

Small-Cell Assurance Solution

The Viavi Solutions Small-Cell Assurance solution addresses the complete life cycle of challenges faced by mobile network operators, starting with backhaul service activation, performance assurance and optimization, and monitoring. Viavi offers operators a comprehensive suite of products and software applications to automate backhaul network activation, centrally troubleshoot, and monitor backhaul performance to service level agreements.

Solving network visibility challenges at aggregation points in the network, the solution minimizes test time, eliminates field dispatches, and obtains key network performance indicators including one-way latency without having to redesign networks or deploy additional equipment.

Small-Cell Backhaul Challenges

Small cells play a critical role for mobile operators fighting to meet coverage, capacity, and performance requirements. Compared to macrocells, small cells are more cost effective and use less power. They can be discreetly and strategically distributed in urban and suburban environments to provide better coverage and capacity while improving spectral efficiency for mobile operators. However, small-cell backhaul creates new challenges for mobile operators.

More End Points

Proliferating small cells means more end points to activate, monitor, and optimize. By 2016, some predict a 100-fold increase in the number of outdoor small-cell backhaul connections. To better leverage field technicians, the activation and optimization of the backhaul network must be automated.

Key Benefits

- Get granular insight into network and service performance—throughout the network—to optimize service performance and enable new revenue
- Accelerate rollouts and improve time-to-revenue while addressing the unique networking challenges facing small-cell backhaul
- Eliminate the need for costly and impractical external instrumentation such as NIDs
- Realize significant space and power savings

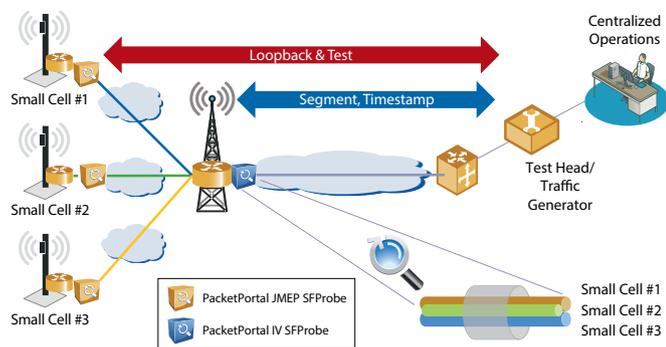
More Complex Network Topologies

Small-cell backhaul will use a variety of network technologies, increasing the likelihood of performance issues resulting from misconfiguration or poorly performing equipment. LTE is based on an IP wireless layer architecture with LTE eNodeB base stations supporting radio control functions, resulting in more inter-eNodeB signaling traffic. For instance, LTE X2 protocol is used for communications between cell sites to control user handover. As a result, LTE requires lower latency than other wireless technologies, and latency monitoring within the backhaul is vital.

Performance Visibility Blindspots

Small-cell backhaul introduces additional layers of aggregation in the backhaul network, creating more “hub-and-spoke” topologies. Traffic is backhauled from outdoor small cells (spokes) to an aggregation point (hub, often located at an existing macrocell) where it is combined with backhaul traffic from other spokes, aggregated, and backhauled to another aggregation point typically at a mobile switching center (MSC) or elsewhere in the mobile core.

Blindspots impact the ability to segment, monitor, and test services between the aggregation point (at the MSC) and the hub, and between the hub and the spokes. While testing can be initiated from the MSC to the spoke, because traffic is tunneled through the hub device (for instance in a MPLS/VPLS tunnel), often visibility into spoke backhaul performance is lost when traffic is aggregated through hub cell-site routers. Mobile operators are left with few choices other than to change the network topology and/or deploy more external instrumentation probes. These workarounds increase the time, complexity, and cost to activate and monitor backhaul services.



Spoke, Hub, and Aggregation

Viavi Overcomes the Obstacles

The Viavi Small-Cell Assurance solution is based on NetComplete® EtherASSURE™ service-aware OSS, the QT-600 test conductor, and PacketPortal, a smart network application platform. The solution lets mobile network operators accelerate rollouts of outdoor small cells, optimize expenses through centralization and automation, and improve the customer experience.



NetComplete EtherASSURE provides scalable software applications that ensure backhaul services meet the most stringent performance requirements of the industry. These applications let backhaul providers verify whether circuits are performing in accordance with SLAs at turn-up.



The solution includes the JMEP SFProbe®, an extension to the PacketPortal portfolio, that can be seamlessly inserted into edge devices such as LTE eNodeB small cells. The JMEP SFProbe provides standards-based Ethernet service operations, administration, and management (OAM) capabilities. Together with the Intelligent Visibility (IV) SFProbe, PacketPortal extends testability and visibility all the way to the network edge, managed and controlled by a centralized software platform, supplying centralized tools and software applications with critical performance data and insight.

PacketPortal lets mobile operators rapidly and simply segment the network, demarcating the location of quality-impacting issues. JMEP addresses the unique requirements for activating and monitoring next-generation Ethernet services. JMEP supports industry standards such as RFC 2544, Y.1564, and Y.1731 test methodologies. When combined together with IV SFProbes, PacketPortal provides a highly scalable approach to overcome the complex service activation, performance monitoring and assurance, and network troubleshooting/segmentation that new multi-vendor hub-and-spoke topologies introduce.



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