The Dialogic® I-Gate® 4000 Session Bandwidth Optimizer (SBO) Core is a standalone system that enables cost-effective transport of VoIP traffic in 3G mobile and next-generation switching networks and offers significantly reduced CAPEX and OPEX associated with bandwidth and IP routing resources.

The I-Gate 4000 SBO Core leverages sophisticated in-house bandwidth and IP packet rate optimization technologies, while preserving the quality and reliability of the original VoIP traffic (for example, voice or fax). By combining high-quality VoIP payload optimization and Quality of Service (QoS) protection techniques, the I-Gate 4000 SBO Core can serve as a powerful CAPEX and OPEX savings solution for 3G mobile and VoIP wireline operators.

### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Leverages sophisticated in-house bandwidth and IP packet rate optimization technologies, while preserving the quality and reliability of the original VoIP traffic</td>
<td>Enables cost-effective transport of VoIP traffic in 3G mobile and next-generation switching networks</td>
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<td>Automatically detects and processes VoIP sessions without impacting any control or signaling element</td>
<td>Allows seamless interconnection to deployed IP network topologies</td>
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<td>Combines high-quality VoIP payload optimization and QoS protection techniques</td>
<td>Delivers substantial CAPEX and OPEX savings for VoIP and 3G mobile media gateway bandwidth applications</td>
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<td>Uses unique bandwidth optimization algorithms and techniques to optimize the already-compressed VoIP sessions</td>
<td>Reduces VoIP bandwidth by more than 70% without degrading original voice quality</td>
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<tr>
<td>99.99995% (six 9s) availability</td>
<td>Provides high reliability at both the terminal and network level</td>
</tr>
<tr>
<td>Supports wide range of transmission infrastructure</td>
<td>Can be used in terrestrial, radiolink, and satellite installations</td>
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High Bandwidth Savings without Compromise

The I-Gate 4000 SBO Core minimizes the bandwidth required for 3G VoIP Nb and IuCS sessions, as well as VoIP sessions from service provider or enterprise media gateways, while preserving the original voice quality. The I-Gate 4000 SBO Core automatically detects and processes the VoIP sessions with no need for interworking with a control or signaling element (MSC-server or softswitch).

Many VoIP and 3G mobile media gateways use bandwidth optimization techniques such as low bitrate codecs and silence suppression, but the overall optimization level of these systems can be relatively low. The I-Gate 4000 SBO Core uses distinctive bandwidth optimization algorithms and techniques to optimize the already-compressed VoIP sessions without degrading the original voice quality. An I-Gate 4000 SBO Core can reduce the original VoIP bandwidth by more than 70%.

IP Network Optimization

The I-Gate 4000 SBO Core reduces the original VoIP packet rate (packets per second) load by more than 98% while providing full application and services transparency. Packet rate reduction helps to release core IP network router resources, which, in addition to yielding CAPEX and OPEX savings, contributes to enhancing the overall QoS.

Applications

3G Mobile Media Gateway

Mobile carriers deploying 3G network infrastructure, either as part of a migration from a 2G TDM network to a 3G IP core or as part of a new 3G mobile network, are faced with the high CAPEX and OPEX associated with bandwidth and IP network routing resources.

In addition, the transport of packetized voice over an IP network, where the VoIP packets are routed through a non-deterministic router-based network path, poses planning and quality challenges for operators.

The I-Gate 4000 SBO Core provides a cost-effective solution that optimizes the VoIP sessions transported between the 3G mobile media gateways (Nb interface) while maintaining the quality and reliability of the transported calls and significantly reducing IP router processing resources and operations. See Figure 2 for a sample configuration.

The same benefits can be achieved when deploying the I-Gate 4000 SBO Core to optimize the VoIP sessions transported between Radio Network Controllers (RNCs) and 3G mobile media gateways (IuCS interface). See Figure 3 for a sample configuration.
Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Core

Today, operators are deploying next-generation switching networks that include VoIP media gateways and softswitches.

Many VoIP media gateways use bandwidth and IP load optimization techniques that provide only a small reduction in bandwidth consumption and the packets-per-second rate.

Figure 2. 3G Mobile Network Nb VoIP Sessions Optimization

Figure 3. 3G Mobile Network IuCS VoIP Sessions Optimization

Next Generation Networking VoIP Media Gateway

Today, operators are deploying next-generation switching networks that include VoIP media gateways and softswitches.

Many VoIP media gateways use bandwidth and IP load optimization techniques that provide only a small reduction in bandwidth consumption and the packets-per-second rate.
Designed to fit transparently between media gateways, the I-Gate 4000 SBO Core can provide substantial CAPEX and OPEX savings by further reducing the bandwidth required and the payload rate of the VoIP sessions generated by the VoIP media gateway, while maintaining the quality and reliability of the transported calls. See Figure 4 for a sample configuration.

Figure 4. VoIP Sessions Optimization in a Satellite Network

**Enterprise VoIP**

The rapid development of broadband access for enterprise customers and the growing demand for IP-based voice and data services poses a challenge to operators aiming to maximize the utilization of their access network infrastructure.

The I-Gate 4000 SBO Core system optimizes the VoIP sessions between multiple VoIP media gateways or IP PBXs while preserving the original voice quality.

The I-Gate 4000 SBO Core system provides a considerable bandwidth savings and a significant reduction in the VoIP packet rate (packets per second), while maintaining the quality of the voice traffic. See Figure 5 for a sample configuration.

Figure 5. Enterprise VoIP Sessions Optimization
Technical Specifications

IP Session Optimization
IP session multiplexing payload aggregation
IP Protocols header optimization
G.711 Lossless Optimization

Voice Codecs
G.711 PCM @64 kbps A-law/µ-law
G.729 CS-ACELP @8 kbps
G.723.1 ACELP /MPMLQ @5.3, 6.3 kbps
GSM-AMR (all rates)

Security
Embedded firewall
Access list

QoS Management
Multiple queues
IP packet classification and marking
Multiple congestion avoidance mechanisms
Scheduling and shaping
Policing

Ethernet Interfaces
1000BaseT (Gigabit Ethernet)
100BaseT (Fast Ethernet)
VLAN Tag — IEEE 802.1q

TDM Interfaces
E1 complying with ITU G.703 and G.704
T1 complying with ITU G.703 and G.704

IP Protocols
IPv4
SNMPv2 (RFC 1907)
FTP (RFC 959)
SNTP (RFC 2030 v4)
IP (RFC 791)
UDP (RFC 768)
Technical Specifications (continued)

Redundancy
- Main module redundancy: 1:1
- Power input redundancy: 1:1
- Power supply redundancy: 1:1
- Fan redundancy and Turbo mode

Reliability
- 99.99995% (Six 9s)
- Hot module swapping
- Hitless SW upgrade
- Runtime configuration

Power
- AC power input: 240 VAC / 100 VAC (nominal)
- DC power input: -48 VDC / -60 VDC (nominal)
- Max. DC power consumption: 73 Watts
- Max. AC power consumption: 95 Watts

Internal Clock Accuracy
- 4.7 ppm (Stratum 3)

Electro-Magnetic Compatibility
- Europe: EN300 386 V1.3.2 (2003-05)
  - Emission: EN55022
  - Immunity: EN61000-4-2,3,4,5,6,11
- North America: FCC rules CFR 47 part 15
- Canada: ICES-003
- Australia/NZ: CISPR 22:04

Product Safety
- UL60950.1:2003 (US) (selected models)
- CAN/CSA-C22.2 No.60950-1-03 for Canada (selected models)
- CE EN60950-1:2001
- CB-Safety: IEC 60950-1:2001 (selected models)
Technical Specifications (continued)

Environmental standards
ETSI — ETS 300 019
Telcordia — GR-63 (selected sections)
EU Directive 2002/95/EC (Restriction of Hazardous Substances — RoHS)

Operating Temperature Range
-5°C to 50°C

Dimensions
Height 44.45 mm (1.75” 1U)
Width 435 mm (17.1”) (not including mounting brackets)
Depth 350 mm (13.8”)

Approvals, Compliance, and Warranty
Hazardous substances RoHS compliance information at www.dialogic.com/rohs
Country-specific approvals Call your local Dialogic sales representative
Warranty Call your local Dialogic sales representative