

INTRALINK

*Robust **Backhaul**, Today!*





Exploding Broadband Usage Intensifies Backhaul Issue...

The emergence of broadband applications has increased consumer demands for multimedia content access, Infotainment services, greater mobility and personalization. Operators are experiencing fast-growing backhaul needs, which impose new investments for network expansion and upgrades. This fact raises a challenge: to evolve backhaul networks efficiently, offer new profitable services and achieve a fast Return On Investment (ROI).

...INTRALINK™ Addresses it Smartly!

INTRALINK™ comprises a **homogeneous** family of Point-to-Point (PtP) digital microwave products that fit a wide range of transport and backhaul applications.

Employing advanced **hybrid** technology to **efficiently** transport legacy (PDH & SDH) and packet-based (Ethernet) traffic, INTRALINK™ allows **cost-effective** backhaul at both the last mile and high-density aggregation sites.

INTRALINK™, a **rich-featured** and **future-proof** platform designed to meet operators' most stringent demands, also offers **high** capacities and unparalleled **flexibility** to support complex network architectures.

With the ability to simultaneously handle **any mix** of TDM and packet-based traffic, INTRALINK™ is a **long-lasting** investment enabling **smooth** migration from pure TDM to pure packet services.

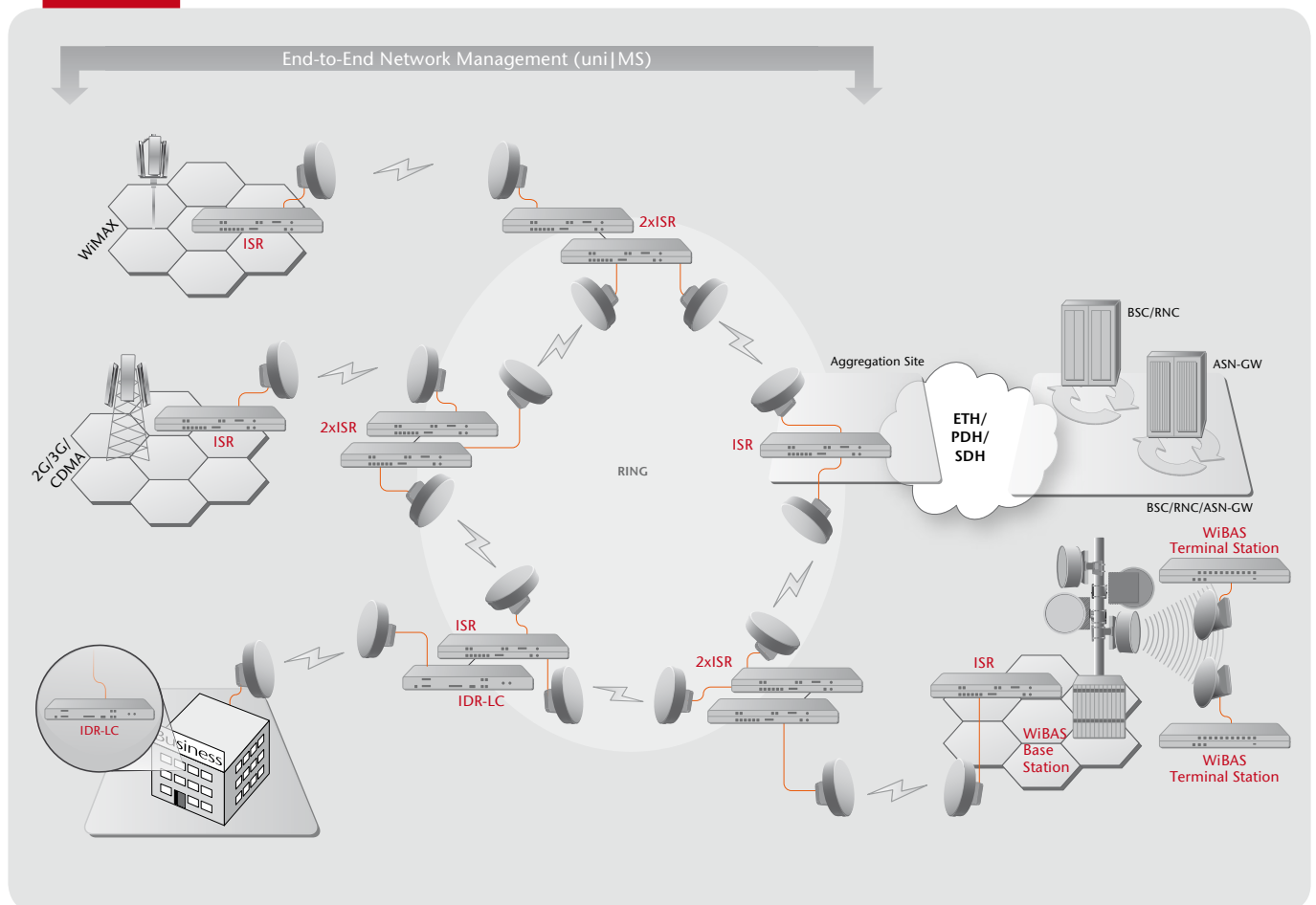
Fig. 1 depicts typical applications and network topologies, enabled by INTRALINK™ ISR and IDR-LC systems, for mobile & WiMAX backhaul, private networks and PtMP access backhaul.

Benefits

- Hybrid design – single technology investment & provisioning for low Total Cost of Ownership (TCO)
- Pay-as-you-grow, scalable architecture – granular capacity management
- Straightforward modular design (ISR), with hot-swappable modules, for:
 - Carrier-class reliability
 - Fast deployment & activation
- Full (100%) utilization of available air bandwidth, for efficient transport of all traffic types and exploitation of available capacity for future applications
- High performance for assured minimal bandwidth usage and less cost per Mbit
- Ring-type architectures (ISR) providing:
 - Reliability through self-healing redundancy
 - Network scalability without service interruption
 - Minimal network maintenance

[Fig. 1]

Typical INTRALINK™ Applications



Overview of INTRALINK™ Components

INTRALINK™ is a split system mainly composed of a compact 1RU indoor unit (ISR, IDR-LC) and the outdoor radio units (ODU-CF) with integrated antennas. Offering a big variety of legacy PDH / SDH and Ethernet interfaces, and allowing flexible fault-tolerant configurations, INTRALINK™ covers a wide range of demanding backhaul & transport applications.

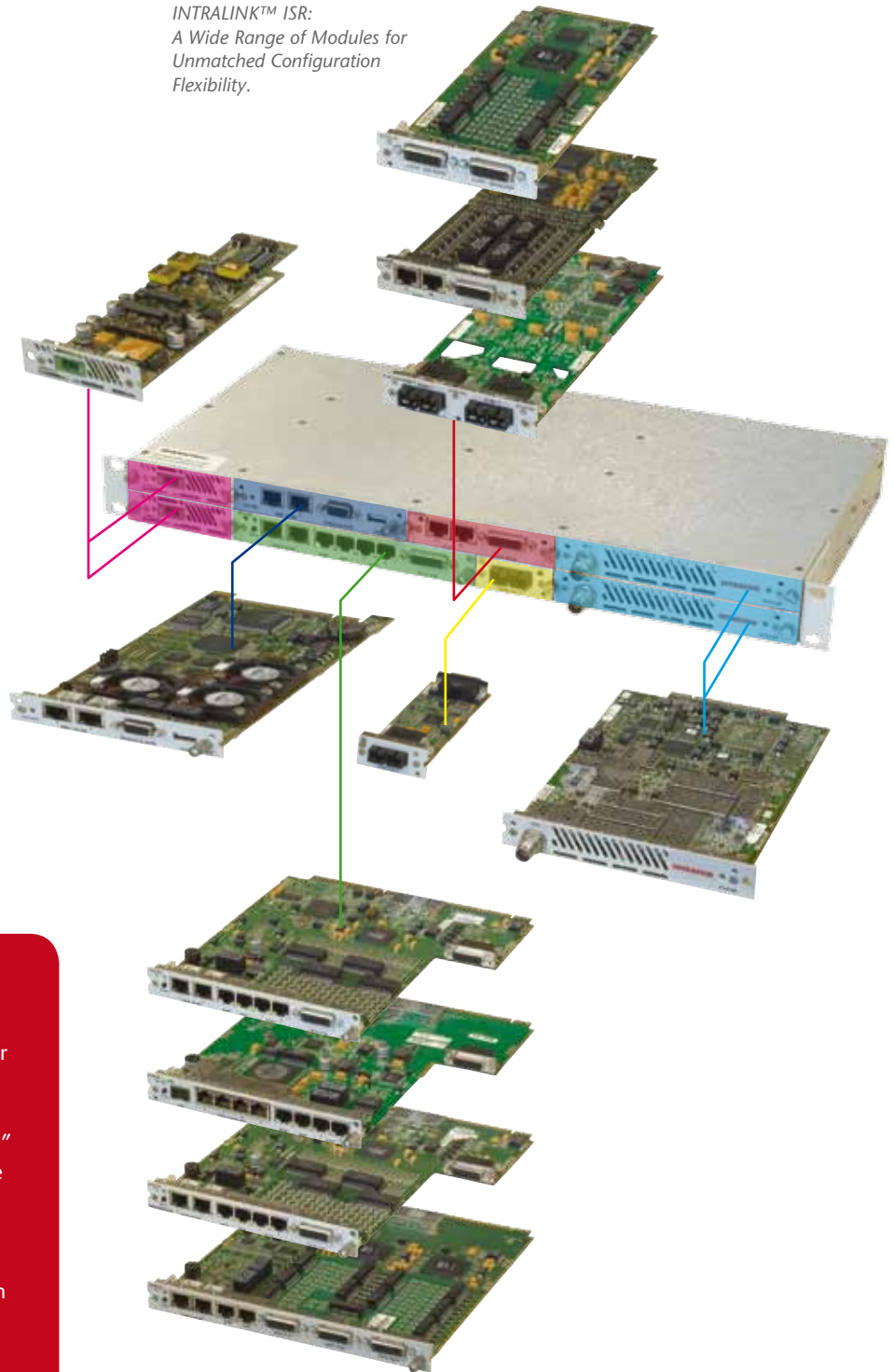
Its rich features (Ethernet QoS, integrated add/drop multiplexer, native SDH transmission, etc.), allow the realization of complex network architectures.

Regarding the management of INTRALINK™ systems over existing third-party equipment, INTRACOM TELECOM's i-converter assures interoperability with multiple vendors⁽¹⁾.

INTRALINK™ ISR Indoor Unit

- Modular & compact (1RU)
- Native Ethernet and native TDM solution
- Cost-effective design with hot-swappable modules
- Pay-as-you-grow capacity expansion
- Ethernet QoS
- Single-chassis configurations with two modems:
 - 1+1 (HSB / FD / SD)
 - 2+0 East / West, for repeater stations or ring deployments
 - 2+0 East / East, for maximum traffic throughputs
- XPIC (Cross-Polarization Interference Cancellation)
- Embedded add/drop multiplexer
- 256QAM
- Up to 56 MHz radio channel

INTRALINK™ ISR:
A Wide Range of Modules for
Unmatched Configuration
Flexibility.



Best fit for

- Mobile 3G / 2G / CDMA and WiMAX operators needing cost-effective backhaul for their networks
- Enterprises and university campuses needing "always-on" IP connectivity for their private networks (PBXs, LANs, etc.)
- Public sector organizations, utility companies, banks, etc. needing to rapidly deploy own resilient & backup networks in underserved areas, or in areas lacking wireline infrastructure

(1) For interoperable equipment, please contact INTRACOM TELECOM.

INTRALINK™ ODU-CF Radio Unit

- Integrated antenna up to 1.8 m
- High-power, high-performance
- Compact & lightweight for easy installation
- Universal – any capacity, any channel size, any traffic type
- Complete homogeneous family (from 6 GHz to 38 GHz)
- Robust, environmentally-hardened housing
- Integrated symmetrical or asymmetrical couplers for protected link scenarios (1+1 HSB, 1+1 FD)
- Leading 120 dB system gain



ODU-CF Radio Unit with integrated antenna

Highlights

- High transmission rates – up to 355 Mbit/s net throughput, upgradeable to 710 Mbit/s (over a single 56 MHz channel with XPIC)
- Diversity of channel sizes (3.5 MHz to 56 MHz)
- Robust transmission – 120 dB system gain
- Hitless radio switching capability
- Adaptive transmit power control to enable dense network deployments
- High capacity agility from a single 1RU indoor unit:
 - Native TDM & native Ethernet
 - Options for TDM capacity: 2 x E1 to 63 x E1
 - Options for Ethernet capacity: from 2 x FE to 4 x GbE
 - Up to 4 x STM-1 (VC-12)
 - Up to 63 x E1 ports for PDH traffic
- Software-selectable modulation – QPSK / 16QAM / 32QAM / 64QAM / 128QAM / 256QAM – for spectral efficiency and adherence to worldwide regulatory emissions guidelines
- Internal add/drop multiplexer for SDH ring configurations
- Rich-featured Ethernet functionality
 - Up to 16 user-defined VLANs
 - Transparent pass of VLAN-tagged frames
 - Tagging of ingress frames / untagging of egress frames
 - Q-in-Q double-tagging
 - Support of Jumbo frames (4000 / 9728 bytes)
- State-of-the-art network management (uni|MST™)

INTRALINK™ IDR-LC Indoor Unit

- Cost-effective compact (1RU) solution for network edge deployments and low cost per bit
- Legacy TDM & Ethernet backhaul – up to 34 Mbit/s capacity
- Seamless integration to 3G / 2G networks
- Protected 1+1 link configurations (HSB / FD / SD)

IDR-LC 1+0 indoor unit



IDR-LC 1+1 indoor unit



Managing INTRALINK™ Networks

The uni|MS™ Unified Management Suite is a state-of-the-art solution for deploying, supervising and managing contemporary telecommunication networks. It is a carrier-class Element, Network and Service management platform for all INTRACOM TELECOM wireless and wireline products (access, transmission and aggregation). Upon request, third-party products can also be managed through easy integration.

The mediation with the managed elements of the network is implemented through add-on drivers, for applying management functions, such as configuration changes, performance counters collection, alarms (traps) collection, service provisioning, inventory collection, and others.

uni|MS™ provides convergent service provisioning capabilities addressing the need for automated service provisioning across multi-vendor networks and diverse IT environments.

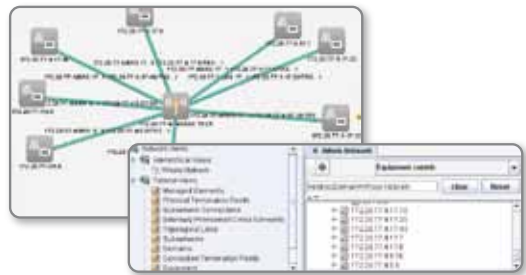
Key Characteristics

- Common management platform for all technology domains and associated services (WiMAX, Wireless transmission, xDSL, etc.)
- Simplified end-to-end provisioning – service agnostic workflow (BPEL) and a design environment, for realizing rapid service provisioning
- Sub-network Connections Management – circuits creation with powerful wizards, alarm correlation and impact analysis
- High system availability (24x7) and fault-tolerant operation through Server redundancy
- Advanced security features – hardened operating system ensures compliance to strict NOC security guidelines with fine-grained users, roles & privileges
- Standardized northbound interfaces for easy integration with third-party systems

End-to-End Network Management

uni|MS™ enables end-to-end management – network deployment, provisioning, real-time monitoring, testing – all through powerful embedded tools:

- “Just define the two end points to connect” – simple connection setup through user-friendly wizards
- End-to-end automatic connectivity – uni|MS™ automatically creates the required connections based on available connection termination points and available physical termination points



Why INTRACOM TELECOM



One-stop Shop:

- Own end-to-end radio access & backhaul solutions
- Proven integration & interoperability
- Own end-to-end network management system

Established Wireless Vendor:

- Growing and continuous presence for a variety of access and transmission solutions
- Growing brand name recognition for own PtMP solutions

Recognized for Service Excellence:

- Extensive implementation track record
- Specialized & highly experienced personnel
- Consulting, design, implementation & support
- Commitment to adding customer value

Continuous Innovation:

- Innovating in the wireless access and transmission field for over 15 years
- Successful development and deployment of PtP and PtMP systems with numerous operators in Europe, the Middle East, the USA and the CIS
- Investing heavily on the continuous evolution of its own wireless product lines
- Adopting latest standards and state-of-the-art technologies to deliver wireless solutions that best fit customer current and future needs



About INTRACOM TELECOM

INTRACOM TELECOM is an international telecommunication systems vendor operating in Eastern Europe, the Middle East & Africa, Russia, the CIS and Asia-Pacific. Over 100 customers in more than 50 countries choose INTRACOM TELECOM for its state-of-the-art products and solutions. INTRACOM TELECOM has 2,400 employees, operates subsidiaries in 16 countries and is amongst the largest European companies leading in R&D investments. Since June 2006, INTRACOM TELECOM is controlled by JSC SITRONICS (Russia) with 51%. JSC SITRONICS is the technology subsidiary of JSFC SISTEMA, a leading diversified holding company in Russia and the CIS. INTRACOM HOLDINGS Group (Greece) retains a 49% stake.

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