PacketPortal® Intelligence Visibility

Redefining customer, content, and network intelligence

PacketPortal is a cloud-based approach that embeds data-capture technology throughout the network, delivering inline intelligence to any monitoring, management, or business application. PacketPortal lets you see the network the way your customers experience it.

The PacketPortal solution consists of management software and a family of 1 and 10 Gigabit Ethernet smart SFP transceivers. This data sheet focuses on the PacketPortal Intelligence Visibility capability.

Key Benefits

- Improve the customer experience with proactive monitoring of subscribers, applications, and content from anywhere in the network
- Gain valuable intelligence to optimize performance, minimize revenue leakage, improve troubleshooting, and introduce new services
- Easily obtain critical data, eliminate monitoring ports, taps, costly overlay networks and remote packet-inspection appliances
- Realize a risk-free return on investment, complement and increase the value of existing tools and applications, and use existing network devices more fully
- Instantly reach critical information anywhere in the network on an unprecedented scale
  - Turn standard SFP ports into packet-collection probes
  - Collect intelligence for monitoring, management, and business applications

Key Features

- Decoupled data collection and management for dramatic reach, visibility, and scale
- Centralized configuration, management, and aggregation of data feeds
- Secure, protected, and encrypted communications
- Extensible platform powered by an open API and Developer’s Toolkit to fuel applications and tools
- Green: reduced cost, footprint, and energy consumption
- Auto-discovered, self-configured cloud accelerates rollout, ROI, and reduced OpEx
- Extended packet-capture capabilities to the edge of the network

Applications

- IPTV service quality monitoring
- LTE mobile- and data-network monitoring and troubleshooting
- IP network monitoring and troubleshooting
- Ethernet/IP performance and SLA management
- Network security and customer analytics monitoring
- Managed enterprise monitoring
- Revenue-generating new service deployments
**Solution Overview**

The Viavi Solutions PacketPortal solution is a software platform that uses passive, inline SFP transceivers to selectively copy and forward packets from an Ethernet network to a target application. Due to its revolutionary form-factor, it can be affordably distributed where traditional tools are not practical; it lets network operators and managers access packets and data at any point in the optical network.

The PacketPortal Intelligence Visibility (IV) SFP examines packets at full-duplex line-rate speeds and identifies packets of interest that are then copied from the network, accurately time-stamped, encapsulated into a results packet, and inserted back into the network for routing to the targeted application—all without causing loss or disruption to the original flows.

**The PacketPortal IV Smart SFP Transceiver**

A PacketPortal IV Smart SFP consists of a proprietary ASIC embedded in an industry-standard SFP. It redefines how and where operators can gather packets throughout today’s networks by eliminating the limitations of SPAN-port, tap, aggregator, or mirror-port availability and locations. They can replace any standard 1/10 GE SFPs, adding PacketPortal intelligent packet collection capabilities to any network element. Smart SFPs turn any SFP port, at any location, into an intelligent remote monitoring port. Packets may then be forwarded to any instrument, monitoring, management, or business application for analysis or collection.
PacketPortal IV Architecture

The Viavi PacketPortal IV solution consists of carrier-grade modular components that allow for scalability from hundreds to thousands of smart SFPs. The PacketPortal cloud-based architecture separates data capture from data analysis, providing more centralized access to remote data throughout the network. This capability enables faster, more cost-effective network troubleshooting, service monitoring, and network analysis while delivering additional revenue opportunities by enabling new and innovative services or applications. As shown below, both the PacketPortal system manager and packet routing engines can be deployed in a physical or virtual virtual machine environment.

PacketDelivery Gateway (PDG)

A key value of PacketPortal is the ability to preserve investments in current, legacy, and future network tools and instruments. The PDG is one element that makes this possible. A PDG allows one or more applications to connect to a PacketPortal system and receive time-aligned packets as if they were locally connected to a monitor port or tap at the remote location. The PDG uses capture timestamps and sequence numbers from the smart SFP to replay aggregated streams out its monitor port. These streams maintain proper sequencing and inter-packet timing that represents what the packets experienced while passing through the remote network port.

PDGs can feed packets to any device or application that would normally connect to a tap, SPAN port, aggregator, mirror port, or equivalent technology. It enables applications to reside in central locations instead of remote locations where it may not be economically practical to deploy.

Virtual NIC Driver (VNIC)

The VNIC is a software component that, when installed on a PC or server, emulates a physical network interface card (NIC) driver and allows virtually any Ethernet-based software application to receive feeds from a PacketPortal system through its NIC interface. The VNIC receives PacketPortal feeds, removes the transport headers and metadata to reveal the network traffic, and retransmits the original packets to the PC’s network stack. The traffic is replayed using the original capture timestamps and sequence numbers to accurately represent the traffic as it was captured at the remote element. The replay may be configured to output on a specific transmission control protocol (TCP) or user datagram protocol (UDP) port from the PRE to the VNIC.

The VNIC can also read captured network data files in the packet capture (PCAP) format and replay them similarly to how live traffic is processed through the PacketPortal system.
Viavi PacketPortal Enabled

PacketPortal empowers a new generation of tools and applications for network monitoring, management, troubleshooting, analysis, security, performance analysis, and service assurance. Even though PacketPortal easily interfaces with existing tools and equipment with the PDG and VNIC drivers today, the comprehensive PacketAccess API allows application developers to create new and even more powerful applications that the system can support. Indeed, most Ethernet-based applications used today can immediately benefit from the pervasive reach and information PacketPortal provides; protecting and enhancing the investment made in existing network tools and applications.

PacketPortal Enabled Applications

- The Viavi Network Instruments Observer — a unified platform that provides complete network, system, and application monitoring across heterogeneous networks. Combined with PacketPortal, it provides a comprehensive solution for carrier-managed enterprise networks.
- The Triple Play Analyzer (TPA) — a powerful and complete monitoring and troubleshooting solution to help you install and troubleshoot voice, data, and video applications. Now enabled by PacketPortal, you can view actual customer video, network errors, packet loss, and voice quality from the network edge in your own office—so you find and fix customer service issues significantly faster.
- The Signaling Analyzer Real Time (SART) — the test industry’s most complete, end-to-end analysis and troubleshooting solution for mobile networks, including LTE, providing comprehensive monitoring and network diagnostics by interpreting, correlating, and analyzing protocol signaling messages produced by multiple network technologies at mobile network interfaces.
- The live performance monitoring extension to EtherASSURE™ — the EtherASSURE platform is a scalable service-assurance solution for the reliable delivery of profitable Ethernet services. EtherASSURE focuses on service activation/acceptance, continuous performance management, and SLA verification. PacketPortal live performance monitoring of live traffic augments standards-based, statistical monitoring performance management tools such as TWAMP™—enabling better decision making.

- The Transport Performance Explorer application in xSIGHT™ — the xSIGHT platform captures the complex relationships between customers, applications, services, and underlying networks. The PacketPortal live performance management solution contributes the transport layer KPIs of the backhaul network to the xSIGHT mediation layer so that the xSIGHT CEA application can correlate to other network and service KPIs to determine the impact on customer experience.

Third-Party Validated Applications

PacketPortal-validated applications have been Viavi tested and certified for use with the PacketPortal system’s PDG and VNIC. These applications include:

- Wireshark — the most widely used, open-source packet analyzer for network troubleshooting and analysis. PacketPortal lets Wireshark provide access from one central office to data across your entire network, to the edge, and to remote offices.
- nProbe — an open-source application software utility that creates NetFlow records from monitored network packets. PacketPortal can feed nProbe from across the network, generating NetFlow records with more reach, less cost, and without impacting element performance. NetFlow is a Cisco Systems® technology that collects IP traffic information and has become an industry standard for traffic monitoring.

Solution Features

Carrier-Class Smart SFP Hardware and System Software

Viavi smart SFPs meet all the same safety, regulatory, reliability, and environmental specifications as traditional SFPs. Operators can confidently deploy smart SFPs knowing that they pass GR-468-CORE, UL, RoHS, FCC, and TUV requirements and have mean time between failures comparable to equivalent optical 1/10 GE SFPs.

PacketPortal’s scalable architecture lets the system grow with the network and customer base. The central SM handles user and element management through an Adobe® Flex web interface. All software is hardened and designed for sustained operation and availability.

Auto Configuration and Discovery

PacketPortal simplifies both management and deployment of smart SFPs throughout a network. Unlike traditional probing and analysis systems, PacketPortal does not require operators to maintain or configure addresses or communication protocols on smart SFPs. Viavi smart SFPs employ technologies that learn the network encapsulations and addresses needed for communications. Users simply install a smart SFP within the network and send a discovery message from the System Manager. The smart SFP recognizes the discovery message, interprets and incorporates the network encapsulations for all communications, establishes a secure encrypted communication channel, and provides addresses that may be used to communicate with it. This revolutionary technique enables operators to easily manage, install, and control systems employing thousands of access locations.
Secure Management
The PacketPortal system employs sophisticated session-based 128-bit Grain cipher encryption algorithms in addition to controlled, unique activation keys for every smart SFP. Individual sessions are additionally protected from unauthorized access through session key hopping, command and control sequencing, and other proprietary methods.

Time Synchronization
Accurate time-synchronized measurements across a network allow for resolving problems faster and with greater precision and confidence. PacketPortal provides globally accurate time synchronization throughout the system from PRE to smart SFP. PREs may be time-synchronized using IEEE 1588v2 master clocks or GPS. PREs then synchronize the smart SFPs on their domain. SFPs may operate in SyncE mode to facilitate transference of clock signals over the Ethernet physical layer.

Line Rate Deep Packet Inspection Technology
Smart SFPs can perform full line-rate (1/10 G) inspection and do not add any additional central processing unit (CPU) load to network equipment and guarantee 100% original network traffic throughput without the risk of dropping network packets.

Examine and logically filter on any bit or byte within any Ethernet packet, IPv4 (shown), or IPv6.
Data and Packet Acquisition

PacketPortal IV simplifies the burden of quickly accessing critical network data. It delivers, on demand, information of interest to the tools and applications that need it by leveraging unused bandwidth on the network being monitored. Costly analysis applications and measurement equipment can now be centrally located and extend their reach all the way to the edge of the network where they can add the most value.

The Viavi smart SFP is a true inline device that does not require a separate network connection to deliver captured packets. Instead, it incorporates Viavi subchannel technology. The subchannel in the smart SFP allows the system to take advantage of interpacket gaps and unused bandwidth in a network when it needs to communicate or send results. When an idle period is detected, a results packet is inserted into the network for routing back to the system and subsequently the destination applications or tools. The subchannel guarantees no network packets will be dropped while passing through the smart SFP.

Adaptive Boolean Filtering

PacketPortal makes acquiring the necessary data to resolve even the most complex network issues easier than ever. Next-generation networks constantly evolve and may use different protocol encapsulations throughout the network. To simplify data and packet acquisition, every smart SFP incorporates a protocol header parser (PHP) that automatically identifies most major protocols over virtually any network encapsulation. This PHP works in conjunction with four programmable filter banks, which may be activated in every smart SFP. Each filter bank may hold up to eight bidirectional independent filter patterns that define the network traffic to be captured and forwarded.

Users can quickly set up simple or complex filters using the SM web-based GUI. They can use libpcap-like expressions and Boolean logic without having to worry about the underlying encapsulations. The PHP automatically adjusts to network changes, eliminating the need to manually maintain or adjust filters. Advanced Boolean logic allows for setting up complex filters that target just the data needed by using logical expressions such as ANDs, ORs, and NOTs. Users can filter based on any value or byte in a header. In addition, filters can be set to look for pattern matches at set or variable offsets that account for variable length headers or differing protocol encapsulations.

Adaptive Header Slicing and Sampling

PacketPortal allows users to determine how much or how little data to return to the analysis application. A smart SFP can be programmed to send entire packets or only packet headers, with the payload sliced out, even for protocols with variable-length headers. Statistical intelligence is also made possible through sampling. Every Nth packet that meets the filter criteria can be sampled instead of every packet. This capability allows operators to efficiently manage bandwidth and receive only the data required for the target application.

A Multiuser and Multi-Application System

PacketPortal improves existing applications and tools by giving them the network access and reach needed to realize their true potential. The solution provides PDGs and an open application programming interface (PacketAccess™ API) that let any Ethernet-based applications receive packets and data from the system. The VNIC and libpcap/WinPcap drivers let software-based applications receive packets without needing modification. The PacketAccess API lets users write or modify applications using the rich metadata, timestamps, and sequence numbers returned with every results packet. All these capabilities are in a hardened, multiuser, multi-access system with administrated levels of access and control that accelerate and simplify user management and system access.

Rapid Return On Investment

PacketPortal redefines how and where critical information is accessed throughout a network. Its pervasive data reach and visibility unleashes network applications and tools with the insight needed to solve problems faster and to drive additional revenue with new innovative services.

PacketPortal delivers a fast return on investment and value from initial installation through final deployment. Scaleable start-up costs and multiple tiers of functionality let the system grow with network and data collection demands. The solution's open system lets it work out-of-the-box with the applications used today to manage, troubleshoot, and maintain networks. PacketPortal improves upon these applications by extending their reach, expanding their access, and enabling appliance and application centralization. In addition, PacketPortal enables a new generation of applications through its open, PacketAccess API features that provide deeper packet metrics and empower new value-added applications.