Improving Enterprise Network Performance During Hurricane Recovery

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Abstract

During hurricane recovery periods, network bandwidth becomes very limited due to major outages in service providers' networks as well as power loss. Enterprises with sites operating in hurricane-affected areas usually suffer poor connectivity with these sites which might lead to major interruption to business operations. The objective of this study is to provide an overview of existing network optimization technologies and solutions that can be used by companies operating in affected areas to improve network performance while the network infrastructure of service providers is being recovered.

1. Introduction

In hurricane-affected areas, communication systems will likely to be the first to fail leading to loss of connectivity with the rest of the world. As service providers in these areas struggle to bring their infrastructure back to operation, Wide Area Network (WAN) bandwidth continues to be very limited until the entire network is fully recovered. During this period, companies that have branches in the affected areas will suffer poor connectivity with these sites due to congested WAN links resulting from network outages in the service providers' networks. These congested WAN links might slow down the entire business operation of the company especially if it depends on real-time transfer of data and files.

In such situations, WAN optimization technologies can be used to improve network connectivity between company sites. In Figure 1 below, WAN optimization devices are used in both offices to optimize network traffic before it is being sent to WAN links. Using WAN optimization devices not only improves network performance when bandwidth is limited but also increases WAN speeds in normal operating environments without adding expensive bandwidth.

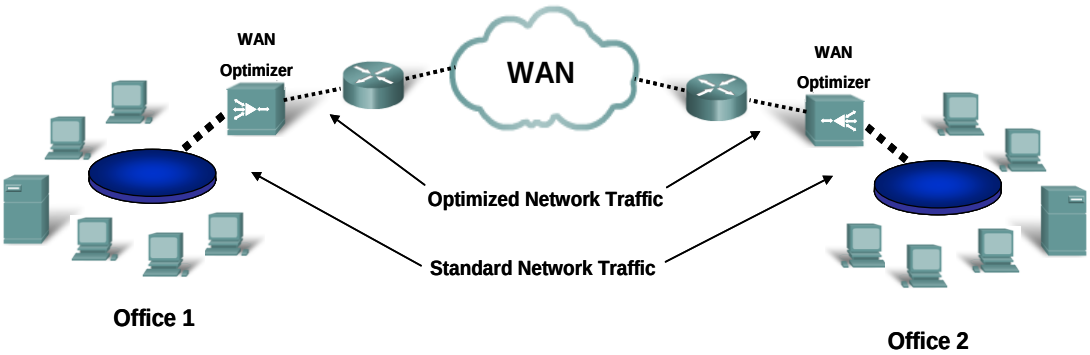

Figure 1: WAN optimization scenario.

2. WAN Optimization Technologies

WAN optimization devices use technologies that can be grouped into three types: data reduction technologies, traffic management technologies, and protocol-specific technologies.

Data Reduction Optimization focuses on minimizing the amount of data transferred over the network. These techniques reduce data transmission by identifying redundancy within network packets and chunks of file blocks. This is more efficient than traditional caching techniques which cache entire objects such as Web pages, images, or data files.
Traffic Management Optimization prioritizes different types of packets by using techniques such as traffic classification, queuing, and traffic shaping. It also includes techniques that deal with common WAN links problems such as packet loss and out-of-order packet delivery.
Protocol-Specific Optimization focuses on increasing the performance of protocols that were originally designed for Local Area Networks (LANs) such as CIFS (Common Internet File System) and MAPI (Messaging Application Programming Interface).

3. WAN Optimization Solutions

The following is a short list of vendors providing products that support multiprotocol byte-and object-level caching; multiprotocol compression; traffic management/QoS; and protocol acceleration.

Vendor	Product Name	Remarks
Riverbed Technologies	Steelhead appliance	Combines data-oriented features like multiprotocol byte-level caching and detailed protocol-specific optimizations.
Juniper Networks	WX and WXC WAN optimization appliances	
Silver Peak Systems	NX Series	Provides solutions that can scale up to 500Mbps of optimized WAN traffic.
Blue Coat Systems	SG Appliances	Proxy-based architectures.
Cisco Systems	WAAS	Advanced all-in-one branch office appliance.
Expand Networks	Accelerator	Very strong compression. Less scalable.
Citrix	WANScaler	Deploys at layer 2

4. Conclusions

In today's fast moving business environment, companies can't afford slow operations due to limited bandwidth in hurricane-affected areas. Different vendors are currently utilizing WAN optimizations technologies to provide solutions that can deliver maximal performance out of the very congested WAN links during hurricane recovery periods. Adopting WAN optimization solutions, companies not only improve performance during disaster recovery, but can also increase WAN speeds without adding expensive bandwidth to support business applications that require transfer of large amount of data in real time.

5. References

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