Dell PowerEdge VRTX WAN Optimization with Silver Peak

A Dell Reference Architecture and Solution Guide

Abstract

This document details the joint solution, benefits, and joint solutions architecture of Silver Peak Virtual WAN Optimization and Dell PowerEdge VRTX.

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Contents

Overview 4
Simplicity is key 4
Minimize IT costs 4
Use Case: Distributed enterprise 4
Use Case: Remote replication and backup 4
Solution component: Dell VRTX 5
Solution component: Silver Peak VXOA 5
Silver Peak and Dell PowerEdge VRTX solution overview and architecture 6
Sample reference architectures with Silver Peak and Dell PowerEdge VRTX 8
Architecture 1: Small remote replication 8
Architecture 2: Small multi-site configuration — 5 remote sites + 1 hub 9
Architecture 3: Mid-size multi-site configuration — 30 remote sites + 1 hub 10
Silver Peak VXOA installation on Dell PowerEdge VRTX 11
Important prerequisites 11
Running the Silver Peak Configuration Wizard 12
Final Configuration: Redirect traffic to Silver Peak 13

Tables

Table 1. Recommended versions of Microsoft Hyper-V and VMware 11

Figures

Figure 1. Dell PowerEdge VRTX 5
Figure 2. Silver Peak VXOA 6
Figure 3. Two sites with Silver Peak for VRTX at each end 7
Figure 4. Multiple remote branches with central data center 7
Figure 5. Small configuration 8
Figure 6. 5-site remote office configuration + head-end 9
Figure 7. 30-site remote office configuration + head-end 10
Figure 8. Silver Peak out–of-path deployment with PBR (router mode) 14
Figure 9. Figure 8: WCCP redirection to Silver Peak 14

Overview

In today's enterprise, users are increasingly distributed while data is increasingly centralized. This places an increased burden on the underlying network infrastructure as a key enabler for various strategic corporate initiatives, such as server/storage consolidation, remote backup/replication, and unified communications.

Dell has partnered with Silver Peak to address this challenge. Silver Peak's Virtual Acceleration Open Architecture (VXOA) can help cost effectively increase network capacity, optimize network quality, and help ensure maximum performance over distance — all while helping to reduce ongoing IT operating costs. The combined Dell and Silver Peak solution delivers local area network (LAN)-like network performance to distributed employees, making it a strategic enabler for enterprises of all sizes.

Simplicity is key

Silver Peak's virtual appliances enable customers, partners, and service providers to deploy wide area network (WAN) optimization more conveniently than ever — deployed as software instances on Dell™ PowerEdge™ servers including VRTX. The result is a flexible and highly-customizable solution for enterprise-wide WAN optimization designed to deliver unprecedented scalability — from Mbps to multi-Gbps of WAN capacity.

Minimize IT costs

The combined Dell and Silver Peak solution enables you to get the most out of your existing network infrastructure. With up to 85% improvement in effective bandwidth, you can avoid or delay costly bandwidth upgrades. Silver Peak's Network Integrity features allow voice, video, data, and storage traffic to be delivered on a single, cost-effective, shared network. Additionally, Dell and Silver Peak can make MPLS, Internet VPNs, and clouds perform like private lines. When combined with Dell PowerEdge VRTX, Silver Peak's virtual appliance allows IT to scale remote offices without waiting for hardware refresh cycles.

Use Case: Distributed enterprise

To provide the distributed enterprise with a seamless user experience regardless of location, Dell and Silver Peak extend LAN responsiveness to remote offices. By accelerating reliable access to centralized applications and data, enterprises can enjoy the cost and management benefits of server/storage centralization without diminishing the remote end-user experience. Enable your network and empower users across your distributed enterprise to work more efficiently and effectively.

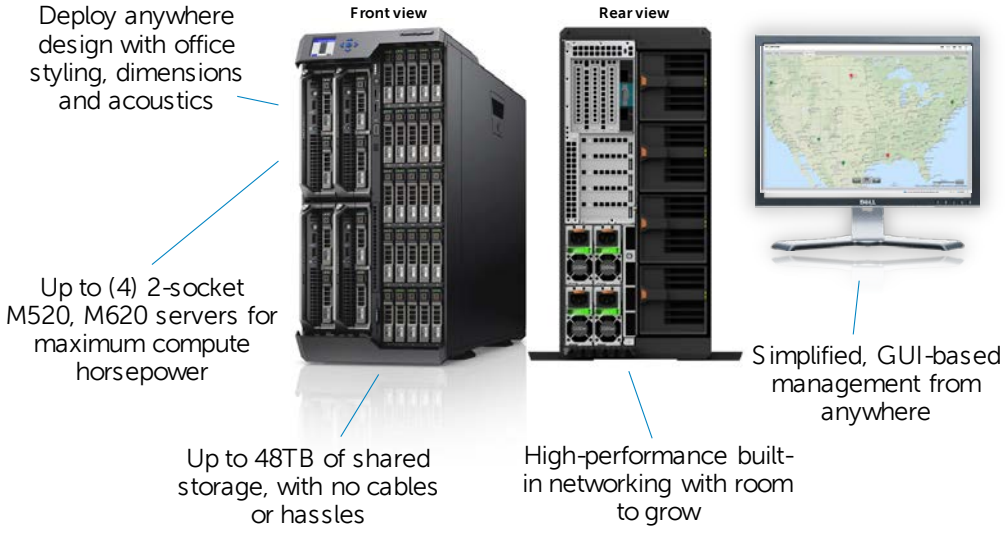
Use Case: Remote replication and backup

Silver Peak extends replication distances, helps lower costs, and allows consistent replication throughput for Dell VRTX customers. With the replication process occurring on the same network as voice, video, and data, a dedicated private network for storage is unnecessary. In the event of an unplanned data loss, a more recent offsite data backup can be recovered more quickly, and help lower disaster recovery costs without sacrificing business continuity.

Solution component: Dell VRTX

PowerEdge VRTX brings simplicity, efficiency, and versatility to any office environment. VRTX is an unprecedented convergence of servers, storage, and networking into a single, office-optimized chassis the size of a desk-side tower. Integrated, pre-tested, and certified, VRTX delivers a complete technology platform that users can deploy smoothly and operate confidently.

Figure 1. Dell PowerEdge VRTX

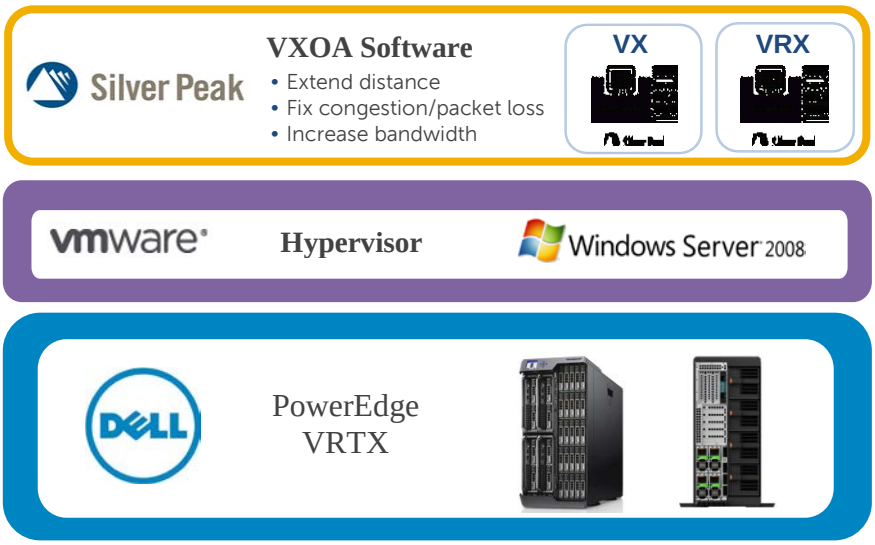


Solution component: Silver Peak VXOA

The Silver Peak solution is built on Virtual Acceleration Open Architecture (VXOA), which uses real-time optimization techniques to overcome bandwidth, latency, and packet loss issues that are common to most WANs. Silver Peak's optimization techniques are all performed in real-time and ensure maximum performance across the widest range of application and WAN environments.

Silver Peak appliances leverage the following VXOA technology components to accelerate all enterprise applications in a secure and reliable way.

Figure 2. Silver Peak VXOA



Network Memory

Network Memory is Silver Peak's patented solution for disk based WAN de-duplication. Network Memory inspects all traffic that is sent between clients and servers, storing information as a local instance in Silver Peak devices. Repetitive information is delivered locally rather than sent across the WAN, improving application performance and WAN utilization.

Network Integrity

Silver Peak employs a variety of real-time techniques to address packet delivery issues common to shared WAN technologies, such as MPLS, Internet VPNs, and cloud.

Network Acceleration

Silver Peak mitigates the impacts of latency due to distance by using various TCP acceleration techniques, like adjustable window sizing and selective acknowledgements, as well as CIFS acceleration techniques, such as read-aheads and write-behinds.

Secure Content Architecture

Silver Peak keeps enterprise data secure with its Secure Content Architecture. Silver Peak VXOA leverages hardware based AES encryption to protect local data stores. Optional IPsec keeps content safe when it traverses the WAN.

Silver Peak and Dell PowerEdge VRTX solution overview and architecture

Silver Peak VX for Dell VRTX is a specially priced and packaged solution designed specifically for VRTX. Based on Silver Peak VXOA, it supports up to a 20Mbps WAN connection. For storage backup and replication, this implies an effective throughput of 60GB/hour. For traditional branch office applications like e-mail, Web, and Microsoft® SharePoint®, it offers approx 100-200Mbps over a 20Mbps WAN connection (assuming 5-10x data reduction).

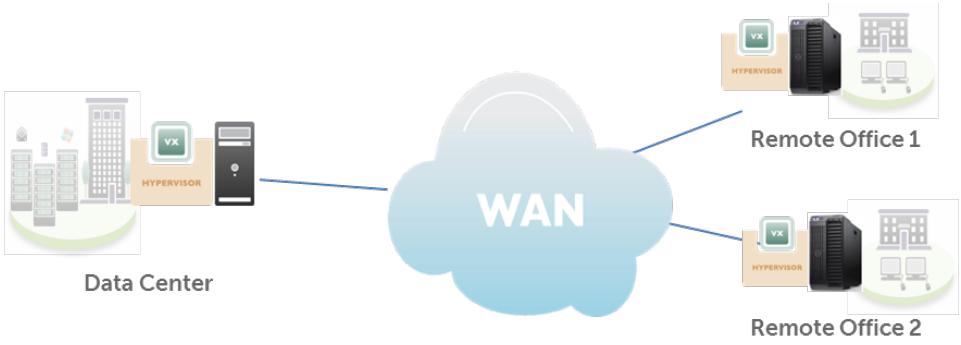
As illustrated in Figure 3, Silver Peak appliances are always deployed in pairs — in addition to the VRTX Silver Peak software, a second Silver Peak instance must be running at the other end of the WAN connection.

For simple site-to-site data replication and backup requirements, a second Silver Peak + VRTX can be deployed as shown in Figure 3.

Figure 3. Two sites with Silver Peak for VRTX at each end

For larger enterprises with multiple branch office locations, each branch can run an instance of Silver Peak for Dell PowerEdge VRTX, but a central location with Silver Peak must also be deployed as shown in Figure 4. This Silver Peak instance should be large enough to accommodate all the remote locations.

Figure 4. Multiple remote branches with central data center



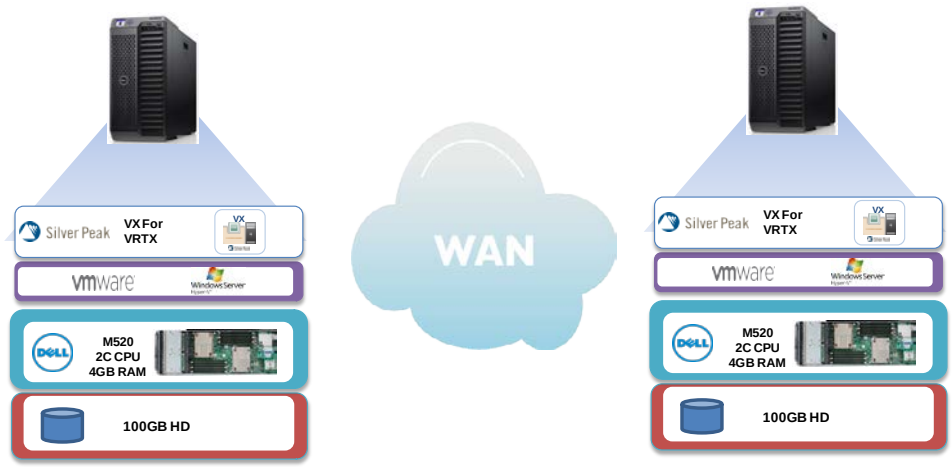
Dell and Silver Peak sales will assist in sizing a central data center location. Please contact your Dell sales representative for more information. A free 30-day trial for the entire Silver Peak product line is available from the Silver Peak marketplace at http://marketplace.silver-peak.com.

Sample reference architectures with Silver Peak and Dell PowerEdge VRTX

Architecture 1: Small remote replication

This architecture example is a common use case for Silver Peak: accelerating remote replication and backup to a DR site (or the cloud). With the combination of Silver Peak and VRTX, customers can run their remote office applications and be assured that their content stored on Dell (or non-Dell) storage can be backed up and replicated to a DR site within the required RPO (recover point objective) — all using existing WAN infrastructure.

Figure 5. Small configuration



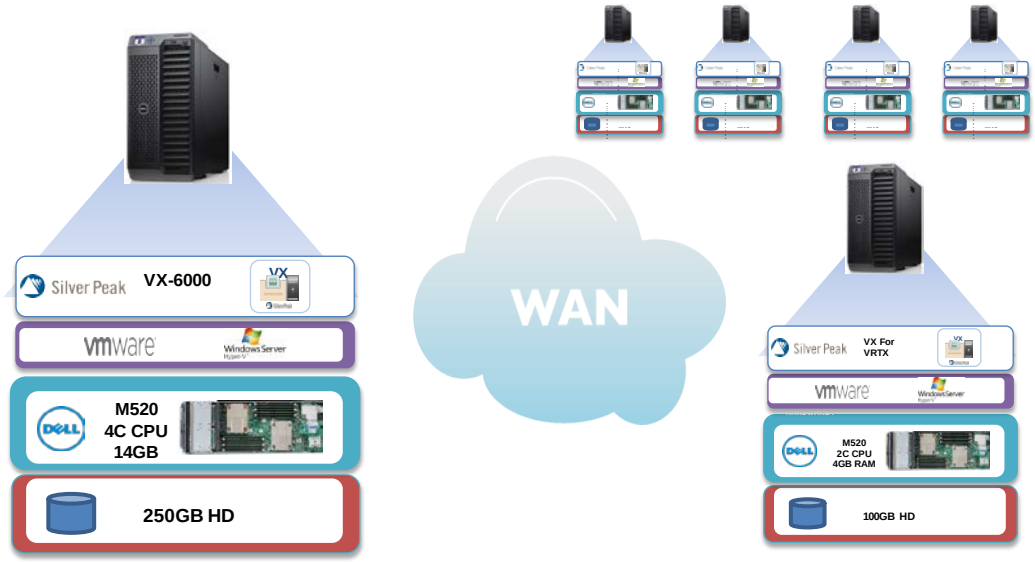
As shown in Figure 5, for the small configuration, the following components are required at each end of the connection.

- PowerEdge M520 with a minimum 2-core CPU (hyperthreaded for 4 cores) + 4GB RAM
- Silver Peak VX for PowerEdge VRTX
- 100GB hard drive (minimum)
- VMware® or Microsoft Hyper-V®

Architecture 2: Small multi-site configuration — 5 remote sites + 1 hub

This architecture example is a common use case for Silver Peak: remote office (ROBO) acceleration. With the combination of Silver Peak and VRTX, customers can run their remote office applications like e-mail, web apps, SQL, and CIFS access to centralized locations and have LAN-like access at their remote offices.

Figure 6. 5-site remote office configuration + head-end



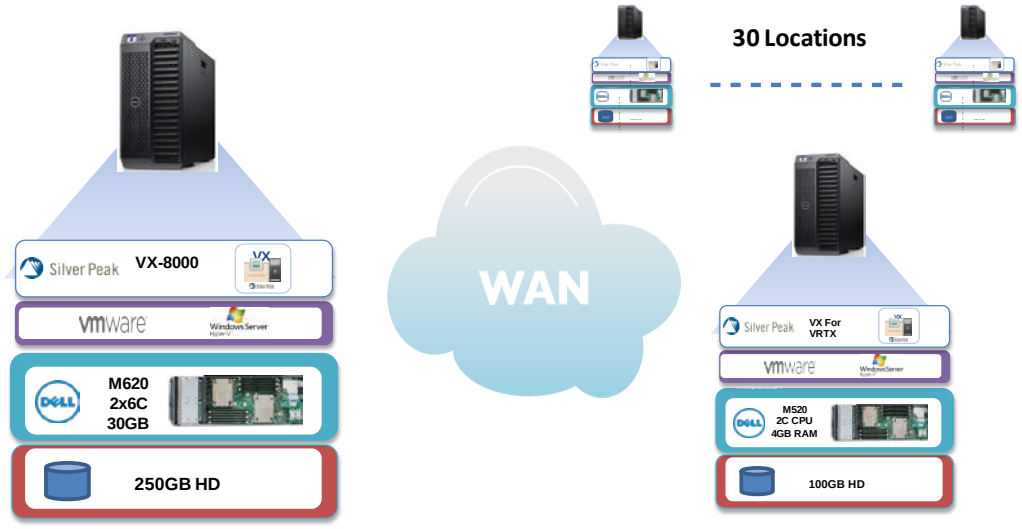
As shown in Figure 6, for this configuration, the following components are required:

- Each remote office (5x)
  - PowerEdge M520 with a minimum 2-core CPU (hyperthreaded for 4 cores) + 4GB RAM
  - Silver Peak VX for PowerEdge VRTX (supports up to 20Mbps)
  - 100GB hard drive (minimum)
  - VMware or Microsoft Hyper-V
- Head-end (1x)
  - PowerEdge VRTX with PowerEdge M520 with minimum 4-core CPU (hyperthreaded for eight cores) + 14GB RAM
  - 250GB hard drive (minimum)
  - Silver Peak VX-6000 software (supports up to 100Mbps)
  - VMware or Microsoft Hyper-V

Architecture 3: Mid-size multi-site configuration — 30 remote sites + 1 hub

This architecture example is a common use case for Silver Peak: remote office (ROBO) acceleration. With the combination of Silver Peak and VRTX, customers can run their remote office applications like e-mail, web apps, SQL, and CIFS access to centralized locations and have LAN-like access at their remote offices.

Figure 7. 30-site remote office configuration + head-end



As shown in Figure 7, for this configuration, the following components are required:

- Each remote office (30x)
  - PowerEgde VRTX with PowerEgde M520 with a minimum 2-core CPU (hyperthreaded for 4 cores) + 4GB RAM
  - Silver Peak VX for PowerEdge VRTX (up to 20Mbps)
  - 100GB hard drive (minimum)
  - VMware or Microsoft Hyper-V
- Head-end (1x)
  - PowerEgde VRTX with PowerEgde M620 with two 6-core CPUs (hyperthreaded for 24 cores) + 14GB RAM
  - Silver Peak VX-8000 software (supports up to 622Mbps)
  - 250 hard drive (minimum)
  - VMware or Microsoft Hyper-V

These are starting points for your configuration. For more information on sizing and applications, please visit the Silver Peak + Dell resource center at http://www.silver-peak.com/dell or contact your Dell sales representative.

Silver Peak VXOA installation on Dell PowerEdge VRTX

Below is a step-by-step guide of your Silver Peak for Dell PowerEdge VRTX environment. The joint solution is designed for easy deployment, but if you have a more complex network or require additional assistance, Silver Peak offers a remote setup option with our WANSTART service — please contact your local Dell sales representative for more information on this service.

Important prerequisites

Before you deploy Silver Peak VX for Dell PowerEdge VRTX, be sure that you have completed the following prerequisites:

- A working VMware or Microsoft Hyper-V environment
- Downloaded the appropriate Silver Peak image file
- Received your Silver Peak licenses
- IP address information (if not using DHCP)

Silver Peak offers easy quick-start guides for both Microsoft Hyper-V and VMware environments that walk through installation, configuration, and startup-up of the Silver Peak VXOA environment in either hypervisor.

For Microsoft Hyper-V, see the quick-start guide at
http://www.silver-peak.com/download/latest/qStartVXHyperVServer.html

For VMware, see the quick-start guide at
http://www.silver-peak.com/download/latest/qStartVXVMWareServer.html

Recommended versions of Microsoft Hyper-V and VMware are listed in Table 1.

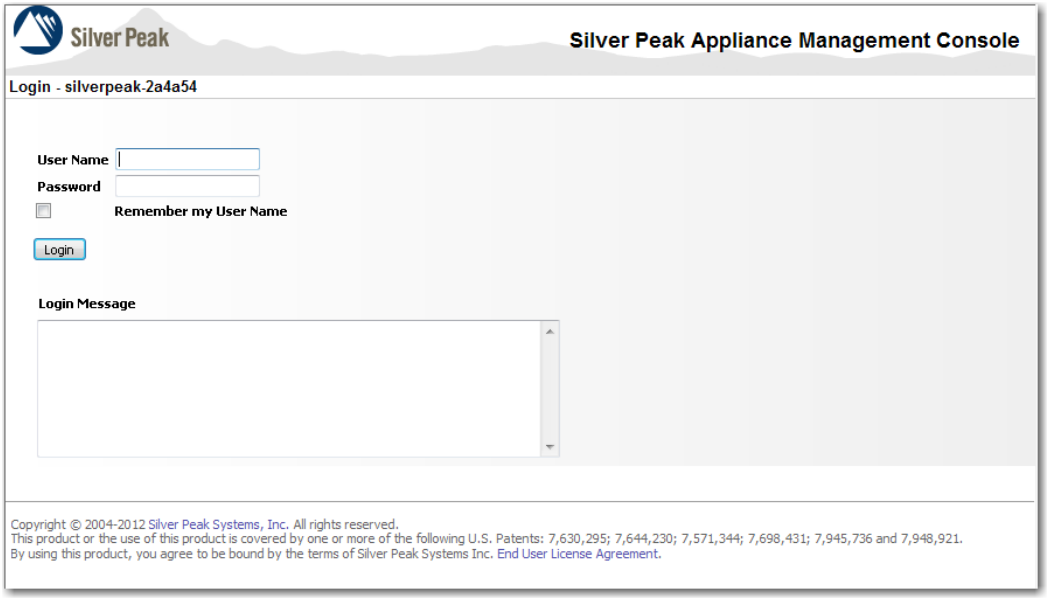
Table 1. Recommended versions of Microsoft Hyper-V and VMware

Microsoft Hyper-V	VMware vSphere
Hyper-V 2008 R2 Hyper-V 2012	vSphere 4: update 1 and later vSphere 5.x

Running the Silver Peak Configuration Wizard

After completing the quick start guide, your Silver Peak environment should be up and running. The next step is to run the Silver Peak Configuration Wizard.

1. In a browser, enter the mgmt0 IP address you just discovered or configured. The Silver Peak Appliance Management Console login page appears.



2. For both the User Name and Password, enter **admin**. The initial configuration wizard appears.

3. Complete the remaining wizard screens.
   a. If desired, change the **Hostname**. This is the name by which Silver Peak knows the virtual appliance.
   b. When the wizard asks for the license number, it also provides a hyperlink to the Silver Peak Support Portal. From there you can retrieve the key and paste it into the **License** field.
   c. Be sure to select **Router** or **Server** mode when asked.
   d. On the last wizard screen, click **Apply**.
   e. The Appliance Manager takes a few minutes to reboot and return to the login page.

The final step is to re-direct traffic to the Silver Peak on VRTX.

Final Configuration: Redirect traffic to Silver Peak

Once Silver Peak has been configured and is live, the final step is to direct your local traffic to the Silver Peak device.

Depending on your environment, there are a number of ways to accomplish this:

1. If your PowerEdge VRTX ARC platform supports static routes, use a **static route** on the Power Connect switch CLI to re-direct traffic to Silver Peak IP for optimization.

   Example:
   Remote-site's network to be optimized :10.10.20.0/24
   Local Silver-Peak Appliance IP : 10.10.10.100

   Static route on Power Connect Switch:
   Console (config#) ip route 10.10.20.0/24 10.10.10.100

2. If your ARC platform does not support static routes, use a packet redirection method such as Policy Based Routing (PBR) or Web Cache Communication Protocol (WCCP) on an external router to redirect traffic to the Silver Peak VX appliance on the VRTX platform for optimization.

   The benefit of these redirection schemes is that, in the unlikely event that the Silver Peak stops functioning, the Dell VRTX fails, or both, Silver Peak will behave as an open port and will not present a link-level carrier to the WAN router. The WAN router will recognize that the link associated with the PBR or WCCP is down and will resume forwarding traffic normally according to its routing tables.

   Figure 7 below depicts PBR redirection and Figure 8 depicts WCCP.

Figure 8. Silver Peak out–of-path deployment with PBR (router mode)

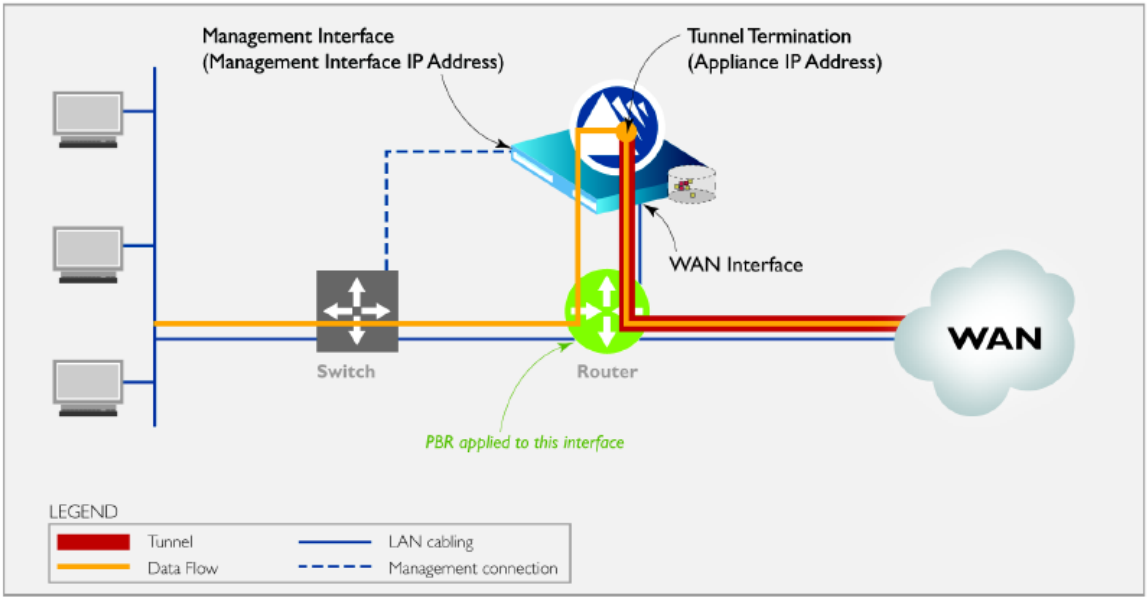
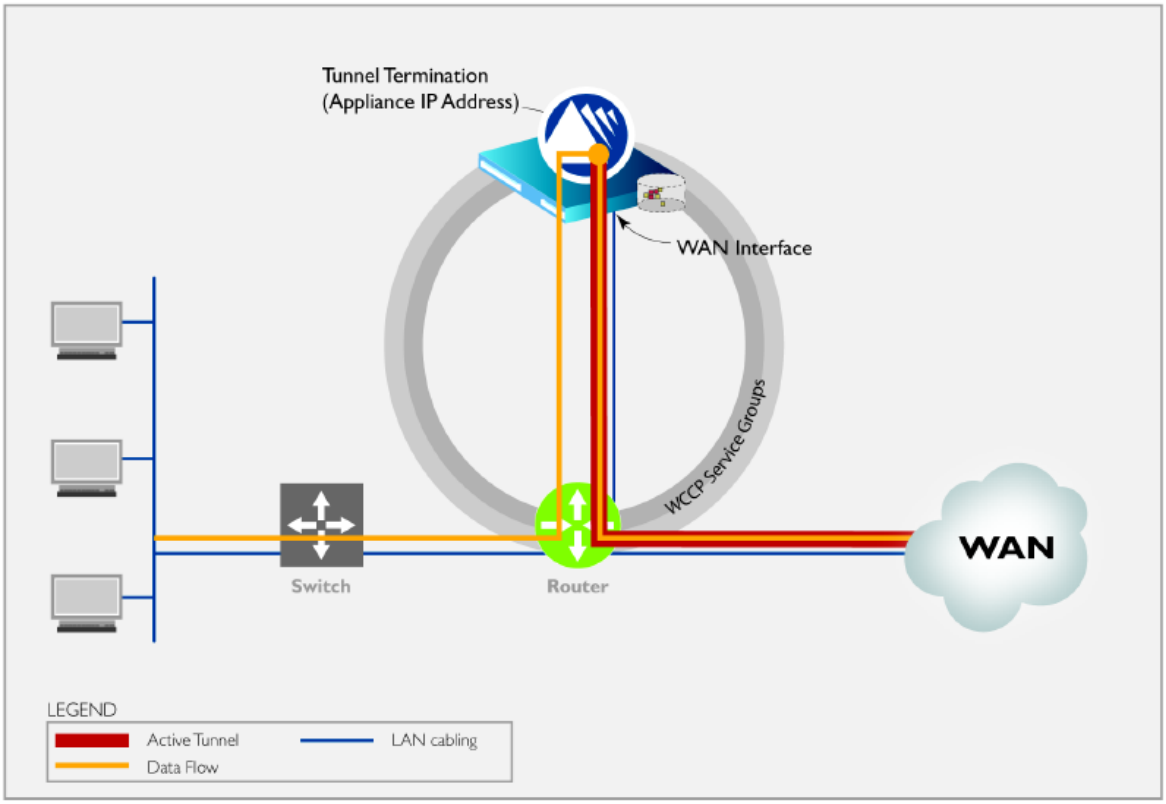


Figure 9. Figure 8: WCCP redirection to Silver Peak



Please refer to the *Silver Peak Network Deployment Guide* for additional details on these and other advanced deployment options at http://www.silver-peak.com/documentation/silver-peak-network-deployment-guide.