

## Solution Brief

# Complete End-to-End Private Network Visibility

Accedian and Keysight provide end-to-end, real-time visibility and insights on user experience, network, application, and RAN performance in a single platform

The Private 5G market is still in the early stages of enterprise and industry 4.0 deployments. Most production deployments are single-vendor solutions deployed in ports, transportation, and mining, with limited 5G requirements, for example addressing WiFi shortfalls and handover issues. As Private 5G deployments advance toward 5G's more disruptive features (high capacity, wireless flexibility, and low-latency performance) to deliver factory automation and immersive experiences, reliable and time-sensitive networks with stringent SLAs will be required.

As advanced Private 5G networks become operational, multi-vendor, best-of-breed networks, with end-to-end assurance and security, will be critical to success. A key challenge will be interoperability pre-testing and ongoing performance visibility from devices, RAN or Open RAN, the standalone core, transport network, and edge platform.

### Solution at a Glance

- A complete solution for planning, deploying, monitoring, and assuring private 5G and LTE networks.
- Remotely and efficiently operate reliable high-performance private networks with stringent SLAs while minimizing maintenance costs.
- Deliver continuous and aggregated visibility of RAN performance, with correlated end-to-end access, edge cloud, backhaul, and transport network performance.
- Assure wireless device and user Quality of Experience (QoE) with enhanced service-level visibility and actionable insights from the user device to the 5G core.
- Deploy O-RAN with Private 5G and continuously assure multi-vendor network functions end-to-end across access, edge cloud, backhaul, and transport networks.
- Prevent application-level and user experience problems with early detection of performance issues. Analyze where the bottlenecks are by correlating RAN function and traffic data together with performance data from access, backhaul, and transport networks for a complete segment-by-segment view of performance.
- Use the same capabilities for end-to-end troubleshooting and faster MTTR resolution times. Analyze and pinpoint root cause of degradations by segment and identify recurring faults and microbursts in traffic that impact customer experience.

## Accedian and Keysight assure Private 5G performance and coverage

### Assurance use cases:

- Rapid deployment and activation of new networks and capabilities
- On-demand diagnostic testing
- Continuous operational monitoring

### Cloud native coverage of 4G/5G/MEC paths:

- Monitor real-world application performance from and between devices, and to local, MEC, or cloud compute services
- Insights and correlation of performance across network domains and layers
- Analytics and correlation of complex RAN-specific issues with service issues

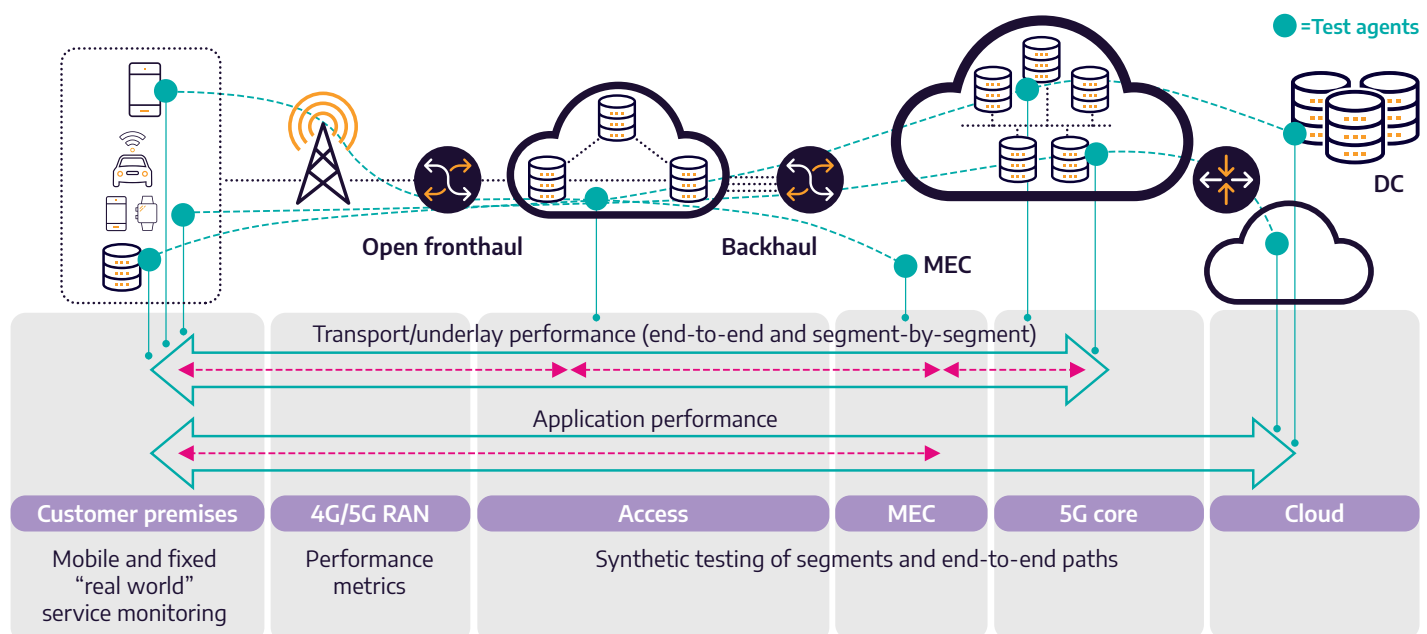


Figure 1: Accedian and Keysight provide complete end-to-end private network assurance

The solution delivered by Accedian and Keysight provides complete end-to-end visibility, from 5G-connected devices through the RAN, overlay, and underlay network infrastructure, and to on-premises, MEC, and remote datacenter compute infrastructure.

Based on a modular, open, cloud-native design, Accedian and Keysight deliver multi-environment capabilities and the ability to leverage lab and pilot testing into live production. It supports open APIs and message buses which can fit traditional NetOps and Continuous Integration, Continuous Design (CI/CD) DevOps models.

The solution combines Accedian's active (primarily Layer 3/Layer 4) testing, Keysight's wireless air interface, application Quality-of-Service (QoS), and Quality-of-Experience (QoE) testing, and Accedian's passive (real application traffic) performance data and analytics, including third-party data ingestion. This provides the necessary KPIs to measure SLA performance, quickly detecting issues before they can impact operations.

This solution enables a single platform to manage both test orchestration and on-demand testing using all of these capabilities. The platform can also correlate RAN data with transport performance and application data, providing quick insights into both which problems are most urgent and the likely root cause or location of the problem.

## Solution Features

- Best-in-class, proven Layer 2 to 7 cloud-native test agents to test 4G, 5G, and edge computing paths
- Real-time, end-to-end network and service performance monitoring from physical to application layer with real-time detailed KPIs (active synthetic testing and end-user application QoE)
- Real-time RAN and RF performance continuous active tests and passive monitoring
- Centralized collection and visualization of all test results through an end-user reporting portal
- Closed-loop automation capabilities through OpenAPI and message bus support (MQTT, Kafka, etc.)
- Analytics to correlate data and generate insights to enable fast troubleshooting, and isolation of RAN and MEC access issues
- Provides capabilities for pre-deployment testing and validation testing before activating real production traffic
- Incident reporting support into solutions such as Service Now, Atlassian, or Jira Software

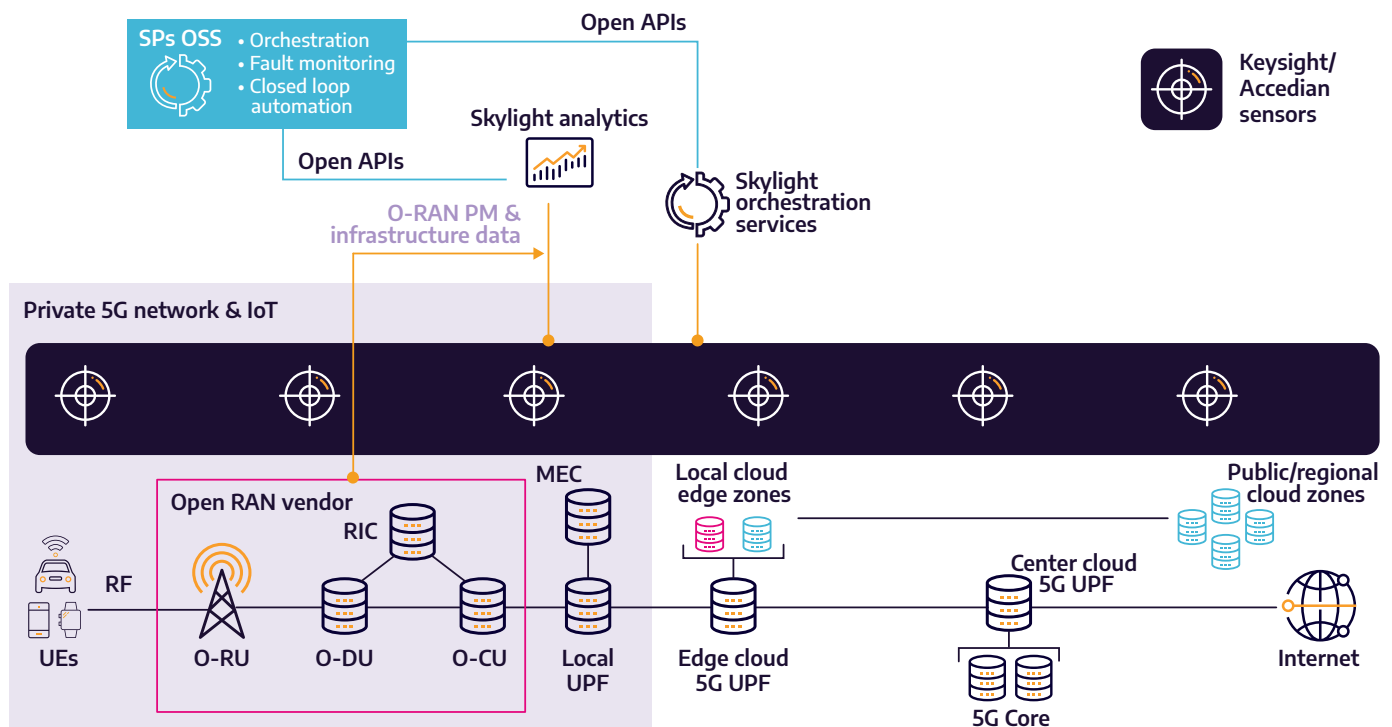
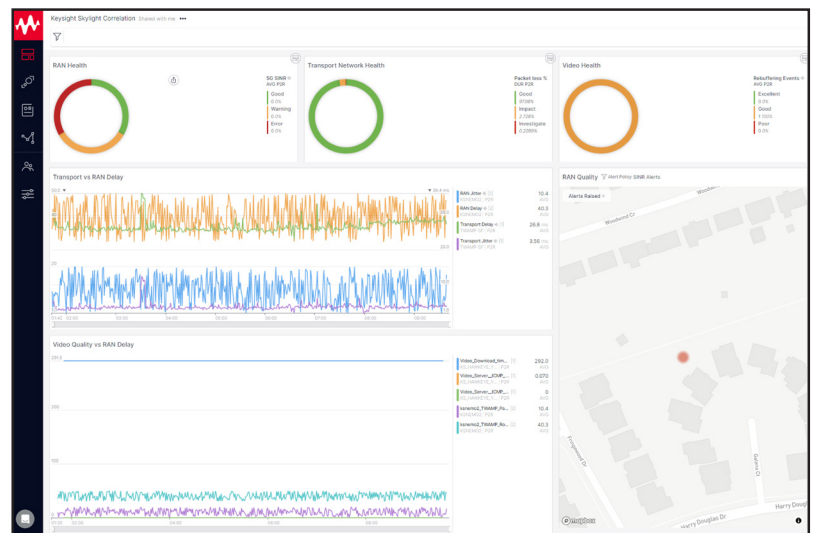


Figure 2: Keysight and Accedian solution for testing and assuring private networks

## Private 5G network troubleshooting

Operations teams can rapidly analyze a specific issue in context to localize the issue and accelerate root cause isolation, for example, they can determine if video latency was due to RAN RF/network performance or due to an underlying transport performance problem.

- **Top-level view of RAN/transport and video health in a single dashboard** - Delivers end-to-end network and service performance monitoring from physical to application layer with real-time detailed KPIs
- Could also act as a centralized collection and visualization of all test results through an end-user reporting portal



- **Drill down to compare transport vs RAN KPIs** - Compare real-time RAN and RF performance with network performance
- **Drill down to compare video quality vs RAN delay** - Detect application-level and user experience problems and correlate with RAN KPIs for early detection of RAN degradation affecting user experience



## Summary

To capitalize on new industry 4.0 opportunities, service providers must ensure that their new and evolving private network offerings are up to the task in terms of latency, speed, throughput, availability, and other critical SLA KPIs. Assurance of application performance for robotics, AR/VR, AGVs, production lines, smart buildings, and other high-value applications, with complete end-to-end RAN and transport visibility, will provide operators with a competitive edge.

With the Accedian and Keysight joint solution, service providers can maximize Private 5G networks success with end-to-end visibility and control to assure the most demanding industrial applications. This includes pre-deployment testing as well as ongoing performance monitoring and analytics to correlate data and visualize insights in reporting dashboards that are easily customized.



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