

Performance Management for Software-Defined Data Centers

VMware NSX™ and Riverbed® SteelCentral™ NetProfiler

Summary

Software Defined Data Centers (SDDC) are based on virtualizing data center infrastructure including server, storage and networking with the promise of significantly improved data center agility, operational efficiency and economics.

VMware NSX provides the network virtualization component of the SDDC and delivers the same benefits to networking that VMware delivered for compute and storage. NSX decouples the physical network from the virtual, reproduces all networking and security services completely in software and provides the equivalent of a hypervisor for the network. NSX networks can be programmatically managed and spun up on demand. This allows network and security services to be provisioned at the same time that compute services are provisioned enabling fast application deployment.

Riverbed® Technology and VMware are working together to provide comprehensive monitoring and troubleshooting in the Software Defined Data Center. The joint solution leverages NSX-aware IPFIX and Riverbed® SteelCentral NetProfiler and Riverbed® SteelCentral NetShark. As a cost-effective, application-aware network performance management (NPM) solution, NetProfiler, provides real-time, end-to-end visibility into the performance of critical business applications across physical and virtual networks.

Benefits of Network Virtualization

With promises of agility and cost savings, customers are accelerating adoption of the Software Defined Data Center and deploying network virtualization to achieve the following benefits:

- **Fast provisioning of network and security services.** While a virtual machine (VM) can be provisioned in a matter of minutes, providing all the necessary network and security services is still cumbersome and slow. NSX provisions network and security services at the same time that a virtual machine is provisioned.
- **Micro-segmentation.** Traditional means of micro-segmentation for security and compliance are complex, costly and un-scalable. Virtual networks are isolated by default and native NSX security capability including distributed firewalling allow segmentation of data center traffic and threat protection at the workload level enabling workloads to share infrastructure without compromising security.
- **Scale and flexibility.** Virtual networks are programmatically managed and can be created on demand. Application infrastructure can be scaled in response to business dynamics without touching the underlying physical network.
- **Identify and troubleshoot performance problems.** NSX provides full visibility into the virtual network including all connected applications, workloads and virtual machines. Combining visibility of virtual environments with visibility into physical environments allows end-to-end data center monitoring and control, enabling performance trouble spots to be quickly identified.

Challenges

Traditional network architectures face challenges:

- Cumbersome to provision and manage network services
- Isolation often requires deploying redundant infrastructure
- Can't scale with dynamic workloads
- Traditional management tools provide limited visibility in virtualized environments

VMware NSX: Delivering agility for software-defined networking

VMware is the leader in the virtualization market and NSX network virtualization is a critical component of the software defined data center. Just as vSphere abstracted compute capacity from the server hardware to create virtual pools of resources that can be consumed as a service, NSX abstracts the network into a generalized pool of network capacity and separates the consumption of these services from the underlying physical infrastructure. NSX provides a method for ‘floating’ virtual domains or overlay networks on top of an existing network infrastructure. Large numbers of virtual networks can be created with complete isolation from each other and the underlying network.

NSX is the key to deploying software defined data centers with the same simplicity and operational ease of virtual machines today. Through its separation of the virtualization and network layers, NSX enables the following benefits:

- **Ease of network provisioning:** Automatically provisions virtual overlay networks and their associated services as needed for virtual datacenters—with no impact to the physical network or involvement of the network team
- **Security:** Virtual overlay networks are isolated from each other and the physical network, addressing security and compliance requirements while using shared infrastructure, and enabling the cost savings associated with it
- **Scalability:** Enable virtual networks and virtual data centers to span physical boundaries, optimizing compute resource utilization across clusters, pods, and even geographically separated data centers—allowing organizations to build virtual data centers anywhere, anytime based on business needs rather than technical limitations

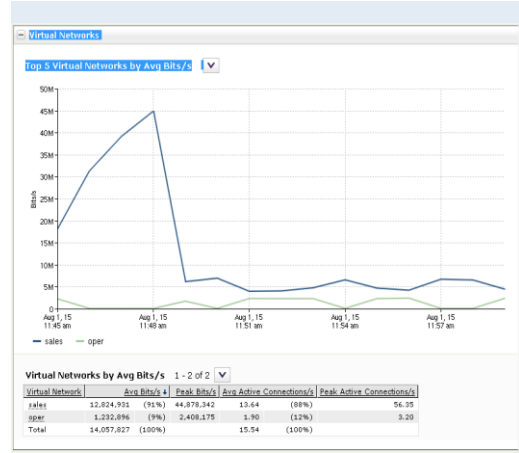


Figure 1: Quickly and easily identify the virtual networks running on your physical network and how much bandwidth each is consuming with SteelCentral NetProfiler.

Riverbed and VMware—network and application visibility for the SDDC

Data center operators need the ability to monitor, troubleshoot, and report on network and application performance. Riverbed and VMware worked together to jointly developed the NSX-aware IPFIX format, which provides performance information about virtual overlay network traffic and associated UDP-encapsulated traffic to extend the performance management capabilities of SteelCentral solutions for monitoring the virtual switch/VDS within vSphere to monitoring virtual data centers and their associated overlay networks.

NSX provides full visibility into the virtual network including all connected applications, workloads and virtual machines, but most traditional network performance management solutions are still unable to leverage these capabilities to provide visibility into virtual environments let alone across both the virtual and physical environments to facilitate end-to-end data center monitoring and control. SteelCentral NetProfiler is the only application-aware NPM solution that enables IT organizations to leverage NSX to enable network operations teams to:

- Control and understand virtual overlay network performance
- Monitor and troubleshoot virtual data centers and the physical network in a single solution
- Provide VDC owners isolated views into their virtual data center performance and SLAs

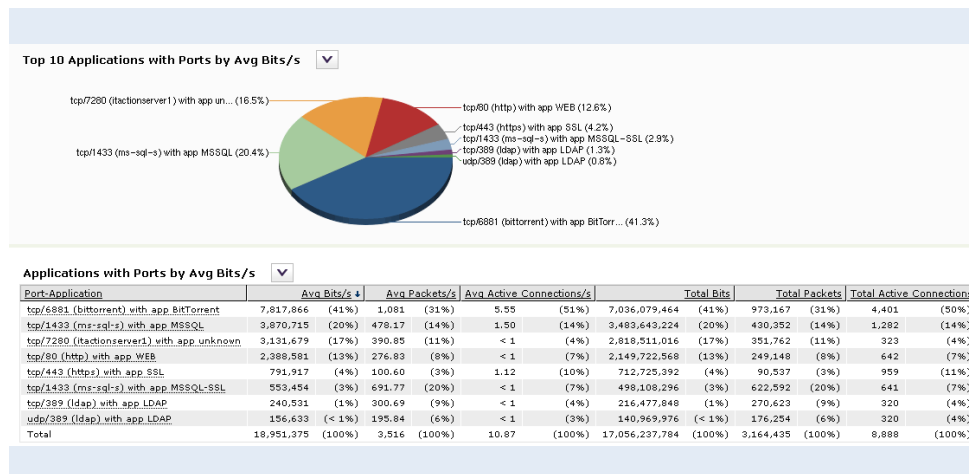


Figure 2: NetProfiler allows you to drill into a virtual network (VNI) to see the applications running within it.

Riverbed SteelCentral—End-to-end visibility

SteelCentral products provide actionable, real-time information into network and application performance to help organizations make smarter decisions and troubleshoot performance issues faster and easier. It not only alerts to problems but also pinpoints where the problems are occurring and what’s causing them.

It provides a simple but elegant architecture that seamlessly combines passive flow and packet collection in a single user interface for true end-to-end visibility across WAN, LAN, virtualized, and cloud data centers. Some of the capabilities that set NetProfiler apart from other solutions include:

- Application-centric performance dashboards for business relevance
- Automated performance analytics for early identification of issues
- Top-down troubleshooting workflows that streamline and accelerate troubleshooting
- Application decodes and transaction analysis for fast problem diagnosis
- Automated discovery to clearly understand the relationship and dependencies between infrastructure and applications

SteelCentral NetProfiler is available as an appliance or a fully virtualized software solution to enable enterprises, public cloud, and other managed service providers the ability to easily deploy it in support of their performance management requirements.

Solution benefits

The joint Riverbed and VMware solution enables organizations to have full administrative control in SDDC environments. NetProfiler is the first and only solution to provide comprehensive and unified visibility across the WAN, LAN, virtual overlay networks, and cloud-based data centers to meet the rapidly changing needs of forward-thinking organizations. It enables network operations to find and fix network and application performance, no matter the architecture—traditional, server virtualized, or fully virtualized.

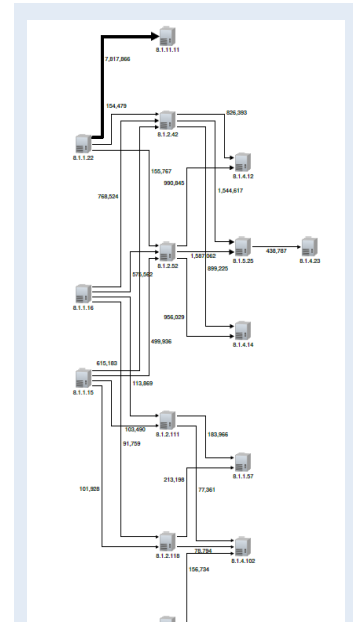


Figure 3: NetProfiler provides a handy diagram of virtual network host pairs with an indication of relative traffic that can easily be exported.

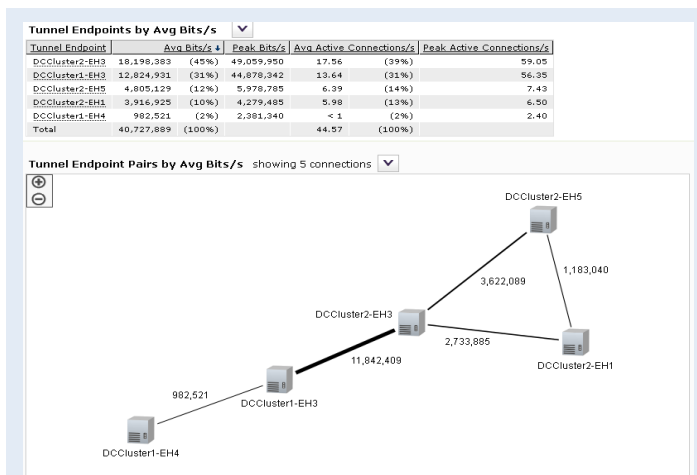


Figure 4: You can also see the virtual tunnel end point (VTEP) and relative traffic between them. Each link is clickable so you can drill down for additional detail.



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