



mobileum

Action driven by intelligence

Emergency Communication Systems and Protocols Testing Services

Technical Proposal

Prepared for



National Single Emergency Call Service 112, Moldova

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1 Executive Summary

Mobileum is happy to assist National Single Emergency Call Service 112, Moldova (hereafter referred to as Service 112) with end-to-end testing capability across its network, helping to improve the network KPIs and offer enhanced services to its subscribers. We are pleased to present this technical proposal from our broad and versatile Testing Portfolio in response to Service 112's requirements.

The modernization of emergency communication networks through SIP-based interconnections and next-generation Service 112 necessitates continuous assurance of service availability, accuracy, and performance. Reliable routing of emergency calls, precise delivery of caller location information, and consistent accessibility across mobile and fixed networks are fundamental to effective emergency response operations. In addition, the expanding scope of emergency services including voice, data, SMS, public warning systems, and automotive eCall requires systematic validation across multiple access technologies and network environments. A centralized, subscription-based testing and monitoring service provides the required visibility, control, and reporting to support operational readiness, regulatory adherence, and sustained confidence in public safety communications.

Mobileum proposes to support Service 112 with its best-in-class GlobalRoamer® platform, a cloud-based, end-to-end active testing solution designed to ensure the availability, reliability, and compliance of emergency communications. The solution enables automated validation of emergency voice calls, SMS, public warning notifications, and eCall/NG-eCall services across 2G, 3G, LTE, VoLTE, IMS, and 5G networks. By generating real mobile traffic through SIM virtualization and a global SIM pool, GlobalRoamer® validates accurate call routing, location handling, and service performance from an end-user perspective. Real-time reporting, alarms, and detailed QoS/QoE metrics provide continuous service visibility and rapid issue detection. This subscription-based approach ensures operational readiness, regulatory compliance, and sustained confidence in Service 112 emergency communications.

We are firmly committed to earning Service 112's trust and respect as its preferred System provider and building a successful, mutually beneficial relationship to contribute positively to Service 112's testing requirements.

1.1 Mobileum Portfolio

Mobileum is the globally acknowledged leader in Testing and Monitoring, Network, and Roaming intelligence, Security, Fraud, and Risk services, and has been supplying industry-leading solutions in Testing and Monitoring intelligence to **over 1,000 global CSPs**. Our rich and exhaustive suite of Testing and Monitoring is used in more than **213 countries globally where 9 in 10 telecom operators use Mobileum testing solutions including all major telecom operators in the world**. Our solutions operate at the heart of several centralized, hub-based service ecosystems. We have been the preferred partner for our customers as they have navigated complex evolutions in the **technology, business and regulatory landscape** that have shaped the communication services business over the past decade and more.

Mobileum is offering active end-to-end domestic and roaming testing solutions to its customers which will assist them to improve network security and service quality for mobile networks. The



offered Testing and Monitoring Solution is capable of performing various tests such as Voice, Messaging, Data, VoLTE and IoT on all technologies i.e., GSM, UMTS, LTE, NBIoT, 5G NSA and 5G SA. The offered Solution is compatible with various deployment models such as BareMetal, Virtualized and Cloud. The Solution will provide information from various levels i.e., from high level to root cause analysis and equip the operator to focus only on the action plan.

Mobileum’s Testing solution is a market-leading and award-winning product suite that has been certified by various standardization bodies, serving as proof of their extremely high-quality product, namely – **DIN EN ISO 9001:2015 Certificate**, **BABT** (British Approval Board for Telecommunications) for SITE System and **Eco Vadis**.



Figure: Mobileum Memberships and Certifications

SITE Test System have the following certificates and product conformities:

- FCC, CE Marking, ETL, Directives 2002/95/EC and 2002/96/EC
- Change Management with OTRS
- Environmental protection like green procurement and recycling
- Ethics like Sarbanes Oxley and "Code of Business Conduct and Ethics"

Mobileum enhanced E2E active testing platform offers capabilities to provide users with all the tools necessary for a complete Network lifecycle addressing multiple uses across all layers of the Network.

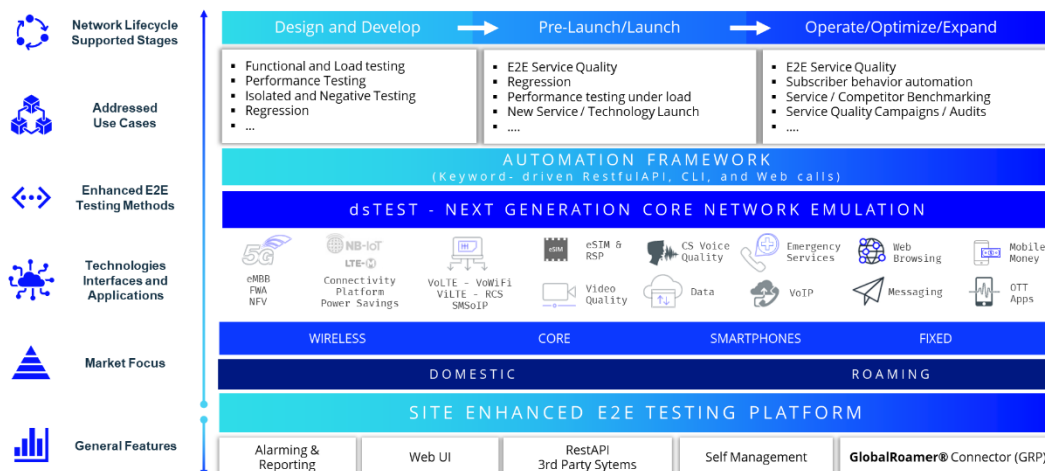




Figure: Mobileum SITE End-to-End Active Testing Platform

GLOBAL ROAMER		
End-to-End Roaming Quality of Service Testing WebUI with SIM multiplexing Technology		
TEST · MONITOR · TROUBLESHOOT · BENCHMARK		
Use the extensive GlobalRoamer platform covering 98% of all countries		
Virtualize any SIM card to any location in the world		
Generate real mobile traffic		
Measure real user experience and network performance		
Monitor GSMA defined KPI's		
Access to the GlobalRoamer platform	User-friendly WebUI Full test library	GlobalRoamer coverage and technologies
Active E2E testing platform	Schedule tests with predetermined KPI's	213 countries
SIM pool to terminate and originate test calls	Scheduler, reporting and trace analysis view	854 networks
Ad-hoc and fully flexible		600+ SIM cards 2G/3G, LTE, VoLTE, IoT, eCall
MONITORING		
END-TO-END TESTING	STEERING OF ROAMING	INTERNATIONAL INTERCONNECTION
End-to-end customer experience testing in specific locations	Monitor Outbound SoR daily or with monthly audits	Verify the quality of your international carriers
Verify Network Performance and Quality of Service	Benefit from OTA based SoR	Identify fraud cases like CLI spoofing and Call Stretching/Voice Playback
Check SS7 Connectivity to ensure outbound partners coverage	Perform Anti-Steering of Roaming Testing	Ensure that SLA's with your international carriers are fulfilled
LATEST FEATURES		
IOT EXPERIENCE	SIM POOL TRAFFIC PACKAGES	
Testing global IoT Connectivity	Use SIM Pools for generating charged calls	
Supports 2G, 3G, LTE, NB-IoT & LTE-M	Local Voice calls, SMS and Data Download	
IoT Specific reports and dashboards	International Voice calls, SMS (P2P and A2P)	
Service Monitoring		

Figure: Mobileum GlobalRoamer® End-to End Active Testing Platform



1.2 Mobileum’s Offering to Service 112

Mobileum’s proposed solution is based on its automated, active monitoring platform, GlobalRoamer®. The GlobalRoamer® platform is the industry’s most advanced end-to-end active testing platform. It’s hardware-based, and software-integrated solutions help operators assess and monitor the performance of network services and components by running real end-to-end tests and monitoring across various interfaces. Detailed explanations of system capabilities and components offered are provided in Chapter 2.

Product Offering	Offer Type	Included in the offer	Description
GlobalRoamer®	Flat rate Subscription Package	Included	Mobileum has offered the GlobalRoamer® platform subscription. The subscription supports automated testing of 112 voice calls, SMS to 112, public warning, and eCall/NG-eCall services, including the 1000 annual test-unit volume.

Table: Our Offer to Service 112

Mobileum has offered the commercial terms based on certain cost assumption and keeping in the mind the project timelines and other milestones to be achieved under this project. Mobileum and Customer acknowledge the any delay in completion of project or fulfilment of requirements may increase the cost of the project or require Mobileum to bear additional costs. Hence, in the event that Customer fails to fulfil any of its responsibilities as specified under this proposal and such failure causes delay in the provision of the products or other services or results in additional costs to Mobileum, Mobileum shall be entitled to such additional costs (including amounts charged by the third party vendors, agents or subcontractors and any internal costs) from the Customer on demand. Mobileum shall provide Customer with a written specification of such delay and the resultant costs.

1.3 Unique Value Proposition and Benefits with Mobileum

Mobileum’s portfolio of products and services has put us in an exemplary position in delivering value to Service 112. Mobileum is confident of delivering an unmatched value proposition through the proposed solution offering, the key elements of which are briefly enumerated below.

- Mobileum offers industry most comprehensive solution to assure E2E availability and quality across all product/services over all the network technologies ranging from 5G Non-standalone (NSA) and standalone (SA) to 3G/4G, Fixed wireless, OTT, VOIP and IOT network proactively and in fully automated way.
- Mobileum offer Domestic, Roaming, Interconnect Active Testing, and monitoring solution that can be leveraged for Benchmarking against competition.
- Rich Reporting capabilities with Dashboards tailored for multiple audience including Management, Engineering, Operation and Marketing.
- Mobileum solution supports 5G NSA/ SA and LTE using various frequency bands to generate an extensive set of standard and additional 5G service KPIs, such as 5G radio, band, and bandwidth, network type, and restrict DCNR.
- The solution ensures accurate location handling, correct call routing, and uninterrupted accessibility to emergency services, minimizing avoidable delays and safeguarding public safety while protecting the operator’s brand and trust.
- By enabling remote testing through TAC and CID emulation, the solution significantly reduces operational expenses associated with site visits while ensuring compliance with emergency and eCall regulations, mitigating the risk of penalties and legal exposure.



- The solution delivers consolidated performance insights, real-time alarms, and diagnostic metrics to proactively identify and resolve time-sensitive issues, ensuring readiness for emergency services and eCall systems with consistent quality assurance.
- Mobileum GlobalRoamer® solution help its customers to get insights into roaming quality for any operator across the world
- Mobileum GlobalRoamer® solution provides advantage to its customers to create an efficient and cost-effective strategy by leveraging GlobalRoamer®'s worldwide footprint
- Mobileum GlobalRoamer® solution helps its customers to compare MNO results per country or per roaming partner, against reference values. "Average" and "Best-in-Class"
- Mobileum GlobalRoamer® solution helps to benchmark routes and make pro-active decisions to balance quality and cost
- Mobileum GlobalRoamer® solution offers comprehensive troubleshooting capabilities with real time alarming upon service interruption or KPI degradation.
- Mobileum GlobalRoamer® is capable of performing the IREG testing for all technologies. We also have Outbound IREG testing in 213 countries to overcome resource constraints on roaming partner side
- Mobileum GlobalRoamer® supports end state tests in various modes such as IDLE, ATTACHED, ACTIVATED, IMS REGISTERED. This allows execution of multiple test cases sequentially using same resources within the same test job which significantly reduces time of test execution.
- Mobileum GlobalRoamer® solution ensures roaming revenue by monitoring service availability and performance with easy-to use dashboards
- Mobileum recognizes the importance of fast time-to-market, and we pride ourselves in accommodating our customer needs by collaboratively designing and managing a plan that helps to deploy our integrated solution platform quickly and efficiently.
- GlobalRoamer® solution can help Customer to verify the inbound market share given by their roaming partners with its inbound market share testing under Steering of roaming test scenario. This test will help Customer to have the actual percentage of the inbound market share and approach their roaming partners for appropriate solutions if any discrepancy is discovered. Let's assume Service 112's roaming partner potentially can give them 3.5 million minutes, but what Service 112 gets is only 1 million minutes. But Service 112 have neither information about the 3.5 million nor how much their competitors gets. To know your Inbound Roaming Market Share is key to define your Roaming strategies and Mobileum can tell you that.

Below is snapshot of some of the salient features of the Mobileum's GlobalRoamer® testing module.

INTERNATIONAL QoS / QoE - Ensure International Network Experience	
❖ Roaming Quality Testing	❖ VoLTE Roaming Testing
❖ IoT & Connected Cars Testing	❖ Performance Intelligence
❖ International Carrier Quality	

Figure: Salient Features



1.3.1 Purchase Order Procedure

When CUSTOMER desires to place a Purchase Order with Mobileum, Inc for EQUIPMENT and/or SERVICES, upon the receipt of a Quotation from Mobileum detailing such EQUIPMENT and/or SERVICES, CUSTOMER shall submit a written Purchase Order to Mobileum, which includes a reference to the Quotation and is signed by an authorized representative of the CUSTOMER, unless the Purchase Order has been automatically generated by the CUSTOMERS on-line system.

The CUSTOMER can choose for the Purchase Order submission one of the following options:

By e-mail to the following address: Customer-Po@mobileum.com

Or, by post to:

SIGOS GmbH.
Attn: Customer PO Team

SIGOS GmbH
Klingenhofstr. 50 d
90411 Nürnberg
Germany
Phone: +49 0911 95168-0
Or, by Fax to the number: +49 911 95168 355

1.4 Key Contacts

Key Mobileum contacts for this proposal are listed below. Any queries regarding the contents of this proposal may be directed in the first instance to them.

Contact Type	Name and Designation	Contact Details
Commercial Contact	Zdravko Stambolov Key Account Manager	E-mail : Zdravko.Stambolov@mobileum.com Mobile: +35 9896 664881
Technical Contact	Victor Sirbu Technical Account Manager	E-mail : Victor.Sirbu@mobileum.com Mobile: +37 379 006477
General Manager	David Rottelman General Manager	E-mail : David.Rottelman@mobileum.com Mobile: +972 544 463899
Global Executives	Miguel Carames Chief Product Officer	E-mail : Miguel.Carames@mobileum.com Mobile: +19252062557
	Raja Hussain Chief Revenue Officer	Email: Raja.Hussain@mobileum.com Mobile: +65 9655 1168

Table: Key Contacts



2 Commercial Proposal

Mobileum has meticulously crafted this commercial proposal outlining a tailored solution to meet Service 112’s business needs. We aim to exceed your expectations with a focus on innovation, cost-effectiveness, and unparalleled quality. Kindly explore the following pages for a detailed insight into the commercials that promise success and mutual growth.

2.1 Pricing Table

Model	Quantity	Months	Total Test Units	Total Base Price (EUR)	Discount %	Total Discount (EUR)	Total Price (EUR)
PRP	1,000	12	1,000	€ 5,930.30	10%	€ 593.03	€ 5,337.27
EMC1 Emergency Services	1	12		€ 5,000.00	10%	€ 500.00	€ 4,500.00
TOTAL							€ 9,837.27

Table: Price Summary

2.2 Billing Milestones and Payment Terms

Payment Terms as follows-

- 100% at PO

2.2.1 Payment Terms

Mobileum’s standard payment terms are net 30 days - all payments are due 30 days from the date of invoice.

Taxes, Fees, Levies are not included in the quotation

All licenses are Right To Use.

2.3 Other Terms and Conditions

- This Commercial Proposal is applicable only to the current version (or any specific version agreed between Mobileum and Customer) of the Products to be provided as mentioned in the scope of this proposal. Upgrade(s), i.e. newer versions of the Product(s), shall be made available, subject to payment of additional fees not included herein.
 - All charges and fees set forth herein are exclusive of any taxes (including sales, withholding or any other tax) duties, or similar charges
 - Mobileum shall at all times remain the owner of the intellectual property in the products provided as part of this Proposal. Customer shall only have a license to use the product provided herewith and such license shall be revocable for breach of the terms of the license
- EXPORT CONTROL** – You acknowledge that the PRODUCTS provided by Mobileum hereunder may be subject to export restrictions of various countries. You shall fully comply with all applicable export



license restrictions and requirements as well as with all laws and regulations relating to the importation of the PRODUCTS, in the United States and in any foreign jurisdiction in which the PRODUCTS are used. Without limiting the foregoing, the PRODUCTS may not be downloaded or otherwise exported or re-exported (i) into (or to a national or resident of) any country to which the U.S. has embargoed goods; (ii) any end user known, or having reason to be known, will utilize them in the design, development or production of nuclear, chemical or biological weapons; or (iii) to anyone on the U.S. Treasury Department's list of Specially Designated Nationals or the U.S. Commerce Department's Table of Denial Orders. By accepting this Proposal or using the PRODUCTS, you are agreeing to the foregoing and you are representing and warranting that you are not located in, under the control of, or a national or resident of any such country or on any such list. If you obtained these PRODUCTS outside of the United States, you are also agreeing that you will not export or re-export it in violation of the laws of the country in which it was obtained.



3 About Mobileum

Over the last 26 years, Mobileum is proud to have over 1000+ mobile networks as customers in over 180+ countries. Our products are supported by a robust intellectual property portfolio of over 300+ issued patents, many of which power foundational technologies in mobile communications. Our customer base represents over 80% of the total number of mobile operator licenses issued in the world, and we are aggressively working towards increasing that organically and inorganically through acquisitions. This vast customer base, spread across diverse geographies, cultures and economies, gives Mobileum a cutting edge since these global requirements make our products extremely feature-rich compared to the competition.

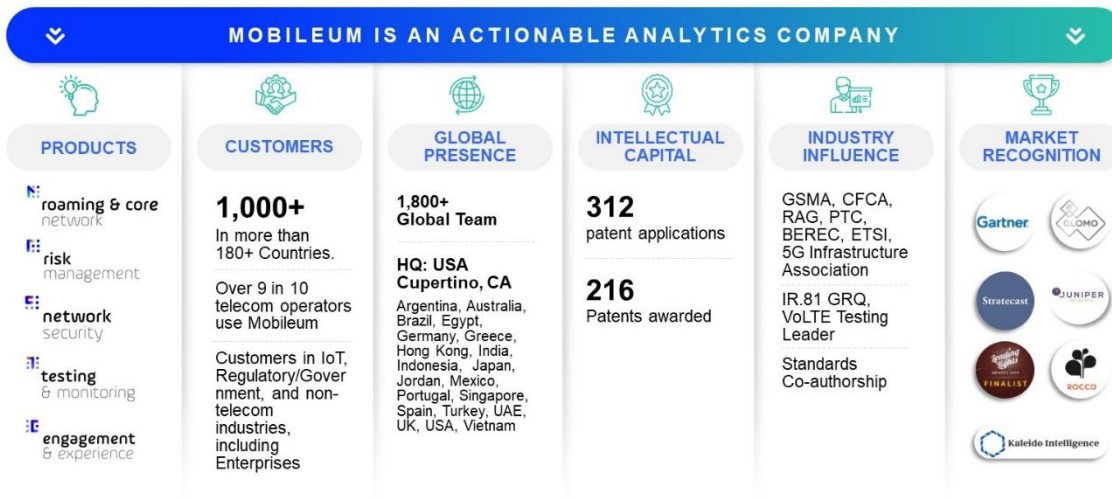


Figure: About Mobileum

Headquartered in Silicon Valley, U.S.A., Mobileum has global offices in Mexico, Argentina, Brazil, Chile, Belgium, Germany, Ireland, Portugal, Romania, Spain, UK, Egypt, Jordan, UAE, China, India, Indonesia, Japan, Malaysia, and Singapore. For more details, refer <https://www.mobileum.com/contact-us>

3.1 Our Story – Growth Through Innovation

Mobileum has grown through innovation in telecoms. We were founded in 2001 as Roamware, where our original insight was that Mobile Operators could manage roaming traffic intelligently to grow their revenue quickly and manage costs efficiently to expand margins and profitability. This innovation in steering allowed us to quickly become a market leader. We built mutually beneficial and lasting relationships with our customers, and we continued to invest in our technology and our people.

We recognized the critical value of analytics early and invested in the capability to combine our domain expertise in the network and BSS with advanced analytics and big data, and this combination is the basis of our unique Active Intelligence platform. Today we leverage this platform to rapidly deliver revenue-impacting solutions in focused areas of roaming, fraud and security and



customer engagement. We work in partnership with CSPs of all kinds to use these solutions and accelerate their digital transformation programs.

Mobileum has acquired many companies in adjacent business areas and this consolidation helped us to serve our customers better by pre-integrating products and technologies. The following paragraphs detail the companies and their business.

Mobileum acquired Evolved Intelligence, a UK-based company, in October 2018. This transaction enhanced our signaling security portfolio. The new converged signaling firewall supports SS7, Diameter, GTP, 5G SBI, and SIP protocols. After acquisition, a voice firewall to detect and prevent voice-based spam/scam and a SMS firewall to detect and prevent A2P bypass and malicious SMS was developed. Mobileum has been able to significantly grow the business since its acquisition.

In August 2019, Mobileum acquired WeDo Technologies (“WeDo”). WeDo was a leader in risk and business management solutions for communication service providers (CSPs) globally, helping them to drive revenues, mitigate risk, and prevent fraud on their networks. WeDo’s rich and expansive portfolio of products and solutions is backed by advanced analytical insights, consulting, and professional and managed services. Mobileum used its presence and knowledge of networks to bring real-time revenue assurance and fraud management solutions to the market - a significant leap in a world that was used to offline CDR processing. The business has significantly increased because of connecting risk management with real time prevention using firewall.

Riding on the success of acquiring and integrating two companies, Mobileum acquired SIGOS, its competitor for global roaming testing, in July 2020. With global operations in Silicon Valley, Belgium, Germany, and Singapore, SIGOS’s Global Roamer and SITE products enabled active end-to-end roaming and domestic testing. These tests helped CSPs to improve their service quality, perform continuous reliability tests, improve network security, and roaming & interconnect revenue assurance. The combination of the two companies created significant value for our customers who were able to now run additional tests for 5G, CloT, and trigger them based on network events. Mobileum also gained many IoT customers as the product portfolio enhanced.

In June 2021, Mobileum acquired three more companies –

a) Developing Solutions, a network testing software provider that focused on core network testing for load and lab use cases covering 3G, 4G, 5G, and IMS. This acquisition complemented the SIGOS acquisition and also enabled Mobileum to expand its customer base to some of the largest core network equipment providers (NEPS).

b) In the same month, Mobileum also acquired Convene Networks, a technology provider of integrated core network solutions for 3G/4G/5G networks. This acquisition expanded our product portfolio with core network elements.

c) the third largest acquisition of the month was Niometrics, a provider of deep network analytics with high bandwidth DNA probes that monitor 10 Tbps data traffic at one of the largest network in the world. The acquisition expanded Mobileum’s actionable analytics platform with customer discovery, engagement, and experience capabilities, enabling Communications Service Providers (“CSPs”) to identify new revenue streams and to improve customer experience across the entire customer lifecycle.



Mobileum's Active Intelligence Platform underpins all its solutions and services. Using Machine Learning and Artificial Intelligence the platform can deliver real-time traffic analytics and customer analytics as well as apply business logic to inform traffic management decisions, assess risk, and protect the network.



Figure: Detailed portfolio of solutions on top of our Active Intelligence Platform

These real-time insights from the platform are fundamental to the way our software solutions help operators protect their revenues and profitably manage existing services as well as successfully plan and introduce new ones. All our insight-fueled solutions aim to improve network and customer performance while at the same time driving and protecting revenues and reducing or minimizing costs.

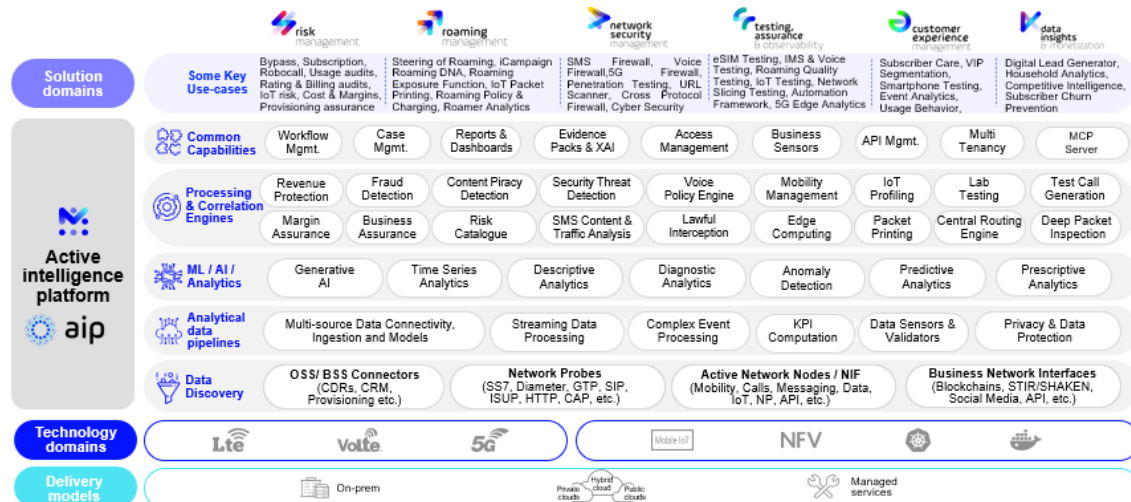


Figure: Solutions Built on Our Cloud-Native Active Intelligence™ Platform



3.2 Various Mobileum Portfolios for Diversified Customers

Mobileum is a leading provider of Telecom analytics solutions for roaming, core network, security, risk management, domestic and international connectivity testing, and customer intelligence. More than 1,000 customers rely on its Active Intelligence platform, which provides advanced analytics solutions, allowing customers to connect deep network and operational intelligence with real-time actions that increase revenue, improve customer experience and reduce costs.

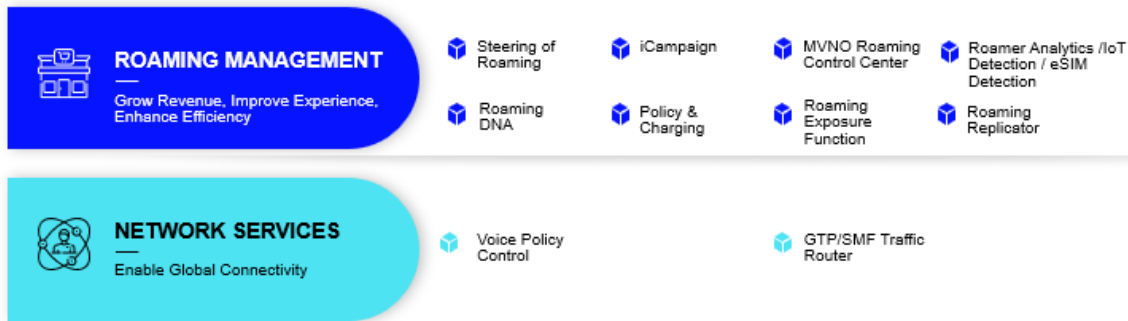


Figure: Roaming and Core Network

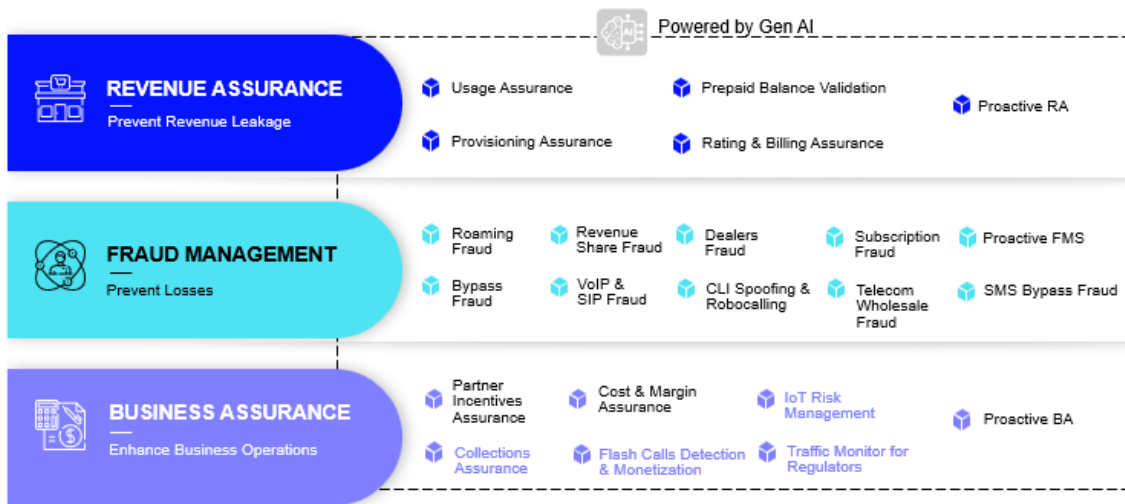


Figure: Fraud and RISK Portfolio

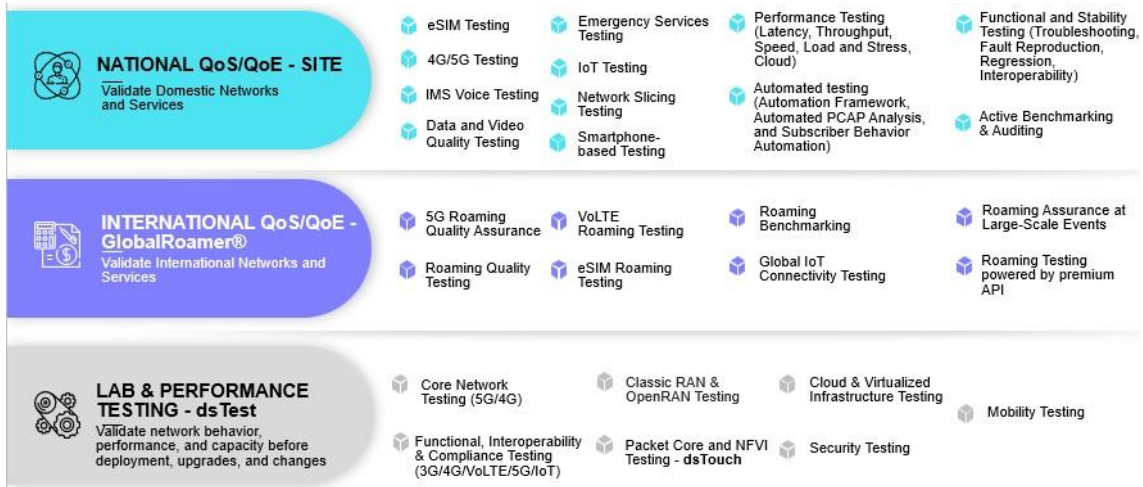


Figure - Testing and Monitoring Portfolio

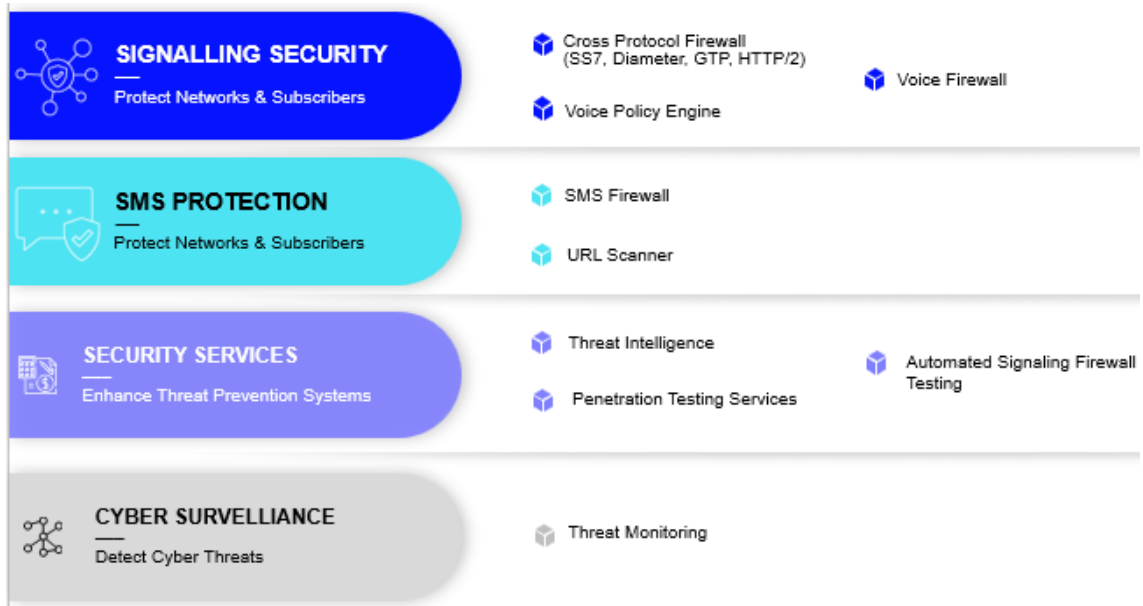


Figure: Network and Security Portfolio

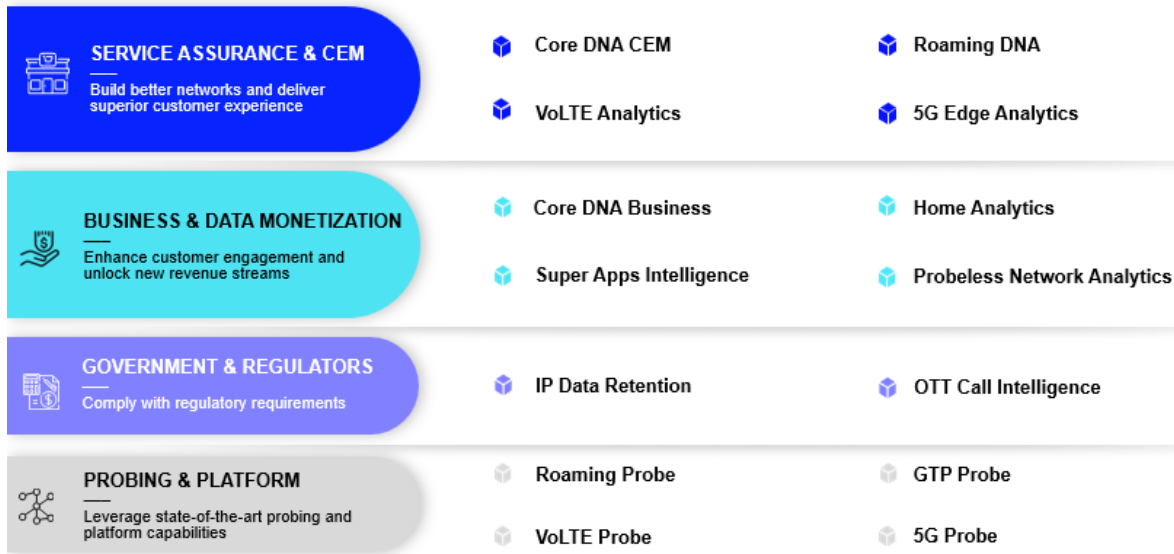


Figure: Engagement and Experience Portfolio

3.3 Global Customer Footprint

Mobileum’s customers include over 1000 plus mobile operator networks in more than 180 countries. Some of the major groups and standalone operators represented in Mobileum’s client base include –



Figure: Global Footprint

3.4 Recognitions

Mobileum is highly recognized by the market and by its customers.

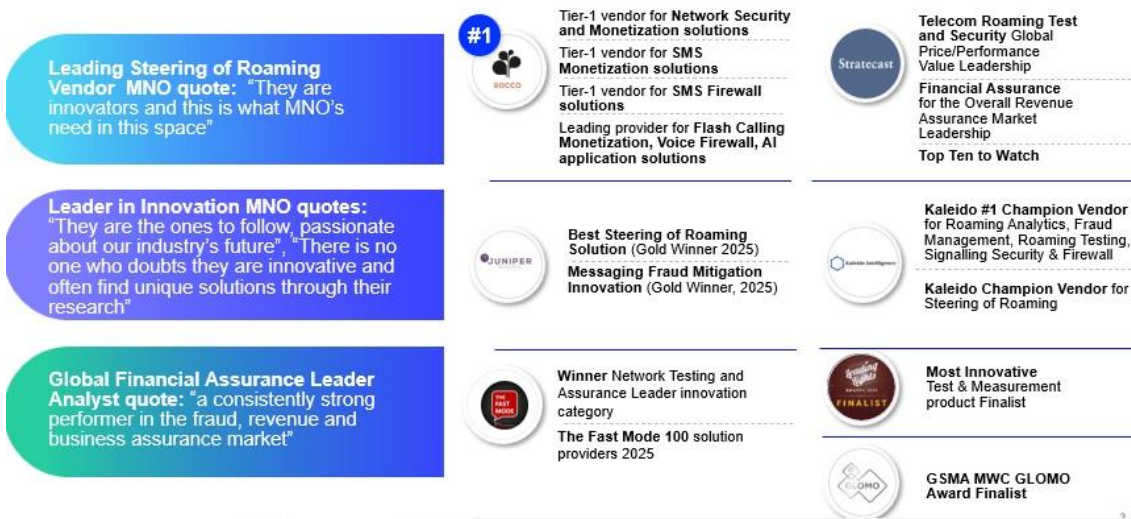


Figure: Recognition



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