VIAVI Solutions



Brochure

VIAVI

TM500

Network Performance and Capacity Tester



Ensuring a high quality and consistent service for mobile subscribers



Don’t let your network strain under load

Optimize new network architecture to meet the needs of new applications

Deliver optimum experience to end-users

There have been several well-publicized cases of existing 4G mobile networks straining under the load of data-hungry devices to the extent that the network can no longer function. To avoid such situations, you need the reassurance that the network can at the very least manage the requested capacity without failure. And of course, no-one wants to find out via a customer complaint that expensively marketed new services are not working,resulting in negative press coverage.

Networks are going through a rapid architectural change with the introduction of 5G technology in order to improve network performance and support new 5G applications, such as time critical driverless vehicles and smart city services that use many IoT type devices. Supporting these new applications requires operators to optimize their network to address the need for increased data speeds for gigabit handsets, cost-effective scaling, securitization of the IoT and reduced latency for critical applications.

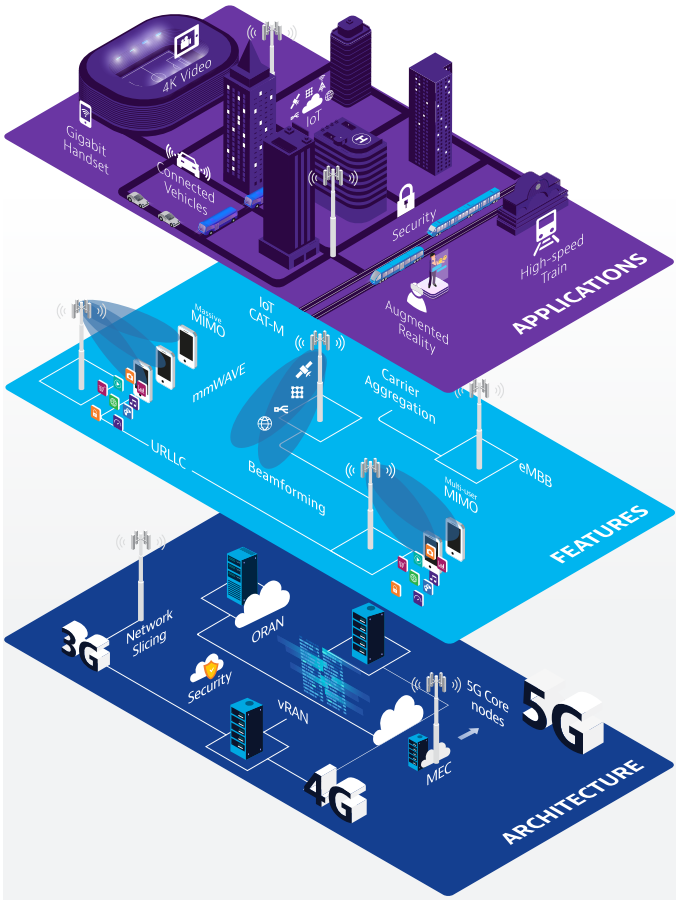
It is vital to ensure the complete network infrastructure performs under loaded conditions, delivering an optimum experience to the end-user, resulting in an excellent Quality of Experience for the wireless subscriber.

The TM500™ is the industry standard network test platform, used by all the major infrastructure vendors worldwide to validate their networks under realistic usage and loading scenarios.

The TM500 is a highly scalable network performance and capacity test product that validates networks by simulating mobile devices connecting to the network under test. It tests the network performance as experienced by end users. By continuing to innovate when it comes to new features, the TM500 continues to stay ahead of market need, empowering network operators to prove network performance under real-life usage conditions before the availability of actual handsets, with the ability to test independent complex services at scale with vendor agnostic performance testing.

This powerful product delivers 5G first while continuing to support the latest 4.5G specifications, allowing simultaneous capacity testing with a combination of 4G and 5G scenarios such as VoLTE, Video users and IoT devices, enabling the assessment of how new 4G services are impacted with the introduction of different 5G requirements. The TM500 is the de facto in ensuring Quality of Service to all types of devices and users at scale, ensuring the network delivers without compromise thus helping to maintain brand reputation.

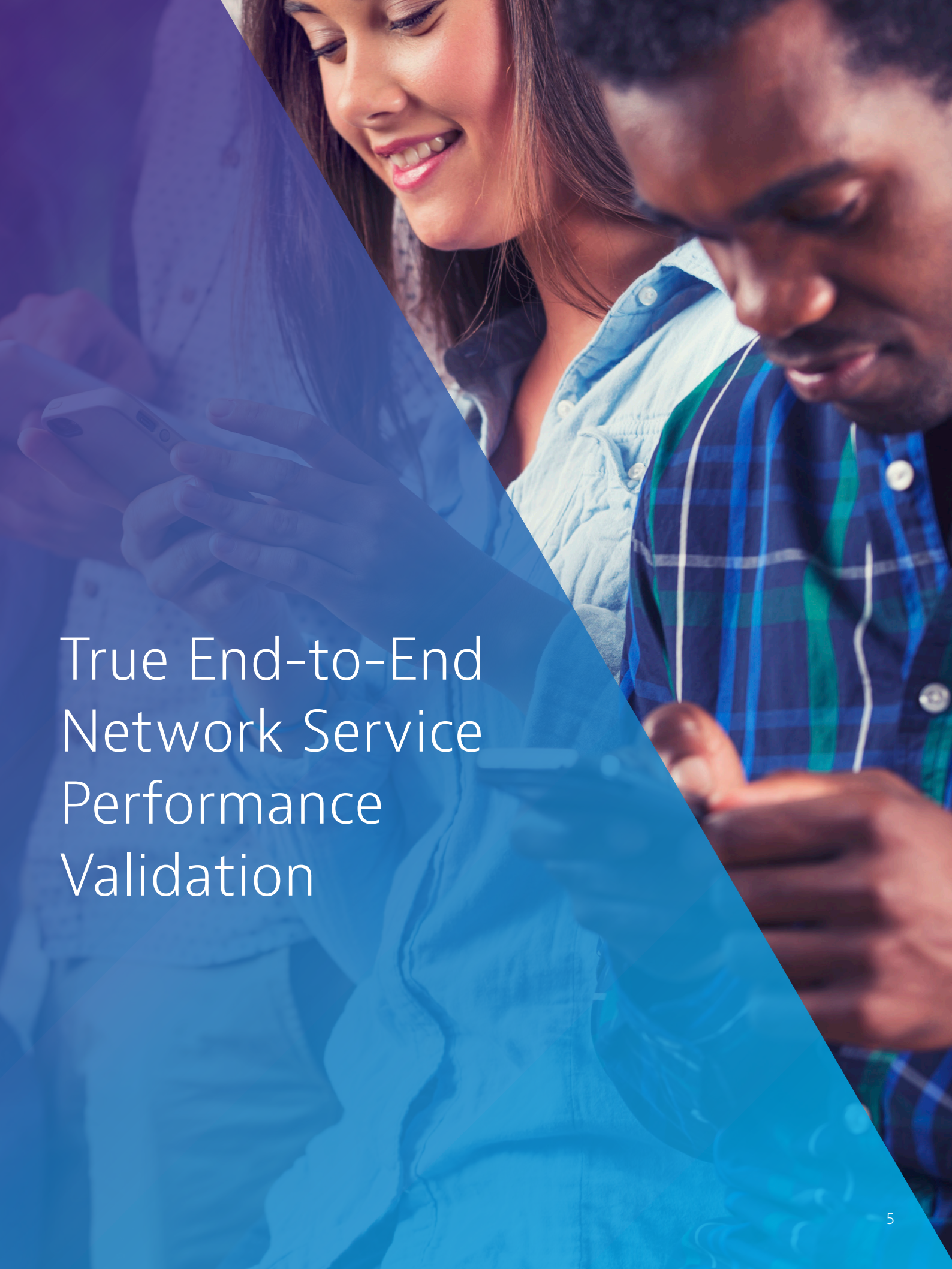
Simplifying complex 5G test scenarios, our solutions:



Inter-work
Across multiple technologies and RATS

Work at scale
Emulate 1000's of devices and applications

Work under stress
Manage a robust network under extreme scenarios



True End-to-End Network Service Performance Validation



Unlock your network's full potential

Optimization

With the complexity of 5G and the additional services it will support, it is important that your current network is optimized. TM500 gives you insight to configure and test, ensuring you are maximizing its capability before the roll out of a new feature.

A good example of where network optimization is vital is VoLTE. In order to validate VoLTE performance effectively, it is vital to define the correct QoS parameters over the complete LTE bearer path, which is not an easy task.

All the individual sections of the path need to be correctly optimized to ensure that the best performance is achieved at scale and maintained throughout a call, without dropping before the call is ended by the user while at the same time not compromising other services such as QoE for video users.

Path sections:

- User equipment (UE),
- Radio Access Network (RAN)
- Evolved Packet Core (EPC)
- IP Multimedia Subsystem (IMS) core

Optimize the network in a test lab and improve the QoE for subscribers in many environments

Because data is now the dominant service and voice services represent just one of the traffic flows, VoLTE must compete for bandwidth with other applications such as video and data, which means it must be validated under realistic traffic conditions while these applications are running. When subscribers are moving rapidly or a call handover takes place, this data is even more difficult to obtain. TM500 can help you assess how many packets are dropped by providing a rich set of statistics that cover, timing, delay and quality across multiple applications at scale. This needs to be scaled to hundreds of calls under real-world conditions. Testing individual calls would not give an adequate indication of the scalability of the service when voice is under contention with other high-bandwidth network traffic.

Before using real mobile devices on the network, the TM500 benefits the operator by proving the network is capable of handling hundreds or thousands of VoLTE users moving around in a multi-technology, multi-scenario environment, including handover, multiple fading profiles and different traffic types. By thoroughly validating VoLTE, the operator will be able to offer high definition voice services and achieve greater utilization from existing infrastructure, while at the same time growing subscribers by delivering a consisent experience.

Network Assurance

After an upgrade to existing or new infrastructure:

- Can you be sure your target KPI's are unaffected?
- If software has been updated, can you guarantee this has not affected other applications?
- Do you fully rely on a third-party company to ensure KPI's are being met?

Repeatable and consistent performance evaluation of complex technologies

TM500 can help to maintain your customers satisfaction by proving your network is reaching those KPI's and is the defacto test equipment to evaluate your choice of network equipment against your exacting needs. TM500 rich set of KPI's are already used by Network Equipment Vendors in a production environment around the world to validate base stations before new software is released. The TM500 doesn't just provide system level statisitics but also application level statistics key for the evaluation of software upgrades affecting target KPI's.

In the race to 5G this only becomes more complex as many extreme use cases are introduced. New 5G applications include those that need ultra-reliable requirements which when they begin to be deployed it will be vital that you can guarantee your KPI's are consistently met and can be validated in the lab prior to deployment. While evaluating 5G the TM500 is able to evaluate the impact on existing 4 or 4.5G services, resulting in the ability to check the throughput, latency and roundtrip times remain unaffected when delivering these new services.

Repeatable performance evaluation of complex technologies such as Massive MIMO is vital for 5G network success and the TM500 provides the tools for accurate and consistant results for the evalutation of these technologies before pre-deployment and maintenance.

Evalute the effect of 5G on exisitng and evolving services

Reliability from your infrastructure has never been more important and the best way to achieve this is to use defacto standard benchmarking. TM500 can ensure RAN vendors are meeting the performance requirements influential in purchasing desicisions.

Defacto-standard benchmarking



Giving customers confidence in your network



Push your network to it's limit

Capacity Management

Is your network able to sufficiently handle a storm? How can you reduce the number of outages on New Years Eve, when your network is under pressure?

New Years Eve Scenario

Emulate low complexity IoT device connection requests combined with 1000's of devices sending bursts of data to emulate a realistic challenging scenario.

Enabling evaluation of network prioritization, load balancing and delay multiplexing management to ensure users receive a consistent service.

TM500 can emulate thousands of devices simultaneaously across multiple cells and technologies enabling it to simulate a storm environment to help prepare for such eventualities.

Stress testing - In base station and Evolved Packet Core R&D testing, only limited data services are covered - therefore the mobile network may not be robust enough to ensure the QoE of mixed user applications. Including services such as Netflix and data-hungry services such as YouTube and Facebook.

- TM500 can help you validate the performance of your network by generating mixed user applications and services
- Check the overall impact to your network when 1000's of devices are running data-hungry services
- Reduce the risk of the network not functioning by validating the new services and applications in a load test environment

TM500 can help you deliver the content and manage the capacity with complete confidence by testing different scenarios in the lab. Ensuring successful content delivery and capacity management - Optimal delivery and quality of the user content is assured while maximizing the capacity of network.



Maintain data QoS to application users



Handle VoLTE capacity bursts and maintain good QoE for users



Manage handover requests

Scalable Visibility

TM500 provides the test tools and availability of KPIs to validate Radio Access Network behavior. TM500 gives visibility of base station performance via multi-layered mode testing combined with rich layer mode statistics for performance evaluation including quality measurements such as timing, delay, lower layer to application layer statistics.

TM500 allows deeper analysis and troubleshooting of the RAN by providing overide command tools to test base station behavior under different test modes and conditions. This overiding capability allows the user to do erroneous configurations to test how the base station will react for example when applying an incorrect connection error message for multiple devices - evaluating how stable the network really is, will it crash or recover?

Alternative testing tools may not give a true insight into end-to-end peformance validation as without significant investment into tools with evolving 4G features and services accurate results will not be achieved. TM500 can give a vendor agnostic appproach to true network insight.



End-to-end performance evaluation



Vendor agnostic network insight



Deep analysis and troubleshooting



True insight into your network's performance

How to achieve the most reliable performance and capacity testing

The TM500 is based on a common highly configurable hardware platform, for testing base station and network functionalities, performance and capacity. It has the ability to connect to tens of base station sectors, emulating tens of thousands of mobile devices and modelling real RF channel conditions.

Test Scenarios

- A set of core test case scenarios allows the user to assess the performance of network features within a loaded network environment. The TM500 supports multiple real stateful data applications enabling true end-to-end data generation and analysis per emulated mobile device.
- Test cases can easily be configured for thousands of application data flows, and allocated to different mobile device groups with different traffic profiles.

User Operation

- The design, scheduling and analysis of complex test cases is made easy via an intuitive graphical user interface.
- Test scenarios managing thousands of mobiles having individual mobility and data applications profiles can quickly be created and executed within a drag-and-drop environment.
- Upon test completion, measurements and KPIs can be viewed or exported to third party tools for post processing and advanced analysis.

Real Data Services

- The TM500 Family supports multiple real stateful data applications enabling true end-to-end data generation and analysis per emulated mobile device. Test cases can easily be configured for thousands of application data flows and allocated to different mobile device groups with different traffic profiles.

Performance KPIs and Statistics

- To enable complete performance analysis, the system produces a comprehensive set of measurement logs, KPIs, and protocol metrics during and after each test case run.

Optimize End-to-end Performance

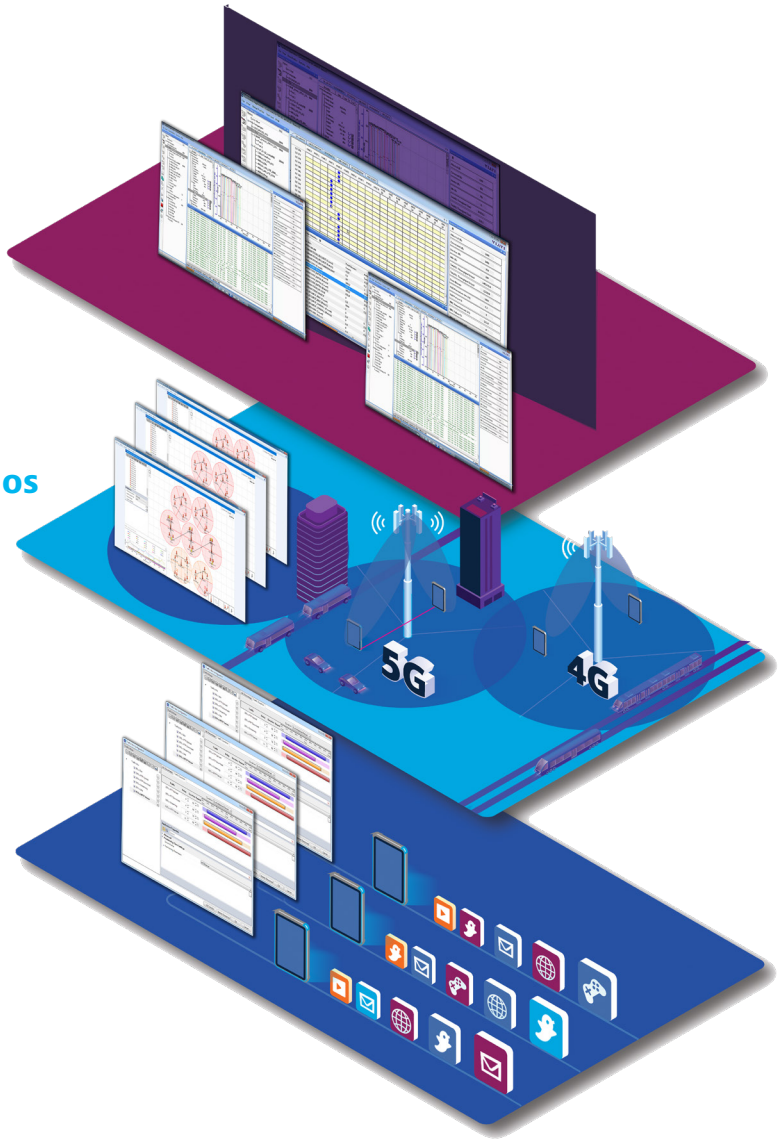
Rich KPI'S and analysis

Manage Complex Deployment Scenarios

Mobility and integrated channel fading models

Generate Realistic Traffic

Real Data Applications and complex traffic profiles



Unparalleled Support Footprint

Today's competitive realities demand new thinking that keeps you on the cutting-edge. To stay current with the latest technologies —and gain productivity—VIAVI can ensure that your engineers and testing labs have the support they need to keep you ahead.

Whether it's a quick initial setup or a comprehensive on-site installation and configuration, VIAVI professional service options are designed to ensure that you get the most out of your VIAVI products and solutions. VIAVI maintenance and support agreements offer comprehensive coverage to protect and maximize your solution investment.

Our dedicated team of Field Application Engineers are located all around the globe to ensure 24/7 support of your VIAVI products.

VIAVI is the global market leader in 5G network testing. It offers the broadest scope of 4G and 5G validation, verification and visibility solutions for end-to-end network testing from the lab to the field.

VIAVI 5G VALIDATION, VERIFICATION & VISIBILITY

VALIDATION

VERIFICATION

VISIBILITY

NITRO Platform

Phase 1:
Lab
Technology & Experience Validation

Field Validation
Lab Validation

Lab to field

Phase 2:
Field
Field Trials, Activate, Scale

Assurance & Automation
Service Turn-up

Field to assurance

Phase 3:
Assurance
Assure, Optimize, Monetize

Think-tanks

Network Equipment Manufacturers

Service Providers



TM500
End-user experience simulation



ONT-600
Optical network testing



CellAdvisor 5G & T-BERD/MTS-5800
RAN and x-haul performance testing



NITRO Mobile
Converged Assurance & Analytics

NITRO GEO
Location Intelligence



TeraVM
Application emulation



RANtoCORE
End to end network simulation testing



T-BERD/MTS-2000
Fiber inspection & certification



NITRO vNET Fusion
Virtual service activation and performance management



OTU-8000/ONMSi
Fiber Monitoring

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