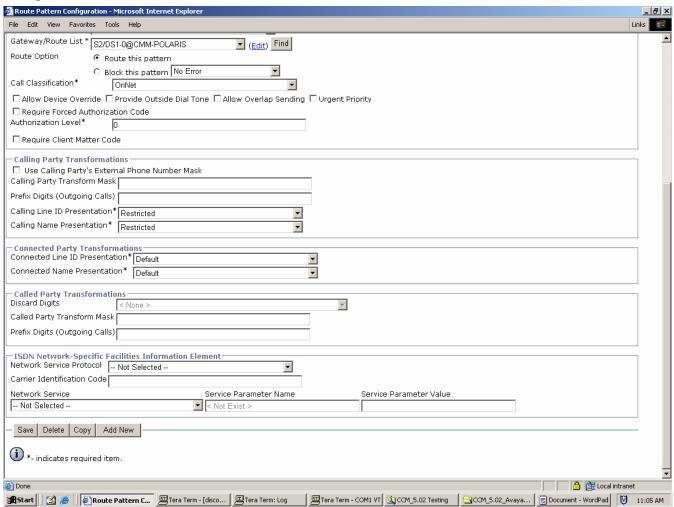


Calling Name and Number Restriction (CNIR and CLIR) - 1



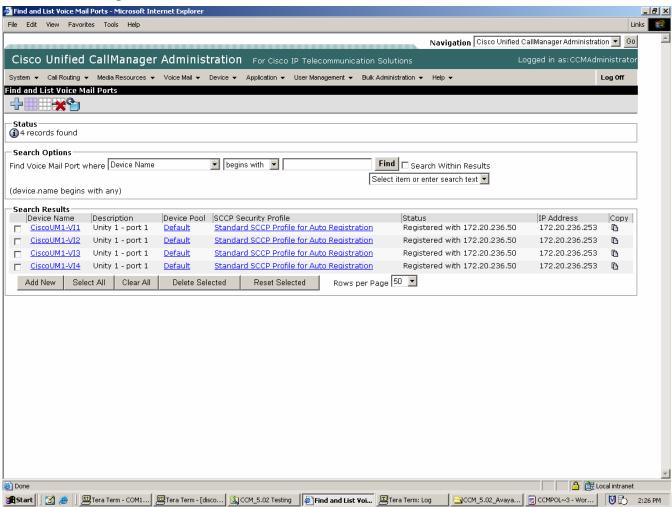


Calling Name and Number Restriction (CNIR and CLIR) - 2



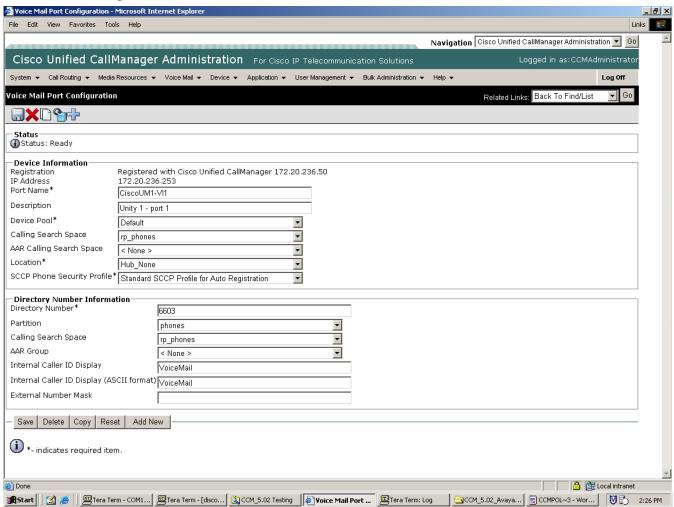


Voice Mail Port Configuration - 1



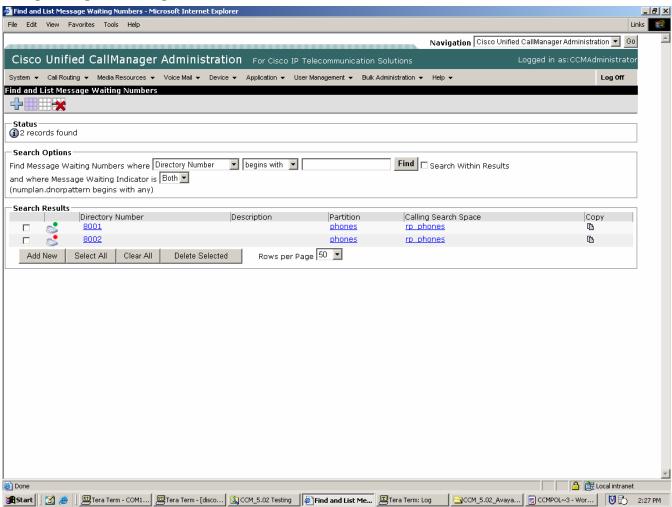


Voice Mail Port Configuration - 2



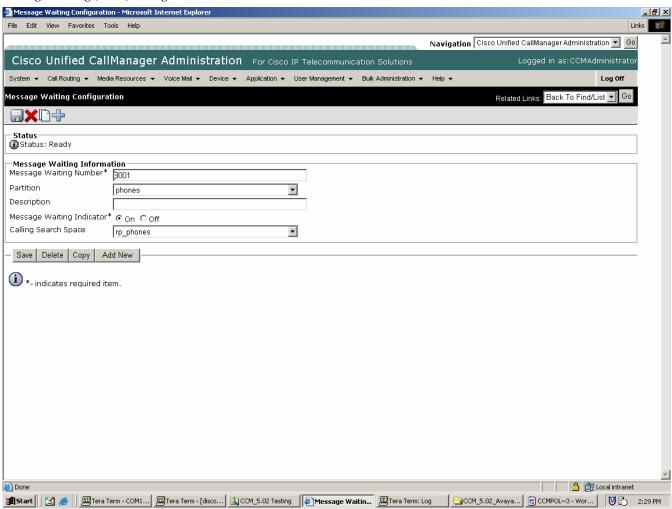


Message Waiting (MWI) Configuration - 1



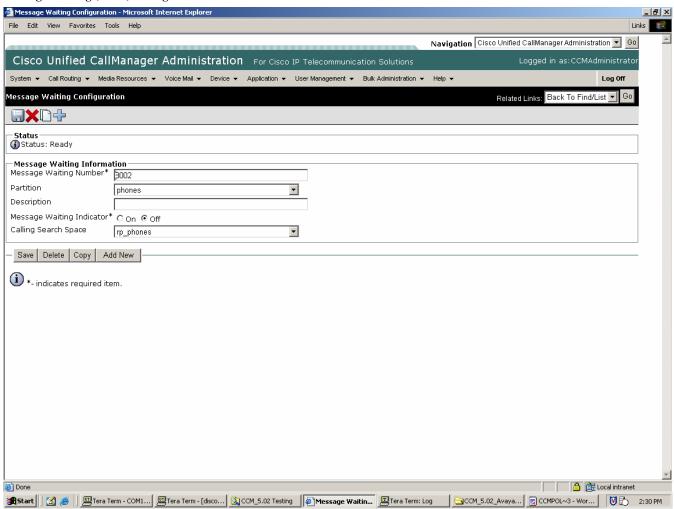


Message Waiting (MWI) Configuration - 2



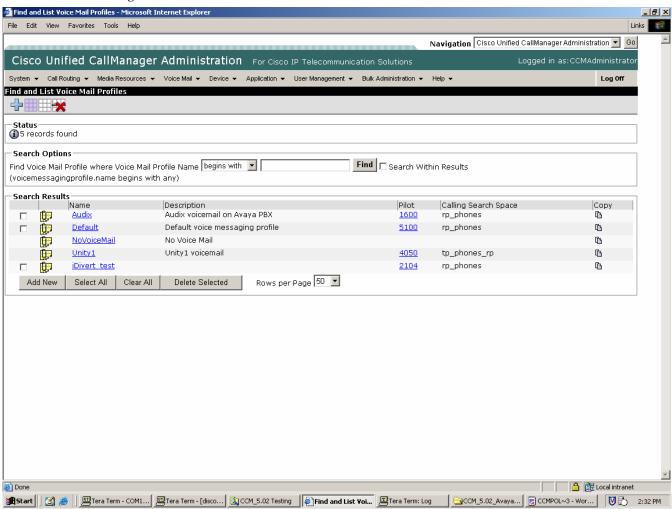


Message Waiting (MWI) Configuration - 3



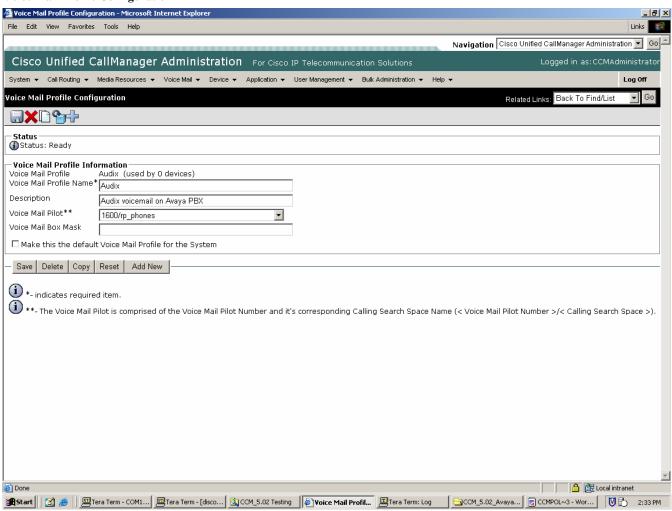


Voice Mail Profile Configuration - 1



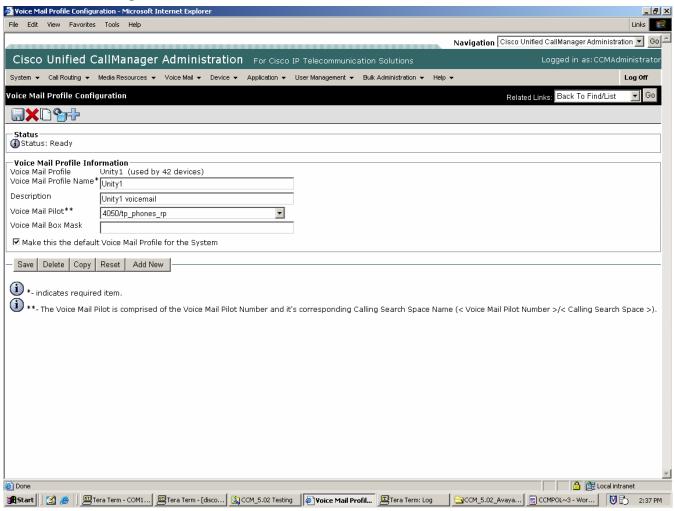


Voice Mail Profile Configuration - 2



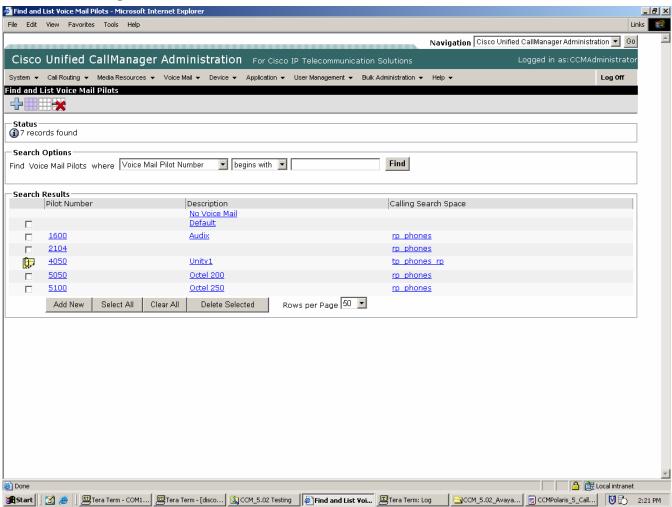


Voice Mail Profile Configuration - 3



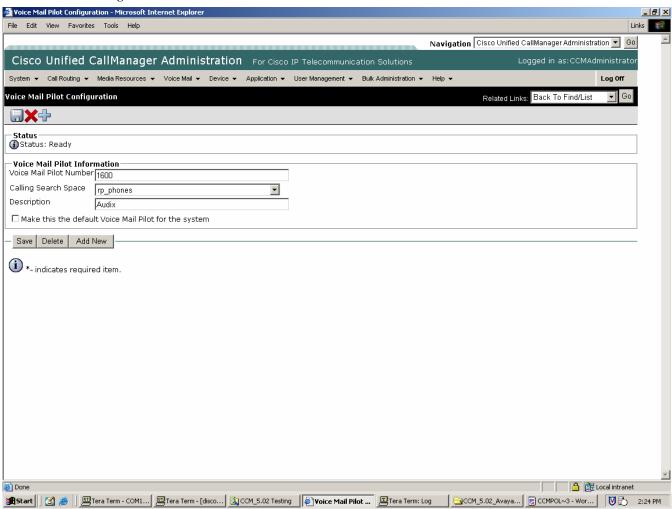


Voice Mail Pilot Configuration - 1



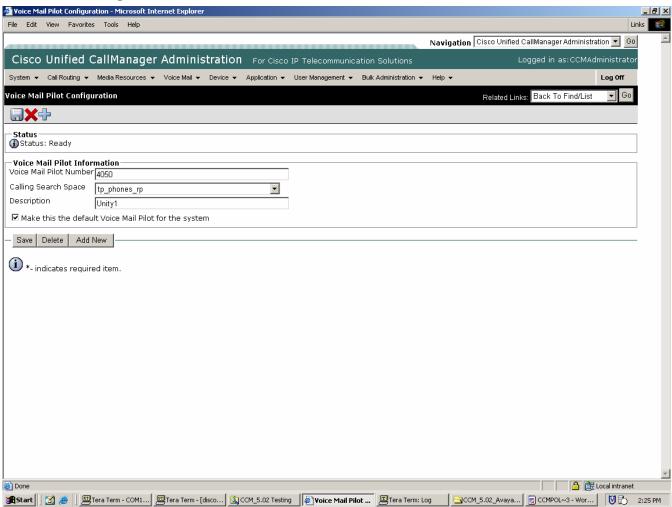


Voice Mail Pilot Configuration - 2

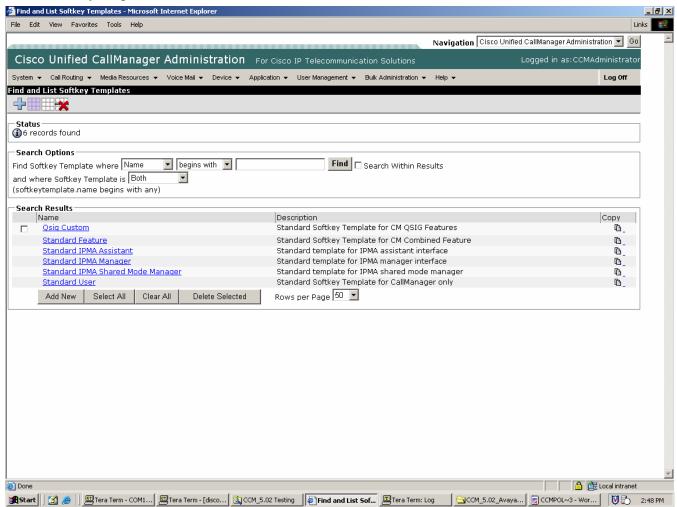




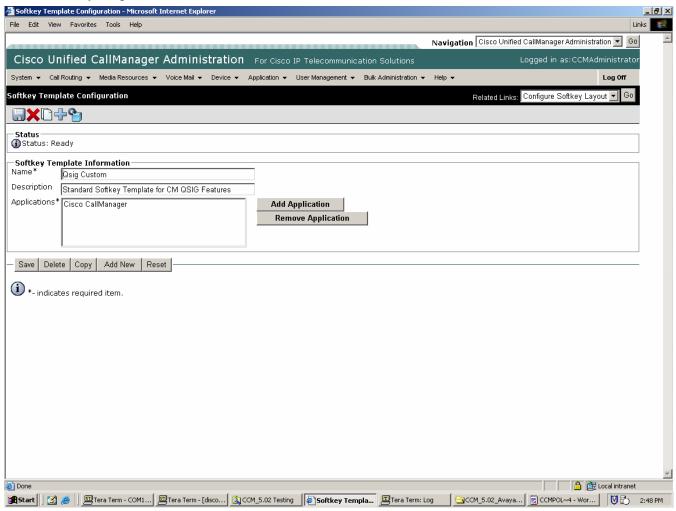
Voice Mail Pilot Configuration - 3



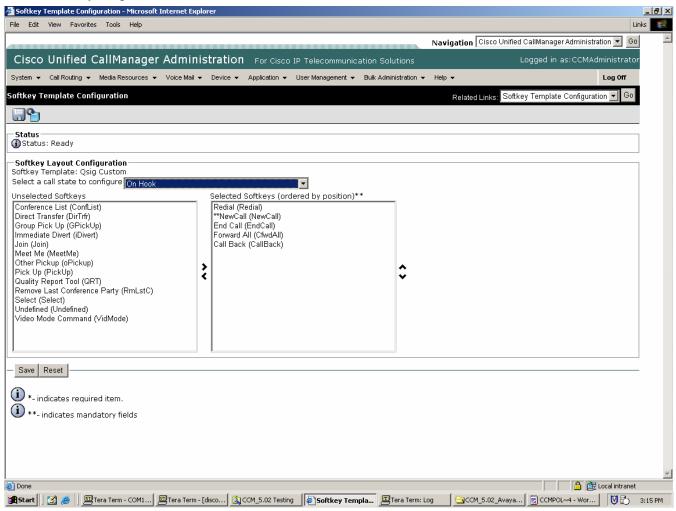




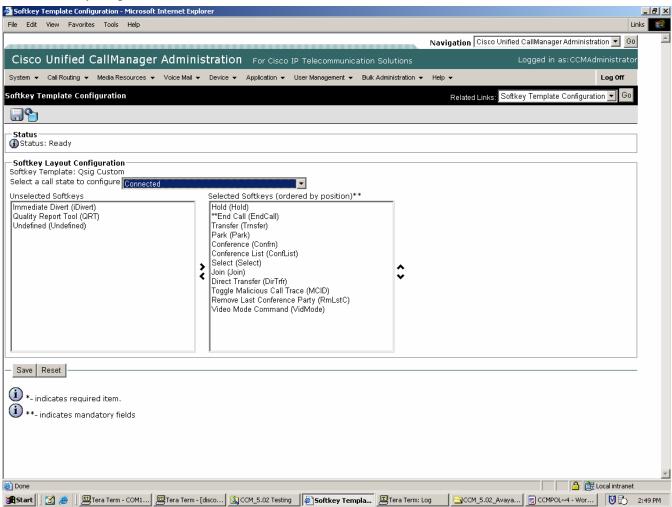




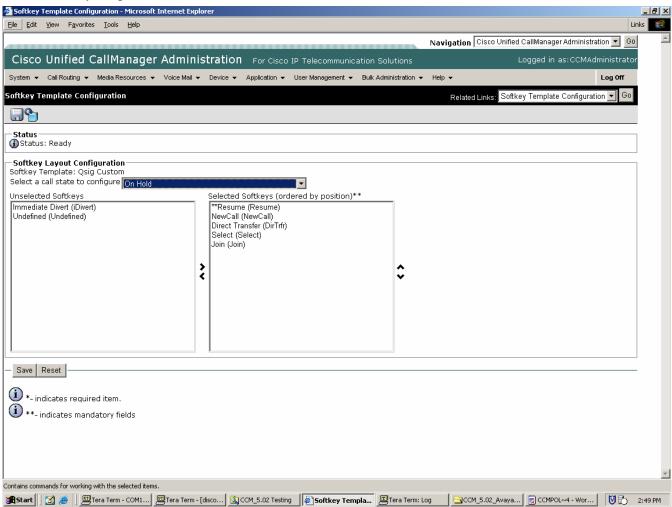




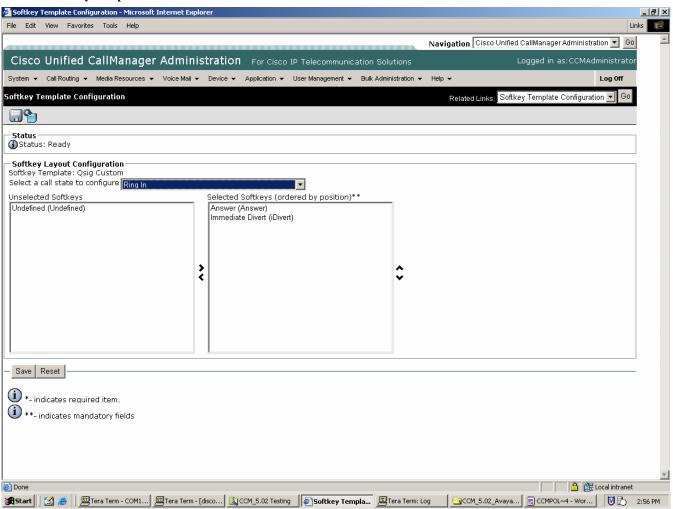




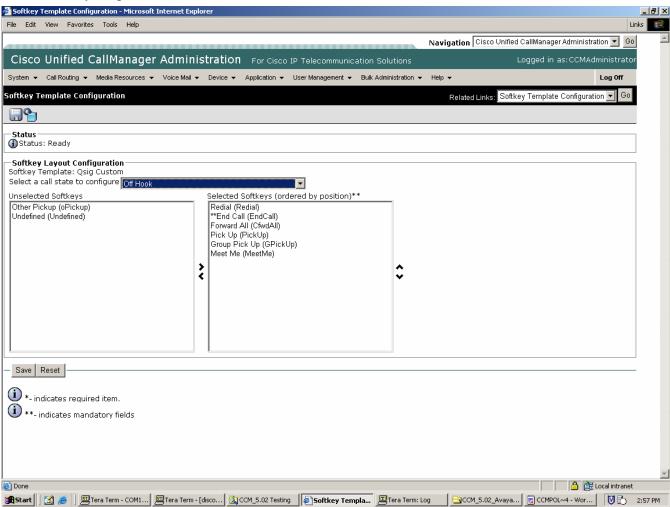




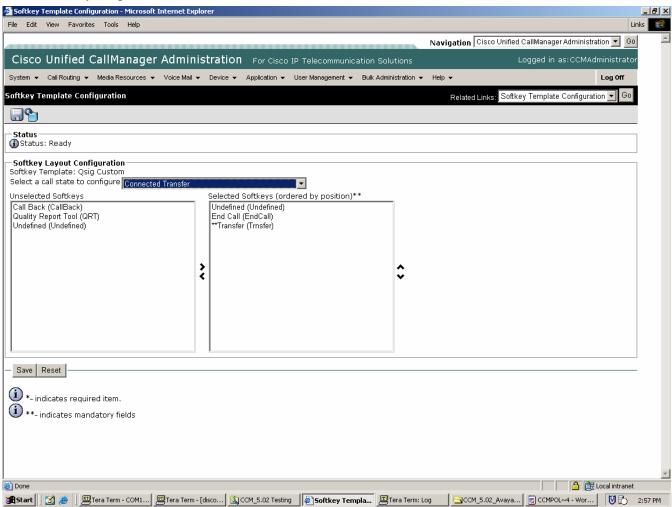




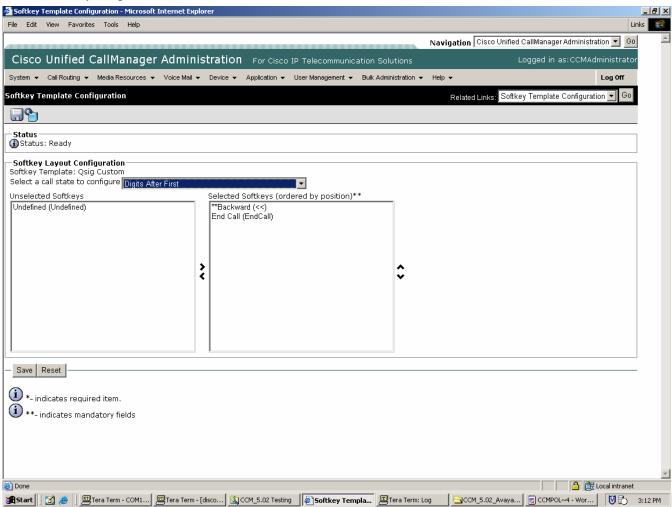




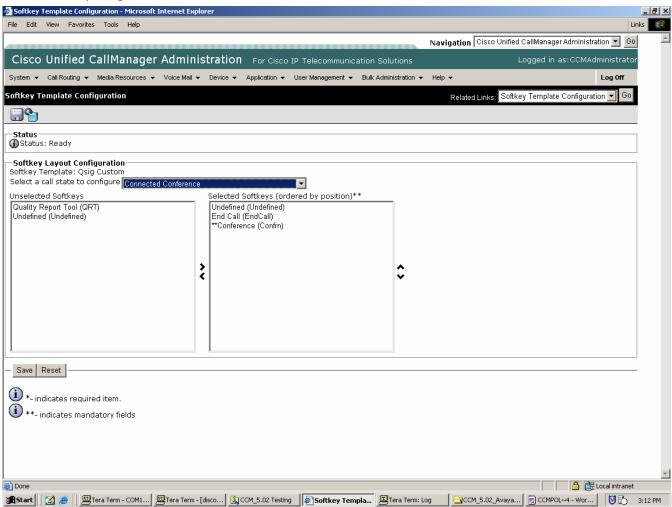




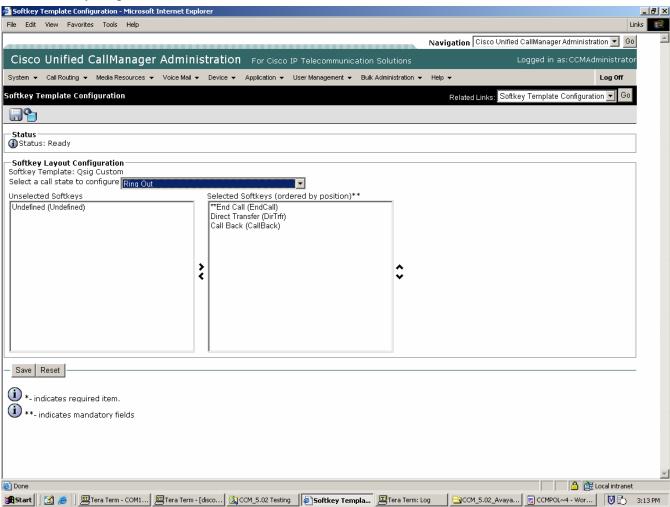




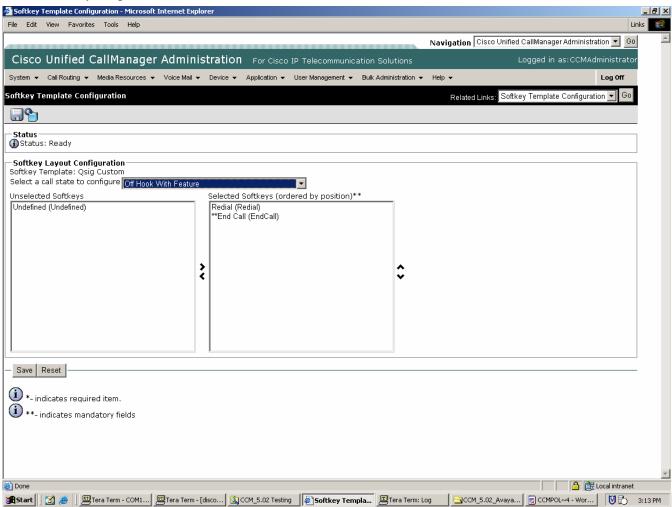




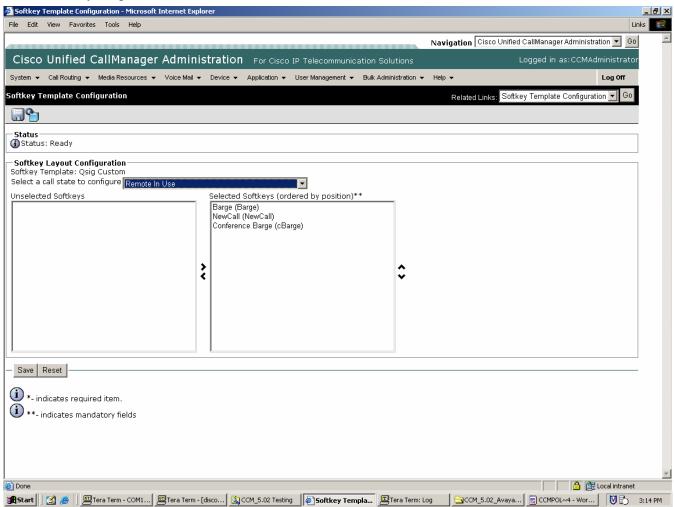




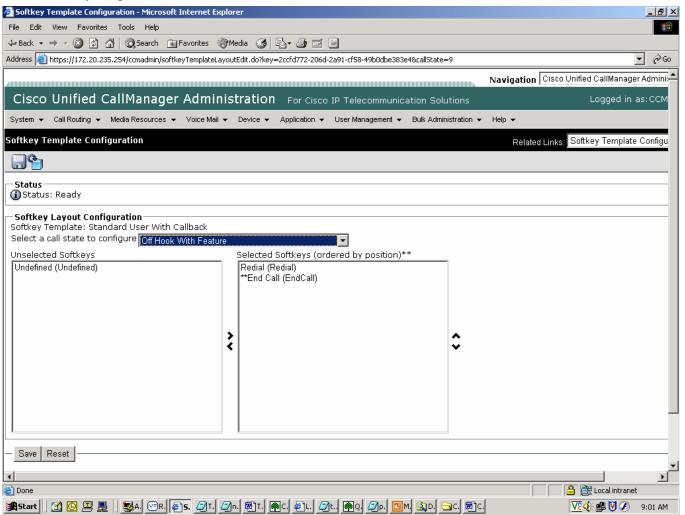




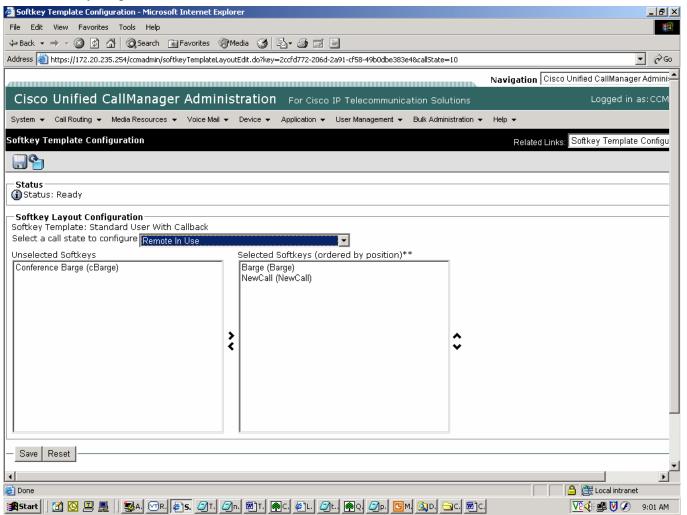






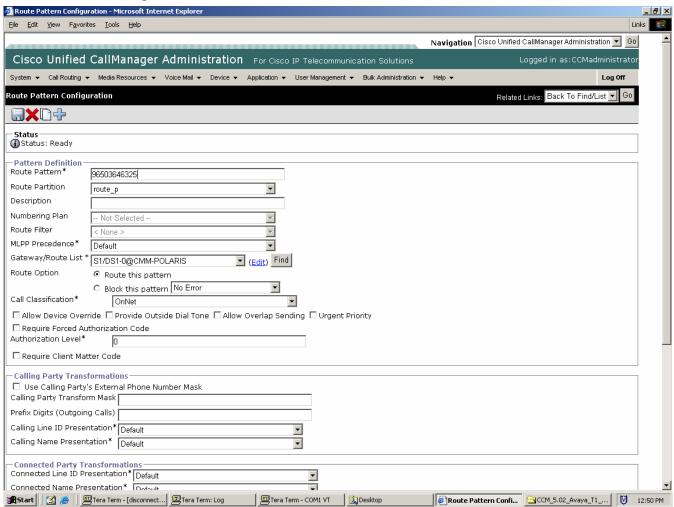






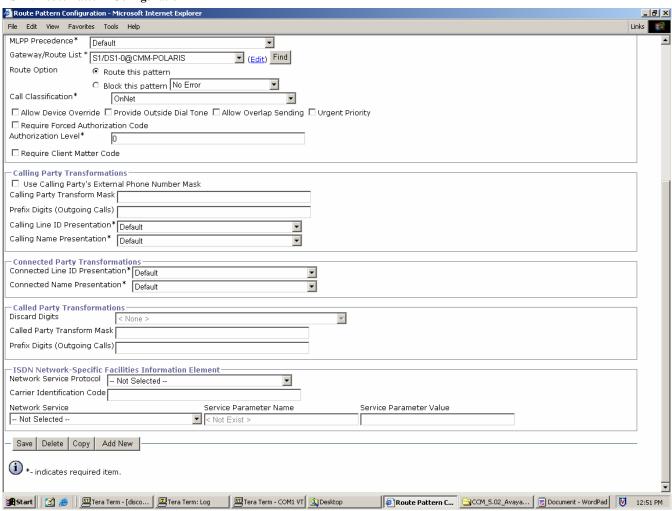


PSTN Route Pattern Configuration – 1





PSTN Route Pattern Configuration - 2





Cisco CMM-T1 Gateway Configuration

```
Current configuration: 4359 bytes
version 12.4
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
hostname CMM-POLARIS
boot-start-marker
boot system bootflash:wscmm-ipvoicek9-mz.124-8.bin
boot-end-marker
logging buffered 1000000 debugging
no logging console
no aaa new-model
resource policy
mmi polling-interval 60
mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
ip tcp synwait-time 13
ip host CM-MARS 172.20.231.254
ip host CM-VENUS 172.20.214.254
isdn switch-type primary-4ess
controller T1 1/0
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
controller T1 1/1
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
controller T1 1/2
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
controller T1 1/3
framing esf
linecode b8zs
pri-group timeslots 1-24
controller T1 1/4
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
```



```
!
controller T1 1/5
framing esf
linecode b8zs
pri-group timeslots 1-24 service mgcp
controller E1 2/0
pri-group timeslots 1-31 service mgcp
controller E1 2/1
controller E1 2/2
controller E1 2/3
controller E1 2/4
pri-group timeslots 1-31 service mgcp
controller E1 2/5
interface GigabitEthernet1/0
ip address 172.20.236.170 255.255.255.0
no ip proxy-arp
no negotiation auto
no keepalive
interface Serial 1/0:23
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bind-13 ccm-manager
isdn bchan-number-order ascending
no cdp enable
interface Serial 1/1:23
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn protocol-emulate network
isdn incoming-voice voice
isdn T310 120000
isdn bind-13 ccm-manager
no cdp enable
interface Serial 1/2:23
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bind-13 ccm-manager
isdn bchan-number-order ascending
no cdp enable
interface Serial 1/3:23
```



```
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bchan-number-order ascending
no cdp enable
interface Serial 1/4:23
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
interface Serial 1/5:23
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
interface Serial2/0:15
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
interface Serial2/4:15
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
ip default-gateway 172.20.236.1
ip route 0.0.0.0 0.0.0.0 172.20.236.1
no ip http server
no ip http secure-server
control-plane
voice-port 1/0:23
voice-port 1/1:23
voice-port 1/2:23
```



```
voice-port 1/3:23
voice-port 1/4:23
voice-port 1/5:23
voice-port 2/0:15
voice-port 2/4:15
!
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 172.20.236.50
ccm-manager config
mgcp
mgcp call-agent 172.20.236.50 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
mgcp package-capability pre-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
mgcp profile default
!
!
dial-peer voice 1 pots
service mgcpapp
port 1/0:23
dial-peer voice 2 pots
service mgcpapp
port 1/1:23
dial-peer voice 3 pots
service mgcpapp
port 1/2:23
dial-peer voice 4 pots
service mgcpapp
dial-peer voice 5 pots
service mgcpapp
port 1/4:23
dial-peer voice 6 pots
service mgcpapp
port 1/5:23
```



line con 0 transport output all line vty 0 4 login transport input all transport output all ! !

CMM-POLARIS#



!

PSTN Gateway (Cisco 3745) Configuration

```
3745E1#sh run
Building configuration...
Current configuration: 1806 bytes
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
hostname 3745E1
!
boot-start-marker
boot system flash:c3745-ipvoice-mz.124-3.bin
boot system slot0:C3745-ipvoice-mz.shamu_p2_18
boot-end-marker
logging buffered 1000000 debugging
no aaa new-model
resource policy
no network-clock-participate slot 2
no network-clock-participate slot 3
no network-clock-participate slot 4
voice-card 2
no dspfarm
voice-card 3
dspfarm
voice-card 4
dspfarm
ip subnet-zero
ip cef
ip tcp synwait-time 13
!
isdn switch-type primary-ni
no voice call carrier capacity active
```



```
controller T1 4/0
framing esf
linecode b8zs
pri-group timeslots 1-24
controller T1 4/1
framing sf
linecode ami
translation-rule 1
Rule 1 914085275004 5004
Rule 2 914085275004 5005
interface FastEthernet0/0
ip address 172.20.33.52 255.255.255.0
duplex auto
speed auto
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
interface Serial4/0:23
no ip address
isdn switch-type primary-ni
isdn incoming-voice voice
no cdp enable
ip classless
ip route 0.0.0.0 0.0.0.0 172.20.31.1
ip route 0.0.0.0 0.0.0.0 FastEthernet0/0
ip route 0.0.0.0 0.0.0.0 172.20.33.1
ip http server
control-plane
voice-port 2/0/0
station-id name Yahoo-PSTN
voice-port 2/0/1
!
voice-port 4/0:23
!
no mgcp package-capability res-package
no mgcp package-capability fxr-package
```



```
no mgcp timer receive-rtcp
dial-peer voice 1 pots
destination-pattern 6503646325
port 2/0/0
dial-peer voice 2 pots
destination-pattern 91408527....
translate-outgoing called 1
direct-inward-dial
port 4/0:23
line con 0
line aux 0
line vty 04
exec-timeout 0 0
password CISCO
login
!
!
end
3745E1#
```



Acronyms

Acronym	Definitions
ANF-PR	Additional Network Feature Path Replacement
CCM	Cisco CallManager
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CFB	Call Forwarding on Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line (Number) Identification Presentation
CLIR	Calling Line (Number) Identification Restriction
CNIP	Calling Name Identification Presentation
CNIR	Calling Name Identification Restriction
COLP	Connected Line (Number) Identification Presentation
COLR	Connected Line (Number) Identification Restriction
CONP	Connected Name Identification Presentation
CONR	Connected Name Identification Restriction
СТ	Call Transfer
MWI	Message Waiting Indicator
PSTN	Public Switched Telephone Network



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