Application Note

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

Initial Version, May 14, 2008

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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.

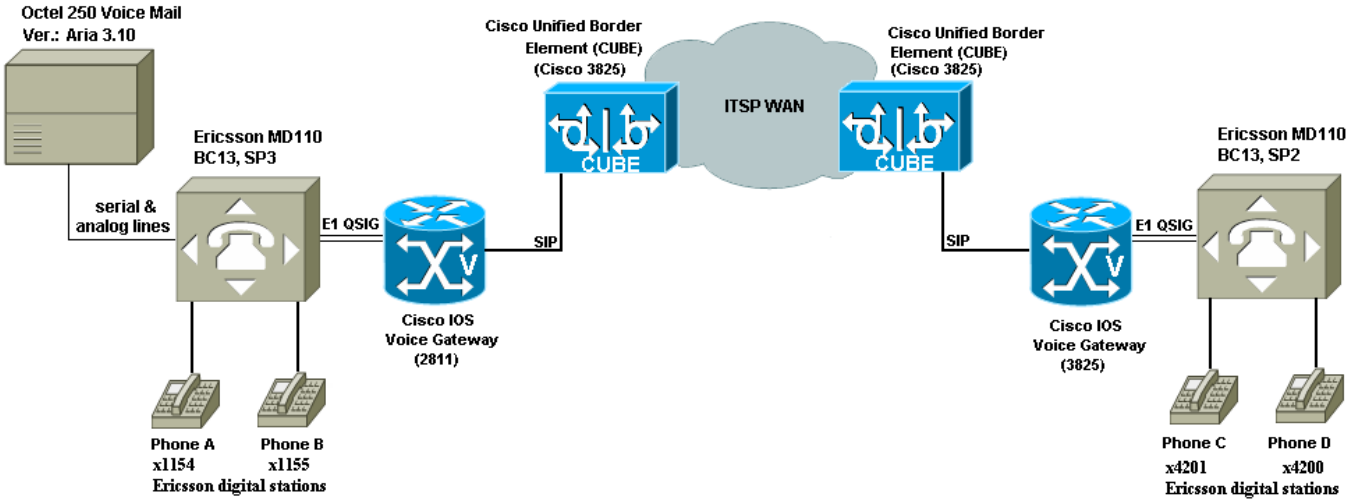
- The following basic call and supplementary services features were verified: proper establishing and disconnecting of calls; calling name and number presentation and restriction; alerting name; call transfer (consultation and early-attended); call forwarding (all, busy, and no reply); callback; path 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 7110000000000010 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 7110000000000010 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          160610000000025000600011000 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          160610000000025000600011000 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   REAVER                                    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

```
< ASAPAP: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
```

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 voip[1]

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 voip[2]

 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

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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 voip[3]

 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

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