

PATTON



VoIP Solutions Guide



ToIP, VoIP that works

VoIP Voice-over-IP

Converting Voice to Packet using industry-standard H.323 and SIP protocols is called *VoIP*. Making it work in YOUR network is something else.



ToIP Telephony-over-IP

Incorporating PSTN telephony and data services into a seamless and integrated private or public network, TRANSPARENT to the end-user is what Patton calls *Telephony-over-IP™*.



Patton's SmartNode Telephony-over-IP gateways and routers offer a full range of solutions to address the challenges of integrating PSTN and IP networks and solve the critical migration issues associated with next-generation IP networks. Unique among VoIP solutions, Patton's SessionRouter™ software offers configurable call-routing policies to support any numbering plan and ease your migration to IP calling.



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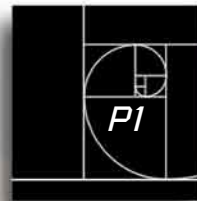
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Telephony-over-IP

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The Case for VoIP

The basic argument for VoIP is the clear advantage of a converged and integrated network. The benefits are cost savings and improved efficiency.

The New Way Converged IP Access

- All services are consolidated to the new lower-cost IP access
- Remote extensions are now integrated with remote PBX with full telephony feature transparency
- Network = Asset

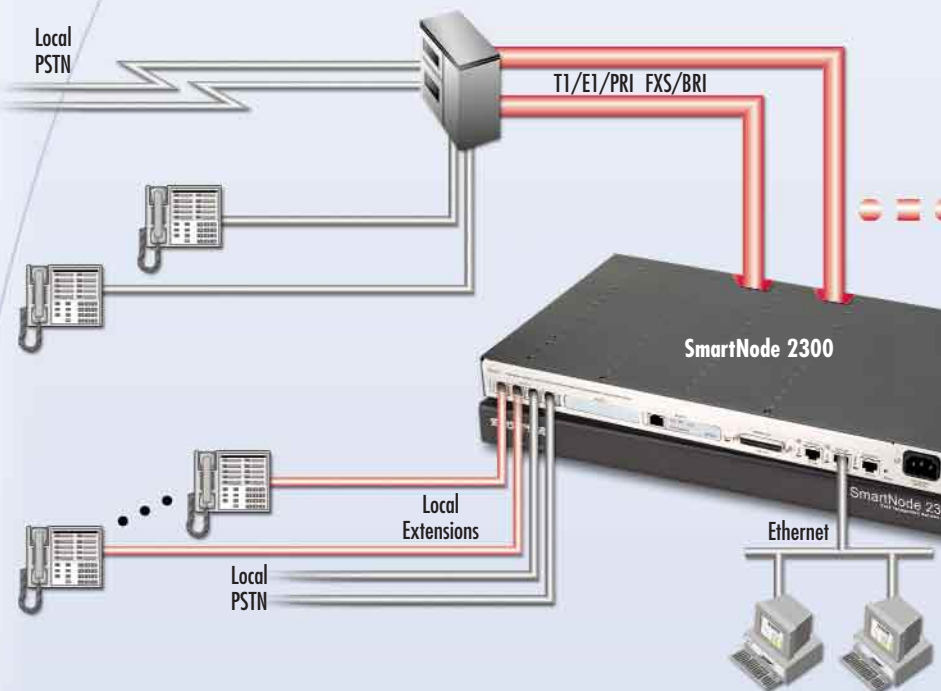
The Old Way Separate Data & Voice Networks

- Multiple, under-utilized facilities with dedicated services for each application
- Separate phones & circuits for local & remote telephone services
- Network = Liability

This Solutions Guide describes how Patton delivers the VoIP promise to Enterprises and Service-Provider Customers.

- Reduce your network's underlying cost base and realize a short term return on investment.
- Contain built-in variable network cost increases and improve efficiency.
- Leverage established systems and migrate to next-generation IP-based networks with feature transparency.
- Achieve customer retention and new business development.

Integrated Data & Voice: Network = Asset



Patton's Telephony-over-IP solutions let you realize the promise of Voice-over-IP by eliminating the problems with deployment. Details on the following page.



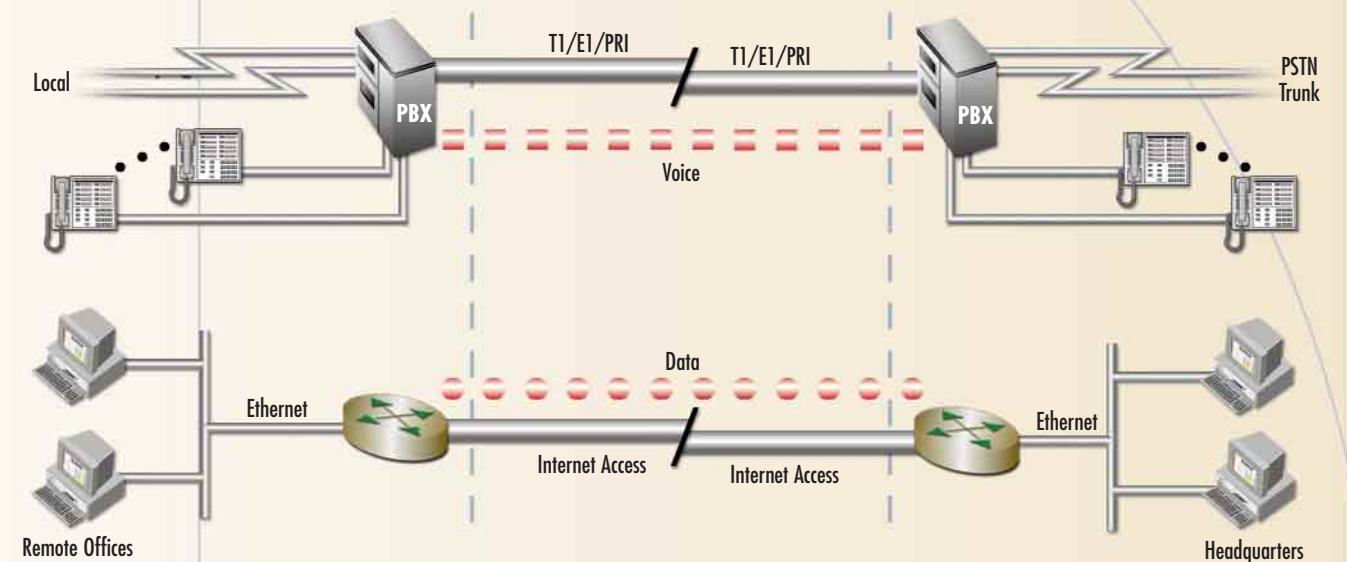
Telephony-over-IP

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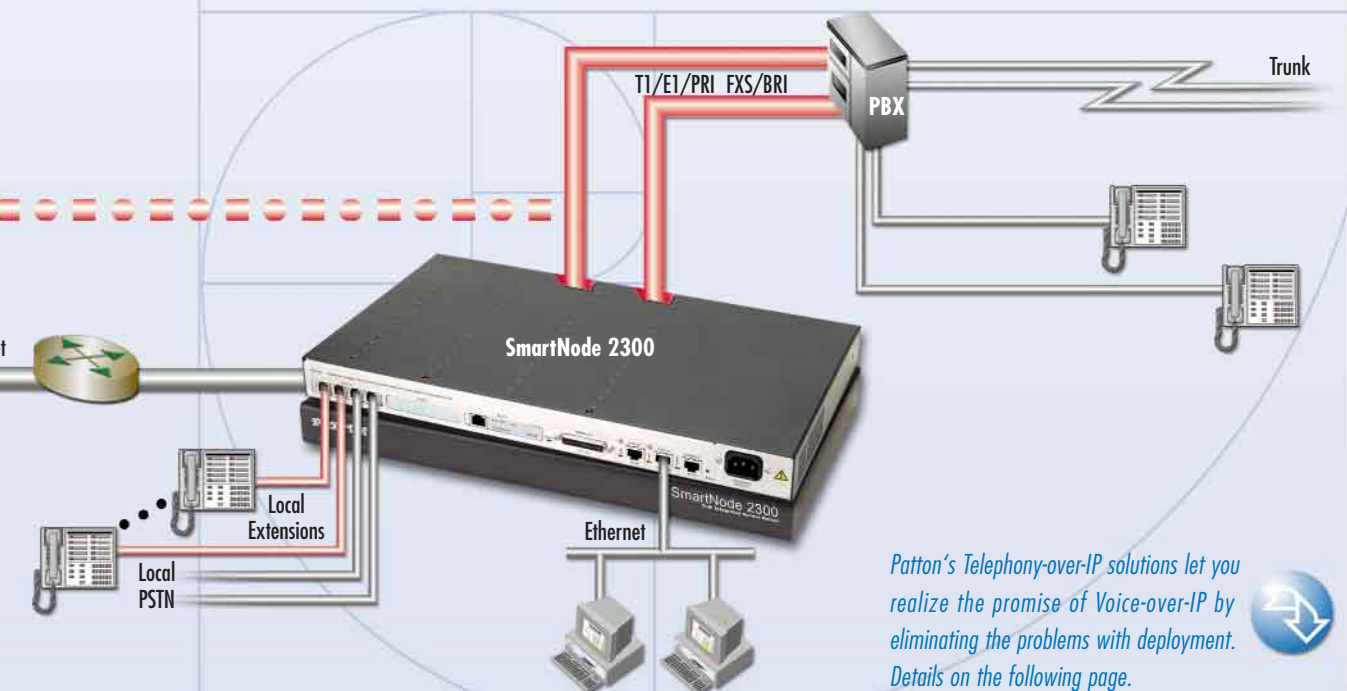
The Case for VoIP

Migration to a Converged Access Network is the challenge.

Separated Data & Voice: Network = Liability



Realizing the benefits of VoIP involves eliminating unnecessary recurring expenses and hardware costs required to support voice & data services.



Patton's Telephony-over-IP solutions let you realize the promise of Voice-over-IP by eliminating the problems with deployment. Details on the following page.



The financial benefits of VoIP for residential, enterprise, and service-provider companies has been well known for years now. Many of the reductions in US domestic long-distance rates are the result of carriers adopting VoIP. And, VoIP technology PROMISES reduced costs, increased profits, and greater efficiencies in the networks of enterprises and service providers of ALL shapes and sizes. BUT THIS PROMISE has not yet come true! Problems with deployment and other challenges have hindered mass voice and data integration over a common IP network.

Problems with deployment and other challenges have hindered mass voice and data integration over a common IP network.

Patton's unique range of Telephony-over-IP products removes the key barriers and solves the issues preventing mass VoIP deployment.

Problems with VoIP

- Supporting numbering plans and dialing procedures
- Supporting supplementary services (Caller-ID, Call-Transfer, etc.)

ToIP Solutions

SessionRouter™ provides a full suite of PBX and PBX-interoperability features. The software allows easy integration with any PBX. You can configure call routing policies that solve practically any numbering and migration issue. The SmartNode SessionRouter supports traffic classification, call filtering, and prioritized routing not only for voice but also for multiple data service classes.

SmartNode SessionRouter™

- Mastering network delay
- Overcoming IP service quality issues

Supporting industry-standard QoS and Patton's Down-Stream QoS™ techniques, SmartNodes ensure that time-sensitive telephone calls are prioritized over other traffic traversing the Internet or private IP network.

SmartNode QoS

- Truly integrating IP and PSTN telephony, migrating existing equipment and operational procedures.

Patton's robust core software includes a full suite of IP routing and services software and all standard low-speed and high-speed CODEC and VoIP protocols.

User Transparency

Teach me VoIP

Voice over IP (VoIP)

samples analog voice into blocks of 10–60 ms, wraps them into digital IP packets, sends them over the network, and reassembles the voice stream on the other side. The quality of VoIP depends on the CODEC—compression/decompression—method used, network conditions, and ranges from ISDN toll quality to GSM.

G.711 This standard CODEC converts the analog speech signal to a digital stream using pulse code modulation (PCM), a logarithmic encoding algorithm. G.711 delivers toll-quality voice using 64 kbps of bandwidth per call. Best choice in high-bandwidth environments.

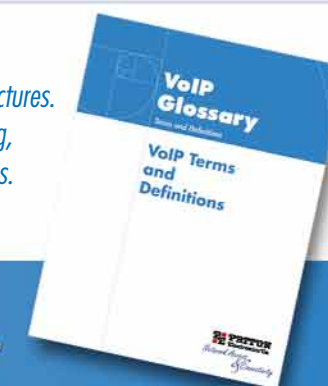
G.723.1 Developed for multimedia, G.723.1 has emerged as the standard low-bandwidth CODEC today. Using just 5.3 kbps or 6.4 kbps of bandwidth per call, G.723.1 delivers good voice quality at low bandwidth in the presence of network impairments such as lost packets and transmission errors.

G.729 This standard CODEC offers toll-quality voice at lower bandwidth. Using 8 kbps of bandwidth, G.729 offers modest processing requirements and tolerates moderate network delay. Delivers high-quality voice in low-bandwidth environments.

The following points represent the KNOWN FACTS about successful VoIP deployments. Understanding these facts is the key to success for implementing any Converged Network strategy. The following pages of this Solutions Guide present a set of business case models that further develop and illustrate the points below.

Telephony-over-IP—Savings and Profit

- 1 Deploying a dedicated telephone system and a separate data system in remote offices is expensive. It costs less to support remote sites over an IP LAN from a centralized location... When you do it with SmartNode's SessionRouter technology, users won't notice a difference.
- 2 International voice and fax calling between offices over IP networks is much less expensive than international long-distance calling.
- 3 Routing voice and fax traffic over an existing IP network infrastructure provides better bandwidth utilization—which equals better asset utilization—and eliminates redundant expenses.
- 4 Traditional telephone equipment for the enterprise network is low-cost, while leased lines, toll charges, network management systems and support are higher-cost elements. Telephony-over-IP offers tremendous cost reductions by leveraging low-cost legacy telephone equipment and radically reducing costs for other network elements—all without impacting the user's experience.
- 5 Consolidating private voice and data networks into a single IP-based communications infrastructure with Telephony-over-IP improves the overall efficiency of the entire communications system.
- 6 Enterprises using Telephony-over-IP realize dramatically reduced administration costs for end-user MACs (moves, adds, and changes).
- 7 IP Telephony software applications are largely based on newer IP-centric server architectures. Patton SmartNodes enable seamless integration of these packages with pre-existing, non-IP-PBXs, thus eliminating the cost of deploying next-generation enterprise networks.



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SIP (Session Initiation Protocol) is the IETF standard call-control protocol between gateways and switches. With SIP, unified services can be easily created which combine elements from telephony and other applications such as email, messaging, and streaming video.

H.323 is a recommendation from the ITU that sets standards for multimedia communications over IP networks. It also addresses call control, multimedia management, and bandwidth management.

ISoIP is ISDN-Over-IP, a patented feature of the SmartNode products which incorporates full ISDN feature tunneling and Q-SIG feature tunneling including ISDN speech, audio data, and ISDN Supplementary Services.

Softswitch is a call control server in a VoIP network providing user Authentication and Accounting services, independent of the VoIP protocol (H.323, MGCP, SIP).

T.38 is a protocol for the real-time transmission of Fax in VoIP networks.

Branch Office Connectivity

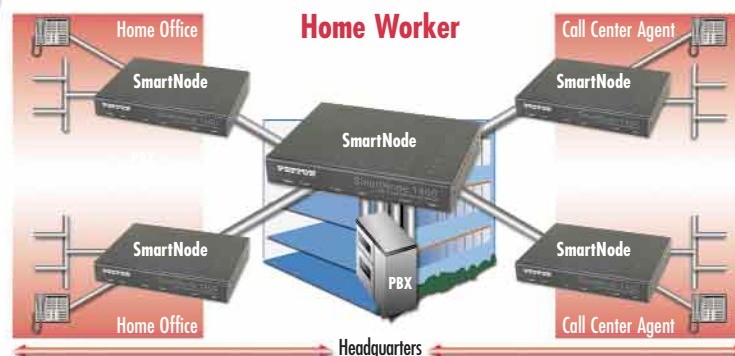
There is no reason to deploy a separate telephone system at each location in an enterprise. Using Telephony-over-IP, remote sites CAN be supported over the Internet, transparent to the user and with the same feature set available to "local" users. Each remote site does not need special IP telephones. At the remote site, voice-extensions to the central site can co-exist with local PSTN connectivity.



Home Workers, Telecommuters, and Remote Call Center Agents

Executives, as well as part-time or full-time home workers, can access the corporate data network *and* the PBX from home or the office without any differences. Home workers can make and receive calls from the PBX while working online, transparent to the caller. The home worker can reach all PBX extensions and use all the same PBX call features available to "local" users.

In a variation of the home workers application, the IP call center agent is located at a contractor's facility or in a home. From the caller's perspective, the IP extension is transparent and the offsite telephone agent is connected using the existing capabilities of the call center operations, including automated call distribution.



Business Case

For small branch offices, it's expensive to deploy a separate telephone system. It can also be very costly to install and maintain remotely. Usually, the remote PBX does not offer "integrated" connectivity nor the same features and functions available to "local" telephony users. The costs of long-distance calls to support "internal communication" are unnecessary.

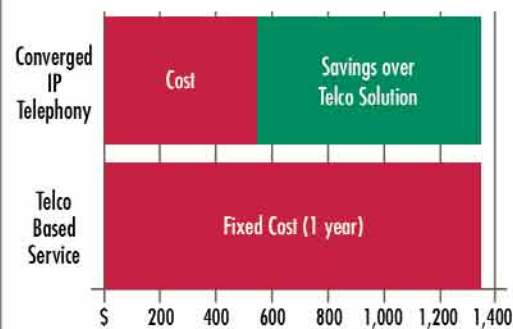
The SmartNode Solution integrates with the HQ's PBX and provides the following benefits:

- Seamless telephone access while expanding your operation's reach and range
- Customers see you as one cohesive organization
- Lowers operational costs by using existing lines and connections
- Lets you realize all the benefits of converged IP and telephony access

Cost Comparison

Telco Based Service with New PBX		
Acquisition & Service Costs	QTY	Total
Telco Line Install + 1 year Service	4	\$2,652
PBX System	1	\$2,735
Total		\$5,387
Per 4 man office \$1,347		

Converged IP Telephony (SmartNode)		
Acquisition & Service Costs	QTY	Total
Patton SmartNode	2	\$1,990
Standard off-the-shelf phones		\$200
Total		\$2,190
Per 4 man office \$548		



Assumptions: 1 year service and deployment; the PBX is a "small business" PBX with voice mail; Internet connection is present at both sites.

Business Case

The 80/20 rule of long distance: 80% of any company's telephone bill is generated by 20% of the numbers dialed. This 80% includes calls to:

- Branch Offices
- Key Customers
- Key Vendors

The voice intranet is simply an expansion of IP-related voice services, first deployed in your organization and then expanded to attack the next cost center of your communications network.

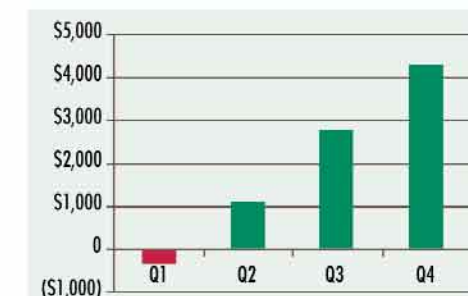
The advantages of the voice intranet go way beyond the hard currency savings. For example, providing your customers quick, easy, and free access to your company. But there are real tangible savings as well, including the elimination of most toll and long-distance expenses.

Cost Comparison

	Long Distanced Based Solution			
	Q1	Q2	Q3	Q4
Without SmartNode				
Local Calling	\$2,925	\$2,925	\$2,925	\$2,925
Long Distance	\$1,575	\$1,575	\$1,575	\$1,575
Total Phone Charges	\$4,500	\$4,500	\$4,500	\$4,500
Cumulative Cash Expense	\$4,500	\$9,000	\$13,500	\$18,000

	Patton Voice Intranet			
	Q1	Q2	Q3	Q4
With SmartNode				
Long Distance Savings	\$1,575	\$1,575	\$1,575	\$1,575
Patton SmartNode	\$1,990	0	0	0
Total Cash Savings	(\$415)	\$1,575	\$1,575	\$1,575
Cumulative Cash Savings	(\$415)	\$1,160	\$2,735	\$4,310

Assumptions: 50 employee office; 35% of total bill is Long Distance and is bypassed with SmartNode; Internet access is available at all sites.



Cumulative total savings over long distance using Patton SmartNode

The Voice Intranet

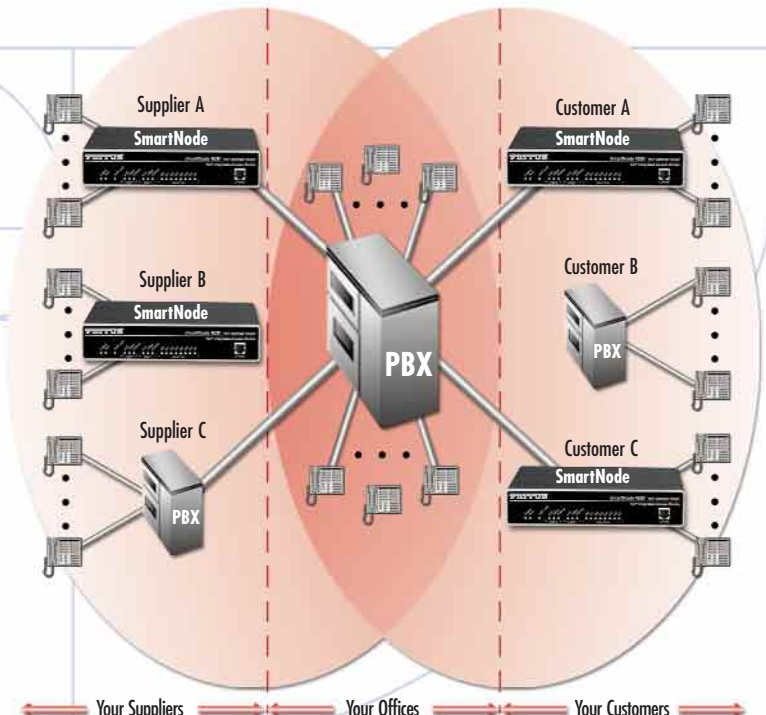
Long, growing, and increasingly efficient relationships with your clients and vendors are invaluable assets for your business. Such relationships produce growing revenues and increased profits for everyone involved. Creating your own voice Intranet is like putting a virtual-cubicle of your company at your customer and vendor sites. The voice intranet puts you on your customer's PBX, and vice-versa, and puts your company in the same position as internal personnel. You are only a 3-digit extension away. This approach propagates partnerships throughout organizations while SAVING MONEY. The Internet-based voice-intranet uses Patton's SmartNodes, saving on both incoming and outgoing calls between the vendor and supplier, effectively creating cost-free trunk lines.

This application enhances customer service by enabling personnel to:

- Instantly respond to customer needs
- Close a pending sale through information sharing and end-user/agent collaboration
- Generate interest in or close additional sales almost immediately

Patton's partners are rapidly joining the Patton voice intranet, for details, email sales@patton.com.

Voice Intranet



ITSP International Trunking/Bypass

International long-distance calling is still one of the most lucrative opportunities for carriers. The construction of low-cost, IP-based long-distance bypass solutions is one of the fastest growing Competitive Carrier solutions for VoIP. Patton's SmartNode ToIP Gateways can switch long-distance voice and fax calls onto IP-based networks. This application is particularly well suited for prepaid-calling card or corporate telephony contracts. IP voice and fax calls can significantly reduce long-distance costs, particularly if a service provider can generate high volumes of calls to on-network international locations.



Global Solutions Group Extension x190 for information on Turnkey VoIP Solutions



I'm Benham Malcom, Patton's Director of the Global Solutions Group. We provide a full range of deployment services including engineering, installation, staging, testing and turn-up. We have more than 20 year's experience in designing, building, and implementing networks worldwide. So if you need help building your next-generation network—whether broadband access networks, multi-service data backbone networks, ISP systems, or VoIP infrastructure networks—please give me a call at (240) 912-1211. You can also send e-mail to sales@www.patton.com



Business Case

Transporting telephony minutes is an incremental revenue source for Competitive Carriers offering international IP connectivity.

- Creating "routes" for long-distance traffic, terminating directly onto mobile and incumbent networks is less expensive using VoIP technology.
- In emerging markets in particular, long distance minutes are extremely expensive, creating a margin opportunity for ITSPs.

IP Satellite Transport Case

	Cents/Minute
Long distance rate MEA countries*	50
Wholesale Termination rates in EU/US	3
Margin for termination in US/EU	47
Number of minutes/month on E1 link (at -70% load)	30,000
Total Margin on E1 link (30 channels)	\$14,100
Cost for 1MHz Satellite Bandwidth (1 Mb/s) per year	\$60,000
Cost per month	\$5,000
Monthly profit for long distance transport	9,100.00
Equipment 2 SN2300/E1VIL/UI Installation	\$13,990
Total investment	\$3,000
ROI after	1.9 month
Profit after first year	\$92,210
Profit each following year	\$109,200

* MEA = Middle East / Africa

Business Case

Cyber-cafes, call shops and Internet/telephony kiosks can generate large revenue and profits, especially in areas with mid to low tele-densities.

- Using VoIP you can bypass Local Carrier Access with a low-cost broadband Internet connection.
- Bypass savings depend on call destination and access cost (an average 20% of bypass savings can be easily achieved).
- The following Business Case does not contemplate either the nominal incremental cost to provide Internet access or the additional revenues and margins available.

Call Shop Kiosk

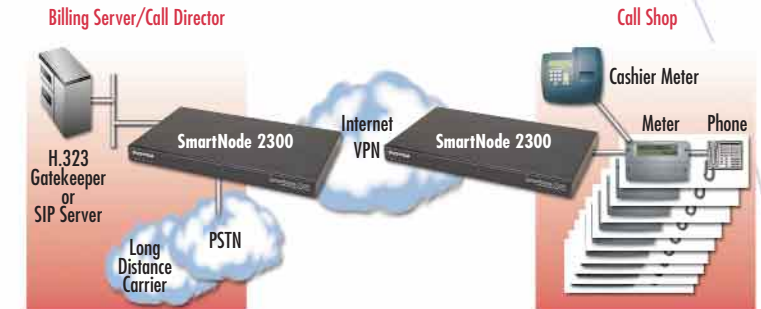
Investment Costs	2 hours/day usage	5 hours/day usage
10 Shops w/8 Lines	\$71,550.00	\$71,550.00
Central Site	\$12,495.00	\$12,495.00
Total Investment	\$84,045.00	\$84,045.00
Total Fixed Monthly Expenses	\$12,333.33	\$12,333.33
Usage Based (LD) Expense	\$10,800.00	\$27,000.00
Monthly Expenses	\$23,133.33	\$39,333.33
Monthly Revenue	\$57,600.00	\$144,000.00
Monthly Net Income	\$34,466.67	\$104,666.67
Return on Investment (month)	2.4	0.8
Earnings year one	\$329,555.00	\$1,171,955.00
Earnings each following year	\$413,600.00	\$1,256,000.00
Earnings per shop, year one	\$32,955.50	\$117,195.50
Earnings per shop, each following year	\$41,360.00	\$125,600.00

Assumptions

# Remote call shops	10
# Customer lines per shop	8
Days per month open	30
Shop IP Access	330
Shop Equipment maint./month	\$30
Customer Service or Tech Rep expense/year	\$100,000
Installation Costs per shop	\$700
PRI to PSTN carrier/month	\$700
SIP Server	\$500
Billing software	\$1,000
% of calls that are LD	0.75
Price to consumer per minute	0.2
LD and toll (USA domestic) costs per minute	0.05

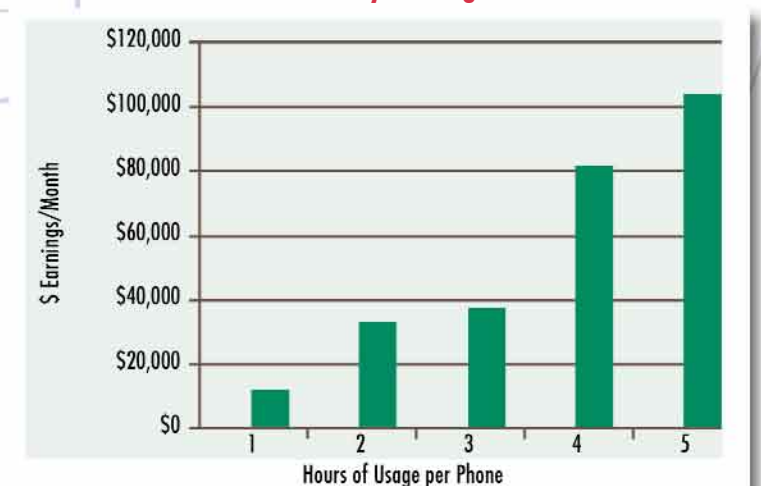
Call Shops and Kiosks

Call shops or telephone kiosks are typically partnerships between telephony service providers and independent call shop or kiosk operators, where the wholesaler provides worldwide connectivity and wholesale billing to the operator. Typically, telephony connections to the call shop or kiosk are via the local PSTN using "carrier selection digits" or call-back operations. The call shop or kiosk operator marks up the wholesale rates in order to make a profit. Using VoIP for call shop operations or kiosks provides not only additional margin on telephony traffic, but affords new sources of margin through multi-functional "Internet Cafe + Call Shop" functionality or "Internet + Phone Kiosk" operations.



Global Solutions Group Extension x190 for information on Turnkey VoIP Solutions

Monthly Earnings



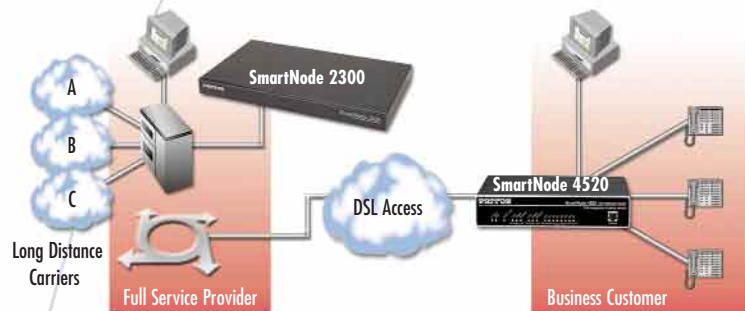
Broadband Service Provider

The single largest cost factor in providing voice services today is the cost of last-mile access between the end user and the service provider's central office. Analog loops and digital carrier loops supporting residential key system or private line trunks to business customers are expensive to deploy, maintain and operate. These costs represent a significant competitive DISADVANTAGE to traditional Carriers.

Meanwhile, ISPs and other "wireline" service providers have deployed broadband access data networks for providing high-speed access to the Internet or VPN services between business locations. DSL, cable, WiFi, FTTPs, IP-VPN are all suitable Digital Carrier Loop bypass technologies since VoIP has become a mature technology. VoIP technology allows legacy voice services to be transported over these access networks with far lower costs than the current arrangement of separate voice and data access facilities.

By using these new telephony access networks, VoIP ELIMINATES the cost and time delay of provisioning voice services.

The converged carrier model is coming true as profits are available to existing and emerging broadband service providers. The following business case focuses on a single model (VoIP over DSL with unlimited local and long-distance calling for business or residential customer calling.)



Other Converged Carrier Applications:

- VoIP Enterprise Services for interconnecting PBXs and IP-PBXs (see Enterprise Solutions) enables remote branch offices to be part of the same dialing plan as the home office and eliminates the need for separate PBX equipment at the branch office, reducing equipment operations and provisioning cost.
- IP Centrex services enable small and medium sized businesses to eliminate totally the investment in PBX or IP-PBXs.
- Unified Messaging where SmartNode IP Gateways are used to integrate voice mail, email, fax etc.
- Global-Number Portability services would enable VoIP road warriors and tele-workers to gain access to telephony services at any location that provides broadband access.
- IP Conferencing where standard telephones or video phones are denoted as an IP presence for NetMeeting applications.

Business Case

Patton's SmartNode Telephony-over-IP solutions enable broadband service providers to deliver more value over IP and acquire new sources of revenue. SmartNode solutions generate new revenue and increase profitability for the broadband service provider.

- Gain a competitive advantage by using existing broadband access networks, combined with VoIP, to bypass expensive analog loops and digital carrier loops.
- Offer competitive voice services using VoIP for SIGNIFICANT revenue growths, with nominal incremental investments.
- Increase ROI by leveraging existing networks to deploy additional competitive next-generation solutions.
- Enable service providers to win new business from subscribers by providing converged voice and data applications.

Business Case Totals

For Service Providers offering broadband access, the additional investment in providing VoIP Services has a compelling ROI.

3C: Business Case Totals

Earnings	\$227,031
Revenues	\$1,361,150
Gross Profit	\$521,600
Care Team	\$90,000
Hotline	\$140,000
Amortization	\$13,137
Interest	\$1,432
Marketing	\$50,000

Revenues & Gross Profits

While dramatically decreasing end user costs and providing integrated services on a single bill, the converged carrier still can generate dramatic gross profits.

3A: Revenues & Gross Profit

Total	Enterprise	SME	SOHO	
1,000	50	250	700	# of subscribers
3,500	600	1,500	1,400	# of voice channels at subscriber site
\$1,361,150	\$235,500	\$762,000	\$363,650	Revenues
\$839,550	\$144,000	\$474,000	\$221,550	Costs
\$521,600	\$91,500	\$288,000	\$142,100	Gross Profit

3B: Operational Expenses

\$90,000	Customer Care Team
\$100	# of customers per care
\$10	# of care people
\$9,000	Cost per sales
\$140,000	Hotline Costs
\$200	# of SO per hotline workers
\$18	# of hotline workers
\$8,000	Cost per hotline worker
\$13,137	Amortization of Capital Expenditures
\$36	Amortization periods
\$8,102	CO gateway amortization
\$5,035	# of hotline workers
\$1,432	Interest Rates
\$0	Rate per month
\$190,972	Average capital employed

Capital Expenditures

\$290,000	CO Gateway
2	CO oversubscription rate
58	# of EI at CO
\$5,000	CO Gateway costs per EI
\$181,250	SoftSwitch
1	# of concurrent calls per voice channel
2,625	# of concurrent calls
\$50	License fee per cc-call
\$50,000	Base license fee
\$100,000	Initial Setup (activated)
\$100,000	Installation of CO

Broadband Service Provider

The Case for Market Value

Converged Carrier can offer a compelling case to Subscribers based on lower cost of services for converged voice and telephony services.

Market	Retail	Value	Cost	Retail
	\$25.00		\$0.00	\$10.00
	\$0.06		\$0.01	\$0.03
	\$0.65		\$0.30	\$0.45
	\$0.10		\$0.02	\$0.06
	\$0.10		\$0.02	\$0.06

Customer Type Assumptions

The following customer-type assumptions capture typical end-customers ranging in size from small offices with 5 employees up to medium-sized enterprises with 100 employees.

SOHO (Assumes 5 Employees)

	Per Employee	SOHO (Total)	Retail	Costs	Margins
Number of Voice Channels		2	\$20.00	\$0.00	\$20.00
National Minutes per month	\$200	\$1,000	\$30.00	\$10.00	\$20.00
Fixed to Mobile Minutes per month	\$200	\$1,000	\$450.00	\$300.00	\$150.00
European Minutes per month	\$45	\$225	\$13.50	\$4.50	\$9.00
Overseas Minutes per month	\$20	\$100	\$6.00	\$2.00	\$4.00
Total per month			\$519.50	\$316.50	\$203.00

SME (Assumes 40 Employees)

	Per Employee	SOHO (Total)	Retail	Costs	Margins
Number of Voice Channels		6	\$60.00	\$0.00	\$60.00
National Minutes per month	\$150	\$6,000	\$180.00	\$60.00	\$120.00
Fixed to Mobile Minutes per month	\$150	\$6,000	\$2,700.00	\$1,800.00	\$900.00
European Minutes per month	\$30	\$1,200	\$72.00	\$24.00	\$48.00
Overseas Minutes per month	\$15	\$600	\$36.00	\$12.00	\$24.00
Total per month			\$3,048.00	\$1,896.00	\$1,152.00

Enterprise (Assumes 100 Employees)

	Per Employee	SOHO (Total)	Retail	Costs	Margins
Number of Voice Channels		12	\$120.00	\$0.00	\$120.00
National Minutes per month	\$120	\$12,000	\$360.00	\$120.00	\$240.00
Fixed to Mobile Minutes per month	\$90	\$9,000	\$4,050.00	\$2,700.00	\$1,350.00
European Minutes per month	\$15	\$1,500	\$90.00	\$30.00	\$60.00
Overseas Minutes per month	\$15	\$1,500	\$90.00	\$30.00	\$60.00
Total per month			\$4,710.00	\$2,880.00	\$1,830.00



Ethernet is not just data anymore: Voice, Video, Data over Ethernet

Ethernet now drives a host of industrial applications. Manufacturing process control, security surveillance, and roadside assistance devices all run over Ethernet. Offering pre-existing infrastructure with low-cost components, Ethernet dominates today's industrial network. Having realized its many advantages, decision-makers in the world of industrial computing have made standard Ethernet their technology of choice.

- Ethernet and IP are now the most common and widely used networking protocols.
- Ethernet/IP cameras simply plug into your existing network infrastructure and give you instant eyes.
- Wireless 802.11 is Ethernet over the air.
- Bar code readers connect to servers via Ethernet.
- Security access control and badge readers use Ethernet for communications.
- With SmartNode gateways, voice communications can use Ethernet/IP for voice/telephony access over industrial ethernet networks.

For other Ethernet solutions, visit www.patton.com.

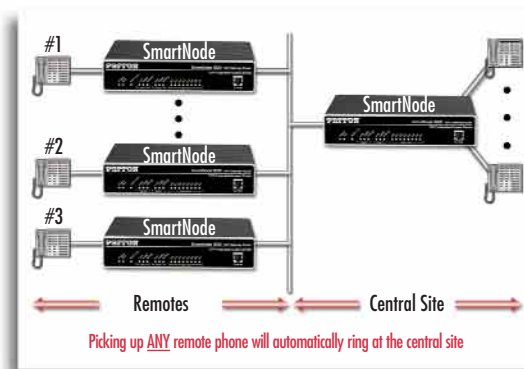
Hot Line Voice

Often used as courtesy phones at ATMs, information kiosks, and emergency assistance pedestals, Private Line Automatic Ringdown—or PLAR—can establish voice communication quickly and automatically, without the need for dialing.

Also known as "hot line", its operation is simple: when you pick up the local handset, the remote handset immediately begins ringing. Using Patton's Telephony-over-IP Gateways, multiple remote locations can all connect to a central site office.

Using an existing Ethernet network, remote telephone access can be available everywhere and with multiple locations:

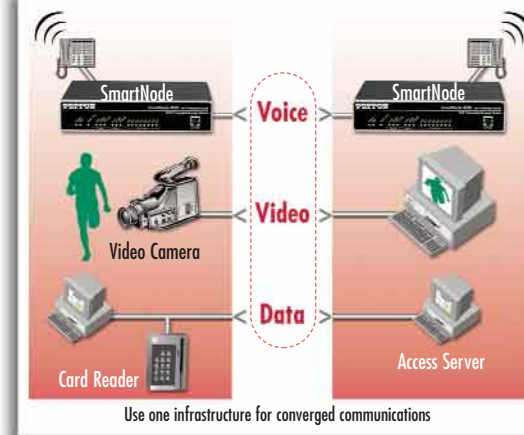
- When any remote handset is picked up, the central phone will immediately ring. When the central phone is picked up, the two users can talk freely.
- The Central site can have multiple phones with roll-over if one phone is busy. The roll-over feature enables one location to serve multiple remotes without busy signals.
- By dialing a remote extension, the central site can establish communication with any remote site. As an alternative, the central site can be configured to automatically ring a certain remote when someone picks up the central handset.



Business Case

Individual Infrastructure Costs	
Voice average cost per drop	\$111
Video average cost per drop	\$418
Data average cost per drop	\$204
Total per Drop	\$733
Costs of Converged Network Infrastructure	
Ethernet average cost per drop	\$204
Cost Savings per Drop with Everything Over Ethernet	\$529

Assumptions: 10 drops, 1000 ft (220 m) of cable, labor, drop ceiling, materials, & permits.

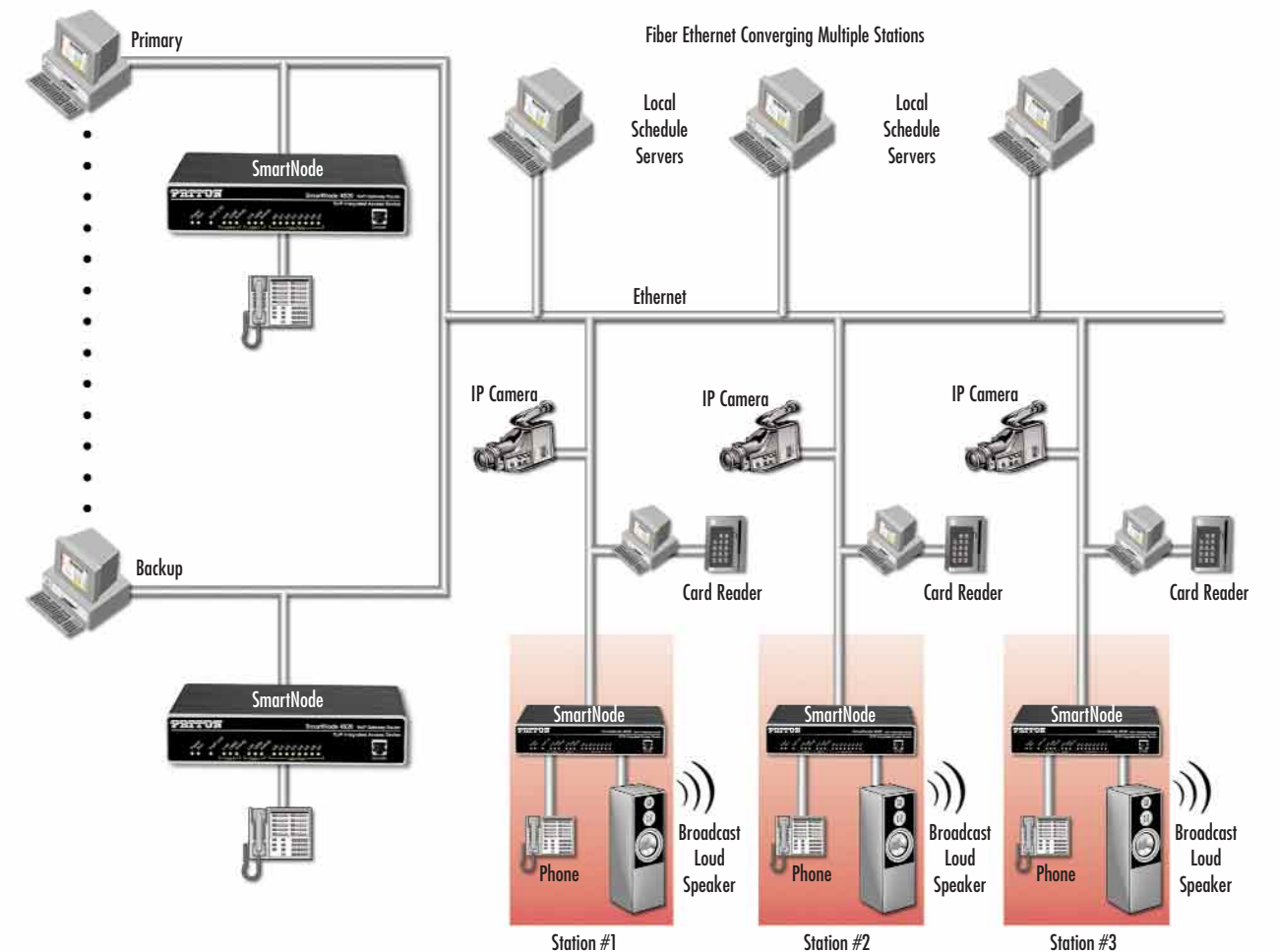


Integrated Voice, Video, Data for Railway Access

For any industry with multiple remote sites, delivering centralized supervision, control, and information to distant locations can be difficult and costly. Not only must information be gathered and disseminated, but video surveillance and two-way communications are also required. Such communications systems are critical for ensuring facility safety, often serving as eyes and ears for facility managers.

As an example, consider a railway system with its many stations. Required system services include electronic schedule delivery, video surveillance, paging, and emergency pedestals. Traditionally, each of these functions required its own separate infrastructure, control system, and local support. Today, Patton's Voice-over-Ethernet™ offers an efficient integrated solution. Leveraging low-cost components for both LAN and WANs segments, Voice-over-Ethernet connects all remote stations to the central management site. The combined system delivers all services over a single low-cost infrastructure.

In the example below, SmartNodes connect to the remote stations via the Ethernet infrastructure. Two Ethernet ports at each station connect to a paging amplifier and a telephone with hot-line capability. For broadcast announcements, servers at the central site deliver the message through a SmartNode to all stations simultaneously. For emergencies at the stations, the remote handset automatically calls the central site for help.



SmartNode

VoIP Gateways & Routers

Modular VoIP Gateways & Routers (Mixed Analog & Digital)



Modular Media Gateways

Model SN2350	Model SN2450
4-60	4-120
3	4
none	none
one	one



Modular Routers

Model SN2300	Model SN2400
4-60	4-120
3	4
1 - V.35/X.21	none
Dual	Dual

H.323v4/SIP 2.0/MGCP*/ISoIP

ToIP—Full call routing based on number and complete number manipulation

ToS/DiffServe Bits Set

Upstream and Downstream QoS with WFQ/Fixed Rates/
Split-Flow Scheduler; Priority Queuing

Standard IP Host

NAT/PAT/NAPT; Static Routes, RIPv1/v2; PPPoE, DHCP
Client & Server, IPSec VPN with DES/3DES/AES Manual
Key, VLAN .p and .Q

Modular VoIP Interfaces



SNIC-4FXS	SNIC-4BRV	SNIC-E1	SNIC-T1
4	8	30	23/24
FXS	ISDN TE/NT selectable	E1 PRI NT/TE selectable	T1 PRI NT/TE selectable
G.711 μ -Law/A-Law (PCM); G.726 ADPCM (40, 32, 24, 16 kbps); G.723.1 (5.3/6.3); G.729ab (8kbps); G.168 echo; full silence suppression and comfort noise generation			
T.38 FAX and G.711 fax bypass			

Model Number
VoIP Calls Capacity with modules
Expansion Modules/Slots
WAN Data Interfaces
Ethernet Ports
Call Control
Call Switching and Reachability Control
Quality of Service
Connectivity Features

Model Number
Voice Calls
Voice Interface
CODECS
FAX

Ordering Information: Modular VoIP Media Gateways and Routers

Modular Media Gateways

SN2300/4FXSL/UI	4 Call, FXS Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2300/4BRVL/UI	8 Call, BRI So Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2300/1E1L/UI	30 Call, E1 RRI Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2300/1T1L/UI	24 Call, T1 RRI Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2300/2E1L/UI	60 Call, E1 RRI Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2300/2T1L/UI	48 Call, T1 RRI Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2400/16FXSL/UI	16 Call, FXS Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2400/16BRVL/UI	32 Call, RRI SoMedia Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2400/4E1L/UI	120 Call, E1 RRI Media Gateway QoS ToIP, Internal UI (90-260VAC) power
SN2400/4T1L/UI	96 Call, T1 RRI Media Gateway QoS ToIP, Internal UI (90-260VAC) power

* Call for availability and product details

Modular Routers

SN2300/4FXSIL/UI	4 Call, FXS Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2300/4BRVIL/UI	8 Call, BRI So Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2300/1E1IL/UI	30 Call, E1 RRI Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2300/1T1IL/UI	24 Call, T1 RRI Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2300/2E1IL/UI	60 Call, E1 RRI Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2300/2T1IL/UI	48 Call, T1 RRI Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2400/16FXSIL/UI	16 Call, FXS Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2400/16BRVIL/UI	32 Call, RRI So Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2400/4E1IL/UI	120 Call, E1 RRI Gateway Router QoS ToIP, Internal UI (90-260VAC) power
SN2400/4T1IL/UI	96 Call, T1 RRI Gateway Router QoS ToIP, Internal UI (90-260VAC) power

* Call for availability and product details

Modular Interfaces

SNIC-4FXS	4 Port FXS, 2 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) Power
SNIC-4BRV	4 Port FXS, 2 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) Power
SNIC-E1	4 Port FXS, 4 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) Power
SNIC-T1	4 Port FXS, 2 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) Power

* Call for availability and product details

SmartNode

Analog VoIP Media Gateways and Routers



Analog Media Gateways

Model 4110
2-8 Calls
one
2-8 FXS or FXO in any 2-port combination



Analog Gateway Routers

Model 4520
2-8 Calls
Dual
2-8 FXS or FXO in any 2-port combination

H.323v4/SIP 2.0/MGCP*/ISoIP

G.711 μ -Law/A-Law (PCM); G.726 ADPCM (40, 32, 24, 16 kbps); **G.723.1** (5.3/6.3); **G.729ab** (8kbps);
G.168 echo; full silence suppression and comfort noise generation

T.38 FAX and G.711 fax bypass

ToIP—Full call routing based on number and complete number

ToS/DiffServe Bits Set

Upstream and Downstream QoS with WFQ/Fixed Rates/
Split-Flow Scheduler; Priority Queuing

Standard IP Host

NAT/PAT/NAPT; Static Routes, RIPv1/v2; PPPoE, DHCP
Client & Server, IPSec VPN with DES/3DES/AES Manual
Key, VLAN .p and .Q

Model Number
VoIP Call Capacity
Ethernet Ports
Voice Interface
Call Control
CODECS
FAX
Call Switching and Reachability Control
Quality of Service
Connectivity Features

Ordering Information: Analog VoIP Media Gateways and Routers

Analog Media Gateways

SN4112/JS/EUI	2 Port FXS Media Gateway, External UI (90-260VAC) power
SN4114/JS/EUI	4 Port FXS Media Gateway, External UI (90-260VAC) power
SN4116/JS/EUI	6 Port FXS Media Gateway, External UI (90-260VAC) power
SN4118/JS/EUI	8 Port FXS Media Gateway, External UI (90-260VAC) power
SN4112/JO/EUI	2 Port FXO Media Gateway, External UI (90-260VAC) power
SN4114/JO/EUI	4 Port FXO Media Gateway, External UI (90-260VAC) power
SN4116/JO/EUI	6 Port FXO Media Gateway, External UI (90-260VAC) power
SN4118/JO/EUI	8 Port FXO Media Gateway, External UI (90-260VAC) power
SN4114/2JS2JO/EUI	2 Port FXS, 2 Port FXO Media Gateway, External UI (90-260VAC) power
SN4116/4JS2JO/EUI	4 Port FXS, 2 Port FXO Media Gateway, External UI (90-260VAC) power
SN4118/4JS4JO/EUI	4 Port FXS, 4 Port FXO Media Gateway, External UI (90-260VAC) power

* Call for availability and product details

Analog Gateway Routers

SN4522/JS/UI	2 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4524/JS/UI	4 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4526/JS/UI	6 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4528/JS/UI	8 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4522/JO/EUI	2 Port FXO QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4524/JO/EUI	4 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4526/JO/EUI	6 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4528/JO/EUI	8 Port FXS QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4524/2JS2JO/EUI	2 Port FXS, 2 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4526/2JS2JO/EUI	4 Port FXS, 2 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) power
SN4528/4JS4JO/EUI	4 Port FXS, 4 Port FXO Media QoS ToIP Gateway Router, Internal UI (90-260VAC) power

* Call for availability and product details



We put our money where our mouth is... ON THE NETWORK! We know you can get Toll Quality voice over IP using our improved VoIP technology. We know that you WILL SAVE MONEY. That is why we are offering you our TALK IS CHEAP GUARANTEE. Use any SmartNode VoIP gateway or router... And if you are not TOTALLY SATISFIED, send it back within 60 days for a full credit or refund.

Call Today...
or Email...

Corporate Headquarters:
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voip@patton.com





EMEA Headquarters:
+41 31 985 2525

SmartNode

Digital Media Gateways

Model Number
VoIP Calls Capacity
Ethernet Ports
Voice Interface
Call Control
CODECS
FAX
Call Switching and Reachability Control
Quality of Service
IP Connectivity Features

Digital Media Gateways

			
Model SN1200	Model SN1400	Model SN1410	Model SN1810
2	4	4	8
Dual	Dual	Single	Single
1x BRI/So S/T NT 1x BRI/So S/T TE	Dual BRI/So S/T NT/TE	3x BRI/So S/T NT/TE	5x BRI/So S/T NT/TE
H.323v4/SIP 2.0/MGCP*/ISoIP			
G.711 μ -Law/A-Law (PCM); G.726 ADPCM (40, 32, 24, 16 kbps); G.723.1 (5.3/6.3); G.729ab (8kbps); G.168 echo; full silence suppression and comfort noise generation			
T.38 FAX and G.711 fax by-pass			
ToIP —Full call routing based on number and complete number manipulation			
ToS/Diffserve IP Packet Labeling, 802.1 .p .Q			
IP/DHCP/PPPoE			

Ordering Information: Digital Media Gateways






SN1200/2VL/UI	2 Call, BRI plus Bypass Media Gateway, internal UI (100–240VAC) power
SN1400/4VL/UI	4 Call, Dual BRI Media Gateway, internal UI (100–240VAC) power
SN1410/4VL/UI	4 Call, Dual BRI plus Bypass Media Gateway, Internal UI (90–260VAC) Power
SN1810/8VL/UI	8 Call, Quad BRI plus Bypass Media Gateway, Internal UI (90–260VAC) Power
SNSW-IPR1	IP Routing License for SN1200 and SN1400

SmartNode

Digital Gateway Routers

Model Number
VoIP Calls Capacity
Ethernet Ports
Voice Interface
Call Control
CODECS
FAX
Call Switching and Reachability Control
Quality of Service
IP Connectivity Features

Digital Gateway Routers

				
Model SN4552	Model SN1200	Model SN1400	Model SN1420	Model SN1820
2	2	4	4	8
One WAN w/ 4 LAN Switch	Dual	Dual	Dual	Dual
1x BRI/So S/T NT 1x BRI/So S/T TE	1x BRI/So S/T NT 1x BRI/So S/T TE	Dual BRI/So S/T NT/TE	3x BRI/So S/T NT/TE	5x BRI/So S/T NT/TE
H.323v4/SIP/MGCP*/ISoIP				
G.711 μ -Law/A-Law (PCM); G.726 ADPCM (40, 32, 24, 16 kbps); G.723.1 (5.3/6.3); G.729ab (8kbps); G.168 echo; full silence suppression and comfort noise generation				
T.38 FAX and G.711 fax bypass				
ToIP - Full call routing based on number and complete number manipulation				
Upstream and Downstream QoS with WFQ/Fixed Rates/Split-Flow Scheduler; priority queuing				
NAT/PAT/NAPT; Static Routes, RIPv1/v2; PPPoE, DHCP Client & Server, IPSec VPN with DES/3DES/AES, 802.1pQ VLAN				

Ordering Information: Digital Gateway Routers

SN4552/BIS/EUI	2 Call, SOHO BRI plus Bypass Media Gateway and QoS ToIP Router external UI (100–240VAC) power
SN1200/2VIL/UI	2 call, BRI plus Bypass Media Gateway and QoS ToIP Router internal UI (100–240VAC) power
SN1400/4VIL/UI	4 Call, Dual BRI Media Gateway and QoS ToIP Router internal UI (100–240VAC) power
SN1420/4VIL/UI	4 Call, Dual BRI plus Bypass Media Gateway and QoS ToIP Router, internal UI (100–240VAC) power
SN1820/8VIL/UI	8 Call, Quad BRI plus Bypass Media Gateway and QoS ToIP Router, internal UI (100–240VAC) power

* Call for availability and product details

Log on to... www.patton.com

One place to go...with everything you need to know!

Models 2603, 2621, & 2635 IPLink Gateway Routers

Patton's IPLink WAN Gateway Routers are complete all-in-one network access devices that easily connect your IP/LAN to any T1/E1, X.21, or V.35 network interface

Close-up unit photograph



Features & benefits

Features & Benefits

- V.35, X.21, or T1/E1 WAN interfaces—Get the WAN interface you need in industry-standard connectors
- ATM, PPP, and Frame Relay—Versatile WAN options enable deployment into any network
- NAT/NAPT, Firewall, DHCP—Powerful routing features make shared Internet connectivity simple and secure.

Overview

The Models 2603, 2621, and 2635 Gateway Routers are the ideal solution for connecting any small to medium enterprise or remote office to an IP/Internet network using standard telco and WAN interfaces.

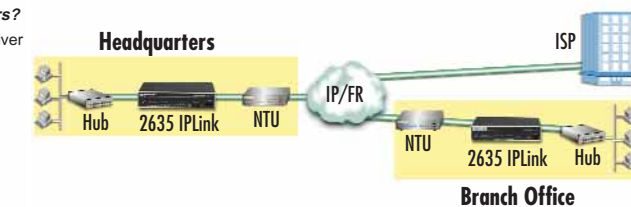
Combining ease-of-use with a full suite of LAN/WAN routing features, the IPLink routers provide selectable bridging or routing functionality along with advanced IP features such as NAT/NAPT, Firewall, and DHCP. A complete set of configurable ATM/FR/PPP/IP WAN protocols allow a wide range of choices when connecting branches via common WAN services. The IPLink Routers boast easy installation offering Console/VT-100, Telnet, and HTTP/SNMP management options.

Application & graphic

Why use our IPLink Series Routers?

Patton's IPLink Gateway routers deliver all the advanced features for secure, reliable, and high speed Internet data connections. They combine ease-of-use with powerful data routing to make shared Internet connectivity simple and easy.

The IPLink series gives you the right interface needed for your WAN service.



PDF data sheets include detailed ordering info

Related Information

Data Sheets (PDF) -- Requires Adobe Acrobat to view
Models 2603, 2621, & 2635 Datasheet April 3, 2004

Manuals (PDF) -- Requires Adobe Acrobat to view
Models 2603, 2621, & 2635 Getting Started Guide April 3, 2004

Software Upgrades

Model 2603 (2603 Single Part T1/E1 Router)
Model 2621 (High Speed Router X21 Interface.)
Model 2635 (High Speed Router V35 Interface.)

Ordering Information

2603/K/48	T1/E1 (RJ45/BNC) ROUTER W/48VD
2603/K/E	E1 (RJ45/BNC) ROUTER NO POWER SUPPLY
2603/K/EUI	E1 (RJ45/BNC) ROUTER W/EXT UI
2603/K/UI	E1 (RJ45/BNC) ROUTER WITH INTERNAL UI POWER SUPPLY
2603/T/48	Eng - 2603 w/RP-48 (48vDC)

1 2

[Next Page >]

Specifications

WAN Interface: 2635: V.35-M/34F, 2621: X.21-DB15F, 2603: T1/E1-RJ48C
Ethernet Connection: Single-port 10/100Base-T switch, auto-sensing, full/half-duplex operation, built-in MDI-X

Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP
ATM Support: UNI 3.0, 3.1, and 4.0 ATM QoS with UBR/CBR/nrt-VBR/rt-VBR and per-VC queuing and shaping.

Protocol: TCP (RFC 793), UDP (RFC 768)
Operating Temp.: 32-122°F (0-50°C)
Humidity: 5-90%
Dimensions: 7.3x6.6x1.62" (185x168x41mm)



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Product model code

Product description

Specifications

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