

INTERVIEW

INTRACOM TELECOM GROUP NEWSLETTER | ISSUE 40

**A LEGACY OF INNOVATION: 35 YEARS OF
EXCELLENCE IN SOFTWARE OUTSOURCING**
> PAGE 10

**THE EVOLUTION OF TELCO STANDARDS IN
THE DIGITAL ERA**
> PAGE 12



INTRACOM
TELECOM



INTERVIEW

INTRACOM TELECOM GROUP NEWSLETTER

ISSUE 40

FEBRUARY 2023 - MAY 2024

For any enquiries or register in the recipient list, you may contact us at newsletter@intracom-telecom.com

Intracom Telecom
19.7 km Markopoulou Ave.,
Peania, Athens, GR 19002
t: +30 2106671000
f: +30 2106671001
www.intracom-telecom.com

Corporate Communications Dept.



All information contained in this document is subject to change without prior notice.

© 2024 Intracom Telecom

FIRST COMMERCIAL GIGABIT FWA NETWORK

Announcing the extension of collaboration with Open Fiber, Italy's largest wholesale network provider, marks a significant milestone. Together, we aim to achieve the EU Gigabit society target supported by key European initiatives. Since 2019, Open Fiber has pioneered Fixed Wireless Access (FWA) for rural networks in Italy, deploying extensively at 28 GHz. In 2022, they secured the "Italia 1 Giga" plan contract from the Italian government for eight provinces. A critical achievement in our partnership was the successful field tests at Open Fiber's commercial site in Puglia, South Italy. The WiBAS™ G5 dual-BS hub and G5 GigaConnect terminals at 28 GHz delivered exceptional performance, achieving 1 Gbps over 5 km distances. FWA technology enables rapid deployment in underserved areas. Intracom Telecom's WiBAS™ G5 platforms ensure Gigabit connectivity with advanced dynamic capacity allocation and automated service provisioning. Kartlos Edilashvili, Acting CEO of Intracom Telecom, expressed enthusiasm for supporting Open Fiber's initiative to bring Gigabit connectivity to Italian citizens, especially in rural areas. He emphasized the pivotal role of operators in driving economic and social progress through cutting-edge technology. Intracom Telecom has specialized in Ultra-Broadband Internet connectivity in Italy since 2014, with the WiBAS™ family operating globally, including 10 networks in Italy, known for their reliability and performance.



PSIM PROJECT FOR ATHENS INTERNATIONAL AIRPORT

We are delighted to announce the award of the Physical Security Information Management (PSIM) system project for Athens International Airport. Utilizing our state-of-the-art SISC² platform, we aim to integrate a unified operational picture that enhances situational awareness across AIA's critical infrastructure. Central to this initiative is our advanced command & control technology, SISC², which will strengthen intrusion detection capabilities and automate alarm triggers within AIA's security operations centers. This proactive approach significantly boosts AIA's readiness against both human-made threats and natural disasters, leveraging sophisticated data integration, processing, and kinematic analysis capabilities from ground surfaces.



Christos Rizos
CTO of SW & ICT solutions

MOBILE AND IOT AWARDS

We proudly announced our success at the Mobile and IoT Awards in Athens, where our company received 3 Awards and 1 Grand Award in Q2 2024. We won the Gold Award in "Industrial IoT" for BigStreamer™, the Gold Award in "Innovative IoT Solution" for BigStreamer™ in Smart Cities, and the Bronze Award in "IoT for Government & Public" for Dynamic Data Center Sizing. The Grand Award for IoT Integrator of the Year was awarded to Intracom Telecom, a recognition that testifies to our commitment to developing excellence.



DISTINCTION AT GREEK ICT FORUM

We are proud to have received recognition for our dynamic performance and global presence in competitive markets at the recent Greek ICT Forum & Athens ICT Expo. Alexandros Tarnaris, our Corporate Communications Director, accepted the award from the Greek Minister of the Interior, Mrs. Niki Kerameus, on behalf of Intracom Telecom. During the Forum, we shared insights on telecom trends and AI. Additionally, our very own Christos Rizos, CTO of SW & ICT solutions of our Group, discussed the rapid growth of AI and its pivotal role in ethical data management across diverse sectors.



ADVANCING SECURITY TECHNOLOGY WITH SISC²

At the Mobile & IoT Connected World Conference, we were honored to receive the esteemed Civil Protection Award for our outstanding command and control platform, SISC², reaffirming our dedication to advancing security technology and improving operational efficiencies. Moreover, Kostas Kardaras, Director of Security & Integrated Systems, impressed the audience with Intracom Telecom's pioneering SISC². This modular software integration platform transforms surveillance, collaboration, coordination, and administration across various security and operations management domains.

LAUNCH OF DUAL-BAND BEAM TRACKING ANTENNA



Our Italian Antenna business unit, FIA Faini Telecommunication Systems, has launched its new 100cm diameter Dual-Band Two Dimensions Beam Tracking antenna. Operating at E-Band and Microwave frequencies (80 GHz & 6/13/15/18/23 GHz), this antenna features Intelligent Beam Tracking capabilities in Two Dimensions and Dual-Band advantages. Designed to ensure robust connectivity in adverse weather conditions and environmental challenges, our Dual-Band antenna offers higher system gain, enhancing radio link performance. Its fast Beam Tracking compensates for issues such as solar radiation-induced pole swaying, ensuring alignment and optimizing capacity and availability. It's noteworthy that our subsidiary specializes in designing and manufacturing a wide range of antennas for global Radio Links, Point-to-Point, and Point-to-Multipoint systems, with installations exceeding one million antennas worldwide.



NEW CHIEF COMMERCIAL OFFICER

We are pleased to announce the appointment of Mr. Kyriakos Vergos as Chief Commercial Officer of the Intracom Telecom Group, highlighting our commitment to expanding our global presence. With extensive experience in leading sales development across diverse telecommunications organizations worldwide, Mr. Vergos brings a proven track record in driving market penetration and revenue growth in wireless technologies, software, and professional services. According to the CEO of Intracom Telecom, Mr. Vergos' appointment aligns with our strategy to unify our sales force and promote our solutions globally. His international expertise will be instrumental in achieving our objectives.

STRENGTHENING TIES WITH ACADEMIA

Intracom Telecom has established three key partnerships aimed at fostering innovation, bridging the skills gap and developing future professionals in the ICT sector.

First, our collaboration with the University of Western Macedonia (UoWM) focuses on innovation and knowledge exchange. This partnership offers students internship opportunities at Intracom Telecom, allowing them to gain valuable skills for their future careers. We also support UoWM's research laboratories and encourage students to explore ICT-related topics for their dissertations, strengthening the connection between academia and industry.



Second, our partnership with the Athens University of Economics and Business (AUEB) is formalized through a memorandum of understanding (MoU) that enhances the relationship between academia and entrepreneurship. This collaboration promotes joint educational activities, research projects, and aligns the educational process with labor market demands. An internship program for AUEB students at Intracom Telecom is also part of this initiative, ensuring students gain practical experience in their field.

Lastly, our educational collaboration with IEK AKMI addresses the shortage of specialized professionals in Greece's ICT sector. This partnership aims to train future professionals in IT and New Technologies, equipping them with the contemporary knowledge needed to meet global technological demands.



TERRAMETA

During February 2024, in the framework of the 6G SNS JU project TERRAMETA, Intracom Telecom together with the French research institute CEA-Leti, setup a joint experiment aiming to provide a preliminary validation of the project's planned use case demonstration. After a close collaboration between the two teams, the experiment was setup and executed in the French institute's labs in Grenoble. Two BBUs from Intracom Telecom, provided real-time baseband data to CEA-Leti's D-band radios and transmissive RIS antennas, creating a link operating in the 129-157 GHz range, with 56.4 Gbps overall data rate. To the best of the teams' knowledge, this was the first time that a D-band link exploiting RIS technology, operating over a band of more than 16 GHz, was demonstrated with real-time traffic communication. The successful experiment, paves the way to wireless systems able to exploit the large amount of bandwidth available at D-band, towards 100 Gbps communications.

➤ <https://terrameta-project.eu>

IOTFEDS

IoTfeds project coordinated by Intracom Telecom completed its activities in December 2023 followed by a successful final technical review on the 5th of April 2024 and a positive outcome. The project developed an innovative platform towards the implementation of a fully distributed IoT federation management and marketplace framework. The developed IoTfeds platform combines an open source interoperability middleware (based on the outcomes of the H2020 symbIoTe project¹) with blockchain technologies to enable IoT data providers and consumers to jointly form IoT federations and collectively operate decentralized IoT data markets for the exchange, sharing and trading of IoT data. The project is co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE (project code: T2EAK-02178).

➤ <http://iotfeds.gr>

PEDVOLUTION

Intracom Telecom participates in PEDvolution, a new collaborative co-funded (Horizon Innovation) project, which started on 1st of January 2024. The PEDvolution project paves the way for cross-sectoral integration of ever-evolving Positive Energy Districts (PED) concept- the pinnacle of community driven urban energy transition. PEDs aim to improve energy efficiency, integrate local renewables more effectively and reduce energy waste, as well as enable new combined services across non-energy sectors like mobility, ICT and industry. Over a duration of 3 years, the project will analyse, co-develop and demonstrate 7 interoperable solutions driven by European pioneers in PED conceptualization, implementation and tool development. Intracom Telecom leads the implementation of a platform for seamless and interoperable data sharing and service integration towards streamlining PED services operation, contributes to the instantiation of the Energy Manager and Decision Support solutions and leads the work on analysis of technical specification.

➤ <https://pedvolution.eu>

ODEON

The Horizon Europe project ODEON started its mission to revolutionise the Green and Digital Energy transition in January 2024. With a budget of 22,56 M€ allocated over 4 years and a consortium of 34 partners from 13 European countries, ODEON aims to make an impact towards a sustainable, secure, and competitive energy supply. The project provides a set of innovations for transforming the energy sector stemming from a sound, reliable, scalable and openly accessible Federated Energy Data Spaces implementation, enabling seamless data sharing and services orchestration in the energy domain over the Cloud-Edge continuum. AI solutions for electricity grid resilience, energy efficiency and cost reduction on top of this ecosystem will be showcased through five large-scale demonstrators in Greece, Spain, Denmark, Ireland, and France. Intracom Telecom is leading the work of data-driven services for energy management of consumers and local energy communities as well as contributes in the development of DataOps /AIOps orchestrators.

➤ <https://odeonproject.eu>

ENHANCING PARTNERSHIP WITH WAVE1 IN AUSTRALIA

We have strengthened our partnership with Wave1 Pty Ltd, a leading provider of Microwave Communications Solutions in Australia. This collaboration aims to meet the growing demand for advanced E-Band and MW systems, enhancing business solutions across the continent. Wave1 will promote our UltraLink™-GX80 products and OmniBAS™-BX radios, targeting sectors such as mines, utilities, city councils, first responders, CSPs, and ISPs. Leveraging advanced technology, Wave1 will deploy OmniBAS™-BX radios for cost-effective, multi-Gigabit transmission solutions. The UltraLink™-GX80 E-Band system, IP/MPLS ready, offers a reliable 80 GHz 10 Gbit/s alternative to optical fiber. This partnership underscores our commitment to delivering cutting-edge communication solutions tailored to the Australian market's needs.



CYBER EUROPE 2024 EXERCISE

We successfully participated in the "Cyber Europe 2024" exercise, where our emergency response teams tested and affirmed our readiness against increasing cyber threats. Managed by ENISA, this two-day exercise simulated real-life scenarios, focusing on cyber threats to the energy sector amid ongoing geopolitical tensions.

It reinforced the importance of maintaining and improving our management systems (ISO 27001, 27701, and 22301) to strengthen resilience and ensure seamless service delivery to our customers.

TRANSFORMING 5G TRANSPORT & TELCO DATA CENTERS

A few months ago at MWC Barcelona, we proudly introduced our latest E-Band radios, the UltraLink™-GX80 Dual and UltraLink™-GX80 Advanced. These cutting-edge models are set to transform 5G transport, offering a 50% boost in spectral efficiency and delivering data rates up to 15 Gbit/s. The UltraLink™-GX80 Dual stands out by doubling capacity for channel sizes up to 1000MHz while maintaining a compact footprint with our new dual polarization antenna. Both models feature seamless L1 Link Aggregation, enhancing compatibility and capacity, underscoring our commitment to pioneering wireless communication technologies. Additionally, we showcased our Dynamic Datacenter Sizing (DDS) feature of the NFV-RI™ platform, designed to boost energy and resource efficiency in telco data centers. DDS integrates cutting-edge AI to dynamically adjust resource use in real-time, spanning both on-premise and cloud-based Kubernetes deployments. Real-world tests with major cloud providers confirmed DDS reduces energy consumption and operational costs by up to 30%, while maintaining high performance and stability, solidifying its role in advancing energy-efficient telecom networks.





GLOBAL EXPANSION HIGHLIGHTED AT ARS

At the Athens Riviera Summit 2024 (ARS), our President, Isak Alon, emphasized our company's ambitious plans for global expansion and innovation in the telecommunications sector. We are focusing on wireless networks, software solutions across various industries, and AI, with a commitment to diversifying revenue streams, particularly in the Greek market. Highlighting our dedication to

cutting-edge technology, he noted our annual investment of over €20 million in R&D and our talented team of over 1000 engineers out of 1600 highly skilled professionals.

ASIA TECH X SINGAPORE 2024

Attending the Asia Tech x Singapore 2024 on May 29-31, gave us the opportunity to present our Wireless Access & Transmission solutions, including Gigabit to the Home with FWA, 10 Gbps capacity with E-Band, and multi-gigabit radio links with dual-band. Our team was there to network and discuss how the network deployment and performance can be enhanced, while reinforcing highly valued partnerships. Here's to the next one and to many more business opportunities in the future!



GREECE: BEYOND 2024

Once again, we participated as a Gold sponsor at Greece's leading technology expo, named BEYOND. The event focused on the AI revolution and its profound impact on daily life. Our colleagues who participated in the main conference proceedings discussed the pivotal role of IoT technologies in fostering sustainable and secure cities, highlighting the vast potential and diverse applications of AI.

ECO-INNOVATION AND 5G ADVANCEMENTS

TM Forum Catalyst at Digital Transformation World 2024 showcased our latest advancements in Eco-Innovation. We highlighted Intelligent 5G Slicing for Enhanced Environmental Impact and Sustainable Solutions for Tomorrow's Data Centers. Contributing to the Catalyst project "Holistic intelligence and GenAI to accelerate 5G monetization," we demonstrated how our innovative solutions improve service quality and operational efficiency for enterprise customers. Intracom Telecom continues to drive innovation and sustainability in the telecom industry through groundbreaking technological advancements.



WINNCOM CONNECT EMEA EVENT

Last May, Nairobi, Kenya, hosted the groundbreaking Winncom Connect EMEA event, sponsored by many vendors including Intracom Telecom. This gathering united Africa's operators, integrators, ISPs, and technology leaders to shape the continent's digital future. The event featured vibrant networking sessions and insightful keynote speeches. A highlight was the presentation by Panos Dallas, our Global Sales Director, focusing on accelerating business growth in rural areas by employing wireless technologies at mmWave spectrum. This commitment to extending broadband to underserved regions marked a significant stride towards socioeconomic development.



THE FUTURE OF DIGITAL HEALTH, TODAY

The 2nd International Conference on Technology and Innovation in Southeast Europe, "The Future of Digital Health, Today" was held with great success on 13 June 2024. Our very own Ioannis Poulos, Deputy GM of the Services Business Unit, attended the panel discussion, entitled "Development Prospects of Medical Tourism in Southeast Europe", highlighting the significant growth opportunities and challenges in medical tourism. Among other topics, he emphasized the potential for developing remote patient monitoring for chronic diseases and elderly care through telemedicine.



JUNIPER AIDE & DATA SOLUTIONS

Intracom Telecom and Juniper Networks customers were invited to the "Juniper AIDE & Data Center Solutions Conference" held at the Golden Age Hotel in Athens in Q1 2024. The event marked a pivotal moment as AI-driven technologies reshape data center management. Attendees seized the opportunity to explore cutting-edge solutions



from Juniper Networks and gain insights from industry leaders. Keynote presentations highlighted AI's potential to optimize data center operations and enhance efficiency. Technical sessions and live demos showcased Juniper's latest AIDE and Data Center solutions, emphasizing agility, scalability, and performance enhancements. Interactive sessions allowed participants to engage directly with Juniper specialists, exchange best practices, and network with peers, ensuring they stay at the forefront of evolving data center technologies.

EVOLVING NETWORK SECURITY SOLUTIONS

Together with GCC and Fortinet, we co-organized a special event named "Level Up Your Security Posture: Explore Fortinet's FortiEDR & FortiSASE" on the 19th of June. The event underscores Fortinet's leading security solutions, FortiEDR and FortiSASE, and how these can empower every organization to achieve Unparalleled Endpoint Protection and Simplified Secure Access. The audience had the chance to get informed about the combined solutions addressing the security challenges effectively and render the network safe.



A LEGACY OF INNOVATION

35 YEARS OF EXCELLENCE IN SOFTWARE OUTSOURCING

An Interview with Dionyssis Kantas, Section Manager of the Telco Software Design Centre



INTERVIEW » Can you elaborate on the journey of the Software Development Center (SWDC) over the past 35 years?

D. Kantas » Absolutely. Our journey commenced in April 1989 when a pioneering team of seven engineers embarked on a transformative mission to master Ericsson's AXE 10 Telephone Exchange system in Athlone, Ireland. This marked the inception of what would evolve into our SWDC, specializing in real-time telecommunication systems. Over the years, we navigated through technological revolutions, expanded our capabilities, and played a pivotal role in the digitalization of Greek telecommunications. From the early days of fixed telephony applications to the current 5G era, we have remained at the forefront of innovation in the telecom industry.

INTERVIEW » In your experience, what are some of the most significant challenges faced by software development centers in the telecom industry?

D. Kantas » The telecom industry presents a multitude of challenges for software development centers. Firstly, the rapid pace of technological evolution demands constant ad-

aptation and learning. Telecom systems are inherently complex, requiring software solutions that are not only robust and scalable but also compliant with stringent performance and security standards. Additionally, the global nature of the industry necessitates effective collaboration across different time zones and cultural contexts. Agile and adaptive operations are imperative to respond swiftly to evolving customer demands and market dynamics. Furthermore, attracting and retaining top engineering talent is crucial for sustained success in this competitive landscape.

INTERVIEW » How does the SWDC tackle these formidable challenges?

D. Kantas » We address these challenges through a multifaceted approach grounded in our commitment to excellence and innovation. Continuous learning and innovation are ingrained in our culture, ensuring that our engineers stay at the forefront of technological advancements. With deep expertise in real-time programming, cloud-native development, and telecom applications, our teams are well-equipped to tackle complex challenges head-on. Agile methodologies underpin our operations, fostering collaboration, transparency, and continuous improvement. Strong partnerships with international counterparts facilitate seamless communication and project coordination across borders. Furthermore, we invest significantly in our employees, providing them with opportunities for recognition, career advancement, and continuous learning. Our emphasis on innovation drives us to explore new ideas and push the boundaries of what is possible in the telecom industry.

INTERVIEW » Can you provide insights into the technical proficiency and expertise of the SWDC?

D. Kantas » Our SWDC boasts a wealth of technical proficiency and expertise across various domains. Our engineers are proficient in a multitude of programming languages, including Python, Java, C/C++, and C#. They stay abreast of the latest coding practices and emerging technologies to develop efficient, scalable, and secure applications. Quality assurance is paramount, with meticulous attention to detail ensuring the reliability and performance of our software

Our flat organizational structure promotes agility and collaboration, enabling us to respond swiftly to market dynamics and customer needs

solutions. Working seamlessly in cross-functional teams, our engineers collaborate effectively, sharing knowledge and integrating their work with others. With a comprehensive understanding of software product lifecycle management, we adeptly manage projects from conception to maintenance and support.

INTERVIEW » How does the SWDC foster a culture of innovation and operational excellence?

D. Kantas » Innovation is the lifeblood of our organization. Our flat organizational structure promotes agility and collaboration, enabling us to respond swiftly to market dynamics and customer needs. Since 2012, our engineers have submitted over forty innovative ideas for patents, with several already granted and many more in the pipeline. Events like our own corporate Innovation Day provide a platform for our teams to collaborate, explore new ideas, and push the boundaries of innovation. Operational excellence is ingrained in our processes, ensuring that we deliver value to our customers efficiently and effectively.

INTERVIEW » Could you elaborate on the role of partnerships in driving success for the SWDC?

D. Kantas » Partnerships are instrumental in our journey towards success. We collaborate with organizations worldwide to develop cutting-edge solutions, leveraging diverse perspectives and skill sets. Strong relationships with our partners foster collaboration and create a supportive ecosystem for innovation and growth. Trust, transparency, and mutual respect form the foundation of our partnerships, enabling us to achieve shared success and drive innovation forward.

INTERVIEW » As we celebrate 35 years of excellence, what are the aspirations for the future?

D. Kantas » As we commemorate 35 years of excellence, we look forward to the future with optimism and determina-

tion. Our aspiration is to continue empowering businesses with cutting-edge solutions that unlock their full potential. With our end-to-end teams, proven methodologies, and unwavering commitment to excellence, we are well-positioned to tackle the most complex challenges in the telecom industry. We remain dedicated to fostering a culture of innovation, collaboration, and meaningful partnerships, guided by our core values of integrity, transparency, and commitment to excellence.

INTERVIEW » Thank you for sharing your insights and experiences. It's clear that the center has made significant contributions to the telecom industry over the past 35 years.

D. Kantas » Thank you. We look forward to many more years of innovation and success. ■



Dionyssis Kantas Short Bio

Dionyssis Kantas has been an employee of Intracom since January 1991, serving as Section Manager in the Patras Branch since 1997. Graduated from the Technological Institute of Patras in 1985, he spent two years studying and working on the digitalization and automated measurement of the efficiency for solar and wind energy systems. He has worked on several positions and roles and has visited and worked in several Ericsson sites in Europe. He played a key role in creating the necessary competencies and capabilities for successfully transferring of the mobile switching subsystems from Ericsson sites to Intracom Telecom. He actively contributed to transforming Ericsson's ways of working by hosting the Ericsson Agile Transformation project, winning the hospitality award from the contributors. Lately, driven by innovation and creativity, Dionyssis organized the ever first Innovation Day, where innovative proposals presented; some are currently under development.



THE EVOLUTION OF TELCO STANDARDS IN THE DIGITAL ERA

MARIA BAKALOULI

Product Marketing Engineer, Digital Transformation,
Telco & Enterprise Software

The telecommunications sector has consistently relied upon standards established by organizations such as the International Telecommunication Union (ITU), the European Telecommunications Standards Institute (ETSI), and the Third Generation Partnership Project (3GPP). These standards have been introduced and served to delineate the protocols governing communication and interoperability among various devices, systems, and networks. Organizations like the TeleManagement (TM) Forum are also instrumental in formulating standards for Telco software and business processes. Moreover, the telecom industry leverages cross-industry frameworks such as Software Development and IT Operations (DevOps), Information Technology Infrastructure Library (ITIL), and The Open Group Architecture Framework (TOGAF) to align Information Technology (IT) services with business requirements, thereby enhancing operational efficiencies.

The introduction of new digital technologies and the evolving socio-

economic imperatives, requires fresh initiatives to set or change the boundaries in business, technology, and operations. Cloud-based Telco architecture, Open Application Programmable Interfaces (APIs), and Sustainability mandates, emerge as prominent themes undergoing standardization spanning across systems, networks, individuals, and processes. These focal areas are strategically framed to set the basis of a plethora of innovative, new generation applications and use cases promising entirely novel experiences and interactions.

STANDARDIZATION BODIES IN THE DIGITAL ERA

Telecommunication standards are established through rules and specifications typically defined by the collective input of various stakeholders, including telecom operators, regulators, HW/SW vendors, technology providers, and industry associations.

3GPP (Third Generation Partnership Program), historically focused on

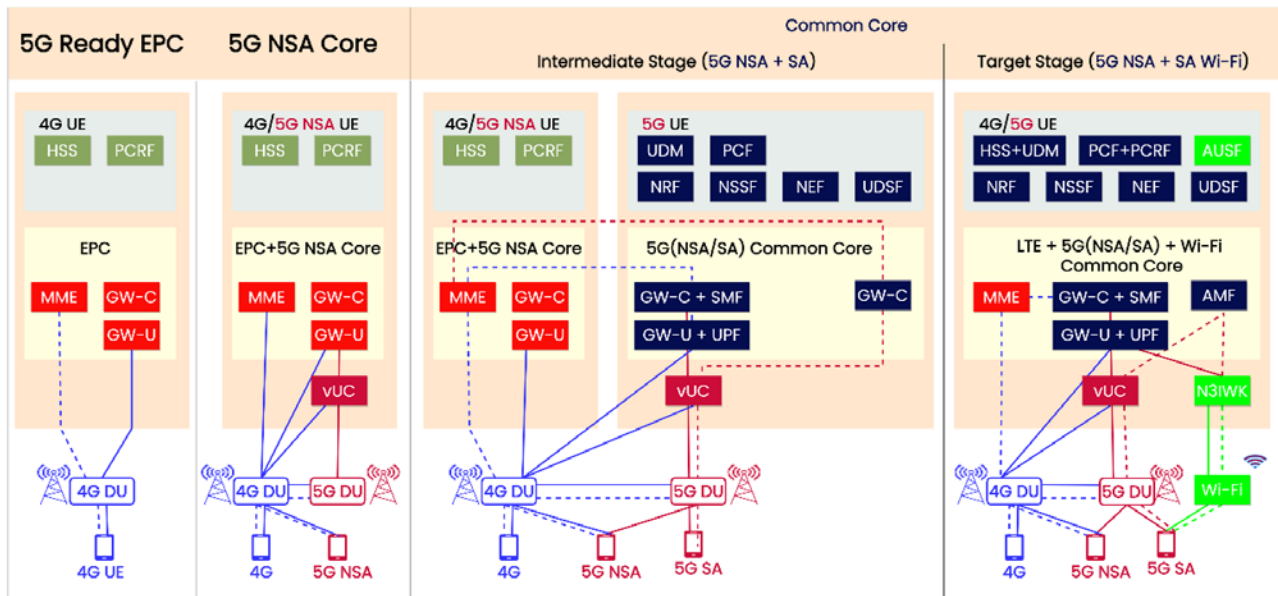
providing system descriptions for mobile telecommunications and broadband markets, during the last years spearheads the establishment of standards for fifth generation (5G) mobile networks.

Similarly, the GSMA (Global System for Mobile Communications Association), is engaged in standardization efforts to leverage the capabilities of 5G. For example, the suite of Network APIs, which furnish insights into subscriber information, device data, location details, and network characteristics are part of this accomplishment which has been standardized by GSMA. Third-party entities, such as merchants, developers, and operators, rely on this information to develop compelling new applications.

Lastly, TM Forum, well known for establishing Business Process, Application, and Information Frameworks for Telcos through initiatives like the Telecom Operations Map (TOM), Application Framework (TAM), and Information Framework (SID), is now focused on defining the so called Open Digital Architecture (ODA). This

Figure 1: Standard Network Architecture provided by TELCOMA

4G to 5G Migration Plan



initiative encompasses a collection of implementation concepts, principles, and best practices tailored for the next generation of IT and network components. In this frame, TM Forum collaborates with software and business development associations, including DevOps, ITIL, and the Open Group, to address various aspects of IT service delivery and evolved business architecture.

ODA components serve as software building blocks, encapsulating logical functionality, and executing both IT and network functions

KEY AREAS SUBJECT TO STANDARDIZATION

In the telecom industry, standardization touches various domains. A brief description of some key areas where new standards are introduced, or the existing standards are under reconsideration, is provided below:

» **Network:** It pertains to Network Functions, previously known as Telco Network Elements. Traditionally, network resources for both the Core and Edge/Radio Access Network were hardware-based; however, they have now transitioned into software abstraction (Figure 1). These

software functions define a novel architecture both for operators and telecommunication software vendors. This standardized architecture, characterized by modularity and reusability, paves the way for innovative services such as Network Slicing in the context of 5G, while it particularly affects Core/Edge network setup, policy implementation, and charging mechanisms.

» **BOSS:** Business and Operations Support Systems undergo a decomposition into reusable components to facilitate the development of cloud-native, plug-and-play information systems (Figure 2). These components serve as software building blocks, encapsulating logical functionality, and executing both IT and network functions. Standardization also affects Telco business processes related to the Customer and Service level, encompassing functionalities such as Product packaging, Ordering, Charging, and Billing.

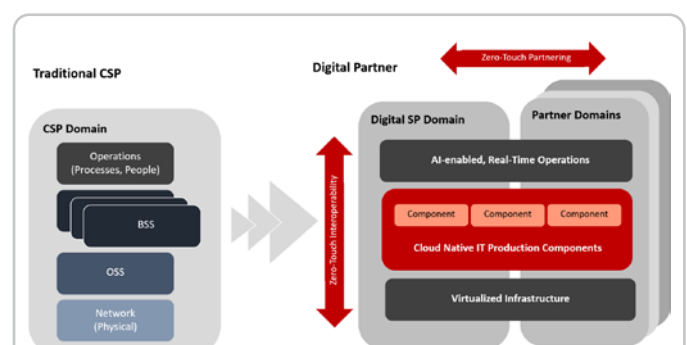
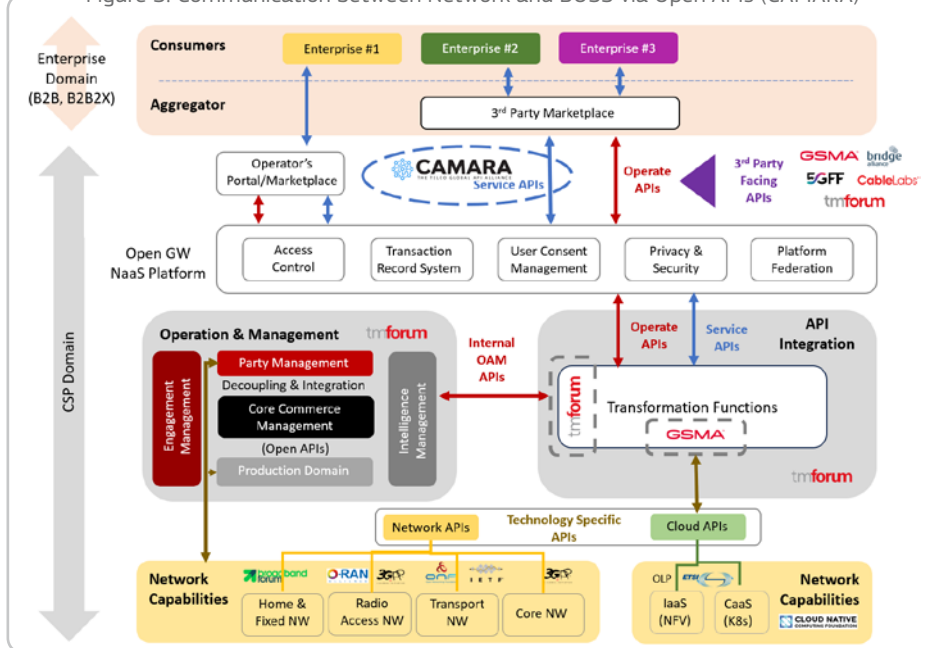


Figure 2: TM Forum develops standards for decomposing BOSS into reusable components

Figure 3: Communication between Network and BOSS via Open APIs (CAMARA)



» **Interfaces:** Network and IT assets require seamless communication facilitated by a unified data model, facilitating integration. This model should be exposed and instantiated through Open APIs, providing access to information across various functional areas, whether business or network related (Figure 3). For example, customer profile, product specifications, and billing information are among the data made accessible across disparate systems. Additionally, location information or Quality on Demand (QoD) related parameters are made readily available to developers and enterprises, empowering the creation of innovative applications.

» **Operations:** With the transition from physical to virtual environments, the need for an operational framework to support the hosting, design, testing, operation, and maintenance of network and IT assets, arises. Numerous organizations advocate for standardized practices and blueprints concerning Network (NetOps), IT (ITOps), and Artificial Intelligence (AIOps) Operations. A universal framework applicable to both net-

work and IT domains is being developed. This framework is designed to bolster automation through AI-driven orchestration capabilities, facilitating seamless integration and efficiency across operations.

» **Security:** Digital technologies usher in revolutionary experiences, yet they also introduce new threats. Challenges such as phishing, cyberattacks, and misuse of AI, require extra attention from security officers and technologists alike. Collaborating closely with technology providers, regulators are actively developing cyber-resilience strategies, establishing robust security policies, and crafting AI ethics frameworks.

» **Sustainability:** Recent environmental and socio-economic developments require a new framework embodied in Environmental, Social, and Governance (ESG) practices. The collective effort of governmental bodies and industry associations aims to establish a foundation where automation is leveraged to address the needs of both people and the planet, paving the way for a better future for all.

BENEFITS OF STANDARDIZATION

Standardization brings value and multiple benefits for an organization, either CSP or vendor, including but not limited to:

» **Cost savings:** Simplified architectural complexity across systems leads to reduced development and deployment costs. Automated and standardized network design improves configuration and setup, simplifies operations, and facilitates implementation of changes, thus lowering expenses.

» **Interoperability:** Adoption of a standardized data model enables seamless communication among applications and systems from different operators and vendors. This fosters a wide ecosystem of partners, creating growth opportunities.

» **Efficiency & Scalability:** Streamlined software development processes which are based on standards shorten the product development lifecycle, enhancing efficiencies and scalability through automation and optimization of code design and testing.

» **Innovation:** By commoditizing software assets and exposing system functionality to third parties, new and improved products and services emerge, driving innovation.

» **New revenue streams:** Through standards, products and services can be made available rapidly on global markets, thus achieving greater reach. GSMA is estimating a potential of 3 billion USD from new applications and use cases enabled by Open Network APIs.

» **Security:** Implementation of educational, coordination, authentication, and automation policies (e.g., GDPR, business continuity) ensures enhanced security, compatibility, and reliability.

» **Fairness & Innovation:** Training, certifications, and Key Performance Indicators (KPIs) foster greater accountability within organizations while meeting environmental and socio-economic mandates.

WELCOMING THE TM FORUM OPEN DIGITAL FRAMEWORK

Since its inception in 1989, TM Forum has been standardizing the processes of Fulfilment, Assurance, and Billing, establishing a common framework for operators and Business and Operations Support Systems (BOSS) vendors.

In response to the evolving telco environment and the new requirements for Cloud/Virtualization, Ecosystem Management, and Artificial Intelligence, TM Forum introduced the Open Digital Framework (ODF) comprising the Open Digital Architecture (ODA) as well as other key assets such as Maturity Models (AI, CEM, etc.), Metrics, Data repositories including AI training data and a complete set of Transformational tool kits. ODF brings a new set of implementation guidelines, principles, and best practices tailored for the new generation of Telco IT and Network. At the core of ODF lie the ODA Components, which serve as reusable, plug-and-play software building blocks executing both IT and network functions.

ODA Components operate within a standardized cloud infrastructure known as the ODA Canvas and share their data with the Intelligence layer, enabling real-time decision-making regarding network operations. Defined in a machine-readable format, these components are designed to function autonomously, facilitating "zero-touch operations" and "zero-touch partnering" without requiring human intervention.

These components expose their functionality through Open APIs that:

- » facilitate end-to-end management of services across their entire lifecycle,
- » are designed to accommodate environments involving multiple partners in service delivery.

INTRACOM TELECOM COMMITMENT TO STANDARDIZATION

Intracom Telecom adopts and follows the standards set forth by 3GPP and TM Forum in telco products and solutions development (e.g., NGINius Charging™ suite, Cognitiva™ AI-powered applications, uiTOP™ IoT orchestration platform).

The company has been an active member of TM Forum for several years, sharing and contributing knowledge and expertise across various domains, including OSS/BSS, IoT, and AI. Notably, in the field of AI, Intracom Telecom has received recognition for its innovative contributions to AIOps Autonomous Service Assurance, earning an award back in 2021.

Some recent TM Forum projects where Intracom Telecom contributed significantly:

- » **Digital Organization Transformation (DOT)** under the People and Planet theme: DOT has to do with how an organization can be transformed into a digital enterprise, starting from building a Digital Culture, and using tools like the Digital Maturity Model (DMM) and strategic Key Performance Indicators (KPIs).
- » **Measuring and Managing Autonomous Operations (MAMA)** under Autonomous Operations theme: MAMA explores how organizations can incorporate autonomy into their operations, driven by value perspectives. Tools like the Value Operations Framework (VoF) and Autonomous Operations Maturity Model (AOMM) are utilized in this context.

The Outstanding Contributor award for 2023 has been assigned to Intracom Telecom, for their invaluable contributions in TM Forum projects.

Additionally, Intracom Telecom signed the TM Forum ODA Manifesto, endorsing TM Forum's design principles and essential standards aimed at facilitating a 'plug and play' set of technology capabilities. This commitment underscores the value placed on membership in the organization.

Intracom Telecom participates in TM Forum activities focused on knowledge creation and innovation, showcasing Sustainability cases in areas like Holistic Intelligence and GenAI to accelerate 5G Monetization.

Our company's team possess a range of skills and certifications, including TOGAF, DevOps, and ITIL, ensuring alignment with modern business and IT architecture development standards.

Finally, at Intracom Telecom we uphold industry standards to ensure equality, health and safety in the working environment, information security and business continuity, while adhering to environmental practices across operations. ■

LONG RANGE FWA NETWORKS

DELIVERING GIGABIT CONNECTIVITY



24.25-29.50 GHz
frequency band



5 Gbit/s
capacity



Coreless
architecture

The WiBAS™ G5 product line makes Ultra-Fast Broadband FWA a reality, delivering Very High-Capacity-Network (VHCN) Gigabit Services. The combination of the MU-MIMO **WiBAS™ G5 smart-BS** hub radio, capable of achieving up to 5 Gbit/s per sector with a single 200 MHz channel, and the **WiBAS™ G5 GigaConnect** MIMO terminal station enables the delivery of Gigabit services to the subscriber even at distances of more than 8 km from the base station.



GigaConnect

smart-BS

WiBAS[™] G5

Enabling Gigabit to the Home



intracom-telecom.com



INTRACOM
TELECOM