# Steer Traffic Intelligently to Optimize Resource Utilization

## Policy-Controlled xApp from Rimedo Labs on VMware RIC Wins the rAppathon at MWC 2023

### PARTNER SOLUTION AT A GLANCE

Rimedo's Policy-Controlled Traffic Steering xApp running on VMware Distributed RIC incorporates both service and mobility load balancing to avoid congestion, improve user experience, and make the network more energy efficient.

### RAPPATHON WINNER AT MWC 2023

Rimedo's xApp was the winner of the rAppathon RIC application developer competition hosted by VMware and Intel at MWC Barcelona 2023. A panel of expert judges selected the xApp ahead of six other competing applications as the one that delivered the greatest business and network impact, showed the most innovation, and fostered higher levels of sustainability.

### COMPANY OVERVIEW

Rimedo Labs specializes in providing high-quality consulting, implementation, and R&D services for modern wireless systems, focusing on Open RAN, 5G, and beyond. Rimedo Labs delivers customized xApps and rApps for RAN intelligent controllers. *https://rimedolabs.com/*

Current Traffic steering mechanisms primarily use radio conditions of the cell to determine where to steer traffic and they offer very reduced steering options, mostly limited to cell reselection, modification of handover parameters, and cell priorities. Communication services providers, or CSPs, adopting these traffic steering methods discover their network to be either underutilized in some areas or severely overloaded in others.

Rimedo Labs policy-controlled xApp, powered by VMware Distributed RIC, helps CSPs by providing service-based and load-balancing-focused traffic steering. Using internal intelligence and following the policies specified via the A1 interface, the Rimedo Labs xApp can simultaneously distribute the load between network nodes and offload specific traffic to dedicated cells (e.g., some cells may have caching enabled for video services, or lower latency or larger buffers).

With Rimedo Labs' policy-controlled xApp supported by the VMware Distributed RIC, CSPs can optimize resource utilization to build more balanced, resilient, and energy-efficient networks while delivering high-quality customer experiences.

## Intelligent Traffic Steering

Traffic steering that is purely service-based would force the handover of a UE to a cell most suited to the service required by that UE. For example, a UE requiring voice service should be directed to a macro cell, whereas a UE requiring MBB service

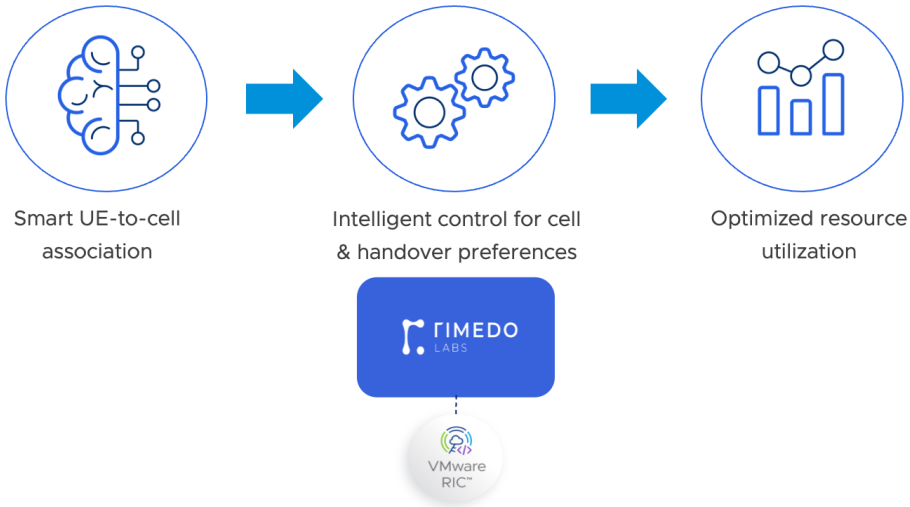
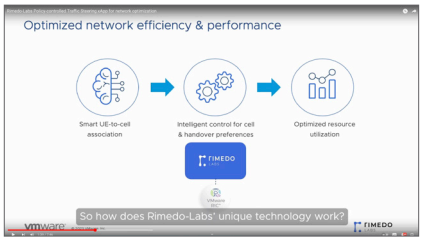



**FIGURE 1:** Optimizing network efficiency and performance with the Rimedo Labs xApp on VMware RIC.

### VIDEO DEMONSTRATION OF THE PARTNER'S SOLUTION ON VMWARE RIC




*Steering traffic with the Rimedo Labs xApp for network optimization*

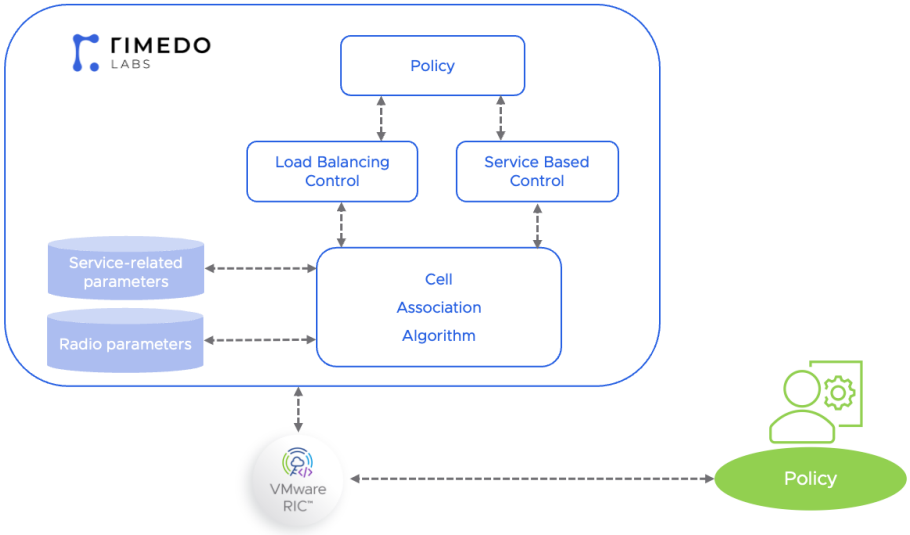
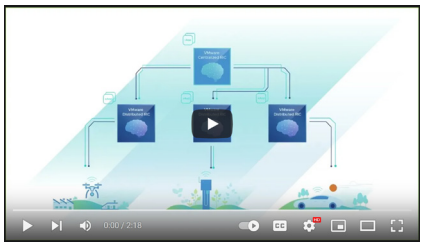



**FIGURE 2:** The Rimedo Labs technical solution with the xApp running on VMware RIC.

### 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*

should be assigned to a micro cell. Traffic steering that is purely load-based would share UEs around available cells regardless of the services that they require.

Taken alone, neither of these scenarios is a perfect solution. Service-based steering could result in cell congestion, and load-based steering could result in a UE being assigned to a cell ill-suited to the service required.

Using Rimedo's xApp, CSPs can efficiently steer UEs to base stations following currently valid policies. This steering avoids network congestion through intelligent load balancing. With rational distribution of UEs among serving base stations and congestion avoidance, the xApp delivers efficient resource utilization.

The intelligence of the Rimedo solution on the VMware RIC platform is to combine both service-based, and load-based steering with configured or AI/ML-derived policies to determine the optimum UE/cell assignments.

## Technical Solution

The Rimedo xApp is composed of the following:

- A service-based control module managing the policies that associate UEs with types of cells based on the services currently used, as derived by the 5QI parameter
- A load balancing control module, which optimizes user association with the cells to keep a load of base stations balanced
- A policy module, which enforces the execution of the policies
- A cell association algorithm module, which ingests data from the policy control modules and the network to produce the final UE-to-cell association decision

The algorithm receives cell load and RRC A3 events information through the E2 layer of VMare Distributed RIC and determines the 5QI, cell capabilities, and RSRP offset values.

Then, if requested, it applies the steering control policies communicated through the A1 interface. As a result, a UE-to-cell association decision is made based on UE metrics, cell capabilities, and current cell load. This association is then communicated to the E2 node through E2SM-RC commands.

### 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/*

## O-RAN Traffic Steering Use Case

The objective of this O-RAN traffic steering use case is to permit UE-centric strategies and proactive optimization by predicting network conditions.

The combination of VMware RIC and the Rimedo Labs xApp lets operators specify different objectives for traffic management by optimizing the network and UE performance to achieve a more balanced cell load.

Operators can flexibly configure desired optimization policies, utilize the right performance criteria, and use machine learning to enable intelligent and proactive traffic steering.

### Data

- Measurement reports – RSRP/RSRQ/CQI of serving and neighbor cells, cell quality thresholds, measurement gaps on per-UE/layer/frequency basis
- Connection and mobility/handover statistics
- Cell load statistics – number of active users and connections, number of scheduled users per TTI, PRB utilization
- Per UE performance statistics

### Realization

O-RAN enables traffic steering using the VMware RIC platform to control the adaptation of diverse scenarios and objectives. The near-real-time and non-real-time RAN intelligent controllers can control traffic steering strategies through AI/ML from data collected through the O1 interface from O-CU and O-DU elements.

## Benefits

The solution provided by the Rimedo xApp on the VMware RIC platform optimizes network efficiency and performance for CSPs, resulting in immediate business benefits. By avoiding congestion at cell sites, the network is more balanced and resilient. Subscribers are guaranteed a superior customer experience because the needs of their required service are included in the traffic steering algorithm. Load and demand are distributed evenly across the RAN, resulting in better performance and greater energy efficiency.

## 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.

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