

E-Band & MW Radio Synergy Addresses Capacity & Availability Issues of 4G/5G Wireless Backhaul

Summary

Network Area

- Ultra-high capacity mobile backhaul

Architecture

- MW Point-to-Point
- mmWave Point-to-Point

Solution

- UltraLink™-GX80
- OmniBAS™-BX (18 GHz)
- Dual-Band Antenna



Intracom Telecom's Dual-Band solution

Wireless Backhaul for Future Networks

Backhaul is a key component of the overall mobile network RAN architecture and wireless transport is the dominant technology for this function in most parts of the world. Traditional MW radios (6-42 GHz) can now offer Gigabit+ capacity, while new wireless technologies, operating in higher frequencies, may offer an order of magnitude more.

E-Band in Mobile Backhaul

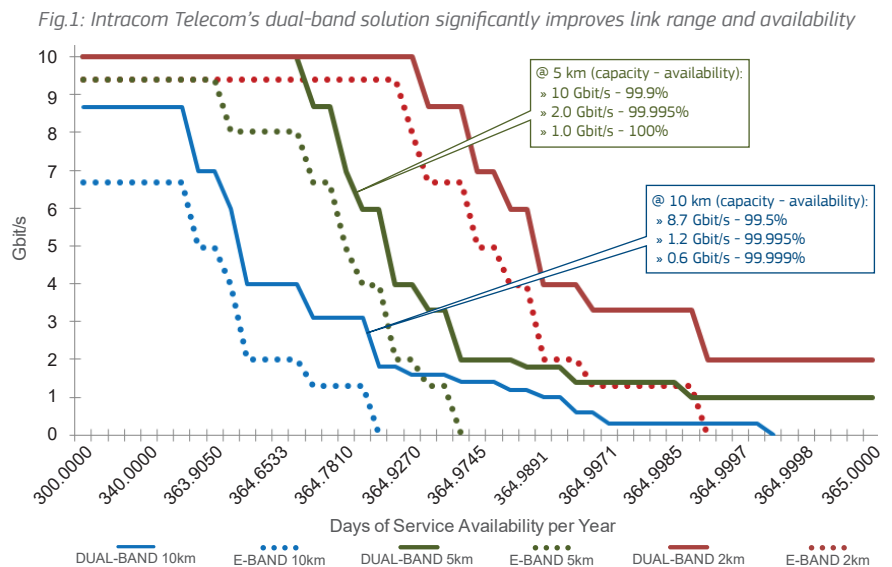
A significant development in the field of wireless technology is the use of the 71-76 / 81-86 GHz band, commonly called E-Band. E-Band radios are compact, fully outdoor, all-in-one devices, which can now offer capacities up to 10 Gbit/s over link ranges of a few kilometres with minimal hardware configuration (1+0). Furthermore, regulators worldwide price the wide channels of the E-Band spectrum favourably. By employing E-Band technology in their backhaul network, operators stand to realize TCO reduction, while ensuring future-proof capacity. Consequently, many operators are upgrading their RAN networks by installing E-Band radios in small-range backhaul links (<4 km), especially in urban areas.

The Limited Range vs. Capacity Challenge

Operators would like to use E-Band radios in even longer links – 10 km or more – but the physics of signal propagation in such high frequencies imposes availability restrictions, which do not meet their carrier class requirements. A way to deal with this shortcoming is to seamlessly combine two radios, one E-Band and one MW, to form a single equivalent logical link. In this way, operators can exploit the E-Band radio multi-Gigabit capacity for the majority of operating time, while relying on the higher availability capability of the lower-frequency MW radio to maintain link operation to carrier class standard.

Getting the Best of Both Worlds

Intracom Telecom addresses the operator need for ultra-high capacity and carrier grade availability with a combination of all-outdoor MW and E-Band radios enabled with enhanced Radio Link Aggregation (eRLA) functionality, along with a novel single dual-band antenna that operates in both MW-XPIC and mmWave frequencies. This allows implementing an enhanced configuration with minimal hardware and complexity.



Key Enablers of the Dual-Band Solution



Industry-Leading All-Outdoor MW Radio

OmniBAS™-BX is the new generation of all-outdoor radios of the OmniBAS™ PtP MW family, supporting 112 MHz channels, XPIC and RLA operation with no single point of failure. Combined with leading 4096-QAM modulation and robust ACM operation, it offers true radio capacity of 2.2 Gbit/s. High-speed network connections are made easy with its 2.5 Gbit/s fiber port interface. OmniBAS™-BX has an ultra-slim and low-weight mechanical design and it will be available at 13, 18 and 38 GHz.



Innovative E-Band Radio for Next-Generation 5G Backhaul & Fronthaul

UltraLink™-GX80 is a compact all-outdoor radio operating in the entire E-Band (71-76 / 81-86 GHz) and is ideally suited for use in demanding applications requiring ultra-high capacity and extended range. It achieves throughputs of up to 10 Gbit/s full duplex, while offering a complete set of networking and packet synchronization features. The UltraLink™-GX80 traffic interfaces include 1 x GbE (RJ45) and 2 x 1GbE/10GbE (SFP/SFP+). An additional SFP+ interface is available for connection to the OmniBAS™-BX to implement advanced RLA functionality for increased link capacity and reach.



Dual-Band Antenna

The solution uses a dual-band antenna that operates in both 18 GHz (MW) and 71-76 / 81-86 GHz (E-Band) frequencies. The MW part incorporates ports for vertical and horizontal polarizations to enable integrated XPIC mode. This antenna is specially designed to provide numerous advantages to operators, as follows:

- 50% less logistics and handling.
- 50% less installation space in the pole and therefore 50% OpEx savings.
- 50% less installation and alignment time, since a single antenna needs to be installed.



Dual-Band Software Functionality

Dual-band link operation – MW and E-Band – is enabled through enhanced Radio Link Aggregation (eRLA) functionality that resides in the UltraLink™-GX80 radio. Network traffic enters through the latter's 10GbE interfaces. Part of the traffic is dynamically relayed to an OmniBAS™-BX radio through the 2.5 Gbit/s SFP port, and subsequently shared over a high-capacity interconnection bus, toward the second OmniBAS™-BX radio to support both polarizations for XPIC operation.

The eRLA functionality distributes traffic optimally between the available radio paths, E-Band and MW, based on the instant bandwidth availability of each path, as determined by ACM algorithms, as well as the assigned priorities of the various traffic flows.

High-priority traffic is always forwarded to the highest-availability radio path. With eRLA, the two radio paths behave like one logical air link with total capacity of up to 10 Gbit/s (full duplex).

About Intracom Telecom

Intracom Telecom is a global telecommunication systems vendor operating for over 40 years in the market. The company has become the benchmark in fixed wireless access and it successfully innovates in the 5G/4G wireless fronthaul, backhaul and small-cell SON backhaul international arena. Intracom Telecom offers a comprehensive revenue-generating software solutions portfolio and a complete range of ICT services, focusing on IoT, SDN/NFV, Big Data analytics & data-driven intelligence, and Smart City solutions. It also addresses the Energy & Utilities industry, emphasizing on smart metering & end-to-end IT solutions. Intracom Telecom has extensive know-how and a proven track record serving more than 100 renowned customers in over 70 countries. The company operates subsidiaries in Europe, Russia/CIS, the Middle East and Africa, Asia and North America.