



Ericsson MD110 BC13 using Cisco IOS Voice Gateways to Tunnel QSIG over SIP (with CUBE)

Initial Version, May 14, 2008

Table of Contents

Introduction	2
Network Topology.....	3
Limitations.....	3
System Components	4
Hardware Requirements	4
Software Requirements	4
Features	5
Features Supported.....	5
Features Not Supported	5
Configuration.....	6
Configuring the Ericsson MD110 BC13 SP3 PBX	6
Configuration Menus and Commands	6
Configuring the Cisco IOS Voice Gateways	26
Acronyms	44

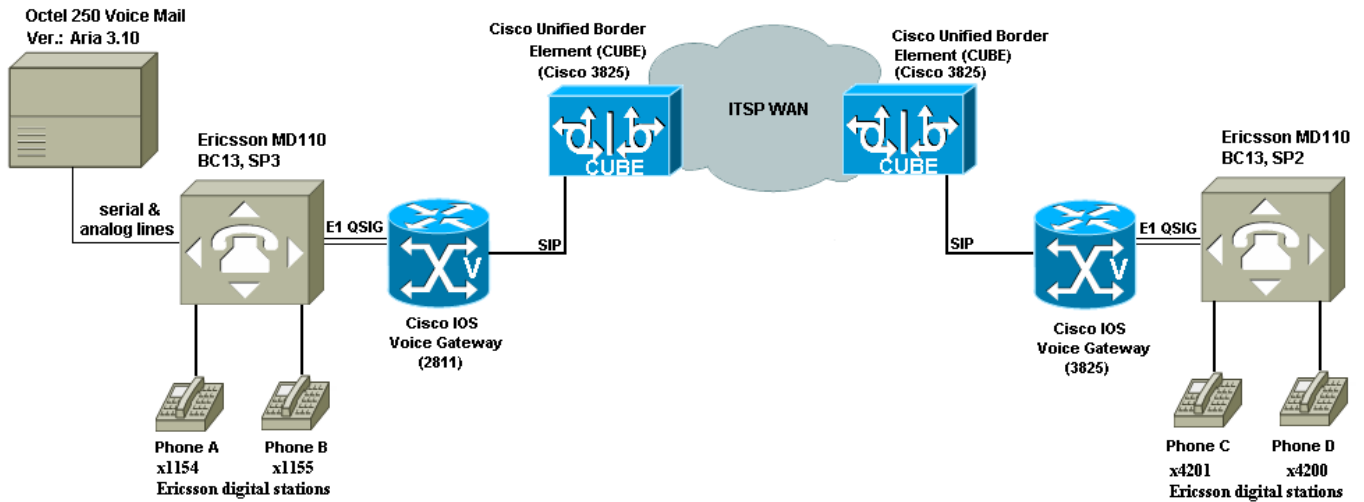


Introduction

- This application note provides interoperability information and documented configurations for a toll bypass solution using Cisco IOS Voice Gateways tunneling QSIG over SIP between two Ericsson MD110 PBXs. The integration consists of two Cisco IOS Voice Gateways connecting to the Ericsson MD110 PBXs using E1 QSIG trunks. The IOS gateways establish the QSIG connection between the two PBXs via SIP. An end-to-end connection is thus established between Ericsson MD110 PBXs. This E1 QSIG connection uses Ericsson proprietary user-to-user information elements (UUIEs). The SIP protocol used between Cisco IOS Voice Gateways “tunnels” the E1 QSIG with Ericsson proprietary UUIEs, resulting in a connection similar to connecting the PBXs directly. This integration also demonstrates use of the Cisco Unified Border Element (CUBE) in the SIP connection between the two Cisco IOS Voice Gateways. Figure 1 shows the integration topology.
- Interoperability was verified using a single CUBE. In a production deployment, two CUBEs will be required: one at either side of the toll bypass network, each acting as a point of demarcation between the service provider network and the privately managed networks. The topology in Figure 1 reflects this deployment. This application note includes a sample CUBE configuration that was used in the verification with a single CUBE. It can be used as a guide in a production deployment with two CUBEs. The outcome of limitations and features will not change with a second CUBE in the topology. However, modifications to CUBE and/or IOS Voice Gateway configurations are necessary to point VoIP dial-peers to the proper session target IP addresses, based upon the implemented dial plan.
- The following basic call and supplementary services features were verified: proper establishing and disconnecting of calls; calling name and number presentation and restriction; alerting name; call transfer (consultation and early-attended); call forwarding (all, busy, and no reply); callback; path replacement on trombone call; and voicemail access with MWI activation and deactivation. All of the above features are tested with join or reroute schema in both internal (local) and external networks. Please note that this document does not address performance and scalability, which are part of a broader criteria for a deployment-ready solution.
- This application note uses the Cisco 2811 and Cisco 3825 IOS Voice Gateways. However, the implementation is not platform-dependent, so you may also choose other Cisco IOS Voice Gateways. Below is a list of Cisco platforms capable of voice gateway and CUBE functions. Be careful when selecting a voice gateway platform and consider the capacity and capability required for the intended deployment.
 - [Cisco 1861 Integrated Services Router](#)
 - [Cisco IAD2400 Series Integrated Access Device](#)
 - [Cisco 2800 Series Integrated Services Routers](#)
 - [Cisco 3700 Series Multi-service Access Routers](#)
 - [Cisco 3800 Series Integrated Services Routers](#)
 - [Cisco AS5350XM Universal Gateway](#)
 - [Cisco AS5400XM Universal Gateway](#)

Network Topology

Figure 1. Basic Call Setup



Limitations

These are the known limitations, caveats, or integration issues.

- The Ericsson MD110 PBX proposes a path replacement on all trombone scenarios (e.g., Phone A calls Phone C and Phone C transfers to Phone B). This path replacement cannot be disabled
- The Ericsson MD110 PBX proposes a reroute on all eligible call forward scenarios (e.g., Phone A calls Phone C and Phone C forwards to Phone B). This path replacement cannot be disabled.



System Components

Hardware Requirements

The following hardware is required:

- Three Cisco Unified IOS gateways, two with E1 ports. For the specific example in this note:
 - Cisco Unified IOS gateway 2811 with NM-HDV and VWIC-2MFT-E1
 - Cisco Unified IOS gateway 3825 with VWIC-2MFT-E1-DI
 - Cisco Unified IOS gateway 3825 (as CUBE)
- Two Ericsson MD110 PBXs and TL76/1, PRI-E1 interface cards
- Four Ericsson MD110 digital stations
- One Octel 250 voice-mail system (or compatible substitute)

Software Requirements

The following software is required:

- PBX software release BC13, SP3
- Octel VM release: Aria 3.10
- Cisco IOS release 12.4(15)XZ or later
 - Two images with IP voice software feature set
 - One image with CUBE software feature set



Features

This section lists supported and unsupported features.

Features Supported

- Basic Call (ENBLOC dialing)
- Disconnect Supervision
- Calling Line (Number) Identification Presentation (CLIP)
- Calling Line (Number) Identification Restriction (CLIR)
- Calling Name Identification Presentation (CNIP)
- Calling Name Identification Restriction (CNIR)
- Connected Line (Number) Identification Presentation (COLP)
- Connected Line (Number) Identification Restriction (COLR)
- Connected Name Identification Presentation (CONP)
- Connected Name Identification Restriction (CONR)
- Alerting Name (See Limitations)
- Consultation Transfer – Local and Network/External
- Early-Attended Transfer – Local and Network/External
- Call Forward Unconditional – Local (See Limitations)
- Call Forward Busy – Local (See Limitations)
- Call Forward No Reply – Local (See Limitations)
- Call Forward Unconditional by Reroute – Network/External
- Call Forward Busy by Reroute – Network/External
- Call Forward No Reply by Reroute – Network/External
- Call Back/Call Completion – Busy and No Reply
- Path Replacement (for trombone connection)

Features Not Supported

- Trombone connection by join



Configuration

This section contains configuration menus and commands, and describes configuration sequences and tasks.

Configuring the Ericsson MD110 BC13 SP3 PBX

Note: The Ericsson MD 110 PBX user interface is precise. All parameters and options are mapped to position-dependent numeric fields within the various commands listed below. You must have the correct revision of the Ericsson MD 110 PBX administration manual to be able to decipher each field position and determine its meaning. It is therefore not advisable to make changes to an MD 110 PBX unless you know exactly what you are doing. A single number out of place in a command string can cause unusual behavior on the PBX.

Configure the Ericsson MD 110 PBX in the following sequence:

1. ROCAI Route Category Initiate
2. RODAI Route Data Initiate
3. ROEQI Route Equipment Initiate
4. RODDI Route External Destination

Configuration Menus and Commands

Route Category Initiate

Setup internal characteristics for the route. For example, Traffic direction, services, Bearer capabilities.

For Ericsson1 node (BC13, SP3) - using route 100 only.

<•ROCAP:ROU=100;

ROUTE CATEGORY DATA

ROU	SEL	TRM	SERV	NODG	DIST	DISL	TRAF	SIG	BCAP
100	71100000000000010	5	3110000011	0	30	128	03151515	111110000031	111111

END

For Ericsson2 node (BC13, SP2) – using route 100 only.

< ROCAP:ROU=100;

ROUTE CATEGORY DATA

ROU	SEL	TRM	SERV	NODG	DIST	DISL	TRAF	SIG	BCAP
100	71100000000000010	4	3110000011	0	30	128	03151515	111100000031	111111

END



Route Data Initiate

For Ericsson1 node

E1-PRI QSIG Route Protocol Characteristics, protocol side "Network"

< RODAP:ROU=100;

ROUTE DATA

ROU	TYPE	VARC	VARI	VARO	FILTER
100	SL60	H'00000310	H'75440000	H'06300000	NO

END

For Ericsson2 node

E1-PRI QSIG Route Protocol Characteristics, protocol side "User"

<•RODAP:ROU=100;

ROUTE DATA

ROU	TYPE	VARC	VARI	VARO	FILTER
100	SL60	H'00000310	H'75440000	H'06400000	NO

END



Route Equipment Initiate

E1-PRI QSIG trunk lines (B-channels)

For Ericsson1 node

```
<•ROEDP:ROU=100,TRU=ALL;  
ROUTE EQUIPMENT DATA
```

ROU	TRU	EQU	IP ADDRESS	SQU	INDDAT	CNTRL
100	001-1	001-0-30-01			H'000000000000	
100	001-2	001-0-30-02			H'000000000000	
100	001-3	001-0-30-03			H'000000000000	
100	001-4	001-0-30-04			H'000000000000	
100	001-5	001-0-30-05			H'000000000000	
100	001-6	001-0-30-06			H'000000000000	
100	001-7	001-0-30-07			H'000000000000	
100	001-8	001-0-30-08			H'000000000000	
100	001-9	001-0-30-09			H'000000000000	
100	001-10	001-0-30-10			H'000000000000	
100	001-11	001-0-30-11			H'000000000000	
100	001-12	001-0-30-12			H'000000000000	
100	001-13	001-0-30-13			H'000000000000	
100	001-14	001-0-30-14			H'000000000000	
100	001-15	001-0-30-15			H'000000000000	
100	001-16	001-0-30-17			H'000000000000	
100	001-17	001-0-30-18			H'000000000000	
100	001-18	001-0-30-19			H'000000000000	
100	001-19	001-0-30-20			H'000000000000	
100	001-20	001-0-30-21			H'000000000000	
100	001-21	001-0-30-22			H'000000000000	
100	001-22	001-0-30-23			H'000000000000	
100	001-23	001-0-30-24			H'000000000000	
100	001-24	001-0-30-25			H'000000000000	
100	001-25	001-0-30-26			H'000000000000	
100	001-26	001-0-30-27			H'000000000000	
100	001-27	001-0-30-28			H'000000000000	
100	001-28	001-0-30-29			H'000000000000	
100	001-29	001-0-30-30			H'000000000000	
100	001-30	001-0-30-31			H'000000000000	

END

For Ericsson2 node

```
< ROEDP:ROU=100,TRU=ALL;  
ROUTE EQUIPMENT DATA
```



ROU	TRU	EQU	IP ADDRESS	SQU	INDDAT	CNTRL
100	001-1	001-1-50-01			H'000000000000	
100	001-2	001-1-50-02			H'000000000000	
100	001-3	001-1-50-03			H'000000000000	
100	001-4	001-1-50-04			H'000000000000	
100	001-5	001-1-50-05			H'000000000000	
100	001-6	001-1-50-06			H'000000000000	
100	001-7	001-1-50-07			H'000000000000	
100	001-8	001-1-50-08			H'000000000000	
100	001-9	001-1-50-09			H'000000000000	
100	001-10	001-1-50-10			H'000000000000	
100	001-11	001-1-50-11			H'000000000000	
100	001-12	001-1-50-12			H'000000000000	
100	001-13	001-1-50-13			H'000000000000	
100	001-14	001-1-50-14			H'000000000000	
100	001-15	001-1-50-15			H'000000000000	
100	001-16	001-1-50-17			H'000000000000	
100	001-17	001-1-50-18			H'000000000000	
100	001-18	001-1-50-19			H'000000000000	
100	001-19	001-1-50-20			H'000000000000	
100	001-20	001-1-50-21			H'000000000000	
100	001-21	001-1-50-22			H'000000000000	
100	001-22	001-1-50-23			H'000000000000	
100	001-23	001-1-50-24			H'000000000000	
100	001-24	001-1-50-25			H'000000000000	
100	001-25	001-1-50-26			H'000000000000	
100	001-26	001-1-50-27			H'000000000000	
100	001-27	001-1-50-28			H'000000000000	
100	001-28	001-1-50-29			H'000000000000	
100	001-29	001-1-50-30			H'000000000000	
100	001-30	001-1-50-31			H'000000000000	

END



Route External Destination Data Initiate

For Ericsson1 node

Route and Access Code for the trunk Information.

<•RODDP:DEST=42;

EXTERNAL DESTINATION ROUTE DATA

DEST	DRN	ROU	CHO	CUST	ADC	TRC	SRT	NUMACK	PRE
42		100			16061000000002500060011000	0	1	0	

END

For Ericsson2 node

Route and Access Code for the trunk Information.

< RODDP:DEST=11;

EXTERNAL DESTINATION ROUTE DATA

DEST	DRN	ROU	CHO	CUST	ADC	TRC	SRT	NUMACK	PRE
11		100			16061000000002500060011000	0	1	0	

END



Exchange ID (System ID)

For Ericsson1 node

<SYIDP;

PRIVATE NETWORK EXCHANGE IDENTITY IS

888

END

For Ericsson2 node

<SYIDP;

PRIVATE NETWORK EXCHANGE IDENTITY IS

666

END

For Path Replacement in three-node scenarios, Exchange IDs must be unique.

Change System ID by using the following commands:

<•SYIDE;

EXECUTED

<•SYIDI : EXGID=888;

EXECUTED



Route Number Data Print – Private Exchange Number Prefix

A prefix can be added to the outgoing number (as connected number) by setting the EXNOPR parameter, which should be left blank. This is accomplished by using the RONDE command.

```
<•RONDE:ROU=100;
```

```
EXECUTED
```

It can be checked with the RONDP command.

For Ericsson1 node

Route and Access Code for the trunk Information

```
< RONDP:ROU=100;
```

```
ROUTE NUMBER DATA
```

```
ROU    PRE    ROUDIR    EXNOPU    EXNOPR    TERAC
```

```
100
```

```
END
```

For Ericsson2 node

```
< RONDP:ROU=100;
```

```
ROUTE NUMBER DATA
```

```
ROU    PRE    ROUDIR    EXNOPU    EXNOPR    TERAC
```

```
100
```

```
END
```



Number Analysis Summary

For Ericsson1 node

NADAP;

NUMBER ANALYSIS DATA

TYPE OF SERIES	NUMBER SERIES
EXTENSION NUMBER SERIES	1001 - 1199 4500 - 4508
EXTERNAL DESTINATION CODE	122 125 233 235 30 - 38 40 42 50 53 553 63 642 645 650 666 70 777
ABBREVIATED COMMON NUMBER SERIES	1200 2200
OWN EXCHANGE NUMBER SERIES	888
TYPE OF SERVICE CODE	SERVICE CODE
EXTERNAL NUMBER LENGTH DATA	
EXTERNAL NUMBER	NUMBER LENGTH
122	4 - 4
125	4 - 4
233	7 - 7
235	3 - 7
30	4 - 4
40	4 - 4
42	4 - 4
50	4 - 4
53	4 - 4
553	5 - 5
63	4 - 4
642	5 - 5
645	5 - 5
650	5 - 5
666	7 - 7



70 4 - 4
777 4 - 4

PROCEED TO SEND SIGNAL DATA

EXTERNAL NUMBER POS. TYPE

CALL DISCRIMINATION DATA

EXTERNAL/INTERNAL NUMBER CAT

END



For Ericsson2 node

< NADAP ;

NUMBER ANALYSIS DATA

TYPE OF SERIES	NUMBER SERIES
EXTENSION NUMBER SERIES	4200 - 4230 4250 - 4299
EXTERNAL DESTINATION CODE	106 11 - 12 20 235 30 40 44 450 50 53 550 - 560 60 750 777 888 950
OPERATOR INDIV. NUMBER SERIES	100
OWN EXCHANGE NUMBER SERIES	666
TYPE OF SERVICE CODE	SERVICE CODE
EXTERNAL NUMBER LENGTH DATA	
EXTERNAL NUMBER	NUMBER LENGTH
10	4 - 4
11	4 - 4
12	4 - 4
20	4 - 4
235	7 - 7
30	4 - 4
40	4 - 4
42	4 - 4
44	5 - 5
450	5 - 5
50	4 - 4
53	4 - 4
550	3 - 7
551	3



750	5 - 5
777	3 - 7
888	7 - 7
950	7

PROCEED TO SEND SIGNAL DATA

EXTERNAL NUMBER	POS. TYPE
-----------------	-----------

CALL DISCRIMINATION DATA

EXTERNAL/INTERNAL NUMBER	CAT
--------------------------	-----

END



Overlap/Enbloc sending

First remove access code

```
<NANLR:EXL=50;
```

To do overlap sending

```
<NANLS:EXL=50,MIN=2,MAX=4;
```

To do Enbloc sending

```
<NANLS:EXL=50,MIN=4,MAX=4;
```

Key System Directory

For Ericsson1 node

```
<•KSDDP:DIR=ALL;
```

KEY SYSTEM DIRECTORY DATA

DIR	CUST	EQU	CAT	ADN	ODN	CALALT	TIMER
1151		001-0-20-00	-			1	0
1152		001-0-20-01	-			1	0
1153		001-0-20-02	-			1	0
1154		001-0-20-03	-			1	0
1155		001-0-20-04	-			1	0
1156		001-0-20-05	-			1	0
1157		001-0-20-06	-			1	0
1158		001-0-20-07	-			1	0
1159		001-0-20-08	-			1	0
1160		001-0-20-09	-			1	0
1161		001-0-20-10	-			1	0
1162		001-0-20-11	-			1	0
1163		001-0-20-12	-			1	0
1164		001-0-20-13	-			1	0
1165		001-0-20-14	-			1	0

END



For Ericsson2 node

<KSDDP:DIR=ALL;

KEY SYSTEM DIRECTORY DATA

DIR	CUST	EQU	CAT	ADN	ODN	CALALT	TIMER
4200		001-1-20-00	1			1	0
4201		001-1-20-01	-			1	0
4202		001-1-20-02	1			1	0
4203		001-1-20-03	1			1	0
4204		001-1-20-04	1			1	0
4205		001-1-20-05	1			1	0
4206		001-1-20-06	1			1	0
4207		001-1-20-07	1			1	0
4208		001-1-20-08	1			1	0
4209		001-1-20-09	1			1	0
4210		001-1-20-10	1			1	0
4211		001-1-20-11	1			1	0
4212		001-1-20-12	1			1	0
4213		001-1-20-13	1			1	0
4214		001-1-20-14	1			1	0
4215		001-1-20-15	1			1	0

END



Calling/Connected Name and Number Restrictions

For Ericsson1 node

<•KSCAP:DIR=ALL;

KEY SYSTEM CATEGORY PRINT

DIR	TRAF	SERV	CDIV	ROC	ITYPE	TRM	ADC	LANG	BSEC
1151	03151515	0211120700	011151111	720004	19	0	00100013010000	0	0
1152	03151515	0211120700	011151111	720004	19	0	00100013010000	0	0
1153	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1154	03151515	0211120700	111151111	720004	20	0	00100013010000	0	0
1155	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1156	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1157	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1158	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1159	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1160	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1161	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1162	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1163	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1164	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0
1165	00151515	0202720500	011151111	000001	19	0	00100013010000	0	0

END

For Ericsson2 node

<•KSCAP:DIR=ALL;

KEY SYSTEM CATEGORY PRINT

DIR	TRAF	SERV	CDIV	ROC	ITYPE	TRM	ADC	LANG	BSEC
4200	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4201	03151515	0211120700	111151111	720004	20	0	00100013011000	F	0
4202	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4203	03151515	0211120700	011151111	720004	20	0	00100013010000	F	0
4204	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4205	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4206	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4207	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4208	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4209	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4210	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4211	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4212	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4213	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4214	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0
4215	03151515	0211120700	011151111	720004	20	0	00100013011000	F	0

END



To configure Calling/Connected Name and Number Restricted, use the following command:

```
<KSCAC:DIR=1154&&1155,ADC=00010013010000;
```

To configure Calling/Connected Name and Number Allowed, use the following command:

```
<KSCAC:DIR=1154&&1155,ADC=00100013010000;
```

To remove Name, use the following command:

```
<NIINE:DIR=1154; //REMOVE NAME
```

To add Name, use the following command:

```
<NIINI:DIR=1154,NAME1="BC12-1",NAME2="ONE",PRES=20; //ADD NAME
```

To print Station's Name, use the following command:

For Ericsson1 node

```
<•NIINP:DIR=ALL;
EXTENSION NAMES
```

DIR	NAME1	NAME2	PRES	INFO
1051	REAL MOFO		11	
1063	V-MAIL P-1		11	
1064	V-MAIL P-2		11	
1151	MX-ONE TSW-SP2	ONE	10	
1152	MX-ONE TSW-SP2	TWO	10	
1153	ZORGON		10	
1154	LOS	ANGELES	20	
1155	SAN	FRAN	20	
1156	REAVAR		10	
1157	MX-ONE TSW-SP2	SEVEN	10	
1158	MX-ONE TSW-SP2	EIGHT	10	
1159	MX-ONE TSW-SP2	NINE	10	
1160	MX-ONE TSW-SP2	ZERO	10	
END				

For Ericsson2 node



<•NIINP:DIR=ALL;
EXTENSION NAMES

DIR	NAME1	NAME2	PRES	INFO
4200	NEW	YORK	21	
4201	PALM	BEACH	21	
4202	filli		11	
4203	samir		11	
4204	MX-ONE TSW-SP2	FOUR	20	
4205	MX-ONE TSW-SP2	FIVE:	20	
4282	MX-ONE TSW-SP2	IP 2	21	
4283	MX-ONE TSW-SP2	IP 3	21	
END				



Path Replacement (Route Optimization)

To enable/disable Path Replacement, use the following command:

```
<ASPAC:PARNUM=66,PARVAL=1; //Route optimization allowed. --- FORWARD
```

```
<ASPAC:PARNUM=66,PARVAL=0; //Route optimization NOT allowed.
```

To print parameter's value, use the following command:

For Ericsson1 node

```
<•ASAPAP:PARNUM=66;  
APPLICATION SYSTEM PARAMETERS  
PARNUM      PARVAL  
    66      0  
END
```

For Ericsson2 node

```
< ASPAP:PARNUM=66;  
APPLICATION SYSTEM PARAMETERS  
PARNUM      PARVAL  
    66      0  
END
```



Call Diversion on Busy/No Reply

For Ericsson1 node

```
<•CDIDP:DIR=ALL;  
CALL DIVERSION INDIVIDUAL DATA
```

DIR	DIV
1152	4500
1153	5001
1154	1155 (showing A CFB/CFNA to B)
1157	4500
1158	4500
1159	4500
1160	4500
1161	4500
1162	4500
1163	4500
1164	4500
1165	4500

END

For Ericsson2 node

```
<•CDIDP:DIR=ALL;  
CALL DIVERSION INDIVIDUAL DATA
```

DIR	DIV
4205	317004

END

To enable/disable Diversion on Busy/No Reply, use the following command:

```
<CDINI:DIR=1154,DIV=1155; // CALL DIVERSION INDIVIDUAL NUMBER INITIATE
```

```
<CDINE:DIR=1154; // CALL DIVERSION INDIVIDUAL NUMBER END
```



Diversion Counter

```
<ASUVP:PARNUM=121; // check current setting for maximum number of hop diversions
<ASPAC:PARNUM=121,PARVAL= VALUE; // To set maximum number of hop diversions where VALUE
range is 0-255
```

For Ericsson1 node

```
<•ASUVP:PARNUM=121;
APPLICATION SYSTEM PARAMETER VALUES FOR UNIT
PARNUM CHA PARVAL MINVAL MAXVAL UNIT REMARK
121 YES 12 0 255 RMP
END
```

For Ericsson2 node

```
<•ASUVP:PARNUM=121;
APPLICATION SYSTEM PARAMETER VALUES FOR UNIT
PARNUM CHA PARVAL MINVAL MAXVAL UNIT REMARK
121 YES 12 0 255 RMP
```

Network Services

```
<ASPAC:PARNUM=223,PARVAL=7; // Network Features: Standard SS-Call Forwarding,
Standard SS-Call Transfer, Path Replacement for route optimization.
```

For Ericsson1 node

```
<•ASPAP:PARNUM=223;
APPLICATION SYSTEM PARAMETERS
PARNUM PARVAL
223 0
END
```

For Ericsson2 node

```
< ASPAP:PARNUM=223;
APPLICATION SYSTEM PARAMETERS
PARNUM PARVAL
223 0
END
```



Ericsson MD 110 Software Version

For Ericsson1 node

```
<•CADAP;  
CALENDAR DATA  
  
IDENTITY=ACM1  
VERSION=CXP1010101/4/TSWSP03/R4A  
  
18:39:50  
TUE 13 MAY 2008  
END
```

For Ericsson2 node

```
<•CADAP;  
CALENDAR DATA  
  
IDENTITY=2MAGS  
VERSION=CXP1010101/4/TSWSP02/R3A  
  
17:37:29  
TUE 13 MAY 2008  
END
```



Configuring the Cisco IOS Voice Gateways

For IOS Voice Gateway 1

sho ver

Cisco IOS Software, 2800 Software (C2800NM-IPVOICE-M), Version 12.4(15)XZ, RELEASE SOFTWARE (fc2)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2008 by Cisco Systems, Inc.

Compiled Fri 11-Apr-08 17:51 by prod_rel_team

ROM: System Bootstrap, Version 12.4(1r) [hqluong 1r], RELEASE SOFTWARE (fc1)

REMOTE-2811 uptime is 1 week, 1 day, 4 hours, 52 minutes

System returned to ROM by reload at 21:21:20 UTC Mon May 5 2008

System image file is "flash:c2800nm-ipvoice-mz.124-15.XZ.bin"

Cisco 2811 (revision 53.51) with 247808K/14336K bytes of memory.

Processor board ID FHK0946F0MZ

2 FastEthernet interfaces

55 Serial interfaces

2 Channelized E1/PRI ports

1 Channelized T1/PRI port

DRAM configuration is 64 bits wide with parity enabled.

239K bytes of non-volatile configuration memory.

62592K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2



REMOTE-2811#sho run

Building configuration...

Current configuration : 2284 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname REMOTE-2811

!

boot-start-marker

boot system flash:c2800nm-ipvoice_ivs-mz.124-17.4.5.XY

boot-end-marker

!

logging message-counter syslog

logging buffered 99999999

no logging console

enable password cisco

!

no aaa new-model

no network-clock-participate slot 1

network-clock-participate wic 0

!

voice-card 0

no dspfarm

!



```
voice-card 1
no dspfarm
!
!
ip cef
!
!
no ip domain lookup
ip dhcp-server query lease retries 5
ip dhcp-server 172.20.15.159
multilink bundle-name authenticated
!
isdn switch-type primary-qsig
!
!
voice call carrier capacity active
!
voice service voip
signaling forward rawmsg
sip
!
!
!
archive
log config
hidekeys
!
!
!
```



```
controller E1 1/0/0
pri-group timeslots 1-31
description ECN-4
!
controller E1 1/0/1
!
!
!
!
!
interface FastEthernet0/0
ip address 172.20.15.159 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
!
interface Serial1/0/0:15
no ip address
encapsulation hdlc
no logging event link-status
isdn switch-type primary-qsig
isdn overlap-receiving
isdn incoming-voice voice
```



isdn global-disconnect

isdn contiguous-bchan

isdn bchan-number-order ascending

no cdp enable

!

ip forward-protocol nd

ip route 0.0.0.0 0.0.0.0 172.20.15.1

!

!

ip http server

!

!

control-plane

!

voice-port 1/0/0:15

!

dial-peer voice 2 voip¹

description REMOTE-2811 to CUBE

destination-pattern 42..

signaling forward rawmsg

session protocol sipv2

session target ipv4:172.20.15.199

session transport udp

!

dial-peer voice 10015 pots

description REMOTE-2811 to PBX1

destination-pattern 1...

direct-inward-dial

¹ In a 2-CUBE scenario, this dial-peer should be pointed to CUBE 1.



```
port 1/0/0:15
forward-digits all
!
!
sip-ua
reason-header override
!
!
line con 0
line aux 0
line vty 0 4
password cisco
login
!
exception data-corruption buffer truncate
scheduler allocate 20000 1000
end
```

REMOTE-2811#



For IOS Voice Gateway 2

NEW-3825#sho ver

Cisco IOS Software, 3800 Software (C3825-IPVOICE-M), Version 12.4(15)XZ, RELEASE SOFTWARE (fc2)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2008 by Cisco Systems, Inc.

Compiled Fri 11-Apr-08 21:10 by prod_rel_team

ROM: System Bootstrap, Version 12.4(13r)T, RELEASE SOFTWARE (fc1)

NEW-3825 uptime is 1 week, 1 day, 4 hours, 52 minutes

System returned to ROM by reload at 20:36:49 UTC Mon May 5 2008

System image file is "flash:c3825-ipvoice-mz.124-15.XZ.bin"

Cisco 3825 (revision 1.2) with 227328K/34816K bytes of memory.

Processor board ID FTX1150A2PX

2 Gigabit Ethernet interfaces

31 Serial interfaces

2 Channelized E1/PRI ports

DRAM configuration is 64 bits wide with parity enabled.

479K bytes of NVRAM.

62720K bytes of ATA System CompactFlash (Read/Write)

Configuration register is 0x2102



NEW-3825#sho run

Building configuration...

Current configuration : 2971 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname NEW-3825

!

boot-start-marker

boot-end-marker

!

logging message-counter syslog

logging buffered 99999999

no logging console

!

no aaa new-model

network-clock-participate wic 1

!

ip cef

!

!

!

ip domain name yourdomain.com

multilink bundle-name authenticated

!



```
isdn switch-type primary-qsig
!
voice-card 0
no dspfarm
!
!
voice service voip
signaling forward rawmsg
sip
!
!
username cisco privilege 15 secret 5 $1$fwCw$48iImAYreOJW9DhXhnZqK/
archive
log config
hidekeys
!
!
controller E1 0/1/0
pri-group timeslots 1-31
!
controller E1 0/1/1
!
!
interface GigabitEthernet0/0
description main connection
ip address 172.20.15.196 255.255.255.0
duplex auto
speed auto
media-type rj45
```



```
!  
interface GigabitEthernet0/1  
no ip address  
shutdown  
duplex auto  
speed auto  
media-type rj45  
!  
interface Serial0/1/0:15  
no ip address  
encapsulation hdlc  
no logging event link-status  
isdn switch-type primary-qsig  
isdn timer T310 120000  
isdn overlap-receiving  
isdn protocol-emulate network  
isdn incoming-voice voice  
isdn global-disconnect  
isdn contiguous-bchan  
no cdp enable  
!  
ip forward-protocol nd  
ip route 0.0.0.0 0.0.0.0 172.20.15.1  
!  
!  
ip http server  
ip http access-class 23  
ip http authentication local  
ip http timeout-policy idle 60 life 86400 requests 10000
```



```
!  
control-plane  
!  
!  
!  
voice-port 0/1/0:15  
!  
!  
!  
dial-peer voice 1 voip2  
description NEW-3825 to CUBE  
destination-pattern 11..  
signaling forward rawmsg  
session protocol sipv2  
session target ipv4:172.20.15.199  
session transport udp  
!  
dial-peer voice 3015 pots  
description NEW-3825 to PBX2  
destination-pattern 42..  
direct-inward-dial  
port 0/1/0:15  
forward-digits all  
!  
!  
sip-ua  
reason-header override  
!
```

² In a 2-CUBE scenario, this dial-peer should be pointed toward CUBE 2.



```
!  
line con 0  
login local  
line aux 0  
line vty 0 4  
access-class 23 in  
privilege level 15  
login local  
transport input telnet  
line vty 5 15  
access-class 23 in  
privilege level 15  
login local  
transport input telnet  
!  
scheduler allocate 20000 1000  
end  
NEW-3825#
```



For CUBE

sho ver

Cisco IOS Software, 3800 Software (C3825-IPVOICE_IVS-M), Version 12.4(15)XZ, RELEASE SOFTWARE (fc2)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2008 by Cisco Systems, Inc.

Compiled Fri 11-Apr-08 21:10 by prod_rel_team

ROM: System Bootstrap, Version 12.3(11r)T2, RELEASE SOFTWARE (fc1)

CUBE_3825 uptime is 3 weeks, 3 hours, 29 minutes

System returned to ROM by reload at 21:58:49 UTC Tue Apr 22 2008

System image file is "flash:c3825-ipvoice_ivs-mz.124-15.XZ.bin"

Cisco 3825 (revision 1.0) with 227328K/34816K bytes of memory.

Processor board ID FTX0925A0ST

2 Gigabit Ethernet interfaces

1 Serial(sync/async) interface

DRAM configuration is 64 bits wide with parity enabled.

479K bytes of NVRAM.

125184K bytes of ATA System CompactFlash (Read/Write)

Configuration register is 0x2102



CUBE_3825#sho run

Building configuration...

Current configuration : 3014 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname CUBE_3825

!

boot-start-marker

boot system flash:c3825-ipvoice_ivs-mz.124-11.XJ4.bin

boot-end-marker

!

logging message-counter syslog

logging buffered 9999999

no logging console

enable password cisco

!

no aaa new-model

!

ip cef

!

multilink bundle-name authenticated

!

!



```
voice-card 0

dspfarm

dsp services dspfarm

!

!

!

voice service voip

allow-connections h323 to h323

allow-connections h323 to sip

allow-connections sip to h323

allow-connections sip to sip

signaling forward rawmsg

fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback pass-through g711ulaw

h323

h225 id-passthru

h225 connect-passthru

sip

header-passing error-passthru

!

!

archive

log config

hidekeys

!

!

interface GigabitEthernet0/0

description $ETH-LAN$$ETH-SW-LAUNCH$$INTF-INFO-GE 0/0$

ip address 172.20.15.199 255.255.255.0

duplex auto
```



```
speed auto
media-type rj45
no keepalive
!
interface GigabitEthernet0/1
no ip address
shutdown
duplex auto
speed auto
media-type rj45
no keepalive
!
interface Serial0/0/0
no ip address
shutdown
clock rate 2000000
!
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 GigabitEthernet0/0
!
!
ip http server
!
!
control-plane
!
!
sccp local GigabitEthernet0/0
sccp ccm 172.20.8.254 identifier 1 version 4.1
```



```
sccp
!
sccp ccm group 1
  associate ccm 1 priority 1
  associate profile 1 register MTP0013C4037300
!
dspfarm profile 1 mtp
  codec g729r8
  maximum sessions software 10
  associate application SCCP
!
dial-peer voice 4200 voip3
  description CUBE to NEW-3825
  destination-pattern 42..
  signaling forward rawmsg
  session protocol sipv2
  session target ipv4:172.20.15.196
  session transport udp
  no vad
!
dial-peer voice 1000 voip
  description CUBE to REMOTE-2811
  destination-pattern 1...
  signaling forward rawmsg
  session protocol sipv2
  session target ipv4:172.20.15.159
  session transport udp
  no vad
```

³ In a 2-CUBE scenario, where this config is for CUBE 1, this dial-peer should be pointed toward CUBE 2.



```
!  
!  
gateway  
media-inactivity-criteria all  
timer receive-rtcp 5  
timer receive-rtp 1200  
!  
sip-ua  
reason-header override  
!  
gatekeeper  
shutdown  
!  
telephony-service  
max-conferences 12 gain -6  
transfer-system full-consult  
create cnf-files version-stamp Jan 01 2002 00:00:00  
!  
line con 0  
line aux 0  
line vty 0 4  
password cisco  
login  
!  
exception data-corruption buffer truncate  
scheduler allocate 20000 1000  
end  
CUBE_3825#
```



Acronyms

Acronym	Definitions
Cisco IOS	Cisco Internetwork Operating System
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
CUBE	Cisco Unified Border Element (formerly Multi-Service IP-to-IP gateway, or Session Border Controller)
PBX	Private Branch Exchange
RTP	Real-Time Protocol
SIP	Session Initiation Protocol
UUIE	User-to-user information element



Important Information

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.



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

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco Web site at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

© 2008 Cisco Systems, Inc. All rights reserved.

CCDE, CCENT, Cisco Eos, Cisco Lumin, Cisco Nexus, Cisco StadiumVision, the Cisco logo, DCE, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn is a service mark; and Access Registrar, Aironet, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0805R)