INTERVIEW

INTRACOM TELECOM GROUP NEWSLETTER | ISSUE 44



E-Band, Multiband, for Network Resiliency

Interview with Stephen Hon, Xiber CEO

> PAGE 8

Rethinking Fixed Wireless Access: Why Purpose-Built mm-Wave Systems Have the Advantage

> PAGE 10

FWA Service Qualification: A Strategic Tool for Network Growth

> PAGE 14

Enhancing Wireless Transmission Performance by Deploying Licensed MW and Unlicensed Radios Dual Band Links

> PAGE 16

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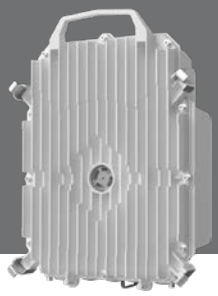
UNVEILING 15 GBPS E-BAND SOLUTION IN THE USA

The UltraLink™-GX80 Advanced, Intracom Telecom's 15 Gbps E-Band radio, has become available in the United States to meet growing wireless transport capacity demands.

Operating in the FCC-regulated 71-76 GHz and 81-86 GHz spectrum bands, UltraLink™-GX80 Advanced provides up to 15 Gbps full-duplex throughput over a single 2000 MHz channel. The platform operates with high spectral efficiency and enhanced system gain, enabling longer and more stable E-Band links for 5G backhaul, fronthaul, enterprise connectivity, and fiber extension deployments.

The solution can be deployed standalone or combined with lower-frequency microwave radios (5-23 GHz) in an all-outdoor Dual Band configuration, extending link availability and range while maintaining ultra-high capacity. All-outdoor installation helps service providers optimize equipment, cabinet space and powering costs.

UltraLink™-GX80 Advanced supports advanced Carrier Ethernet networking and is software-upgradable to enable IP/MPLS functionality. Through its multiple high-capacity interfaces, it is seamlessly integrated in modern network infrastructure, reducing network complexity and TCO.



ULTRALiNK-GX80 advanced

SHOWCASING THE FUTURE OF WIRELESS CONNECTIVITY

Intracom Telecom showcased its latest wireless connectivity and AI-driven network technologies at MWC Barcelona 2026. At its stand, the company presented its next-generation, AI-driven multi-gigabit Fixed Wireless Access (FWA) platform, designed to deliver fiber-class performance to residential and multi-dwelling environments. The solution offers speeds of up to 2.5 Gbps and coverage extending beyond 13 km, enabling operators to expand broadband services faster and more cost-effectively.



The company also demonstrated advanced 5G backhaul solutions, including multi-gigabit microwave transmission, ultra-long-range E-Band links of up to 40 Gbps, and Intelligent Beam Tracking antennas for enhanced network performance.



A key highlight was uni|MS™ AI, an AI-enabled platform supporting autonomous network operations through intelligent diagnostics, predictive analytics, proactive interventions and automated workflows. The solution helps communications service providers improve service quality, accelerate issue resolution and reduce operational costs.

ADVANCING AI & DATA FOR 6G

During the EuCNC & 6G Summit 2026 last June in Spain, the workshop "Data Platforms for Advanced AI-native Networks: 6G Data Space, DataOps, MLOps, Dataset Generation & Curation", co-organized by Intracom Telecom's Dr. Vasileios Theodorou and ATHENA Research Center's Prof. Christos Verikoukis, brought together leading SNS-JU projects, researchers, industry experts, and open-source communities to discuss how Europe can transform innovations in AI, DataOps, Data Spaces, and Autonomous Networks into operational platforms for future 6G systems. As Technical Manager of the SNS flagship EU project 6G-DALI and leader of the ETSI OpenOP initiative, Intracom Telecom contributed to shaping the discussion around trusted data ecosystems, AI-native telecom platforms, and the convergence of research, open source, and standardization.



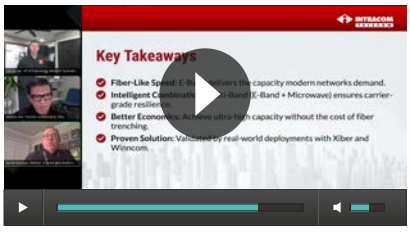
POWERING SMARTER, FASTER BROADBAND NETWORKS

Earlier this year, Intracom Telecom participated in Connect(X) 2026 in Florida, USA, showcasing its latest solutions designed to help ISPs stay ahead of evolving connectivity demands. The company presented its multi-gigabit FWA portfolio for homes and multi-dwelling units, delivering high-speed broadband through WiBAS™ G5 solutions. Extended-reach dual-band solutions, including UltraLink™-GX80 and OmniBAS™-BX, demonstrated network extension capabilities with performance of up to 15 Gbps over long links. Intracom Telecom also highlighted uni|MS™, its AI-enabled network lifecycle management platform, which streamlines multi-technology networks through automation, integrated radio planning and a unified user interface (UI), supporting more efficient network operations and smarter service delivery.



WEBINAR SERIES: "TECH TALKS BY INTRACOM TELECOM"

Intracom Telecom, in partnership with our U.S. distributor Winncom Technologies, hosted the third episode of its "Tech Talks by Intracom Telecom" webinar series, titled "Breaking the Limits of Wireless Connectivity", bringing together industry experts to explore the latest advances in wireless backhaul.



The episode focused on how E-Band and Microwave technologies can deliver fiber-class capacity over longer distances, offering operators a flexible alternative where fiber deployment is challenging. The panel examined how the two technologies complement each other to extend network reach, while also sharing insights from real-world deployments and discussing their role in building high-capacity, carrier-grade networks.

The discussion featured Stephen Hon, President & CTO of Xiber, and Kyle Barnes, VP of Engineering at Winncom Technologies, alongside experts from Intracom Telecom. Together, they explored how these technologies are supporting today's 5G networks and helping operators prepare for future connectivity demands.

GSMA JOINS THE OPENOP ECOSYSTEM

A significant milestone for Intracom Telecom and the ETSI OpenOP community, as GSMA, representing over 1,000 mobile operators and ecosystem players worldwide, joins the initiative. Since its launch within the EU SNS Flagship SUNRISE-6G project, the OpenOP initiative led by Intracom Telecom and chaired by Dr. Vasileios Theodorou, Head of Research Collaboration, has expanded from 8 to 26 members, including major operators such as BT Group, Orange Romania, OTE Group and Altice Group. This milestone further advances OpenOP Release 1 and strengthens collaboration on open architectures, Telco Cloud innovation and 6G experimentation within the framework of ETSI and a growing ecosystem of 6G EU Projects.

↘ https://oop.etsi.org/

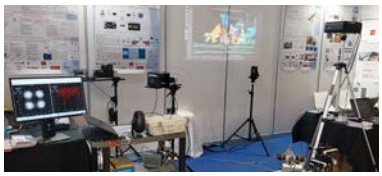
TERRAMETA - FINAL DEMONSTRATIONS

As the 6G SNS project TERRAMETA approached its final phase, Intracom Telecom participated in three major demonstrations, at Instituto de Telecomunicações in Lisbon, at CEA Leti in Grenoble and at EuCNC in Malaga.



During the Lisbon campaign at the end of 2025, the project progressed to a full application-level demonstration, integrating D-band and 300 GHz radio front-ends, baseband units, multiple RIS prototypes, and Dell's industrial robotics use case into one end-to-end platform. In the industrial scenario, a mobile robot streamed high-bandwidth 3D sensor data to an edge server for real-time reconstruction, visualization, and AI-based perception, a characteristic example of "factory of the future" applications that will require multi-Gbps throughput, sub-ms latency, and resilient operation.

At the end of March 2026 at CEA Leti Labs in Grenoble, a joint experiment between CEA-Leti and Intracom Telecom was performed, where a Point-to-Point link at 42m, operating in the D-band (140 GHz) was demonstrated with real time processing. The CEA Leti-provided RF chain was composed of D-band up/down converters and custom transmitarray-based (TA) planar lens as antennas, with gains up to 32 dBi. The dual-modem baseband units from Intracom Telecom offered channel bandwidth up to 2 GHz, generating I/Q signals up to 512-QAM reaching up to 30 Gbps. The tests achieved maximum throughput of 6.5 Gbps for the case of 32-QAM.



Finally, at the EuCNC 2026 in June 2026, the project showcased a dual application live demonstration, where both the industrial robotics use case and a telecom use case based on O-RAN, streamed traffic through a D-band link reflected on an RIS. The setup used baseband processing from Intracom Telecom, D-band RF front-ends and transmissive RISs from CEA Leti, reflective RISs from NOVA University, and an industrial robot, an edge server, an O-CU and an O-DU from Dell. Further, the team managed to setup and showcase a 42m point-to-point link operating in the D-band.

On all three occasions, Intracom Telecom's baseband units, a key part of the experimental setup, enabled the project to achieve major milestones such as an 8.52 Gbps throughput at 128-QAM at a 140 GHz uplink link, simultaneously with a 300 GHz downlink at 2.09 Gbps, where in both links, RISs were used to redirect the beam. These final demonstrations provided valid proofs for the concept of RIS-assisted THz links in applications that will exploit in the future, the abundant bandwidth available in THz frequencies.



INTRACOM TELECOM AT NATO BRIEFING IN BRUSSELS

Intracom Telecom participated in the 1st NATO Briefing on the Hellenic Defence Ecosystem, held at NATO Headquarters in Brussels earlier this year. The workshop convened over 100 participants from companies, research institutions, and government organizations, providing insights into NATO's innovation, collaboration, and operational frameworks. The event offered a valuable opportunity for Intracom Telecom to engage with industry peers, explore collaboration opportunities, and strengthen our role in the defence and security sector, reflecting company's ongoing commitment to innovation, partnerships, and contributing to collective technological development within the Hellenic defence ecosystem.

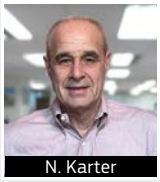


STRENGTHENING OUR LEADERSHIP TEAM


N. Pappas


T. Siamani

Intracom Telecom has strengthened its international management team with three strategic appointments supporting the company's continued growth and global expansion. Nick Pappas joined as Group Chief Financial Officer (CFO), bringing nearly 20 years of experience across finance, strategy and transformation in the telecom, consulting and FMCG sectors. Thalia Siamani assumed the role of Chief Legal Officer (CLO), contributing extensive expertise in corporate and commercial law, regulatory compliance and multinational legal frameworks.


N. Karter

In the United States, Nick Karter was appointed Senior Vice President at Intracom Telecom USA. Combining strategy, business development and engineering expertise, he will focus on strengthening customer relationships, advancing strategic engagements and supporting the company's technology vision as the industry moves towards 6G. Together, these appointments reinforce Intracom Telecom's capabilities and international growth ambitions.

ETSI OPENOP PLENARY AND HACKFEST

In July, Intracom Telecom hosted the ETSI OpenOP Plenary Meeting at its headquarters in Greece, bringing together the OpenOP community to review progress since Release 1 and define the roadmap for the next phase of the project.

As coordinator of OpenOP, Intracom Telecom, under the leadership of Dr. Vasileios Theodorou, OpenOP Chair and Intracom Telecom's Head of Research Collaboration, continues to drive the vision of an open, federated, AI-native and data-driven Telco Cloud platform, bridging research, open source and standards to accelerate innovation in future networks.

Moreover, the community continued with the OpenOP Hackfest, a hands-on event focused on integration, validation and experimentation across OpenOP components and partner platforms, focusing on the newly launched Data Lab module with contributions by the SNS flagship EU project 6G-DALI on 6G Data & AI, technically managed by Intracom Telecom.

ADVANCING MULTI-GIGABIT CONNECTIVITY FOR ISPS

Earlier this year, Intracom Telecom participated as a Platinum Sponsor at ISPAMERICA 2026 in Atlanta, showcasing its latest wireless solutions for Internet Service Providers (ISPs). At its booth, the company presented its portfolio of multi-gigabit wireless transport solutions, including the latest UltraLink™-GX80 Advanced, alongside the field-proven UltraLink™-GX80 and OmniBAS™-BX. Visitors also explored the company's multi-gigabit FWA solutions for homes and multi-dwelling units, including WiBAS™ G5 Smart, WiBAS™ G5 GigaConnect and WiBAS™ G5 MDUConnect. The showcased extended-reach dual-band solutions deliver up to 15 Gbps over long links, enabling ISPs to expand coverage and enhance network performance. Intracom Telecom experts also engaged with visitors on tailored solutions and financial options to support their network investments.



SUPPORTING GREECE'S WISP COMMUNITY

The 2nd WISP Forum 2026, held in Athens, Greece, gathered industry stakeholders to explore innovative Fixed Wireless Access (FWA) technologies that can help Greek Wireless Internet Service Providers (WISPs) expand coverage, enhance network performance and unlock new revenue opportunities.



Representing Intracom Telecom, Ioannis Tenidis, Marketing Director of Wireless Network Systems, highlighted how international best practices can be effectively adapted to the Greek market. He also presented how the company's wireless broadband solutions are designed to address the evolving needs of Greece's telecommunications transformation. Through its participation, Intracom Telecom reaffirmed its commitment to supporting the Greek WISP ecosystem with advanced, locally relevant technologies that enable reliable, high-performance connectivity.

MAKING A POSITIVE IMPACT

This Easter, Intracom Telecom employees across Greece once again demonstrated the power of solidarity by enthusiastically supporting two charitable organizations, ELEPAP and The Smile of the Child, through their Easter bazaars hosted at our premises.



ELEPAP's mission is to provide lifelong support and access to rehabilitation, education and care for children and adults with disabilities, helping them take their own "Life Steps" toward greater independence and inclusion. The Smile of the Child works nationwide, 24/7, to protect children from violence, respond to cases of missing children, address health and poverty-related needs, and support children and families in crisis.



Employee participation was truly remarkable, with colleagues embracing the opportunity to purchase Easter gifts and seasonal items turning these bazaars into meaningful opportunities to contribute, make a positive difference and celebrate the spirit of giving together.

INTERVIEW

E-BAND, MULTIBAND, FOR NETWORK RESILIENCY



Stephen Hon, Xiber CEO

XIBER

In the competitive environment of ISPs across USA, Xiber's CEO Stephen Hon explains how nextgen E-Band and multiband wireless transport architectures enable business objectives, providing faster and resilient networking.

Stephen, which are the key network challenges Xiber faces in its continuous effort to remain a leading ISP in the Midwest, for service quality, coverage, and speed of connection?

Stephen Hon » The honest answer is that we operate in a market that rewards two things simultaneously, and they often pull in opposite directions: best-in-class price-to-performance on one hand, and a residential-grade subscriber experience on the other.

Within that operating model, the recurring challenges fall into three categories. First, sustaining high-capacity links at meaningful distances. The physics of millimeter-wave is unforgiving, and the difference between a vendor that engineers for the edge of the link budget and one that engineers for the data sheet is enormous. Second, finding vendor partners with genuine product depth and a credible development roadmap, rather than a single hero product that ages out in three years. Third, support: when a link goes down at three in the morning, the quality of the support organization is, candidly, the entire vendor relationship.

When choosing Intracom Telecom, what stood out most?

S. Hon » Three things, in this order. First, product excellence, and not in the marketing sense, but in the way the radios actually behave under stress. ***We do not buy on spec sheets; we buy on how a link performs in week six, in a thunderstorm, on a tower that has settled an inch since installation.*** Second, the development track. Intracom Telecom is not a single-product company. They have demonstrated the willingness to invest in successive generations of E-Band, dual-band, and multiband platforms, which tells me they intend to be in this business in ten years. Third, the support organization, specifically U.S.-based engineering support that understands our network rather than reading from a script. That last point is genuinely rare in this market.

What makes an ISP decide to use standalone vs. MBL configuration?

S. Hon » It comes down to a series of trade-offs that have to be evaluated link by link, not as a network-wide doctrine. The first question is whether the link is part of a ring topology that already has wireline diversity. If the link is itself the resilience layer for a market, multiband becomes far more attractive because it preserves throughput under rain fade rather than failing over to a degraded mode. The second question is the SLA committed to the end customer. A 99.99% SLA on a 10-kilometer hop in a humid Midwestern summer is a different engineering problem than a 99.9% SLA on the same hop. Multiband, by combining the capacity of E-Band in clear conditions with the resilience of microwave under fade, lets us write SLAs we can actually defend.

What are the key factors that influence your decision?

S. Hon » Beyond the obvious technical and commercial factors, two things weigh heavily for me.

Spectrum strategy. The regulatory environment around 70/80 GHz, 60 GHz, and traditional licensed microwave bands is not static, and the cost and availability of spectrum varies dramatically by market and over time. A vendor whose product portfolio gives us flexibility across bands is, in effect, an insurance policy against regulatory change.

The lifecycle of the network management system matters just as much. We will live with whatever NMS we standardize on for the better part of a decade, and the difference between a usable NMS and a frustrating one compounds across thousands of operator-hours. ***This is one of those areas where the procurement decision looks small at the time and turns out to be one of the most consequential choices the company makes.***

What ultimately gave you confidence in choosing Intracom Telecom's solution?

S. Hon » Confidence is the right word, because in vendor selection at this scale you are not buying a product so much as betting on an organization. The decision came down to a constellation of factors rather than any single feature, and it is worth naming them honestly.

On the technical side: the online RF planning tools, dual-band antenna support, and the willingness to integrate third-party microwave radios in multiband configurations. That last point matters more than it might appear. It signals a vendor confident enough in its own platform to play well with others, rather than trying to lock the customer into a closed ecosystem.

On the commercial side: meaningful product availability in the United States, genuine reach across the markets we operate in, and price-to-performance that is competitive against vendors several times Intracom Telecom's size. Combined with U.S.-based technical support that has, in our experience, actually answered the phone, this matters enormously to a company that runs lean.

On the strategic side: continuity in new product delivery, factory ownership, ongoing R&D investment, and the uniMS™ network management platform. ***Factory ownership in particular is something the industry has, in my view, undervalued for a generation***. The supply-chain shocks of the last several years have made it extremely clear that vendors who actually own their manufacturing have a structural advantage in delivery, quality control, and long-term roadmap credibility. We chose Intracom Telecom in part because we wanted that advantage on our side of the table.

After deployment, what changed in your network?

S. Hon » The most important change is one that does not show up directly on a metrics dashboard: confidence. We now have empirical confidence in E-Band performance at distances that, three or four years ago, would have required a microwave link or a fiber dig. That confidence has translated into real, durable architectural decisions. We are designing greenfield expansions today around assumptions about wireless capacity and reliability that we simply would not have made in 2022.

If I had to summarize the operational result in one sentence: ***we are relying less on traditional microwave under most conditions, not because microwave has failed us, but because the new generation of E-Band has earned the role microwave used to play***.

> When a link goes down at three in the morning, the quality of the support organization is the entire vendor relationship

What has been your experience integrating Intracom Telecom into your L2 network? Have you used any specific tools, such as Radio Link Monitoring?

S. Hon » Integration has been, frankly, smoother than I expected. The Layer 2 behavior is clean and standards-compliant, which is not always a given in this segment of the market. Some radios technically support carrier Ethernet but introduce subtle behaviors at scale that create real operational friction. We have not encountered that with Intracom Telecom. On the monitoring side, we lean heavily on link-level instrumentation as part of our broader observability stack. We pull telemetry into our network monitoring infrastructure alongside everything else: routers, optical transport, power systems. Our operating philosophy is that the network is a single system, not a collection of independently monitored components. Intracom Telecom's radios have integrated cleanly into that model, which is exactly the outcome we wanted.

Beyond the technology itself, how important is having a vendor that acts as a long-term partner?

S. Hon » It is, I would argue, more important than the technology itself, and I do not say that lightly. Technology decisions in this industry get re-litigated every five to seven years as new generations of equipment come to market. The vendor relationship, if it is a good one, persists across those cycles and becomes the institutional memory of why certain architectural choices were made and how they have evolved.

The qualities I look for in a long-term vendor partner are straightforward to name and difficult to find together: trust, by which I mean predictable behavior under stress; responsiveness, particularly in the moments when something has gone wrong; engineering depth, so that the conversation can move past the data sheet to the actual problem; and a credible long-term roadmap, so that we are not reinventing our network architecture every time we pick up the phone.

When all four are present, the vendor relationship stops being a procurement function and starts being a strategic asset. ***That is what we have been building with our best partners, and it is what we look for in every new relationship we enter into***. ■

ARTICLE



RETHINKING FIXED WIRELESS ACCESS: WHY PURPOSE-BUILT MM-WAVE SYSTEMS HAVE THE ADVANTAGE

DR. CHARALAMBOS PAPANASTASIOU
Principal Product Manager, Wireless Network Systems

PURPOSE-BUILT MM-WAVE FWA VS 3GPP-BASED FWA

Purpose-built millimeter wave (mm-Wave) Fixed Wireless Access (FWA) systems are increasingly viewed as a superior alternative to 3GPP-based 5G FWA for high-capacity broadband delivery. While 3GPP technologies were originally designed for mobile networks serving smartphones moving across wide geographic areas, purpose-built mm-Wave FWA platforms are optimized specifically for fixed broadband. The result is significantly higher spectral efficiency, lower network overhead, and better economics for dense broadband deployments.

The main weakness of 3GPP-based FWA is spectral efficiency. In mobile networks, a large percentage of radio resources is consumed by mobility management, signaling, synchronization, handovers, random access procedures, paging, and support for devices operating at different speeds and radio conditions. These features are essential for mobile phones but largely unnecessary in a fixed wireless environment where customer terminals remain stationary.

Purpose-built mm-Wave FWA systems eliminate much of this overhead. Because subscriber units are fixed and precisely aligned, the network can use highly directional beams with stable modulation schemes and minimal control signaling. This allows a much larger percentage of the available spectrum to be devoted to user traffic rather than protocol overhead. In practice, purpose-built systems can achieve spectral efficiencies several times higher than those typically seen in 3GPP 5G deployments.

Another limitation of 3GPP technology is its dependence on wide-area cellular architecture. 5G standards are designed to guarantee coverage continuity and mobility across large networks, forcing operators to compromise between coverage, capacity, and latency. Purpose-built FWA systems, by contrast, are engineered for point-to-multipoint broadband delivery in specific sectors or neighborhoods. They can therefore use optimized frame structures, deterministic scheduling, and highly asymmetric traffic patterns tailored to broadband consumption, where download traffic dominates.



MM-WAVE SPECTRUM UTILIZATION AND BEAMFORMING ADVANTAGES

This difference becomes especially important in mm-Wave spectrum bands such as 24 GHz, 28 GHz, 39 GHz, and above. Millimeter wave (mm-Wave) spectrum offers enormous bandwidth, but propagation distances are not extremely long and link budgets are highly dependent on beamforming precision. Purpose-built systems take advantage of this by using narrow beams, GPS synchronization or Packet Time Protocol from the network, and static link optimization to maximize bits-per-second-per-hertz performance. Many proprietary systems also support coordinated multipoint transmission and interference suppression techniques that are difficult to implement efficiently in standardized 3GPP environments.

The economics also favor purpose-built FWA in dense broadband scenarios. Because of lower spectral efficiency, 3GPP networks require more spectrum and more cell sites to deliver the same aggregate throughput. This increases capital expenditure, power consumption, and tower density. In urban environments where spectrum costs are high, poor spectral efficiency directly translates into reduced profitability.

In addition, 3GPP systems often inherit complexity from the broader mobile ecosystem. Operators must maintain compatibility with evolving standards, handset ecosystems, roaming requirements, and multi-vendor interoperability. Purpose-built FWA systems are simpler because they are optimized for a single application: delivering fixed broadband. This allows vendors to innovate faster and tailor MAC-layer behavior, antenna design, and scheduling algorithms specifically for residential and enterprise internet access.

> Purpose-built mm-Wave FWA systems offer optimum spectrum utilization with maximum efficiency

LATENCY, DETERMINISM AND OVERALL EFFICIENCY

Latency consistency is another advantage. Since fixed systems operate with stable radio conditions and predictable traffic patterns, they can offer lower jitter and more deterministic performance than mobile-oriented 5G systems under heavy load.

Where the objective is maximizing capacity, spectral efficiency, and long-term broadband economics in mm-Wave spectrum, purpose-built FWA architectures are increasingly proving to be the more efficient and technically elegant solution. ■



WiBAS™ G5 GigaConnect+ terminal

WiBAS™ G5 Smart base station

ENABLING ALWAYS-ON BROADBAND CONNECTIVITY IN PUERTO RICO

How Carrier-Grade FWA Provides an Outstanding Broadband Experience

THE CUSTOMER

Neptuno is a leading Puerto Rico–based telecommunications and IT solutions provider, specializing in wireless and wireline (fiber) connectivity. The company delivers high-speed broadband, cloud, cybersecurity, and data center services to residential customers and enterprises. With over two decades of telecom experience, Neptuno covers all municipalities in Puerto Rico and has a strong focus on business continuity and reliability. Within a few years of its founding, it has become the largest wireless internet provider in Puerto Rico and has expanded its service offering across other islands (including Vieques, Culebra, USVI).

THE CHALLENGE

Puerto Rico presents unique connectivity challenges. Frequent hurricanes, mountainous terrain, and seismic activity can significantly impact traditional wireline infrastructure, resulting in costly repairs and service disruptions. To address these challenges, Neptuno sought to use its L2 band at 28 GHz (425 MHz of wireless licensed spectrum) to offer Gigabit service. In 2025, Neptuno enriched its network with WiBAS™ G5 Smart Base Stations and WiBAS™ G5 GigaConnect+ Terminal Stations to deliver up to 2000 Mbps download services to homes and businesses. This was a clear decision after extensively testing WiBAS™ G5 radio equipment in the field, under challenging environmental conditions. More specifically, Neptuno tested 5G NR-based solutions in addition to WiBAS™ and found that WiBAS™ outperformed all other offerings as it delivered higher capacity, longer range and more reliable service with practically no service interruptions up to 2 miles.

THE SOLUTION

WiBAS™ G5 is a purpose-built, millimeter-wave FWA (Fixed Wireless Access) system with superb RF performance optimized for fixed services. It offers fiber-class multi-gigabit capacity and QoS, and is exceptionally resilient to rainy environments. WiBAS™ G5 accommodates coreless technology based on flat Layer-2 access principles consistent with the architectures used by Internet Service Providers. Its design is simpler and less energy demanding than solutions that have to support the full mobility stack within the core.



WiBAS™ G5 uses Multi-User MIMO operation, with active antennas and beamforming / beam steering capabilities, for higher real-world speeds during peak hours and less “slow-down” when many users are active. This feature fundamentally optimizes efficiency, which is exactly what dense wireless access networks need.

The key characteristics of the WiBAS™ G5 system, comprising Smart Base Stations and GigaConnect+ Terminal Stations, include:

- **Market-leading performance:** 5.6 Gbps aggregate sector capacity at FR2 bands (mm-Wave).
- **Exceptional spectrum efficiency**: 28 bits/Hz/s in one sector, or 56 bits/Hz/s per typical 4-sector base station. Up to 2.4 Gbps download speed per end user.
- **Light weight & compact terminals**: easy installation in about 20 minutes.
- **Long-range of multi-gigabit services**: practical alternative to fiber deployments

In addition, WiBAS™ G5 is fully synchronized with the 3GPP timing profile, minimizing interference issues with 5G NR networks that can be deployed in the neighboring L1 band at 28 GHz.

Neptuno has also deployed Intracom Telecom’s uni|MS™ Network Lifecycle Management and Automation platform as part of the FWA solution. uni|MS™ offers advanced functionality for all network lifecycle phases: planning, rollout, optimization and maintenance. The uni|MS™ Radio Planner software is used to optimize the network design and support the automatic Service Qualification process. Zero-touch provisioning is also offered with the uni|MS™ SON Gateway plugin, supporting massive rollout, realizing error-free Terminal Station network entry and optimizing costs through the minimization of site visits and NOC engagement. ■

UNLOCKING GIGABIT ACCESS IN EVERY APARTMENT



WiBAS G5 MDUconnect

RELIABLE GIGABIT FWA FOR HOMES & MDUs

The **WiBAS™ G5 MDUConnect** solution features a rooftop-installed mmWave Terminal Station connected to a Base Station, with connections speeds exceeding the gigabit benchmark. The Terminal Station is connected to a G.hn Aggregator, located on the MDU rooftop or indoors, which redistributes the offered bandwidth through legacy coaxial or twisted-pair wiring to individual apartments. Compact G.hn CPEs at each apartment complete the chain, delivering Ethernet connectivity while enabling unified QoS management and reverse power feeding where applicable.

intracom-telecom.com

INTRACOM TELECOM

FWA SERVICE QUALIFICATION: A STRATEGIC TOOL FOR NETWORK GROWTH

STAVROS PAPAVLASOPOULOS
Head of Pre-Sales Software, Wireless Product Line Management

Fixed Wireless Access has become one of the fastest-growing broadband technologies. Network operators increasingly rely on FWA to monetize their infrastructure while extending broadband services to suburban and rural areas where fiber deployment remains economically challenging.

Fiber broadband offers high-capacity connectivity but requires the deployment of dedicated physical infrastructure, resulting in significant capital investment, lengthy rollout times, and complex installation processes. Even after infrastructure is in place, the delivered service quality may vary due to installation issues, in-building cabling limitations, infrastructure faults, or other operational constraints. Fixed Wireless Access (FWA) on the other hand provides a much faster and more cost-effective alternative. Its service availability and achievable performance, however, are determined by real-time network conditions such as radio coverage, signal quality, available spectrum, sector capacity, network load, terrain characteristics, and the customer's precise location. Especially in licensed mm-Wave FWA spectrum, it is important for the Network Operators to analyze all available factors and maintain service quality with minimum risk of failure.

This creates a common business challenge for FWA Network Operators: "*Can a new customer be really served at the requested location and if yes, does the acceptance of this new customer affect the experience of existing subscribers?*"

The Business Challenge

When a potential customer requests an FWA subscription, the operator typically needs to answer several questions:

» Is there LoS at the customer's location?

» Which service package can actually be guaranteed?

» Is there enough available capacity?

» How will this addition to the network affect existing users?

» What signal quality can be expected?

» Which is the best Base Station to serve the connection?

Answering these questions manually often requires engineering expertise and the use of different systems and tools. This slows customer acquisition and increases operational costs. Even worse, accepting customers without proper qualification may lead to installation failures, unnecessary site visits, network congestion, poor customer experience and finally possible customer churn.

THE SOLUTION

A modern platform for the management of expanded and multiservice FWA networks, throughout the entire network lifecycle, should transform the Service Qualification process into an instant response to a simple question. Using a specifically designed network lifecycle automation application, upon input by the user who needs only to specify the desired installation location, entering an address or providing GPS coordinates, the software engine evaluates in an instant the location using radio coverage predictions over the supplied terrain and clutter models, sector utilization and performance KPIs such as available throughput and commercially available service profiles. The result is a clear answer to the question if this customer can be served, along with the service profile(s) that can be offered. Such network lifecycle management does not merely determine whether Line of Sight exists. Instead, it evaluates whether the requested service can actually be delivered and with what installation prerequisites (location, equipment and antenna details). If coverage and capacity are sufficient, the customer can immediately be onboarded with the recommended service profile. This enables commercial teams to sell realistic service offerings. On the other hand, if the answer is negative the operator avoids unnecessary site visits and installation costs and may use this information to better plan network expansion.

Network Intelligence Behind the Decision

The management platform should be able to create a continuously updated representation of the current network, coming from the live data, and the future network, coming from the integrated RF Planning Tool. Actual data from the network such as number of active users, utilization

and sector load, throughput, RSSI and SINR, historical and busy hour statistics are combined with design data such as coverage prediction, propagation models, terrain and clutter information, antenna characteristics, expected performance and interference levels as well as sector boundaries all stored within its database. The Service Qualification decision is enhanced using smart algorithms that take into consideration specific facts and requirements. Priority templates determine what are the best options to serve the new customer. For example, Base Stations that operate in different bands/sub-bands or use different channel bandwidth can be automatically excluded from the selection list.

Link budget attributes such as environmental conditions (rain rates or other geoclimatic factors) can be used to reflect the actual area conditions and the expected connection and service reliability. Link Budget and Interference analysis results can also be used to determine the Committed Information Rate (CIR) and Peak Information Rate (PIR) per subscriber equipment type while the Sector Load can also be checked to exclude Base Stations with high utilization and avoid future bottlenecks and service degradation. Even a negative answer comes with an analytical in-depth understanding of the reasons why a customer cannot be served at the specific location. These reasons may be insufficient radio coverage, exhausted sector capacity or installation constraints.

The FWA Service Qualification App should be able to run either directly in the management platform's user interface or remotely through a REST API, that will expose the functionality to higher OSS/BSS systems such as customers' CRM systems, Order Management platforms, Website and portals, making the decision an automated step within the customer acquisition process.

Looking Ahead

The evolution towards AI-driven operation, will combine the FWA Service Qualification App results, positive or negative, with real-time network analytics and live network telemetry, traffic forecasting to continuously refine serviceability decisions, identify service gaps and predict future performance, based on expected traffic patterns, planned network upgrades, and evolving subscriber demand.

BENEFITS ACROSS THE ORGANIZATION

- A successful FWA Service Qualification Application provides numerous benefits to different teams in customers' organization.
- The Sales representatives receive immediate answers while interacting with customers, significantly reducing order processing time.
- Customer Care Support agents can verify service availability without involving radio planning teams.
- Planning teams can analyze the Application results to identify network expansion opportunities and optimize the design process.
- Network Engineering teams automate engineering decisions through configurable admission policies that protect network performance, avoid oversubscribing heavily loaded sectors and maximize utilization of underused capacity.
- NOC Operations and Installation resources are optimized through fewer unsuccessful installations and less troubleshooting activities, saving site visits and reducing operational costs
- New customers have realistic expectations regarding achievable speeds, expected quality and available service packages, while existing customers' quality of experience stays intact, leading to higher satisfaction and lower churn.

CONCLUSION

The success of an FWA business depends not only on radio coverage but also on making informed, data-driven admission decisions. Accurately determining customer serviceability is no longer simply an engineering task—it is a critical business capability. In an increasingly competitive broadband market, the ability to answer a simple question—"Can this customer be served?"—quickly and accurately can become a significant competitive advantage.

uni|MS™ with the embedded FWA Service Qualification Network Lifecycle Automation Application (NLA App) and its unique Planning-Physical Interworking capability, empowers operators to instantly determine whether a new customer can be served, what level of service can be guaranteed, and whether the network can accommodate the additional demand without compromising existing subscribers. uni|MS™ integrates RF planning data, coverage analysis, real-time network status, capacity assessment, configurable business policies and smart algorithms into a single workflow. The operators can accelerate customer acquisition, reduce operational costs, improve installation success rates, and protect network performance. Ultimately, this shifts FWA service qualification from a reactive engineering task to a strategic capability that enables profitable and sustainable broadband growth. ■

ARTICLE

ENHANCING WIRELESS TRANSMISSION PERFORMANCE BY DEPLOYING LICENSED MW AND UNLICENSED RADIOS DUAL BAND LINKS

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Wireless Microwave (MW) Point-to-Point (PTP) transmission systems play a significant role in empowering a wide variety of telecommunication networks because they offer muti-Gigabit IP capacity and can be deployed quickly and cost-effectively.

MW systems are used today in an extensive range of modern applications, such as ISP rural broadband, enterprise connectivity, public surveillance, and safety networks. The dominant use for licensed band MW radios remains that for backhaul to 5G networks, serving more than 70% of the live networks around the world. In parallel, unlicensed MW spectrum at lower frequencies is widely adopted for non-telco applications. The present article analyses the pros and cons of licensed and unlicensed MW spectrum and provides ideas for their optimal combination in Dual Band (DB) links.

MICROWAVE NETWORKS DEPLOYMENT SCENARIOS AND CHALLENGES

As we are moving further into the 5G era, the 5G mobile networks rollout is moving at full speed. To serve the ever-increasing 5G traffic, mobile operators continuously work at densifying networks in urban areas and expanding the 5G coverage in sub-urban and rural areas. A critical factor for cost-effective acceleration of 5G networks rollout is the availability of 5G capable MW transmission systems, like OmniBAS™ MW PTP product family, that are extensively used as the last-mile backhaul solution.

In addition, many telecom operators rely on unlicensed MW band radios to provide rapid wireless connectivity services to various enterprises and residential customers.

This section presents MW network deployment scenarios and analyzes their performance and operational challenges.

Licensed MW

Licensed microwave bands (6-38 GHz) are traditionally used for multi-gigabit carrier-grade communications because they operate in protected spectrum allocated by regulatory authorities. Since these frequencies are coordinated and controlled, they experience minimal interference from external systems. This allows licensed links to deliver predictable performance, stable throughput, and high reliability, making them appropriate for critical services and mobile networks backhauling.

Typical MW mobile backhaul systems in urban areas rely on bands in the upper part of the MW spectrum (13-38 GHz) and in combination with E-Band radios in Dual-Band (DB) links can offer speeds 10 Gbps or more. For longer link ranges required in rural and isolated areas, the lower MW spectrum (6-11 GHz) needs to be used. However, this part of spectrum is saturated in most countries, does not offer wide channels and has extremely high spectrum charges.

Normally, MW networks are professionally designed to offer high link availability, typically 99.99% or more. This is needed because MW links availability is affected by environmental conditions such as heavy rain, humidity, or atmospheric fading that can degrade microwave performance, particularly at higher frequencies. Depending on the link range and prevailing climatic conditions, achieving the desired link availability necessitates large antennas or more spectrum or more complex and expensive HW configurations.

Unlicensed MW

Unlicensed microwave bands (e.g., 5-6 GHz), on the other hand, offer greater deployment flexibility and lower equipment as well as operational costs because they do not require spectrum licensing fees. These bands can provide high-capacity, longer-range connectivity and rapid deployment, especially in urban or temporary network scenarios. However, unlicensed frequencies are more vulnerable to interference from nearby systems operating in the same spectrum.

That is why the unlicensed frequency bands have been used so far for enterprise connectivity networks, for ISP rural broadband, public surveillance, etc.

The following table compares the main technical performance and operational aspects of MW radios:

Table 1: Licensed and unlicensed MW systems comparison

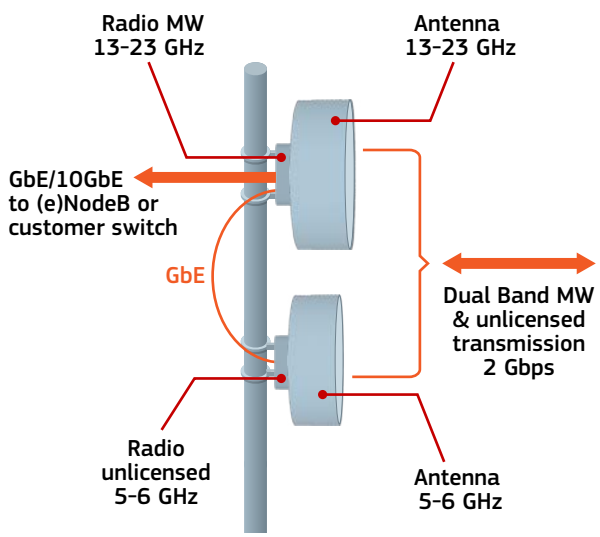
Performance attributes	Unlicensed MW spectrum (5/6 GHz)	Licensed MW spectrum (13-23 GHZ)
Capacity – Throughput (full duplex)	1-3 Gbps	2 Gbps (per radio)
Range	Medium - Long	Medium
Link Availability	Not guaranteed (can be higher if interference is avoided)	Can be designed for > 99.99%
Carrier grade	No	Yes
Networking functionality /QoS	Limited	Rich
Synchronization support	No	Advanced
Low latency	No (when based on WiFi standard)	Yes
Interference risks	High (unless they support interference mitigation)	Very Low
Equipment capex	Low	Moderate
Spectrum allocation	Not required	Required
Spectrum charges	No	Moderate
Heavy Rain attenuation	No	Yes

DUAL BAND MW AND UNLICENSED RADIOS: DEPLOYMENT SCENARIO AND BENEFITS

To exploit the advantages of both licensed and unlicensed MW spectrum and alleviate their drawbacks many operators consider combining both technologies in Dual-Band (DB) links for demanding last-mile mobile backhaul and other time critical connectivity applications.

A typical configuration example of such a DB link is shown in the following figure:

Figure 1: Dual Band (DB) MW link combining licensed (11-23 GHz) and unlicensed spectrum (5-6 GHz)



> OmniBAS™ has been a pioneering platform of IP MW transport for contemporary mobile networks since 2010. It is an ecosystem of products which can support effectively and efficiently the modern networks, based on innovative technologies developed by Intracom Telecom

In this architecture, IP traffic from the mobile base station or other customer switches/CSR feeds the MW radio. Then the MW radio is connected to the unlicensed radio through a GbE interface. The MW band link acts as the primary reliable transport path, while the unlicensed band link supplements the link by providing redundancy.

The DB link can be deployed either as a greenfield complete solution or as expansion of an already installed unlicensed radio with a MW radios. In the latter case network traffic must be redirected to the MW radio.

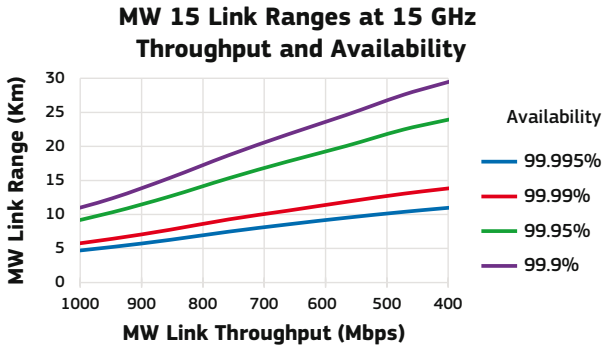
The MW radio, thanks to its advanced networking and radio functionality, plays the role of the master unit. It continuously monitors signal strength and quality of MW signals and adjusts transmission parameters in real time. During periods of reduced signal strength, the system can lower modulation rates (throughput) using advanced Adaptive Coding and Modulation (ACM) algorithms to maintain con-

nectivity rather than allowing the link to fail entirely. In case of severe MW link degradation or complete link failure due to heavy rain the master unit redirects the critical traffic to the unlicensed path. Note that operators can set the desired minimum MW throughput, according to supported modulations, where the traffic will be directed to the unlicensed radio. When environmental conditions improve again and the MW path is reestablished, then the MW radio reverts traffic from the unlicensed path to the MW.

To substantiate the potential benefits of a DB solution let us consider a MW link in New Delhi at 15 GHz using 0.6 ft antenna and 56 MHz channel in configuration XPIC 2+0 that typically offers 1 Gbps throughput.

The following figure shows the maximum range that can be achieved for given speeds and various link availability planning targets. As an example, 1000 / 500 Mbps can be ensured at 12/27 Km with an availability of 99.9%, which means 525 mins unavailable time per year. Therefore, in these 9 hours per year that the MW network will not be available due to heavy rain, the unlicensed radio may provide continuous connectivity.

Figure 2: MW links 15 GHz ranges, throughput & availability



The key benefits of Dual-Band deployment are increased link availability and improved network resilience. Licensed MW links provide the stability required for mission-critical services and last-mile mobile backhaul, while unlicensed links can provide backup capacity during MW outages. This redundancy is particularly valuable for mobile network operators and other enterprise mission-critical services. Note that in case of Mobile Networks backhaul, GPS for network timing need to be employed by Base Stations to ensure continuous synchronization.

Dual-Band configurations may also facilitate cost effective capacity expansions in cases where the unlicensed radio can support essential networking/QoS functionality and low latency transmission. Expanding capacity

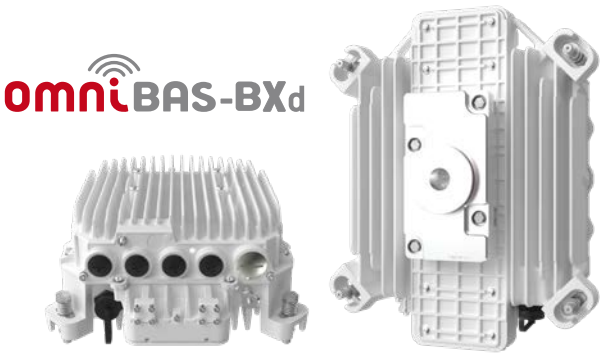
With the new dual-core all-outdoor radios, OmniBAS™-BXd, supporting 2 Gbps per unit, operators can deploy flexible last-mile MW backhaul solutions that offer enhanced performance while optimizing CAPEX & OPEX

solely through licensed spectrum can be expensive and time-consuming due to regulatory coordination. Adding an unlicensed link may enable operators to increase throughput quickly without significant additional licensing costs while still maintaining and enhancing the carrier-grade reliability of the licensed connection.

Another important benefit of DB links is that longer MW hops can be deployed by considering lower link availability design targets and/or using smaller antennas. The example of Figure 2 indicates that 1 Gbps MW throughput can be extended from 5 (99.995% availability) to 12 Kms (99.9% availability), thus increasing the effective MW hop length.

CONCLUSIONS

As wireless communication networks continue to grow, Dual-Band microwave architectures are becoming an increasingly attractive solution for reliable last-mile MW backhaul connectivity. A Dual-Band MW configuration that combines a licensed MW band link with an unlicensed band link provides an effective method for improving network availability and reliability. By leveraging the reliability of licensed spectrum together with the flexibility and additional capacity of unlicensed bands, telecom operators can achieve higher uptime, better performance, and more cost-effective network expansion. ■



RESTORING CRITICAL CONNECTIVITY FOR GLADSTONE CENTRAL MEDICAL CENTRE IN LESS THAN 24 HOURS



How Dreamtilt deployed Intracom Telecom's WiBAS™ G5 Smart platform at 28 GHz to deliver enterprise-grade, ultra-reliable internet to an essential healthcare facility in Gladstone, Queensland.

THE CUSTOMER

Dreamtilt Pty Ltd. (ABN 65 089 188 876) is a licensed Australian telecommunications carrier under the Telecommunications Act 1997 (Cth), delivering Fixed Wireless Access (FWA), Internet and voice services to residential and business customers in the Gladstone, Queensland region.

THE CHALLENGE

Gladstone Central Medical Centre's existing internet service, delivered over a traditional fixed-line connection, failed outright. In the lead-up to the outage, the service had already been delivering poor and inconsistent performance, well short of what a clinical environment demands. When the connection went down completely, the practice was left without the ability to reliably access patient records, process billing, or maintain normal clinical operations — a situation no medical center can sustain for long.

The issues included:

» No clear **restoration timeline** from incumbent carrier's side.

» Unreliable and underperforming **internet service**.

» Unacceptable **extended downtime** given the practice's reliance on connected patient management and telehealth systems.

Gladstone Central Medical Centre needed an alternative solution that could be deployed quickly, be independent of the legacy copper / fiber infrastructure path that had failed and be capable of matching or exceeding the performance of a modern fiber connection.

THE SOLUTION

Dreamtilt's response was immediate, deploying a dedicated wireless FWA link based on Intracom Telecom's WiBAS™ G5 Smart (Base Station) / GigaConnect+ (Terminal Station) platform. This platform combines Multi-User MIMO (MU-MIMO) with Advanced Antenna System (AAS) technology for precise beamforming to deliver robust, interference-free Point-to-MultiPoint (PtMP) connectivity in shared licensed spectrum environments — making it well suited to a fast, single-site deployment in an urban setting like Gladstone.

The key characteristics of the WiBAS™ G5 platform include:

» **TDD all-outdoor PtMP hub radio** operating in the 28 GHz licensed mm-Wave band, avoiding the congestion and unpredictability of unlicensed spectrum.

» **MU-MIMO and AAS beamforming** that deliver robust, interference-free ultra-broadband connectivity to the Terminal Station site.

» **Over 5 Gbps** aggregate sector capacity on a 200 MHz channel, giving significant headroom above what a single medical centre requires.

» **Hitless adaptive modulation** up to 1024-QAM, maintaining link stability and avoiding service drops as conditions change.

» **Zero-footprint** equipment of easy installation.

In less than 24 hours, Dreamtilt carried out everything – from initial callout to live – inclusive of site assessment, installation of the WiBAS™ G5 GigaConnect+ Terminal Station on the rooftop, alignment with the nearest WiBAS™ G5 Smart Base Station, and configuration of routing and QoS settings to suit the practice's clinical and administrative traffic. This rapid turnaround was made possible by combining Dreamtilt's existing 28 GHz fixed wireless network footprint in Gladstone, as well as its own carrier-grade RADIUS, routing and network operations infrastructure already deployed in production across its customer base. The implemented solution offered a series of significant benefits to the Gladstone Central Medical Centre:

» **Rapid service recovery**: Brought online all the Internet-dependent clinical and administrative systems within one business day from the outage.

» **Ultra-fast and low-latency connection**: Download / upload speeds in excess of 500 Mbps / 200 Mbps – fiber-class service.

» **Multi-purpose communication platform**: Support of simultaneous clinical, telehealth and administrative workloads on a single platform.

» **Outstanding service reliability**: Relief from the legacy fixed-line network, prone to cable cuts, and elimination of accidental outages. ■

15 GBPS FULL DUPLEX

WHY SETTLE FOR LESS?

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15 Gbps
capacity



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