

## Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Core

The Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Core (I-Gate 4000 SBO-C) is a standalone equipment solution designed to deliver a large reduction in the bandwidth requirements and the traffic load (packets per second) for VoIP, Nb or LuCS traffic, allowing for significant CAPEX and OPEX savings. It is a versatile solution, which can be deployed in applications such as:

- VoIP traffic optimization between VoIP media gateways
- Nb traffic optimization between 3G mobile media gateways
- LuCS traffic optimization between a 3G mobile media gateway and a Node B ( )
- VoIP or Nb traffic optimization for Session Border Controllers traffic

The I-Gate 4000 SBO-C can leverage sophisticated in-house bandwidth and IP packet rate optimization technologies, while preserving the quality and reliability of the original VoIP, Nb and LuCS traffic. By combining high-quality VoIP, Nb and LuCS traffic optimization techniques, the I-Gate 4000 SBO-C can serve as a powerful CAPEX and OPEX savings option for operators that have deployed 3G mobile networks as well as for operators and service providers using VoIP interconnecting networks.



Features	Benefits
<b>Leverages sophisticated bandwidth and IP packet rate optimization technologies from Dialogic, while preserving the quality and reliability of the original VoIP, Nb and LuCS traffic</b>	Can enable substantial CAPEX and OPEX savings for VoIP and 3G mobile media gateway bandwidth applications
<b>Automatically detects and processes VoIP, Nb and LuCS traffic streams without requiring control or external equipment for its operation</b>	Enables cost-effective transport of VoIP, Nb and LuCS traffic in 3G mobile networks and in VoIP next-generation switching networks
<b>99.99995% (six 9s) availability</b>	Provides high reliability at both the terminal and network level
<b>Supports a wide range of transmission infrastructure</b>	Can be used in terrestrial, radiolink, and satellite installations

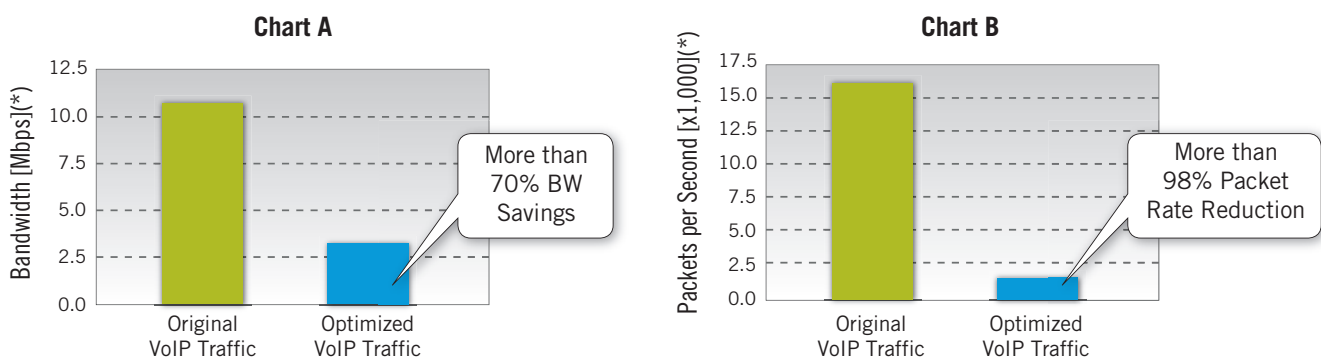
## High Bandwidth Savings

The I-Gate 4000 SBO-C can significantly reduce the bandwidth required for 3G Nb and luCS traffic, as well as VoIP traffic from service provider or enterprise media gateways, while preserving the original voice quality. The I-Gate 4000 SBO-C automatically detects and processes the Nb, luCS or VoIP traffic streams without interworking with a control or signaling element.

A number of VoIP and 3G mobile media gateways use bandwidth optimization techniques such as encoding and silence suppression; however, the overall optimization level of these systems can be relatively low. In contrast, the I-Gate 4000 SBO-C uses distinctive bandwidth optimization algorithms and techniques to optimize the already-compressed VoIP, Nb or luCS traffic without degrading the original traffic quality. See Figure 1, Chart A example.

## IP Network Optimization

The I-Gate 4000 SBO-C can significantly reduce the original VoIP, Nb or luCS packet rate (packets per second) load while providing full application and services transparency. Packet rate reduction can help release core IP network router resources, which, in addition to contributing to CAPEX and OPEX savings, can help enhance overall Quality of Service. See Figure 1, Chart B example.



(\*) 500 AMR 12.2 kbps calls, 50% speech activity, 20 msec PI

Figure 1. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Core Performance

Figure 1 shows an example that compares the bandwidth requirements (Chart A) and the packet rate (Chart B) of VoIP traffic before and after an I-Gate 4000 SBO-C solution has been deployed. In Chart A, the green column depicts the bandwidth requirements before deploying an I-Gate 4000 SBO-C solution and the blue column depicts the bandwidth requirements after deploying an I-Gate 4000 SBO-C solution. Similarly, In Chart B, the green column depicts the packet rate before deploying an I-Gate 4000 SBO-C solution and the blue column depicts the packet rate after deploying the an I-Gate 4000 SBO-C solution.

## Applications

### Between 3G Mobile Media Gateways

The I-Gate 4000 SBO-C allows for cost-effective optimization of the Nb traffic streams transported between the 3G mobile media gateways (Nb interface) while also being able to maintain the quality and reliability of the transported calls and to significantly reduce IP router processing resources and operations. See Figure 2 for an example configuration.

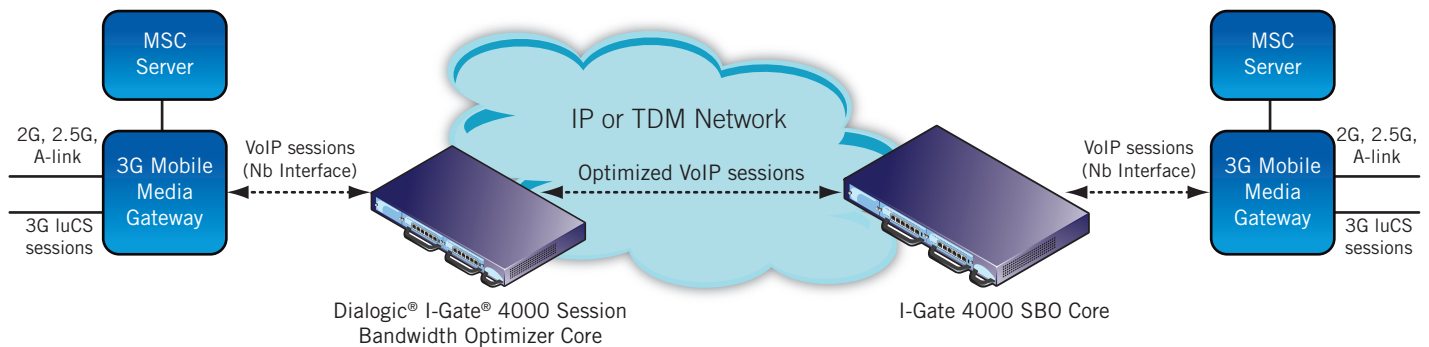


Figure 2. 3G Mobile Network Nb VoIP Sessions Optimization

Similar benefits also are available when deploying an I-Gate 4000 SBO-C to optimize the luCS traffic streams transported between Radio Network Controllers (RNCs) and 3G mobile media gateways (luCS interface). See Figure 3 for an example configuration.

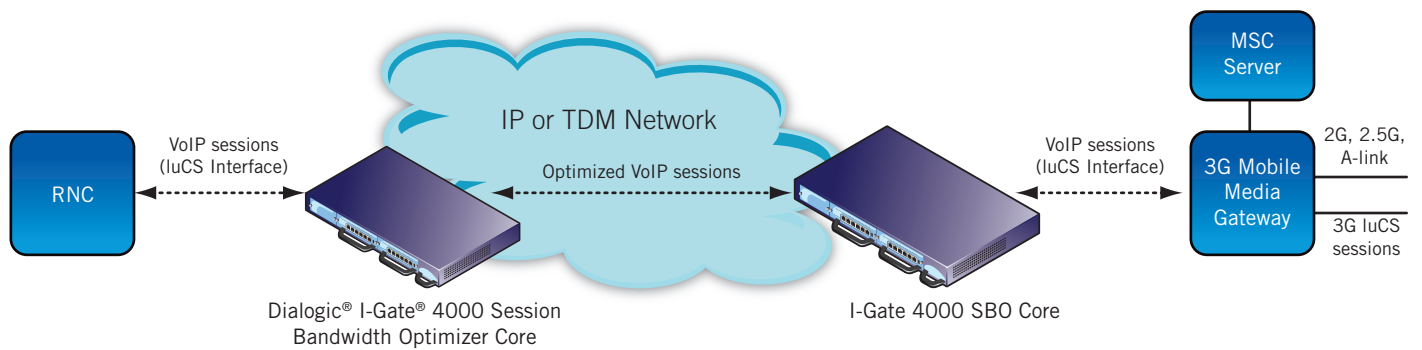


Figure 3. 3G Mobile Network luCS VoIP Sessions Optimization

### Between VoIP Media Gateways

Operators are deploying next-generation switching networks that include VoIP media gateways and softswitches. A number of VoIP media gateways use bandwidth and IP load optimization techniques that often provide only a small reduction in bandwidth consumption and packets-per-second rate.

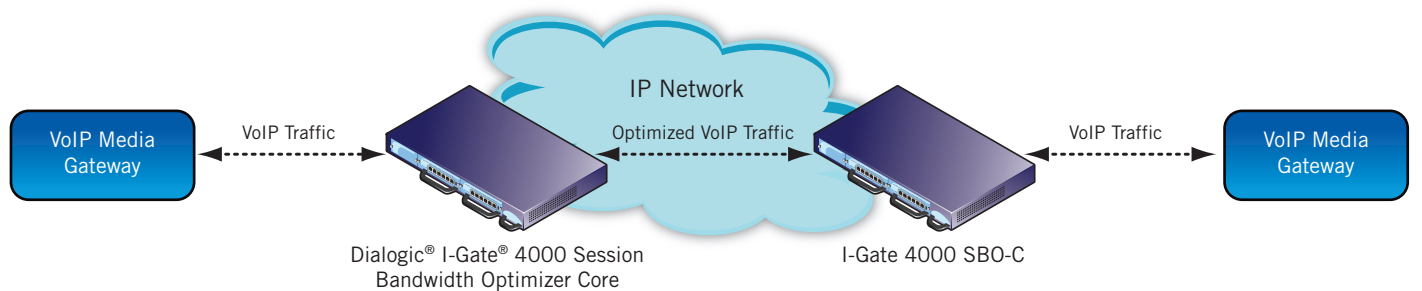


Figure 4. Next Generation Switching Network VoIP Traffic Optimization

Able to fit transparently between media gateways, the I-Gate 4000 SBO-C can allow for substantial CAPEX and OPEX savings by further reducing the bandwidth required and the packet rate of the VoIP traffic generated by the VoIP media gateways, while maintaining the quality and reliability of the transported calls. See Figure 4 for an example configuration.

## Satellite Applications

For telecom operators and service providers carrying VoIP, Nb or LuCS traffic over costly or bandwidth-bounded satellite links, bandwidth optimization systems that use I-Gate 4000 SBO-C provide an unparalleled solution that is capable of delivering substantial savings on bandwidth resources, network equipment and operations, while also providing high-quality services as well as efficient utilization of the existing transmission infrastructure and satellite modem routers. See Figure 5 for an example configuration.

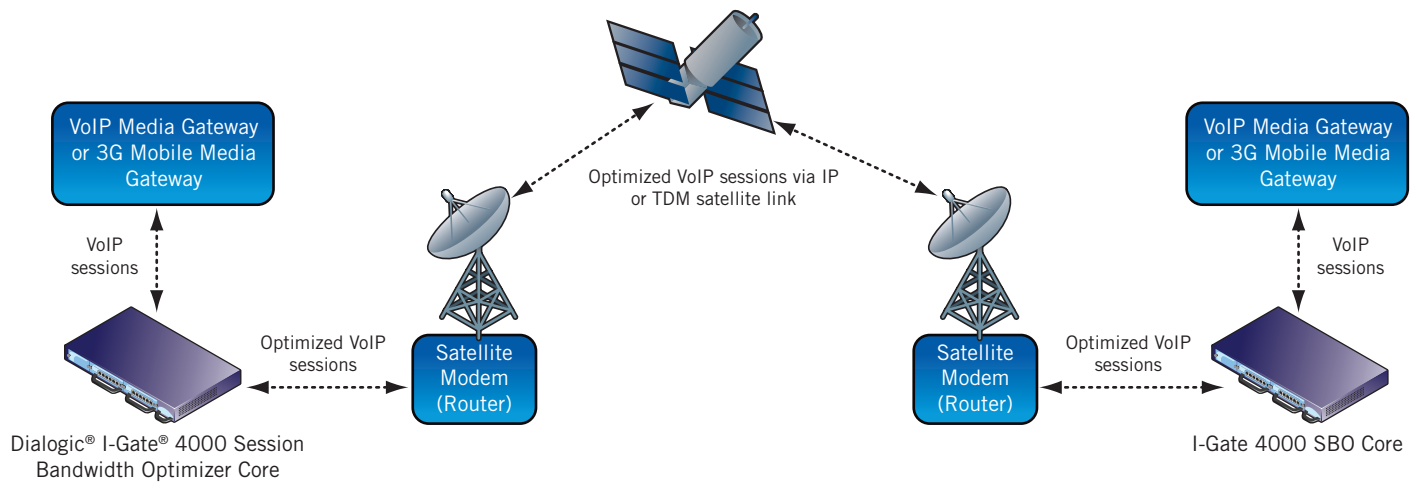


Figure 5. VoIP or Nb Traffic Optimization in a Satellite Network

## Call Centers and Enterprise VoIP

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

The I-Gate 4000 SBO-C optimizes the VoIP sessions between multiple VoIP media gateways or IP PBXs while preserving the original voice quality. It also is capable of providing a considerable bandwidth savings and significantly reducing the VoIP packet rate (packets per second), while maintaining the quality of the voice traffic.

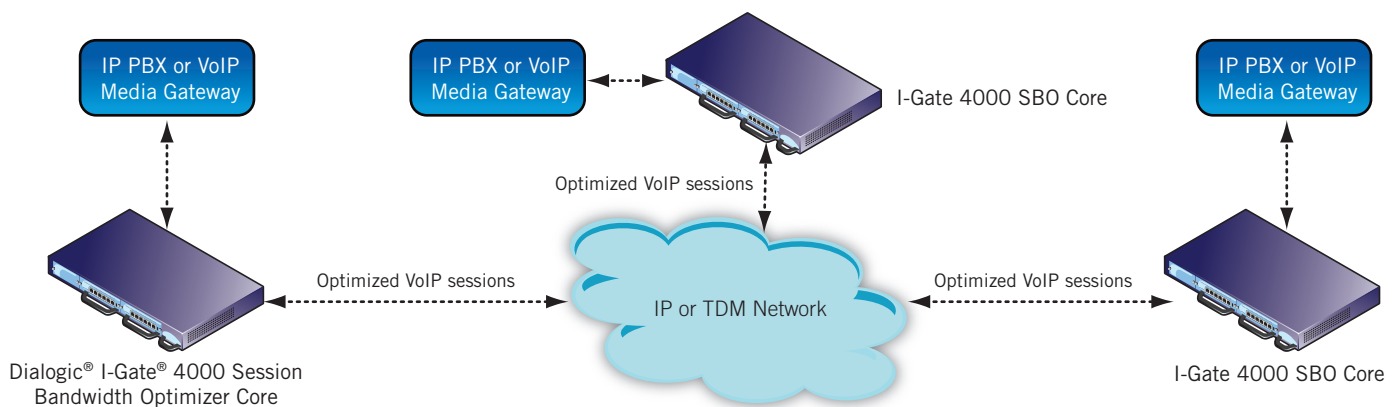


Figure 6. Enterprise VoIP Sessions Optimization

## 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/ $\mu$ -law  
G.729 CS-ACELP @8 kbps  
G.723.1 ACELP /MPMLQ @5.3, 6.3 kbps  
GSM-AMR (12.2 kbps and standard sub-rates))

### Ethernet Interfaces

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

### IP Protocols

IPv4  
SNMPv2 (RFC 1907)  
FTP (RFC 959)  
SNTP (RFC 2030 v4)  
IP (RFC 791)  
UDP (RFC 768)

### Redundancy

Main module redundancy 1:1  
Power supply redundancy 1:1

### Reliability

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

### Power

DC power input	-48 VDC / -60 VDC (nominal)
Max. DC power consumption	73 Watts
Max. AC power consumption	95 Watts

**Technical Specifications** *(continued)***Electro-Magnetic Compatibility**

Europe	EN300 386 V1.3.3 (2005-04) Emission - EN55022 Immunity - EN61000-4-2,3,4,5,6, 11
North America	FCC rules CFR 47 part 15 Class A
Canada	ICES-003 Class A
Japan	VCCI V-3/2001.04
Australia/NZ	CISPR 22:2004

**Product Safety**

UL60950.1:2007 for US  
CAN/CSA-C22.2 No.60950-1-07 for Canada  
CE EN60950-1:2006 + A11:2009  
CB IEC 60950-1:2005 2nd Edition

**Environmental Standards**

ETSI — ETS 300 019  
Bellcore — GR-63 (selected sections)  
EU Directive 2002/95/EC (Restriction of Hazardous Substances — RoHS)  
EU Directive 2002/96/EC (Waste Electrical and Electronic Equipment — WEEE)  
China RoSH

**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 <a href="http://www.dialogic.com/rohs">www.dialogic.com/rohs</a>
Country-specific approvals	Call your local Dialogic sales representative
Warranty	Call your local Dialogic sales representative



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