

How to Configure the NEC SV8100 for use with Integra Telecom SIP Solutions

Overview: This document provides a reference for configuration of the NEC SV8100 IP PBX to connect to Integra Telecom SIP trunks. The document covers a basic setup with required steps for interoperability with Integra Telecom only.

Hardware and Software: The following hardware and software were employed to test interoperability between the NEC IP PBX and Integra.

Manufacturer	Model	Software Version
NEC	UNIVERGE SV8100	5.0
MetaSwitch	MetaSphere	7.2
Adtran	NV3305	17.09.02

Tested Features: The following is a list of interoperability features that were tested. Please note that neither the NEC IP PBX Conference Bridge nor the NEC Inrouter was tested.

Feature	Description	Issue (if any)
Basic Call	Making and receiving a call between the IP-PBX and Integra Telecom service provider with both G.711 and G.729 codec.	None
Call Hold	Placing a call in On Hold state and retrieval of a call from same station.	None
Call Transfer	Relocation of an active call from one station to another. Both internal and external, attended and unattended transfers were tested.	None
Call Forward	Forwarding of calls from one station to another.	None
3-Party Conference	Conference call between internal and external participants.	None
Fax	Fax Transmission. Fallback to both G.711 and T.38 were tested.	None

Network Topology: Figure 1 shows how the network was configured for interoperability testing.

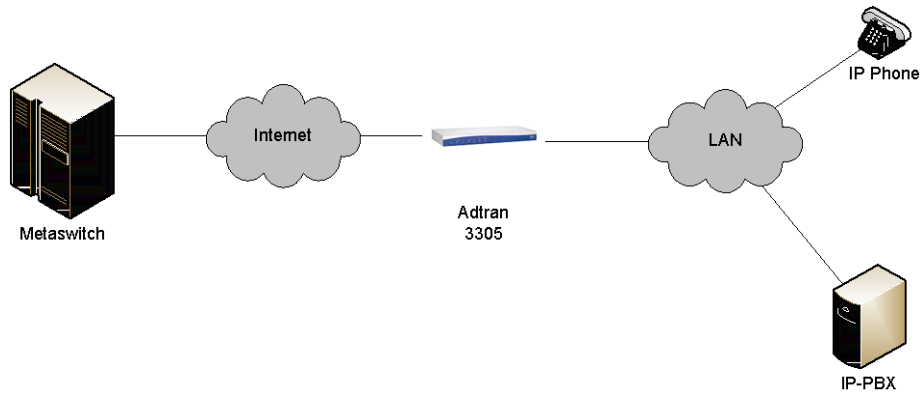


Figure 1: interoperability Network Diagram

Configuration Notes: This section contains a detailed description of how the NEC SV8100 was configured for interoperability testing with Integra Telecom services.

Network Requirements: As in any VoIP deployment there must be adequate bandwidth to support VoIP traffic. A proper network assessment should be performed before any VoIP deployment.

Assumptions:

- All SIP Signaling uses UDP on port 5060
- SIP Signaling packets use Differentiated Services Code Point (DSCP) 24
- Real-Time Transport Protocol (RTP) uses DSCP 46

Licenses: The NEC SV8100 must be equipped with licenses to support SIP Trunks.

System Data > IPLA Configuration (10-03)

Select Trunk Type "SIP" for trunks to be used.



System Data > IPLA DSP Resource Selection (10-19)

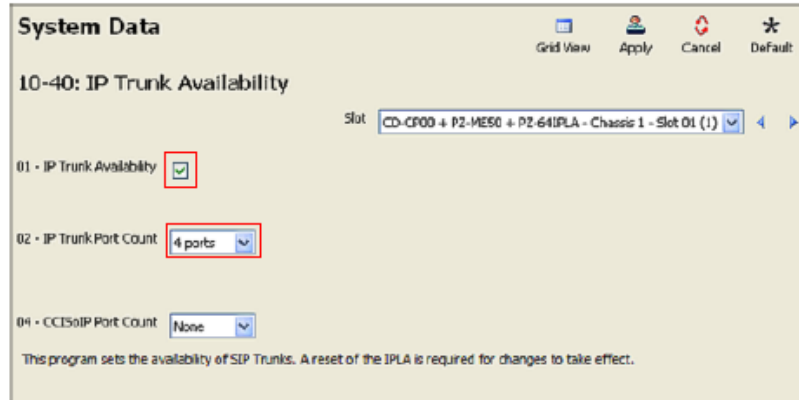
Select the desired operating mode for DSP Resources. Some resources must be allocated as “Commonly used for both IP extension and trunks” or “SIP trunks only”



System Data > IP Trunk Availability (10-40)

Turn on option “IP Trunk Availability”

Select the appropriate “IP Trunk Port Count”



System Data > CD-CP00 Network Setup (10-12)

The values shown are for example purposes only. Actual values will be determined by the local LAN administrator.

Set the LAN IP address for the system Ethernet port (10-12-01) to 0.0.0.0

Set the subnet mask for the system Ethernet port (10-12-02) to be a different subnet than the IPLA blade.

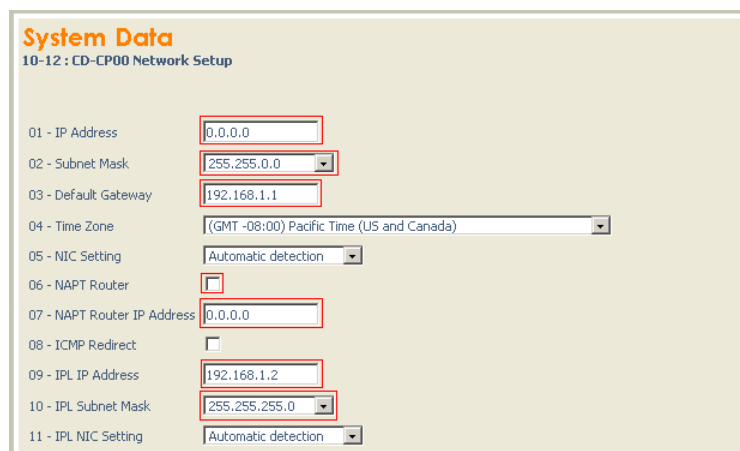
Set the default gateway for the IPLA blade (10-12-03)

Ensure that the NAPT settings (10-12-06 and 07) are not enabled.

Select a static IP address for the VoIP connection (10-12-09)

Select the subnet mask for the VoIP connection (10-12-10)

In order for these changes to take effect the SV8100 must be reset.



VoIP Hardware Setup > IPLA DSP Basic Setup (84-26)

The values shown are for example purposes only. Actual values will be determined by the local LAN administrator.

Configure appropriate IP addresses and RTP Port values for each equipped VoIP Gateway.

VoIP Gateway	IP Address	RTP Port	RTCP Port
1	10.10.3.20	10020	10021
2	10.10.3.21	10052	10053
3	10.10.3.22	10084	10085
4	10.10.3.23	10116	10117
5	0.0.0.0	10148	10149
6	0.0.0.0	10180	10181
7	0.0.0.0	10212	10213
8	0.0.0.0	10244	10245

System Data > SIP System Information Setup (10-28)

The values shown are for example purposes only. Actual values will be determined by Integra Telecom.

Define the Domain Name (10-28-01) as provided by Integra. Note that this field should not include the host name.

Define the Host Name (10-28-02) as provided by Integra

Verify the Transport Type (10-28-03) is set to UDP

Enter the SIP User ID (10-28-04)

Set Domain Assignment (10-28-05) to "Domain Name"

Verify IP Port Trunk Binding (10-28-06) is not enabled.

System Data

10-28: SIP System Information Setup

01 - Domain Name

02 - Host Name

03 - Transport Protocol

04 - User ID

05 - Domain Assignment

06 - IP Trunk Port Binding

This program sets basic system information used in SIP Trunk.

System Data > SIP Server Information Setup (10-29)

The values shown are for example purposes only. Actual values will be determined by Integra Telecom.

Verify Outbound Default Proxy (10-29-01) is enabled.

Enter the default Proxy IP Address (10-29-03) as provided by Integra

Verify the Default Proxy Port (10-29-04) is set to 5060

Set the Register Method (10-29-05) to "Manual"

Enter the Registrar IP Address (10-29-06; should be same as 10-29-03 above)

Verify the Registrar Port (10-29-07) is set to 5060

Enable DNS Mode (10-29-08)

Enter the DNS IP Address as provided by Integra

Enter the Registrar Domain Name (10-29-11) as provided by Integra

Enter the Proxy Domain Name (10-29-12) as provided by Integra

Enter the Proxy Host Name (10-29-13) as provided by Integra.

Verify SIP Carrier Choice (10-29-14) is set to Default

Make sure to leave Registration Expiry Timer (10-29-15) set to the default value of 3600

System Data

10-29: SIP Server Information Setup

01 - Outbound Default Proxy

02 - Inbound Default Proxy

03 - Default Proxy IP Address

04 - Default Proxy Port

05 - Register Mode

06 - Registrar IP Address

07 - Registrar Port

08 - DNS Mode

09 - DNS IP Address

10 - DNS Port

11 - Registrar Domain Name

12 - Proxy Domain Name

13 - Proxy Host Name

14 - SIP Carrier Choice

15 - Registration Expiry Time

16 - Register Sub Mode

17 - DNS Source Port

This program sets the information of SIP Server this system uses

System Data > SIP Authentication Information Setup (10-30)

The values shown are for example purposes only. Actual values will be determined by Integra Telecom.

Define the User Name (10-30-02) as provided by Integra

Define the Password (10-30-03) as provided by Integra

Ensure that the Authentication Trial Count (10-30-04) is set to 2 or greater on SV8100 release 5.0 systems. If a higher release is installed, a value of 1 may be used.

System Data

10-30: SIP Authentication Information Setup

02 - User Name

03 - Password

04 - Authentication Trial Count

This program sets Authentication information used in SIP Trunk

VoIP Hardware Setup > SIP Trunk Codec Setup (84-13)

The values shown are for example purposes only. Your values may vary.

Set DTMF Relay Mode (84-13-32) to RFC2833

If T.38 fax compression is required enable Fax Relay Mode (84-13-50)

84-13: SIP Trunk Codec Setup

21 - Signal Limiter	Mode 5
22 - Echo Canceller Non-linear Processing Mode	2 wire only
26 - TX Gain	-20.0dBm 0.0dBm (20) 20.0dBm
27 - RX Gain	-20.0dBm 0.0dBm (20) 20.0dBm
28 - Audio Capability Priority	G.711_PT
31 - DTMF Payload Number	110
32 - DTMF Relay Mode	RFC2833
33 - G.722 Maximum Audio Frame Size	30ms
34 - G.722 Voice Activity Detection	<input type="checkbox"/>
35 - G.722 Minimum Jitter Buffer Size	30
36 - G.722 Average Jitter Buffer Size	60
37 - G.722 Maximum Jitter Buffer Size	120
38 - G.726 Maximum Audio Frame Size	30ms
39 - G.726 Voice Activity Detection	<input type="checkbox"/>
40 - G.726 Minimum Jitter Buffer Size	30
41 - G.726 Average Jitter Buffer Size	60
42 - G.726 Maximum Jitter Buffer Size	120
43 - ILBC Maximum Audio Frame Size	30ms

48 - ILBC Payload Number	98
49 - RTP Filter	<input type="checkbox"/>
50 - Fax Relay Mode	On
51 - T.38 Protocol mode	LDPTL
52 - Fax Max Rate	14400bps
55 - High Speed Data Packet Redundancy	40ms
56 - Low Speed Data Redundancy	0
57 - High Speed Data Redundancy	0
58 - TCF Handling Method	Local
59 - Maximum Low Speed data packetization	1
60 - Transmit network Timeout	150
61 - T.38 RTP Format payload Number	100
62 - DTMF Level Mode	VOIPU
63 - DTMF Level High	28
64 - DTMF Level Low	28

Use Program 84-13: SIP Trunk CODEC Information Basic Setup to setup the basic CODEC options for SIP trunks.

VoIP Hardware Setup > ToS Setup

For RTP/ RTCP (Protocol 5) and SIP Trunk (Protocol 9) set the ToS Mode to Diffserv

For each of the following protocol types set the following priorities (Diffserv)

RTC/ RTCP: Priority 46

SIP Trunk : Priority 24

The SV8100 must be reset in order for these changes to take effect.

System Data

84-10 : ToS Setup Apply

Protocol Type	ToS Mode	IP Precedence Priority	IP Precedence Delay	IP Precedence Throughput	IP Precedence Reliability	Priority (Diffserve)
DRS	Disabled	0	Normal	Normal	Normal	0
Protims	Disabled	0	Normal	Normal	Normal	0
Voice Control	Disabled	0	Normal	Normal	Normal	0
H.323	Disabled	0	Normal	Normal	Normal	0
RTP/RTCP	Diffserve	0	Normal	Normal	Normal	46
SIP	Disabled	0	Normal	Normal	Normal	0
CCIS	Disabled	0	Normal	Normal	Normal	0
DT.700	Disabled	0	Normal	Normal	Normal	0
SIP Trunk	Diffserve	0	Normal	Normal	Normal	40
NetLink	Disabled	0	Normal	Normal	Normal	0

This program sets the ToS Data.