

# PacketPortal— A Breakthrough for Network Intelligence

For network operators, complexities have never been greater, while bandwidth demands have never been higher. Facing fierce competition, operators are under pressure to reduce operating costs and customer churn while introducing new, value-added services. Operators are in a unique position because of the role they play in the service-delivery chain and their access to customer and content data. The challenge is to extract this data in a practical and cost-effective way and transform it into intelligence.

Viavi Solutions PacketPortal is a new software solution that decouples data capture from management and analysis. Distributed microprobes embedded in existing network elements such as switches, routers, and edge devices communicate over a self-forming, secure cloud to a centralized, open-software platform, providing unprecedented visibility into the network. This new visibility enhances existing troubleshooting tools, optimizing the customer experience for voice, video, and data services. And, detailed intelligence available from PacketPortal helps create revenue-generating applications such as specialized service-level agreements (SLAs) and managed services.

This white paper outlines the limitations of current packet-acquisition techniques and shows how the new PacketPortal paradigm for network monitoring and management redefines customer, content, and network intelligence.

For detailed descriptions of the PacketPortal solution and components, refer to the Viavi *How PacketPortal Works* white paper.



**PacketPortal™**

## Limitations of Current Approaches

Traditional methods of packet acquisition using standalone “heavy iron” probes are expensive and are designed to operate in the core of the network or at a small number of aggregation points. These technologies have difficulty adapting to the volume of information resulting from the increased bandwidth traversing today’s networks. Current network monitoring activities center on detecting network events, errors, or capacity planning, but fail to provide the necessary intelligence to resolve or address the root cause of the errors. In short, there continue to be blind spots in the network. Operators are drowning in data overload, yet still lack the ubiquitous access and underlying intelligent data needed to address the errors and alarms. As a result, operators often resort to brute-force remediation by simply rebooting/replacing elements or even provisioning more network resources, namely bandwidth, in the hope of resolving an issue. These approaches result in higher operational costs and expenses while the underlying issues affecting customer experience persist.

Compounding the challenge is the dynamic nature of connectionless protocols such as IP, making traffic flows, connectivity, and session paths very difficult to isolate. In addition, traffic may not even reach a probing point.

Network operators who are troubleshooting issues may also have challenges accessing data even when they know where it resides. Administrative access to network elements may be controlled by a different organization, even within the same company. The resulting delay to information increases the mean-time-to-diagnose (MTTD).

Issues adding to the complexities may include:

- the need to deploy sophisticated instruments or analysis tools in remote locations when overlay or management networks are absent. These expensive devices and the skilled personnel needed to operate them are often not readily available and add to the time needed to resolve critical network and service issues.
- the backhaul of collected data over an overlay network may alter the characteristics of the information, making it impossible to measure actual customer experiences.

Finally, in a multi-layered environment, the physical media, network layer, and application/service planes operate largely independently of one another. This means that crucial service information is located in different places and is not coordinated at a higher level. Traditional data-probing solutions are not time synchronized and typically do not have the ability to coordinate this disparate data. This lack of coordination prevents network operators from seeing and controlling the network and services as a single, coherent entity.

Today’s dynamic networks—highly distributed, multi-vendor, and often self healing—require that operators access network intelligence on demand. One solution is to deploy more probes in more locations. Unfortunately, data-acquisition technologies have not evolved to the extent that wide-scale deployment is economical or practical. Traditional data-collection solutions are costly, energy inefficient, and complex to deploy. And, they are unable to scale in order to provide pervasive, end-to-end reach.

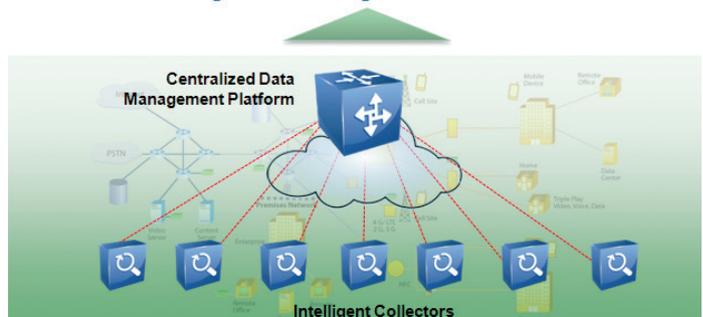
## PacketPortal Advantages

PacketPortal is a breakthrough solution that lets operators intelligently inspect, selectively copy, timestamp, and send data packets to any application. This pervasive access to information results in increased operational efficiency and quality while decreasing costs. Insight into customer experience and network and content intelligence lets operators introduce new revenue-creating services. PacketPortal replicates the robust acquisition, filtering, and capture provided by costly network diagnostics tools, yet the technology can be embedded within any existing network device or link. This scalable and on-demand functionality significantly reduces the cost and time required to troubleshoot network issues and monitor overall network health and performance. PacketPortal reverses the traditional paradigm of sending an application and/or expert to the data by bringing intelligent information to centralized tools and experts.

The unprecedented reach and visibility that PacketPortal delivers, together with its open software architecture and robust APIs, dramatically increase the value of existing network applications. Indeed, PacketPortal enables a world of new, revenue-enhancing network monitoring, management, and business solutions. Any Ethernet-based appliance using an SFP can access and share PacketPortal intelligence by simply replacing the SFP with an SFProbe.



### Enabling and Extending New Business Models



PacketPortal advantages over current approaches include:

#### **Affordable access to packets and data**

PacketPortal-enabled microprobe technology can be embedded into any network element, such as Gigabit Ethernet small form factor pluggable (SFP) transceivers. These components can be deployed in virtually any optical Gigabit Ethernet link, at any location within a network.

#### **Dramatically lower operational expenses**

No additional rack space, external power, hardware, or maintenance is required to provide in-line intelligence collection. PacketPortal-enabled microprobes are implemented with an optimized architecture that does not require a costly embedded and complex operating system. Through the PacketPortal self-forming cloud, no separate management or overlay network is required.

#### **On-demand access**

PacketPortal enables comprehensive, on-demand packet filtering with a multiuser, multi-probe software platform. Technicians do not need direct access to network elements in order to access the data required. Users can centrally view any subscriber, service, or quality of experience, on demand, leading to quick diagnoses and expeditious problem resolutions.

#### **Ubiquitous visibility everywhere in the network**

PacketPortal data collectors can be easily embedded into existing network elements throughout a network from the core to the edge. Any network element can now provide the same access to information. This increased visibility, from anywhere, results in reduced time to resolve issues, in turn leading to increased customer satisfaction.

#### **Time-synchronized captures**

PacketPortal provides globally accurate time synchronization throughout the system and allows for easy integration with existing network timing methods through its support of IEEE 1588v2 master clocks, network time protocol, GPS, and other standard time-synchronization methods. With 16 nanosecond inter-packet timestamp accuracy and global time synchronization between data collectors (such as PacketPortal-enabled SFPs) of less than one millisecond, PacketPortal enables highly and accurate and time-synchronized captures that enable applications to correlate network events and information in ways that are not possible with traditional methods.

#### **Line-rate DPI technology with intelligent filtering**

PacketPortal performs full line-rate inspection of every bit of every packet, eliminating the need to worry about monitor-port bandwidth or acquisition-hardware performance. Furthermore, PacketPortal data collectors do not add any additional CPU load to network equipment and they guarantee 100 percent traffic throughput without dropping customer network packets. Users or automated applications can quickly configure simple or complex intelligence collection filters.

#### **Self-forming cloud**

Unlike traditional probing and analysis systems, PacketPortal does not require operators to maintain or configure addresses or communication protocols on remote data collectors and includes technologies that enable auto-configuration and discovery. Once inserted into a network element, a PacketPortal data collector recognizes and responds to discovery messages, establishes an encrypted communication channel, and provides addresses that may be used to communicate with it. This revolutionary technique enables operators to easily and cost-effectively manage, install, and control systems employing up to tens of thousands of access locations.

#### **IP-Lock™ security**

PacketPortal incorporates sophisticated and powerful security mechanisms built to maintain safe and secure command, access, and control even in the most complex environments. IP-Lock not only provides safe and secure packet-acquisition hardware, but the platform also supplies multiple layers of access and user control with carrier-grade security and user management. Encrypted communication is used with each remote data collector. Because of its cloud-based architecture, no passwords, network addresses, or other sensitive information is stored at the collectors. Furthermore, because collectors are centrally managed and maintained, they can be easily re-configured or redeployed without the concern that sensitive information follows.

## Conclusion

PacketPortal delivers a multitude of cost savings through its software-based, open-cloud architecture, modular design, and time-synchronized captures and through the paradigm switch of bringing intelligent data to applications and appliances compared to the traditional model of deploying “heavy iron,” monolithic probes in the network. Operators can now centrally locate analysis tools and expert personnel, making them more efficient and cost effective. The open platform and varied integration methods let the solution work seamlessly out of the box with virtually any analytic tool, appliance, or application used today and in the future. This preserves the value of existing infrastructure and personnel while simultaneously letting these resources perform better and more efficiently. With pervasive access to rich intelligence, network operators can also develop new creative business and revenue-generating opportunities.

PacketPortal redefines customer, content, and network intelligence.



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