



Product Brief

Voice over IP Solutions — Nortel's Media Gateway 15000

Your gateway to fixed and mobile convergence

A high-density, carrier-grade voice over IP (VoIP) trunk media gateway that maximizes service offerings while bridging TDM networks to next-generation packet networks in line with IMS and IP standards.

Although data may be driving network growth, as a service provider you cannot ignore that voice continues to account for the lion's share of revenue. So why not look at a solution that combines voice and data services on one unified packet network, while securing your existing voice revenues at a better margin?

With the Media Gateway (MG) 15000 solution, you are poised to take advantage of new opportunities while maintaining the same high service quality and reliability your customers have come to expect from your voice network.

Nortel's Carrier Voice/Multimedia over IP portfolio delivers voice and multimedia over packet networks that combine the best of the Internet and packet-based infrastructures with the best of telephony networks. Choosing the Media Gateway 15000 as your trunk media gateway provides a rapid path to the world of voice over IP solutions while maintaining the same

quality and reliability as a TDM network. Offering the capacity and quality needed for today's integrated voice and data networks, Nortel's Media Gateway solutions are the market leader solution¹ being deployed today by service providers around the world, with over 20 million ports shipped, providing them the value and savings of a single network infrastructure.

Your gateway to VoIP fixed and mobile convergence

The Media Gateway 15000 unifies Carrier VoIP networking across multiple network types integrating packet traffic into the existing public network infrastructure, while simultaneously providing toll-quality voice. It is Nortel's IMS media

gateway, TISpan NGN and Carrier VoIP trunk media gateway, 3GPP2 Packet MSC media gateway and 3GPP G/U VoIP media gateway all on a single platform. It offers complete carrier-grade options for wireline and wireless operators, cable operators and emerging IP carriers. Its advanced voice processing and carrier-grade features enable toll-quality voice over DSL or high-speed metro IP networks.

Designed to ITU-T, 3GPP IMS, 3GPP2 MMD and ETSI TISpan NGN standards, Nortel's Media Gateway 15000 delivers toll-quality voice on a data-optimized platform with the density and scalability required to get the most from your network.



¹ According to Dell'Oro report "IP Telephony Carrier Report", May 30, 2007.

Media Gateway 15000 — a solution like no other

The Media Gateway 15000 provides a suite of voice-enabling functionality (both hardware and software) built on Nortel's award-winning Multiservice Switch 15000 platform (MSS 15000). Nortel's Media Gateway 15000 Trunk solution offers medium (as small as 2,016 DS-0s) to very high-capacity (over 48,000 DS-0s per frame-fully redundant) options. The same platform is used for CDMA Packet MSC VoIP solutions, GSM/UMTS-CS VoIP solutions, IMS solutions and TISPAN NGN solutions, thus ensuring a converged wireline and wireless network solution.

What makes Media Gateway 15000 a unique solution?

Leading-edge, toll-quality voice features

The Nortel Media Gateway 15000's advanced voice processing functionality — including multiple voice compression algorithms, voice quality enhancements, Quality of Service (QoS) silence suppression, T.38 Fax relay and RFC 2833 DTMF relay — enables band-



Media Gateway 15000

width savings while ensuring toll-quality voice and reliable modem/fax transport.

It uses advanced patented voice coding and processing techniques to dynamically compress traditional 64-kbps bandwidth voice streams into 32-kbps, 24-kbps, 16-kbps, 8-kbps streams and even 4.75-kbps (i.e., G.711, G.726, G.729, EVRC and AMR), thus providing options to fully optimize available bandwidth. Some of these patented voice features include advanced dynamic echo canceller and background noise reduction techniques that provide toll-quality voice.

Density and scalability

Nortel's Media Gateway 15000 server-based processing architecture maximizes scalability while minimizing incremental investments.

Additional functionality, services and capacity are attainable through the simple addition of Voice Services Processor (VSP) cards and/or the downloading of new software. The result: you can grow your business or network seamlessly and cost-effectively.

The Media Gateway 15000 covers a wide range of DS-0 densities from 2,016 to over 48,000 DS-0s per frame on a switching platform that scales to 50-Gbps switching fabric with future plans to increase these densities even further on the existing platform.

Not just voice...

When deploying Media Gateway 15000, you're not just limited to voice! In addition to wireless and wireline voice services, the Media Gateway 15000 also offers reliable fax transport via ITU-T T.38 and modem transport via Voice Band Data all on a single platform.

Carrier-grade

Reliability is the key to today's successful PSTN network and will continue to be just as important as the industry evolves to VoIP, hence Nortel's Media Gateway 15000 was built from the beginning to be carrier-grade and has field-proven performance of 99.999 percent availability.

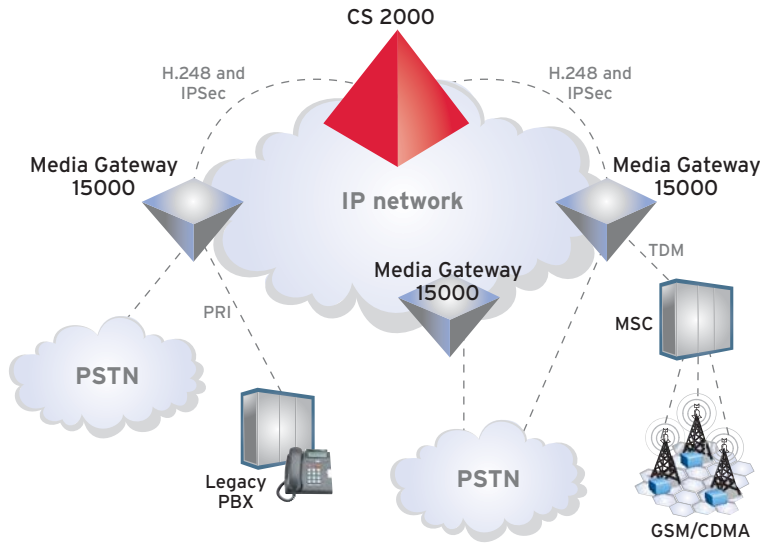
Since not all customer or service provider requirements are alike, Nortel's Media Gateway 15000 delivers a variety of carrier-grade functionality to meet the needs of multi-service and multi-SLA networks such as:

- Hitless software migration on active gateway cards
- Fully redundant hardware, hot swappable and hot standby, providing a complete hitless node if 1+1 sparing is used
- NEBS level 3 compliant
- GR 929 and GR 1110 compliant
- Routine Switch of Activity (SWACT) — a software feature that allows one to functionally test on a routine basis the status of the backup hardware by allowing one to schedule the switch between active and inactive cards on the Media Gateway 15000

Standards-based interfaces

Nortel's Media Gateway portfolio is built on an open interface architecture and is based upon industry standards. To this end, the Media Gateway 15000 comes with an open interface capability that not only provides network flexibility, but also enables interoperability with multiple vendors' equipment. Specifically it supports, between many others, standards such H.248, RFC 2833 (for DTMF and MF relay), T.38 (for Fax relay), V5.2, G.799.1 (trunk media gateway standard), and Voice Band Data (V.152) for modems and text telephone over IP.

Figure 1. Typical carrier VoIP Media Gateway 15000 solution configuration



Media Gateway 15000 applications

The Media Gateway 15000 provides the capacity and reliability required for today's integrated voice and data networks. Whether you're routing PSTN or wireless traffic over a packet backbone, cost-effectively extending voice services to remote locations or unifying wireline and wireless networks, the Media Gateway 15000 is your gateway!

IP Multimedia Subsystem (IMS) Media Gateway

The Media Gateway 15000 is Nortel's IMS media gateway which, under the control of the MGCF (such as Nortel's MGC 2000), enables you to link your IMS-based network to the PSTN network, thus ensuring a smooth migration from TDM to an all IMS-based network.

A single media gateway technology for wireless and wireline voice and multimedia

As part of Nortel's Carrier Voice over IP and IMS portfolio, the Media Gateway 15000 is an ideal interface to the Communication Server 2000 or Communication Server 2000 —

Compact deployed in Nortel's Carrier VoIP (TISPAN NGN) solutions, Nortel's MSC server deployed in 3GPP R4 solutions, CDMA Packet MSC deployed in 3GPP2 CDMA solutions or to Nortel's MGC 2000 deployed in IMS solutions. It therefore allows you to easily and cost-effectively evolve your network from a simple "transport" application to a full-featured voice and multimedia packet solution, including IMS, without major changes in gateway technology.

Wireless packet telephony

The Media Gateway 15000 is the same platform used for wireless CDMA and GSM/UMTS networks as well as wireline networks. Thus, as a gateway linking a wireless network and a packet network, the Media Gateway 15000 positions you to evolve wireless and wireline networks from circuit-based to packet-based networks. The new infrastructure is optimized to drive revenue through enhanced wireless Internet services while also taking advantage of the latest technological developments for operational expense savings.

A flexible VoIP gateway

- Nortel's 3GPP IMS, 3GPP R4, 3GPP2 MMD and TISPAN NGN Media Gateway all on a single platform
- Delivers scalable trunking capacity — a single frame cost-effectively serves over 48,000 DS-0s in a fully redundant 1+1 configuration
- Leading-edge packet switched voice applications with Nortel's Carrier VoIP/multimedia solutions, 3GPP R4 VoIP solution, 3GPP2 Packet MSC solution and Nortel's IMS and TISPAN NGN solutions
- Delivers the carrier-grade quality and reliability standards that Tier 1 Carriers expect for VoIP networks
- Most comprehensive set of voice processing features including compression algorithms, silence suppression, Fax relay, Digit relay, Voice Band Data transport and integrated non-blocking Echo Cancellation (ECAN)
- Distributes network architecture and reduces network complexity
- Improves facility fill rates
- Requires fewer trunk groups and reduces trunk rearrangement
- Eliminates the need for further TDM investment

Technical specifications

Base capabilities

- Interworking with PSTN voice switches via DS3c and E1 to OC-3/STM-1c TDM interfaces
- Modular, high-density, voice processing server architecture
- DSP Hot sparing
- Advanced OOS Voice Service Processor diagnostics
- Routine SWACT support for all cards
- Over 99.999% availability
- Based on Nortel's proven Multiservice Switch (MSS) platforms
- Same platform can be used, with minor configuration changes, for GSM/UMTS-CS VoIP solution, CDMA packet MSC VoIP solution, wireline Carrier VoIP/TISPAN NGN solutions and IMS solutions, thus enabling true wireline and wireless convergence

Voice/fax services

- Toll-quality wireline codecs, G.711, G.726, G.729 A/B voice with silence suppression, comfort noise generation and dynamic down-speeding capability for congestion management
- Wireless codecs: GSM EFR, GSM FR AMR, HR AMR, OHR AMR, UMTS AMR, UMTS AMR2 and UMTS MR-WB (as well as support of NbUP interface), EVRCO, EVRC, EVRC-B and EVRC-WB with advanced patented voice quality features and support of TrFO and TFO

- 56/64-kbps clear-channel fax and modem support
- ITU-T G.165- and G.168-compliant integrated non-blocking echo cancellation and tone detection
- Speech and Voice Activity Detection (SAD/VAD)
- PRI signaling support (ANSI/ETSI)
- CAS signaling support (including E1 variants to PBXs)
- SIGTRAN support
- ITU-T T.38 fax relay
- Fax idle suppression
- V.152 Voice Band Data for transport of non-3GFE faxes and modem including text telephony
- Tone generation
- DTMF digit collection
- RFC 2833 for efficient transport of DTMF, MF and tones over IP

Interfaces

- ATM: Multi-port DS-1/E1, DS-3/E3, OC-3/STM-1, OC-12/STM-4
- IP: GigE, 100BaseT
- Integrated OC-3/STM-1 optical TDM interface on Voice Service Processor (VSP) card

Communication and call server interfaces

- Compliance is based on industry-accepted standards and protocols
- Supports several call server interfaces with compliance to the H.248 standard including:
 - › 3GPP IMS Mn interface towards the MGCF
 - › 3GPP/MSF compliant Open Mc interface towards R4 MSC server
 - › TISPAN NGN interface towards Trunk Gateway Control Function
- Supports IPsec towards the call server/MGCF/TGCF

Network management

- Nortel's proven and widely deployed Integrated Element Management System (IEMS)

Telecom and interconnect compliance

- Optical TDM interfaces (OC-3/STM-1) integrated with the voice services processor (VSP) card

Capacity

- Up to 48,000 voice DS-0s per frame using a fully 1+1 redundant configuration; this capacity can be almost doubled for a non-redundant configuration



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