VIAVI
VIAVI Solutions

Brochure

Solutions to Accelerate Base Station Development and Roll-out

5G | Command the 5G network.

Contents

Acclerate Base Station Development and Roll-out

5G and Open RAN are creating opportunities for companies to both expand their product portfolios and enter new markets. To be successful, organizations need to be able to bring new products to market quickly and demonstrate to prospective customers that they can deliver commercially robust solutions that meet demanding performance criteria. However, 5G technology is complex and Open RAN architectures create additional demands on interoperability with third party components. New architectures such as mobile edge access computing, network slicing and new technologies including advanced MIMO configurations further add to the demands on engineering teams.

The right test strategy and the right test tools are an essential part of mitigating the risks that development teams face. As a specialist in network testing, VIAVI possesses unrivaled experience in network equipment development, deployment and operation. VIAVI has worked with the world's leading operators to help bring new products to market quickly and deploy them reliably.
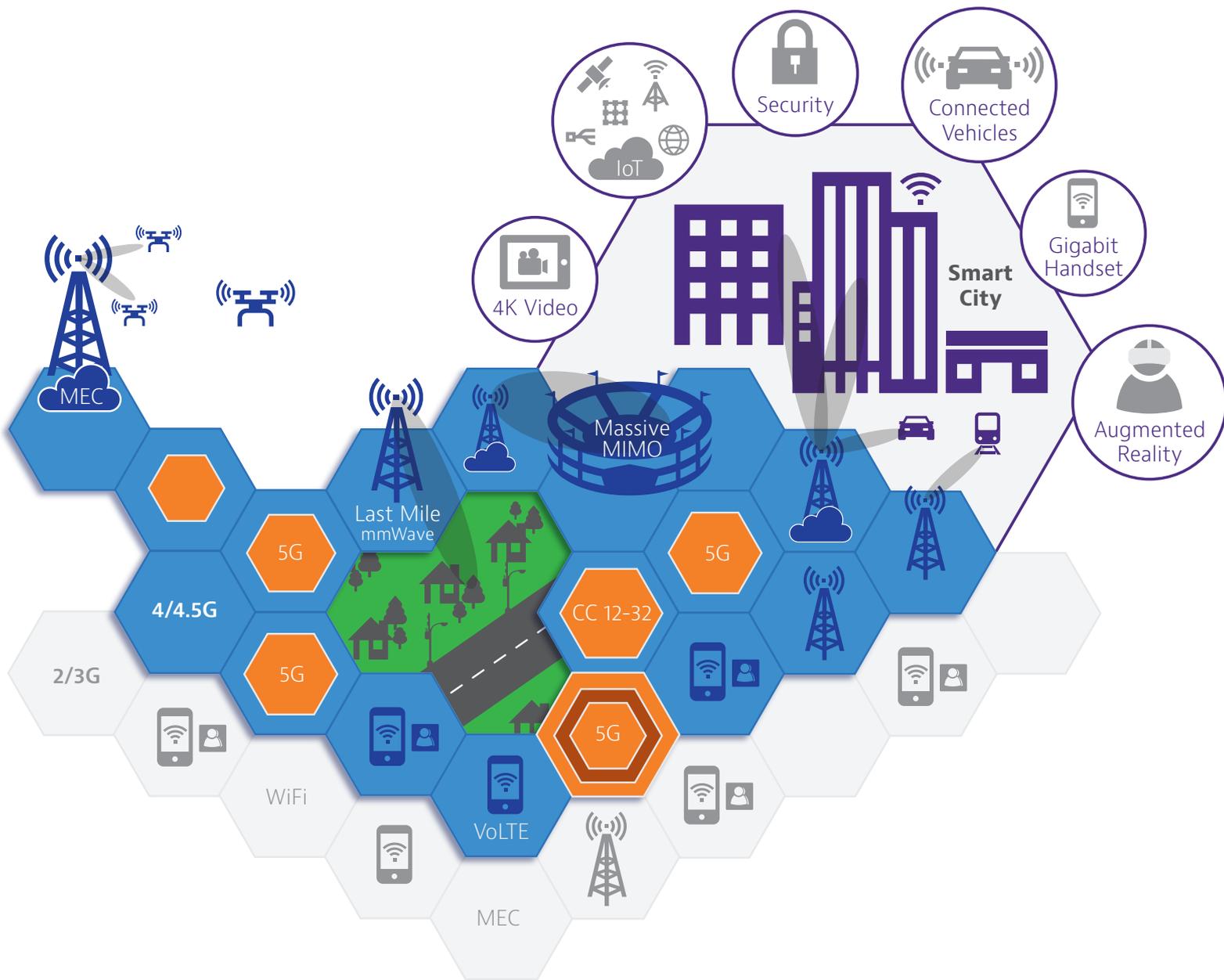
5G and Open RAN

VIAVI can help to test your network equipment within an Open RAN environment. Not only has VIAVI adopted the O-RAN Alliance specifications, we have been and are actively involved in specification development. This is particularly important in supporting multiple vendors with different vendor specific requirements. The requirement for robust, high performance test equipment is vital for testing against the latest specifications so you can guarantee your radio access equipment not only interoperates with equipment from other vendors but also ensure you are optimizing the performance of that equipment.

VIAVI provides a range of solutions to support test strategies that maximize engineering productivity, and give you access to the right tools for rapid delivery of high performance and ultra-reliable cellular communications products. As 5G and O-RAN evolve, VIAVI is well placed to support you. VIAVI will help you meet your goals your goals to demonstrate high quality and leading edge capability to your customers.

" Through close collaboration with ecopartners like VIAVI, and leveraging our R&D expertise, we will continue accelerating innovation in 5G commercial services. "

– Network Equipment Manufacturer

MEC

5G

4/4.5G

2/3G

WiFi

5G

Last Mile
mmWave

Massive
MIMO

5G

CC 12-32

5G

VoLTE

MEC

IoT

Security

Connected
Vehicles

4K Video

Smart
City

Gigabit
Handset

Augmented
Reality

VIAVI Provides Test Solutions for a Wide Range of Application Requirements

Achieving a Consistent 5G Experience

With video consumption growing, buildings getting taller, higher frequencies and energy efficiency standards changing—achieving consistent experience for end users and devices, across all applications is increasingly difficult. Investing in a long term testing partnership from the lab development phase onwards will be vital to ensure your network components are meeting the high data capacity, reliable connectivity and low-latency KPI requirements for all 5G/O-RAN applications, individually or as part of the whole network. By testing in the lab, you can guarantee your network equipment is ready for 5G application requirements, prior to deployment. With solutions from VIAVI, you can address these 5G test and measurement challenges and more:

eMBB

• Ensuring high capacity with multiple users running eMBB applications such as HD video
• Ensuring a consistent service despite other users utilizing high bandwidth applications. This is suitable with thousands of UEs.
• The above two points in different scenarios such as in fading, mobility, handover etc

Massive IoT

• Thousands of IoT devices with different reporting, and bandwidth profiles
• Emulate different application profiles (low/high-speed and low/high-power devices)

URLLC (V2X, V2V)

• Achieving very low latency requirements such as the Round Trip Times
• Ensuring reliability in meeting timing requirements as the impact can be serious for certain applications such as V2X

Non-public networks (private 5G)

• Reliability for peak efficiency in manufacturing
• Guaranteeing high throughput
• Reliability
• Hitting the target KPI's for low-latency
• Is the network secure
• Is the network tested against core network

Massive MIMO

• Have you achieved the optimal beamforming position for maximum throughput?
• Advanced knowledge in RF
• Over the air testing
• Testing at high frequencies (mmWave)
• Performance for multiple users in various beam mobility scenarios

Open RAN

• Multi-vendor interoperability
• Network performance is equal or better than traditional RAN
• Network can interact with legacy technologies

Security

• Robustness of security system (threat emulation capability)
• What is the impact if a security breach occurs and how to limit the effect

5G and O-RAN Test Strategy

When developing a network, you need to be assured that you have a test strategy across the entire protocol stack. From the physical layer to the NAS and application layers, ensuring the part of the development lifecycle your product is in, you need the statistics and logs from different layers of the protocol stack along, with powerful data processing, to problem solve fast and mitigate against the risk of a delayed deployment.

Lifecycle Testing

Testing across the lifecycle includes early functional, performance, capacity and regression testing as well as system integration and ensuring your system is fully tested against a 5G core to ensure complete confidence that your product performs as you expect.

For example:
- Best Quality of Service (QoS) for each user
- Smallest latency and round trip times for voice,
- Maximum throughput for multiple users running eMMB applications
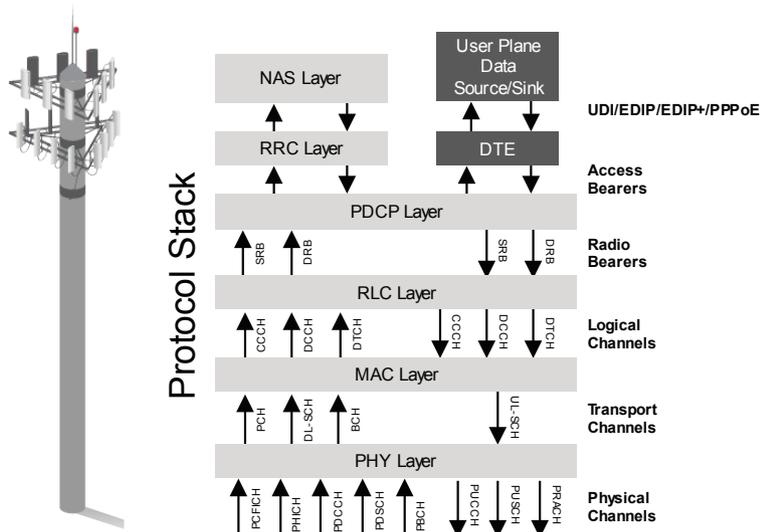
Functional Testing

Functional testing ensures basic communication protocols and interfaces work as per the specifications, this includes: Layer testing L1/L2/L3, 3GPP Compliance and Interoperability and data throughput verification.

Performance Testing

Performance, capacity or stress testing is necessary to ensure the network works at scale (loaded with thousands of devices), works consistently over long time periods and delivers the Quality of Experience (QoE) expected by end users across each individual device. It is also vital in assuring the network is achieving maximum data rates, optimum latency per application and achieving the QoS targets necessary.

Regression Testing

Regression testing enables the network to be validated as stable and verifies that it behaves in the same way, repeatably. A test system that can support this heavy processing of data is essential and saves time and resource for engineering teams.

Core Emulation

Engineers who manage a live or test 5G core make changes constantly to ensure that the core is up-to-date. A constant and repeatable environment is necessary when debugging a gNB problem or trying to optimize performance. An emulated core enables engineers to insert errors on the N2 interface allowing the robustness of the gNB design to be checked.

Developing O-RAN Sub-System Components

In previous technology generations, operators have had a limited choice for RAN network equipment making it easier to achieve performance objectives while liaising with very few vendors for support and optimization to provide a good user QoE.

Achieving the same level or better of performance from individual O-RAN network components and more crucially when they are all inter-operating end-to-end is vital for making O-RAN a success. By testing O-RAN subcomponents in phases from functional, conformance, interoperability, capacity and performance testing, you can ensure your network hits performance KPIs. VIAVI offers the ability to test at all these stages of development across the entire network from end-to-end with the full 5GNR stack. We also ensure the Control, User, Synchronization and Management plane messaging are validated to ensure the protocols work as they should, but also that performance metrics such as achieving the maximum data rates are achieved for different frequency bands and antenna configurations to name a few examples. This helps to avoid uncertainties when inter-operating with other O-RAN components.

Achieving the True Potential of O-RAN

To achieve the true potential of O-RAN, it is necessary for operators to have the confidence that all components in an O-RAN network have been tested in a trusted and controlled environment. Further, all open interfaces and components must be proven to work correctly so that a multi-vendor O-RAN network cost-to-performance ratio is better than that of a traditional single-vendor network.
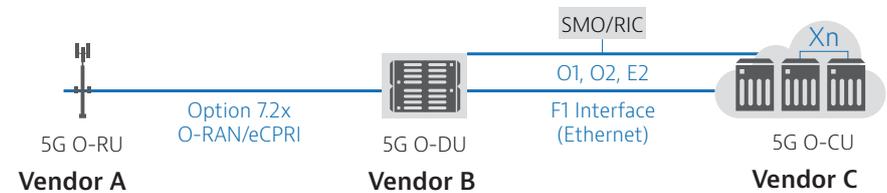
Operators will deploy a network with an O-RU from one vendor, O-DU from another, and O-CU from a third one only if the performance and cost meet their targets and their network integration is robust.

Test Evolution

For a smooth test progression, it is important to use the same test tools throughout the evolution of the testing regimen. This facilitates the means to identify issues early and it opens opportunities to implement optimizations in the event o added features and software and maintenance upgrades. Furthers benefits of using the same test tools include lowered cost of ownership, as compared to a new purchase, and continued productivity by eliminating the need to learn new equipment.

VIAVI products cover a wide range of test capabilities, allowing customers to ensure conformance, interoperability and performance testing of O-RAN components.

5G System Testing

Functional and conformance testing alone cannot provide the level of confidence operators need to deploy a successful network. VIAVI ensures comprehensive test coverage is achieved to avoid cases that can easily be left out for example cell edge scenario tests. The scope of testing can include, but is not limited to, increasing the number of UEs and 5G carriers, testing different frequency bands and MIMO antenna configurations in different and realistic traffic, fading and mobility scenarios, all with the same test tools.
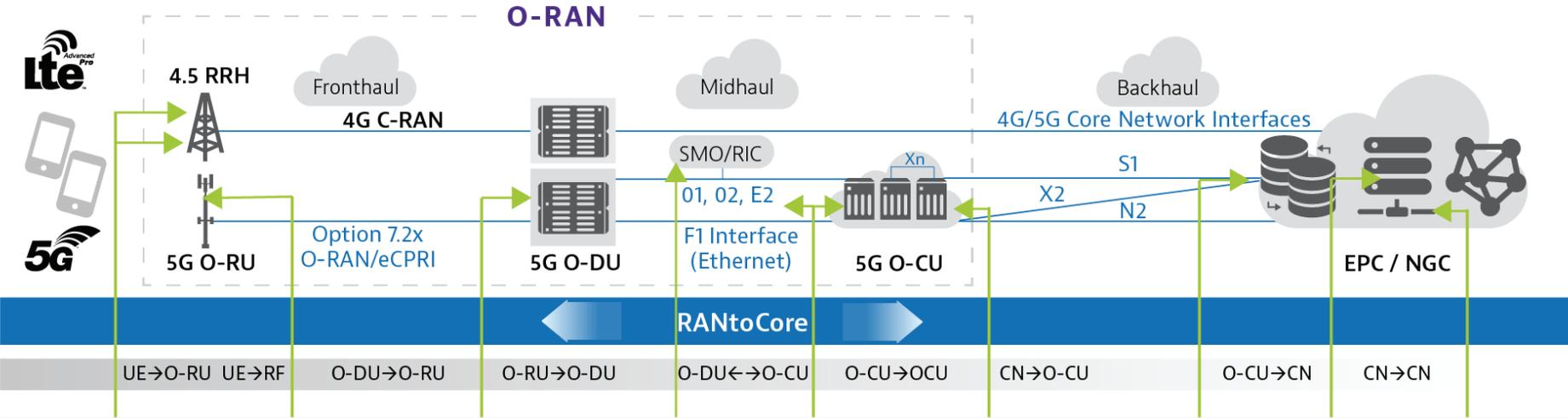
VIAVI holds a leading position in testing 5G and Open RAN architectures has been achieved due to our history and expertise working with NEMs and operators and in defining benchmarks for how high-performance networks must operate. There is much scope to re-use benchmarking tests developed for 5G and 4G RAN that would benefit for example O-RAN benchmarking scenarios that involve 4G-5G handover scenarios. Our TM500 and TeraVM Family of products emulate both the UEs and network elements to verify functionality, scalability and performance prior to deployment. In addition, we provide full 5G core emulation for the most realistic end-to-end testing environment.

Our CellAdvisor 5G™ and T-BERD®/MTS-5800 products help with solving and checking pre-installation and post-installation performance in situations where the transmitter and receiver paths must be leveled, and provide signal demodulation to evaluate signal quality, along with performance testing.

5G and O-RAN creates significant challenge in terms of test and integration. Having the right test and network management strategy and the right partner during the development can help operators overcome those challenges. VIAVI comprehensively validates each of the O-RAN components providing the confidence that your network works as it should when all components are connected together for successful end-to-end operation. And with our integrated lab, field and assurance solutions, operators can be certain network performance issues will be isolated and rectified quickly to meet KPI goals.

FUNCTIONAL / PERFORMANCE / CAPACITY TESTING / TROUBLESHOOTING & ASSURANCE

O-RAN

4.5 RRH
Fronthaul
4G C-RAN
Midhaul
Backhaul
4G/5G Core Network Interfaces

SMO/RIC
Xn
S1

5G O-RU
Option 7.2x
O-RAN/eCPRI
5G O-DU
01, 02, E2
F1 Interface
(Ethernet)
X2
N2
5G O-CU
EPC / NGC

RANtoCore

| UE→O-RU UE→RF | O-DU→O-RU | O-RU→O-DU | O-DU←→O-CU | O-CU→OCU | CN→O-CU | O-CU→CN | CN→CN |

Complete set of Network Test Solutions & Services for 4G/5G, Open RAN and Cloud Networks

TM500 Family

End User Simulation
4G and 5G Device and
Application emulation

Single point of control
R&S® FSVA3000 VSA
TM500
R&S® SMW200A VSG

O-DU Emulation
O-RU (OFH) Test

TM500

O-RU Emulation
O-DU (OFH) Test

TeraVM Family

O-CU Emulation
O-DU (F1) Test

E2 Emulation
RIC Test

O-DU Emulation
O-CU (F1) Test

RAN Emulation
Core Test

Core Emulation
RAN Test

**App
Emulation**

Flexible test deployment via dedicated hardware or cloud-native platforms (Taas, Saas, Laas)

1049-3.900.0722

O-RAN LAB Portfolio

Solutions to Accelerate Base Station Development and Roll-out

VIAVI Products

VIAVI Test Portfolio for Base Station Development

System Integration and Capacity Test

TM500 Family

Comprehensive Test Capability to Speed gNB Development and reduce 5G Base Station Time to Market

The TM500 Family of products is used for functional, system integration and capacity test in the lab and emulate up thousands of mobile devices, across multiple cells to set-up and test 4G and 5G Base Stations.

The TM500 has been the defacto industry standard for base station testing since 3g. It is used in virtually all Network Equipment Manufacturers worldwide and now boasts capability across 3G, 4G, 5G including O-RAN. TM500 delivers real voice and data and 4G/5G core emulation, providing the most comprehensive lab validation portfolio. The TM500 Family offers the right test tools, expertise and support across the entire development lifecycle.

Early functional test

TM500 delivers early functional base station development when most of your engineering resource is allocated for writing code and developing specific elements of functionality. As your engineering teams adopt "shift left", development and testing methodologies provide the benefit of detecting problems early in the development cycle. This saves time and money by avoiding the need for expensive rewriting of software. VIAVI offers the best test tools for the exact stage of development enabling you to maximize your ROI.

For example:

1. An engineer that is working on channel coding will need only L1 tools.

2. An engineer working on layer 2 or layer 3 testing needs only the layer 2 and 3 modes of testing.

System integration, capacity, performance and regression test

As your project continues through the development lifecycle the test requirements become more complex however, there are usually less engineering resources allocated to tasks such as system integration or performance testing.

For example:

Testing handovers and mobility with a mix of traffic types and then scaling up the number of UEs. Regression testing has the most Complex test scenarios and therefore requires more complex and larger scale test systems.

The TM500 Family offers large scale and functionality to suit the needs of this later stage development. This gives you the reassurance and support of a industry standard test tool with best in class and automation capabilities when engineering resource is at a premium.

TMLite

Ensure the delivery of 5G products to market rapidly, on-budget and with reduced risk of costly delays.

TMLite is a cost-effective multiple UE simulator, running on an industry-standard server. The TMLite has been specifically designed to give R&D engineers an early stage functional development tool to help bring 5G products to market faster

TMLite offers comprehensive debugging tools, and a validated automation framework to accelerate 3GPP gNB functional development, early in the development cycle. By employing this focused testing earlier in the development cycle, developers can boost engineering productivity and avoid costly delays incurred because defects remain undetected while significant effort is spent writing software and integrating functional components.

Key Features

- Single server supports 5G SA with support for 2x2/4x4MIMO
- Multiple UEs
- RF Test interface
- PDCP, NAS, MTS Test Modes
- 5G NR: SA, NSA
- Automation and logging capability
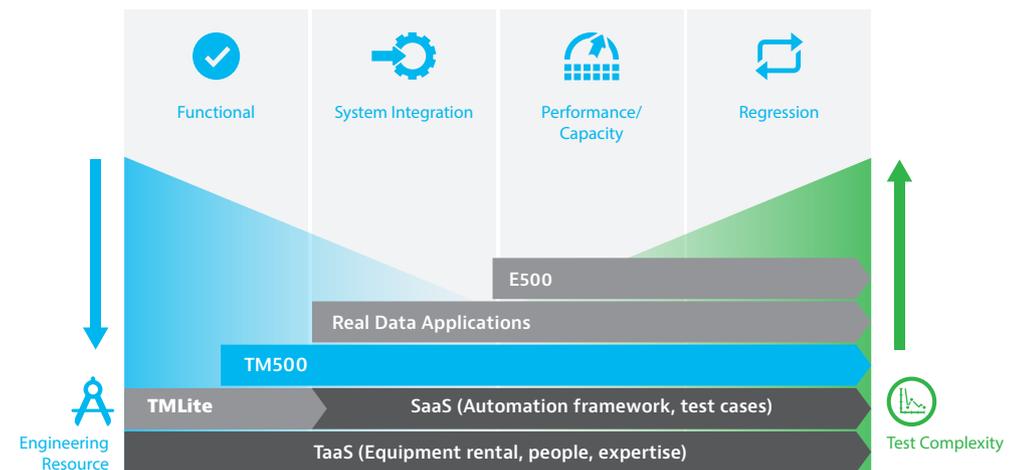- Data applications
- Bandwidth 100 MHz
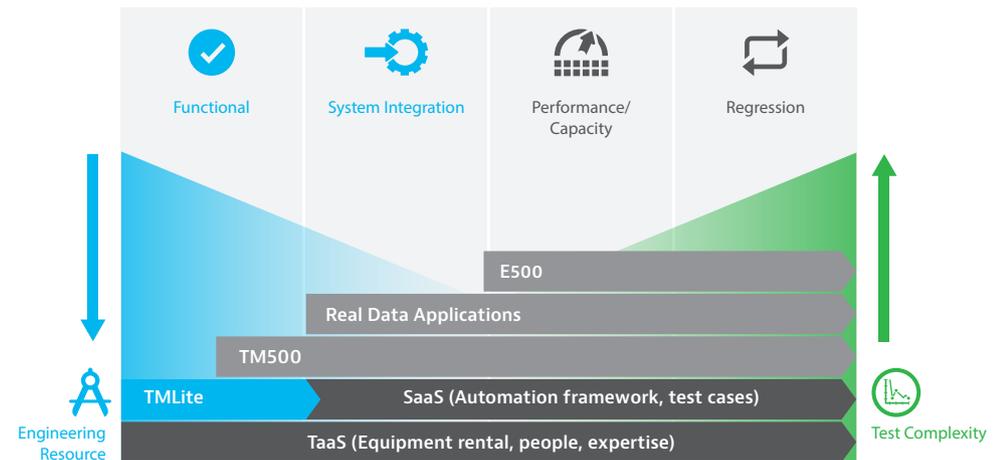
TM500 Benchtop

The flagship TM500 can be used for functional testing all the way through the development cycle up to performance and regression testing.

The TM500 is a scalable test system for validating network performance as experienced by end users, across multiple cells and different radio access technologies. With integrated data services it is able to measure the complete performance of the network, from RF through to the packet core—this includes interaction with other users, the simulated RF environment and mobility.

Key Features

- Over thousands 5G UEs with NSA and SA with feature parity
- Models real RF channel conditions
- Up to 4CC Carrier Aggregation in DL
- 4CC Carrier Aggregation in the UL
- Most comprehensive mobility scenarios with NSA and SA
- OTA, RF and eCPRI
- Supports multiple vendors across the RAN and Core
- Peak performance of 4/5G services with thousands of UEs
- Ensure traditional services that drive revenue are not undermined e.g. voice
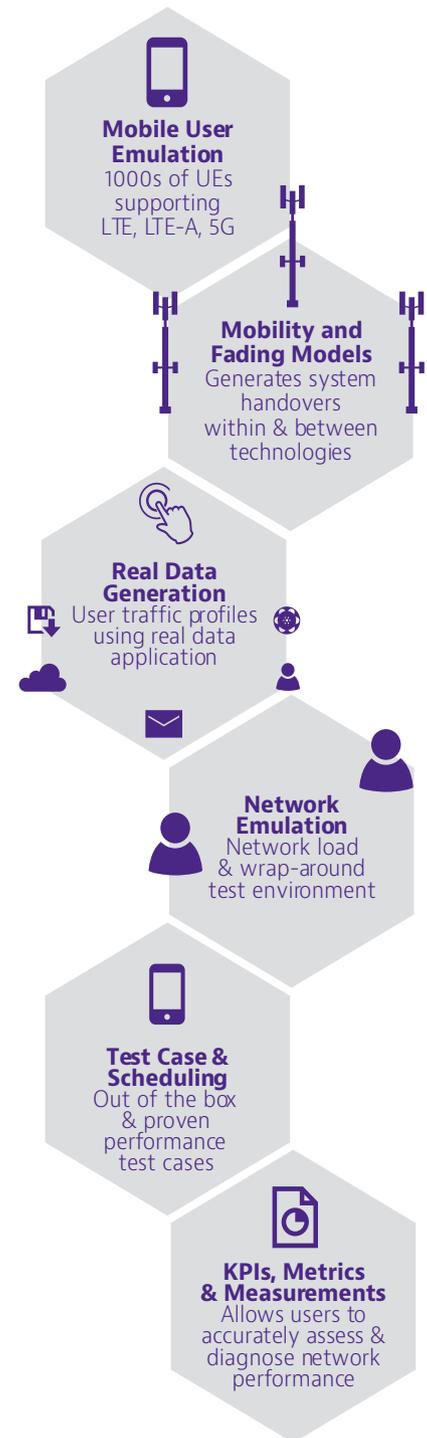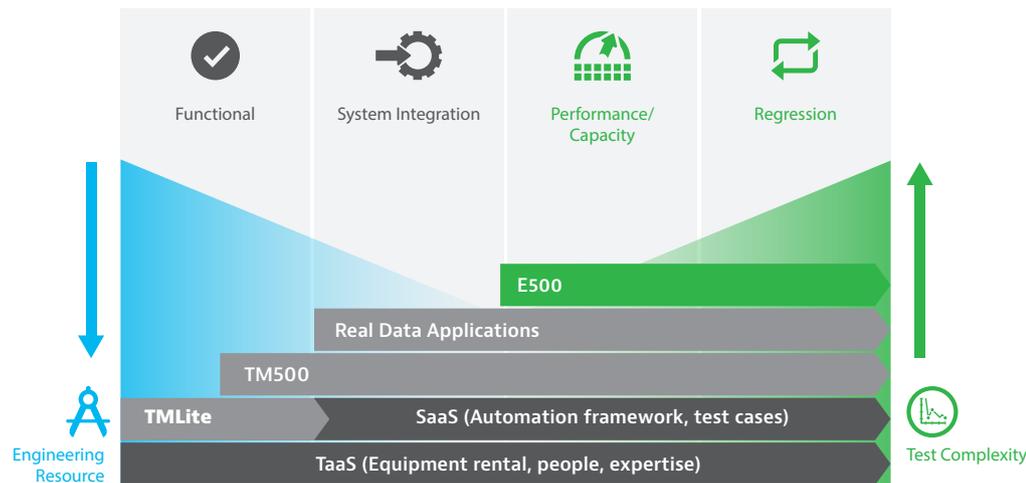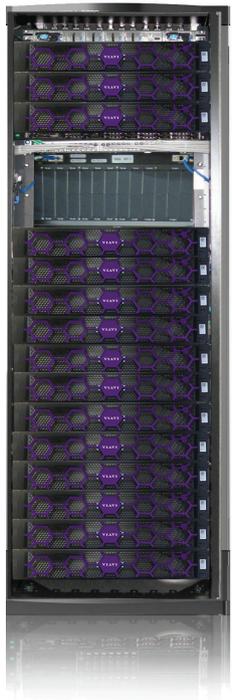
E500

The E500 is designed specifically to support highly scalable network performance, capacity and regression 5G and O-RAN testing. The E500 supports real data applications e.g. HTTP, FTP, and streaming/UDP traffic, performance validation can be done to ensure that KPIs such as throughput, latency, and round trip times (RTT) meet customer requirements even though the O-DU and the O-CU may come from different vendors.

5G adds new fading profiles and handover scenarios which must be tested for including low, medium, and high UE capacity test scenarios.

The TM500/E500 can be used for high capacity end-to-end performance tests in simulated real-world environments facilitating validation of the different mobility, traffic and handover scenarios for 4G and 5G. Such end-to-end validations continue to be vitally important when testing disaggregated RAN networks leveraging O-RAN based components.

Mobile User Emulation
1000s of UEs supporting LTE, LTE-A, 5G

Mobility and Fading Models
Generates system handovers within & between technologies

Real Data Generation
User traffic profiles using real data application

Network Emulation
Network load & wrap-around test environment

Test Case & Scheduling
Out of the box & proven performance test cases

KPIs, Metrics & Measurements
Allows users to accurately assess & diagnose network performance

Functional	System Integration	Performance/ Capacity	Regression

E500

Real Data Applications

TM500

TMLite | SaaS (Automation framework, test cases)

TaaS (Equipment rental, people, expertise)

Engineering Resource

Test Complexity

5G Core Network Emulation

The VIAVI TeraVM Core Emulator adds to the capabilities of industry-standard TM500 test UE emulator to provide a full wrap-around test of a 5G gNB for both non-standalone (NSA) and standalone (SA) modes.

TeraVM Core Emulator can remove the pain of Core Network dependencies by giving engineers a controllable and repeatable test environment that helps implement 3GPP standards rapidly and simplify the development lifecycle of 5G small cells and the introduction of 5G services to the market.

Key Features

- First to market alignment with 3GPP standards
- Runs in lightweight VM on standard x86 hardware
- Run 2G, 3G, 4G and 5G on same x86 host
- Standalone, non-standalone 5G plus legacy RATs (2G, 3G, 4G)
- Supports IoT and VoLTE (IMS)
- Automation and scripting tools
- Negative testing via error injection on the N2 interface (gNB -AMF)

| UE & Apps | RAN under test | Emulated Core Network | TeraVM Servers |
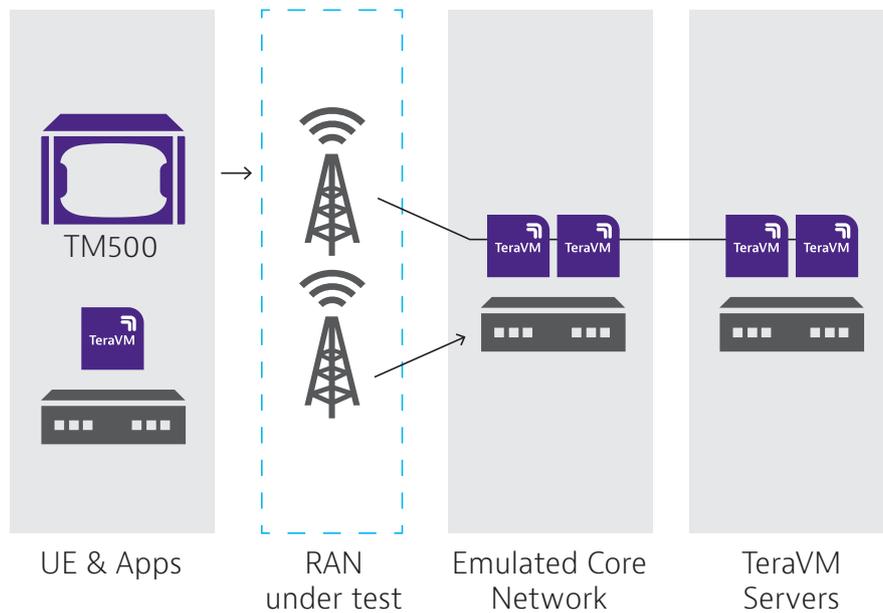
O-RAN Subsystem Testing

TM500 O-RU Tester

The TM500 O-RU Tester covers a wide range of test capabilities, allowing customers to ensure conformance, interoperability and performance testing including real-time generation of the O-RAN Control/User/Synchronization/Management plane messaging for the IQ data stream. The TM500 O-RU Tester supports interoperability validation for different vendor O-RUs, addressing key challenges seen with testing within the O-RAN test framework.

The TM500 O-RU Tester implements the O-RAN Distributed Unit (O-DU) side of the M-plane and C/U-plane functionality. This is necessary to configure the interface with the O-RAN Radio Unit (O-RU) under test and exchange of I/Q data over the U-plane. When used in conjunction with the widely used T-BERD/MTS-5800, S-plane and SyncE timing signals can be provided to ensure correct S-plane operation with all S-plane deployment topologies.

Integrated Conformance Test

Together with Rohde & Schwarz, VIAVI offers a proven, powerful test solution to verify the FH conformance of your O-RU radio unit. The VIAVI TM500 O-RU Tester, synchronizes and configures the O-RU. Rohde & Schwarz signal generators and signal and spectrum analyzers, such as R&S®SMW200A and R&S®FSW provide RF signals and waveforms, capture signals and analyze the I/Q data both in uplink and downlink.

The VIAVI O-RU Test Manager Application (O-RU TMA) provides a clear pass/fail overview for the main parameters. For in-depth debugging, customers can use R&S®VSE Vector Signal Explorer analyzing software to access detailed measurement results.
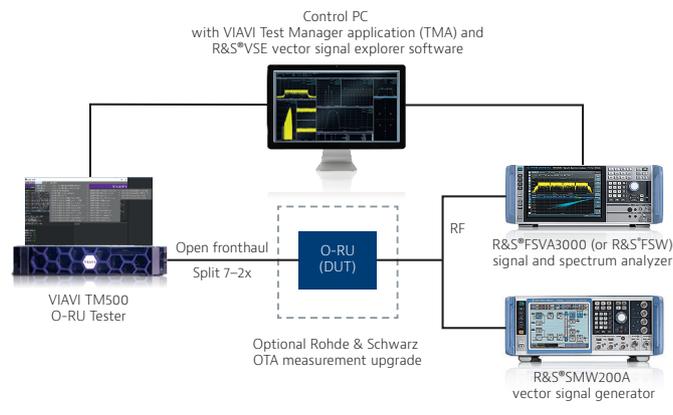
Key Features

- NETCONF Client to support Start-Up and get/edit configuration of M-plane attributes in the O-RU under test
- O-RAN C/U-plane functionality to exchange I/Q data over Lower Layer Split 7–2x interface
- Real time C/U-plane eCPRI packets generation
- Embedded protocol analyzer for OFH traffic analysis
- C/U-plane messaging support with eCPRI over Ethernet
- PTP/SyncE Grandmaster + PTP Client for Synchronization with external PTP Master
- OFH interface connectivity monitoring
- Wide range of synchronization topologies
- Multiple options for stimulus waveform generation

Control PC
with VIAVI Test Manager application (TMA) and
R&S®VSE vector signal explorer software

VIAVI TM500
O-RU Tester

Open fronthaul
Split 7–2x

O-RU
(DUT)

RF

Optional Rohde & Schwarz
OTA measurement upgrade

R&S®FSVA3000 (or R&S®FSW)
signal and spectrum analyzer

R&S®SMW200A
vector signal generator

Conformance, interoperability and performance testing

Fully stateful testing over the O-RAN Open Fronthaul interface

Extensions to characterize and optimize performance of 5G NR

TM500 O-DU Tester

The ability to test O-DUs with different profiles from different vendors can be complex and expensive as may need multiple test lines. The TM500 O-RAN Fronthaul Solution allow multiple O-DUs from different vendors to be tested including having different profiles. This reduces complexity and cost of testing.

The O-RAN Fronthaul Solution is an extension of the TM500 which has an unparalleled global support footprint to assist customers in expediting delivery and deployment around the world.

The TM500 O-RAN Fronthaul Solution provides seamless access to already leading 3GPP 5G features supported today over RF, e.g., in End-to-End tests when testing the latest high order Carrier Aggregation and MIMO.
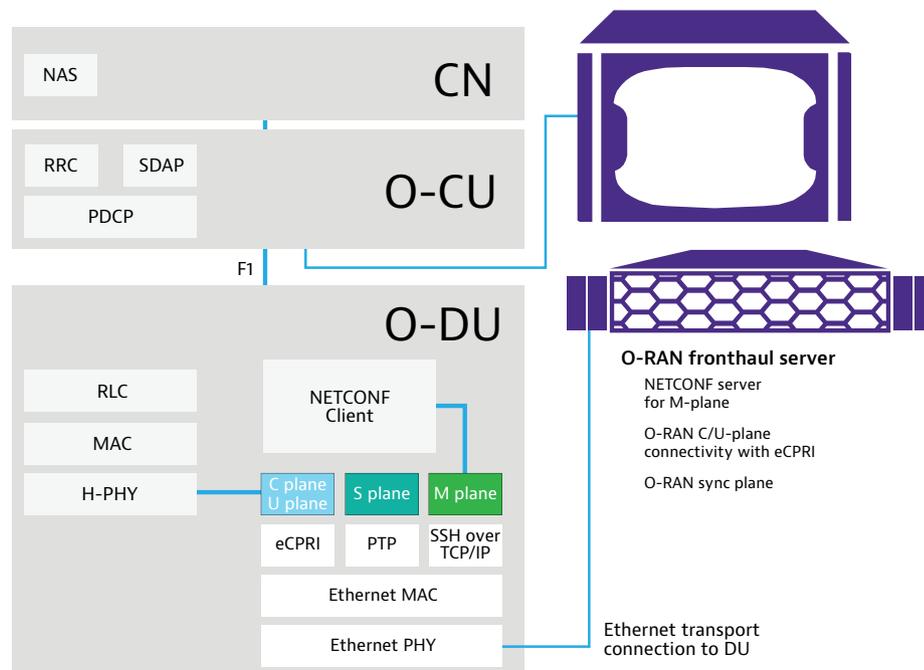
Key Features

- Extends capabilities of market leading TM500 Test UE emulator that is used extensively by the world's leading vendors and operators
- New interface and software options to interface directly to O-DU without an O-RU present
- Support multiple O-RAN profiles to ensure interoperability against a wide range of Radio Units and vendors
- Ensure delivery of commercially robust gNBs and software that support high numbers of subscribers consuming large amounts of data
- Test using real world data flows at high scale with realistic mobility modeling

Benefits

- The TM500 5G already supports today thousands of UEs with a rich KPI set for network performance testing over RF
- 5G functionalities supported over RF can be accessed over O-RAN as it matures. This is important to operators for network performance testing and interoperability with 4/4.5G where the TM500 clearly leads.
- All mobility scenarios are supported over 5G and is key as the deployment scenarios become more complex
- Lightweight: deploy and configure in real-time
- One-stop test support

O-RAN fronthaul server
NETCONF server for M-plane
O-RAN C/U-plane connectivity with eCPRI
O-RAN sync plane
Ethernet transport connection to DU

TeraVM O-CU Tester

The first-to-market TeraVM O-CU Tester, delivers a complete wraparound testing framework for the O-CU with TeraVM's stateful emulation capabilities, ensuring that the O-CU can be robustly tested and optimized for high-quality and performance in a deterministic, repeatable and reproducible manner.

TeraVM O-CU Tester for O-CU subsystem test validates that the O-CU works:

- According to 3GPP standards and O-RAN C-plane and U-plane profiles
- Interoperates with other 5G and O-RAN network functions and components
- Performs optimally when fully loaded with complex mobile traffic profiles

TeraVM O-CU Tester for O-CU subsystem test can emulate:

- Over the F1 interfaces: network topology and slice aware UE sessions and the O-DUs testing the O-CU (device under test) with stateful 3GPP and O-RAN compliant F1-C and F1-U sessions and procedures
- Complex application traffic flows emulation traversing over the established 4G core PDN sessions and 5G Core network slices and PDU sessions

Key Features

- First to market O-CU wraparound test compliant with latest 3GPP, O-RAN standards
- Runs in lightweight VM on standard COTS hardware
- CI/CD Automation Integration
- Functional Testing

Benefits

- X86 Server based HW gives flexibility for multiple users to share the test system increasing the ROI
- Highly scalable reducing hardware obsolescence issues
- Works seamlessly with sister products TM500 and TeraVM so that engineers familiar with other VIAVI products have a faster ramp-up time
- Works with TeraVM Core Emulator and vRAN Emulator to enable O-CU testing to be done in a stable and constant environment giving increased reliability and boosting productivity by avoiding the constant changes to a real core
- Automation and scripting to speed up testing and thereby also increase engineering productivity and optimize customer experience

Supporting Products

Industry-leading field test equipment capability from VIAVI brought into the lab delivers the most comprehensive pre-deployment test environment.

CellAdvisor 5G

The CellAdvisor 5G complements the TM500 5G for monitoring and accelerating troubleshooting of 5GRF channel performance. It provides the following complementary benefits following some of the use cases cited below:

- Expediting laboratory pre-verification checks when e/gNBs and UE emulators are often connected over long cables with RF attenuators, splitters and couplers.
- Accelerating troubleshooting when testing signal quality sensitive features such as higher order MIMO

Key Features

- Radio performance testing to validate successful O-RAN deployment
- Massive MIMO and active antenna beam validation
- Interference analysis and PIM detection over CPRI
- Comprehensive RF signal analysis
- Fronthaul and RRH verification over CPRI
- Cable and antenna analysis with optional RF source
- Real-time spectrum and interference analysis with persistence display for 5G FR1 (sub-6GHz) and FR2 (mmWave)
- 5G carrier scanner measuring up to eight wide-band carriers' power as well as strongest beam power level and its corresponding ID
- 5G beam analyzer assessing individual beam's ID, its power level and corresponding signal to noise ratios

T-BERD/MTS-5800 Handheld Network Tester

The VIAVI T-BERD/MTS-5800 performs eCPRI tests including throughput, delay, and packet jitter. Engineers can configure eCPRI message types according to eCPRI specification, measure bandwidth for each message type, and measure Round Trip Delay (RTD) with sub 5ns accuracy.

The T-BERD/MTS-5800 with O-RAN support not only can check the health of the open fronthaul, but it also can capture O-RAN CP and UP packets and filter those packets to validate if the packet transmission is compliant with the O-RAN fronthaul protocol specification. Operators can view the captured and filtered packets in Wireshark® expediting the analysis and allowing faster troubleshooting and a successful on-time network launch.

Key Features

- Integrated Timing/Synchronization testing including PTP/1588v2, SyncE, Wander, and One Way Delay test
- Fronthaul Testing CPRI/OBSAI Layer 1/Layer 2 and emulation of Baseband and Remote Radio units
- Supports efficient best practices with repeatable methods and procedures
- Validate S-plane conformance tests with timing measurements
- Comprehensive M-plane client supports multiple O-RAN profiles proven with multiple vendors e.g. FR1, FR2, FDD, TDD
- Supports stateful M-plane client enabling repeatability of tests
- T-BERD/MTS-5800 was used widely and successfully in plugfests to resolve synchronization issues vendors were facing

Test as a Service (TaaS) Model

VIAVI provides Test as a Service enabling our customers to optimize quality and time to market of their product to:

• Increase the speed of test execution
• Reduce software development time

Our test automation capability with consistency and repeatability allow our customers to lower their costs and improve agility and scalability while bringing an independent testing process.

How does it work?

The delivery of Test as a Service provides Test Case Packages to users of the TM500 and TeraVM family products, enabling them to integrate their results and KPIs into everyday activities.

VIAVI delivers bespoke test packages based on your needs provided with our network and system analysis to de-risk and accelerate project's deliverables.

• Engagements start with on-site system analysis and work shop sessions to help customers get started with the test case packages. Subject matter experts are available throughout the engagement to support successful testing.
• An open-source Automation Framework is provided with an adaptable and easy to use GUI generating KPIs, reports and log analysis.

Increase the speed of test execution
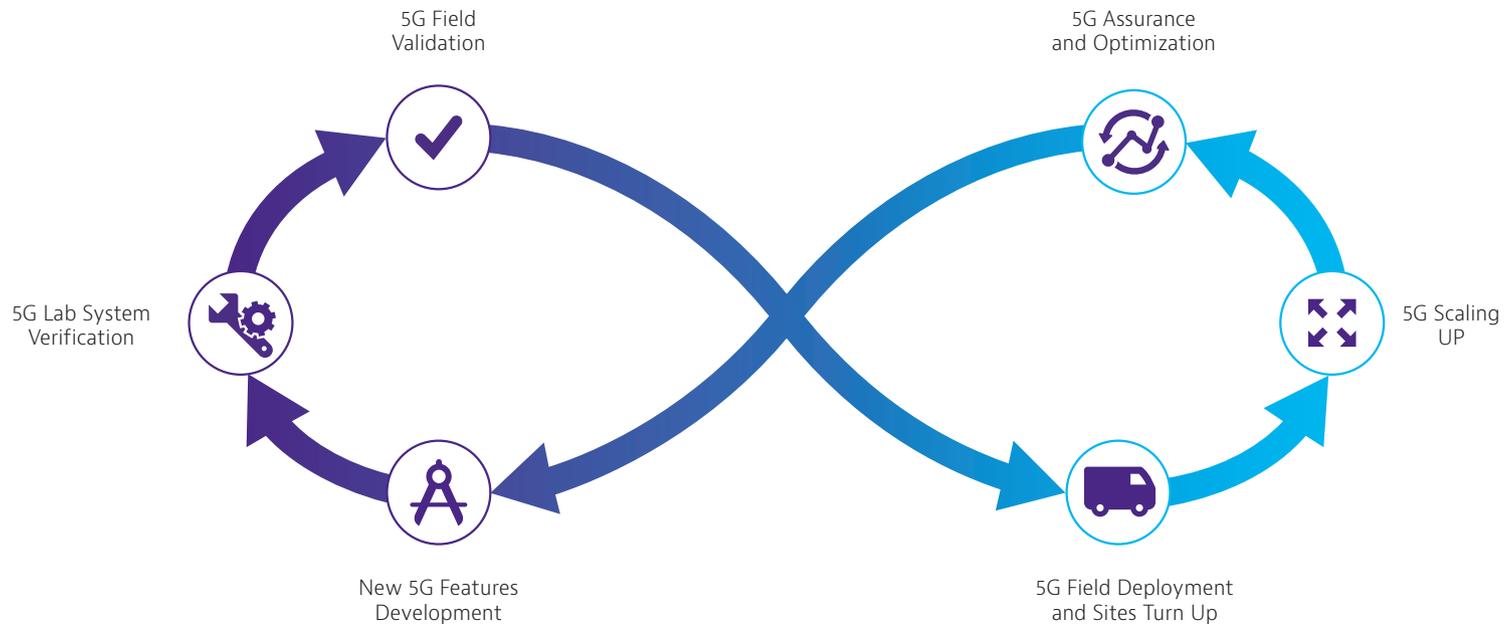
Reduce software development time

Why VIAVI?

VIAVI offers the most comprehensive test platform on the market for lab validation, field deployment and service assurance of O-RAN networks. VIAVI delivers integrated solutions to validate that all interfaces are working correctly—including RF, O-DU, O-RU, signaling, timing and synchronization—and equipment is performing to specifications even under load and stress, from the lab to the field. With vast experience validating network products for operators and manufacturers worldwide, including all Tier-1 network equipment manufacturers, as well as partnerships with best-of-breed vendors, VIAVI helps network operators ensure interoperability—the principal concern in a multi-vendor based O-RAN environment.

- Access to the industry's leading edge development tools
- Support to bring your products to market on time and on budget
- A flexible range of solutions to address different needs and budgets
- Upgradeable solutions to allow the test strategy to grow with your business – Our "Pay as you grow" ethos is enabled by scaleable software options.

- Automation/test scripting options to boost engineering productivity
- Ability to match investment phasing to project phasing
- Test equipment configuration optimization to align to your test strategy
- Best test practice: We can advise on the correct test equipment to meet your needs.
- Access to a world-class support organization

5G Field
Validation

5G Assurance
and Optimization

5G Lab System
Verification

5G Scaling
UP

New 5G Features
Development

5G Field Deployment
and Sites Turn Up

VIAVI delivers solutions for Validation, Verification and Visibility throughout the 5G Network Lifecycle

VIAVI Solutions

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