



Ericsson MD110 BC12 to a Cisco IAD243X using E1-Q.SIG with SIP

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Introduction

This is an application note for connectivity to an Ericsson MD110 BC12 SP5 with Cisco IAD243X Gateway via QSIG-to-SIP communication (10/100baseT).

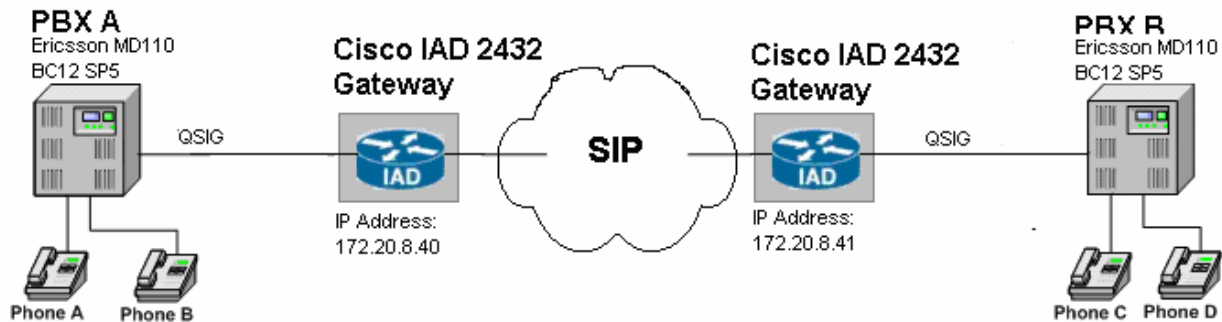
The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco IAD243X Gateway connected to the PBX via QSIG (E1 PRI). IP trunk connectivity between the Cisco IAD243X's is achieved by using SIP protocol.



Network Topology

Figure 1. Network Topology

Basic Call Setup End-to-End Configuration



Limitations

Calling Name (CNIP) feature does not interoperate. The limitation is due to the Cisco IAD2432 encoding the Calling Name using QSIG profile 'Rose' and gives an operation value of LocalValue=0, these parameters are unrecognized by the Avaya PBX and Calling Name presentation fails.

Connected Name (CONP) feature does not interoperate. The limitation is due to the Cisco IAD2432 not supporting this feature.

Connected Number does not follow the CallForward feature (e.g. If Phone A calls Phone C, and Phone C is forwarded to Phone D, the connected number displayed on Phone A will be Phone C's number, not Phone D's). The limitation is due to the Cisco IAD2432.

Connected number restriction is not honored. The limitation is due to the Cisco IAD2432.

Alerting name presentation feature does not interoperate. The limitation is due to the Cisco IAD2432 not supporting this feature.

When Call Transfer or Call forward features are invoked the name and number updates have limited functionality. The limitation is due to the Cisco IAD2432 not supporting the Q931 FACILITY message.

Call Forward All network/external feature access code (*22#) is handled as voice call by the Cisco IAD243X, when in fact it is "Unrestricted Digital" information. This causes the call to ring the DivertedTo number and either the destination phone answers and call fails (enabling CallForward external on forwarding station), or the call times out and the call fails (This enables CallForward external).



Hardware Requirements

- 2 Cisco IAD2432 24FXS
- 2 Ericsson MD110 w/ TLU76/1, E1 PRI circuit card
- 2 Ericsson DBC 203 digital phones
- 1 Cisco Catalyst switch (CAT6500)

Software Requirements

- Ericsson MD110 BC12 SP5
- Cisco IOS Release: c2430-ik9o3s-mz-124-9.T1

Features

Features Supported

- Basic end-to-end calls with CLIP (Calling Number) and COLP (Connected Number)
- Calling Number Restricted (CLIR calling number only)
- Overlap Receiving – IAD2432 can perform Overlap-Receiving, but outgoing call will be ENBLOC
- Call Transfer – Local and Network/External
- Call on-hold
- Call Forward (Unconditional, Busy and No answer) – local , Call Forward Unconditional network/external
- 3-way Conference
- DTMF end-to-end

Features Not Supported

- Calling Name and Connected Name presentation
- Alerting Name presentation
- Call Forward No Answer and busy for network/external
- Call Transfer Name/Number Facility updates
- Call Forward Name/Number Facility updates
- Overlap-Sending (Dialing out-from IAD)
- QSIG-MWI

Configuration

Configuring the Ericsson PBX

1. **ROCAI** Route Category Initiate
2. **RODAI** Route Data Initiate
3. **ROEQI** Route Equipment Initiate
4. **NADAP** Number Analysis (dialing plan)
5. **RODDI** Route External Destination Data Initiate



6. Digital Station

ROCAI

<L rocap:rou=1;

ROUTE CATEGORY DATA

ROU SEL TRM SERV NODG DIST DISL TRAF SIG BCAP

1 7110000000000010 5 3110000000 0 30 128 03151515 111110000031 111111

END

RODAI

<L rodap:rou=1;

ROUTE DATA

ROU TYPE VARC VARI VARO FILTER

1 SL60 H'00000310 H'55440000 H'06400000 NO

END



ROEQI

<L roedp:rou=1,tru=all;

ROUTE EQUIPMENT DATA

ROU	TRU	EQU	IP ADDRESS	SQU	INDDAT	CNTRL
-----	-----	-----	------------	-----	--------	-------

1	001-1	001-1-40-01		H'000000000000		
1	001-2	001-1-40-02		H'000000000000		
1	001-3	001-1-40-03		H'000000000000		
1	001-4	001-1-40-04		H'000000000000		
1	001-5	001-1-40-05		H'000000000000		
1	001-6	001-1-40-06		H'000000000000		
1	001-7	001-1-40-07		H'000000000000		
1	001-8	001-1-40-08		H'000000000000		
1	001-9	001-1-40-09		H'000000000000		
1	001-10	001-1-40-10		H'000000000000		
1	001-11	001-1-40-11		H'000000000000		
1	001-12	001-1-40-12		H'000000000000		
1	001-13	001-1-40-13		H'000000000000		
1	001-14	001-1-40-14		H'000000000000		
1	001-15	001-1-40-15		H'000000000000		
1	001-16	001-1-40-17		H'000000000000		
1	001-17	001-1-40-18		H'000000000000		
1	001-18	001-1-40-19		H'000000000000		
1	001-19	001-1-40-20		H'000000000000		
1	001-20	001-1-40-21		H'000000000000		
1	001-21	001-1-40-22		H'000000000000		
1	001-22	001-1-40-23		H'000000000000		
1	001-23	001-1-40-24		H'000000000000		
1	001-24	001-1-40-25		H'000000000000		
1	001-25	001-1-40-26		H'000000000000		
1	001-26	001-1-40-27		H'000000000000		
1	001-27	001-1-40-28		H'000000000000		
1	001-28	001-1-40-29		H'000000000000		
1	001-29	001-1-40-30		H'000000000000		
1	001-30	001-1-40-31		H'000000000000		

END



NADAP

<└ nadap;

NUMBER ANALYSIS DATA

TYPE OF SERIES	NUMBER SERIES
----------------	---------------

EXTENSION NUMBER SERIES	4200 - 4230
	4250 - 4299

EXTERNAL DESTINATION CODE	11 - 12
	21 - 40
	50
	550 - 560
	60
	777
	950

OPERATOR INDIV. NUMBER SERIES	100
-------------------------------	-----

OWN EXCHANGE NUMBER SERIES	666
----------------------------	-----

EXTERNAL DESTINATION CODE WITH COORDINATED NUMBERING PLAN	45
--	----

TYPE OF SERVICE CODE	SERVICE CODE
----------------------	--------------

EXTERNAL NUMBER LENGTH DATA

EXTERNAL NUMBER	NUMBER LENGTH
-----------------	---------------

11	4 - 4
12	4 - 4
21	6 - 6
23	6 - 6
31	6 - 6



40	4 - 4
45	4 - 4
550	3 - 7
551	3
777	3 - 7
950	7

PROCEED TO SEND SIGNAL DATA

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

CALL DISCRIMINATION DATA

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

END

RODDI

<L roddp:dest=11;

EXTERNAL DESTINATION ROUTE DATA

DEST	DRN	ROU	CHO	CUST	ADC	TRC	SRT	NUMACK	PRE
------	-----	-----	-----	------	-----	-----	-----	--------	-----

11	1			15050000000000250105001001	0	1	0		
----	---	--	--	----------------------------	---	---	---	--	--

END

Digital Station

<L KSDDP:dir=4200;

KEY SYSTEM DIRECTORY DATA

DIR	CUST	EQU	CAT	ADN	ODN	CALALT	TIMER
-----	------	-----	-----	-----	-----	--------	-------

4200		001-1-20-00	1		1	0	
------	--	-------------	---	--	---	---	--

END

<L kscap:dir=4200;

KEY SYSTEM CATEGORY PRINT

DIR	TRAF	SERV	CDIV	ROC	ITYPE	TRM	ADC	LANG
BSEC								

4200	03151515	0211120700	011151111	720004	20	0	00100013011000	F
------	----------	------------	-----------	--------	----	---	----------------	---



Path Replacement (Must be turned off)

```
<L asap:parnum=66;  
APPLICATION SYSTEM PARAMETERS  
PARNUM PARVAL  
66 0  
END
```

```
<L asap:parnum=223;  
APPLICATION SYSTEM PARAMETERS  
PARNUM PARVAL  
223 3  
END
```

Configuring the Cisco IAD2432 24FXS

Ericsson-3#sh run
Building configuration...

```
Current configuration : 2227 bytes  
!  
version 12.4  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname Ericsson-3  
!  
boot-start-marker  
boot system flash:c2430-ik9o3s-mz-124-9.T1.bin  
boot-end-marker  
!  
card type e1 1  
logging buffered 10000000 debugging  
no logging console  
enable secret 5 $1$39sy$WJXNyjgXw.0HypvItDAMD/  
!  
no aaa new-model  
!  
resource policy  
!  
network-clock-participate E1 1/0  
network-clock-participate E1 1/1  
network-clock-select 1 E1 1/0  
!  
!  
no ip domain lookup  
!  
!  
!  
isdn switch-type primary-qsig  
!
```



```
voice-card 0
!
!
!
!
!
voice service voip
notify redirect ip2pots
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
controller E1 1/0
pri-group timeslots 1-31
!
controller E1 1/1
mode cas
framing NO-CRC4
!
!
!
!
!
!
interface FastEthernet0/0
ip address 172.20.8.41 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial1/0:15
no ip address
encapsulation hdlc
isdn switch-type primary-qsig
isdn overlap-receiving
isdn protocol-emulate network
isdn incoming-voice voice
isdn supp-service name calling
isdn T310 120000
isdn contiguous-bchan
no cdp enable
!
ip default-gateway 172.20.8.1
ip http server
```



```
no ip http secure-server
!  
ip route 0.0.0.0 0.0.0.0 172.20.8.1
!  
!  
!  
!  
!  
control-plane
!  
!  
!  
voice-port 1/0:15
!  
voice-port 2/0
!  
voice-port 2/1
!  
voice-port 2/2
!  
voice-port 2/3
!  
voice-port 2/4
!  
voice-port 2/5
!  
voice-port 2/6
!  
voice-port 2/7
!  
voice-port 2/8
!  
voice-port 2/9
!  
voice-port 2/10
!  
voice-port 2/11
!  
voice-port 2/12
!  
voice-port 2/13
!  
voice-port 2/14
!  
voice-port 2/15
!  
voice-port 2/16
!  
voice-port 2/17
!  
voice-port 2/18
!  
voice-port 2/19
!  
voice-port 2/20
!  
voice-port 2/21
!  
voice-port 2/22
```



```
!  
voice-port 2/23  
!  
!  
!  
!  
dial-peer voice 1100 voip  
destination-pattern 11..  
session protocol sipv2  
session target ipv4:172.20.8.40  
dtmf-relay rtp-nte  
supplementary-service pass-through  
!  
dial-peer voice 4200 pots  
destination-pattern 42..  
supplementary-service pass-through  
direct-inward-dial  
port 1/0:15  
forward-digits all  
!  
!  
gateway  
timer receive-rtp 1200  
!  
sip-ua  
!  
!  
!  
line con 0  
password cisco  
login  
line aux 0  
line vty 0 4  
exec-timeout 0 0  
password cisco  
login  
!  
end
```

Ericcson-3#



Acronyms

Acronym	Definitions
IAD	Integrated Access Device
SIP	Session Initiation Protocol



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