VIAVI Solutions

NITRO Wireless

MU-MIMO Test

Reach Peak Efficiency in 5G

Challenges

MU-MIMO validation, deployment, and operation underscore the balance between high QoS expectations and the growing demand for high-speed, low-latency communications. To provide efficiency improvements through MU-MIMO integration, the base station must have accurate channel information for each discrete user while accounting for interactions between complex gNB scheduling.

The VIAVI Solution

Validation in the lab is the key to realizing the efficiency benefits of MU-MIMO in the field. The industry-leading VIAVI TM500 Network Tester provides an ideal platform for advanced multi-carrier MU-MIMO testing and validation, with dynamic digital channel modelling and fully integrated UE emulation. With digital spatial channels conveniently modelled in the FPGA cards, the VIAVI MU-MIMO Front End is designed to verify throughput and capacity while maintaining an emphasis on flexibility.

The TM500 helps to overcome the challenges preventing efficient 5G spectrum utilization. Modular and economically scalable MU-MIMO validation coupled with easy setup and reliable results puts vastly improved efficiency within reach. These attributes lie at the heart of an end-to-end MU-MIMO test strategy that also encompasses:

- **VIAVI TeraVM AI RAN Scenario Generator:** provides hundreds of UEs per beam and sophisticated mobility patterns to ensure MU-MIMO and beamforming performance is vetted through demanding real-world scenarios. Immediate "per UE" visibility delivers real-time metrics and results.
- **TM500 O-RU Tester:** This purpose-built solution is designed to meet the unique challenges of radio unit and fronthaul testing for disaggregated Open RAN networks. VIAVI and Rohde & Schwarz have partnered to deliver defacto standard UE emulation with top-tier RF capabilities and market leadership, essential for verifying MU-MIMO performance in an Open RAN environment.

Business Impact

Shifting comprehensive MU-MIMO test and validation processes upstream through a combination of emulation, dynamic channel modelling, and OTA testing is the best way to proactively impact QoS while minimizing unnecessary rework and delays.

Sample Use Cases

Use Case 1: MU-MIMO E2E RF Test (Cable)

- The TM500 and TeraVM Core Emulator with Real Data Applications create a comprehensive, end-to-end (E2E) test configuration
- Validate the performance and interoperability of connected O-RU, O-DU, and O-CU system elements.
- Data streams produced through this use case provide inputs for UE emulation that incorporates a wide variety of MU-MIMO scenarios.

Use Case 2: MU-MIMO End-to-End Test (Open RAN)

- The O-DU is responsible for intensive beamforming and MU-MIMO data processing in Open RAN.
- TM500 digitally connects to a TM500 O-RU Simulator to test the MU-MIMO beamforming performance of the O-DU in a simulated Open RAN fronthaul configuration.
- Emulation of both the UEs and O-RU allows the O-DU to be validated in isolation before it is integrated with an actual O-RU.

VIAVI Benefits

TM500 Family

De Facto No. 1 Base Station Test Tool.

Improved Test Efficiency

Embedded, Digital and Dynamic Channel Modelling, consistent and repeatable results.

Optimized Test Investment

Modular and Scalable, upgradable from existing purchases, futureproofed for 5GA/6G.

Get started with VIAVI MU-MIMO Solution

Visit: MU-MIMO Test Solutions for 5G Networks

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