Juniper Networks WX Application Acceleration Platforms

The Juniper Networks WX™ application acceleration platforms provide distributed enterprises with a scalable solution for accelerating the delivery of client-server and web-based business applications and services – including ERP, CRM, e-mail and file services as well as voice, video and terminal services such as Citrix® – over the WAN. Based on the comprehensive WX Framework™, which defines the elements required to accelerate business operations over wide-area links, the WX platforms optimize existing WAN resources and improve application response times by providing a more LAN-like experience for remote and branch-office users.

Product Description

The WX application acceleration platforms, members of a larger family of WAN optimization solutions from Juniper Networks, provide distributed enterprises with a cost-effective method for accelerating mission-critical business applications, as well as voice, video and terminal services, over wide-area networks, maximizing WAN investments and improving application response times for branch office users.

The WX platforms improve application performance over the WAN by eliminating redundant transmissions, accelerating TCP and application-specific protocols, prioritizing and allocating access to bandwidth, and ensuring high application availability at sites with multiple WAN links.

The WX products communicate constantly to provide distributed stateful intelligence about the entire network, exchanging vital information such as topology, reachability, and path-performance metrics. The WX devices also interoperate with their companion WAN optimization devices, the WXC™ application acceleration platforms, which include onboard hard drives to support the WX Framework's Network Sequence Caching technology.

Through integrated WebView device management software, the WX platforms also provide unprecedented visibility into WAN performance. With the WebView software, managers can identify top talkers, monitor application throughput, performance and packet distribution across the WAN, review acceleration statistics, and create Executive Summary reports that provide a high-level overview of important performance characteristics.

The WX product family includes five members: the WX 15, WX 20, WX 60, WX 100, and WX Stack.

WX 15: The WX 15 application acceleration platform features two copper fail-to-wire 10/100 Ethernet ports and supports total reduction throughput speeds ranging from 64 Kbps to 1 Mbps. Designed for small branch office applications, the WX 15 can support up to six connections to other branch office or data center WX or WXC devices.

WX 20: The WX 20 application acceleration platform offers two copper fail-to-wire 10/100 Ethernet ports and supports total reduction throughput speeds ranging from 64 Kbps to 2 Mbps. Designed for small to medium-sized branch office deployments, the WX 20 supports up to 10 connections to other branch or data center WX or WXC devices.
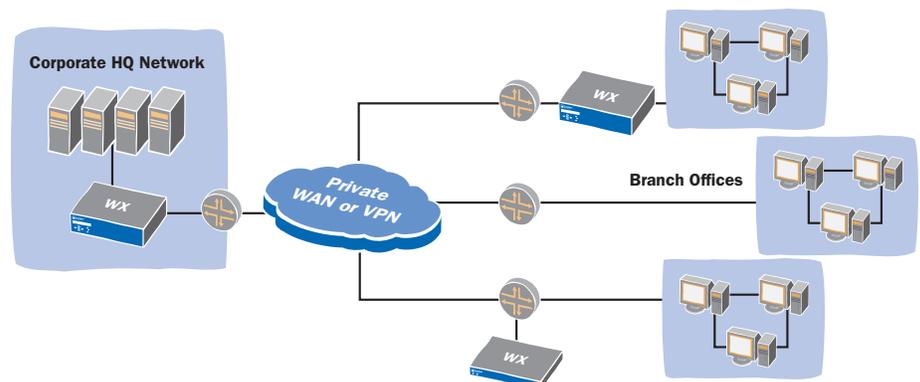
WX platforms are deployed on the LAN side of the WAN router, supporting flexible deployment options.

WX 60: The WX 60 application acceleration platform, designed for large branch office and small data center applications, features two copper fail-to-wire 10/100/1000 Ethernet ports and supports total reduction throughput speeds ranging from 512 Kbps to 20 Mbps. The WX 60 also supports up to 110 connections to sites where other WX or WXC platforms are installed.

WX 100: The WX 100 application acceleration platform offers two copper fail-to-wire 10/100/1000 Ethernet ports or two fiber 1000 Ethernet ports and supports total reduction throughput speeds ranging from 1 Mbps to 20 Mbps. Designed for large branch office or data center deployments, the WX 100 supports up to 105 connections to other WX or WXC branch office or data center devices.

WX Stack: The WX Stack consists of one WX 100 platform and up to six WX 60 clients working together as a single unit, delivering a scalable solution for the data center that provides total reduction throughput speeds up to 155 Mbps and supports up to 660 connections to WX or WXC platforms distributed throughout the enterprise. New client units can be added to the WX Stack incrementally, as needed, to keep pace with growing demands. Multiple communities of WX devices and WX Stacks can also be configured to support an unlimited number of locations.

Features and Benefits

Compression

The patented Molecular Sequence Reduction™ (MSR™) technology enables WX platforms to deliver up to a 10-fold increase in effective WAN capacity, providing immediate congestion relief for all IP-based traffic, including TCP- and UDP-based applications, while allowing businesses to avoid costly WAN upgrades. The MSR algorithm recognizes repeated data patterns and replaces them with labels, dramatically reducing WAN transmissions and improving overall application performance. Operating in memory, the MSR dictionary can store hundreds of megabytes of patterns for a broad cross-section of application types, from short chatty ones to those with longer patterns.

TCP Acceleration

The WX platform's Packet Flow Acceleration™ (PFA™) technology liberates data traffic from limitations imposed by TCP, increasing throughput across the WAN and accelerating applications on low-bandwidth or high-latency connections between WX/WXC platforms. Forward Error Correction (FEC), a component of PFA, limits the need for retransmissions on "lossy" networks such as satellite links by making use of recovery packets to reconstruct lost transmissions.

SSL Optimization

The Juniper WX SSL acceleration capabilities provide SSL encrypted applications like web-based (HTTPS), mail (imaps/pop3s/smtps), and directory services (ldaps) with the same performance benefits as unencrypted applications. Once the applications certificates and private keys are installed on the WX, they learn on the fly the key used by the client/server. This allows the WX to read the flow decrypted and apply all its different optimizations like compression and caching or application acceleration. To enhance security, the traffic moving between the WX platforms is encrypted using an IPSec tunnel to ensure privacy is retained.

Application- and Protocol-specific Acceleration

The Application Flow Acceleration™ (AppFlow™) technology improves the performance of specific applications and protocols – including Microsoft Exchange, Windows file services and web-based applications – over the WAN.

AppFlow for Microsoft Exchange and Windows and Linux file services improves application performance by accelerating their underlying protocols – MAPI and CIFS, respectively. These protocols send data in small blocks that must be received and acknowledged before the next block can be sent, requiring hundreds or even thousands of round trips to complete a single transaction. The AppFlow for Exchange and AppFlow for CIFS technology pipelines these data blocks in quick succession, delivering up to a 50-fold improvement in application performance, meeting the needs of remote and branch office users accessing centralized applications or Network Attached Storage (NAS) data over the WAN.

AppFlow for HTTP accelerates web-based applications over the WAN by enabling WX platforms to learn and cache objects associated with URLs. Similar to MAPI and CIFS, HTTP submits a series of sequential requests for web objects, requiring tens or hundreds of round-trips between the client and server to build a web page. With AppFlow for HTTP, the WX platform either confirms the freshness or pre-fetches updated objects in advance of the client's request, resulting in much faster pages loads.

Application Control

The WX platform's Quality of Service (QoS) capabilities allow IT to assign priority and set bandwidth levels to ensure that business-critical and latency-sensitive applications such as Voice over IP (VoIP) always have sufficient bandwidth. The easy-to-use Juniper QoS implementation preserves QoS markings applied by other devices as needed and transparently map traffic onto carrier classes of service.

In addition, a congestion control feature that tightly couples the WX platform's QoS engine with the MSR compression technology allows QoS policies to dynamically detect changes in bandwidth availability and adjust allocation and prioritization schemes accordingly.

The WX platform also offers a Policy-based Multipath™ feature which enables IT to assign applications to a specific path in locations served by multiple WAN links. The WX platform monitors loss and latency characteristics on each link and automatically diverts applications to the alternate path if performance falls below acceptable levels.

WX CMS Software

An embedded WebView feature and the WX Central Management System™ (WX CMS™) software provide visibility into and control over the WX devices. The WX CMS software allows IT to monitor application performance across multiple WX and WXC devices, enabling extensive configuration and management capabilities. Individual device monitoring and configuration is accomplished via the WebView device management feature or the command line interface (CLI).

Easy Installation and Configuration

The WX platforms can be deployed and configured in just 10 minutes using a web-based installation wizard. The WX platform and WX CMS software also enable fully automated configuration; IT simply defines centralized configuration templates and, when remote WX

devices boot up, they retrieve a network address via DHCP, locate the WX CMS software server through the domain name service (DNS), download their configuration file, and begin operation.

The WX products also support a number of redundancy features and configurations, including redundant power supplies, to ensure uninterrupted operation. In the event of any failure, the WX devices automatically convert to hardware bypass mode, allowing traffic to pass through untouched.

The WX platforms operate independently and are transparent to other network devices. WX products can be installed directly inline between a LAN switch and WAN router, or they can be deployed offline attached to an available Ethernet port on the switch or router. The WX devices also work effectively alongside VPN servers, firewalls, and other security devices, where they optimize traffic before it is encrypted.

WX Application Acceleration Platform Functions

Product Features	
Traffic services	IP payload compression, protocol acceleration, QoS, traffic visibility, application identification, route optimization, IPSec encryption, packet aggregation
Protocols supported	Any IP-based traffic (TCP, UDP, GRE, ICMP, L2TP, etc.)
Applications supported	All IP-based applications, including Microsoft Office applications, Oracle E-Business Suite, Sharepoint, Microsoft Exchange, Citrix, SAP, web-based applications, etc.

Network Integration	
Installation	Inline between aggregation switch and edge router, or off WAN router using route injection (RIP), WCCPv2, or policy-based routing
Auto-deployment	No-touch auto-configuration available out of the box through WX CMS software
Transparency	Transparent bridge mode operation, configurable DSCP and IP port transparency
Topology support	Point-to-point, hub-and-spoke, full mesh
Network discovery	Via RIP v1/v2, OSPF, and router polling
Tunnel creation	Automatic or manual
Asymmetric routing support	Supported for both inline and off-path
Load balancing	Active/active or active/passive, with passive in hot standby
Fault-tolerant non-stop operation	10/100/1000Base-T auto switch-to-wire on any power, hardware, or software failure condition
High availability	Backup device can support multiple primary devices; automatically fail-to-wire

Quality of Service	
Honor, preserve and/or set ToS/DSCP	Retain settings or prioritize using ToS/DiffServ values by application
Bandwidth allocation	Create traffic classes for bandwidth allocation with time of day option
Application identification	Automatic, based on source/destination IP address/port, ToS/DSCP, IP protocol, L7 identification for HTTP and Citrix; follows port hopping applications (FTP, Exchange)
Route optimization	Multipath: application level path selection based on link SLA

Traffic Acceleration	
Packet Flow Acceleration	TCP Acceleration, Fast Connection Setup, and Forward Error Correction
Application Flow Acceleration	Microsoft CIFS, Linux file services, Microsoft Exchange and HTTP

Device Management	
SNMP, Syslog	SNMPv2c, MIB II, WX Enterprise MIB and local Syslog
Secure remote access	SSHv1, SSHv2, and HTTPS (SSL)
Reports	26 device-level reports available through WebView; 36 network-wide reports available with WX CMS
Authentication, Authorization and Accounting	AAA local database, RADIUS and TACACS+ support
Network upgradeable	Via FTP, HTTP and TFTP; dual software images and configurations

Monitoring	
Compression statistics	Per device, per application, and per destination; both real-time and historical
WAN performance statistics	Network latency, loss, and availability for SLA monitoring and enforcement
QoS, bandwidth management	Per destination, per traffic class, real-time and historical
Acceleration	TCP session time and throughput; both real-time and historical
Application reporting	Detail by IP addresses, and/or port numbers, and/or IP protocol, and/or DSCP/ToS value, with greater detail by URL element or application type
Event/performance monitoring	Generate automatic alerts (SNMP traps, e-mail, console) for up to 200 administrator definable performance or system events

Specifications

	WX 15	WX 20	WX 60	WX 100	WX Stack
Performance					
Total reduction through-put speed	64 Kbps to 1 Mbps	64 Kbps to 2 Mbps	512 Kbps to 20 Mbps	1 Mbps to 20 Mbps	1 Mbps to 155 Mbps
Tunnels supported	Up to 6 with all features enabled	Up to 10 with all features enabled	Up to 110 with all features enabled	Up to 105 with all features enabled	Up to 660 with all features enabled
Connections					
Network interfaces	Two copper fail-to-wire 10/100 Ethernet ports	Two copper fail-to-wire 10/100 Ethernet ports	Two copper fail-to-wire 10/100/1000 Ethernet ports	Two copper 10/100/1000 fail-to-wire Ethernet ports Or Two fiber 1000 Ethernet ports	
Power					
Power requirement	100-240 VAC, 50-60 Hz, 50 Watts max or 170 BTU/hr	100-240 VAC, 50-60 Hz, 150 Watts max or 510 BTU/hr	100-240 VAC, 50-60 Hz, 150 Watts max or 510 BTU/hr	Dual 100-240 VAC, 50-60 Hz, 300 Watts max or 1025 BTU/hr	
Dimensions and Weight					
(W x H x D)	15.3 x 1.8 x 9.1 in (38.9 x 4.5 x 23 cm) 1 rack unit	17.1 x 1.8 x 14.3 in (43.4 x 4.5 x 36.3 cm) 1 rack unit	17.1 x 3.4 x 16.7 in (43.4 x 8.7 x 42.4 cm) 2 rack units	17.1 x 3.4 x 16.7 in (43.4 x 8.7 x 42.4 cm) 2 rack units	
Weight	4 lbs (1.8 kg)	19 lbs (8.6 kg)	20.2 lbs (9.2 kg)	30 lbs (13.6 kg)	
Operating Environment					
Temperature	41º to 104º F (5º to 40º C)	41º to 104º F (5º to 40º C)	41º to 104º F (5º to 40º C)	41º to 104º F (5º to 40º C)	
Humidity	10% to 85%, noncondensing at 95º F (35º C)	10% to 85%, noncondensing at 95º F (35º C)	10% to 85%, noncondensing at 95º F (35º C)	10% to 85%, noncondensing at 95º F (35º C)	WX Stack includes 1 WX 100 and up to 6 WX clients (excluding WX 15s and WX 20s)
Maximum altitude	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)	
Non-operating Environment					
Temperature	-40º to 158º F (-40º to 70º C)	-40º to 158º F (-40º to 70º C)	-40º to 158º F (-40º to 70º C)	-40º to 158º F (-40º to 70º C)	
Humidity	5% to 95%, noncondensing at 95º F (35º C)	5% to 95%, noncondensing at 95º F (35º C)	5% to 95%, noncondensing at 95º F (35º C)	5% to 95%, noncondensing at 95º F (35º C)	
Maximum altitude	40,000 ft (12,192 m)	40,000 ft (12,192 m)	40,000 ft (12,192 m)	40,000 ft (12,192 m)	
Regulations					
Emissions	FCC Class A, EN 55022 Class A, EN 55024 Immunity, EN 61000-3-2, VCCI Class A	FCC Class A, EN 55022 Class A, EN 55024 Immunity, EN 61000-3-2, VCCI Class A	FCC Class A, EN 55022 Class A, EN 55024 Immunity, EN 61000-3-2, VCCI Class A	FCC Class A, EN 55022 Class A, EN 55024 Immunity, EN 61000-3-2, VCCI Class A	
Safety	CAN/CSA-C22.2 No. 60950-1-03 - UL 60950-1 and EN 60950-1	CAN/CSA-C22.2 No. 60950-1-03 - UL 60950-1 and EN 60950-1	CAN/CSA-C22.2 No. 60950-1-03 - UL 60950-1 and EN 60950-1	CAN/CSA-C22.2 No. 60950-1-03 - UL 60950-1 and EN 60950-1	
Acoustic noise	Maximum noise level is less than 70 dB	Maximum noise level is less than 70 dB	Maximum noise level is less than 70 dB	Maximum noise level is less than 70 dB	

Ordering Information

The table below reflects base models only. Bandwidth upgrades (up to 1 Mbps for the WX 15, 2 Mbps for the WX 20, 20 Mbps for the WX 60, and 155 Mbps for the WX 100) and other options are also available. Please contact your Juniper representative or reseller for details.

Model	Description
WX-15	WX 15, incl. RTU SW License to 64 Kbps
WX-20	WX 20, incl. RTU SW License to 64 Kbps
WX-60	WX 60, Gigabit Ethernet, incl. RTU SW License to 512 Kbps
WX-100C	WX 100C with copper interfaces, incl. RTU SW License to 1 Mbps
WX-100F	WX 100F with fiber interfaces, incl. RTU SW License to 1 Mbps

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

To purchase Juniper Networks solutions, please contact your Juniper Networks sales representative at 1-866-298-6428 or authorized reseller.