Cisco Wide Area Application Services Mobile and Cisco Unified Computing System: Extend Data Center Scalability and Flexibility for Mobile Users

What You Will Learn

The Cisco Unified Computing System™ extends the scalability and flexibility of Cisco® Wide Area Application Services (WAAS) Mobile, supporting up to 10,000 concurrent users on the Cisco UCS C-Series Rack-Mount Servers and enabling Cisco WAAS Mobile servers to be incrementally deployed as virtual machines by aligning server infrastructure deployment with service growth requirements.

Challenge

Cisco Wide Area Application Services (WAAS) Mobile extends Cisco WAAS application acceleration benefits to teleworkers, small and home office workers, and mobile employees who travel outside the branch office. Compared to corporate WAN and branch-office optimization, acceleration of mobile VPN connections over the public Internet brings additional technical challenges:

- **Quality of the network connection is lower than the corporate WAN:** Rather than using dedicated branch-to-corporate WAN leased lines, mobile users are using public Internet connections such as DSL, Wi-Fi, satellite, dial-up, cable, and cellular. These connections have lower bandwidth, higher packet loss and latency, and additional challenges such as time-slicing delay in cellular environments;
- **Small footprint for the PC/laptop:** In contrast to branch-office users who can rely on a dedicated branch-office device for application acceleration, mobile users have to share laptop or PC computing resources and the TCP software stack with numerous other PC applications;
- **Support cost and manageability concerns:** The open environment of a Windows PC, in contrast to the controlled environment of an appliance, has a very different class of stability and interoperability requirements, with a variety of operating systems, browser versions, end point security applications, VPN client software and a wide range of business applications.

Business Benefits

To address these challenges, Cisco WAAS Mobile provides the smallest PC footprint and the lowest Total Cost of Ownership (TCO) normally associated with mass-user deployment of PC software, plus it achieves industry-leading performance under the most challenging network connectivity conditions. Cisco UCS enables organizations to provision capacity as needed, with scalability to meet the requirements of the largest enterprises. The result:

- Higher productivity. Workers can be productive wherever they are working.
- Low IT resource requirements. Easy to deploy and support.
- Flexible and scalable architecture that aligns to business needs.

Solution

The Cisco UCS C-Series is a powerful, virtualization-optimized foundation upon which resource-intensive networking applications such as Cisco WAAS Mobile can be hosted to provide market-leading scalability and deployment flexibility.

Cisco WAAS Mobile is part of the Cisco WAAS family of WAN optimization and application acceleration solutions. Cisco WAAS Mobile extends Cisco WAAS benefits to small-office and mobile employees and is a client-server software application purpose-built for PCs.

A Cisco WAAS Mobile server can be deployed on a wide range of Cisco Unified Computing System configurations, including Cisco UCS C-Series Rack-Mount Servers and Cisco UCS B-Series Blade Servers, and can be deployed on bare metal or as a virtual WAN optimization appliance.

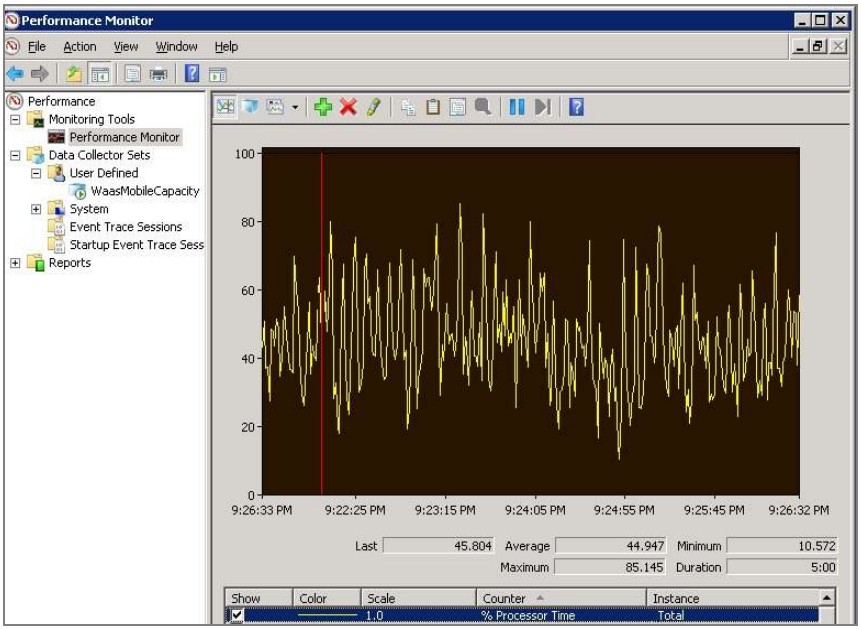
Using the Cisco UCS C200 M1 High-Density Rack-Mount Server, Cisco WAAS Mobile achieves industry-leading scalability benchmarks. The Cisco UCS C200 M1 server uses open standards to deliver the power of the latest generation of Intel Xeon 5500 series processors, with up to 4 terabytes (TB) storage, 48 GB of RAM, quad 10 Gigabit Ethernet ports, and optional Fibre Channel host bus adapters (HBAs) and dual redundant power supplies in a one-rack-unit (1RU) form factor.

Scalability to Accelerate 10,000 Concurrent Users

The power of the Cisco Unified Computing platform enables the Cisco WAAS Mobile server application to scale to meet the demands of the world's largest enterprises. Cisco WAAS Mobile scalability is assessed on a concurrent-user access basis. In typical deployments, one concurrent-user access can service the needs of three to four end users in an organization. Thus, a single 1RU Cisco UCS C200 M1 server that accelerates 10,000 concurrent users typically can service the acceleration requirements of 30,000 to 40,000 end users.

Cisco capacity tests verifies that the Cisco UCS C200 M1 can accelerate 10,000 concurrent users on a steady-state basis while optimizing 100,000 TCP connections and providing reserve capacity to handle peak load. As shown in Figure 1, with 10,000 concurrent users, CPU utilization averages 45 percent, with a steady-state throughput of 300 Mbps on the LAN side and 100 Mbps on the WAN side; at peak CPU utilization, sustained throughput of 600 Mbps on the LAN side and 200 Mbps on the WAN side is supported.

Figure 1. CPU Load with 10,000 Users Averages 45 Percent



Flexibility to Add Server Capacity as Service Evolves

Cisco WAAS Mobile and Cisco Unified Computing System can also be deployed as part of a virtualized data center solution, with capacity provisioned incrementally on a schedule that best suits the organization's timing and budget. Cisco WAAS Mobile virtual machines can be hosted on either Cisco UCS B-Series Blade Servers or Cisco UCS C-Series Rack-Mount Servers.

	Cisco WAAS Mobile Server Virtual Machine Configuration			Cisco WAAS Mobile Delta Cache	Software	
Concurrent Users	**CPU Cores**	**RAM**	**Disk**	**External SAN or SAN Virtual Machine**	**VMware License**	**Microsoft Windows Server Edition**
Up to 50	2	2 GB	61 GB	25 GB	ESX Enterprise	Standard
50 to 199	2	2 GB	61 GB	100 GB	ESX Enterprise	Standard
200 to 499	2	4 GB	61 GB	250 GB	ESX Enterprise	Standard
500 to 2000	6	6 GB	100 GB	1 TB	ESX Enterprise	x64 Standard

VMware supports disks of up to 256 GB. To support larger delta caches and to flexibly manage this storage, a virtual SAN can be created in a separate virtual machine that is co-hosted on the Cisco Unified Computing System server. For the testing conducted in Cisco laboratories, the 1-TB delta cache was configured as an external SAN by employing a separate virtual machine for the storage and the Openfiler SAN server software.

Cisco WAAS Mobile Enterprise Application Acceleration

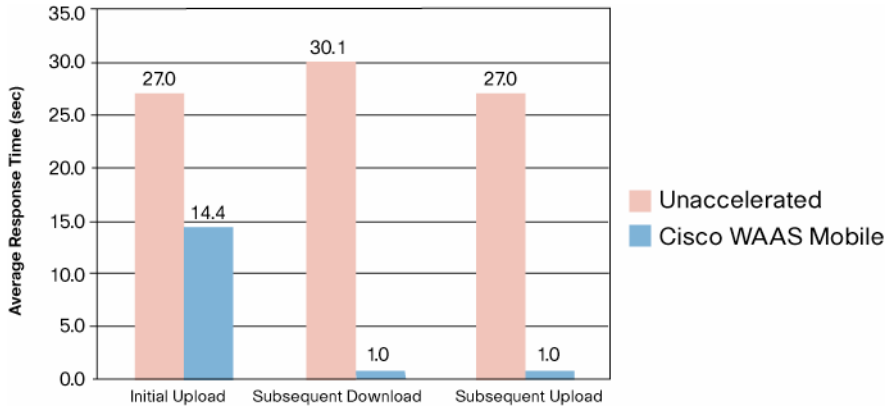
Cisco WAAS Mobile increases application response times by 3 to 30 times, as shown in Figure 2. Cisco WAAS Mobile achieves these application response time improvements by:

- **Mitigating latency:** Application protocol optimizations for chatty protocols such as Common Internet File System (CIFS), Messaging API (MAPI), and HTTP/HTTPS enable file transfers, email, and web-based applications to perform nearly as well over moderate-to-high latency connections as they do over the LAN.
- **Sending less data:** Bidirectional, byte-level delta compression and caching eliminate the transmission of redundant data so that only compressed differential traffic is transmitted across the WAN.
- **Increasing link throughput:** Transport optimization increases the effective information rate across the link and substantially improves performance over VPN connections.

In addition, Cisco WAAS Mobile:

- Increases productivity when mobile users transition between networks or through wireless dead spots by maintaining connections to applications through brief network outages.
- Enables virtual desktop solutions (such as virtual desktop infrastructure (VDI) and Microsoft Remote Desktop Protocol (RDP) to be deployed successfully across WAN links.
- Optimizes the quality of soft phone voice over IP (VoIP) service by preserving voice bandwidth in the presence of data traffic

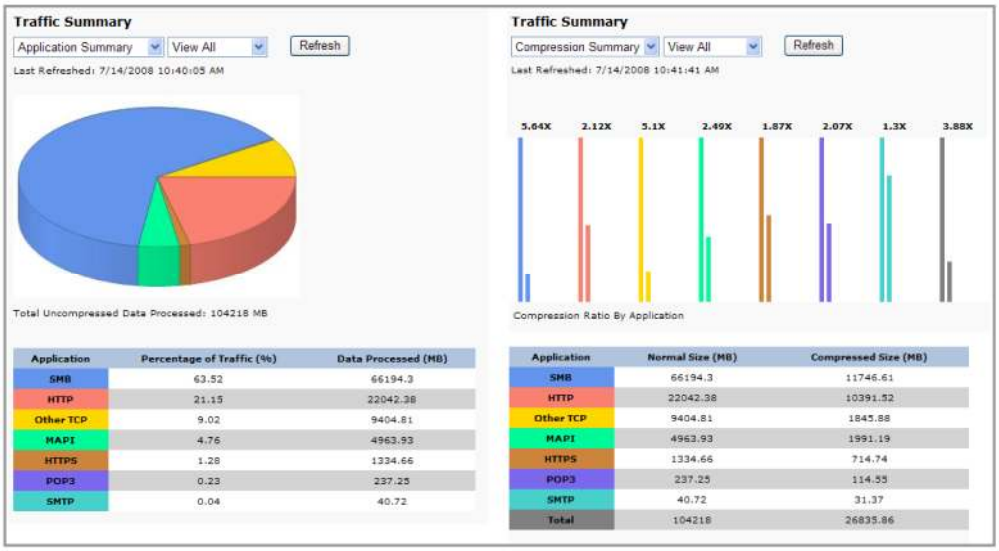
Figure 2. File Upload and Download Performance over a Home Network



Cisco WAAS Mobile Centralized Management and Performance Reporting

Cisco WAAS Mobile management analytics allow administrators to monitor performance and measure return on investment (ROI). The charts depicted in Figure 3 provide a consolidated view of all users' performance. Administrators can open individual screens to monitor performance for individual protocols or end users.

Figure 3. Cisco WAAS Mobile Centralized View of Network Traffic and Protocol Performance



Why Cisco?

Cisco WAAS Mobile running on the Cisco Unified Computing System platform is the industry's most scalable and flexible acceleration solution for mobile workers and small offices today. Using the Cisco UCS C200 M1 platform, Cisco WAAS Mobile can be scaled to support up to 10,000 concurrent users or can be deployed as a virtual machine on this platform, scaling up as enterprise demand grows.

For More Information

For more information about Cisco WAAS Mobile, visit the product website at http://www.cisco.com/en/US/products/ps9523/index.html.

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

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