The data center is the lifeblood of any large enterprise organization. In the data center, applications and the associated data traverse the networked infrastructure 24x7 providing critical services to both internal and external users. Today's data centers are increasingly complex with many different technologies working together at faster speeds than ever before.

As a result, downtime in the data center is unacceptable. Modern IT infrastructures have become so entrenched into the day-to-day operations of most companies that network vitality has become one with the business. Network downtimes can cost companies millions of dollars in lost revenue. To ensure the efficient operation of the data center, reduce bottlenecks, prevent outages, and maintain security, it is vital to carefully monitor and analyze all the traffic as it moves across the data center. This is best accomplished using a Gigamon Visibility Fabric™ to gather information from the various access points and intelligently forward the proper traffic to the proper security, analysis, and monitoring tools.

Building a Secure Unified Visibility Fabric

The data center is a part of a network ecosystem that drives the business of any large company. The data center is comprised of switches, routers, firewalls, application servers, IP services (DNS, RADIUS, and LDAP), virtualized applications, and storage area networks. Often, customers understand the need for monitoring the data center, but do not monitor their data center as securely and efficiently as possible.

Organizations typically implement networks with a myriad of monitoring and security tools to defend the network, then find that it is neither efficient nor cost effective to have a tool connected to every critical data element. The key to improved secure access and better visibility is to build a Visibility Fabric that filters, aggregates, consolidates, and replicates data to the monitoring and security tools that are found in the data center. The diagram (Figure 2) below is a sample large network throughout which Visibility Fabric nodes are deployed.

One method to achieve secure access is to TAP inline between major network devices found in the data center including core switch-to-switch links, switch-to-router links, and switch-to-server links. TAPs are passive network connections that effectively and efficiently copy data from the link to monitoring devices. Although a TAP can connect directly to a monitoring device, a more effective method is to connect the TAP to the Visibility Fabric itself. This provides multiple tools access to the same traffic. It also allows for intelligent filtering to make sure each tool sees only the required packets, making the tool much more efficient. Another option is to embed the TAP within the GigaVUE® Visibility Fabric node itself.
There are many key benefits users can experience when deploying a traffic visibility platform within their data center. Some of these benefits include:

Increase the Effectiveness of Existing Tools: Many times an analytical tool is overburdened by the amount of data that it is receiving. This is especially problematic when attempting to monitor higher-speed connections such as 40Gb leaf/spine connections or even 100Gb trunks with lower-speed 10Gb tools. A Visibility Fabric node virtually eliminates this problem through

proper filtering. Users can reduce this data to manageable levels that can be monitored by lower-speed 10Gb or 1Gb tools, significantly improving visibility into the data, while decreasing or deferring potential cost.

Expanded Intelligence Using GigaSMART®: A true visibility system extends beyond simple packet forwarding to provide a higher level of intelligence. GigaSMART technologies leverage powerful processors further enhancing the monitoring infrastructure and improving tool performance. Line-rate packet modification technology eliminates unwanted content with de-duplication and packet slicing features. SSL decryption provides visibility into encrypted sessions, while masking allows network security teams to hide confidential information like passwords, financial accounts, or personal medical

information. Enhanced packet distribution is available using Adaptive Packet Filtering to search for details anywhere in the packet. GigaSMART even offloads NetFlow generation to better enable switches and routers to do their job.

Eliminate SPAN/Mirror Port Contention: Most switch and router manufacturers place limitations on the number of available SPAN/mirror connections offered. If only two are available, what happens to the third tool that requires the traffic? These manufacturers also consider SPAN traffic as a secondary forwarding priority. If for any reason switch processing becomes burdened, the SPAN traffic is the first to be dropped. With a Gigamon Visibility Fabric solution, users can connect these same SPAN/port mirroring connections to the Visibilty Fabric node and easily replicate the appropriate data to multiple tools at the same time.
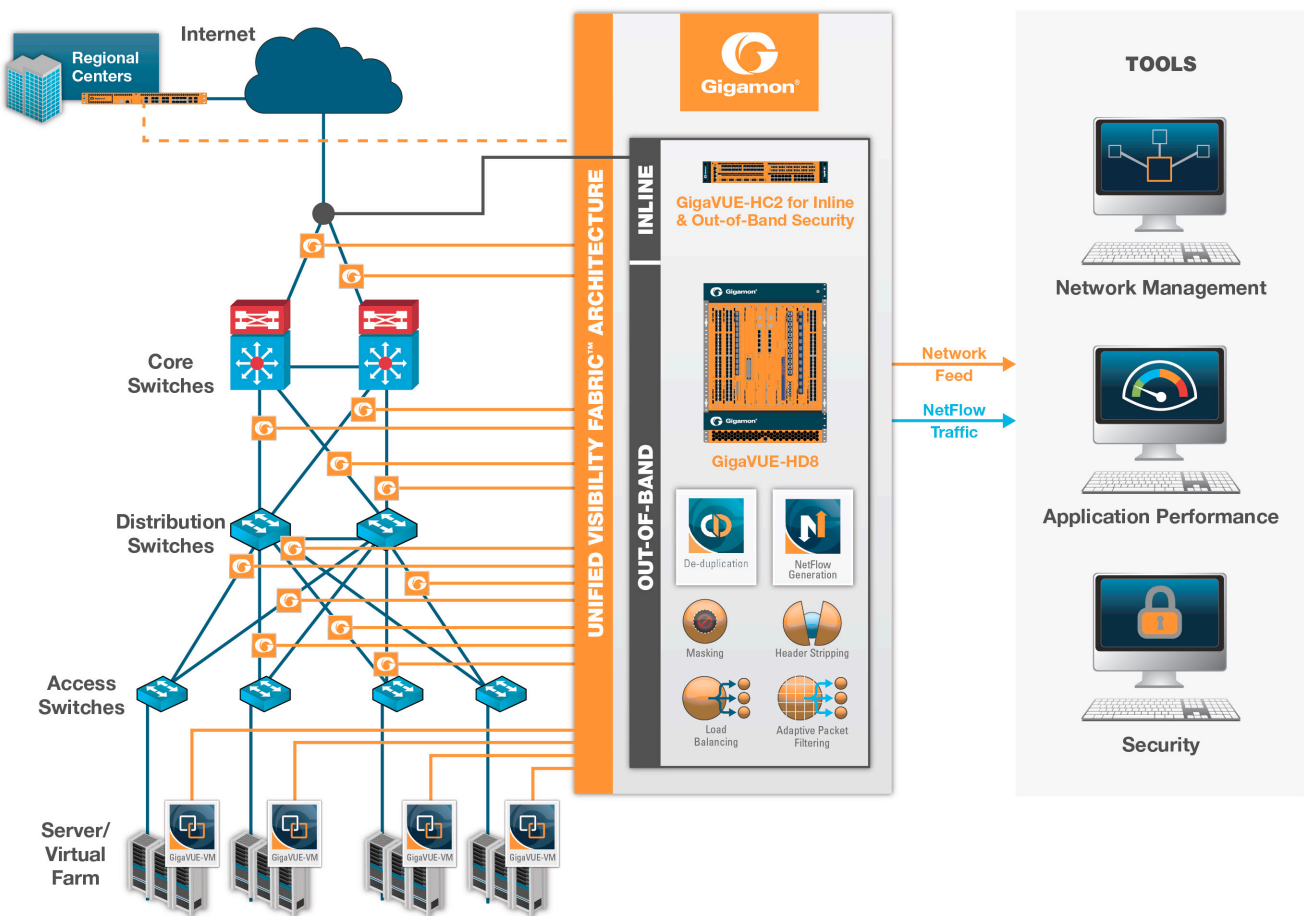

Figure 1: Network example leveraging the Gigamon Visibility Fabric

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Quickly Introduce New Tools and Monitor New Applications: Data centers are continuously evolving, adding new applications or services and new monitoring tools. When all data to be monitored is routed through a Visibility Fabric platform, users can easily connect new tools or monitor new applications using Gigamon patented Flow Mapping® technology that can quickly distribute traffic without disturbing existing monitoring connections. The Visibility Fabric node enables all data to be passively monitored, meaning new tools can be added without having to wait for lengthy change management processes because no downtime is incurred.

Integrate both Physical and Virtual Traffic: Since most data centers have already virtualized 80 or more percent of their infrastructure, traffic needs to be seen wherever it flows. Gigamon provides a holistic visibility platform to gather information from both physical and virtual infrastructures. GigaVUE-VM is a light-footprint fabric node that not only copies traffic directly from the hypervisor, it also monitors the overall system to understand when data in motion migrates from one virtual server to another. This provides a total visibility unmatched in the industry.

Secure Monitored Data: A final consideration when monitoring or capturing data is controlling access to that data ensuring that only authorized users can capture or see data. GigaVUE fabric nodes secure data integrity by offering multiple options such as:

• User-based port locking to ensure that only authorized users can access specific ports

• Packet slicing that can remove the payload of application data containing sensitive information

• SNMP traps that are triggered when a device is unplugged or a new device is plugged into an empty port

• Data masking that can hide the contents of sensitive information

• User and group based centralized authentication using RADIUS/TACACS. Also, all out-of-band management functions use secure access technologies such as SSH and HTTPS

Conclusion
Deploying comprehensive Visibility Fabric platforms leveraging GigaVUE nodes in data centers provide secure access and complete visibility to all mission critical traffic 24x7. With complete visibility and secure access, customers can reduce downtime and time to resolution of complex data center issues that will benefit all internal and external users. With Gigamon's solution, many issues are resolved such as SPAN/mirror port contention, monitoring high-speed connections with lower-speed tools, dramatic reduction of configuration and change order management, and other obstacles that otherwise require a significant amount of time and resources to overcome. With Gigamon, users can better enable user experience, threat vulnerabilities, and maximize data center performance while lowering the total cost of management.

About Gigamon
Gigamon provides an intelligent Visibility Fabric™ architecture to enable the management of increasingly complex networks. Gigamon technology empowers infrastructure architects, managers and operators with pervasive visibility and control of traffic across both physical and virtual environments without affecting the performance or stability of the production network. Through patented technologies, centralized management and a portfolio of high availability and high-density fabric nodes, network traffic is intelligently delivered to management, monitoring and security systems. Gigamon solutions have been deployed globally across enterprise, data centers and service providers, including over half of the Fortune 100 and many government and federal agencies.

For more information about the Gigamon Unified Visibility Fabric visit: **www.gigamon.com**