

How to Configure the Toshiba Strata CIX for use with Integra Telecom SIP Solutions

Overview: This document provides a reference for configuration of the Toshiba Strata CIX IP PBX to connect to Integra Telecom SIP trunks. The document covers a basic setup with required steps for interoperability with Integra Telecom only. Not all PBX configuration requirements are covered.

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

Manufacturer	Model	Software Version
Toshiba	Strata CIX 40	AR5.20.MT037
Toshiba	GIPU VoIP Card	NPU01_28DA200
MetaSwitch	MetaSphere	7.2
Adtran	NV3305	17.09.02

Tested Features: The following is a list of interoperability features that were 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.	T.38 fax not supported

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

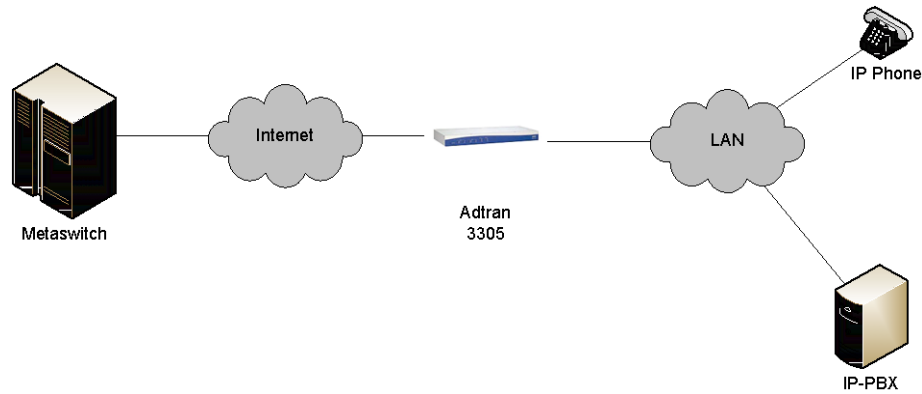


Figure 1: interoperability Network Diagram

Configuration Notes: This section contains a detailed description of how the Toshiba Strata CIX 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 use Differentiated Services Code Point (DSCP) 24
- Real-Time Transport Protocol (RTP) uses DSCP 46

Licenses: The Toshiba Strata CIX must be equipped with licenses to support SIP Trunks.

Programming the MIPU/ GIPU Card

Set the card type for the slot holding the MIPU

Choose the type of MIPU for use in the system. The number of channels entered must match the number of channels on the card.

100 CIX/CTX CABINET SLOT PCB ASSIGNMENTS

Cabinet 01 Slot 01

PCB Type: GMAU3A Base Card - 8 DKTs without Spkr OCA

Cabinet	Slot	PCB Type
01	01	GMAU3A Base Card - 8 DKTs without Spkr OCA
01	02	GMAU3A Base Card - 4 analog loop start lines with built-in Caller ID interface
01	03	GVPH-1A - 8 voice mail ports
01	04	GMAU3A Base Card (1st), optional GSTU1A (2nd) - max. 2 standard telephone ports
01	05	GIPU8 - 8 IP channels
01	06	Not used
01	07	Empty Slot
01	08	Empty Slot
01	09	Not used

Figure 1: MIPU/ GIPU Programming

Programming the Incoming Line Group

Create an ILG Group

Set 01-Group Type to SIP

Set 03-CO Service Type to DID

Select the appropriate number of digits for 11-DID Digits

304 INCOMING LINE GROUP ASSIGNMENT

Group Number 7

01 Group Type	<u>SIP</u>	02 Line Type	<u>CO</u>
03 CO Service Type	<u>DID</u>	04 Private Service Type	<u>Standard</u>
05 GCO Key Number	<u>0</u>	06 Pool Key Number	<u>2</u>
07 CO8 Day1	<u>1</u>	CO8 Day2	<u>1</u>
08 DRL Day1	<u>1</u>	DRL Day2	<u>1</u>
09 FRL Day1	<u>1</u>	FRL Day2	<u>1</u>
10 QPL Day1	<u>1</u>	QPL Day2	<u>1</u>
11 DID Digits	<u>7</u>	12 Speech/3.1KHz	<u>Audio</u>
13 Delay1 Ringing Timer	<u>12</u>	14 Delay2 Ringing Timer	<u>24</u>
15 Interdigit 1 Timer	<u>15</u>	16 Interdigit 2 Timer	<u>5</u>
17 Auto Campon	<u>Enable</u>	18 Calling Number ID	<u>User Provided</u>
19 Intercept	<u>Disable</u>	20 Send Dial Tone	<u>Disable</u>
21 TGAC Override	<u>Disable</u>	22 Network CO8	<u>1</u>
23 LCR Group	<u>1</u>	24 Change CO8 Override Code	<u>Disable</u>
25 Register Speed Dial Codes	<u>Disable</u>	26 Originator Invoke OCA	<u>Disable</u>
27 Senderized Tone Mode	<u>Dial Tone</u>	28 Emergency Call Group	<u>1</u>
29 Tenant Number	<u>1</u>	30 Call-By-Call Cause	<u>User/Busy</u>

Figure 2: ILG Programming

Assigning the Trunk DID Destination

Enter the incoming digits used to direct the dialed number to route the call in 01-DID Number

Select the appropriate action in fields 05 through 07

ILG Group Number	7		
309 DIRECT INWARD DIALING			
01 DID Number	8529783	List	
02 MOH Source	1 Processor MOH Jack		
03 GCO Key Group	0	04 Pooled Key Group	2
05 Audio Day1 Det Type	Dialing Digits	Audio Day1 Det Digits	203
06 Audio Day2 Det Type	Dialing Digits	Audio Day2 Det Digits	203
07 Audio Night Det Type	Dialing Digits	Audio Night Det Digits	203
08 Data Day1 Det Type	No Data	Data Day1 Det Digits	
09 Data Day2 Det Type	No Data	Data Day2 Det Digits	
10 Data Night Det Type	No Data	Data Night Det Digits	
11 DID/DNIS No. VMID	203	12 DID/DNIS Name	INTEGRA
15 VM Application Digits	203	16 Tenant Number	1

Figure 3; DID Destination Programming

Programming the Outgoing Line Group

Create a new Outgoing Line Group and designate it as SIP

Set 01-Group Type to SIP

Other values can be left at defaults

306 OUTGOING LINE GROUPS

Group Number	4	
01 Group Type	SIP	02 Trunk Type
03 Service Type	Standard	CO/DID
06 Pool Key1 Number	2	04 GCO Key1 Number
08 COS Day1	1	07 Pool Key2 Number
09 FRL Day1	1	0
10 QPL Day1	1	0
11 Speech/8.1KHz	Audio	COS Day2
13 Account Code	Enable	1
14 Destination Restriction	Enable	FRL Day2
15 Credit Card Calling	Enable	1
16 Send CESID	Enable	FRL Night
17 QSIG Sending Type	Cut Through	1
18 Network COS		1
19 Recall on AC15		1 Processor MOH Jack

Figure 4: OLG Programming

OLG Flexible Access Code Programming

An access code is required for the Outgoing Line Group that was created for SIP Trunks.

Assign an access code for SIP Trunks in 00-Access Code

Feature name set to Line group access code in field 01. One access code for each OLG

Enter the OLG number set in Programming OLG (above) in field 02

102 FLEXIBLE ACCESS CODES

00 Access Code

01 Feature Name

Flexible Access Code	Flexible Feature
#	ISDN Sub-address (dial to enter sub-address number)
#12	Door Lock Control - Unlock door
#15	Door Phones - Call Door phone
#18	CTI Application Start (dial to enter application number)
#19	Remote Maintenance Modem DN - call CTX built-in maintenance modem
#30	Page (All Group) - Page the 'All Page Group'
#31	Page (One Group) - Page a selected Page Group
#32	Call Park Pickup - pickup a parked call
#33	Call Park - park a call on an orbit
#37	Emergency Page (All Group) - Emergency Page the 'Emergency Page Group'
#38	Emergency Page (Group) - Emergency Page a selected Page Group
#407	Voice Mail - Transfer
#408	Message Waiting Answer - answer MW led set on your phone
#409	Message Waiting Cancel- cancel MW led on your phone
#411	Advisory Message Set
#412	Advisory Message Cancel
#431	ACB Cancel - cancel Automatic Call Back
#441	Automatic Busy Redial - Set
#442	Automatic Busy Redial - Cancel
#450	Flash - short hoodflash on connected CO line
#451	Flash - long hoodflash on connected CO line
#46	Account Code - to enter an account code
#471	Travelling Class Override Code - TCO code changes DRL before dialing
#490	BGM On - turn on telephone Back-Ground Music
#491	BGM Off - turn off telephone Back-Ground Music
#492	BGM over External Page On - turn on external Back-Ground Music
#493	BGM over External Page Off - turn off external Back-Ground Music
#494	Three Way Conferencing (Override Tandem Connection)
#495	LCD display - change language
#5422	Call Pickup-Directed DN Pickup of ringing call (dial directory number)
#5429	Call Pick Up-Directed DN pickup of either Ringing or Held DN calls and Call Park Answer
#5432	Call Pickup-Directed Group Pickup of ringing call (dial pickup Grp. number)
#5434	Call Pickup-Group Pickup of ringing call (you must be in the group)
#5436	Page Answer (External) - Answer External Paging Zone
#5439	Night Ring Answer - answer night bell or night ringing
#545	Call Pickup-Directed station pickup of any ringing call (dial station PDN)
#546	Call Pick Up-Directed DN pickup of either Ringing or Held DN calls
#5471	Call Pickup-Local on-hold retrieve (any held call on your telephone)
#5472	Call Pickup-Remote retrieve of any call on-hold on any station (dial sta.PDN)
#5473	Call Pickup-CO line on-hold retrieve (dial line number)
#5474	Call Pickup-Directed DN Retrieve of any DN on-hold (dial directory number)
#549	Call Pickup-Any ringing incoming line call

Figure 5: Flexible Access Code Programming

Creating the Channel Group

Go to IP Telephony > SIP Trunking. The first tab is Channel Group settings.

Enter the appropriate group number in 00-SIP Trunk Channel Group

Enter the cabinet number and slot number (4-digits) in 01-Equipment Number

In 02-LAN Interface number enter 1 as the MIPU/ GIPU has one IP interface

Enter the total number of ports on this card that are going to be dedicated to SIP trunking in 03-Strata Net Channels.

In 04- RBT enable the CIX to provide ring back tone (RBT)

Channel Group Setting	Service Definition	Service Assignment	URI
326 SIP TRUNK ASSIGNMENT			
00 SIP Trunk Channel Group	1	<input type="button" value="List"/>	
01 Equipment	0105	02 LAN Interface Number	1 <input type="button"/>
03 SIP Trunk Channels	2 <input type="button"/>	04 RBT on Incoming Call	Enable <input type="button"/>

Figure 6: Channel Group Settings

Service Definition

The Service Definition tab is where the Integra SIP provider is defined.

Create the Service Kind Table Index.

Set the 01-Registration Mode to None

Use the previously created ILG number for 02-ILG

Use the previously created OLG number for 03-OLG

Enter the number of SIP trunks to be provided by Integra in 04-Effective Channel Number

Enter the domain name provided by Integra in 05-Domain Name

Enter the IP Address provided by Integra in 06-SIP Server

Set 12-Network Transfer to Enabled

Set 34-SIP Trunk Options Interval to 60

Set fields 35 and 38 to FQDN

These are the only mandatory program entries. Remaining fields can be left at default values.

Channel Group Setting	Service Definition	Service Assignment	URI
327 SIP TRUNK SERVICE KIND ASSIGNMENT			
00 SIP Trunk Service Kind Table Index	1	List	
01 Registration Mode	None	02 ILG	7
03 OLG	4	04 Effective Channel Number	2
05 Domain Name	proxy1.integravoip.net		
06 SIP Server	207.173.7.100		
07 Primary Voice Packet Configuration	1	08 Secondary Voice Packet Configuration	3
09 Registration Period	3600	10 TimerB	5
11 Recovery Timer	60	12 Network Transfer	Enable
13 User Agent Header	Disable	14 Server Header	Disable
15 Protocol Option	Disable	16 Session Timer	1800
17 Primary Audio Codec	G.711u	18 Secondary Audio Codec	G.729a
19 DTMF Transmission Method	RFC2833	20 RTP Support	Enable
21 T.38 Support	Disable	22 SIP Server Caches	10
23 Diffserv for Media	Disable	24 TOS Field Type for Media	TOS
25 TOS Precedence Type for Media	Critical/ESF	TOS Delay Type for Media	Normal
		TOS Throughput Type for Media	Normal
		TOS Reliability Type for Media	Normal
26 DSCP for Media	0		

Figure 7: Service Definition Programming

Service Assignment

This tab must be completed before entries can be made on the next tab. If not completed, entries attempted in the URI tab will not be saved. After URI entries are made in URI tab, changes to the Service Assignment tab will DELETE all of the URI's programmed. It is advised that once this is set, it not be changed.

In 00-Channel Group enter a channel group number

In 02-Service Index select the Service Number by clicking on one of the table's line entries. Use the drop down box to select the SIP trunk provider to which the URI's belong. This is to match the Service Kind Table Index number of the desired SIP trunk provider.

Channel Group Setting Service Definition Service Assignment

00 Channel Group 1

328 SIP TRUNK SERVICE ASSIGNMENT

02 Service Index 1 Set

Service No.	Service Index
1	1
2	<Empty>
3	<Empty>
4	<Empty>
5	<Empty>
6	<Empty>
7	<Empty>
8	<Empty>
9	<Empty>
10	<Empty>
11	<Empty>
12	<Empty>
13	<Empty>
14	<Empty>
15	<Empty>
16	<Empty>

Figure 8: Service Assignment Programming

URI Programming

The SIP URI is the Telephone Number (TN) provided by Integra Telecom. The MIPU/ GIPU registers each TN using the same authentication credentials (03 and 04). When the URI TN is dialed (from outside) Integra will send a SIP INVITE just as if it were a call to a SIP station. However an outbound call using one of the UAs does not busy out the UA against an incoming call. That is a key difference of SIP trunks.

In 00-URI Service Index enter the service index that defines Integra.

In 01-Index click the Index line in the table to select one of the indexes 1 – 160

In 02-SIP URI enter the URI/ User Name provided by Integra

In 03-SIP URI User Name enter the same information as 02 above

In 04-SIP URI Password enter the password provided by Integra

05-Channel Group Number will be automatically populated when the Add button is clicked.

Leave 06-SIP URI Attribution at the default value of MAIN

URI's will register as soon as they are Added, Modified or when the MIPU/ GIPU is reset.

Channel Group Setting Service Definition Service Assignment **URI**

329 SIP URI ASSIGNMENT

00 SIP URI Trunk Service Index: 1 Add Modify Remove

01 SIP URI Index: 1

02 SIP URI: 3608529783 03 SIP URI User Name: 3608529783

04 SIP URI Password: 05 SIP URI Channel Group: 1

06 SIP URI Attribution: main

Index	URI	User Name	Password	Reg. Channel Group	Attribution
1	3608529783	3608529783	integra8529783	1	main
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Figure 9: SIP URI Programming

Configuring the MIPU/ GIPU

Most MIPU/ GIPU values will be determined by the PBX owner’s IT department. Integra strongly recommends that the IPU be assigned a static IP address.

For static IP address assignment, the fields 01-MIPU/ GIPU IP Address, 02-Subnet Mask and 03-Default gateway Address must be completed.

As the MIPU/ GIPU has only one interface, fields 04 through 06 are left blank.

Populate 22-Primary DNS IP address and 23-Secondary DNS IP address with values provided by Integra.

Once the MIPU/ GIPU has been configured, click Submit and wait for programming to be completed then press the Restart button on the MIPU/ GIPU.

161 LIPU/MIPU/GIPU CONFIGURATION

00 Cabinet & Slot Number	0105
01 IPU IP Address	192 . 168 . 254 . 200
02 IPU Subnet Address	255 . 255 . 255 . 0
03 IPU Default Gateway Address	192 . 168 . 254 . 1
07 Version of IPUIPH	MIPU01_28DA200
09 Available IPUIPH IP Ports	6
04 LIPS IP Address	0 . 0 . 0 . 0
05 LIPS Subnet Address	0 . 0 . 0 . 0
06 LIPS Default Gateway Address	0 . 0 . 0 . 0
08 Version of LIPS	
10 Available LIPS IP Ports	0
11 IPUIPH Packet Prioritization	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
12 IPUIPH Packet Prioritization Type	<input type="radio"/> Best Effort <input checked="" type="radio"/> Voice
13 IPUIPH VLAN	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
14 IPUIPH VLAN ID	1
15 LIPS Packet Prioritization	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
16 LIPS Packet Prioritization Type	<input type="radio"/> Best Effort <input checked="" type="radio"/> Voice
17 LIPS VLAN	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
18 LIPS VLAN ID	1
19 IP Strata Net RTP Base Port (IPUIPH)	20992
20 IP Strata Net RTP Base Port (LIPS)	20992
21 MIPU DHCP Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
22 MIPU Primary DNS	207 . 173 . 7 . 100
23 MIPU Secondary DNS Server	0 . 0 . 0 . 0
24 MIPU Hostname	
25 MIPU Primary DNS Suffix	

Figure 10: MIPU/ GIPU Configuration