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 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.

SmartNode™ Awards

- **2011 Internet Telephony Product of the Year**: SmartNode™ 5400/2GS
- **2010 Internet Telephony Product of the Year**: SmartNode™ 5400
- **2009 Internet Telephony Product of the Year**: SmartNode™ 4400 Series
- **2008 Internet Telephony Product of the Year**: SmartNode™ 4961
- **2007 Internet Telephony Product of the Year**: SmartNode™ S-DTA
- **2006 Internet Telephony Product of the Year**: SmartNode™ 4960
- **2005 Internet Telephony Product of the Year**: SmartNode™ 4630
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.

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 and voice processing
VoIP channels—512 to 32,768
OC3/STM1** with APS (automatic protection switching) • 1 to 48 DS3 • Dual R4/48C for BITS or T1/E1 for signaling
VoIP interfaces—Dual 100/1000Base-T • RJ45 connectors on rear of unit
Vocoding—Universal codecs: G.711, G.722.1, G.728, G.729ab, T.38 • Other codecs: G.722.2 (AMR-WB), G.728, G.729eg, iLBC, clear mode (RFC 4040)
RJ48C for BITS or T1/E1 for signaling
Voice processing—128 ms echo tail on all channels
Echo cancellation—G.168 echo cancellation • 128 ms echo tail on all channels simultaneously
Voice activity detection (VAD) • Comfort noise generation (CNG)
Voice activity detection (VAD) • Comfort noise generation (CNG)
Voice activity detection (VAD) • Comfort noise generation (CNG)
Voice processing—Dynamic and programmable jitter buffer (200 to 200 ms) • Voice activity detection (VAD) • Comfort noise generation (CNG)
SessionRouter
Management interfaces—Dual 100/1000Base-T for OAM&P
Provisioning—Web-based interface for software upgrade • System backup, restore and maintenance • Automated system maintenance
SN10300/CH/RUI: SN10300 Server with Control Software
SN10300/16E/RUI: SN10300 16 E1/T1, 512 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248, HW Upgradeable to 64 T1/E1
SN10300/32E/RUI: SN10300 32 E1/T1, 1024 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248, HW Upgradeable to 64 T1/E1
SN10300/48E/RUI: SN10300 48 E1/T1, 1536 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248, HW Upgradeable to 64 T1/E1
SN10300/64E/RUI: SN10300 64 E1/T1, 2048 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248
SN10300/1DS3/RUI: SN10300 1 DS3, 672 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248, HW Upgradeable to 3 DS3
SN10300/2DS3/RUI: SN10300 2 DS3, 1344 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248, HW Upgradeable to 3 DS3
SN10300/3DS3/RUI: SN10300 3 DS3, 2016 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248
SN10300/STM1/RUI: SN10300 1 OC3/STM-1, 2016 VoIP Channels, SIP, ISDN PRI, CAS R2, H.248
SN10300/SWITCH/RUI: SN10300 Smart Media Switch Non-Blocking TDM switching fabric

** Specifications subject to change without notice.

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07MSN10300-DS2

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Electrical characteristics
Power input—90 to 260 VAC, 47 to 63 Hz • 40 to -60 VDC • Redundant power supply with dual power inputs
Physical characteristics
Dimensions—4U to 39U VoIP Gateway
Each 2U is 3.5H x 17.4W x 16D in. (88.9H x 442W x 406D mm)
Weight—20 lbs (9.1 kg)
Regulatory compliance
UL/CSA 60950, CSA C22.2—EMC: FCC Part 15:2009
EN50022:2006, Class A, 4028 (*partial compliance)
(EN55022:2006, Class A, EM60950,
EN61000, ETS 300 386)
Environmental
Operating temp—0 to +55 °C • 95% relative humidity, non-condensing
Storage temp—-10 to +75 °C, 95% relative humidity, non-condensing
NEBS Level 3 compliant
RoHS compliant