SMARTNODE™ PRODUCT LINE OVERVIEW

From the leading manufacturer of UC, Connectivity, IoT & All-IP Solutions







Contents

VoIP Starts with SmartNode	3
Why SmartNode™?	3
Patton Cloud	4
SmartNode Product Comparison	6
Virtual SmartNode	8
Carrier-Grade TDM + VoIP SmartMedia Gateways	9
Enterprise Solutions	10
Legacy PBX to SIP Trunk Migration	10
Connecting Analog Legacy Terminals	11
IP PBX PSTN Gateway with Survivability	11
Connecting Remote Offices	12
Remote Office Survivability	12
All-IP Set-up with Enterprise Session Border Controllers	13
Automated SIP Survivability Solution	14
Carrier Solutions	15
Carrier CPE: Legacy PBX	16
Hosted PBX and On-premise IP Carrier CPE: PBX	17
Carrier Network	18
Microsoft Skype for Business	19
SmartNode Certifications	20
Enterprise Telephony Solutions	20
Carrier Softswitch IMS and Cloud Solutions	20

Copyright and Trademark Statement

Copyright © 2009–2019 Patton Electronics Co. All rights reserved.

Patton is a registered trademark and the terms SmartNode, SmartWare, SmartLink, Trinity, and SmartMedia are trademarks of Patton Electronics Company in the United States and other countries. All other trademarks, trade names, or company names referenced herein are used for identification only and are the property of their respective owners.

VoIP Starts with SmartNode...

SmartNode integrates IP and TDM communications for Enterprise and Carrier access networks, offering VoIP gateways combined with IP access routing, WAN transmission, and transcoding functionality. SmartNode scales from 1 to 32,768 VoIP or fax calls with various telephony interfaces including analog FXS/FXO and digital ISDN BRI, PRI, DS3 and STM-1.

Award-winning SmartNode™ equipment delivers state-ofthe art VoIP technology that integrates seamlessly with existing analog PSTN, digital ISDN, and IP infrastructures. SmartNode provide any-to-any multipath switching, and supports simultaneous SIP, H.323, ISDN and PSTN calling—plus T.38 SuperG3 FAX and modem over IP.

SmartNode's proven interoperability with all major brands of softswitches and IP PBXs makes it easy for carriers and enterprises to deploy future-proof VoIP systems quickly and profitably. As VoIP Gateway pioneers since 1998, tens of thousands of SmartNode™ products are up and running in enterprise and carrier networks worldwide.

✓ Telephony interfaces on Gateways include:

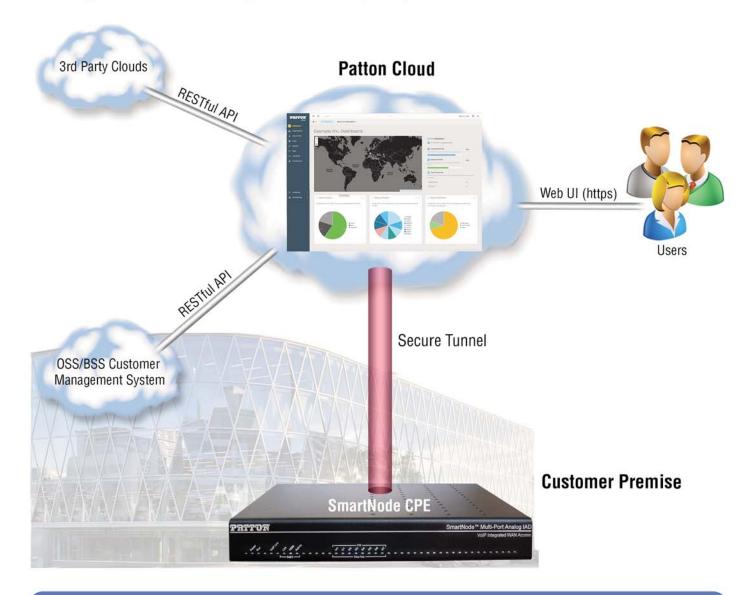
- 1 to 32 FXS/FXO
- 1 to 8 ISDN BRI
- 1 to 1024 T1/E1/PRI
- 1 to 48 DS3
- 1 to 16 STM1
- √ 1 to 32,768 VoIP or fax call capacity
- ✓ Optional internal IP router, WAN interface and transcoding functionality
- ✓ Supports simultaneous SIP, H.323, SS7, H.248/Megaco, ISDN, and POTS calling—plus
 T.38 faxing
- ✓ Managed, Monitored and Administrated by Patton Cloud

Why SmartNode?

- ✓ Patton Quality and Reliability
- ✓ Industry-Best Customer Support
- ✓ Robust Enterprise Feature Sets and Functionality
- ✓ Proven Interoperability
- ✓ Swiss Engineered. Made in the USA.

Patton Cloud

The Patton Cloud is a new and revolutionary service to accelerate and aid processes for system integrators, installations firms, and service providers in making the transition to converged All-IP networking, IoT, and telephony services.





Patton Cloud Benefits



Service Plans

	BASIC	STANDARD	ADVANCED	PROFESSIONAL
Dashboard	V	V	V	V
User/Role Management	V	V	V	V
Device on-boarding	V	V	V	V
Managed Devices	5*	10*	50*	500*
Redirect Service	~	V	V	V
Status, Firmware, Uptime	V	~	V	V
Quick Tools	V	V	V	V
Device CLI & Web Terminal Access	X	V	V	V
License Server	×	V	V	V
File Management, Back-up & Restore	×	X	V	V
Provisioning	×	X	V	V
Notification & Alerting	×	X	V	V
Remote Support	×	X	X	V
Multi-Tenant Operation	×	×	X	V
API	×	X	X	V

^{*} Additional managed devices purchased separately

^{**} Trinity & Smartware. Unlimited number of devices

SmartNode Product Comparison

Depending on the model, SmartNode comes with four software packages developed for different applications:

- Trinity™—Small/medium enterprise feature sets (including nextgen features like, Patton Cloud Connect, IPv6 Networking & SIP, TLS and SRTP, Secure Zero Touch, etc.).
- SmartLink™—Basic SoHo feature sets.

- SmartWare™—Small/medium enterprise feature sets (SIP, PSTN, Routing, QoS, transcoding, etc.).
- SmartMedia[™]—Large enterprise and carrier network feature sets (SIP, PSTN, Call routing, QoS, transcoding, SS7, etc.).

For more info, see www.patton.com/products/smartnode software.asp.

Analog Gateways										
	M-ATA	SN100	SN200	SN4110	SN4140	SN4520	SN4830	SN4300	SN4400	SN4900*
		PRITOR		tidat nam o			THE ME TO STATE OF THE PARTY OF	James de	Jan	dun- 17 D
Software	SmartLink	SmartLink	Trinity	SmartWare	Trinity	SmartWare	SmartWare	SmartWare	SmartWare	SmartWare
Patton Cloud Connect	No	No	Yes	Redirect Only	Yes	Redirect Only	Redirect Only	Redirect Only	Redirect Only	Redirect Only
Telephony Interfaces	FXS	FXS & FXO	FXS & FXO	FXS & FXO	FXS	FXS & FXO	FXS & FXO	FXS or FXO	FXS or FXO	FXS or FXO
Telephony Ports	1	1, 2 or 4	1, 2 and 4	2, 4, 6 or 8	2, 4 or 8	2, 4, 6 or 8	2, 4, 6 or 8	12, 16, 24 or 32	12, 16, 24 or 32	12, 16, 24 or 32
IP Router: IP Routing, QoS, VPN, etc.	No	No	No	No	No	Yes	Yes	No	Yes	Yes
Ethernet Ports	1	2	1	1	1 or 2	2	2	1	2	2
WAN Access	No	No	No	No	No	No	G.SHDSL Serial X.21 Serial V.35 ADSL	No	No	(Optional) Serial X.21 Serial V.35

^{*}The SN4900 differs from the SN4400 in that it has a redundant internal power supply, optional WAN access, and 0 to 50 °C operating temperature

ISDN BRI Gateways							
	SN-DTA	SN4120	SN4130	SN4150			
	201 V C - 3152			-100			
Software	SmartWare	SmartWare	SmartWare	SmartWare			
Patton Cloud Connect	Redirect Only	Redirect Only	Yes	Yes			
Telephony Interfaces	BRI (NTor NT+TE)	BRI (TE)	BRI	BRI, FXS, FXO			
Telephony Ports	1 or 2	1 or 2	2, 4 or 8	2, 4 or 8			
VolP Channels	2 or 4	2 or 4	4, 8, 16	4, 8 or 16			
IP Router: IP Routing, QoS, VPN, etc.	No	No	No	No			
Ethernet Ports	1	1	1 or 2	1 or 2			
WAN Access	No	No	No	No			

T1/E1/PRI Gateways							
	SN4170	SN4970	SN4980	SN4990			
	an in the	The state of the s	-	-			
Software	Trinity	SmartWare/Trinity	SmartWare/Trinity	SmartWare/Trinity			
Patton Cloud Connect	Yes	Yes	Yes	Yes			
Telephony Interfaces	PRI	T1/E1/PRI	T1/E1/PRI	T1/E1/PRI			
Telephony Ports	1 or 2	1 or 4	1 or 4	1 or 4			
VoIP Channels	15 to 30	15, 24, 30, 48, 60, 96 or 120	15, 24, 30, 48, 60, 96 or 120	15, 24, 30, 48, 60, 96 or 120			
VoIP Gateway: Converts TDM to IP	Yes	Yes	Yes	Yes			
IP Router: IP Routing, QoS, VPN, etc.	No	No	Yes	Yes			
Ethernet Ports	1 or 2	1	2	2			
WAN Access	No	No	No	Fiber, ADSL, G.SHDSL, VDSL			
Transcoding: Interconnect multiple VoIP networks	No	No	Optional	Optional			

	Enterprise Session Border Controllers (eSBC)									
	SN5200	SN5300	SN5480	SN5490	SN5500	SN5530	SN5540	SN5550	SN5600	SN5570
	Omm)	10.10				Sho too		201 3 0001		101 - T. Lines
Software	SmartWare	Trinity	Trinity	Trinity	Trinity	Trinity	Trinity	Trinity	Trinity	Trinity
Patton Cloud Connect	Redirect Only	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Telephony Interfaces	None	None	None	None	None	2, 4 or 8 BRI	2, 4 or 8 FXS	2 or 4 BRI, FXS, FXO	None	1 or 2 PRI
SIP Sessions	Up to 32	Up to 60	Up to 80	Up to 80	Up to 200	Up to 200	Up to 200	Up to 200	Up to 1000+	Up to 200
Transcoded Calls	N/A	N/A	Up to 64	Up to 64	Up to 16	2 or 4	1, 2 or 4	2 or 4	N/A	16
Transcoding: Interconnect multiple VoIP networks	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
VoIP Gateway: Converts TDM to IP	No	No	No	No	No	Yes	Yes	Yes	No	Yes
IP Router: IP Routing, QoS, VPN, etc.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethernet Ports	5	4	2	2	2	2	2	2	2	2
WAN Access	Optional X.21	G.SHDSL.bis (ATM or EFM)	No	Fiber, G.SHDSL, VDSL/ADSL	Fiber, G.SHDSL, VDSL/ADSL	Fiber, G.SHDSL, VDSL/ADSL	Fiber, G.SHDSL, VDSL/ADSL	Fiber, G.SHDSL, VDSL/ADSL	Ethernet	Fiber, G.SHDSL, VDSL/ADSL
SIP & RTP Security	No	Yes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes

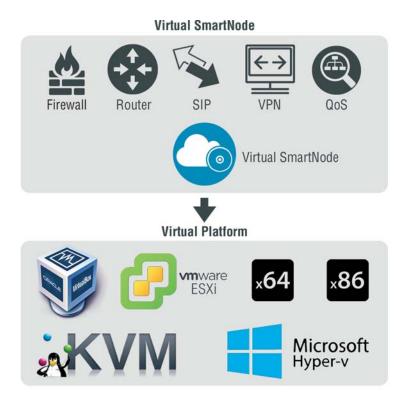
Virtual SmartNode

The Virtual SmartNode provides a comprehensive feature set (as shown at right) that is required for you as an enterprise or service provider looking to virtualize your infrastructure.

Use Case Examples

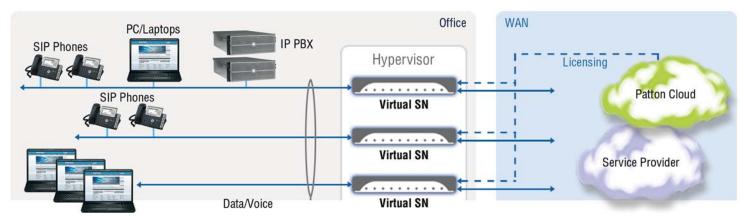
The Virtual SmartNode adapts to a variety of use cases that include:

- eSBC—for VoIP service demarcation functions such as network topology hiding (security), SIP normalization, Session control & routing, IPv4 to IPv6 Network translation, TCP to UDP protocol conversion.
- VPN termination—of VPN links from branch offices to central site
- IP Routing—scalable network router with NAT & NAPT, DHCPv4 & v6, RIP, BGP, VRRP, GRE and ACL functionality
- IP Network Gateway—IPv4 to IPv6 interoperability. WAN-LAN network separation, multi access link management and much more.

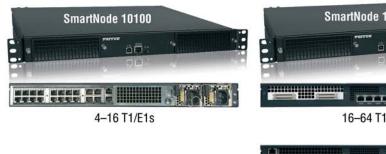


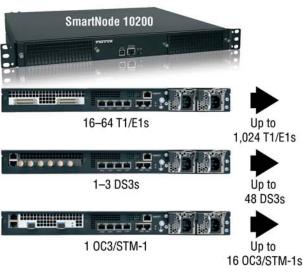
Virtual SmartNode Application

Quickly and easily scale Vservices you need for your clients, using the Patton Cloud as shown below.



Carrier-Grade TDM + VoIP SmartMedia Gateways & SBCs







Connect your SS7 edge, core and peer zones with emerging H.323 and SIP networks. By supporting TDM-to-TDM, TDM-to-IP, and IP-to-IP architectures, the SmartNode 10K supports your Converged IP migration plan.

- SS7 Media & Signaling
- 1+1 & N+1 Redundancy
- Up to 48 Ethernet Ports
- Scriptable Call Routing

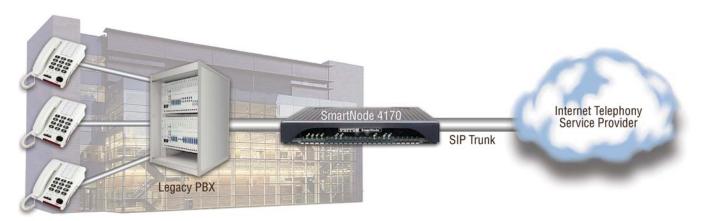
T1/E1/PRI Gateways for Carriers							
	SN10100	SN10200	SN10300	SN10500			
Software	SmartMedia	SmartMedia	SmartMedia	SmartMedia			
Telephony Interfaces	T1/E1/PRI	T1/E1/PRI DS3 STM-1	T1/E1/PRI DS3 STM-1	None			
Telephony Ports	4 to 8	16 to 64 1, 2, or 3 1	16 to 1024 1, 2, or 3 1 to 15 +1	None			
VoIP Channels	up to 256	up to 2,048	up to 32,768	25 to 5000 (SIP to SIP)			
VoIP Gateway: Converts TDM to IP	Yes	Yes	Yes	No			
IP Router: IP Routing, QoS, VPN, etc.	No	No	No	No			
Ethernet Ports	2	2	up to 48	4 to 6			
WAN Access	No	No	No	No			
Transcoding: Interconnect multiple VoIP networks	No	No	No	up to 2,744			

Enterprise Solutions

Legacy PBX to SIP Trunk Migration

Solution Gateway

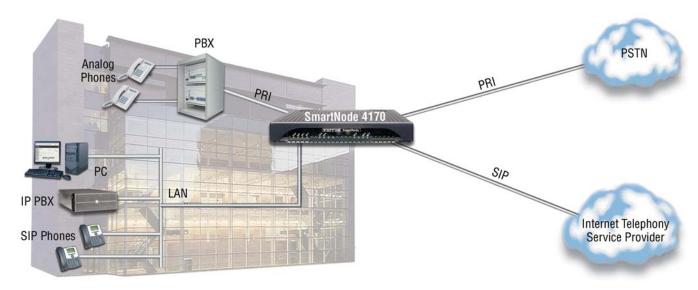
By installing a PRI SmartNode for a few hundred dollars, it allows an enterprise connecting their PBX to a SIP Trunk service which helps to cut telephony cost with up to 600\$ savings per month. Which results after a few months with the hardware cost being paid off.



Solution Gateway-eSBC

As the business grows and starts investing in next-generation IP telephones while at the same time utilizing the perfectly good analog/digital phone equipment the same SmartNode providing any-to-

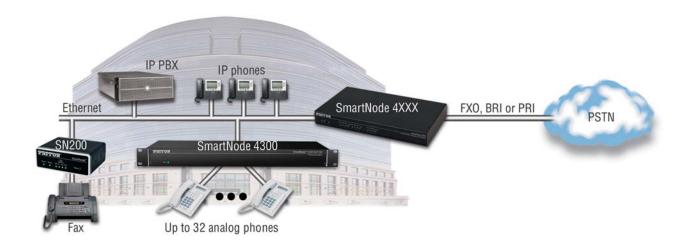
any flexible call routing between legacy PBX, IP PBX, PSTN and SIP trunks.



Connecting Analog Legacy Terminals

When migrating to a VoIP network, many businesses find it difficult to replace every legacy terminal with a brand new IP terminal all at once. The SmartNode Gateway gives SMBs and hotels the ability to connect this existing equipment to their IP phone system.

As the world transitions to All-IP, fax has become a particularly hot topic as it has proven to be an indispensable technology. When sending faxes over a VoIP network, even the slightest interruption in the data stream will drop a fax. Hence, to ensure reliable fax delivery, SmartNode offers T.38 and G.711 fax-over-IP.



IP PBX PSTN Gateway with Survivability

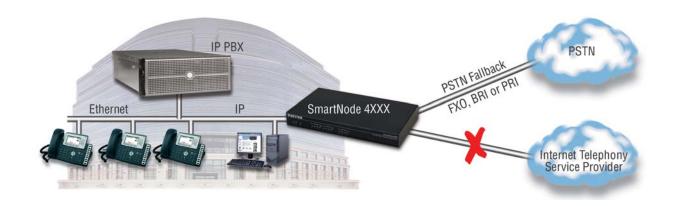
Many businesses wish to keep their existing traditional phone service provider connected to their IPPBX because they are satisfied with their current service, stuck in a contract or possibly don't trust VoIP too much yet. In these cases, offering Patton's SmartNode Gateways in conjunction with an All-IP setup enable you to provide the benefits of SIP while allowing businesses to continue using their trusted PSTN lines and existing telephony service providers.

If the business is satisfied, you can switch them over completely to the VoIP provider and possibly keep one or two POTS lines as a fallback.

Survivability—Fallback

The best VoIP providers provide 99% reliability given the necessary bandwidth requirements. A SmartNode ensures businesses telephony continuity by setting their VoIP phone network up with survivability.

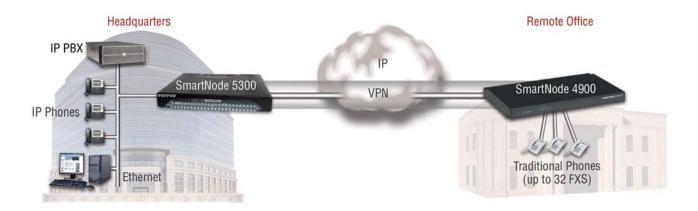
A SmartNode VoIP Gateway can be used to fallback to your PSTN lines (99.999% reliability) in cases where the Internet telephony service provider or Internet connection goes down.



Connecting Remote Offices

The SmartNode Gateway can be used to connect analog, ISDN and IP telephony from a remote office to your IP PBX phone system in your headquarters.

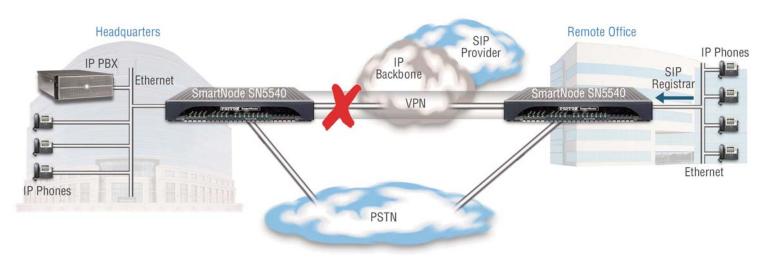
With integrated routing, QoS and VPN features, the SmartNode can ensure a secure connection and maximum voice quality between offices.



Remote Office Survivability

A SmartNode provides a SIP Registrar for your IP phones in your remote office to register with the SmartNode directly rather than just the IP PBX in your headquarters. This way, in the case where you lose

your connection to your headquarters, the remote office can act independently making and receiving calls over PSTN lines.



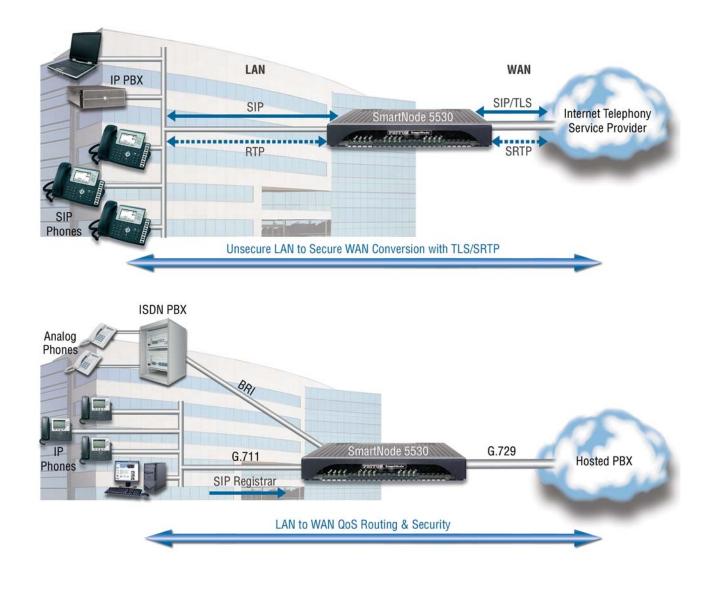
All-IP Set-up with Enterprise Session Border Controllers

For All-IP environments, a SmartNode Enterprise Session Border Controller (eSBC) can be placed at the edge of your network to provide several key voice quality, survivability, and security features:

- Back-to-back-user-agent (B2BUA): Isolates your network from the outside world to hide your private addresses and network topology for security purposes.
- SIP Automated Survivability: Patented self-learning survivability algorithm, which learns the SIP Registration Records of the SIP endpoints. Opposed to a regular B2BUA, the SmartNode in this case acts passive during normal operation and only becomes active in case a WAN link fails.
- **Transcoding**: Provide any-to-any codec conversion allowing efficient use of bandwidth and improved voice quality. Reduce

WAN-access bandwidth requirements by converting high bandwidth G.711 codec on your LAN to low bandwidth G.729 for WAN transport. Transcoding also provides seamless integration between multiple VoIP providers using different VoIP codecs.

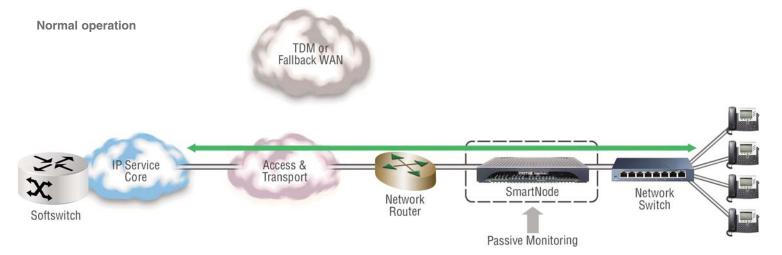
- Quality-of-Service (QoS): Ensures voice quality by managing data communications so that voice packets and other real-time data are prioritized.
- **SIP Registrar**: Enables any registration and authentication scenario between IP PBX on one side and SIP Trunk provider on the other.
- Security: Translates SIP and RTP to SIP/TLS and Secure RTP when traffic is leaving the LAN side of the network.



Automated SIP Survivability Solution

Many organizations that chose to move forward with adopting an All-IP communications system will demand a comprehensive and innovative solution for the survivability problem. Patton's patented self-learning survivability algorithm—embedded in customer-

premise SmartNode enterprise session border controllers (eSBC)—combines intelligent self-learning capability with automated monitoring, switching and notification mechanisms.



Normal operation

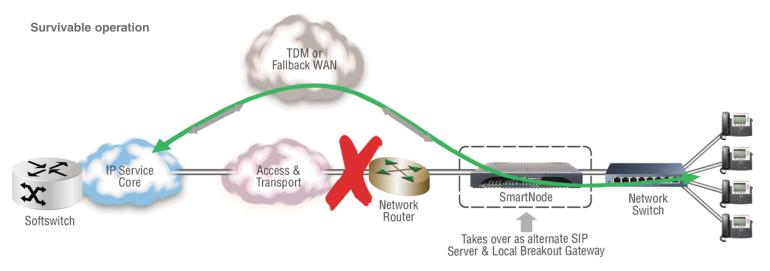
The intelligent CPE engages in discovery operations to learn and record the fully qualified domain name (FQDN) of SIP servers residing in the provider networks (see image above). Further, the eSBC discovers and records the FQDN of each local IP endpoint (hardware SIP phones, IP softphones) located within the subscriber LAN environment.

The CPE then monitors the up/down state of SIP servers. If no response is received from a server, a WAN failure is indicated, and link switchover is initiated.

Survivable state

Upon detection of a WAN failure, the CPE becomes the SIP server providing the necessary features allowing local station to station calls, emergency calls (e.g. 112 / 911) as well as regular calls, by rerouting them in to the PSTN or over an alternate WAN link being wired or wireless (see image below).

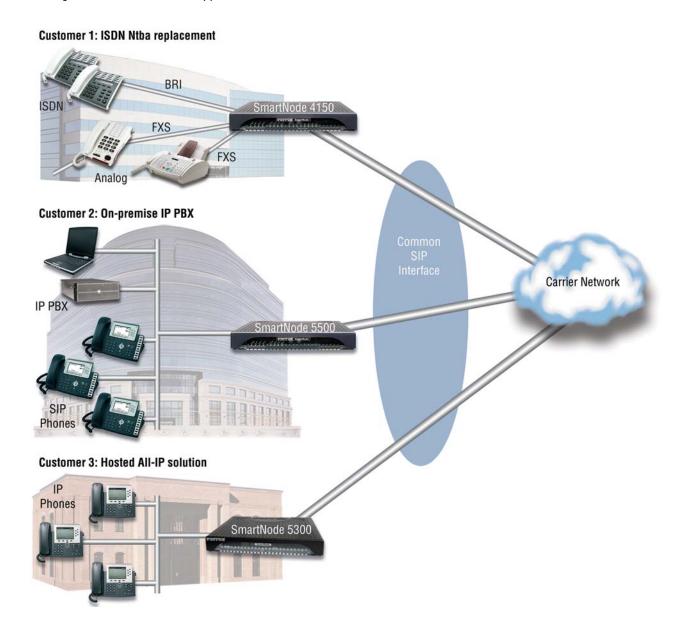
During this state the CPE is always checking if the WAN link is up again. Once back up, things revert back to normal operation.



Carrier Solutions

The Patton SmartNode™ product line supports IP PBX and hosted PBX, as well as legacy PBX systems. The feature-rich capabilities of the Patton SmartNode VoIP CPE means the service provider can have a single vendor solution that supports all VoIP services to the

end user. By providing a single and consistent SIP interface for all three of the above services, Patton can help you simplify VoIP deployment while controlling your OAM costs.



The Patton SmartNode™ solution operates under a single software platform allowing ease of installation and configuration, regardless

of the application being supported. And the specific features explained above are available on all SmartNode products.

Carrier CPE: Legacy PBX

As a growing number of Service Providers are offering VoIP services, they face the challenge of connecting a wide array of legacy PBX systems. The SmartNode will always provide the same SIP to the service provider regardless of the type of legacy PBX attached to it.

Patton's SmartNode supports all varieties of legacy PBXs, regardless of the type of trunk supported. This includes Analog, BRI, PRI, DS3 or STM-1 connections.



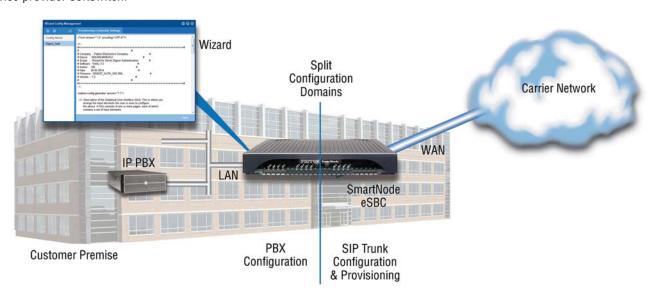
Carrier CPE: Session Border Controller for SIP Normalization

The major problem for carriers is the wide selection of IP PBXs available on the market today. Even though each IP PBX provider claims to be SIP standards based, each system does something different with the SIP protocol. This means the service provider must have a unique softswitch profile for each type of IP PBX system that ties directly to OAM (operations, administration and maintenance) costs.

This device receives SIP requests from the customer premise equipment and reformats the SIP to meet the requirements for the service provider softswitch.

This SIP normalization standardizes setup because no matter what vendor IP PBX is used at the customer premise, the SIP presented to the service provider is always the same—eliminating the need for individual service profiles for each vendor's IP PBX.

Also moving the typical SBC features of these VoIP Routers from the Carrier network to the customer premise provides the customer with QoS, transcoding and a security demarcation point.

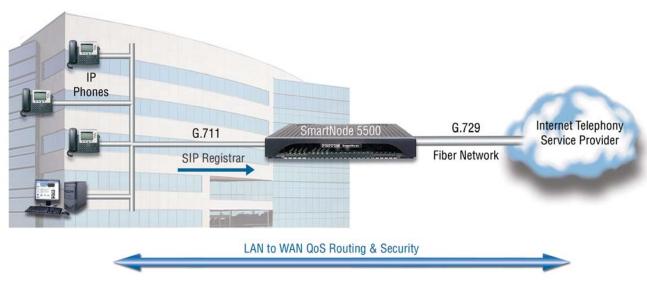


^{*}Any provisioning solution supporting tftp, http or https will work with the Patton SmartNode.

Hosted PBX and On-premise IP Carrier CPE: PBX

With the wide variety of SIP phones available on the market today, the same number of softswitch SIP profiles is required to support each vendor's SIP phone. By utilizing the SmartNode Enterprise Session Border Controller with the SIP Back-to-Back user agent, a single softswitch profile can be used to support all varieties of SIP phones. This will allow control of OAM costs by not utilizing support personnel's valuable time to develop and implement multiple SIP phone profiles.

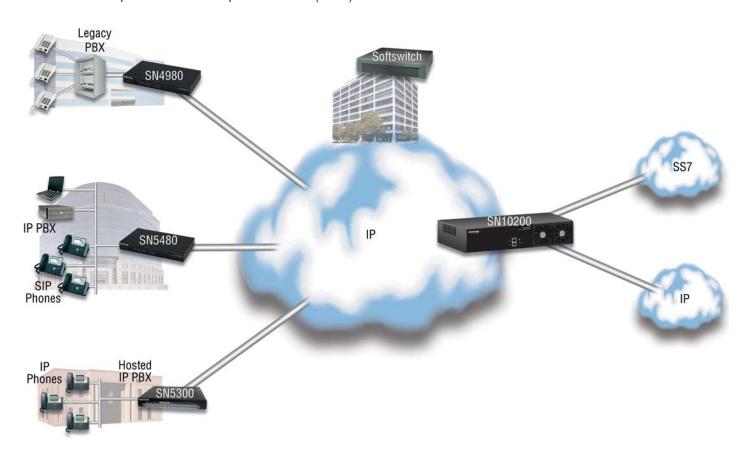
A second problem is that most SIP phones require registration to some type of softswitch or Session Border Controller to be able to function. Most eSBCs on the market today support a SIP registrar function to allow SIP to continue operation in the case of a softswitch failure. But in the case of a broadband connection failure, the SIP phones will not be able to reach the SBC to registrar and will not function. The solution for this problem is to move that eSBC functionality to the customer premises. By complementing the SBC functionality with the SmartNode eSBC that supports SIP registration, all SIP phones will be able to operate locally without the broadband connection.



Carrier Network

The end-of-life (EOL) of parts used to maintain a TDM infrastructure is forcing Service Providers to replace TDM-based equipment. As a result, Service Providers are migrating their networks to All-IP. This can be best accomplished using a SmartNode 10XXX Series media gateway that enables the delivery of VoIP services by bridging voice traffic between the public switched telephone network (PSTN)—

based on time-division multiplexing (TDM)—and IP networks such as the Internet. Whether sitting at the network core or at the edge, SmartNode media gateways enable service providers to introduce VoIP into their networks while maintaining the quality and the reliability of traditional TDM networks.



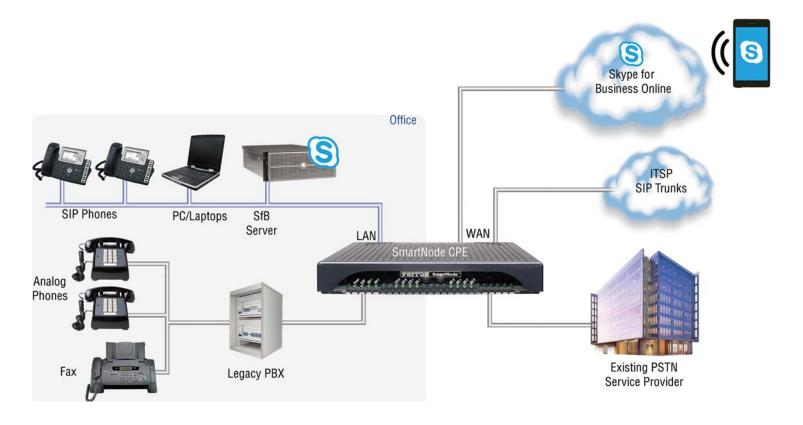
Microsoft Skype for Business

All of Patton's eSBC and gateway products—including the Virtual SmartNode—are validated by the Microsoft-defined categories of SBC and Enhanced Gateway.

Patton, in combination with Skype for Business, offer a unified communication solution that simplifies and accelerates All-IP environment for SMEs. Providing a solution that is based on the lowest

OPEX in the market with its Virtual SBC centrally orchestrated and managed through a single portal: The Patton Cloud.

Covering every need of SME customers from Mobile applications, Skype for Business Online and on-premise (hybrid), legacy equipment integration and failover and survivability.



SmartNode Certifications

Patton's interop certification program includes all the major technology brands.

Enterprise Telephony Solutions



















SWype for Business



Carrier Softswitch, IMS and Cloud Solutions













...and more! Check our partners page for more info at www.patton.com/partners/

Notes

Notes

Patton Electronics Co. 7622 Rickenbacker Drive Gaithersburg, Maryland 20879 USA Phone +1 301 975 1000 Fax +1 301 869 9293 E-mail sales@patton.com Patton-Inalp Networks AG Meriedweg 7 CH-3172 Niederwangen Switzerland Phone +41 (31) 985 25 25 Fax +41 (31) 985 25 26 E-mail we@patton.com Patton Hungary Zrt Gábor Dénes utca 4. Infopark Building C, Budapest H-1117 Hungary Phone +36 1 439 4844 E-mail ce@patton.com

