Patton Trinity eSBC SmartNode

with BroadCloud UC & SIP Trunking

May 2018

Document Version 1.0

Table of Contents

Document Revision History

| Version	Reason for Change	Date	Author
1.0	Document Created	2018-05-31	Danny Staub

1   About this Guide

This guide describes the configuration procedures required for the Patton Enterprise Session Boarder Controller (eSBC) SmartNode for interoperability with BroadCloud Carrier Service SIP Trunks and Legacy/IP-PBX environments.

2   General Information

This section describes a brief overview of the SmartNode eSBC, factory settings along with model and licensing options available.

2.1   Patton SmartNode eSBC Series Overview

The SmartNode uses the Session Initiation Protocol (SIP) to communicate with other SIP enabled devices. SmartNode products are multi-service network devices that offer high flexibility for the inter-working of circuit-switched and packet-routed networks and services. In order to consistently support a growing set of functions, protocols, and applications, Trinity configuration is based on a number of abstract concepts that represent the various Trinity components.
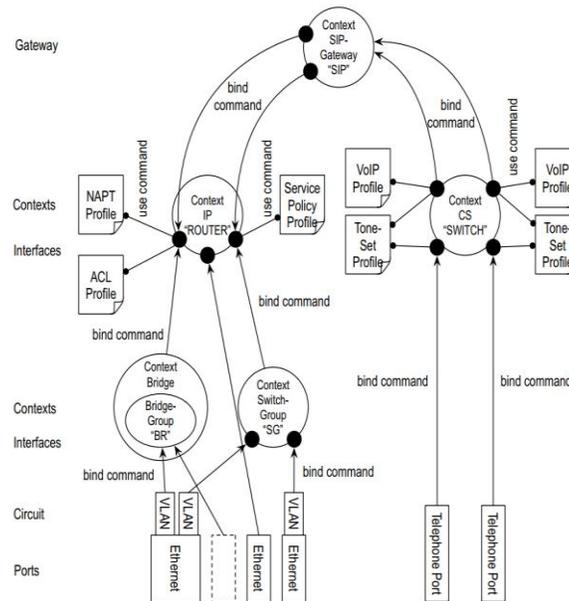
This figure shows the various elements of a complete Patton device configuration. Each of these elements implements one of the configuration concepts described in this chapter. The figure also shows the relationships and associations between the different elements. The relations are specified through bind (arrow) and use (bullet lines) commands.

2.2 Factory Defaults

Below shows the factory default settings of a SmartNode eSBC.

2.2.1 Username/Passwords

The default username and password is the same for all Patton SmartNode products.

Username	Password
administrator	Leave blank

2.2.2 IP Defaults

	IP Address	Network Mask
WAN interface Ethernet 0 (ETH 0/0)	DHCP	DHCP
LAN interface Ethernet 1 (ETH 0/1)	192.168.1.1	255.255.255.0 (/24)
DHCP address range	192.168.1.10-192.168.1.99	255.255.255.0 (/24)

2.2.3 Serial Connection Defaults

Root Model	Speed	Bits	Parity	Stop Bit	Flow Control
SN5300	19200	8	No	1	No
SN5480/5490	9600	8	No	1	No
SN4970/4980/4990	9600	8	No	1	No

2.3 Supported SmartNode Model Series

The following Root Model eSBC SmartNodes are certified for interop with BroadCloud Carrier Services.

Root Model (Series)	Comment(s)	Supported Software Version(s)
SN4980	eSBC with Multi-WAN Edge and T1/E1/PRI options	Trinity 3.13.x or newer
SN4990	eSBC with Multi-WAN Edge, T1/E1/PRI and DSL IAD options	Trinity 3.13.x or newer
SN5300	All-IP eSBC with Multi-WAN Edge and DSL IAD options	Trinity 3.13.x or newer
SN5480	All-IP Transcoding eSBC with Multi-WAN Edge	Trinity 3.13.x or newer
SN5490	Transcoding eSBC with Multi-WAN Edge and DSL IAD options	Trinity 3.13.x or newer
SN5530	eSBC with Multi-WAN Edge, BRI and DSL IAD options	Trinity 3.13.x or newer
SN5540	eSBC with Multi-WAN Edge, Analog and DSL IAD options	Trinity 3.13.x or newer
SN5550	eSBC with Multi-WAN Edge, Analog+BRI and DSL IAD options	Trinity 3.13.x or newer
SN5570	eSBC with Multi-WAN Edge, T1/E1/PRI and DSL IAD options	Trinity 3.13.x or newer

2.4 Software License Add-Ons

	Root Models	Comment(s)
Add-On Software Licenses	**TSW-PSMART**	Trinity License to enable PacketSmart monitoring & assessment
	TSW-SIP-AUTO-SURVIVABILITY	Automated, Self Learning Survivability (Patent Pending)
	SNSW-1B	SmartNode License for 1 additional SIP Sessions for Trinity ESBRs only (SIP back-to-back calls using 2 SIP Legs)
	SNSW-54P1	SmartNode License for 1 Transcoded Call (using 2 VoIP Channels) for SmartNode eSBC
	TSW-CELLMODEM	License enabling USB Cell Modem support on all Trinity devices with embedded USB port
	TSW-BAL-FO	Load Balancing and Failover License
	TSW-SIP-Failover	Seamless outbound call hunting license
	TSW-WRTC	WebRTC client license
	TSW-VPN1	VPN License for the SN5300 and SN5530/40/50 series
	TSW-VPN2	VPN License for the SN4170 and SN5570 series
	SNSW-VPN2	VPN License for the SN4970/80/90 and SN5480/90 series

NOTE: For more information on how to configure these features, please refer to the Trinity Administrator's Guide or contact support@patton.com for assistance.

3 BroadCloud Provisioning

Before configuring your SmartNode eSBC, you will need to configure the SIP Trunk parameters within BroadCloud. Once configured, you will need to know the following:

BroadCloud SIP Trunk Settings	
Parameters	**Input**
BroadCloud Outbound Proxy Address	
BroadCloud Registrar/SIP Server Address	
BroadCloud Assigned DIDs	

NOTE: For more information on BroadCloud's SIP Trunking configuration, please visit https://xchange.broadsoft.com. Here you will find documentation, Knowledge Base articles and FAQ's about BroadCloud services and confoiguration.

4 SmartNode Access and Installation

The following section provides information on how to connect your SmartNode to the network and gain access for configuration. For more detailed information on how to install your specific SmartNode, please click the root model of your device below to download the User manual.

- ➢ SN4980 Series
- ➢ SN4990 Series
- ➢ SN5300 Series
- ➢ SN5480 Series
- ➢ SN5490 Series
- ➢ SN5530 Series
- ➢ SN5540 Series
- ➢ SN5550 Series
- ➢ SN5570 Series

4.1 Device Access

There are multiple ways to connect to your Patton SmartNode eSBC. The most common methods are Ethernet and Console (Serial Port). SmartNode's are equipped with Auto-MDX Ethernet ports, so you can use straight through cables for host or hub/switch connections. Below are the steps to connect using either method.

4.1.1 Ethernet Access via DHCP Client Port (ETH 0/0)

On all SmartNode devices, Ethernet port 0/0 acts as a DHCP Client, as seen in the figure below, so it will take a DHCP address from your networks DHCP Server. You can then use the SmartNode Discovery tool to find the IP address assigned to the unit.
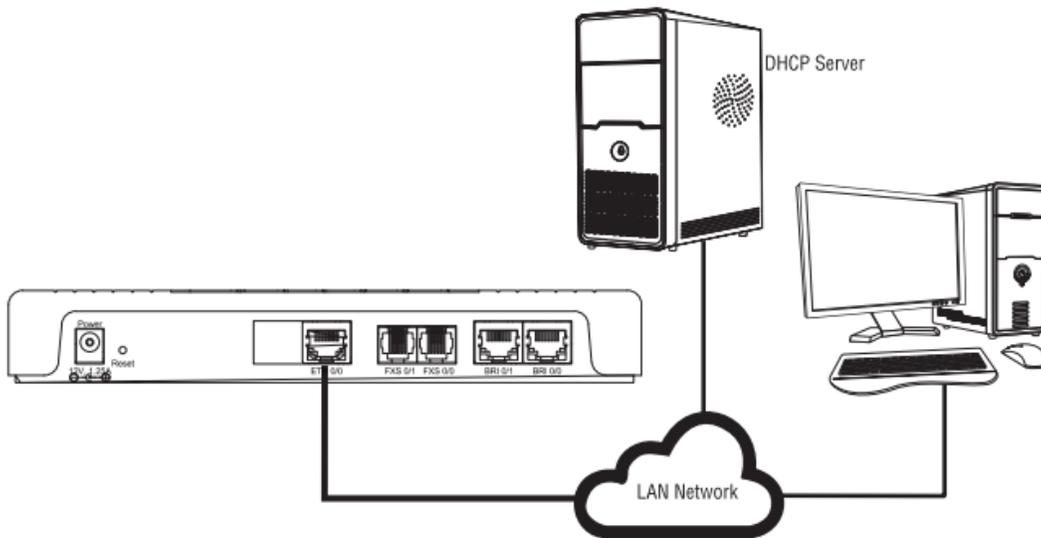
SmartNode as DHCP Client

4.1.2   Ethernet Access via DHCP Server Port (ETH 0/1)

The SmartNode comes with a built-in DHCP server to simplify configuration. Therefore, to automatically configure the PC for IP connectivity to the SmartNode, the laptop PC must be configured for DHCP. The SmartNode will provide the PC with an IP address. You can check the connection to the SmartNode by executing the ping command from the PC command window as follows:
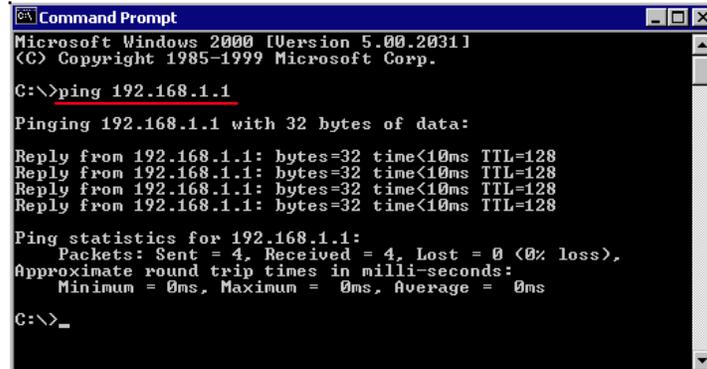
```
Command Prompt                                      _ □ ✕
Microsoft Windows 2000 [Version 5.00.2031]
(C) Copyright 1985-1999 Microsoft Corp.

C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<10ms TTL=128
Reply from 192.168.1.1: bytes=32 time<10ms TTL=128
Reply from 192.168.1.1: bytes=32 time<10ms TTL=128
Reply from 192.168.1.1: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms

C:\>_
```
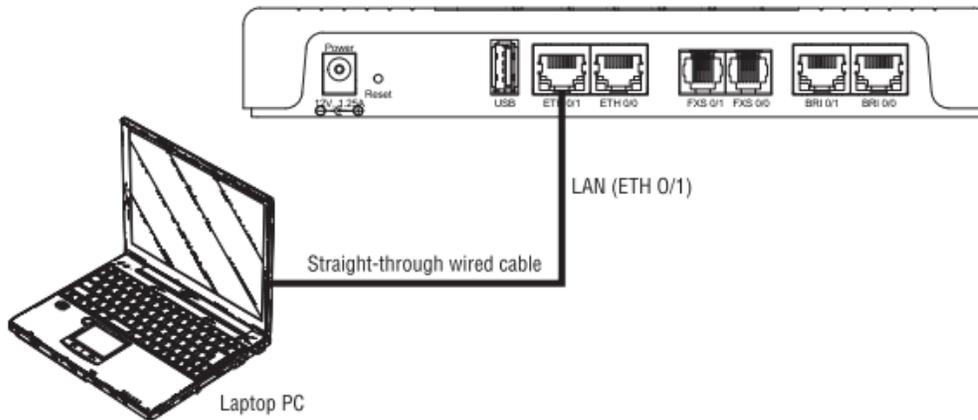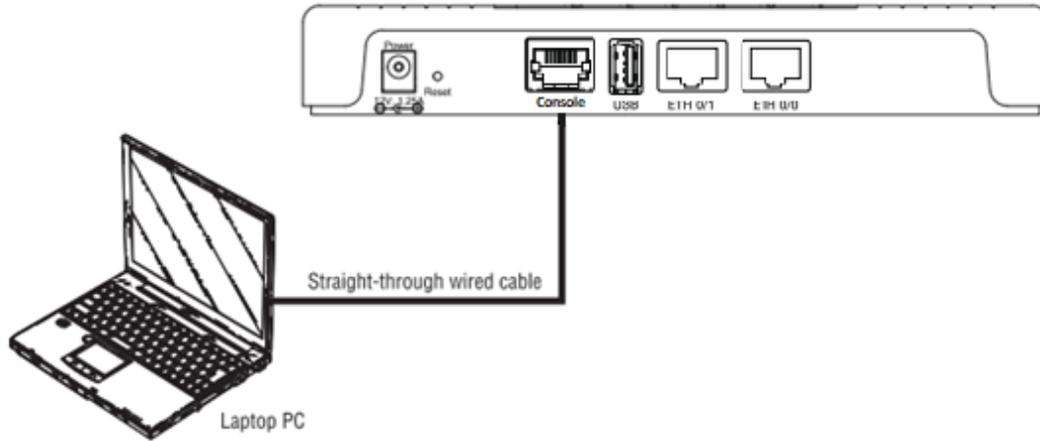
SmartNode as DHCP Server. Connecting the SmartNode (port 0/1) to your laptop PC.

4.1.3   Console (Serial-RS232) Access

Certain SmartNode eSBC devices can be connected to a serial terminal (RS232) over its serial console port if applicable. (Reference sections 4.1.3 – "Serial Connection Defaults" for connection details)

Connecting a serial terminal

NOTE: A Patton Model 16F-561 RJ45 to DB-9 adapter is included with each SmartNode eSBC 4970 Series device

5   SmartNode eSBC Configuration

This section describes the configuration settings required for the SmartNode Trinity integration with BroadCloud, primarily focusing on the SIP interface configuration. The SmartNode Trinity configuration settings identified in this section have been derived and verified through interoperability testing with BroadCloud. For configuration details not covered in this section, see the Trinity Administrator's Guide for more information.

5.1   Patton Web Wizard Configuration

The Web Wizard is a standard functionality within the Trinity Operating system. Regardless of which Trinity enabled device is being used, the Web Wizard is a helpful tool to reduce time for installs and it helps to simplify the configuration efforts for deployments. Trinity Web Wizards are simple text files that contain a template configuration and an XML description of the Graphical User interface that is presented to the installer. The Template configuration contains all the application specific settings which are static while the WEB GUI gives simple access to settings which are customer or installation specific.

5.1.1   Accessing the WEB Wizard

There are one or more WEB Wizards on every unit running Trinity. These WEB wizards can be found under the Menu or by clicking on the magic wand in the top right corner of the Trinity GUI. Clicking on the Wizard Menu item will open a window containing all the pre-loaded wizards.
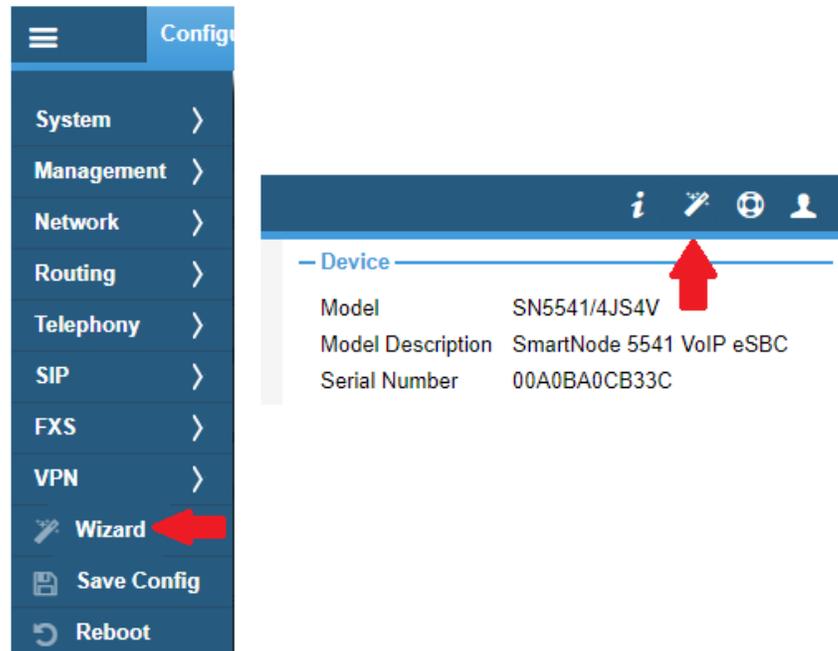
5.1.2 Adding new WEB Wizard files

Under the System Menu, the Wizard config can be accessed and new Wizards can be imported or existing ones can be deleted.

All the Wizard files use XML coding which must have a filename ending with .xml
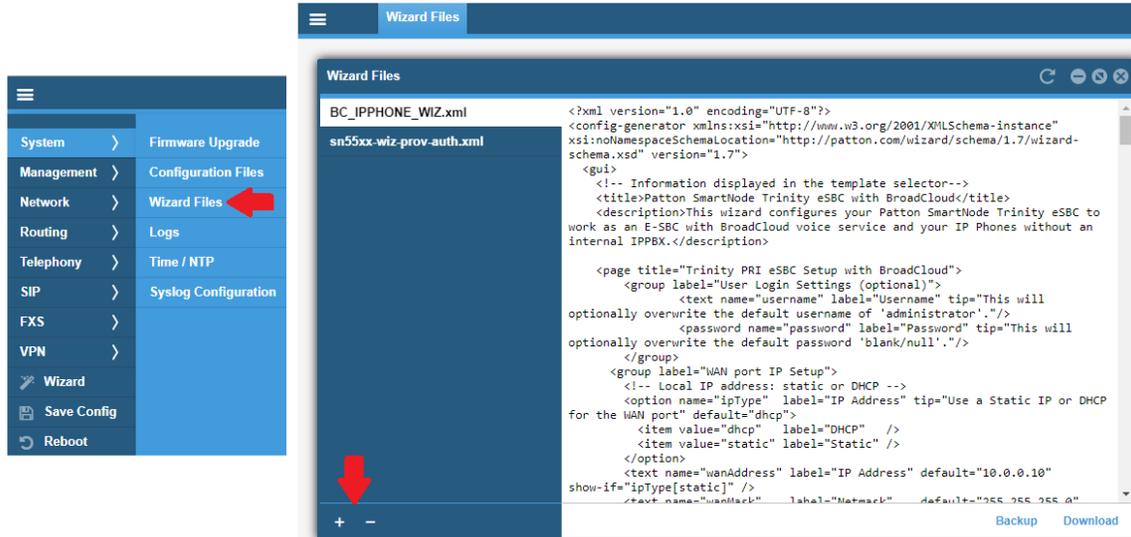
In order to add a new Wizard file, just click on the "+" button, select your .xml wizard file and hit OK. A preview of the uploaded Wizard file can be seen on the right section of the Wizard config Management window.

A Wizard XML file consists of 3 sections.

1) WEB Wizard GUI elements description using XML

2) The config-snippet element defines conditional variables that can be included inside the final system configuration file controlled by item 1.

3) The config element defines the actual system configuration file that will be uploaded to the device

5.1.3 Executing a WEB Wizard

Execute a Wizard simply by clicking on an entry in the list. The Wizard will open in a new window. There the user will have to enter the configuration parameters based on the available fields. A wizard may have multiple pages which are accessible by clicking on the "next" button at the bottom of the Wizard window. Once all parameters are set, the user can:

1) Verify the generated CLI config, by hitting the "Preview" button
2) Apply the generated config to the unit by hitting the "Save & Reboot" button.

Note: a reboot of the device will be executed in order for the config to become active.

5.2   General Configuration

5.2.1   Username and Password

Here you will specify the username and password for the SmartNode eSBC.

Parameter	Description
Username	Username for Management Access
Password	Password for Management Access

5.2.2   WAN/LAN IP Addressing

Input the IP Address for the WAN and LAN side of your network. There are two options, static or DHCP.

WAN Port Settings (ETH 0/0)	
Parameter	**Description**
IP Address	DHCP – SN gets address from network DHCP Server Static – Manually set the IP of the SN
Netmask	Netmask for the IP Address configured
Default Gateway	IP Address of Default Gateway for the Network configured
DNS Server	Specify either 1 or 2 DNS Servers
NTP Server	IP Address of the Network Time Server

LAN Port Settings (ETH 0/1)	
Parameter	**Description**
IP Address	Manually set the IP of the SmartNode eSBC
Netmask	Netmask for the IP Address configured

5.2.3 BroadCloud Server Information

Use the information obtained from the earlier section BroadCloud Provisioning.

— BroadCloud Server Information —————

Outbound Proxy
Address: _____

Registrar/SIP
Server Address: _____

— BroadCloud Credentials —————

Username: _____

Password: _____

Retype
Password: _____

Parameter	Description
Outbound Proxy	Outbound Proxy IP Address or Domain name for BroadCloud Services
Registrar/SIP Server	IP Address or Domain Name of BroadCloud Services Registration Server
Username	BroadCloud Username for registration
Password	BroadCloud Password for registration

5.3   ISDN Configuration

The SmartNode eSBC can support 1-4 ISDN T1/E1 connections from a Legacy PBX or a PSTN line. Below are the options to configure this within the Web Wizard.

Parameter	Description
# of PRI Lines	Select the number of PRI lines that will connect to the SmartNode eSBC
PRI Line Type	T1 - Used primarily in the USA E1- Used everywhere other than the USA
Connecting to	Select what the PRI from the SmartNode eSBC will connect to. ISDN PBX - If you have an existing PBX with T1/E1 connections ISDN PSTN Network - If you have a line delivered from the local PSTN

5.4   Analog Configuration

The SmartNode eSBC can support 1-8 Analog FXS connections for a Legacy PBX to simulate the PSTN or for Analog Phones. Below are the options to configure this within the Web Wizard.

— **Number of FXS ports** —

Number of FXS ports to be configured: 1

— **DID Settings** —

Name for extension (FXS 0/0):

Extension or DID (FXS 0/0):

Parameter	Description
# of FXS ports to be configured	Select 1-8 FXS ports/lines that will connect the SmartNode eSBC with a Legacy PBX or Analog Phones
Name for extension	Name of the user that will use the phone connected to this port (Options are for port 0/0 through port 0/7)
Extension DID	DID associated with the user connecting to this port (Options are for port 0/0 through port 0/7)

5.5   SIP Connections

The SmartNode eSBC can support SIP connections for an IP-PBX SIP Trunk or IP Phones that can register directly to the eSBC using the internal SIP Registrar feature. Below are the options to configure this within the Web Wizard.

5.5.1   IP-PBX Configuration

The SmartNode eSBC can act as a Back to Back User Agent, integrating an existing IP-PBX with BroadCloud services. Below are the options to configure this within the Web Wizard.

Parameter	Description
IP Address of IPPBX	Put the IP address or Domain name of the IP-PBX located in the LAN
IPPBX Username	Username for registering the IPPBX to the SmartNode eSBC
IPPBX Password	Password for registering the IPPBX to the SmartNode eSBC

5.5.2   IP Phone Configuration

Using the SIP Registrar feature, the SmartNode eSBC allows for inbound registrations from SIP devices such as IP Phones and integrates them with BroadCloud Services. No IP-PBX needed. Below are the options to configure this within the Web Wizard.

— LAN VOIP Settings —

IP Phone 1
Username:

IP Phone 1 DID:

IP Phone 1
Extension:

IP Phone 1
Password:

Retype IP Phone
1 Password:

IP Phone 2
Username:

IP Phone 2 DID:

IP Phone 2
Extension:

IP Phone 2
Password:

Retype IP Phone
2 Password:

IP Phone 3
Username:

IP Phone 3 DID:

IP Phone 3
Extension:

IP Phone 3
Password:

Retype IP Phone
3 Password:

| Parameter (x=1-3)	Description
IP Phone x Username	Username for the IP Phone user registering to the SmartNode eSBC
IP Phone x DID	DID of the IP Phone user registering to the SmartNode eSBC
IP Phone x Extension	Extension of the IP Phone user registering to the SmartNode eSBC
IP Phone x Password	Password for the IP Phone user registering to the SmartNode eSBC

6   Applications

The ideal solution for a given enterprise will depend on the type of telephony system currently installed. For each application, you will find a corresponding Web Wizard to install and execute in your Patton SmartNode eSBC.

6.1   SIP Trunking with a Legacy PBX (E1/T1, FXS)

When an enterprise has invested and deployed a traditional PBX system (which is typically SIP un-aware) with legacy handsets, there is little incentive to rip it all out and replace it with a completely SIP-based solution. However, to realize the cost savings of IP telephony, a SIP Trunking eSBC gateway is required to convert the PBX interfaces to Ethernet while packetizing the voice traffic for transport over the IP-based trunk to the SIP service provider network.
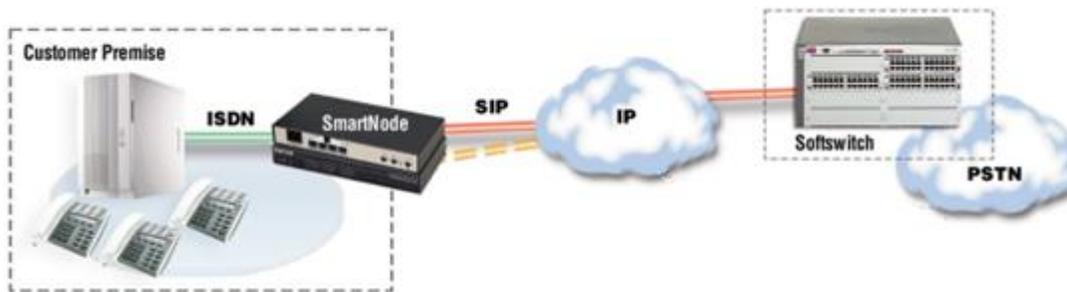
To configure your eSBC SmartNode for this application, please use one of the following Web Wizards, depending on your product model.

Download Location
Web Wizards - SIP Trunking with a Legacy PBX

6.2   SIP Trunking with an IP-PBX

For new offices where infrastructure is just being setup this might be the perfect way to go. The scenario involves providing a SIP trunk for IP devices that are already SIP enabled. These devices could typically interact with the trunk directly. However, to provide certain advanced features, such as call admission control, billing, QoS, security and others, intermediate devices must be deployed. These may include an IP-PBX and a session border controller.

To configure your eSBC SmartNode for this application, please use one of the following Web Wizards, depending on your product model.

Download Location
Web Wizards - SIP Trunking with an IP-PBX

6.3   SIP Trunking with IP Phones

This scenario involves providing a SIP trunk for IP devices, such as IP Phones, that are already SIP enabled. These devices could typically interact with the trunk directly. However, to provide certain advanced features, such as call admission control, billing, QoS, security, failover, survivability and others, intermediate devices must be deployed.

To configure your eSBC SmartNode for this application, please use one of the following Web Wizards, depending on your product model.

Download Location
Web Wizards - SIP Trunking with IP Phones

7   Contact Patton Support

If you have any issues with your Patton eSBC SmartNode, please contact Patton Support for further assistance.

https://patton.com/support/