

SMARTER NETWORKS, FASTER APPLICATIONS

COMPREHENSIVE SOLUTIONS FOR WAN OPTIMIZATION AND APPLICATION ACCELERATION

In Summary

- Support for your key IT initiatives: Virtualization, Server-Based Computing, Server Consolidation and Satellite Communications
- Ideal for a wide range of network environments: VDI, Citrix Presentation Server, Terminal Services and Satellite
- A holistic solution for both WAN Optimization and Application Acceleration
- Acceleration, compression, QoS, caching and security
- Flexible deployment, comprehensive management

Benefits

- Enhances performance of any application
- Accelerates applications an average of 400 percent with peaks of more than 1,000 percent
- Increases the number of user sessions by an average of two to three times and peaks of more than ten times with superior network, server and user performance on the same infrastructure
- Significantly improves ROI and reduces TCO
- Eliminates need for WAN and bandwidth upgrade
- Easy integration into a virtualization infrastructure

Today, organizations of all kinds are increasing their reliance on Wide Area Networks (WANs) to provide employees, partners and customers with better access to information and applications.

Delivering access to applications over the WAN is now an essential aspect of any IT strategy. WANs offer a way to reduce Total Cost of Ownership (TCO) and improve Return on Investment (ROI)—through virtualization, server-based computing and server consolidation strategies that shift servers out of the branch offices to consolidate and centralize them in the data center.

Supporting Your Key IT Initiatives

Expand Networks delivers WAN Optimization solutions specifically designed to enhance applications performance over the WAN and support IT initiatives such as virtualization, server-based computing, server consolidation, satellite, disaster recovery and voice and data convergence.

Expand Networks solutions—its award-winning line of Accelerators and ExpandView management platform—address WAN performance issues holistically. Unlike other solutions that focus on just acceleration, compression or quality of service, Expand delivers all of these capabilities working together in a comprehensive, multi-service platform with extensive management capabilities.

While other solutions take a “bandwidth in a box” approach and treat each application the same, Expand provides tools that are application- and protocol-specific, managing the data stream at the byte-level.

The net result from Expand is that IT managers now have a complete set of tools they can use to create a network that is not only faster, but also smarter. IT managers can now work at the appli-

cation and protocol level to squeeze the maximum efficiency out of the available bandwidth without sacrificing application performance, user satisfaction or data security.

Latency and Congestion

However, any IT strategy that requires access to data and applications over the WAN must account for the negative impact on the applications’ performance.

Latency: Applications over the WAN will typically run more slowly—the distance involved inevitably introduces latency. For example, “chatty” back and forth requests and replies required for the inefficient Common Internet File Services (CIFS) protocol in an existing Microsoft domain inevitably slows performance.

Congestion: More traffic on the network also leads to congestion, which will also cause slowdowns, particularly for bandwidth hungry applications such as file transfers, interactive training programs and video streaming. If the WAN makes use of satellite links or is operating in rural areas where there are low-bandwidth connections, the problems are exacerbated.

Server-based Computing Protocols: The applications running server-based computing protocols, such as Citrix’s ICA or Microsoft’s RDP, have their own unique issues. For example, for desktop virtualization environments running RDP, when a Virtual Desktop Infrastructure (VDI) is used remotely, users are accessing an entire desktop operating environment and applications over the WAN. This significantly increases the amount of bandwidth required and degrades the applications performance, particularly when they are graphics intensive, such as interactive presentations or training.

Expand—A Decade of Leadership and Results

Expand pioneered WAN Optimization solutions in 1998 and has continually evolved its solutions to address the changing challenges of network performance. Expand's extensive experience and technology leadership have consistently placed it in the Gartner's Leaders Quadrant for WAN Optimization Controllers.*

Expand has helped more than 3,000 organizations, deploying over 36,000 WAN optimization devices worldwide—more than 6,000 alone for optimizing communications over satellite links. Expand is responsible for the largest single deployment in the WAN Optimization industry, over 4,500 devices integrated into a single customer network.

Expand's WAN Optimization solutions work on all applications, expanding average network capacity by 400 percent with peaks of over 1,000 percent.

Expand solutions can significantly enhance ROI and reduce TCO. They typically pay for themselves—often within a matter of months—by making a WAN upgrade unnecessary and from the cost savings generated by:

- Lower capital expenditure
- Lower operational expenditure
- Reduced bandwidth costs
- Higher employee productivity

Physically consolidating servers from remote branch offices to the data center also cuts down on power and cooling usage, reducing the carbon footprint by up to 80 percent. Centralizing servers also supports data integrity, helping increase compliance with regulations such as Sarbanes-Oxley.

What Makes Expand Different?

While many vendors offer solutions for enhancing network performance, Expand is unique in addressing the challenge using acceleration, compression and Quality of Service technologies that work together holistically:

Compression

Expand uses patented compression algorithms that are dynamic and self learning, delivering a powerful combination of byte-level (versus block-level) compression, packet header reduction and adaptive packet compression.

Working at the byte-level enables Expand's compression to operate directly on the packet stream of protocols such as Citrix/ICA and Microsoft's RDP. Because the typical packet size in these environments is so small, compression technologies from other vendors that work at the block level are not effective.

The combination of byte-level compression along with packet header reduction and adaptive packet compression allows for typical capacity gains of 400 percent and peaks of over 1,000 percent. Also, because compression is provided on the Expand device itself, this frees up valuable resources on the server.

Application and Protocol Acceleration

Because most applications today were designed to be "co-located" with their users—either on the same device or at a data center—operating them over a WAN inevitably introduces performance issues. This is as true of applications based on the Microsoft CIFS protocol as well as protocols designed for accessing applications over long distances, such as Citrix/ICA and RDP.

Expand addresses application performance issues by changing the serial nature of application communication to a latency mitigating parallel nature, reducing the number of back and forth data transactions.

Expand solutions are application-specific, providing a breakthrough approach that works in combination with its compression algorithm to improve application response times even further: TCP Acceleration: enables TCP transfer speeds in excess of WAN link speed, even under

challenging latency and packet loss conditions. Expand's TCP acceleration uses the standards-based SCPS protocol (the Space Communications Protocol Standards) that was developed by NASA and the DoD for performance optimization in high latency links.

HTTP Acceleration: Provides LAN-like Web application response times for chatty HTTP transactions by eliminating repetitive download of frequently accessed objects, applets, etc.

FTP Acceleration: Provides LAN-like response times by caching frequently accessed files.

DNS Acceleration: Allows Accelerators to assume branch DNS responsibilities. The DNS capabilities allow it to serve as a branch level DNS in complete synchronization with the primary enterprise DNS server. By offloading the primary DNS server and providing branch-level DNS, unnecessary WAN transactions are avoided and user experience is improved

Server Consolidation and Wide Area File Services

(WAFS): Expand provides full-scale acceleration for WAFS and CIFS-based applications, enabling server consolidation without paying the price in reduced application performance over the WAN. Expand's enhanced WAFS address the key performance, availability and management issues raised by server consolidation:

Microsoft Compliance: Built to perform in the real world, Expand Accelerators not only work with the Microsoft domain, but also are actually part of the domain. Being part of the domain allows Accelerators to strictly maintain all user and document security and controls while optimizing the performance. Expand is fully compliant with Microsoft's SMB-signing protocol guaranteeing communication authenticity.

Faster File Access: A cached instance of the file is kept in the remote appliance, thereby maintaining LAN-like performance for file access. Expand's fully synchronous solution maintains standard file-server permission and authentication to remote branch users.

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This avoids data integrity issues that are common in semi-synchronous solutions that rely on “store-and-forward” techniques. Corporate files will not be lost even in the event of lost or corrupted branch data, since the latest version of the file is always available at the centralized file-server.

Virtual-Server: Expand’s enhanced WAFS retain critical remote branch system services such as DNS, DHCP and print.

WAN-Outs: In the event of a network outage, remote users can continue working because files are served from a local cache.

Quality of Service (QoS): Cleaning up congestion and overcoming latency are essential to WAN Optimization, but organizations also need to be able to control the allocation of network bandwidth—devoting more bandwidth to mission-critical applications, slowing down non-critical applications and preventing inappropriate use.

Expand provides this control through a powerful QoS engine that allows filtering, shaping and marking to ensure that important and urgent application traffic gets priority treatment.

Bandwidth can be reserved for specific applications so that delay-sensitive traffic such as VoIP can be allocated a minimum amount of bandwidth even when WAN links are congested. At the same time, Expand can restrict greedy applications, such as file sharing and Internet audio streaming, to a maximum bandwidth budget. Packet fragmentation assures that VoIP and video streaming quality is not hurt by large data packets, while packet aggregation ensures higher WAN capacity for these demanding applications and stabilizes jitter.

Expand’s QoS is transparent to router-based QoS implementations, preserves existing priorities and integrates seamlessly with advanced networking features such as load-balancing, WAN monitoring and MPLS tagging.

Transparent and Flexible Deployment

Expand Accelerators optimize traffic transparently without tunneling, simplifying integration into your infrastructure now and in the future. The Expand solution works with HSRP/VRRP and WCCP and maintains original protocol headers (IP, TCP, UDP, etc.) so that there is minimal impact to your networking infrastructure, while also preserving investments in other systems relying on the accuracy of these headers.

Expand solutions are designed to be used in any network environment, whether it is a private line, frame relay, MPLS, VPN, IP, ATM, xDSL, ISDN, wireless local loop or satellite. Some of the Accelerator’s benefits can be realized with no far-end Accelerator. For satellite networks, Expand works with any satellite environment, including VSAT, Inmarsat and BGAN.

The Accelerators can be deployed rapidly with minimal configuration and no network architecture changes:

- Easy-to-use WebUI and central deployment stations
- Quick and easy configuration via front panel keypad
- Secure management with HTTPS, SSH, SNMP
- Integration with existing user authentication and administration systems (RADIUS, TACACS+ and Windows Directory)

Expand Product Family

Accelerators: With more optimization, functionality, and reliability residing in a single appliance, Expand Accelerators can be deployed in small and regional branch offices, as well as in datacenter environments that require scale and flexibility to survive in some of the largest and most complex networks.

ExpandView: ExpandView is a centralized monitoring and management system for Expand Accelerators. It provides total visibility, via a Dynamic Network Map, into global WAN operations enabling global changes to be implemented in minutes. Detailed graphs and reports, easy-to-use QoS templates and tight integration with Expand’s award-winning Accelerators make ExpandView the ideal centralized monitoring and management system for ensuring optimal application performance over the WAN.

Accelerators

Product	Connected Accelerators	No. of IP Connections	WAN CAPACITY				Hard Drive Capacity	No. of WAFS Users	Redundant Power Supply
			Compression ¹	Optimization ²	Acceleration ³	WAFS ⁴			
Accelerator 7940	350	256,000	45Mbps	250Mbps	100Mbps	Unlimited	1TB RAID 5 *	1000	✓
Accelerator 7930	350	256,000	10Mbps	100Mbps	45Mbps	Unlimited	500GB RAID 5 *	500	✓
Accelerator 6940	350	256,000	45Mbps	250Mbps	100Mbps	Unlimited	500GB	1000	✓
Accelerator 6840	350	256,000	45Mbps	250Mbps	100Mbps	-	-	-	✓
Accelerator 6930	200	128,000	10Mbps	100Mbps	45Mbps	Unlimited	500GB	500	✓
Accelerator 6830	200	128,000	10Mbps	100Mbps	45Mbps	-	-	-	✓
Accelerator 4930	100	64,000	6Mbps	45Mbps	15Mbps	Unlimited	160GB	200 ⁵	Optional
Accelerator 4830	100	64,000	6Mbps	45Mbps	15Mbps	-	-	-	Optional
Accelerator 1610 **	10	32,000	1Mbps	6Mbps	3Mbps	-	-	-	-

¹ Maximum Bandwidth For Monitoring, Layer 7 QoS And Compression.

² Expected Bandwidth For A Mixture Of Services Such As TCP Acceleration, Partial Compression, WAFS, Web Caching.

⁵ Accelerator 4930 Can Only Be Used As A Branch Device For WAFS.

³ Maximum Bandwidth For Monitoring Layer 7 QoS And TCP Acceleration (SCPS).

⁴ Maximum Bandwidth For Monitoring Layer 7 QoS And WAFS, Limitation Is The Number Of Users And The Physical Connection.

* Hot Swappable Raid 5

** The 1610 accelerator is a PC104+ compliant device and requires a PC104+ compliant enclosure for use.

COMPREHENSIVE SOLUTIONS FOR WAN OPTIMIZATION

- Dynamic routing enables effortless installation even in complex networks that use OSPF, RIP and other routing protocols.
- The ability to operate in Router Transparency Mode (RTM) enables IP header preservation ensuring guaranteed compatibility with any kind of WAN device. RTM also preserves Layer 4 for TCP and UDP traffic.

Visibility and Management

Expand backs its leading edge WAN Optimization technology with ExpandView, a centralized management platform that enables IT managers to seamlessly manage the Expand solutions, configurations and inventory. ExpandView provides powerful monitoring and graphical reporting for full application-level visibility and cost-effective end-to-end network management:

- Quickly detect WAN performance issues
- Automatically discover, classify and report on the performance of hundreds of enterprise applications
- Provides hundreds of historical and real-time reports for applications and links (throughput, performance and acceleration)

Security and Data Protection

Expand addresses data security and integrity issues in a number of ways:

IPSec: Expand Networks has integrated standard IPSec implementation, one of the strongest encryption solutions, to its current Accelerators. Via IPSec implementation, the integrated security works to ensure confidentiality, data integrity and data authentication between a remote branch and the data center. Confidentiality means that even in cases where transmission is intercepted, the data cannot be deciphered. This is ensured by data encryption based on block-CBC cryptography. Block ciphers encrypt chunks of data supporting AES-128, AES-192, AES-256 or 3DES algorithms.

AAA: Expand Accelerators let users manage access by means of Authentication, Authorization and Accounting (AAA). The Accelerators' AAA functionality will allow you to easily integrate your existing AAA infrastructure (RADIUS and TACACS+) with the Expand solution. This will efficiently ensure that only the actual, authorized individuals can access your Expand solution, as well as providing you with a log of all user activity. Ease of integration and compliance with your existing standards are critical for safe and secure deployments.

Maximum Uptime and Reliability: With built-in resiliency and standards-based implementation, Expand Networks Accelerators are designed to deliver unsurpassed uptime and availability:

- HSRP/VRRP failover
- External flash card for effortless device swap-out
- Switch-to-wire and software watchdogs assure zero network downtime
- Out-of-band management

Professional Services

You can benefit from Expand's extensive experience and expertise in WAN Optimization by taking advantage of our people, processes and knowledge through Expand Professional Services. From evaluating your WAN options, to implementing an optimization/acceleration solution, to training personnel in how to maximize the value of a WAN—Expand Professional Services can provide you with resources, expertise and state-of-the-art tools that are simply not available anywhere else.

Choose from a suite of professional services—including Consulting, Implementation & Planning and Training—that can be adapted based on your budget considerations, your time-frame and your specific goals and objectives.

Learn More

Some of the best known names in financial services, manufacturing, retail, health care, as well as leading government agencies and the military, rely on Expand Networks for optimized network infrastructures and superior applications performance.

For more information on how Expand solutions can benefit your company, contact your local Expand representative today or visit us at www.expand.com.

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