



Harness the Power of Location Intelligence for the RAN

Running VIAVI's xApp on VMware RIC to Locate Subscribers and Foster Optimization Use Cases

MWC rAPPATHON PARTICIPANT

VIAVI's xApp was one of seven applications demonstrated during the rAppathon RIC developer's competition hosted by VMware and Intel at MWC Barcelona 2023.

COMPANY OVERVIEW

VIAVI is a global provider of network testing, monitoring and assurance solutions for CSPs, hyperscalers, equipment manufacturers, enterprises, governments, and avionics.

VIAVI's Network and Service Enablement solution portfolio focuses on solving network visibility challenges. By helping customers to develop, install, test, optimize and monetize 5G and future O-RAN networks, VIAVI's cloud-enabled portfolio of instruments, software, and platforms enables better network performance, productivity, and quality of service.

VIAVI is striving to minimize the risks of transformation while enabling today's 5G networks and tomorrow's cloud and open technologies, from lab to live. See www.viavisolutions.com/united

The Importance of Geolocation Information

As Communication Service Providers (CSPs) adopt RAN programmability to onboard technology for automation and optimization of RAN resources, they are discovering that access to subscriber-centric geolocated KPI data is of the utmost importance to realize the full potential of these new operational models.

Current positioning techniques are under the control of device manufacturers and rely on technologies like GPS, WiFi, or BLE, which are plagued with shortcomings such as poor indoor coverage, high battery consumption and varied support on different devices. Consequently, CSPs cannot effectively leverage this information for services or network optimization.

VIAVI's Geolocation xApp, powered by VMware Distributed RIC, unlocks the power of location intelligence for the RAN. By using mobile cellular signaling data as the primary input for its location technology and pairing it with network configuration management data, radio site information, and subscriber digital geospatial information, VIAVI's xApp accurately locates subscribers 24/7, and makes this information available for consumption by other apps in the near-real-time domain.

Location as a Foundational Capability

The VIAVI Geolocation xApp provides a foundational capability on the RIC by exposing the rich subscriber centric information via the RMR messages or the

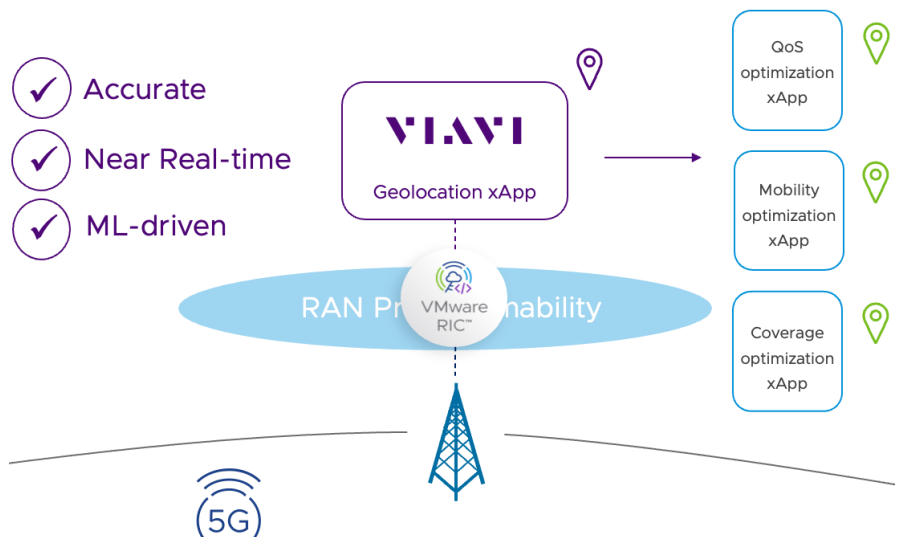
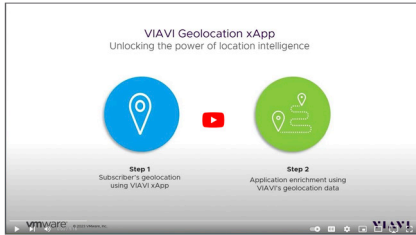


FIGURE 1: The VIAVI Geolocation xApp on VMware RIC.

VIDEO DEMONSTRATION OF THE PARTNER'S SOLUTION ON VMWARE RIC



Harnessing the Power of Location Intelligence with the VIAVI Geolocation xApp on VMware RIC

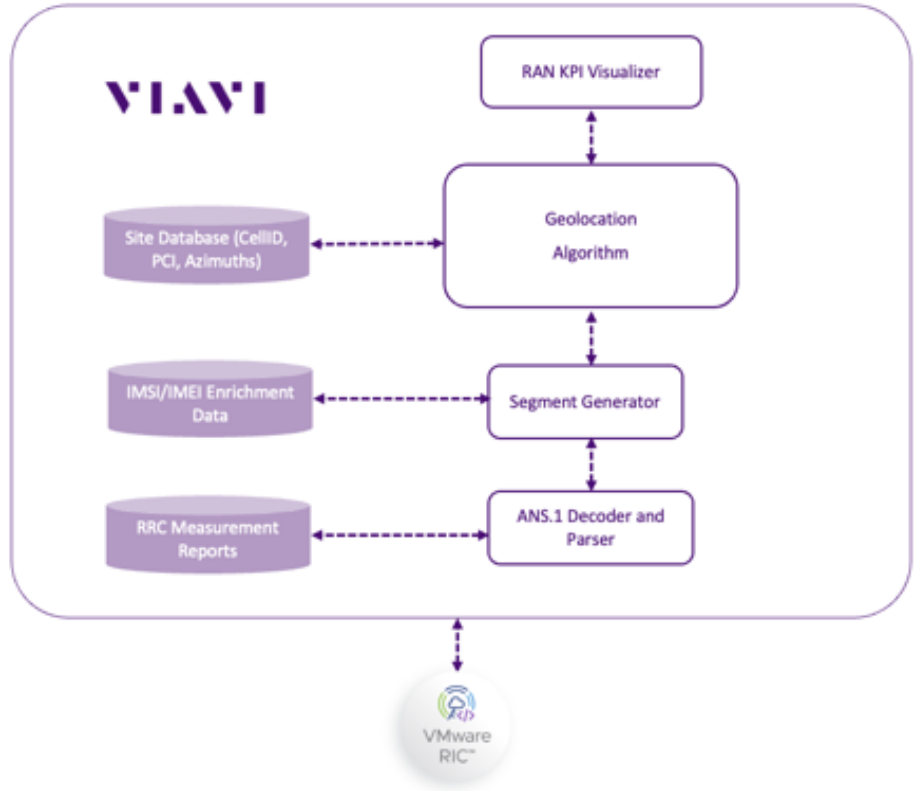


FIGURE 2: The components of the VIAVI xApp for location intelligence. The VIAVI xApp runs on VMware RIC.

RAN PROGRAMMABILITY

The RAN intelligent controller gives applications from different vendors access to the functions running in the control and management planes of your radio access network, empowering you to program and optimize your RAN by using methods like artificial intelligence and machine learning.



Demo Video: Activating Network Programmability with VMware RIC

Subscriber Data Layer (SDL) API. The availability of geolocation estimates in near real-time allows other applications registered with VMware Distributed RIC or VMware Centralized RIC to use this information and make more informed decisions. VMware Distributed RIC runs xApps, and VMware Centralized RIC runs rApps.

VIAVI's Geolocation xApp intelligently aggregates location information through time. Aggregating the data centrally has additional potential – the measurements and locations of mobile devices over longer periods reveal the dynamics of subscriber behavior and how this affects the RAN.

This data unlocks a range of data-driven optimization use cases to tailor the network and the demands placed on it.

How it Works

The xApp is composed of:

- A parser module responsible for decoding serving and neighbor cell information from RRC messages.
- The segment generator module is responsible for breaking up the subscriber's connection into several segments that can be individually geolocated.
- The geolocation module applies VIAVI's proprietary algorithm to locate the segments, thereby providing subscriber-level insights that can be shared with other xApps and rApps.

VMWARE RIC AT A GLANCE

VMware RIC lets you programmatically manage and control your radio access network (RAN). The RAN intelligent controllers from VMware enable third-party application developers to tap into network data, process it, and use it to modify RAN behavior.

VMware Distributed RIC hosts near-real-time applications (xApps), and VMware Centralized RIC runs non-real-time applications (rApps). These apps introduce new use cases — automation, optimization, and service customization — that fuel innovation across a telecommunications network.

KEY BENEFITS

- **Multi-vendor interoperability and a vibrant partner ecosystem** – use a vendor- and technology-agnostic platform and tap pioneering solutions.
- **Network optimization** – gain network-wide observability and automate optimization with AI/ML.
- **Efficiency** – reduce energy consumption and improve spectrum utilization by using applications from various partners.

RIC SDK PARTNER PROGRAM

A rich developer ecosystem is critical to the successful adoption of open RAN technology. The VMware RIC SDK Partner Program expands access to and simplifies the development of RIC applications. The program gives partners access to RIC SDKs as well as training videos and application developer support. To find out more, visit

<https://techpartnerhub.vmware.com/programs/vmware-ric>

LEARN MORE

For more information about the VMware Telco Cloud or VMware RIC, call 1-877-VMWARE (outside North America, dial +1-650-427-5000) or visit <https://telco.vmware.com/>

VIAVI's algorithms use different models to assist in different types of decisions:

- Low-latency geolocation data as input to handover decisions
- Spatially correlated modeling of coverage of each network layer
- Models to characterize pairing strength, including location and trajectory
- Models to characterize interference of RE allocations, including location and trajectory

Benefits

The precise geolocation information delivered by the VIAVI Geolocation xApp is a key enabler of RAN automation, enhancing use cases such as:

- RAN Energy Savings
- Coverage and Capacity Optimization
- Traffic Steering
- mMIMO SSB Beam Optimization
- MU MIMO Pairing

As a consequence of improving service experience, subscriber churn is reduced, and the valuable insights provided to other applications unlock new revenue streams.

VMware and the Path to a Disaggregated, Programmable RAN

For the past five years, VMware has been methodically introducing new telco cloud solutions and changing expectations in the service provider industry about modernization. With an established footprint in telco cloud deployments globally, VMware has been expanding its capabilities to address the challenges in the disaggregation of the RAN.

With a horizontal platform that enables workload consistency from the core and the RAN to the public cloud, we've revealed what is possible—simplicity, speed, agility, and far-reaching automation. The objective is to enable our customers to modernize their entire networks, simplify their operations with end-to-end consistency, and further disaggregate their RAN.