Dialogic®

Technology Brief

Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul – Application Topologies

Mobile operator backhaul segment designs are each unique and based on several factors such as geography (urban versus rural), population density, terrain, and so on. In order to address the varying requirements of the backhaul designs, the Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul products (I-Gate 4000 SBO-MB and I-Gate 4000 SBO-MBX) support a wide range of deployment strategies, including these topologies:

- Point to Point (PTP)
- Point to Multi-Point (PTMP)
- Drop and Continue
- Ring
- Data Offload

Point to Point Topology

An I-Gate 4000 SBO-MB/MBX terminal can be installed and operated in a single destination solution using the Point to Point (PTP) topology. Such a solution can include one or more pairs of I-Gate 4000 SBO-MB/MBX terminals, where each pair of the terminals optimizes the traffic carrier between them. Figure 1 shows an example of this type of configuration.

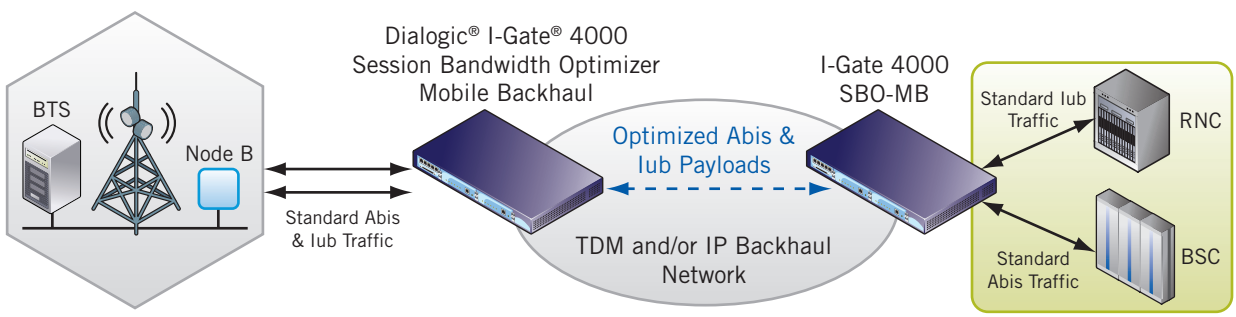

Figure 1. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul in a Point to Point Topology

Point to Multi-Point Topology

A Point to Multi-Point (PTMP) topology includes three or more I-Gate 4000 SBO-MB/MBX terminals, where an I-Gate 4000 SBO-MB/MBX terminal simultaneously optimizes the traffic between it and several remote I-Gate 4000 SBO-MB/MBX terminals. Figure 2 shows an example of this type of configuration.

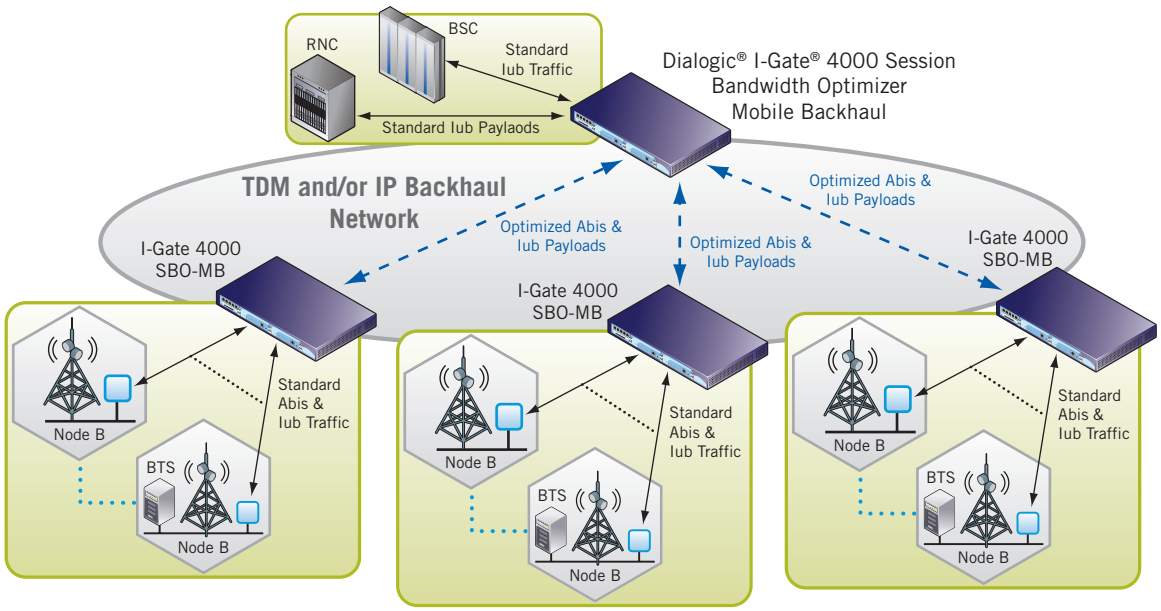

Figure 2. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul in a Point to Multi-Point Topology

Drop and Continue Topology

Usually Base Station Controller (BSC) and Radio Network Controller (RNC) systems are co-located at an operator MSO (Mobile Switching Office) site or at large Point of Presence (POP) sites. As a BSC system can handle tens of Base Transceiver Stations (BTSs), and an RNC system can handle hundreds of Node B Stations, typical mobile applications including 2G and 3G networks covering the same areas include more BSC systems than RNC systems, and accordingly there could be many BSC sites without collocated RNC systems.

Figure 3 shows an example of an I-Gate 4000 SBO-MB/MBX solution suitable for a scenario of the type described above where the RNC and BSC systems are deployed at different sites and control collocated BTSs and Node B sites.

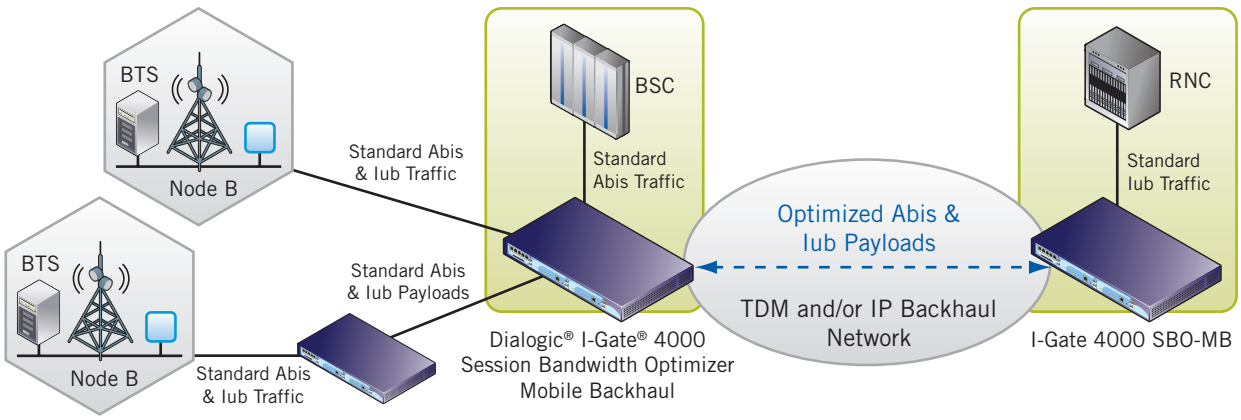

Figure 3. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul in a Drop and Continue Topology

In such a solution, the traffic is handled as follows:

- At a cell site, an I-Gate 4000 SBO-MB/MBX terminal interconnects to the BTS and performs backhaul payload optimization and aggregation for the 2G Abis traffic; and interconnects to the Node B and performs backhaul payload optimization and aggregation for the 3G Iub traffic.
- At the BSC site, the optimized 2G Abis traffic received from the BTS sites is decompressed and terminated to the BSC system. The optimized 3G Iub traffic received from the Node B sites is forwarded to the I-Gate 4000 SBO-MB/MBX terminal at the RNC site.
- The I-Gate 4000 SBO-MB/MBX terminal at the BSC site can also interconnect to other Nodes B sites and performs backhaul payload optimization and aggregation for the 3G Iub traffic.
- The optimized traffic is carried over the backhaul transport network.

Ring Topology

Mobile networks using microwave links for the backhaul of the cell sites' traffic are challenged by high CAPEX and OPEX when required to expand transmission bandwidth and traffic-carrying capability. As these backhaul transmission links are typically built over Synchronous Digital Hierarchy (SDH) ring transmission infrastructure, expansion of traffic capacity generally demands additional transmission resources, antenna upgrading, additional radio frequencies, and modifications to the existing microwave infrastructure for both ring directions and at all radio sites. The use of an I-Gate 4000 SBO-MB/MBX based solution that optimizes the backhaul traffic end-to-end from the BSC and/or RNC sites to the BTS and/or Node B sites allows an operator to build the required network expansion while enabling significant CAPEX and OPEX savings. Figure 4 shows an example of this type of solution.

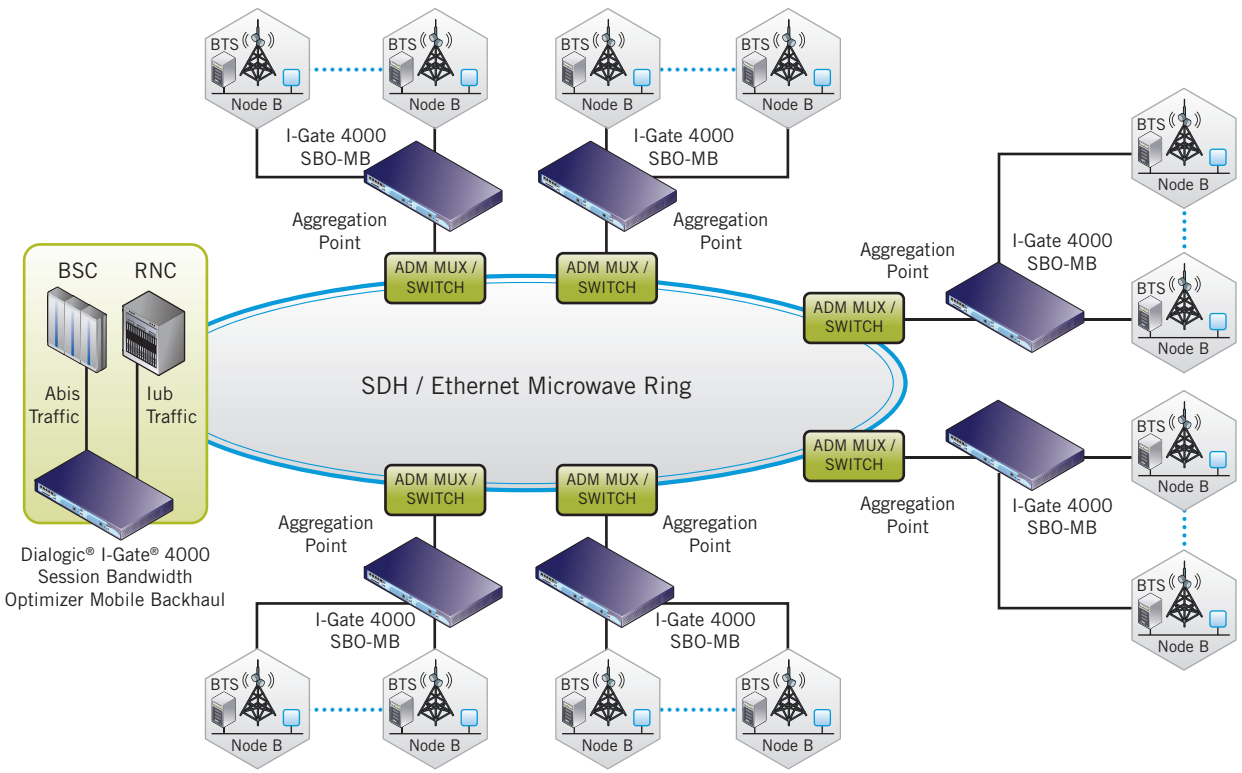

Figure 4. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul in a Ring Topology

In such a solution, the traffic is handled as follows:

- I-Gate 4000 SBO-MB/MBX terminals aggregate and optimize the various BTS and/or Node B traffic before it is transmitted to the associated Add Drop Multiplexer (ADM MUX) or switch on the SDH rings.
- At the radio controller site, the BSC and/or RNC systems are connected to I-Gate 4000 SBO-MB/MBX terminals which also interconnect to ADM MUX or switch on the SDH rings. The optimized traffic is carried over the SDH rings.

Data Offload Topology

An I-Gate 4000 SBO-MB/MBX terminal can simultaneously support TDM and Ethernet backhaul bearer links. Continuous growth of data traffic presents challenges for operators responding to requirements for additional backhaul network transmission resources and their associated expenses.

A cost-effective solution to this can be to offload the data traffic (for example, High Speed Packet Access [HSPA]) through a best-effort packet data network while the voice traffic is transported over the existing (and more expensive) backhaul network transmission links.

Figure 5 shows an example of an I-Gate 4000 SBO-MB/MBX data offload type of solution.

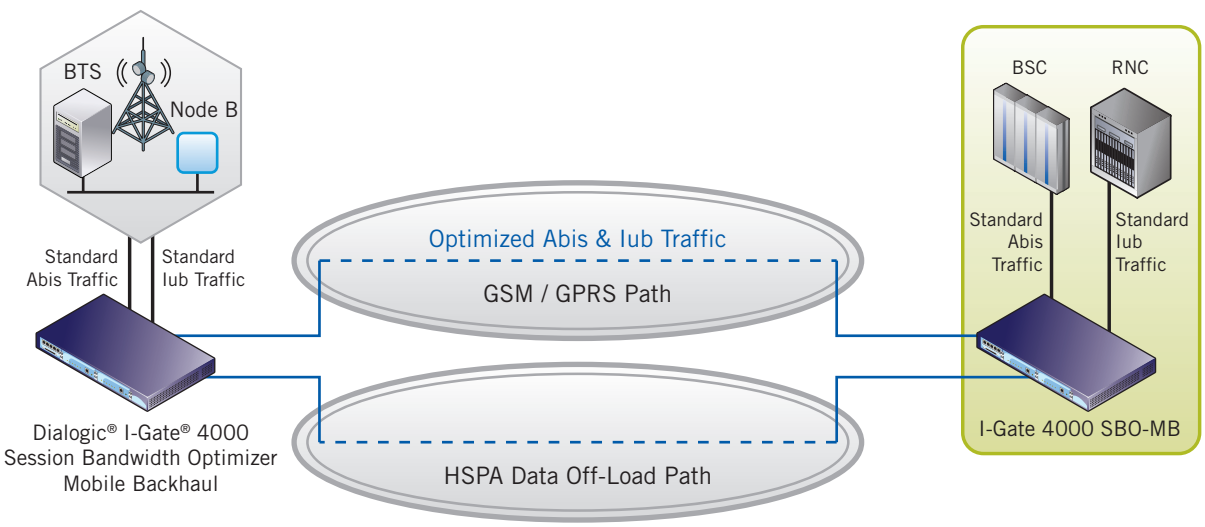

Figure 5. Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul in a Data Offload Topology

In such a solution, the traffic is handled as follows:

- At a cell site, the I-Gate 4000 SBO-MB/MBX terminal interconnects to one (or, although not shown, more) Node B systems. The same terminal could also interconnect to BTS systems.
- At the RNC site, an I-Gate 4000 SBO-MB/MBX terminal interconnects to the RNC system. The same terminal could also interconnect to a BSC system.
- An I-Gate 4000 SBO-MB/MBX terminal separates the HSPA traffic from the Iub stream and transports the HSPA traffic over a broadband IP network (for example, a DSL network), while the other traffic types are transported over a separate TDM/MPLS/Ethernet network.
- The optimized traffic is carried over the backhaul transport network.

Acronyms

ADM-MUX	Add Drop Multiplexer
BSC	Base Station Controller
BTS	Base Transceiver Site
CAPEX	Capital Expenditure
GSM/GPRS	Global System for Mobile/General Packet Radio Service
HSPA	High Speed Packet Access
MSO	Mobile Switching Office
OPEX	Operating Expense
POP	Point of Presence
PTMP	Point to Multi-Point
PTP	Point to Point
RNC	Radio Network Controller
SBO-MB	Session Bandwidth Optimizer Mobile Backhaul
SBO-MBX	Session Bandwidth Optimizer Mobile Backhaul X
SDH	Synchronous Digital Hierarchy

Questions?

If you have questions about the technology or Dialogic® products discussed in this technology brief, contact your local Dialogic representative.

Detailed information is also available on the Dialogic website for this product: "Dialogic® I-Gate® 4000 Session Bandwidth Optimizer Mobile Backhaul" datasheet.

Dialogic®

www.dialogic.com

Dialogic Inc
1504 McCarthy Boulevard
Milpitas, California 95035-7405
USA

04/13 12641-02

NETWORK FUEL™