TDM+VoIP Smart Media Gateway
Model SN10300

Offering industry-leading highest port density, scalability, and lowest operating costs, the SmartNode 10300 is a multi-unit, carrier-grade VoIP gateway solution that is 100% redundant. Ideal for service providers looking to drive convergence between TDM and IP networks, while maintaining the maximum in reliability.

16 to 1024 x T1/E1/J1, 1 to 48 DS3, or 1 to 16 OC3/STM-1
Highest system density in the market means the lowest cost per port; up to 66% rack and space cost savings

512 to 32,768 VoIP channels (field upgradable)
Simple field upgrade by 16 T1/E1 and 512 VoIP channels or 1 DS3 and 672 VoIP channels or 1 STM-1 and 2,016 VoIP channels.

Increased system up-time
N + 1 reliability, SS7 link redundancy, field-upgradable components

Low operating expense (up to 80% cost savings) significantly improves ROI
Low power consumption (150 W for the SN10300 at full capacity)

Connect with confidence to diverse VoIP endpoints and IP fax
Extensive media handling support for wireline, wireless and fax codecs

Service providers are adding VoIP capabilities to their networks, whether to reduce costs when interconnecting with other carriers, to cost-effectively build out their network footprints, or simply to transport voice traffic across their IP backbones. This can be best accomplished using a SmartNode 10300 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.

TDM interfaces

Service providers, whether providing local, long-distance or international voice services, are interconnected with a multitude of other providers using T1/E1/J1, DS3 or STM-1 links. It is critical for service providers to be able to rapidly establish new interconnections without having to always deploy new devices. SmartNode 10300 Series media gateways therefore offer flexibility and can be configured to support T1/E1/J1, DS-3 or STM-1 interfaces.

Signaling and control protocols

Just as flexibility in the selection and deployment of TDM links is a key requirement for service providers, the need to support multiple signaling protocols across various carrier partners is just as important. Each SN10300 media gateway

provides support for the concurrent use of ISDN, SS7/C7, CAS (R2), SIP, and SIGTRAN signaling in the same device. The ability to provide both switching and conversion across multiple TDM and IP signaling protocols at once is paramount to enabling the operational flexibility and cost savings that drive service providers to expand their carrier relationships and converge their networks.

In parallel with the TDM and IP signaling protocols mentioned above, SN10300 devices also support the H.248 media gateway control protocol, which enables

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any H.248-compliant third-party softswitch to control a media gateway. While the softswitch manages call control interactions, the SN10300 handles transmission of call media as well as any required transcoding.

Media handling

Service providers will use one or more codecs on their VoIP networks according to their desire to save bandwidth, to provide a certain level of voice quality, or simply to interoperate with other VoIP devices or providers. The ability to support multiple different concurrent codecs and to allocate them in real time based on traffic is the key to delivering true network convergence.

SmartNode 10300 gateways feature extensive support for various wireline, mobile and IP telephony audio formats, delivering seamless transcoding in real-time. The media gateways ship with support for G.711, G723.1, G.726, and G.729ab right out of the box, with no additional license fee required. They also offer optional support for mobile and IP vocoders such as AMR, AMR-WB (G.722.2), GSMFR/ GSM-EFR, EVRC/QCELP, G.728, G.729eg, and iLBC. SN10300 gateways offer independent dynamic codec selection per channel. This means that it is possible to assign different vocoders to different channels, on a channel-by-channel basis. The devices can then run all of these codecs concurrently and do so with no impact on system performance.

SN10300 gateways also provide unparalleled support for Internet-based fax, also known as Fax over IP or Fax relay, using the T.38 protocol, which is used to carry fax communications over an IP network. (They also support the T.30 protocol for fax over the PSTN.)

System density

SN10300 gateways feature the industry's highest system density in a 2U form factor. Beside the capital savings achieved by purchasing less units of equipment, system density also provides operational cost savings in the form of reduced co-location fees as well as lower power and cooling costs.

Energy efficiency

For many, if not most, service providers, the payoff from reducing energy use can be particularly impressive; typically, for every watt of power required to operate a device, another watt is required to cool it. The SN10300 media gateways can play a major role in reducing energy costs, with an average two-thirds less power consumption than competing products of similar capacity.

Provisioning and maintenance

For network convergence efforts to contribute positively to revenue and profitability, service providers must maintain their reputation for uptime and availability during the introduction, operation, and maintenance of new services. The SN10300 offers an operations, administration, maintenance, provisioning (OAM&P) solution. OAM&P enables the service provider to perform the initial setup of the SN10300 media gateway and any subsequent maintenance operations. These range from the simple, such as the collection of statistics and alarms, to the more complex, such as system configuration changes, the addition of new hardware or software components, and the application of software patches or software upgrades.

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Enterprise Application

In the Enterprise market, SmartNode now offers a solution to the large Enterprise. We are substantially increasing TDM/digital port density to be the best and most reliable high-density Media Gateway going from 512 up to 32,768 VoIP calls. Now SmartNode offers from 1 analog port to up to 1024 T1/E1 or 48 DS3 or 16 STM-1 in a single box or a single system. The SmartNode 10300 is a key component for business trunking, call center, and transcoding solutions for the Enterprise.
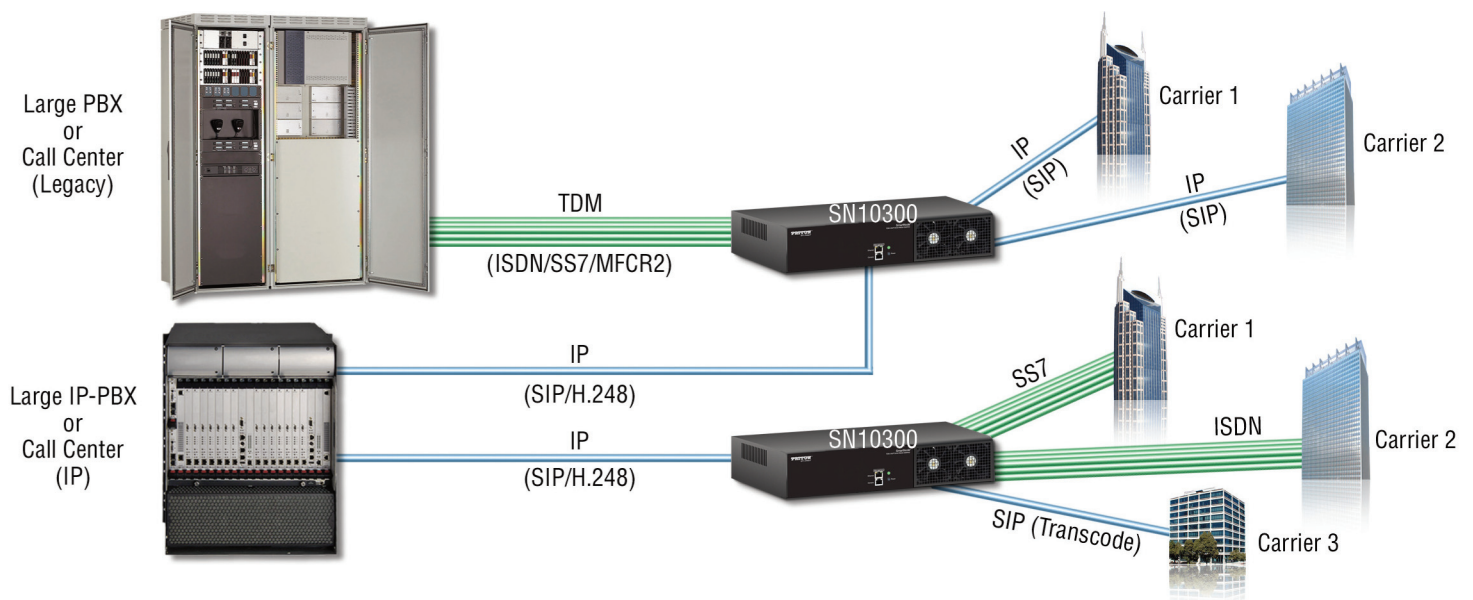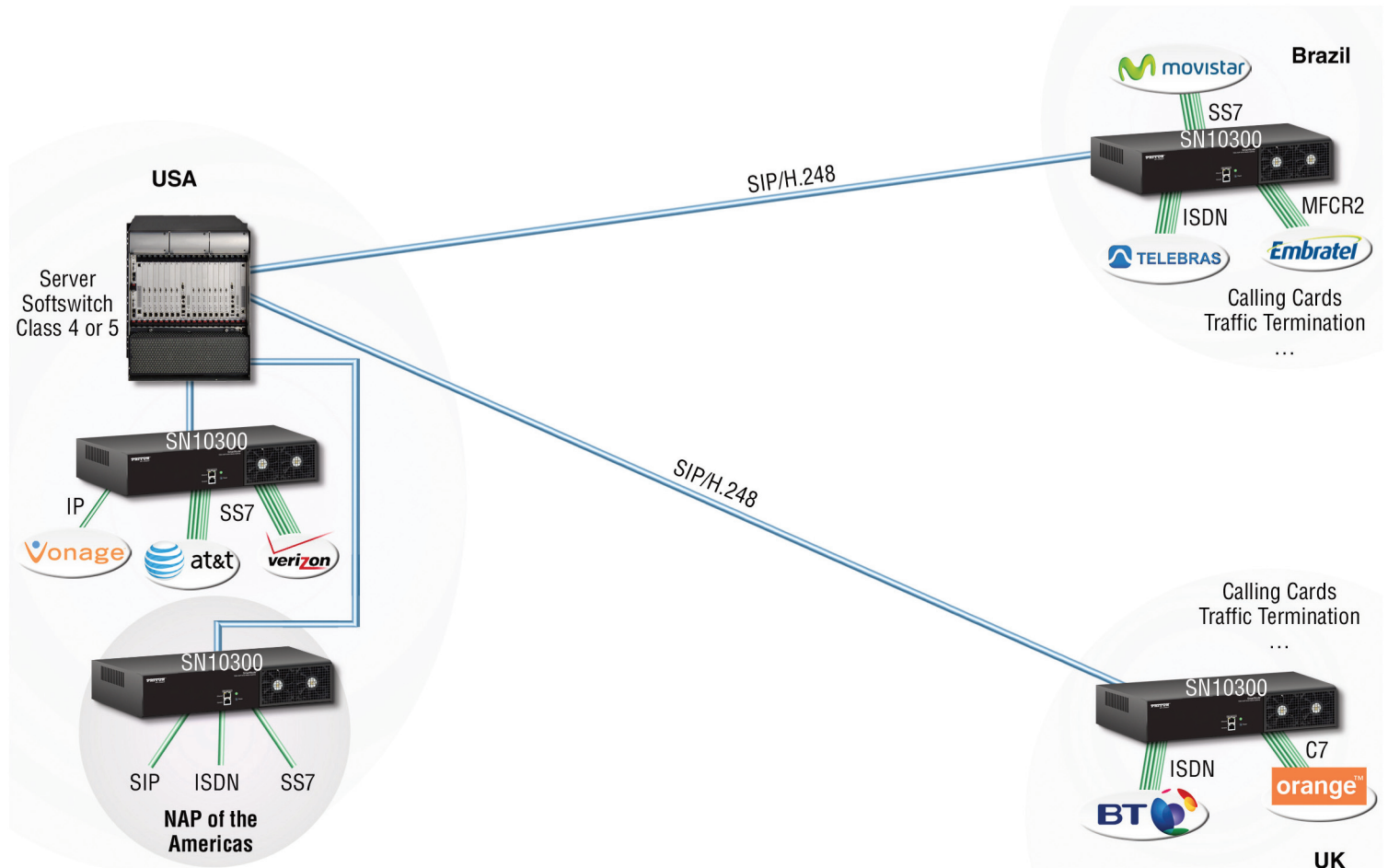
In the Carrier market, the SmartNode has become a preferred advanced CPE and the SmartNode 10300 expands the portfolio with a high traffic CPE.
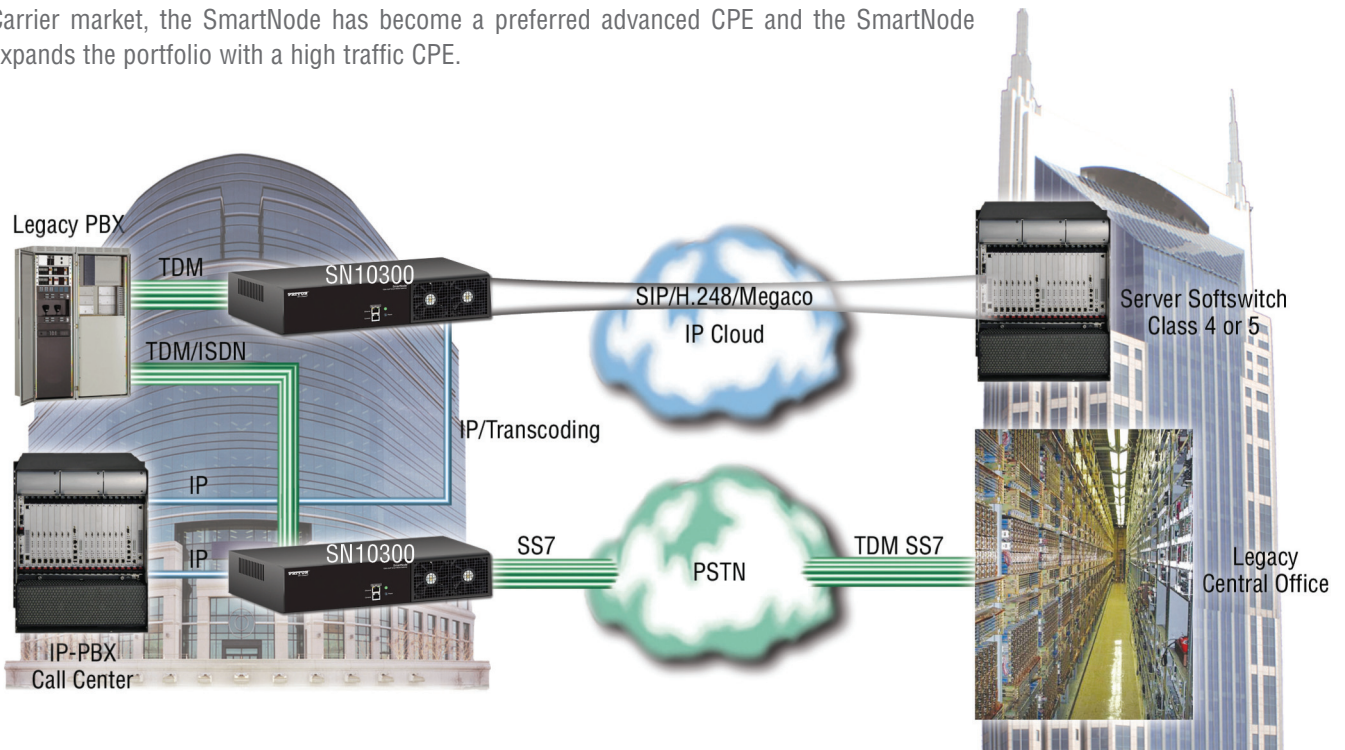
In addition, the SmartNode 10300 expands our reach onto the Carrier as the Media Gateway is a key component for applications at the Carrier operational level as well as in connecting advanced value-added services.

Specifications*

Capacity & voice processing

PSTN interfaces
- 16 to 1024 T1/E1 per cluster or
- 1 to 48 DS3 per cluster or
- 1 to 16 OC3/STM1 with APS per cluster
- Framing independently configurable per port
- 2 BITS interfaces on DS3/OC3/STM-1 units

VoIP interfaces
- Up to 32 Ethernet ports 100/1000Base-T per cluster (2 per telecom unit)
- RJ45 connectors on rear of unit
- Up to 256 different IP addresses per cluster (16 per telecom unit)
- Ethernet port bonding & 802.1q VLAN support

Vocoding
- 512 to 32,768 VoIP channels with universal codecs per cluster
- Universal codecs: G.711, G.723.1, G.726, G.729ab, T.38 V.17, clear mode (RFC 4040)
- Other codecs: G.722, G.722.2 (AMR-WB), G.728, G.729eg, iLBC, AMR, EVRC, GSM FR/EFR, QCELP, T.38 V.34

Fax/Modem/Data
- T.38 fax relay (V.17 & V.34)
- Automatic G.711 fallback
- Modem & data passthrough, NSE, VBD support
- Clear mode (RFC 4040)

DTMF relay
- RFC 2833/4733, SIP INFO method, in-band

Echo cancellation
- G.168 echo cancellation
- 128 ms echo tail on all channels simultaneously

Voice processing
- Adaptive & programmable jitter buffer (20 to 200 ms)
- Voice Activity Detection (VAD)
- Comfort Noise Generation (CNG)

Voice recording & announcement playback
- Up to 32,768 channels per cluster (using optional IVR mezzanine on each telecom unit)

High Availability & Redundancy
- IP port redundancy
- Self-recovery software
- Fault tolerant software
- MTP2/SS7 links redundancy

1+1 solution (optional)
1+1 solution extends the high-availability & redundancy features of the SN10K
- SN10K telecom unit redundancy
- Full capacity protection (TDM & IP)
- Configuration database redundancy
- Seamless software upgrade
- M3UA/MTP3/ISUP redundancy

SN10K 1+1 solution consists of:
- 1 active unit & 1 standby unit
- Up to 8 units 1+1 Patch Panel(s) per cluster 1+1 Patch Panels are passive (no power required)

SN10300A N+1 solution (optional)
The SN10300A N+1 solution extends the high-availability and redundancy features of the SN10300A
- SN10300A telecom unit redundancy
- Full capacity protection (TDM & IP)
- Configuration database redundancy
- Seamless software upgrade
- M3UA/MTP3/ISUP redundancy
SN10300A N+1 solution consists of:
- Up to 15 active unit(s) & 1 standby unit
- Up to 7 units N+1 Patch Panel(s)

Signaling (Simultaneous signalling support)
Simultaneously supports any combination or all of the following signaling protocols:

SIP
- Supported RFCs: 2327, 2833, 2976, 3204, 3261, 3262, 3263, 3264, 3311, 3323, 3325, 3326, 3372, 3389, 3398, 3515, 3551, 3555, 3578, 3581, 3665, 3666, 3764, 3891, 4028, 4694, 4733, 5806
- SIP-I/SIP-T
- Extensive SIP header manipulation

SS7
- Up to 512 MTP2 links (56, 64, n x 56/64 kbps) or 32 x HSL
- Multiple redundant MTP2 links
- Up to 64 originating point codes and 256 linksets
- Up to 512 destination point codes
- ISUP variants: ITU 92, ITU 97, ANSI 88, ANSI 92, ANSI 95, Q.767, Telcordia 97, ETSI v3, China, Singapore, UK, SPIROU, Japan NTT, Russia

SIGTRAN
- M2PA, M2UA, M3UA (IPSP, ASP, SG), IUA
- SCTP (raw IP and UDP)
- SS7 termination and/or relay supported
- Up to 512 M2UA / M2PA links
- Up to 64 M3UA peer server processes

ISDN PRI
- Q.931 ISDN PRI (user and network side)
- ISDN variants: NI-2, 4ESS, 5ESS, DMS-100, DMS-250, Euro ISDN ETSI NET5 (France, Germany, UK, China, Hong Kong, Korea), Euro Numeris (VN6), NTT (Japan), Australia
- ISDN NFAS with D-channel backup

CAS
- MF R1 (including E&M, loop start, ground start)
- MF R2 (including standard ITU, Brazil, Mexico, Venezuela)
- Customizable script files to implement any CAS variant

SmartNode - CONTROL
- Call routing based on: trunk group, calling/called numbers (with digit manipulation) and/or various other protocol information/headers.
- Customizable routing including priority-based, load balancing, black listing, call limiting, route retries, etc.
- Customizable call cause code mapping
- Programmable call routing: Access & manipulation of call parameters (SIP, SS7 & ISDN), including Nature of Address (NOA)
- RADIUS authentication & authorization (supports multiple RADIUS servers)
- NPA-NXX routing (over 5 million records)
- SIP-based local number portability and CNAM lookup

H.248 (MEGACO) call control
- ITU-T H.248 versions 1 and 2
- UDP, SCTP, IPSec transport
- DTMF and fax detection
- Call progress, DTMF and COT tone generation
- Call quality & inactivity alerts
- H.248 control port redundancy (supports virtual IP)

Session Management & Billing
- SIP peer availability polling
- RTP inactivity monitoring, RTCP
- CDR generation (RADIUS and/or csv files)
- Integrated lawful intercept (ETSI ES 201 671 v.2.1.1)

OAMP+T

Operation & Administration
- Provisioning, management & status GUI
- CLI and configuration file machine-to-machine interface (RESTful)
- Configuration change audit logging
- Access, user and privilege management
- SNMP V2, V3 GET, TRAPs (alarms)
- Extensive SNMP call statistics MIBs

Management
- Up to 4 Ethernet ports 100/1000Base-T (2 per SN10300A/CTRL unit)
- Up to 2 VGA for local monitor (1 per SN10300A/CTRL unit)
- Up to 8 USB ports (4 per SN10300A/CTRL unit)
- Up to 2 DB9 RS232 serial port (2 per SN10300A/CTRL unit)
- GUI-based and CLI system upgrade
- GUI-based configuration copy, backup and restore
- Storage for multiple software versions
- Storage for multiple configuration files
- Extensive system status display

Provisioning
- Non-service affecting configuration changes
- Offline configuration validation
- Multiple configuration files archive
- Northbound API (RESTful) for automated provisioning

Troubleshooting
- Live call trace with protocol information and ladder diagrams
- Live test call with media playback and recording
- Protocol signaling capture into pcap files
- Media call recording (scriptable for calling and called numbers)

Maintenance
- Replaceable fan filters on telecom units

Regulatory compliance

Safety
- CAN.CSA C22.2
- EN 60950-1:2005
- EN 60950-1:2006

EMC
- FCC Part 15:2013, Subpart B,
- CE Mark (EN55022:2010, Class A, EN61000, ETSI EN 300 386)

Environmental
- Operating temperature: 0 to +70 °C, 95% rel. hum. non-condensing
- Storage temperature: -10 to +85 °C, 95% rel. hum. non-condensing
- Designed to meet NEBS Level 3
- RoHS compliant

SN10300A/CTRL specification
- IBM 5458 System x3250 Express Model
- Xeon E3-1231 v3 3.4GHz 1600MHz 4C processor
- 8MB cache, 16 GB memory
- 40 GB RAID 1 SSD

Electrical Characteristics
- Power Input -90 to 260 VAC, 47 to 63 Hz, -40 to -60 VDC
- Redundant power supplies (for each component)
- From 616 to 3210W power consumption per cluster (depending on configuration)

Ordering Info

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- web: **http://www.patton.com/products/product_detail.asp?id=500&tab=Ordering**
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