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

The Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Core X (I-Gate 4000 SBO-CX) 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 IuCS traffic, allowing for significant CAPEX and OPEX savings. It is a versatile solution, which can be deployed to optimize traffic carried in applications such as:

- Between VoIP media gateways (VoIP traffic optimization)

- Between 3G mobile media gateways (Nb traffic optimization)

- Between a 3G mobile media gateway and a Radio Network Controller (IuCS traffic optimization)

- Between a Session Border Controller and VoIP media gateways (VoIP traffic optimization)

- Between a Session Border Controller and 3G mobile media gateways (Nb traffic optimization)

- Between Session Border Controllers (VoIP or Nb traffic optimization)

The I-Gate 4000 SBO-CX can leverage sophisticated in-house bandwidth and IP packet rate optimization technologies, while preserving the quality and reliability of the original VoIP, Nb and IuCS traffic. By combining high-quality VoIP, Nb and IuCS traffic optimization techniques, the I-Gate 4000 SBO-CX 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
Leverages sophisticated bandwidth and IP packet rate optimization technologies from Dialogic, while preserving the quality and reliability of the original VoIP, Nb and IuCS traffic	Can enable substantial CAPEX and OPEX savings for VoIP media gateway, 3G mobile media gateway and Session Border Controller traffic carrying applications
Automatically detects and processes VoIP, Nb and IuCS traffic streams without requiring control or external equipment for its operation	Enables cost-effective transport of VoIP, Nb and IuCS traffic in 3G mobile networks, in VoIP next-generation switching networks and in VoIP or Nb interconnecting networks
Networking transparency	Allows seamless insertion of an I-Gate 4000 SBO-CX terminal into deployed links and interconnection to operating networks without having to modify existing equipment or network topology
99.99995% (six 9s) availability	Provides high reliability at both the terminal and network level
Supports a wide range of transmission infrastructure	Can be used in terrestrial, radiolink, and satellite installations

High Bandwidth Savings

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

Usually, deployed 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-CX uses distinctive bandwidth optimization algorithms and techniques to optimize the already-compressed VoIP, Nb or IuCS traffic without degrading the original traffic quality. See Figure 1, Chart A example and accompanying description.

IP Network Optimization

The I-Gate 4000 SBO-CX can significantly reduce the original VoIP, Nb or IuCS 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 and accompanying description.
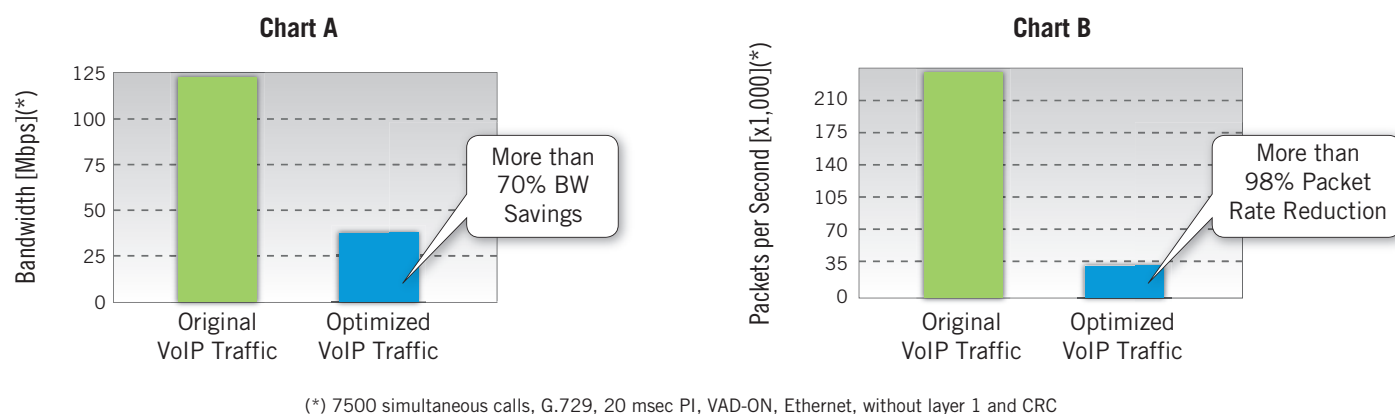
Chart A

Bandwidth [Mbps](*)

More than 70% BW Savings

Original VoIP Traffic | Optimized VoIP Traffic

Chart B

Packets per Second [x1,000](*)

More than 98% Packet Rate Reduction

Original VoIP Traffic | Optimized VoIP Traffic

(*) 7500 simultaneous calls, G.729, 20 msec PI, VAD-ON, Ethernet, without layer 1 and CRC

Figure 1. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Core X 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-CX solution has been deployed. In Chart A, the green column depicts the bandwidth requirements before deploying an I-Gate 4000 SBO-CX solution and the blue column depicts the bandwidth requirements after deploying an I-Gate 4000 SBO-CX solution. Similarly, In Chart B, the green column depicts the packet rate before deploying an I-Gate 4000 SBO-CX solution and the blue column depicts the packet rate after deploying the an I-Gate 4000 SBO-CX solution.

Applications

Between 3G Mobile Media Gateways

The I-Gate 4000 SBO-CX 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.
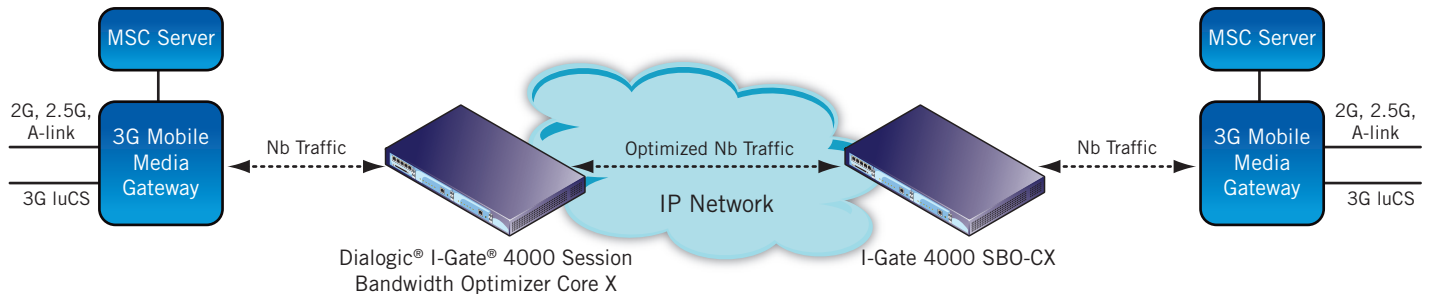
Figure 2. 3G Mobile Network Nb VoIP Sessions Optimization

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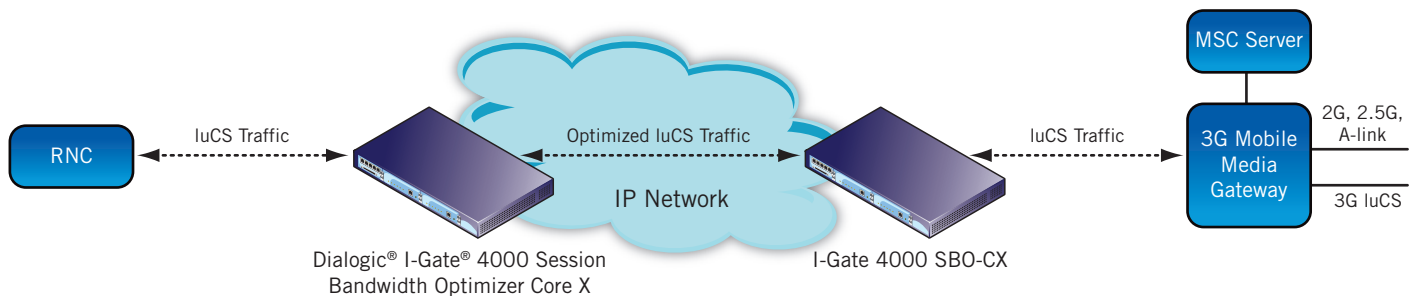

Figure 3. 3G Mobile Network IuCS VoIP Sessions Optimization

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.
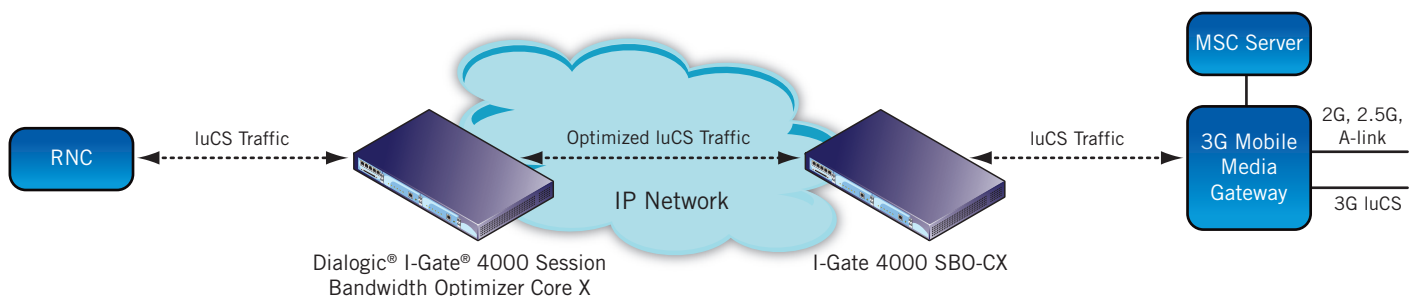

Figure 4. Next Generation Switching Network VoIP Traffic Optimization

Able to fit transparently between media gateways, the I-Gate 4000 SBO-CX 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 IuCS traffic over costly or bandwidth-bounded satellite links, bandwidth optimization systems that use I-Gate 4000 SBO-CX 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.
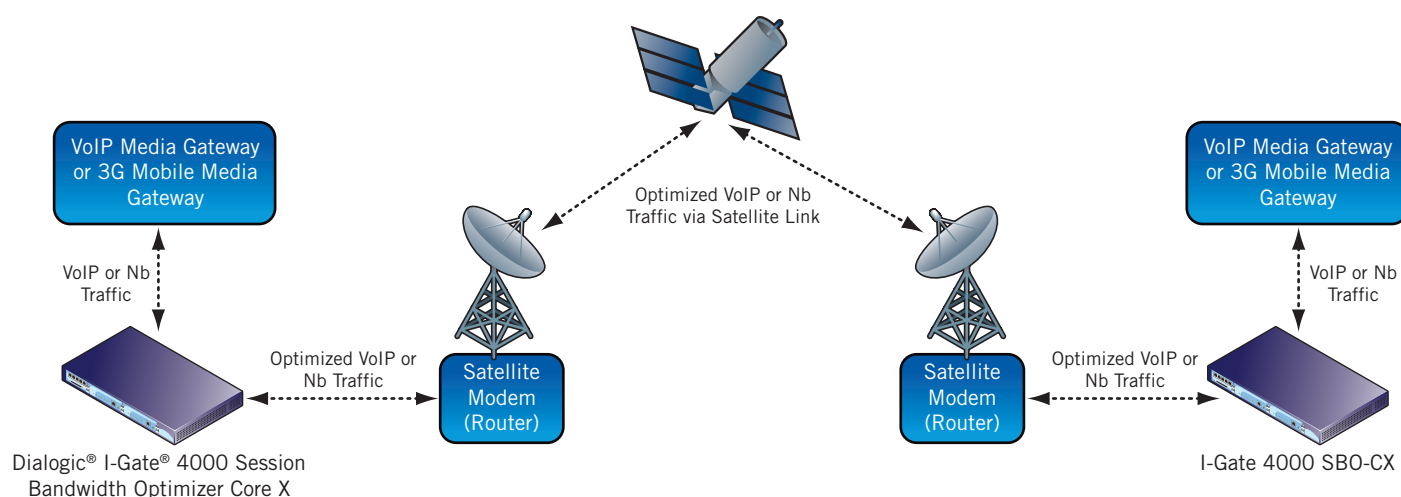
Figure 5. VoIP or Nb Traffic Optimization in a Satellite Network

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-CX 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.
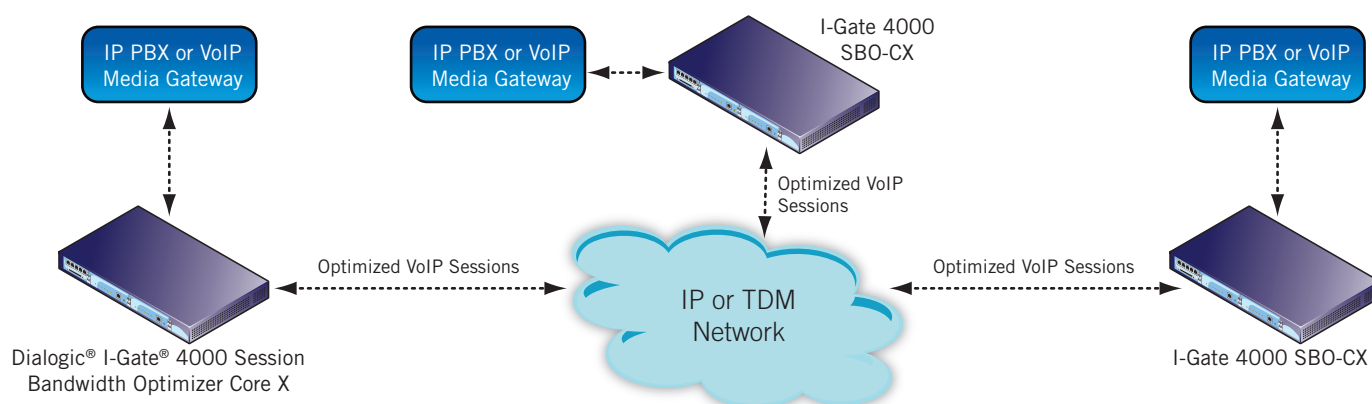

Figure 6. Enterprise VoIP Sessions Optimization

Technical Specifications

Traffic Handling

Encoded voice payloads	• G.711 PCM @ 64 kbit/sec (A-law and µ-law)
	• G.729, CS-ACELP @ 8 kbit/sec
	• G.723.1, ACELP / MPMLQ @ 5.3, 6.3 kbit/sec
	• GSM-AMR (all rates)
	• All packetization intervals (framing periods)
	• With and without Silence Suppression (VAN-ON and VAD-OFF)
Traffic Links	• Supports: terrestrial links, microwave links, satellite links
Tunneling	• Over GRE (Generic Routing Encapsulation) for Ethernet bearer links
	• Up to 16 GRE tunnels

Network Interfaces

Electrical Gigabit Ethernet Ports

Interface	• Complies with IEEE 802.3ab
Connector	• RJ45

Optical Gigabit Ethernet Ports

Single-mode	• Complies with IEEE 802.3z
	• 1310 nm
	• Optical Output Power: -9.5 dBm to -3 dBm
	• Receiver Sensitivity: -20 dBm (10-12 BER)
	• Connector Type: Duplex LC
Multimode	• Complies with IEEE 802.3z
	• 850 nm
	• Optical Output Power: -9.5 dBm to -4 dBm
	• Receiver Sensitivity: -17 dBm (10-12 BER)
	• Connector type: Duplex LC

Redundancy and High Availability

Main Module	• 1:1 SBPM redundancy
Power Supply	• 1:1 DCPS redundancy
	• Load sharing
Power Feed	• 2 independent power feed connections through main and redundant DCPS
Fan Tray	• 6 fans
	• Support for Fan Turbo mode
Failover Time (Redundancy Switchover Time)	• Less than 1 sec.
Ethernet Link Protection	• 1:1 (based on ELET/SOIE ports redundancy modes)
Availability	• 99.99995 % (six 9's)
Additional High Availability Features	• Hitless Hot-module swapping -- Hot extractions/insertions of modules
	• Hitless Hot Software Upgrade -- Non-traffic-affecting
	• Runtime configuration

Temperature Control	• Built-in temperature sensors
	• Fan Turbo mode
	• Alarms: High & Extreme High Temperature

Power

| DC power input | • -48 / -60 VDC (nominal) |
| | • -40.5 / -72 VDC (min/max) |

Physical Characteristics

Dimensions	• Width: 435 mm (17.1") - not incl. mounting brackets
	• Height: 44.45 mm (1.75" - 1U)
	• Depth: 448 mm (17.6")
Weight	• 5.7 Kg (full redundant system)
Installation	• Can be installed in 19" or 23" cabinets or relay racks, or as wall mount, or on top of any rigid infrastructure (desktop)

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

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