

# Nortel CS1000M Release 4.0 using T1 QSIG to Cisco Unified Communications Manager 6.0 and Cisco Emergency Responder 2.0

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## July 11, 2007 Initial version

# **Table of Contents**

Introduction	2
Network Topology	2
LimitationsLimitations	3
System Components	3
Hardware Requirements	3
Software Requirements	3
Features Supported	3
Features Supported	4
Configuring Cisco Unified Communications Manager	4
Configuring Cisco Emergency Responder	42
Configuring the Cisco Catalyst 6000	66
Configuring the Nortel CS1000M with Succession 4.0 Software Release PBX	
Acronyms	



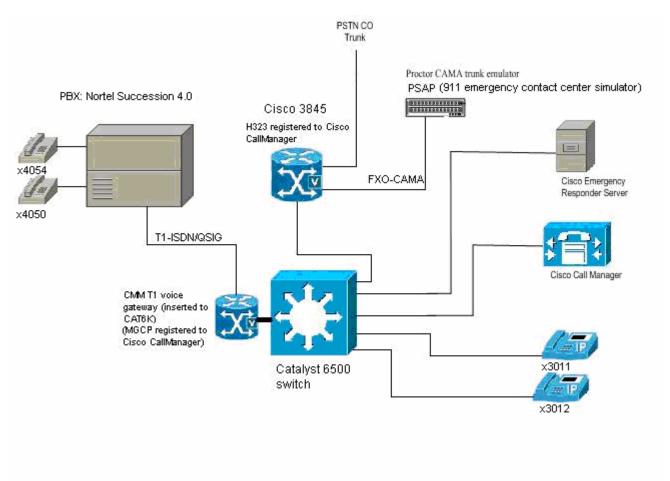
### Introduction

The following is an Application Note for E911 Interoperability of a Cisco Unified Communications Manager 6.0 and Cisco Emergency Responder 2.0 to a Nortel CS1000M Succession 4.0 PBX via a Cisco Media Module CMM T1-QSIG trunk. The CUCM system is connected to a simulated E911 PSAP (Public Safety Answering Point) via a Cisco 3845 w/ CAMA trunk registered using H323.

The Network Topology diagram shows the test set-up for interoperability between the Cisco Unified Communictaions Manager and Cisco Emergency Responder connected to the PBX via a T1 QSIG trunk using Cisco WS-SVC-CMM-6T1 MGCP gateway and connection to E911 PSAP using a Cisco 3825 H323 gateway via a CAMA trunk.

# **Network Topology**

Figure 1. Network Topology or Test Setup





## Limitations

Unique DID numbers must be used to associate with each Emergency Response Location to allow the return call if the 911 caller is disconnected.

Each available calling party that might dial 911 from the PBX side must have that calling party number configured in the Manually Configured Phones screen of the Cisco Emergency Responder.

## **System Components**

# **Hardware Requirements**

Cisco Hardware

Cisco 3825 Gateway with VIC2-4FXO (CAMA trunk)

Cisco WS-SVC-CMM-6T1 Communications Media Module (inserted into cat6K)

Cisco Cat6K switch

Cisco Unified Communications Manager server

Cisco Emergency Responder server

Nortel Succession PBX

## **Software Requirements**

IOS Software release "c3825-ipvoice-mz.124-11.T"

IOS Software release "wscmm-ipvoicek9-mz.124-11.T

PBX Software: Version 4.0

Cisco Unified Communications Manager 6.0

Cisco Emergency Responder 2.0

# **Features**

## **Features Supported**

Calling Number

E911 ERL DID number passed to PSAP

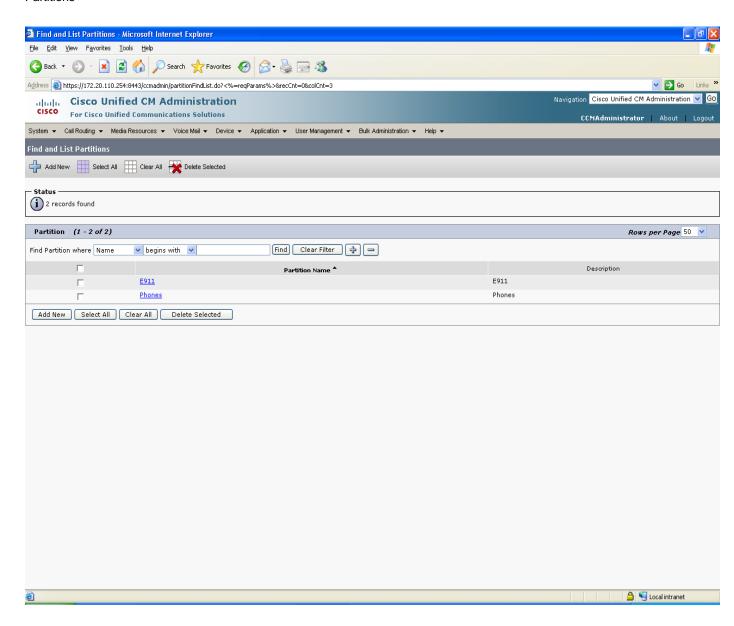
Incoming DID calling to disconnected 911 originating caller



# Configuration

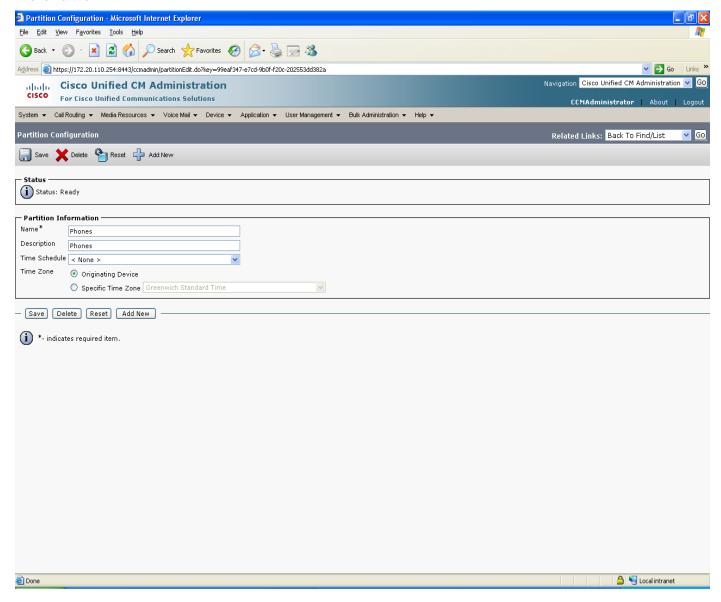
## **Configuring Cisco Unified Communications Manager**

**Partitions** 



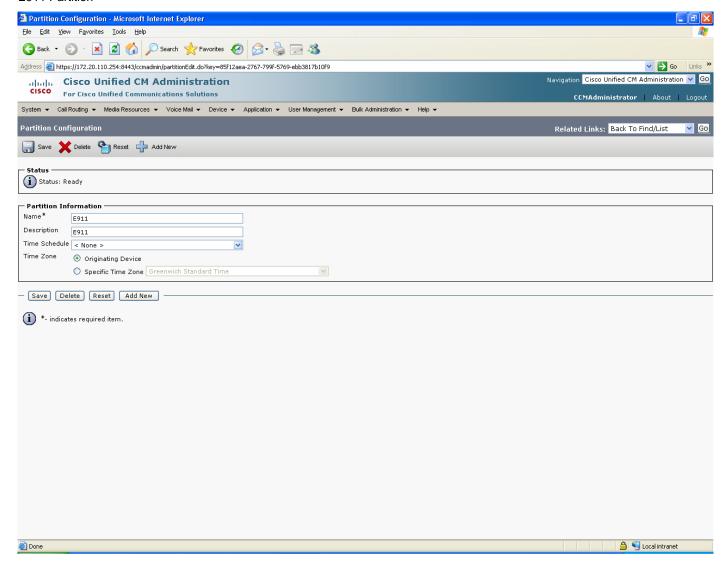


### Phone Partition



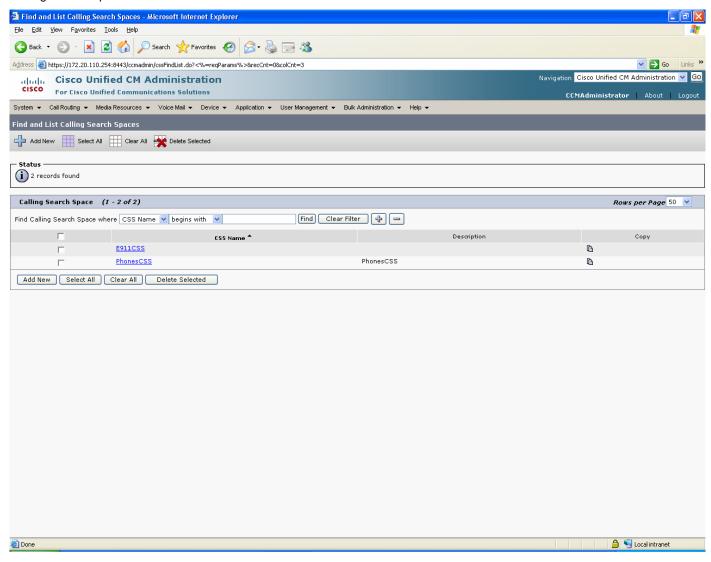


### **E911 Partition**

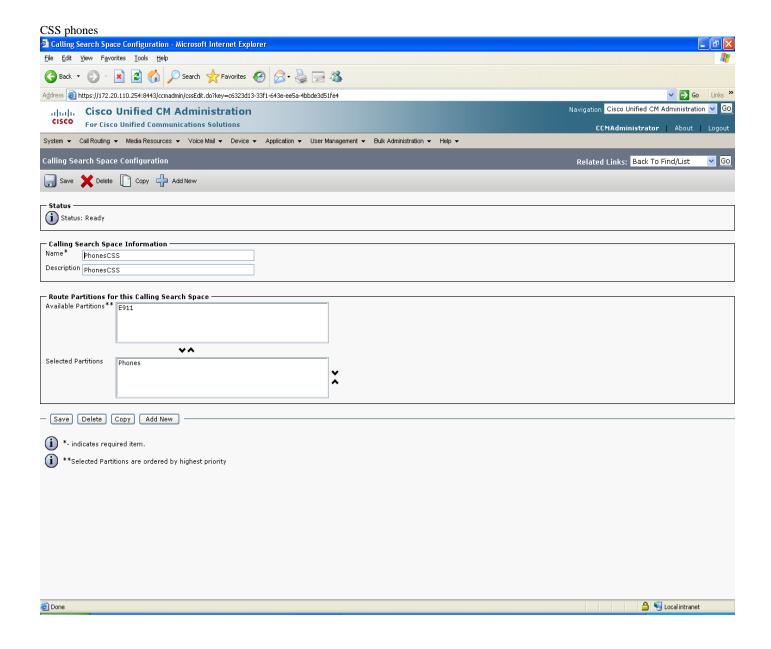




## Calling Search Space

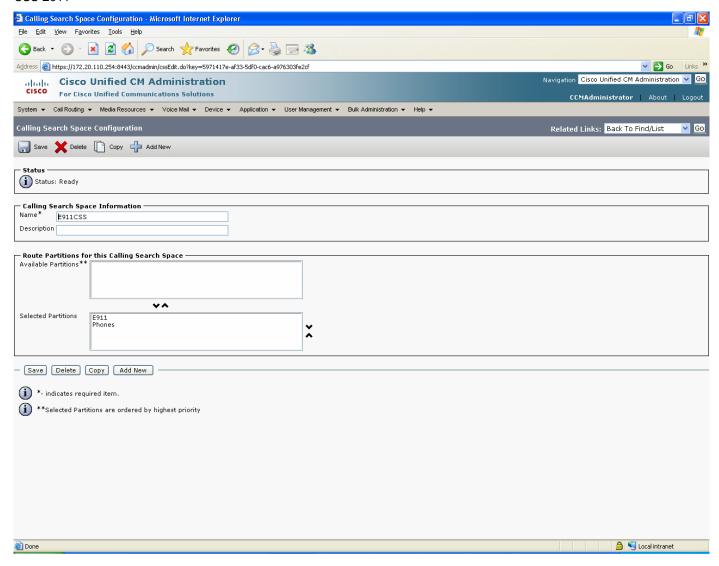






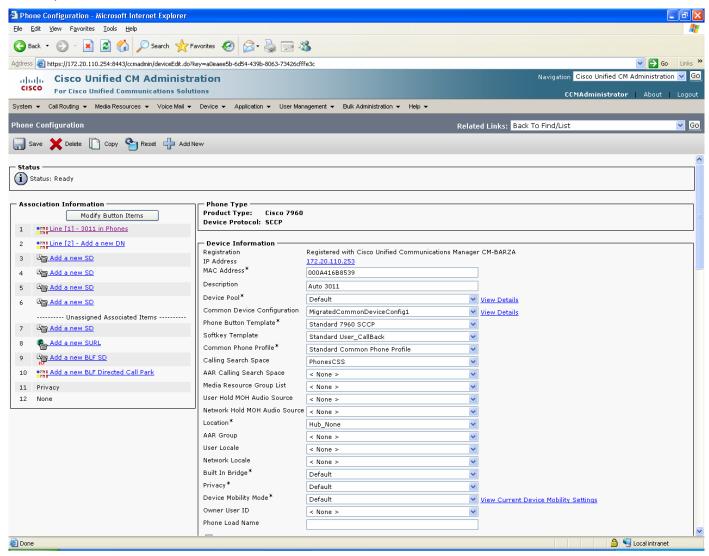


# **CSS E911**

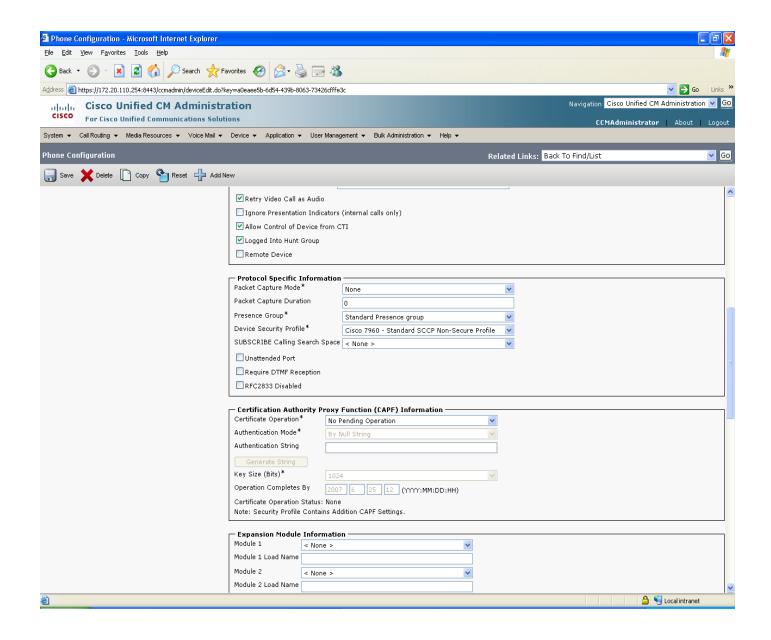




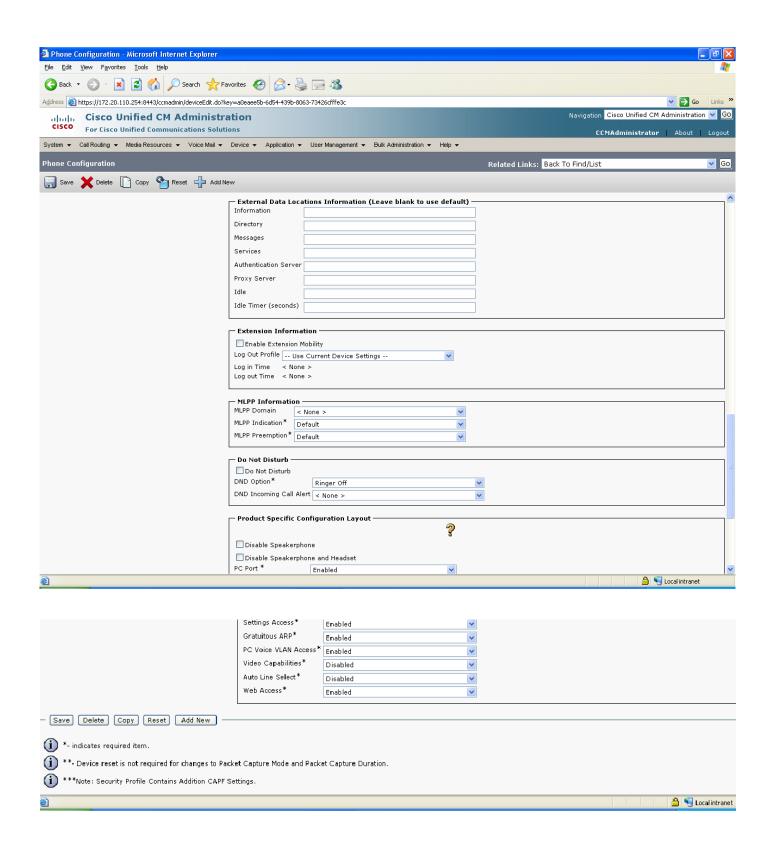
## CCM IP phones



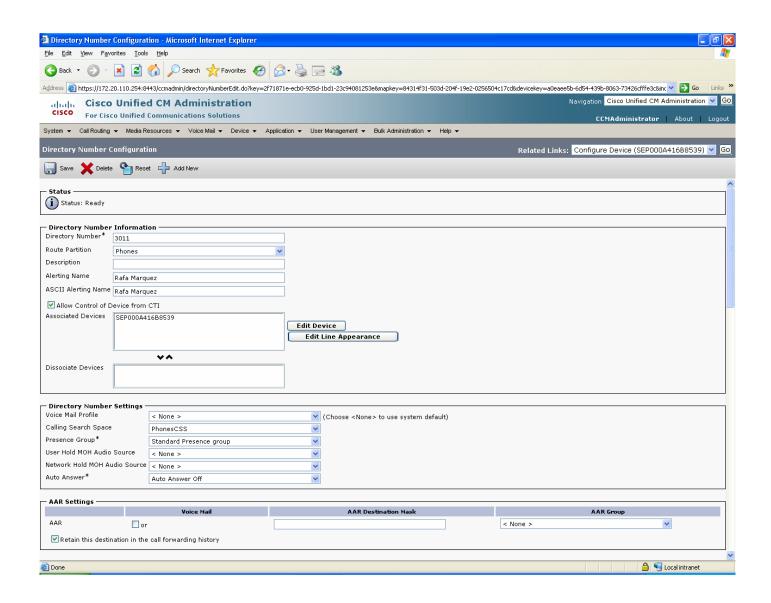




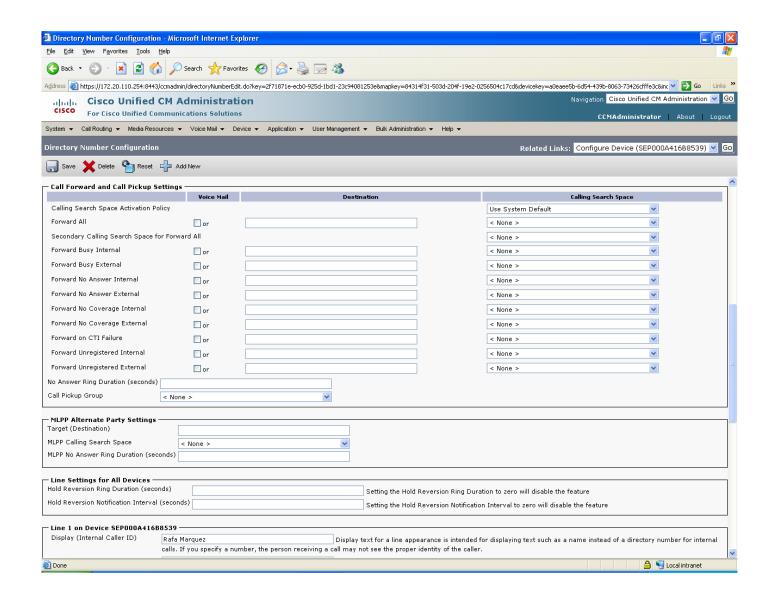




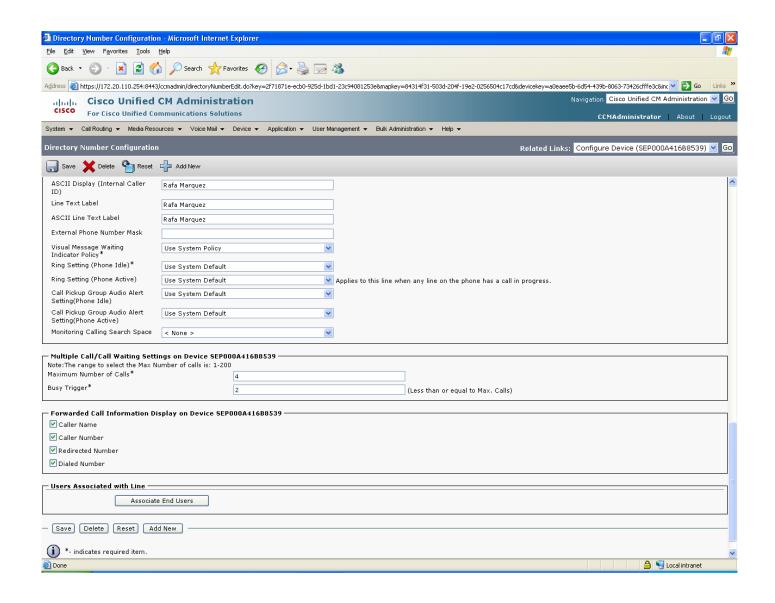






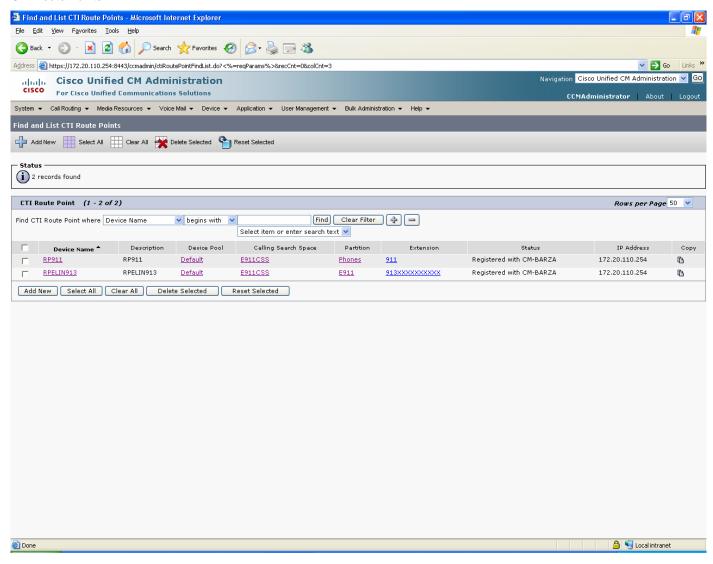






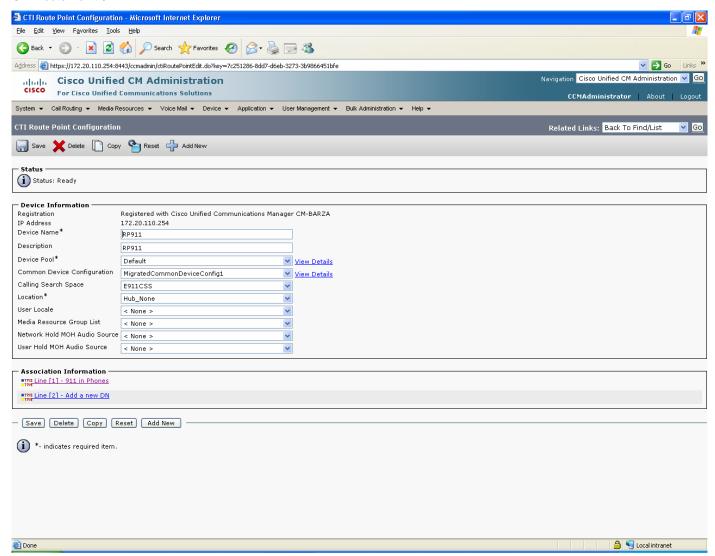


### **CTI Route Points**

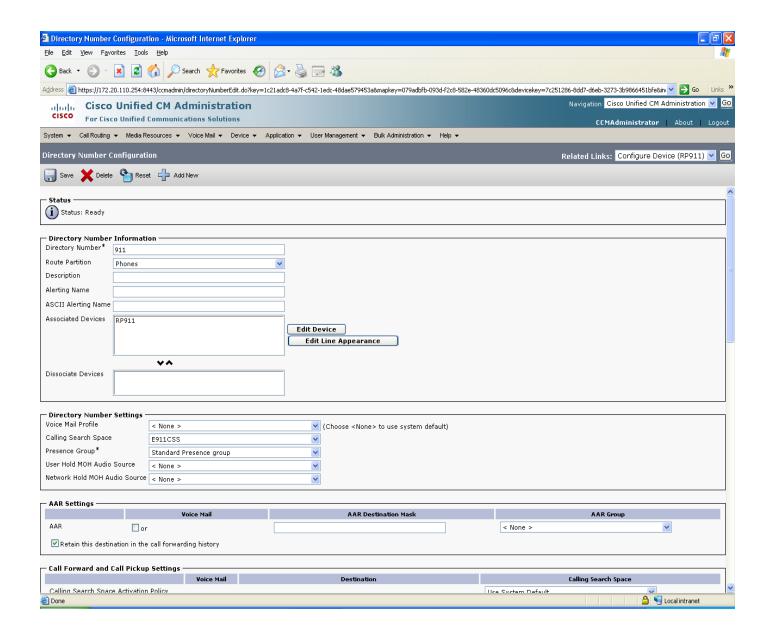




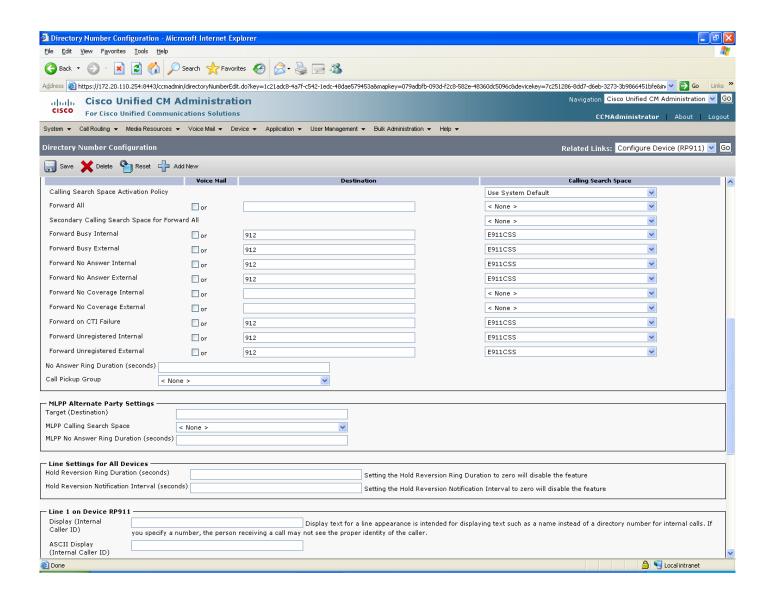
#### CTI Route Point 911









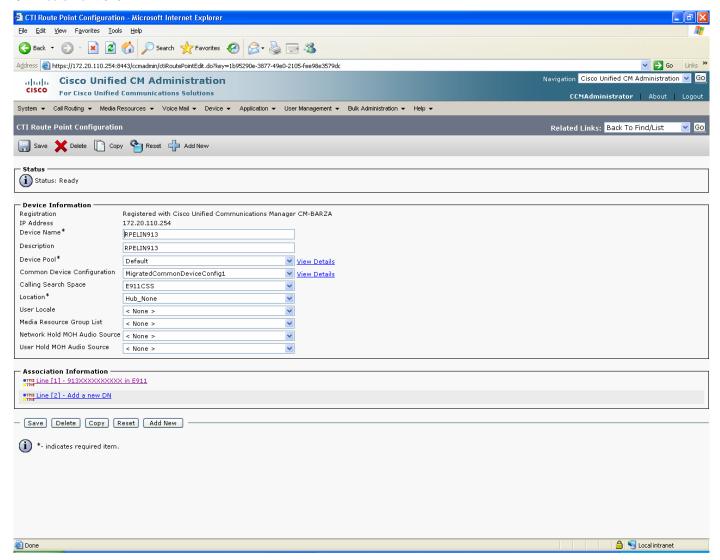




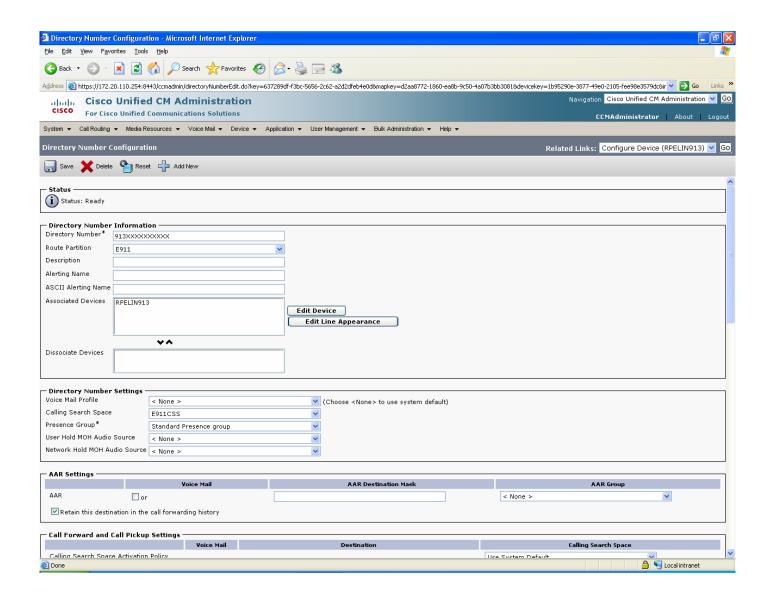
External Phone Number Mask			
Multiple Call/Call Waiting Settings on Devi Note:The range to select the Max Number of call: Maximum Number of Calls*  Busy Trigger*		(Less than or equal to Max. Calls)	
Forwarded Call Information Display on De	vice RP911		
☐ Caller Number ☐ Redirected Number ☑ Dialed Number			
Users Associated with Line  Associate End Users			
- Save Delete Reset Add New -			
i *- indicates required item. i **- Changes to Line or Directory Number s	ettings require restart.		
© Done			🔒 🥞 Local intrane



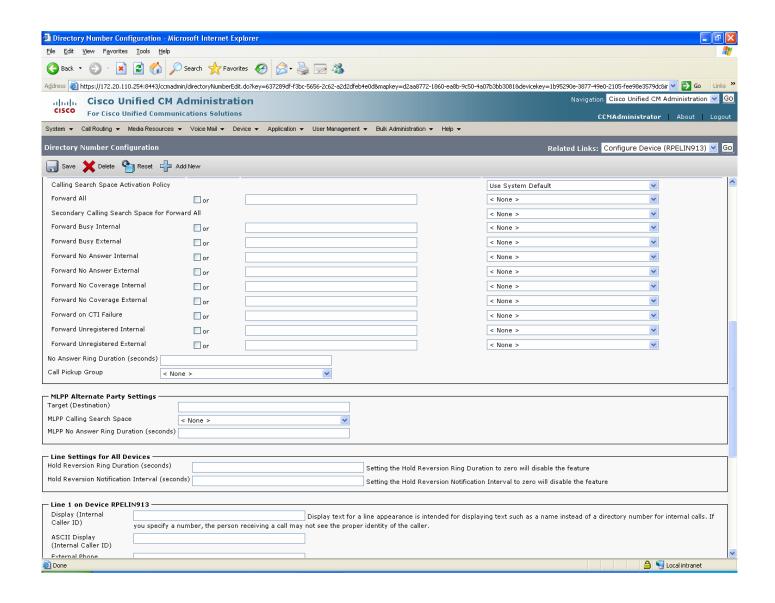
#### CTI Route Point 913











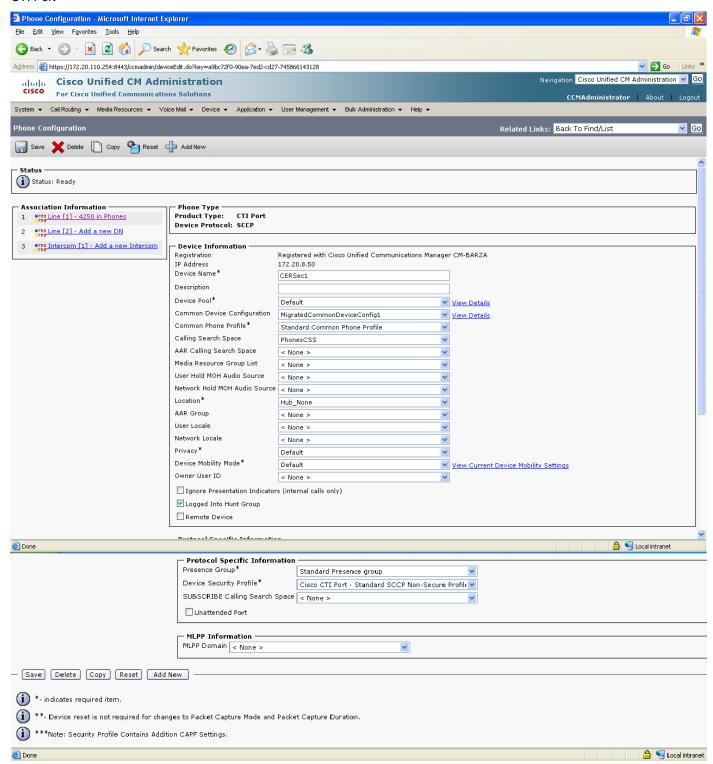


External Phone Number Mask					
	ing Settings on Device RPELIN he Max Number of calls is: 1-1000 *		(Less than or equal to Max. Call	s)	
Forwarded Call Inform	nation Display on Device RPELI	N913			
☑ Caller Name					
Caller Number					
Redirected Number					
☑ Dialed Number					
— Users Associated with	Line —				
	Associate End Users				
— Save Delete Res	et Add New				
i *- indicates required	item.				
i **- Changes to Line	or Directory Number settings requ	iire restart.			
Done					🔒 🥞 Local intrane
					_

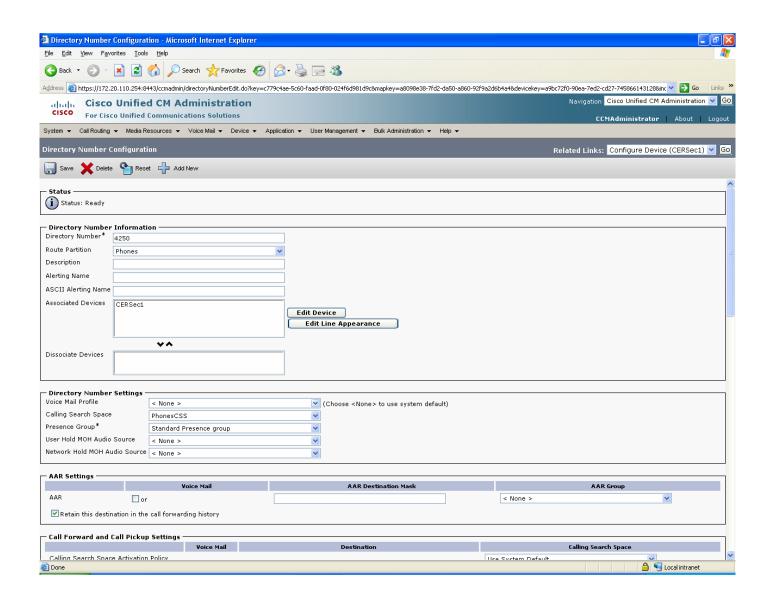
Note: A Backup CER server was not used during testing therefore CTI route point for 912 was not created.



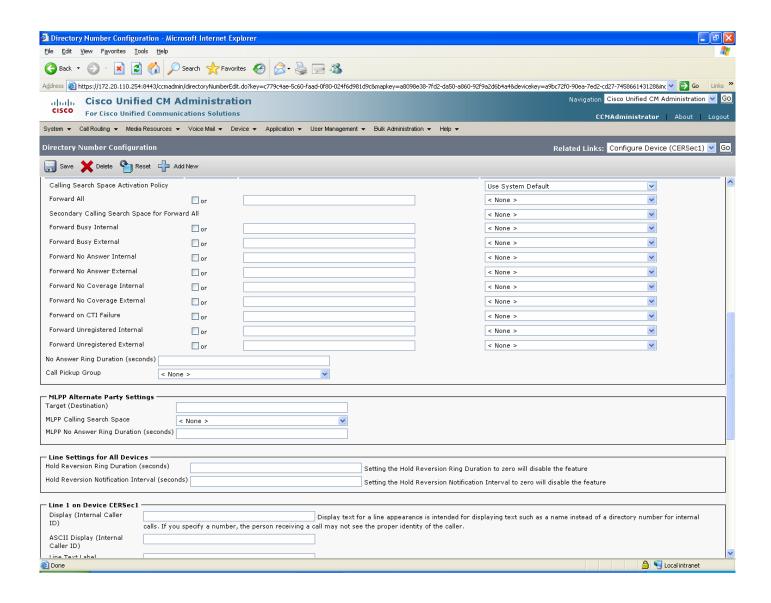
### CTI Port









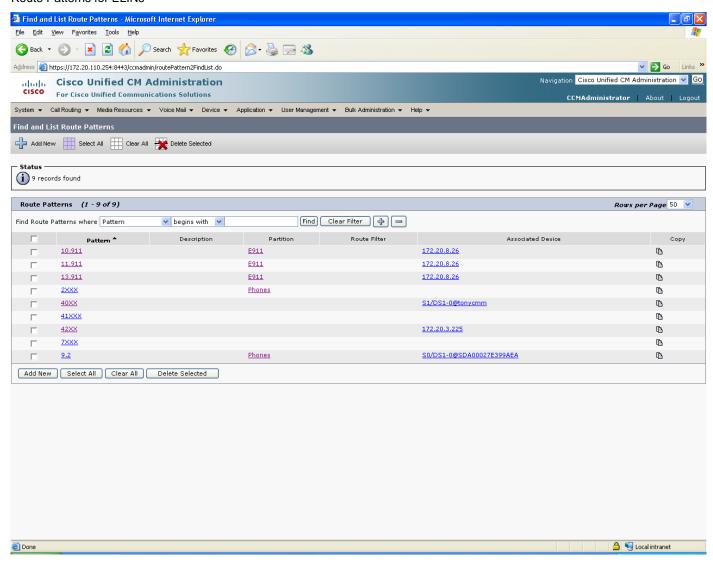




Line Text Label					
ASCII Line Text Label			]		
External Phone Number Mask			]		
Visual Message Waiting Indicator Policy*	Use System Policy	~			
Monitoring Calling Search Space	< None >	<b>Y</b>			
─ Multiple Call/Call Waiting	Sattings on Davice CEDSa	c1			
Note:The range to select the I					
Maximum Number of Calls*		4			
Busy Trigger*		2		(Less than or equal to Max. Calls)	
Forwarded Call Informati	on Display on Douise CERS	ins 1			
✓ Caller Name	on display on device cake	ec i			
Caller Number					
Redirected Number					
☑ Dialed Number					
Dialed Marriber					
Users Associated with Lin	ie				
Ass	sociate End Users				
— Save Delete Reset	Add New				
(i) *- indicates required ite	m.				
**- Changes to Line or	Directory Number settings rec	uire restart.			
Done					🔒 🍤 Local intranet

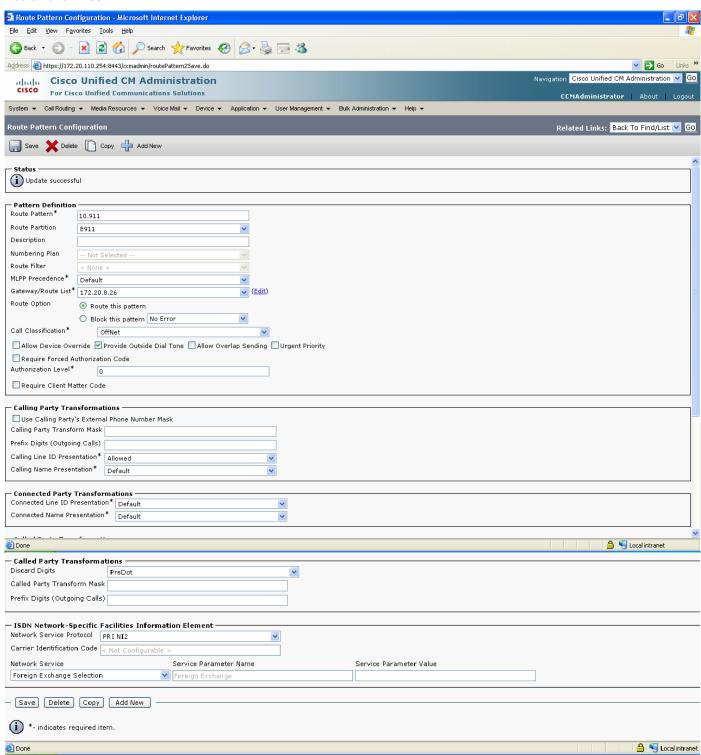


## Route Patterns for ELINs



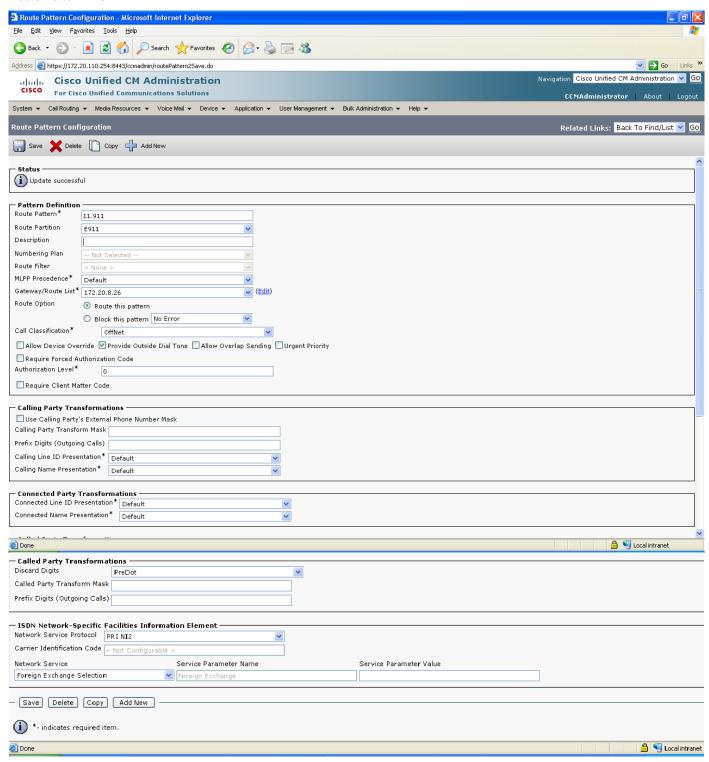


#### Route Pattern 10911



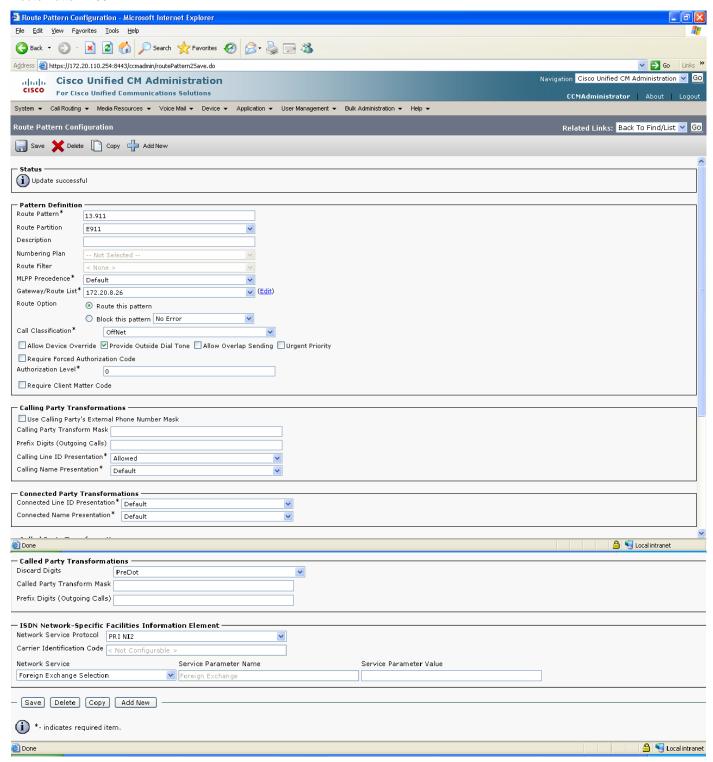


#### Route Pattern 11911



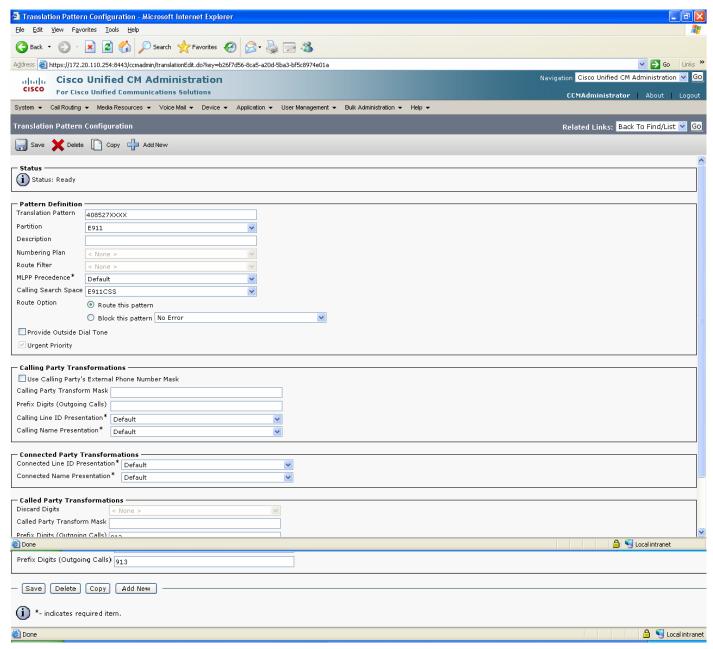


#### Route Pattern 13911



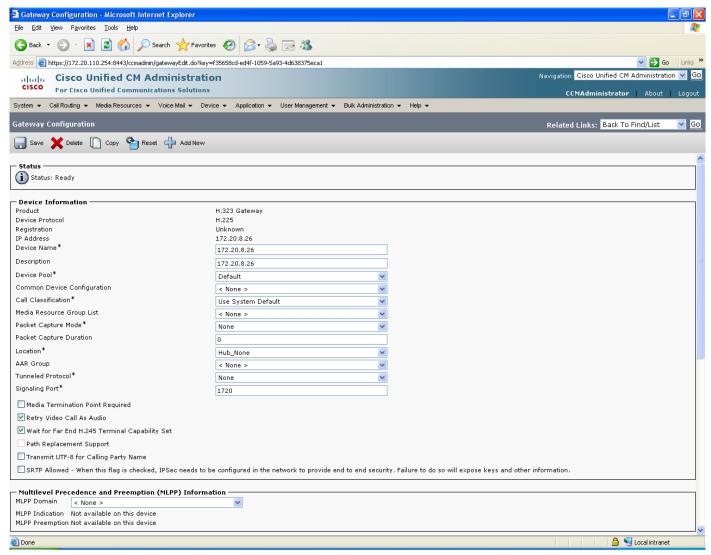


## Translation Pattern for ELINs

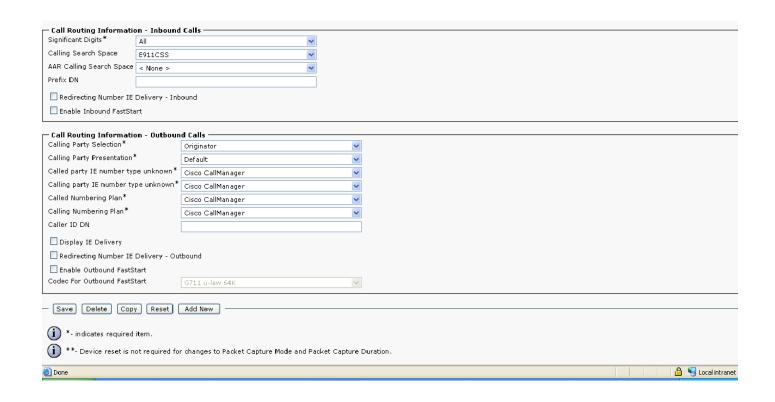




# PSAP Gateway configuration (CAMA TRUNK)

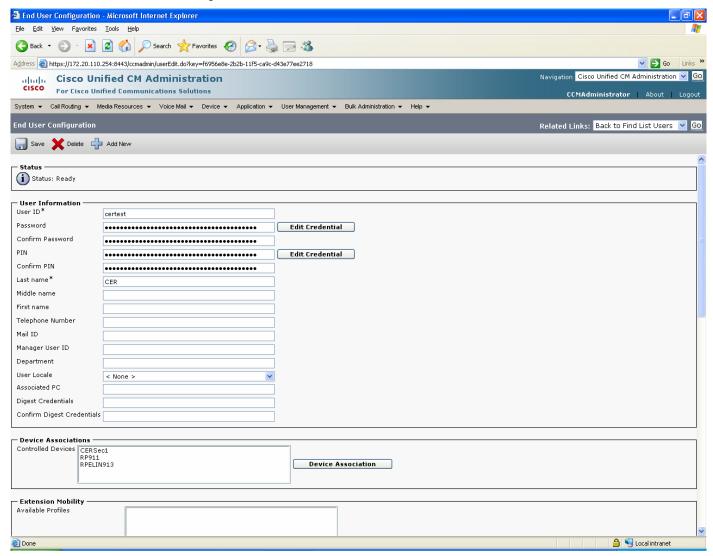




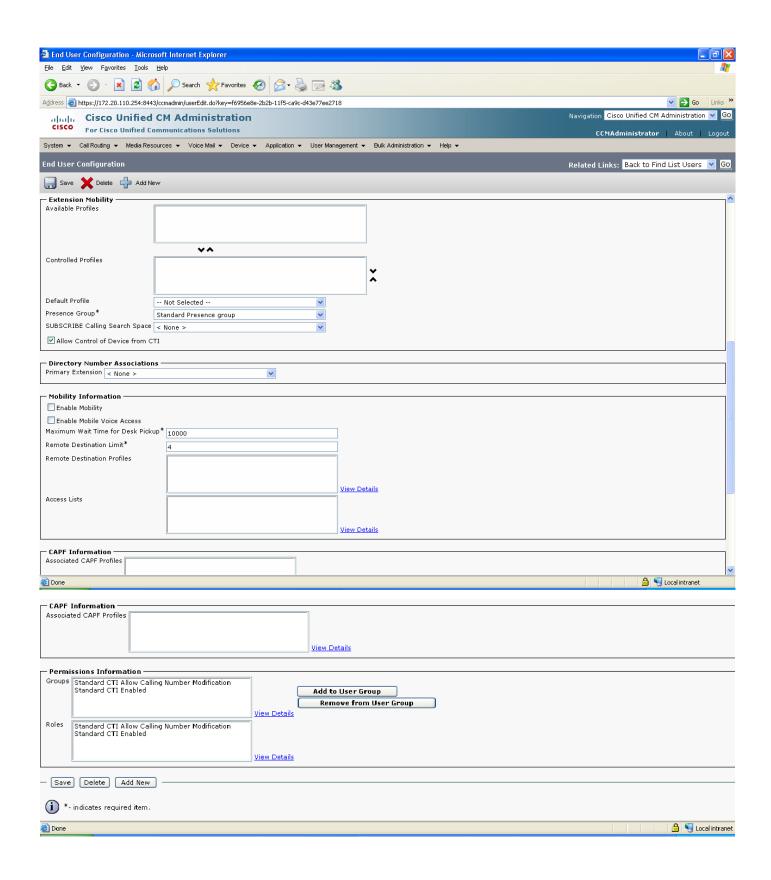




## Cisco Unified Communications Manager User

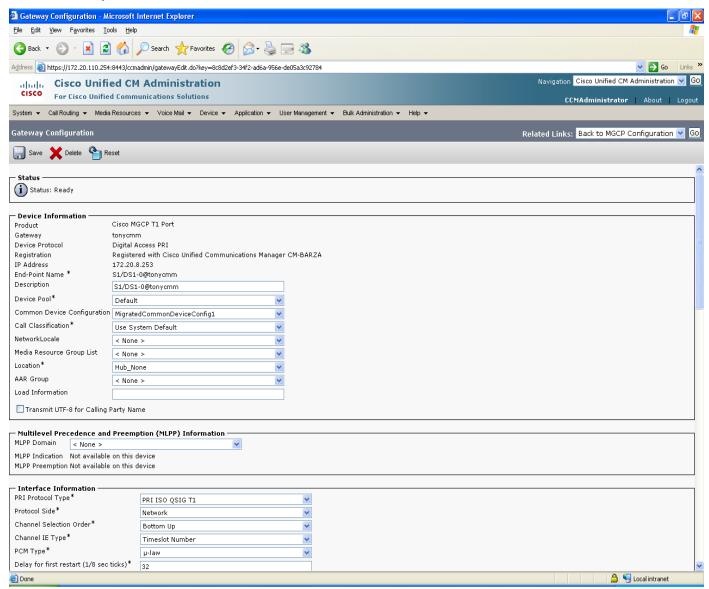




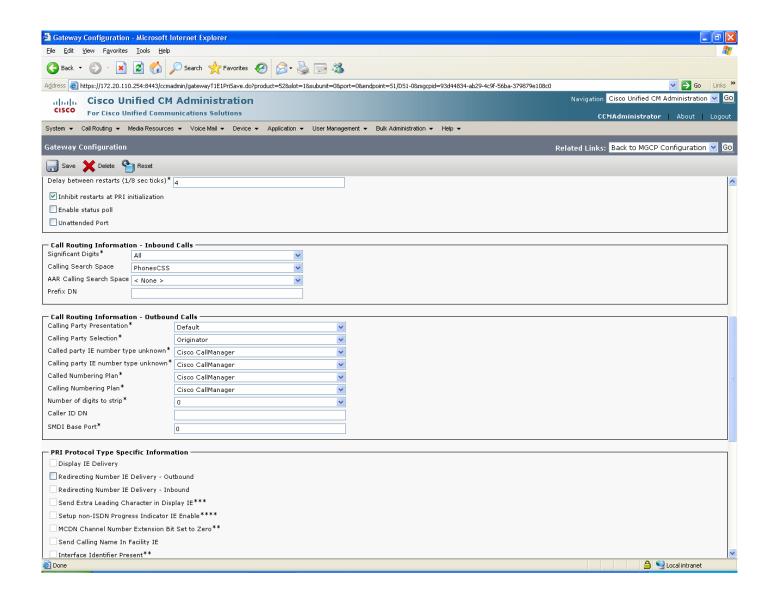




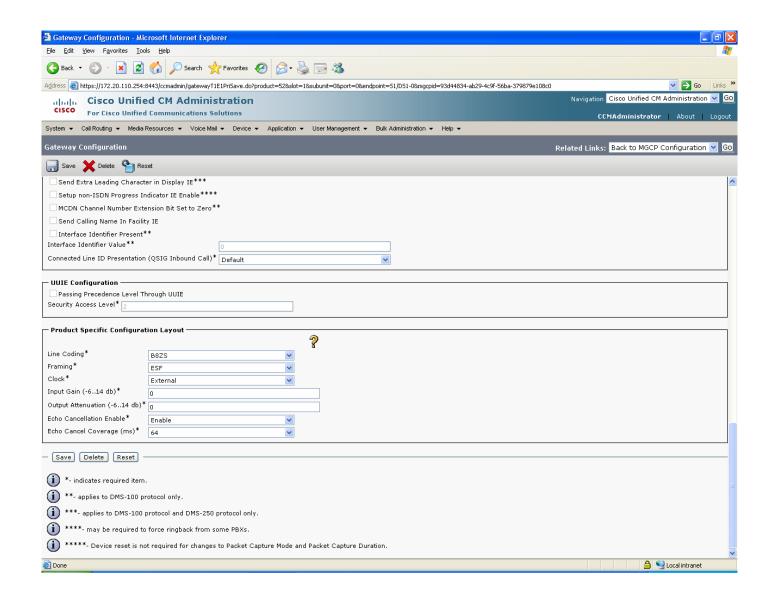
## T1-QSIG Gateway





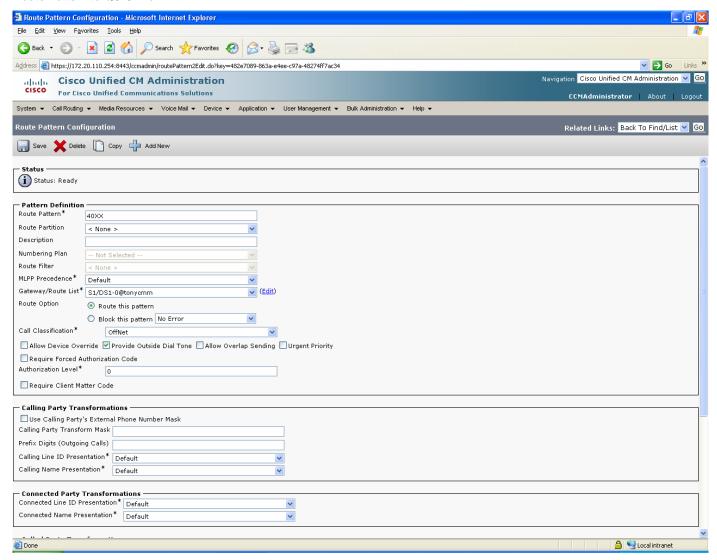








#### Route Pattern to QSIG Trunk



Note: For detailed information regarding QSIG interoperability between CCM and NEC PBX go to: http://www.cisco.com/warp/public/779/largeent/avvid/inter\_operability/flash/portal.html

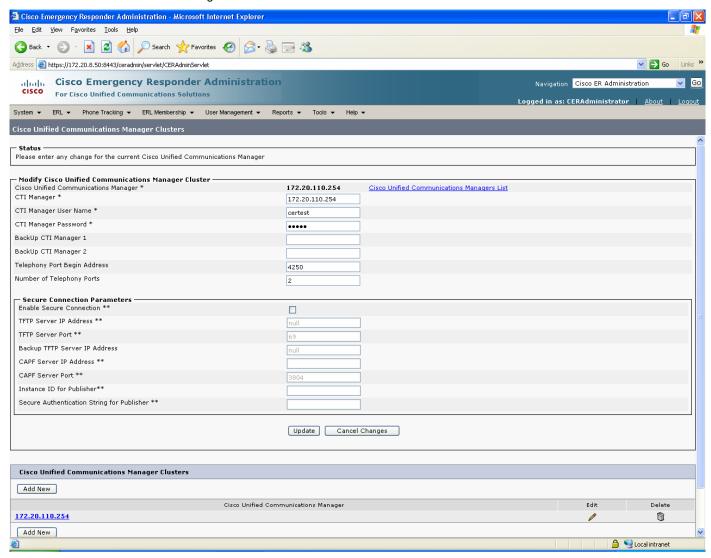
## SNMP service must be active

Perform	Performance and Monitoring Services		
	Service Name	Activation Status	
✓	Cisco Serviceability Reporter	Activated	
✓	Cisco CallManager SNMP Service	Activated	



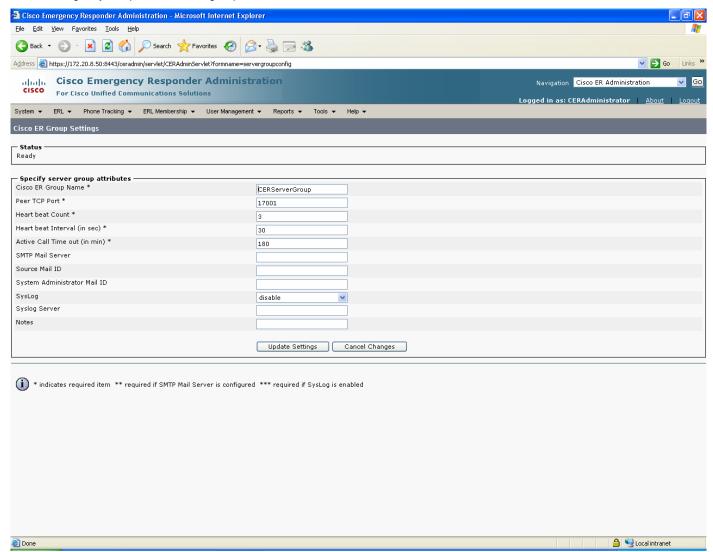
## **Configuring Cisco Emergency Responder**

Cisco Unified Communications Manager Details



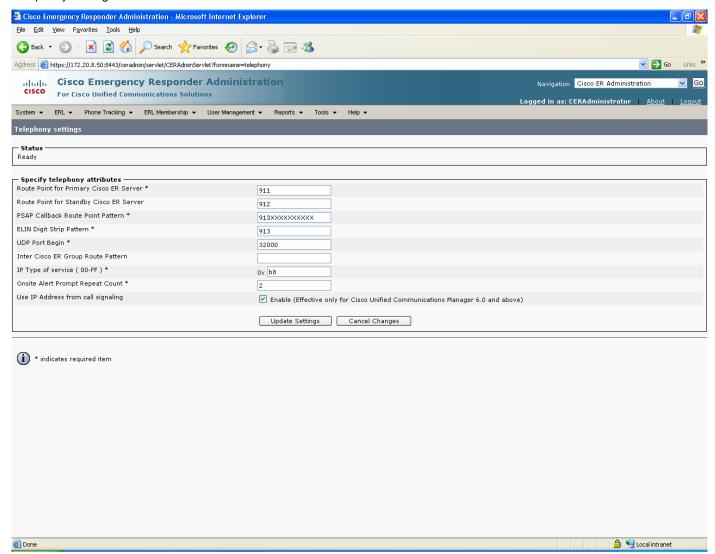


## Cisco Emergency Responder Server group



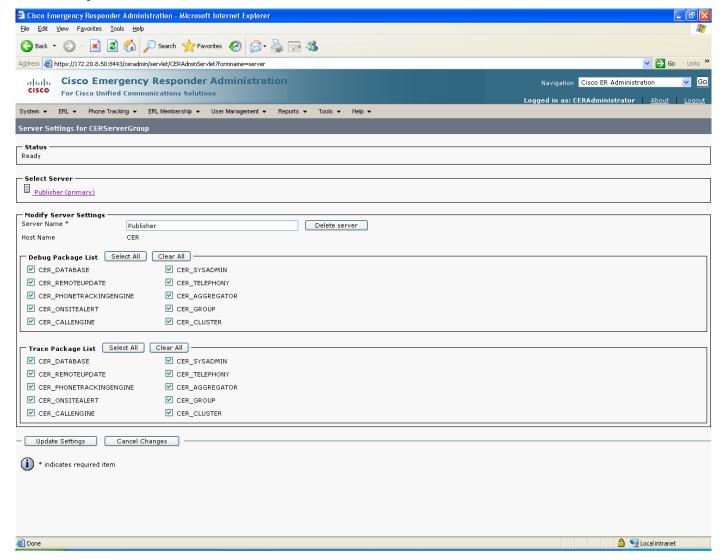


## **Telephony Settings**



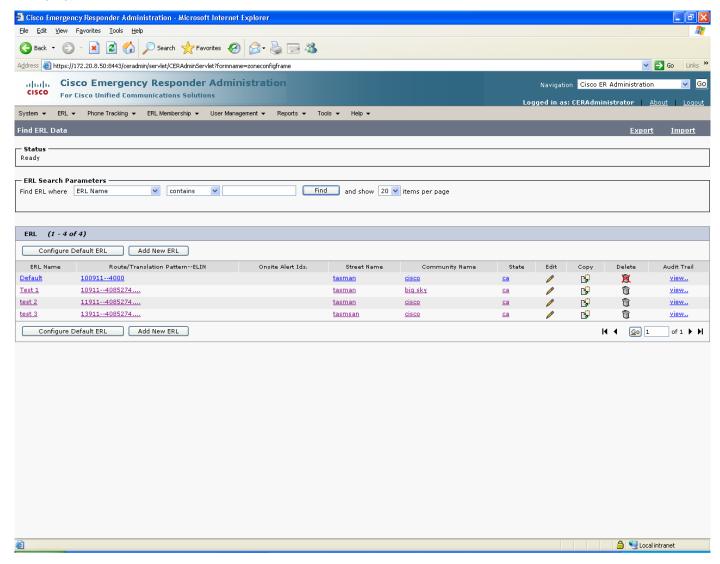


## Server Settings



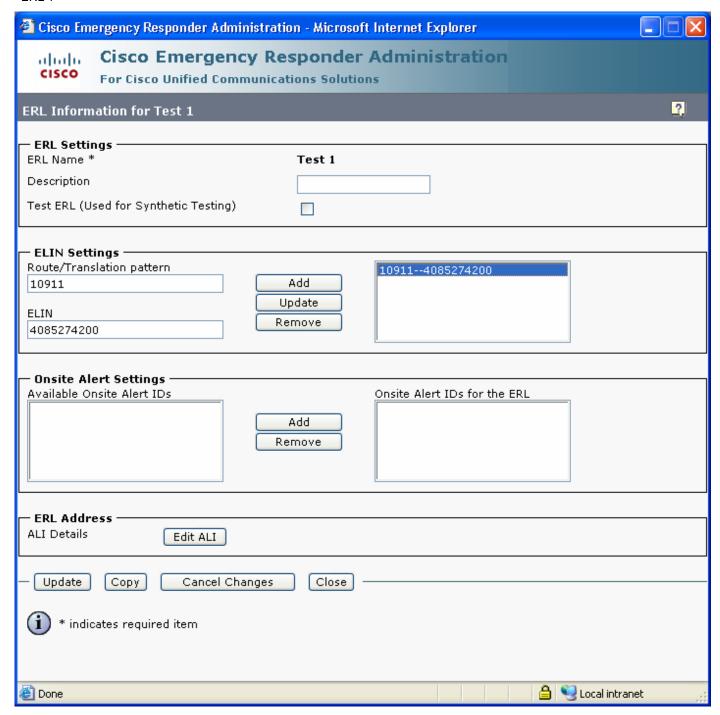


## **ERLs List**



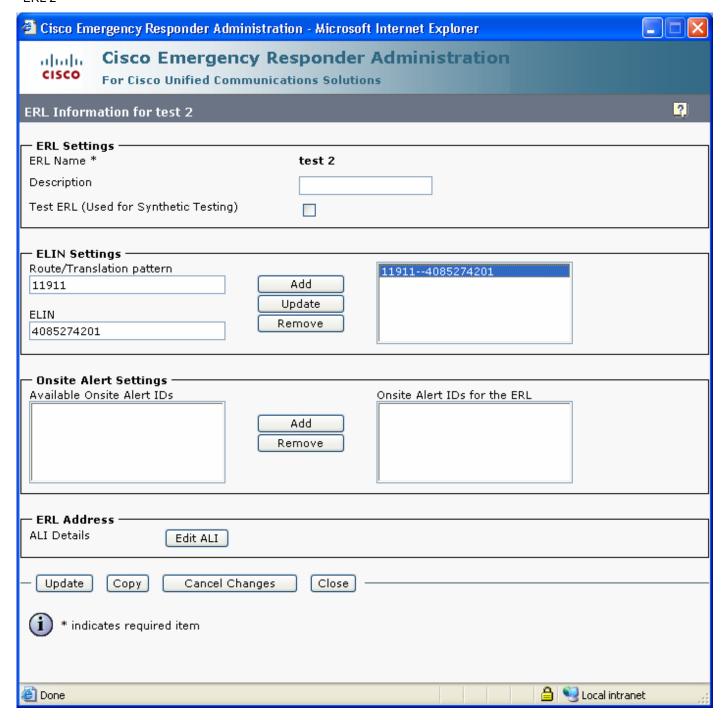


## ERL 1



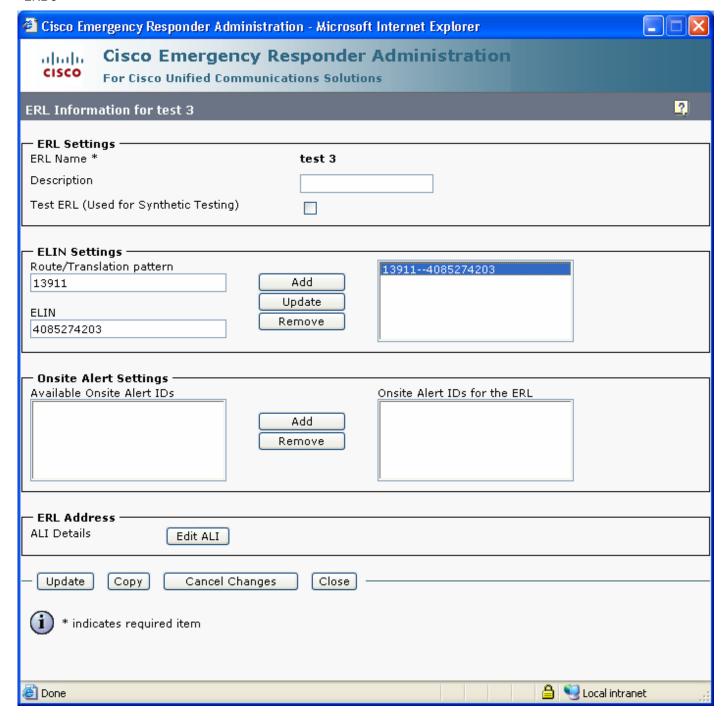


#### ERL 2



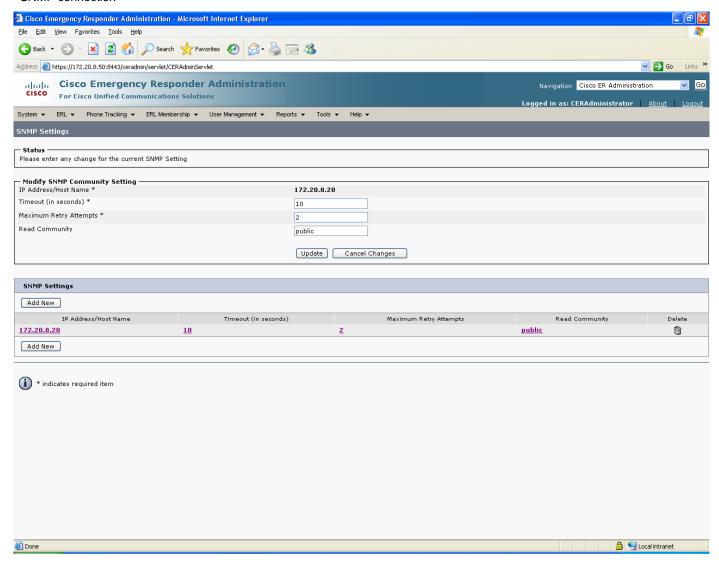


## ERL 3



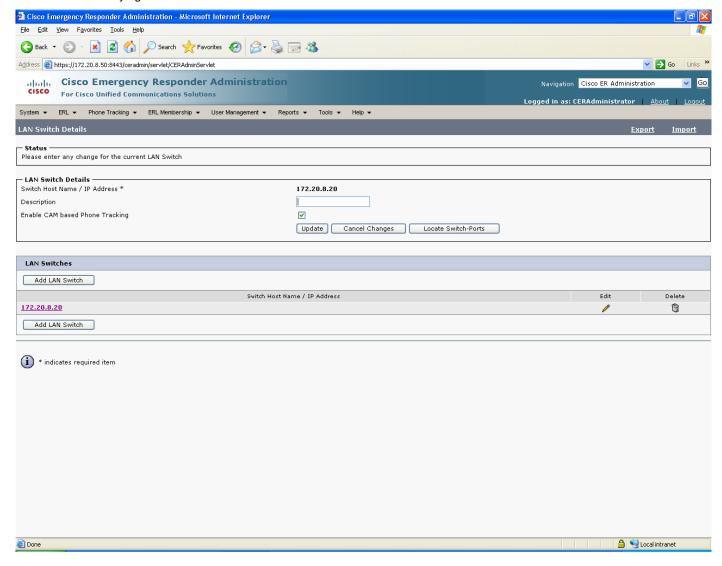


#### SNMP connection



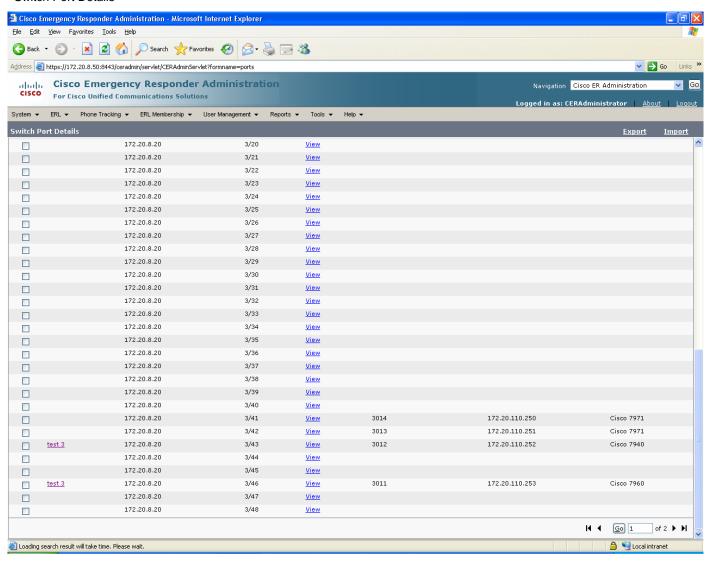


## LAN Switch identifying



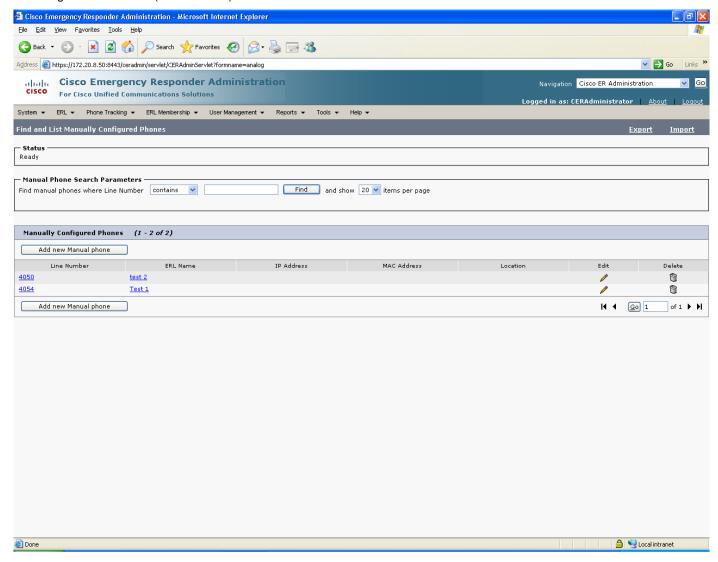


#### Switch Port Details

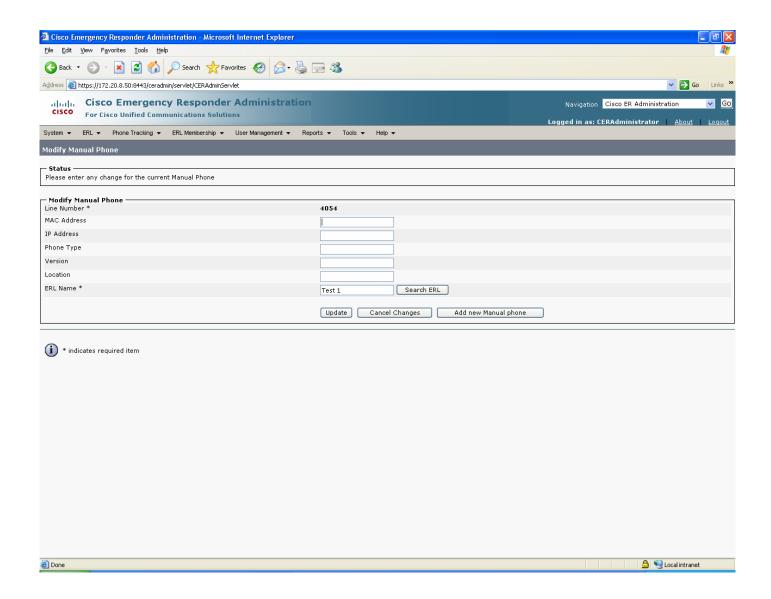




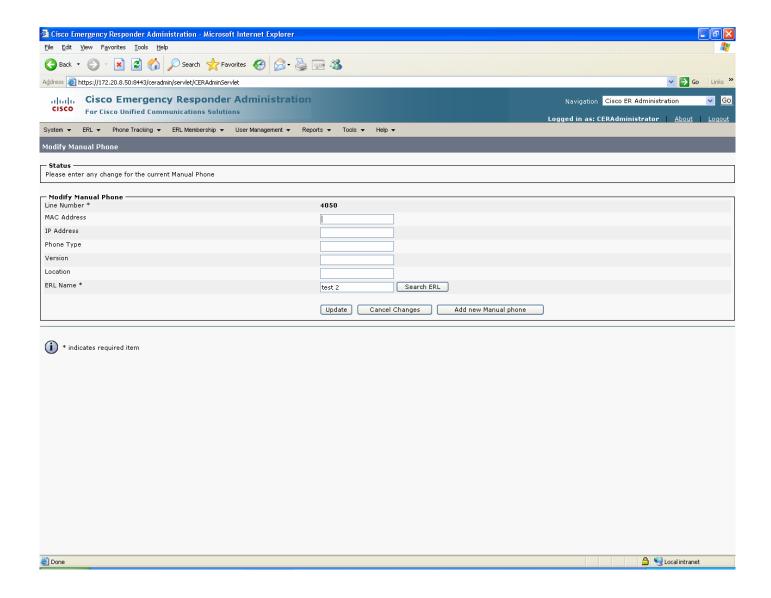
## Defining Manual Phones (PBX Stations)











Cisco CMM IOS Gateway MGCP configuration for QSIG connectivity

tonycmm#sh run

Building configuration...

Current configuration: 2077 bytes

!

version 12.4



```
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
hostname tonycmm
boot-start-marker
boot system bootflash:wscmm-ipvoicek9-mz.124-11.T.bin
boot-end-marker
logging buffered 10000000
no logging console
enable password cisco
no aaa new-model
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
!
no ip domain lookup
ip host CM-BARZA 172.20.110.254
multilink bundle-name authenticated
isdn switch-type primary-qsig
```



```
controller T1 1/0
pri-group timeslots 1-24 service mgcp
controller T1 1/1
controller T1 1/2
!
controller T1 1/3
controller T1 1/4
controller T1 1/5
interface\ GigabitEthernet 1/0
ip address 172.20.8.253 255.255.255.0
no ip proxy-arp
no negotiation auto
no keepalive
interface Serial1/0:23
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn protocol-emulate network
isdn incoming-voice voice
isdn bind-13 ccm-manager
```



```
no cdp enable
ip default-gateway 172.20.8.1
ip route 0.0.0.0 0.0.0.0 172.20.8.1
no ip http server
no ip http secure-server
control-plane
voice-port 1/0:23
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server CM-BARZA
ccm-manager config
!
mgcp
mgcp call-agent CM-BARZA 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
!
!
```



```
line con 0
password cisco
transport output all
line vty 04
exec-timeout 0 0
password cisco
login
transport input all
transport output all
!
end
tonycmm#
 Cisco 3825 Cisco IOS Gateway H323 configuration for CAMA trunk connectivity
CAMA_GW#sh run
Building configuration...
Current configuration: 1241 bytes
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
hostname CAMA_GW
boot-start-marker
boot-end-marker
!
```



enable password cisco
!
no aaa new-model
ip cef
!
!
!
!
multilink bundle-name authenticated
!
voice-card 0
no dspfarm
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!

!



```
interface GigabitEthernet0/0
ip address 172.20.8.26 255.255.255.0
duplex auto
speed auto
media-type rj45
no keepalive
!
interface\ GigabitEthernet 0/1
no ip address
shutdown
duplex auto
speed auto
media-type rj45
no keepalive
ip route 0.0.0.0 0.0.0.0 172.20.8.1
!
ip http server
no ip http secure-server
control-plane
!
voice-port 0/2/0
signal cama KP-0-NPA-NXX-XXXX-ST
dial-type mf
timing hookflash-out 500
description CAMA
voice-port 0/2/1
```



```
voice-port 0/3/0
voice-port 0/3/1
dial-peer voice 911 pots
destination-pattern 911
no digit-strip
port 0/2/0
forward-digits all
dial-peer voice 999 voip
description Call-in PSTN simulation
destination-pattern .T
session target ipv4:172.20.110.254
line con 0
password cisco
login
stopbits 1
line aux 0
stopbits 1
line vty 04
password cisco
login
scheduler allocate 20000 1000
!
end
```



CAMA\_GW#



## CAMA voice-port config

CAMA\_GW#sh voice port 0/2/0

Foreign Exchange Office 0/2/0 Slot is 0, Sub-unit is 2, Port is 0

Type of VoicePort is FXO

Operation State is DORMANT

Administrative State is UP

The Last Interface Down Failure Cause is Administrative Shutdown

Description is CAMA

Noise Regeneration is enabled

Non Linear Processing is enabled

Non Linear Mute is disabled

Non Linear Threshold is -21 dB

Music On Hold Threshold is Set to -38 dBm

In Gain is Set to 0 dB

Out Attenuation is Set to 3 dB

Echo Cancellation is enabled

Echo Cancellation NLP mute is disabled

Echo Cancellation NLP threshold is -21 dB

Echo Cancel Coverage is set to 64 ms

Echo Cancel worst case ERL is set to 6 dB

Playout-delay Mode is set to adaptive

Playout-delay Nominal is set to 60 ms

Playout-delay Maximum is set to 250 ms

Playout-delay Minimum mode is set to default, value 40 ms

Playout-delay Fax is set to 300 ms

Connection Mode is normal

Connection Number is not set

Initial Time Out is set to  $10\ s$ 



Interdigit Time Out is set to 10 s	
Call Disconnect Time Out is set to 60 s	
Ringing Time Out is set to 180 s	
Wait Release Time Out is set to 30 s	
Companding Type is u-law	
Region Tone is set for US	
Analog Info Follows:	
Currently processing none	
Maintenance Mode Set to None (not in mtc mode)	
Number of signaling protocol errors are 0	
Impedance is set to 600r Ohm	
Station name None, Station number None	
Translation profile (Incoming):	
Translation profile (Outgoing):	
Voice card specific Info Follows:	
Signal Type is cama	
Cama Type is KP-0-NPA-NXX-XXXX-ST	
Battery-Reversal is enabled	
Number Of Rings is set to 1	
Supervisory Disconnect is signal	
Answer Supervision is inactive	
Hook Status is On Hook	
Ring Detect Status is inactive	
Ring Ground Status is inactive	
Tip Ground Status is inactive	
Dial Out Type is mf	
Digit Duration Timing is set to 75 ms	



InterDigit Duration Timing is set to 65 ms

Pulse Rate Timing is set to 10 pulses/second

InterDigit Pulse Duration Timing is set to 750 ms

Percent Break of Pulse is 60 percent

GuardOut timer is 2000 ms

Minimum ring duration timer is 125 ms

Hookflash-in Timing is set to 600 ms

Hookflash-out Timing is set to 500 ms

Supervisory Disconnect Timing is set to 350 ms

OPX Ring Wait Timing is set to 6000 ms

CAMA\_GW#

## **Configuring the Cisco Catalyst 6000**

Console> (enable) sh snmp
SNMP: Enabled
RMON: Disabled

Extended RMON Netflow Enabled : None.

Memory usage limit for new RMON entries: 85 percent Engineld: 00:00:00:09:00:01:97:31:c8:00:00:00

Chassis Alias:

Traps Enabled: None Port Traps Enabled: None

Community-Access Community-String

-----

read-only public read-write private read-write-all secret

Additional- Access-

Community-String Access-Type Number View

-----

Trap-Rec-Address Trap-Rec-Community Trap-Rec-Port Trap-Rec-Owner Trap-Rec-Index

------

Console> (enable) sh cdp CDP : enabled



Message Interval : 60
Hold Time : 180
Version : V2
Device Id Format : Other
Console> (enable)

set interface sc0 109 172.20.8.20/255.255.255.0 172.20.8.255



## Configuring the Nortel CS1000M with Succession 4.0 Software Release PBX

## Common Equipment

```
REQ prt
TYPE cequ
CEQU
 MPED 8D
 SUPL 000 004 008 012
       016 032 036
                    040
       044 048 064
                    068
       072 V096 V100
 TDS
      000
 CONF 029 030 031 062
       094 095
 DLOP NUM DCH FRM TMDI LCMT YALM T1TE TRSH
  PRI 02 24 ESF NO B8S FDL -
                                    0.0
       06 23 ESF NO B8S FDL -
 PRI2 04 05 07
 DTI2
 MISP
```

## Configure D-Channel

```
REQ prt
TYPE adan dch 4
ADAN
        DCH 4
 CTYP MSDL
 CARD 04
 PORT 1
 DES toJupiter
 USR PRI
 DCHL 4
 OTBF 32
 PARM RS422 DTE
 DRAT 64KC
 CLOK EXT
 IFC ISGF
   PINX_CUST 0
   ISDN_MCNT 300
 CLID OPT0
 CO_TYPE STD
 SIDE USR
 CNEG 2
 RLS ID 4
 QCHID YES
 RCAP COLP NDI CCBI CCNI PRI DV3I CTI QMWI
 PR_TRIGS DIV 2 3
      CON 0 1
       CTR1 2 3
 MBGA NO
 OVLR NO
 OVLS NO
 T310 120
 T200 3
 T203 10
 N200 3
 N201 260
```



## Configure Route Data Block

```
REQ: prt
TYPE: rdb
CUST 0
ROUT 104
TYPE RDB
CUST 00
DMOD
ROUT 104
DES TOJUPITER
TKTP TIE
NPID_TBL_NUM
ESN NO
CNVT NO
SAT NO
RCLS EXT
VTRK NO
NODE
DTRK YES
BRIP NO
DGTP PRI2
ISDN YES
    MODE PRA
    IFC ISGF
    SBN NO
    PNI 00001
    NCNA NO
    NCRD NO
    CTYP UKWN
    INAC NO
    ISAR NO
    CPFXS YES
    DAPC NO
    INTC NO
DSEL VOD
PTYP DTT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 204
TCPP NO
TARG 01
CLEN 1
BILN NO
OABS
INST
{\tt ANTK}
SIGO STD
ICIS YES
TIMR ICF 512
    OGF 512
     EOD 13952
     NRD 10112
DDL 70
     ODT 4096
     RGV 640
```



GRD 896 SFB NBS 2048 NBL 4096 IENB 5 TFD 0 VSS 0 PAGE 002 VGD 6 DRNG NO CDR NO VRAT NO MUS NO FRL 0 0 FRL 1 0 FRL 2 0 FRL 3 0 FRL 4 0 FRL 5 0 FRL 6 0 FRL 7 0 OHQ NO OHQT 00 CBQ NO AUTH NO TTBL 0 ATAN NO PLEV 2 ALRM NO ART 0 SGRP 0 AACR NO

## Configure Trunk

REQ: prt TYPE: tnb TN 4 1 DATE PAGE DES DES TOJUPITER TN 004 01 TYPE TIE CDEN SD CUST 0 TRK PRI2 PDCA 1 PCML A NCOS 0 RTMB 104 1 B-CHANNEL SIGNALING TGAR 1



AST NO
IAPG 0
CLS UNR DTN WTA LPR APN THFD
P10 VNL

## Software Release

>LD 22

PT2000

MARP NOT ACTIVATED

ld 22 PT2000

REQ iss

CALL SERVER/MAIN CAB
VERSION 2121
RELEASE 4
ISSUE 00 T +
IDLE\_SET\_DISPLAY NORTEL
REQ \*\*\*\*

## Software package Installed (Succession 4.0)

OPTF 1 CUST 2 4 CDR 5 CTYRAN 7 8 TAD DNDI 10 EES INTR 11 12 ANI ANIR 13 BRTE 14 DNDG 16 MSB 17 SS25 18 DDSP 19 20 ODAS 21 DI CHG 23 24 CAB BAUT 25 CASM 26 CASR 27 28 BQUE NTRF 29 NCOS 32 33 CPRK SSC 34 35 IMS UST 35 35 UMG ROA NSIG 37 MCBQ 38 39 NSC BACD 40



ACDB	41
ACDC	42
LMAN	43
MUS	44
ACDA	45
MWC	46
AAB	47
GRP	48
NFCR	49
LNK	51
FCA	52
SR	53
AA	54
HIST	55
AOP	56
BARS	57
NARS	58
CDP	59
PQUE	60
FCBQ	61
OHQ	62
NAUT	63
SNR	64
NXFR	67
HOT	70
	71
DHLD	
LSEL	72
SS5	73
DRNG	74
PBXI	75
DLDN	76
CSL	77
OOD	79
SCI	80
CCOS	81
CDRQ	83
·-	
TENS	86
FTDS	87
DSET	88
TSET	89
LNR	90
DLT2	91
PXLT	92
SUPV	93
CPND	95
DNIS	98
BGD	99
RMS	100
·-	
MR	101
AWU	102
PMSI	103
LLC	105
MCT	107
ICDR	108
APL	109
TVS	110
TOF	111
IDC	113
DCP DAGE	115
PAGT	116
CBC	117
CCDR	118
EMUS	119
PLDN	120
SCMP	121
FTC	125
BKI	127



DELT O	100
DTI2	129
TBAR	132
ENS	133
·-	
FFC	139
DCON	140
MPO	141
ISDN	145
PRA	146
ISL	147
NTWK	148
IEC	149
DNXP	150
CDRE	151
FXS	152
IAP3P	153
PRI2	154
THF	157
FGD	158
NAS	159
FNP	160
ISDN_INTL_SUP	161
SAR	162
MINT	163
LAPW	164
GPRI	167
ARIE	170
CPGS	172
ECCS	173
AAA	174
NMS	175
EOVF	178
HVS	179
DKS	180
SACP	181
VNS	183
OVLP	184
EDRG	185
POVR	186
SECL	191
ORC-RVQ	192
AINS	200
IPRA	202
XPE	203
XCT0	204
XCT1	205
MLWU	206
HSE	208
MLM	209
MAID	210
VAWU	212
EAR	214
ECT	215
BRI	216
IVR	218
MWI	219
MSDL	222
FC68	223
SSAU	229
BRIT	233
FCDR	234
BRIL	235
MCMO	240
MULTI_USER	242
ALRM_FILTER	243
SYS_MSG_LKUP	245
VMBA	246
CALL_ID	247
CUUTTI	41/



DPNA	250
SCDR	251
ARFW	253
PHTN	254
ADMINSET	256
ATX	258
CDRX	259
QSIG	263
NI-2	291
IPEX	295
MAT	296
CPP	301
QSIGGF	305
CPRKNET	306
PAGENET	307
-	310
CPCI	
TATO	312
OPEN_ALARM	315
OSIG-SS	316
NGEN	324
-	
RANBRD	327
MUSBRD	328
ESA	329
ESA_SUPP	330
ESA_CLMP	331
_	
CNUMB	332
CNAME	333
NI-2 CBC	334
MEET	348
MC32	350
DBA	351
FDID	362
NMCE	364
STS_MSG	380
_	381
CDIR	
VIRTUAL_OFFICE	382
ATAN	384
NI2NAME	385
M3900 PROD ENH	386
VIR_OFF_ENH	387
OAS	394
ICON	397
PCA	398
H323_VTRK	399
LOCX	400
PVQM	401
SIP	406

REQ

## Acronyms

Acronym	Definitions	
CAMA	Analog "Centralized Automatic Message Accounting" E911 Trunk	
PSAP	Public Service Answering Point	



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