

# Overcoming Enterprise Branch-Office Visibility Blind Spots

Unified communications (UC), including VoIP and video conferencing, can be implemented in-house by an enterprise IT organization or delivered as a managed service by a communication services provider (CSP). In both cases, the goal is to provide the highest-possible voice quality while minimizing costs and complexities. This is especially challenging for enterprises with distributed architectures, whose many remote offices must be seamlessly connected, monitored, and maintained in a cost-efficient and scalable way.

PacketPortal™ is a new approach to distributed-data intelligence collection that enables network-wide visibility all the way to remote branch offices. PacketPortal-enabled SFProbes™ deploy seamlessly into existing enterprise and CSP networking equipment to provide in-line data capture for effectively monitoring and troubleshooting service performance.

Observer Management Platform™ offers exceptional UC analytics and troubleshooting capabilities, including MOS, jitter, R-factor, and dropped packets providing detailed call breakouts or summary views of user activity over time, spanning business units, or across geographic locations. Each session is intuitively broken out between data and control planes, making root cause detection simple. Equally important, it also offers contextual awareness of UC traffic in relation to other network traffic.

When combined with customer-experience and performance-analysis tools, Observer and PacketPortal can enhance VoIP, UC, and video-conferencing monitoring resulting in improved business processes, user productivity, and customer service. Together, they capture detailed information for rapidly detecting user-affecting issues, reducing the time to detect and remediate issues, and helping ensure service level agreements (SLAs)—all without the need for additional branch-office equipment or software.



**OBSERVER  
MANAGEMENT  
PLATFORM**

## UC Challenges in Distributed Enterprise Environments

UC applications generate small packet sizes and approximately 10X more packets than other applications. As a result, any network impairment results in significant packet loss. Furthermore, branch-office IP routers often become congested from processing small packets at high rates. Because UC applications are real-time, users are easily affected by network issues such as congestion.

Session initiated protocol (SIP) and real-time transport protocol (RTP) are the standards for delivering highly time-sensitive audio and video over IP networks. SIP is the most commonly used signaling protocol. Once a SIP session is established, data (like speech or video) is formed into RTP packets and transmitted until the end of the session. High-quality customer experience requires constant and consistent RTP packet streams, while poor customer experience would include VoIP with broken speech or dropped words. Symptoms are typically a result of disruptions to the RTP packet flow. Furthermore, typical quality issues could be attributable to the endpoint device, codec, or the network itself, or any combination, and may result in symptoms such as:

- Distorted, garbled, or warped voice
- Echoes
- Background noise
- Long delays from end-to-end
- Occasional, unexpected quiet periods
- Video artifacts
- Choppy video

## Measuring UC Quality

Successful UC implementations require objective measurements to assess quality. Observer Analyzer uses collected data to correlate how various factors impact perception of quality by calculating mean opinion scores (MOS) and R-factors from live networks to report end-user experience.

For comprehensive UC awareness, it is important to measure all aspects of the call: control and data planes including SIP, RTP, and RTCP along with broad codec support. Only then can true end-user performance be assessed, and if issues are detected, the problem rapidly solved. It is even possible to replay calls to fully quantify exactly what a user experienced.

Observer Platform uses ITU g.107 and PacketPortal IV to provide metrics such as:

- MOS and R-factor (audio and video)
- Dropped and out-of-order packets
- Burst and gap density

## Network Core-to-Branch Probing Strategies Resolved

Achieving full visibility requires placing probes across the entire infrastructure from near the call manager to the remote branch office to capture data and control plane traffic. This traffic can then be collated and analyzed with Observer intelligence to yield key performance metrics like MOS and R-factors.

Network operators can use a network probe or appliance from a central location to monitor SIP signaling. However, once a SIP session is established, the VoIP call itself proceeds using RTP communication between endpoints, bypassing the central probe entirely.

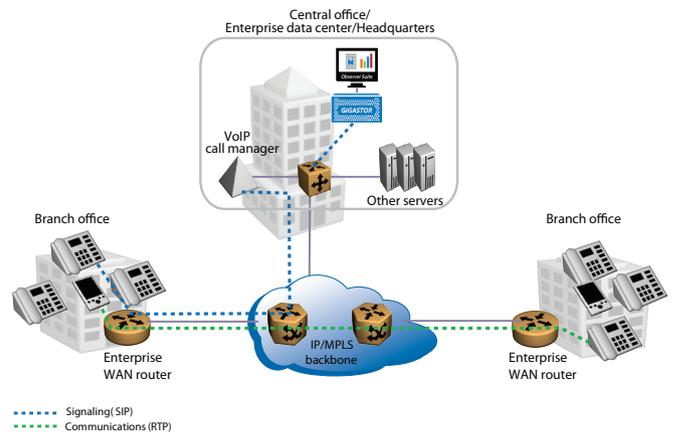


Figure 1. VoIP signal routing and probe location

Fortunately, the Viavi Solutions carrier-managed enterprise solution offers the optimal balancing of cost-effective, infrastructure-wide visibility without compromising on UC performance monitoring capabilities. With Observer Management Platform, customers can choose from high-performance Observer Probes or GigaStor™ appliances for detailed data center awareness. Complimenting this, and where higher-cost probe technology is typically not required (branch and remote locations), PacketPortal SFProbes can collect crucial RTP traffic, passing it seamlessly to GigaStor for analysis.

Alternative approaches involve software agents installed on endpoints. However, often the accuracy of agents may be impacted by other processes running on the endpoint. Many software agents also only collect coarse-grained data or summary measurements. While a software agent may confirm the existence of a problem, there may be inadequate information to diagnose the issue in real time.

## The Carrier Managed Enterprise Solution

PacketPortal provides a powerful, cost-effective, and simple approach for both IT organizations and CSPs to achieve ubiquitous VoIP monitoring at remote branch offices, augmenting the reach of centralized monitoring probes.

PacketPortal is a breakthrough in distributed-data collection that lets operators intelligently inspect, selectively copy, timestamp, and send data packets to any application. PacketPortal data collectors embed inside Gigabit Ethernet small form factor pluggable (SFP) transceivers, turning them into microprobes (SFProbes). SFProbes deploy seamlessly into existing branch office networking equipment such as network interface cards (NICs), Ethernet switches, or wide-area network routers, consuming no additional space, power, or branch-office resources.

PacketPortal can gather data from actual VoIP calls from anywhere in an IP network, allowing the quality of RTP streams to be tracked during transit. PacketPortal provides vendor-independent, non-intrusive, and in-line traffic visibility to easily troubleshoot and diagnose UC call quality and rapidly isolate problems at the interface between enterprise and CSP networks.

PacketPortal is an open software platform that easily integrates into any centralized software tool including network-performance and service-assurance applications. Centrally-configured SFProbes monitor and forward, in real-time, key data such as RTP to central analysis applications. This type of data can help calculate MOS scores and help understand network packet loss, jitter, and other performance metrics to help narrow the source and cause of experience-impacting issues. Rapid identification leads to rapid remediation, helping ensure SLAs are met.

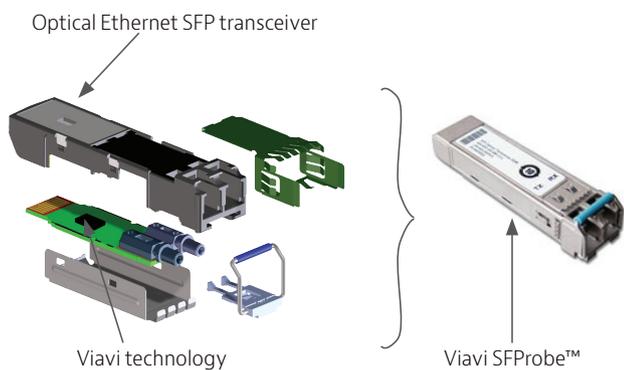


Figure 2. The Viavi SFProbe with embedded PacketPortal technology

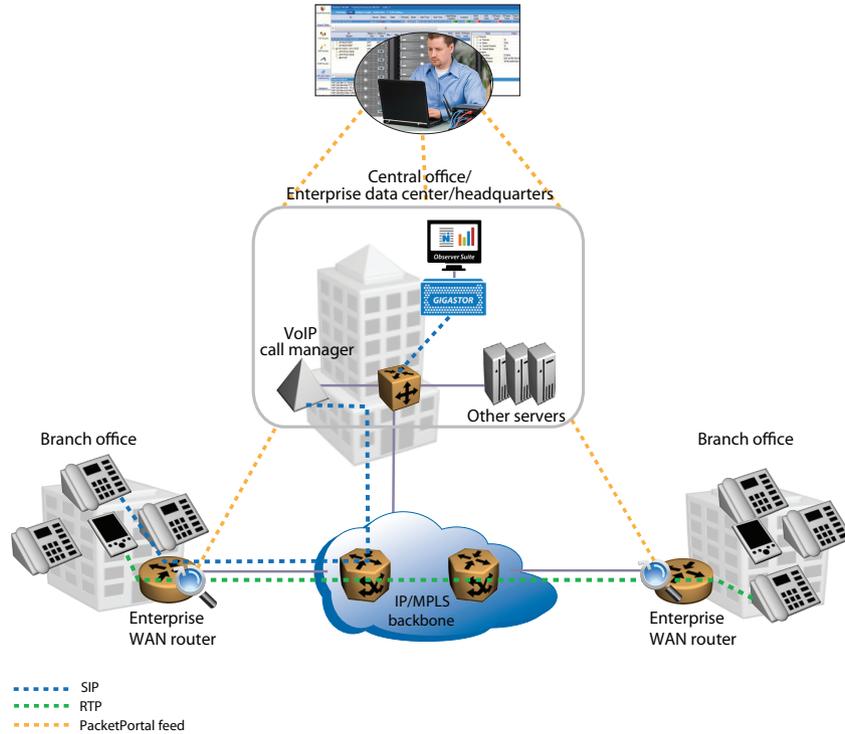


Figure 3. Real-time communications bypass central monitoring

## The Power of Observer Platform and PacketPortal

The Viavi carrier managed enterprise solution, built on a seamless combination of Observer Platform and PacketPortal, offers deep insight into highly distributed UC deployments. Observer delivers detailed information on all call sessions including key operational metrics like MOS and R-factor. It also provides in-depth intelligence of all applications within the environment along with contextual awareness of how they interact with the network. Designed to work within one of the largest data centers in the world, it offers numerous flexible probe options for the core and distribution layers. With tight integration via GigaStor with PacketPortal and a RESTful API, it serves as the command-and-control center for all application and network performance monitoring across the entire infrastructure.

PacketPortal enables visibility where Observer Platform leaves off, cost-effectively capturing customer experience traffic at the branch office. With built-in intelligence, unique filters to capture only relevant data can be quickly programmed in specific PacketPortal probes and then centrally collected and passed to GigaStor.

Observer Platform and PacketPortal provide a scalable solution that delivers infrastructure-wide service visibility all the way to remote branch offices. The combination of Observer Analyzer proactive monitoring and accelerated fault isolation enables the fast resolution of UC quality issues wherever they occur in the environment, helping to ensure SLAs are achieved. Furthermore, the increased end-to-end business intelligence obtained can drive new and enhanced business opportunities.



Contact Us **+1 844 GO VIAVI**  
(+1 844 468 4284)

To reach the Viavi office nearest you,  
visit [viavisolutions.com/contacts](http://viavisolutions.com/contacts).

© 2015 Viavi Solutions Inc.  
Product specifications and descriptions in this document are subject to change without notice.  
pp-observer-3-an-nsd-nse-ae  
30176092 900 0215