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Improving WAN Optimization Strategies

New applications, including social networking, cloud applications, and interactive high-definition video, all contribute to the growing complexity of WAN performance. Congestion, latency, protocol issues, and traffic burstiness all challenge quality of experience. It may be tempting to solve poor performance issues through traditional brute-force tactics such as adding more WAN capacity and deploying WAN-optimization appliances. However, without a deep understanding of the traffic traversing the networks, the success of these approaches will be limited at best. In the end, visibility is the key prerequisite for effective WAN policies and performance management.

Accurately characterizing network performance requires obtaining a current and detailed understanding of key applications used, assessing bandwidth consumption by application and by content, and identifying top consumers. It is only then that traffic management policies such as policing, shaping, and quality of service (QoS) can be effectively implemented.

Characterizing the Network

To characterize the network usefully, operators need to understand specific network conditions including the number of sites being connected, traffic QoS mapping, and the proportion of traffic backhauled (recreational traffic) from remote locations to a central location for Internet access. The topology of the network indicates traffic patterns that could provide insight to potential performance

issues. Similarly, application profiling is important. Typically, there is a very broad mix of applications in the network, with varying performance characteristics. However, the economic value of applications differs.

PacketPortal™

OBSERVER
MANAGEMENT
PLATFORM

Application Type	Usage
Business critical	These applications are the most important and carry the greatest business impacts. Applications include ERP, CRM, finance, credit processing, inventory, health records and imaging, customer transaction records, and equity trading.
Latency-sensitive	Unified communications, including voice and video conferencing and enterprise IM, require adequate bandwidth to perform properly. Applications include systems from Polycom®, Cisco®, and Avaya®, and Microsoft®.
Server and storage consolidation data	File services, storage, backup, disaster recovery, software update distribution, and network services (DNS, DHCP, and Authentication) can consume large amounts of bandwidth and are easily impacted by background traffic such as non-critical social media. Applications include Microsoft file access, NetApp®, and Equal Logic® synchronization traffic.
On-demand and video streaming	These fast-growing applications are typically very bandwidth-intensive with a single stream consuming as much as 1-2 Mbps. Applications include internal video servers, cloud-based learning management systems (LMS), and Enterprise YouTube.
Cloud and SaaS	Applications include those from Amazon®, Salesforce.com®, Taleo®, Microsoft Office 365, and video LMS.
Recreational	Applications include YouTube, gaming, and social media that often account for a significant portion of overall bandwidth utilization.

Assessing Service Performance

Once characterization is complete, it's important to assess network performance from latency and bandwidth consumption perspectives including ensuring the health of the transport layer. Application and service response times are crucial to determining the source of service degradation: network, application, or server. Examples include understanding VoIP quality by holistically measuring jitter, latency, packet loss, and mean opinion score (MOS) all the way to the remote branch office location. Another is quantifying the health of complex multitier applications, which are often deployed across numerous geographically-distributed hosts.

Enacting Network Policies

With the right intelligence regarding application and network performance, carrier-managed enterprise network operators can implement appropriate policies for QoS and traffic engineering to ensure the optimal usage of network resources. The right policies will minimize the impact from recreational and malicious traffic, ensuring availability and the performance of critical applications. Today's network devices, especially those deployed at enterprise branch offices, typically lack the application and content awareness needed to enforce specific policies and use, instead, a broad-brush approach. WAN-optimization solutions from vendors such as Riverbed®, BlueCoat®, and SilverPeak® effectively accelerate the performance of key applications and reduce the bandwidth required for large, data-intensive applications through data compression. WAN-optimization solutions often eliminate or defer costly WAN link bandwidth upgrades. However, if deployed incorrectly, this technology can adversely affect latency, causing bandwidth expansion and complicating troubleshooting.

The Carrier-Managed Enterprise Solution

PacketPortal is a software solution that cost-effectively gathers intelligence on voice, video, and data anywhere in the network including previously unreachable locations such as enterprise remote branch offices. In addition to improving troubleshooting, PacketPortal can provide intelligence about applications, networks, and content to help operators optimize application performance and improve the user experience while minimizing network investments.

Together as an integrated solution, Observer Management Platform and PacketPortal offer broad network and application visibility from the infrastructure core to the network edge. Using the advanced, cost-effective packet capture capabilities of PacketPortal enables Observer Platform to seamlessly combine remote branch traffic with resource-wide instrumentation for comprehensive intelligence of all the services traversing the infrastructure. Observer Analyzer provides in-depth application intelligence including expert analytics and the ability to perform payload analysis.

Beyond improving troubleshooting, the carrier-managed enterprise solution can provide detailed information about services, applications, the network, and infrastructure, helping operators and carrier-managed enterprises enhance performance, improve user experience, and optimize investments in IT resources.

Problem	Symptom	How the Carrier-Managed Enterprise Solution Helps
Slow performance of business-critical applications	Fully-utilized WAN links causing application timeouts due to slow acknowledgements	· Real-time visibility of all applications traversing the WAN identify how much bandwidth is consumed by each. · Enables appropriate QoS mechanisms on branch routers and gives key applications high priority. · Reclaims WAN bandwidth by throttling recreational applications. · Payload capture aids in determining root cause of application degradation.
Users not receiving e-mail messages in a timely fashion	High protocol latency and increased bandwidth after mail servers are removed from branch offices and consolidated in headquarters. WAN bandwidth upgrades do not resolve the issue.	· Identifies MAPI protocol levels and latency from each branch office location. · Implements appropriate WAN optimization technologies. · Avoids WAN bandwidth upgrades by optimizing latency. · Provides multi-hop visibility as application conversations traverse the infrastructure.
Slow file transfers between branch offices	Increased protocol latency and bandwidth from server consolidation results in slow file transfer performance. WAN bandwidth upgrades do not resolve the issue.	· Identifies specific and most-frequently used file-sharing protocols used such as CIFS and SMB v1/v2. · Measures specific end-user latencies. · Implements protocol-optimized acceleration technologies.
VoIP or video-conferencing performance issues	Interactive traffic over a converged WAN—choppy call quality and dropped video frames. Network operators and carrier-managed enterprises are unable to adequately monitor and troubleshoot performance issues.	· Obtains real-time protocol quality metrics from remote branch offices. · Isolates performance issues down to specific users. · Increases network bandwidth to only specific locations in order to improve application performance, avoiding costly over-investments. · Offers contextual awareness of UC behavior as it interacts with other running services.
Increased Internet traffic levels	High levels of Internet traffic impact user productivity by affecting business-critical applications.	· Visibility into user activity and QoS lets IT manage ingress and egress Internet traffic to ensure performance of important applications and/or user productivity. · Awareness into specific web-user resource usage patterns enables optimal utilization and prioritization of resources.

Conclusion

Observer Platform and PacketPortal provide an integrated solution that offers broad network and application visibility from the infrastructure core to the network edge. Using the advanced, cost-effective packet capture capabilities of PacketPortal enables Observer Platform to seamlessly combine remote branch traffic with resource-wide instrumentation for comprehensive intelligence of all the services traversing the infrastructure.

Observer Analyzer provides in-depth application intelligence including expert analytics and the ability to perform payload analysis. Beyond improving troubleshooting, a carrier-managed enterprise solution can provide detailed information about services, applications, network, and infrastructure, helping network operators and carrier-managed enterprises enhance performance, improve user experience, and optimize investments in IT resources.

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