



The latest Internet phenomenon, Web 2.0, is transforming the World Wide Web from a collection of static portals to a dynamic interactive medium ideally suited for commerce, advertising, grass-root content creation, and on-demand multimedia consumption.

Critical mass in broadband and wireless accessibility, an important enabling factor for Web 2.0, has made high-speed networking technology a commodity. In the year 2000, service providers struggled with deploying expensive 100Mbps Fast Ethernet switching technology, today they have almost completely transitioned to Gigabit Ethernet to stay competitive. As this trend continues, the second decade of the 21st century will emerge as the decade of 10 Gigabit expansion. Few customers are willing to be left behind and most are already moving to transition their core network to 10 Gigabit in order to realize additional cost savings and substantial performance gains.

Port mirroring has its limitations and since managed switches are an integral part of the infrastructure, it is important to be careful not to establish a point-of-failure. Understanding what can be monitored is important for success. SPAN ports are often over used leading to dropped frames. LAN switches are designed to groom traffic (change timing or add delay), extract bad frames and ignore all layer 1 & 2 information. Furthermore, typical implementations of SPAN ports cannot handle FDX monitoring, and analyzing VLANs is also problematic.

Technical Challenges

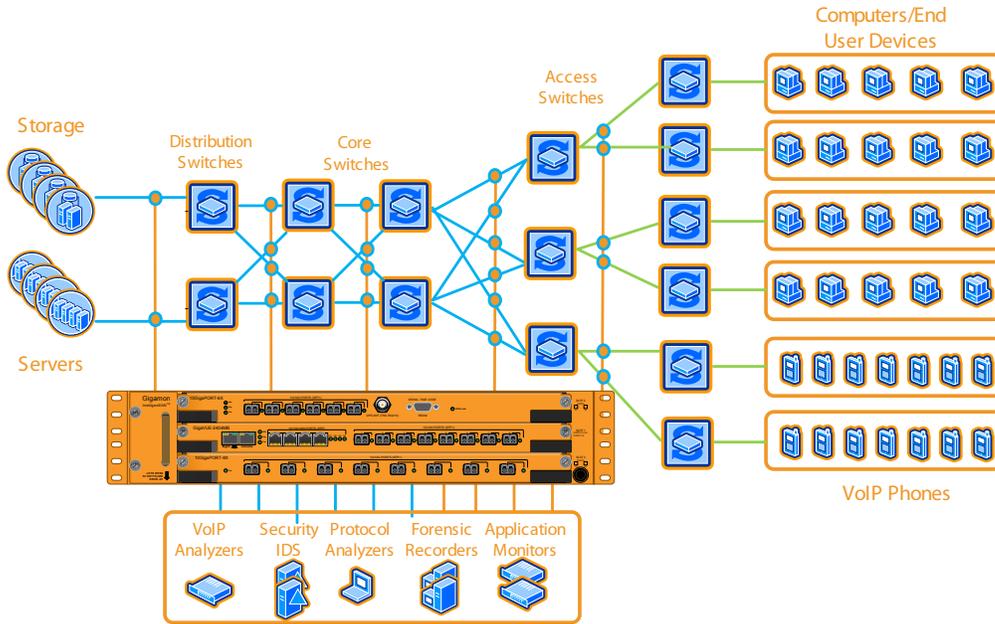
A major issue faced when deploying 10GbE core networks is to provide a cost-effective, comprehensive solution to monitor mission-critical traffic at full line-rate. Ensuring network integrity including performance, security and compliance is paramount.

Unfortunately, 10 Gigabit monitoring tools while available, are either prohibitively expensive or simply incapable of handling full line-rate except in short bursts.

Recently, a new class of Traffic Visibility Switch, designed specifically for out-of-band network monitoring has been introduced and can accommodate multiple bit-mask filtering rules at each ingress port (both 1GbE and 10GbE).

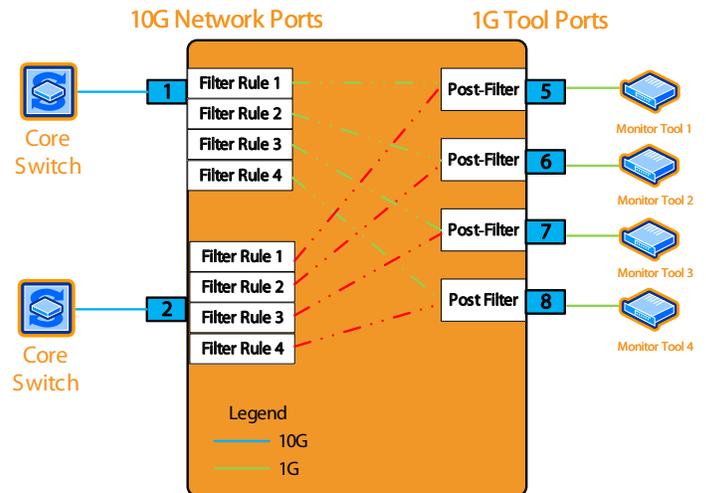
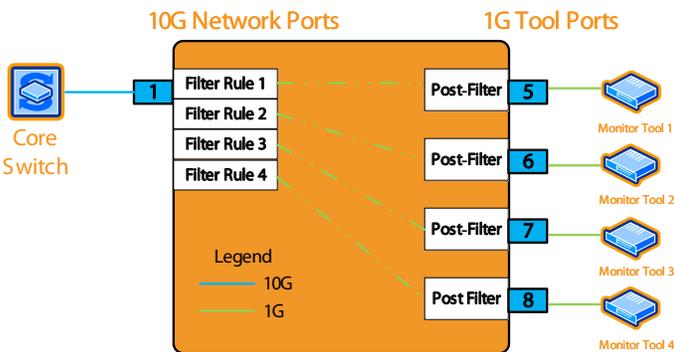
Using these multi-rule sequential pre-filters, 10 Gigabit traffic can be “mapped” to multiple load-sharing 1 Gigabit analyzers. With each tool analyzing a specific VLAN range, port number or IP subnet according to the specific filter rule, comprehensive monitoring at 10Gbps without oversubscribing any single Gigabit tool is achieved. Since mapping filters are hardware based, latency is negligible and full line-rate performance is guaranteed.





Network Monitoring with a Single Core Switch

Network Monitoring with Multiple Core Switches



Whether it is Gigabit or 10 Gigabit, mission critical core networks are almost always tiered, meshed and fully redundant. High availability network architecture dictates that multiple 10Gbps links are deployed between parallel switches to improve reliability. Therefore, packets do not travel on a unique path and in order to provide thorough monitoring, multiple 10Gbps traffic streams would have to be mapped simultaneously and aggregated so that each tool gets a logical slice of the total traffic.

Shown here is a typical web-centric customer data center running a 10Gbps core. In order to support the tremendous amount of web traffic (on the order of tens of millions of page views per week), it is not uncommon to have up to ten 1Gbps links to the Internet (to ISP's and peering sites). Furthermore, it is estimated that total traffic is also increasing at 30% per quarter. Therefore a scalable monitoring solution is needed to match growth. In the core of the network, servers are organized in clusters, each serving specific business functions. These functions range from online shopping, credit verification, merchandise delivery,

product support, uploading and downloading of music, pictures, podcasts, video, and various online activities including search, chat, email, blogging, etc. Each server switch is connected to the core switches using two 10Gbps redundant links, which are connected to the Internet through multiple 1Gbps redundant links.

A large number of best-of-breed monitoring tools from multiple vendors are deployed including performance tools to track real-time user experience and to enable internal charge-back to various business functions, database security tools to prevent leakage of confidential information and forensic data storage to proactively and retroactively examine attacks and abuses. All of these monitoring appliances compete for out-of-band traffic access.

With the Traffic Visibility Switch, the 10Gbps traffic streams mirrored from the core switches are captured and aggregated. Mapping filters based on IP address range corresponding to the server switches are used to segregate the total traffic into different logical groupings such that each appliance is responsible for monitoring traffic belonging to one or several specific business functions.

Using a Traffic Visibility Switch with multi-rule mapping features to share the load among multiple parallel processing Gigabit tools is the most effective way to cost-effectively monitor your 10Gbps network.

Moreover, the Traffic Visibility Switch acts as the virtualization layer between the network and monitoring tools. It is the building block for a flexible Traffic Visibility Network that enables IT engineers to deploy monitoring tools at will. Adds, changes and moves can be performed without requiring any physical changes or exerting load to the production network. Speed change (1Gbps to 10Gbps or 10Gbps to 1Gbps) and media conversion (copper to optical, multimode to single mode) can also be easily accommodated.



About Gigamon

Gigamon provides intelligent Traffic Visibility Networking solutions for enterprises, data centers and service providers around the globe. Our technology empowers infrastructure architects, managers and operators with unmatched visibility into the traffic traversing both physical and virtual networks without affecting the performance or stability of the production environment. Through patented technologies, the Gigamon GigaVUE portfolio of high availability and high density products intelligently delivers the appropriate network traffic to security, monitoring or management systems. With over seven years' experience designing and building intelligent traffic visibility products in the US, Gigamon serves the vertical market leaders of the Fortune 1000 and has an install base spanning 40 countries.

For more information about our Gigamon products visit:

www.gigamon.com

