



IP Telephony Media Gateways

I-Gate 4000 Series

es applications

networks devices applications

applications



At a Glance

- Toll-Quality voice with 12:1 compression gain
- Unmatched Voice Quality over Packet Networks
- Options for high-and low-port density sites
- Variety of TDM interfaces
- Gigabit Ethernet and 100 BaseT network connections
- Optimization for co-located TDM to TDM calls
- High-quality echo cancellation
- High-quality fax demodulation / remodulation
- Stable modem/VBD transport
- Low end-to-end system delay
- Sophisticated packet-loss concealment
- High call completion rate
- High degree of system scalability Low entry cost
- Small-step granularity
- Superior system reliability -- 99.9997%
- True carrier-class performance
- Low operating costs

Energizing Communications

About Veraz

Veraz Networks, Inc. is a leading global provider of voice over IP (VoIP) softswitches, media gateways and digital compression products to wireline, broadband and wireless service providers. Veraz compression and switching solutions optimize voice quality and network efficiency. When combined with Veraz programmable service platforms the result is a service infrastructure responsive to changing demands of end users, regulators and competitors. Veraz solutions enable service providers to profitably migrate from traditional voice networks to all-IP fixed-mobile and multi-media networks consistent with the emerging IMS standards. Veraz is a trusted supplier to 700 service providers in 140 countries including VOIP deployments in over 50 countries.

Media Gateways are fundamental elements of most VoIP networks, as they function as a "bridge" between today's TDM-based legacy network and the Voice-over-IP network infrastructure.

The I-Gate 4000 Media Gateways product line was designed for telecom operators seeking a competitive advantage by moving to an operationally efficient and service-centric IP network.



I-Gate 4000 PRO™
High-Port Density



I-Gate 4000™
Medium-Port Density



I-Gate 4000 EDGE™
Low-Port Density

High-port density/ low-port density options

Veraz' media gateway product suite leverages a sophisticated in-house DSP technology, and has set the benchmark for voice quality in packet telephony while preserving end-to-end service transparency for voice, fax and 'voice band data'(modem) calls. By combining carrier-class performance, scalability and reliability with open standards-based interfaces, the high performance and capacity I-Gate 4000 and I-Gate 4000 PRO serve as powerful next-generation switching platforms for both incumbent and greenfield carriers.

The industry leader in delivering true fixed-line toll-quality voice to packet telephony, the I-Gate 4000 and the I-Gate 4000 PRO media gateways are complementary products, equipped with a similar stack of features, though designed for different market segments. While the I-Gate 4000, with up to 2,016 compressed channels, is more suitable for medium-density applications (i.e. international VoIP market), the I-Gate 4000 PRO, a high-density media gateway is better matched to large-scale applications (i.e. carriers providing domestic telephony services).

Field-Proven Voice Quality over Packet Networks

Over two decades in the market, more than 700 carriers in 140 countries have put their trust in Veraz Networks with their voice, fax & VBD traffic. Utilizing the same field-proven technology and in-house expertise, the I-Gate 4000 media gateways enable carriers to bridge the gap between circuit-switched and next-generation packet networks by delivering packet voice quality that equals or exceeds established PSTN standards.

Best-of-Breed Flexibility

The I-Gate 4000 series is built to allow carriers to select best-of-breed system for each segment of the network. The I-Gate 4000 and I-Gate 4000 PRO media gateways are built with total openness in mind –ready to interoperate with any standards-compliant packet telephony network element. The I-Gate 4000 series is fully consistent with the three-tiered NGN architecture model and the IMS architecture, offering proven interoperability with any multi-vendor softswitch based on standard protocols such as MGCP, H.248/Megaco and SIGTRAN.

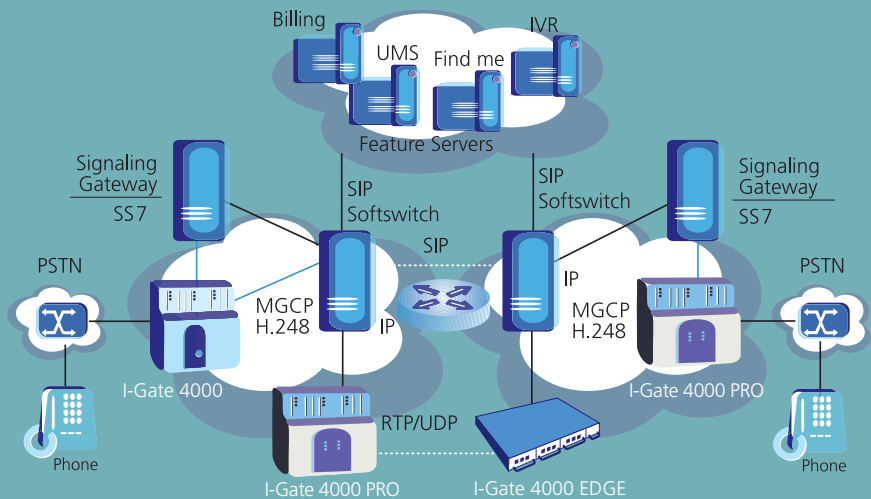
Robust & Flexible SS7 Backhaul Options

The I-Gate 4000 platform's unique ability to support robust and highly reliable transport of SS7 signaling information over packet networks lowers costs for carriers by enabling an efficient network architecture with distributed media and centralized call control and signaling. This capability allows carriers to leverage their investment in media gateways for direct termination of SS7 links, eliminate the need for expensive signaling gateways in remote locations and centralize call processing resources in a few strategic locations.

Applications

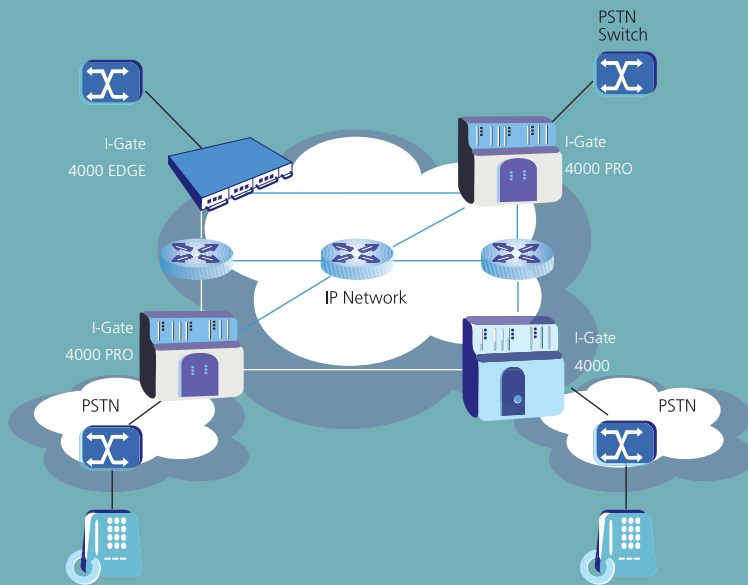
Softswitch-based Packet Toll/Tandem and Other Services

The I-Gate 4000 and I-Gate 4000 PRO support proven interoperability with Veraz's ControlSwitch softswitch platform as well as with third-party softswitch platforms based on the standards MGCP, H.248/Megaco and SIGTRAN. Through this capability, the I-Gate 4000 enables carriers to deploy end-to-end next-generation telephony solutions for applications like domestic and international long-distance services, tandem switching, Class 4 switch replacement and business integrated voice-data services. With support for a wide range of global PSTN trunk interfaces (E1, T1, DS3, OC3, STM-1), the I-Gate 4000 media gateways empower carriers worldwide to deploy these services over their domestic and international packet networks.



VoIP Static Trunking

With the I-Gate 4000 series VoIP static trunking capabilities, carriers can build one IP transport network and use it for both voice and data - enjoying the cost-efficiencies of converged IP transport, prior to undertaking a full-fledged network migration. Carriers can use their existing IP and bypass the PSTN transmission core without compromising existing quality or stability, while preserving PSTN switch investment (e.g. switches and OSS). A single I-Gate 4000 or I-Gate 4000 PRO terminal can provide VoIP trunking capabilities to thousands of calls in multiple associated PSTNs. A VoIP trunking topology can be an initial step towards a softswitched network topology. With the I-Gate 4000 series' proven interoperability with multiple softswitch platforms, carriers can evolve smoothly from a VoIP static trunking infrastructure to a switched VoIP networking infrastructure, while protecting their existing network investments in the process.



Common Platform for Static VoIP Trunking and VoIP Switching

Since the same core platform can be used for both static VoIP trunking and switched VoIP services, the I-Gate 4000 series offers a unique, smooth evolution path from traditional TDM switches and transmission links to all IP next-generation networks. Carriers with a TDM switching infrastructure can initially leverage the I-Gate 4000 series static IP trunking capabilities to lower costs by transporting both voice and data over their packet-based data networks. Utilizing the same infrastructure, carriers can then migrate to a more flexible and cost-effective switched IP network by adding a softswitch platform to their network.

Bandwidth Savings without Compromising Voice Quality

Superior codec implementations coupled with a rich set of packet-payload optimization and silence suppression algorithms enable carriers to realize substantial bandwidth savings. Backed by field-proven voice processing technology, the I-Gate 4000 media gateways can deliver a voice compression ratio of 12:1 while still maintaining carrier-grade voice quality.

VoIP Static Trunking over TDM Bearer (I-Gate 4000)

This feature enables the I-Gate 4000 to be used concurrently as a VoIP Media Gateway and as a DCME compression system which has the inherent capability of migrating to a VoIP bearer

network. It can also be configured in the same chassis with a standard VoIP Media Gateway. The operator can then choose whether the bearer interface will be IP or TDM per IGWM (traffic processing) card.

I-Gate Announcement Server (I-Gate 4000 PRO)

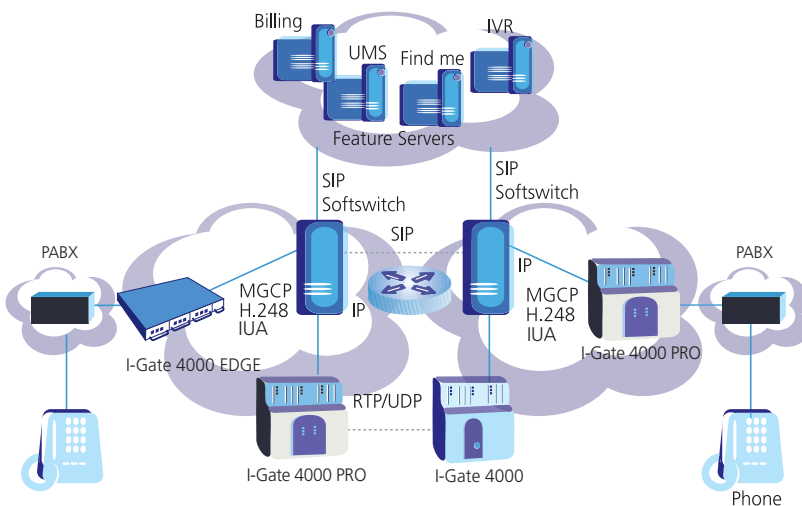
Carriers now have the option of playing thousands of concurrent announcements toward their IP network cost-effectively thanks to Veraz' I-Gate Announcement Server. The I-Gate Announcement Server is a media processing system optimized for stand-alone announcement server network applications or a single card with a redundancy option that can be inserted to the I-Gate 4000 PRO in available slots. The announcements can be sent to different types of VoIP media gateways--to high-capacity trunking gateways, small analog IAD's and IP phones. It has been designed for continuous, carrier-grade applications and is based on Veraz's state-of-the-art technology, ensuring lower CapEx and high-density announcement traffic generation for traditional and emerging service solutions.

Veraz Small Media Gateway

Veraz I-Gate-4000 EDGE has a set of features similar to the I-Gate 4000 the I-Gate 4000 EDGE, and I-Gate 4000 PRO with a pizza box style mechanical design to accommodate cost-effective small-site deployments. Veraz I-Gate 4000 EDGE offers the greatest compression ratio for any mix of voice, fax, and data traffic. It incorporates T.38 compression for fax and supports voice band data transmission and compression of SS7 and ISDN signaling information. Veraz I-Gate 4000 EDGE can operate in VoIP Trunking mode or under the control of a softswitch delivering a carrier-grade solution.

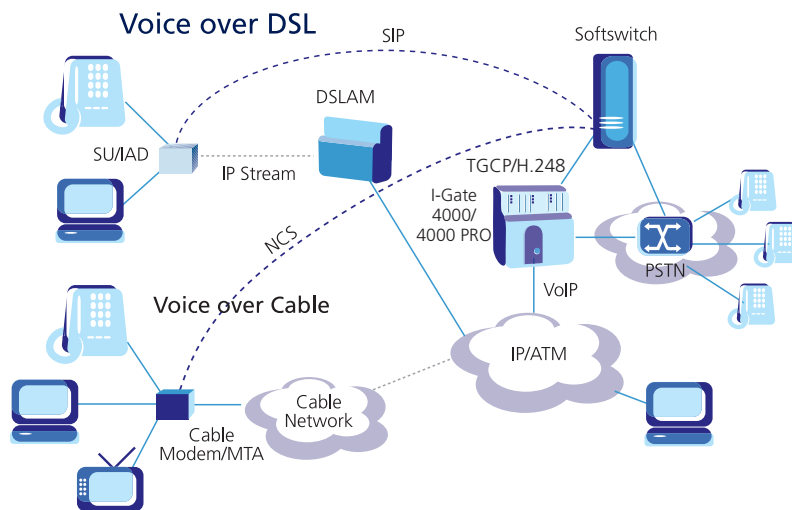
PABX/PBX Access via ISDN-PRI

By leveraging the I-Gate 4000 series support for ISDN-PRI using the SIGTRAN/IUA protocol, carriers can offer direct access services to enterprise customers' PABX/PBX systems, which provide enterprise connectivity to the PSTN and also link multiple enterprise locations together using a packet network. This enables carriers to offer new revenue-generating enterprise services and enter new markets with low incremental costs. This capability also allows carriers to link their packet networks to the PSTN using ISDN-PRI in markets where SS7 links may not be available. The same system can support a mixture of ISDN-PRI and SS7 trunk connections.



Voice over Broadband (xDSL/Cable/IP)

In conjunction with a softswitch platform, the I-Gate 4000 line of media gateways provide seamless connectivity to the PSTN for existing and emerging broadband packet-based access networks. A single I-Gate 4000 or I-Gate 4000 PRO terminal can support thousands of enterprise and residential end-users, thus enabling broadband access providers to offer cost-effective, high-quality telephony services to end-users utilizing IP end-points such as IP Phones and broadband IADs.



Low Entry Cost
High Scalability
Openness

Where flexibility and
capability meet



Technical Specifications

Telephony Traffic

Total Capacity

- Maximum of 2016 channels*
- Maximum of 12960 channels**
- Maximum of 480 channels***

Traffic Processing

- Signal Classification (Voice, fax, VBD, DTMF)
- Silence Suppression (Voice Activity Detection, Digital Speech Interpolation and Comfort Noise Injection)
- Bandwidth efficient mechanism

Voice CODECS

- G.711 PCM @64Kbps alaw/ulaw
- G.729A(+B) CS-ACELP @8Kbps
- G.723.1 ACELP /MPMLQ @5.3,6.3 Kbps
- EFR (12.2Kbps)*

Echo Canceller

- ITU-T G.168 & G.165 compliant
- Up to 128 msec tail length

Fax support

- Group 3 faxes (up to 14.4 kbps)
- ITU-T T.38 fax relay or over clear channel, according to a configuration parameter
- Fax redundancy available as configuration parameter

Voice Band Data (modem) support

- Over clear channel
- Modem payload redundancy as configuration parameter

DTMF Handling

- Detection and generation according to RFC 2833
- MGCP -DTMF package support

Multiplexing support

- Support RTP Mux for packets to the same destination in order to save bandwidth and router's power

Network Jitter compensation

- Configurable adaptive jitter buffer
- The system can overcome jitter of up to 300 msec with no quality degradation

Routing Protocol

**IS-IS, RIP

Security

IPSEC (in future release)

Trunk Interfaces (PSTN)

E1 2.048 Mbps Balanced 120Ω /Unbalanced 75Ω

Up to 32 trunks*/Up to 192 trunks**

T1 1.544 Mbps Balanced 100Ω

Up to 40 trunks*/Up to 192 trunks**

DS3 44.736 Mbps Unbalanced 75Ω

Up to 3 trunks*/Up to 18 trunks**

OC3 155.52 Mbps optical interface

Up to 1 trunk*/Up to 6 trunks**

STM-1 155.52 Mbps optical interface

Up to 1 trunk*/Up to 6 trunks**

Trunk Signaling

- Signaling transparent reliable transmission over the IP network to the central Signaling entity
- ISDN support: ISDN-PRI through IUA Sigtran Protocol (RFC3057)* Layer 4 is SCTP (RFC 2960)*
- SS7 -Layer 2 termination (MPT2), transfer to upper layers via: M2UA/SCTP/IP (SIGTRAN model) - transparent payload with redundancy (in future release)
- CCS compression over SCTP ISDN-PRI*
- CAS-R1 support. Implemented by MGCP CAS package**
- V5.2 / GR303 support (in future release)

Packet Network Interfaces (IP)

Physical

- Gigabit-Ethernet --Optical Interface
- 100BaseT
- 1000BaseSX- Multimode, 850 nanometer
- 1000BaseLX- Single mode, 1310 nanometer (up to 5km)**
- 1000BaseTX – Electrical, RJ-45 connector**

Protocols

- IPv4 best effort
- IPv4 Diff-Serv (TO.S bits)

DSP Pooling functionality

- Configurable DSPK card to handle 720-1440 concurrentcalls depending on the active codecs
- Ability to 'overbook' to maximize system utilization for low Erlang deployments

Packetized Voice Traffic

- RTP/RTCP

Bearer Control Protocols

- MGCP Version 1.0
- H.248/MEGACO
- Static Trunking --Fixed routing with no control protocol

General

DC power input

- -48VDC /-60VDC

Internal Clock Accuracy

- 4.7 ppm (STRATUM 3)

Electro-Magnetic Compatibility

- Europe - EN300386 FTZ 1TR9 Emission -EN55022-Class A Immunity -EN61000-4-2,3,4,5,6
- North America - FCC part 15 Bellcore GR-1089

Product Safety

- UL 1950, 3rd edition for US
- CAN.CSA-CSA-C22.2 No.609509-for Canada
- CE EN60950 3rd edition

Environmental standards

- ETSI 0 ETS 300 019: Storage-Class 1.2 Transport-Class 2.3 Operational-Class 3.1
- Bellcore -GR-63

NEBS Level 3 Certification

- GR-1089 CORE
- GR-63 CORE Including earthquake zone 4 complianceincluding MCI and SBC deviations

Operating Temperature Range

- -5C to 50C

Redundancy

- Full redundancy of traffic affecting modules
- Power input redundancy
- IP link redundancy
- TDM link redundancy (STM-1, OC3)
- Softswitch redundancy support

Reliability

- MTBF 13.8 years (traffic-affecting, redundancy)
- Mean Down Time -1.6 min/year

Availability

- 99.9997%

Dimensions

I-Gate 4000*

- Height -17.7 inches (45 cm)
- Width -17.4 inches (44.3 cm)
- Depth -10.7 inches (27.2 cm)
- Weight -20Kg
- Enables 3 terminals in a 7-foot rack
- Racks can be placed back-to-back or against wall
- Cable run (25 mm) and Fan Tray (44.5 mm) should be added to the height

I-Gate 4000 PRO**

- Height: max.24.83 in.(63.4 cm)
- Width: 17.44 in.(44.3 cm)
- Depth: 10.82 in.(27.5 cm)
- Weight: 20 Kg
- 3-terminal installation in a 7-foot, (2.2m) high rack
- Racks can be placed back-to-back or against wall
- Installable in ETSI rack or 19"/23" rack with adapters

Management

- SNMP V2 support remote multi site management
- Remote FCAPS management of distributed media gateways
- User friendly GUI
- Open interface Northbound NFS System

I-Gate Announcement Server

Announcements Handling

Storage capabilities:

- Total duration of more than five hours
- Up to 2,000 files, each of 10 seconds
- Announcement play capabilities: Up to 3,000 concurrent announcements per IGMS card
- Announcements are supported for all codecs and all packetization periods

Legend: * I-Gate 4000
** I-Gate 4000 PRO
*** I-Gate 4000 EDGE

Award Winning Packet Telephony Solutions



Best Product:

Frost & Sullivan IP Communication
Carrier Infrastructure, product line of
the Year Award, 2006

Best Product:

Internet Telephony Magazine selects
ControlSwitch for Softswitch
excellence award, 2005

Best Product Line:

Frost & Sullivan selects Veraz for
best product Line Strategy award
of the year 2005

Best Private Company:

AlwaysOn selects Veraz
as one of the Top 100 private
Companies of the year 2005

Best Company:

FierceVoIP selects Veraz
as one of the top 15
VoIP companies, 2005

Best Teamwork:

Frost & Sullivan selects
Veraz management as
VoIP Executive team
of the year 2004

Best Product:

Internet Telephony Magazine selects
Controlswitch 5.5 release as
Product of the year 2004

Best Product:

Internet Telephony Magazine selects
I-Gate 4000 PRO as
Product of the year 2003

Best Voice Quality:

Rated no.1 for
Voice Quality by ETSI
2nd Speech Quality
Test Event 2002

Global Offices

Veraz Networks, Inc
Global Headquarters
926 Rock Avenue, Suite 20
San Jose, CA 95131
USA
Tel: +1-408-750-9400
Fax: +1-408-546-0081

USA - HERNDON
585 Grove Street, Suite 320
Herndon, VA 20170
USA
Tel: +1-703-787-9364
Fax: +1-703-787-9793

CARRIBEAN and LATIN AMERICA
1201 W. Cypress Creek Road
Ft. Lauderdale, FL 33309
USA
Tel: +1-954-351-4490
Fax: +1-954-351-4498

BRAZIL

Av. Dr. José Bonifácio C. Nogueira, 150
Térreo – Sala 31
Campinas - SP – CEP 13091-611
Tel: +55 (19) 3707-1616
Fax: +55 (19) 3707-1599

FRANCE

West Europe, Middle East & Africa HQ
Espace Velizy "Le Nungesser"
13 Avenue Morane Saulnier
78140 Velizy
France
Tel: +33-1-34630495
Fax: +33-1-39462118

INDIA

219 Antariksh Bhawan
Kasturba Gandhi Marg
New Delhi, 110001
India
Tel: +9111-5152-4560/4570
Fax: +9111-5152-4580

INDIA

#2&4 Ground Floor
Pride Silicon Plaza
Senapati Bapat Road
Pune, 411016
India
Tel: +91-20-5601-0477
Fax: +91-20-5601-0473

ISRAEL

30 Hasivim St.
Petach-Tikva, 49517
Israel
Tel: +972-3-926-8989
Fax: +972-3-926-6470

RUSSIA

P.O. Box 8
Prospect Mira V.V.Ts. Bldg. 206
Moscow 129223
Russia
Tel: +7-095-974-3311
Fax: +7-095-234-5317

SINGAPORE

Level 57, Republic Plaza
9 Raffles Place
Singapore 048619
Tel: +65-6823 1544 - 8
Fax: +65-6823 1420

UNITED KINGDOM

Quatro House
Lyon Way
Frimley Road
Camberley
Surrey, GU16 7ER
United Kingdom
Tel: +44 1276 804670
Fax: +44 1276 804671

Veraz is a registered trademark of Veraz Networks, Inc. ControlSwitch, I-Gate 4000, I-Gate 4000 Pro, I-Gate 4000 Edge and DTX-600 are trademarks of Veraz Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks may be the property of their respective owners. Any representation(s) in this document concerning the performance of Veraz product(s) or service (s) are for informational purposes only and are not warranties of future performance, either express or implied. All material contained herein is provided "AS IS," with all faults, and without any warranties, including, but not limited to, warranties of merchantability, performance, non-infringement or fitness for a particular purpose. While reasonable efforts have been made in the preparation of this publication to assure its accuracy, Veraz Networks, Inc. assumes no liability resulting from technical or editorial errors or omissions, or for any damages resulting from the furnishing, performance, or use of the information contained herein. Veraz has no obligation to provide any future releases or upgrades or any of the features, enhancements or functions set forth in this document. Unless specifically required in a written agreement with Veraz, no product purchased from Veraz is conditioned upon Veraz' development or delivery of any future release or upgrade or of any feature, enhancement or function. This material does not constitute a commitment on the part of Veraz Networks, Inc. Veraz Networks, Inc. reserves the right to revise this publication, and to make changes on the content hereof without notice. Copyright © 2006 Veraz Networks, Inc. All rights reserved. This publication may be used, copied, or distributed only in accordance with the terms of a license agreement. Any other use, reproduction or distribution may occur only with Veraz's prior written consent.

