

ExtremeCloud SD-WAN

Reduce Risk and Simplify Operations

Accelerated Transformation

- Scaled digital transformation
- Simplified multi-cloud and SaaS connectivity
- Simplified integration of new IoT, AR, and collaboration tool technologies

Modernized WAN

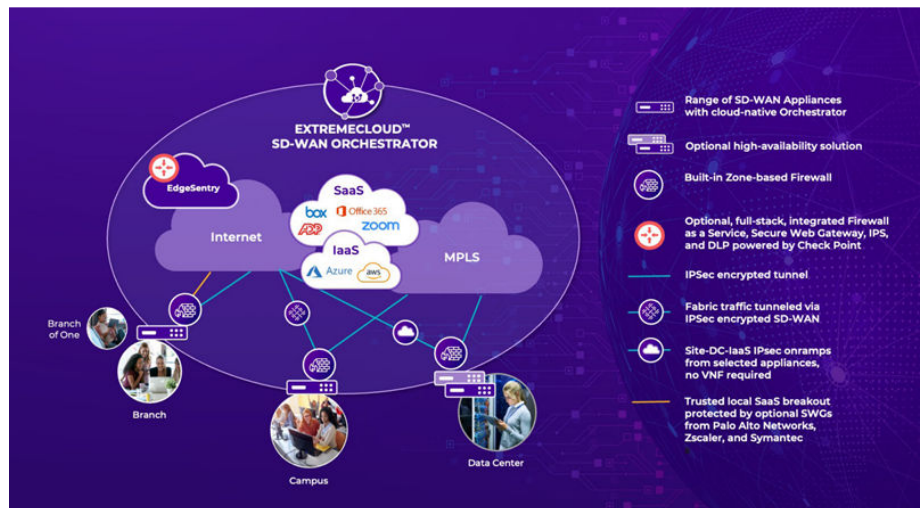
- Centralized configuration and management
- Reduced security complexity and exposure
- Accelerated root cause analysis and MTTR

Improved Operational Efficiency

- Improved user experience
- Increased site availability and resilience
- Optimized processes and automation

Improved Outcomes

- Increased business agility
- Data-driven decisions
- Improved productivity



Reduce Risk and Simplify Operations

Network and security complexity are rapidly increasing. Legacy networks are straining to support today's hybrid IT environments, a mix of on-premises, cloud, and SaaS technologies, as well as real-time, bandwidth-intensive collaboration services and applications required by hybrid work. As organizations adapt to an unprecedented rate of change, IT teams are grappling with a lack of automation and integration between technologies, a lack of broad and deep visibility, widening skills shortages, and increasingly complex licensing.

SD-WAN offers connectivity, continuity, and cost benefits. However, as both network edges and the attack surface increase, SD-WAN also creates management, security, and visibility challenges.

ExtremeCloud™ SD-WAN is a flexible, secure solution that delivers the benefits of SD-WAN, while reducing risk, simplifying operations, and improving productivity with Unified Management, Fabric to the Edge, and best-in-class Application Performance Management packaged as a cost-effective OPEX subscription.

Unified Management

Reduced complexity with a holistic management experience provided by ExtremeCloud SD-WAN and ExtremeCloud IQ.

- Centralized configuration and management of Wi-Fi access points, Ethernet switches, and SD-WAN devices.
 - LAN-to-WAN-to-Cloud performance monitoring powered by AIOPs, contextual telemetry, and granular network and application performance visibility across users, devices, sites, links, and locations enables rapid troubleshooting.
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Fabric to the Edge

Seamless extension of Extreme Fabric services over low-cost internet access transport improves visibility, performance, and resilience at all branches.

- Extreme SD-WAN optimizes performance and security for tunneled Fabric traffic
 - Extreme Fabric enables zero-touch provisioning of Extreme Wi-Fi APs and Ethernet switches at branch locations
 - Fabric hypersegmentation enables secure connectivity, simplified compliance, and improved attack resistance against lateral threats.
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Application Performance Management and Visibility

Consistent, exceptional user experiences and evidence-based network refinement.

- Automated application discovery for more than 5,000 SaaS applications streamlines deployment and identifies shadow IT.
 - Intelligent application performance control analyzes and optimizes traffic to enforce an end-to-end, per-session QoS for critical application sessions, even when the network is congested.
 - Advanced application performance visualization enables at-a-glance performance assessment and rapid troubleshooting when needed.
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Solution Components

Cloud-Native SD-WAN Orchestrator

- Orchestration policies for SD-WAN appliances, topology, security profiles, cloud on-ramps, and end-to-end QoE.
- Applications Any where simplifies and accelerates digital transformation with direct-to-internet policy definition for SaaS applications and maintenance-free cloud on-ramps —no VNF required.
- Site-to-data center-to-iaaS connectivity over any WAN transport enables flexible, secure overlay topologies.

Built-In SD-WAN Security and Segmentation

- Built-in zone-based firewall enables VPN traffic segmentation and internet traffic steering (direct-to-internet, data center backhaul, and web gateways).
- Advanced cloud-based security platform EdgeSentry (powered by Check Point) provides firewall as a service, secure web gateway (SWG), IPS, DLP, and more.
- Optional bring your own security approach enables robust WAN and internet access security from leading vendors.

Risk-Free SD-WAN Subscriptions

- 100% OPEX with flexible 12, 24, and 36-month terms reduces purchase risk and speeds time to value.
- A range of speed tiers and SD-WAN appliances support the smallest branch to the largest data center.
- Next-Business Day Advance Hardware Replacement ensures business continuity.
- Industry-leading 7x24x365 global technical support and Extreme's unique Customer Success program to help customers get the most from their investment.

Solution Components Overview

SD-WAN Orchestration

Features	Description
Cloud-native	Cloud hosted and managed by Extreme Networks, integrated with ExtremeCloud
Onboarding and Configuration	Appliance template and configuration policy (overlay, security, application performance, routing, High Availability) Coming soon: Applications Anywhere, EdgeSentry, local port forwarding, and configuration versioning and rollback
Secure Communications	HTTPS, TLSv2, mutual authentication, secure device enrollment
User Access Control	Per-user RBAC, suited for flexible delivery models, managed service vs DIY
Fabric with SD-WAN Integration	Automated, encrypted SD-WAN overlay for Fabric remote sites, basic SD-WAN features for tunneled Fabric traffic, advanced application performance and SD-WAN features for specific Fabric traffic

Connectivity

Features	Description
Overlay	IPsec based, full mesh, automated hub-and-spoke topology with manual spoke-to-spoke and hub-to-hub shortcuts, external VPN gateway support
Multisite Deployment Model	Full-routed, bridge-routed hybrid, full-bridged
Transparent Level 2 Connectivity	Bridge mode, fail to wire (HW model-dependent), Link State Propagation
Automated Hub-and-Spoke Topology	IPsec IKEv2, automatic tunnels set up between spokes and hubs
Automated Full-Mesh Topology	Coming soon: automatic tunnels set up between sites
Custom Topologies	IPsec IKEv2, manual hub interconnection, manual site-to-site shortcut, manual site-to-aaS
Optional High Availability	VRRP, OSPF, BGP, Level 2 proprietary synchronization

Application Performance Management

Features	Description
Applications Anywhere	Coming soon: Automated connectivity between SD-WAN Sites and public cloud hyperscalers (Azure, AWS), DTI policy for SaaS applications, application performance monitoring and QoS enforcement without hosting VNF in the VPC
Automated Application Recognition	5000+ SaaS applications, DPI dictionary, and custom Layer 3-Layer 7 applications definition
Dynamic WAN Selection	Per-session, based on network performance, application-specific requirements, and application criticality
QoE-Based QoS	Per-session prioritization, based on application-specific requirements and application criticality
Monitoring and Troubleshooting	Appliance and application troubleshooting: MapView, Appliance360, Site360, Application monitoring Coming soon: WAN optimization/compression, SLA, WAN availability, VoIP, WAN360, App360, network troubleshooting tools, Netflow application troubleshooting
Alerting	Default alarms Coming soon: Custom alarms
Reporting	Default PDF reports, report scheduling Coming soon: dynamic reports, custom reports

Features	Description
Integration	RESTful Alerting API
Optional WAN Optimization	Compression, SSL optimization

Security

Features	Description
Zone-Based Firewall	Level 3 VPN segmentation, internet traffic policies with application granularity
Direct to Internet	Stateful firewall, NAT, log export, local port forwarding
External SWG Compatibility	IPsec IKEv2, ZScaler Internet Access, Symantec WSS, Palo Alto Prisma Access
Optional EdgeSentry Integration	IPsec IKEv2, Threat Prevention, access control policies, HTTPS inspection, logs and reporting, IPS, Antivirus, Antibot, powered by Check Point

SD-WAN Subscriptions Packages and Appliances

SD-WAN Subscriptions Packages and Appliances	
Zero Touch Provisioning	Secure SD-WAN appliance inventory, per-device SN-based enrollment
Enterprise Packages	ENT-Branch-XS, ENT-Branch-S, ENT-Branch-M, ENT-DC-S, ENT-DC-M, ENT-DC-L
Speed Tiers	250Mbps to 10Gbps
Networking and Routing	DHCP client, DHCP relay, NAT, VLANs, BGP, OSPF, static routes, BFD, DPD, local preferences
Physical Connectivity	GE 10/100/1000 base-T, 10G base SR/LR, optical, copper
WAN Interface Operation	Bridged (802.3), Routed

Cloud-Native SD-WAN Orchestration

Configure and set orchestrator policy for connectivity, performance, and security

Connectivity

ExtremeCloud SD-WAN simplifies and transforms your WAN edge with full connectivity between your sites, data center, and Infrastructure as a Service (IaaS), with flexible, secure topologies, featuring:

- An automated hub-and-spoke topology for customer sites in geographical proximity when neither site-to-site communications nor multi-cloud integration is required.

Applications Anywhere enables automated connectivity between SD-WAN sites and top public cloud VPC hyperscalers (such as Azure, AWS), as well as direct-to-internet policy definition for SaaS applications, allowing internet breakout directly at the origin site. Applications Anywhere requires no VNF hosting in the VPC and is powered by application performance monitoring and enforced prioritization, enabling heavily optimized deployment times, no impact on VPC performance, and reduced single point of failure risk.

- Third-party gateway integration enables customers to integrate remote sites not equipped with SD-WAN appliances within their overlay network.

ExtremeCloud SD-WAN service is delivered locally by our SD-WAN Appliance hardware and provided as part of the ExtremeCloud SD-WAN solution. Appliances are deployed at locations between the WAN transport devices and the LAN switch. Deployment modes include a broad range of options configurable from the orchestrator, including:

- Pure bridge mode (for example, application performance over MPLS use cases)
- Full SD-WAN router with comprehensive networking, routing, overlay, and security capabilities

Fabric to the Edge

Extreme Fabric works seamlessly over ExtremeCloud SD-WAN to extend our widely deployed Fabric Connect services from the campus or data center all the way to branches at the edge via low-cost internet access transport.

- ExtremeCloud SD-WAN provides a secure, cost-effective, and low-risk means to connect sites and extend Fabric services globally between the smallest branches and the largest data centers, while improving resilience, visibility, and performance across the network.
- Extreme Fabric facilitates auto discovery and configuration of fabric-enabled switches and access points across SD-WAN connected branches, enabling a zero-touch provisioned, centrally managed fabric across all sites.
- Fabric Connect enables enhanced security and granular management via the use of LAN hypersegmentation based on IEEE 802.1Q. This greatly reduces the attack surface, acts as a stealth networking technology, and prevents east-west threat movement.

Note that, when a customer deploys ExtremeCloud SD-WAN in its Fabric to the Edge mode, all traffic is routed through a centralized hub for egress. Direct access to IaaS and SaaS from branches is not possible via the SD-WAN appliance, enabling centralized policy and control.



Unrivaled application performance management

Full security stack

Site-DC-IaaS connectivity

Application Performance Management and Visibility

From online banking and shopping to distance education and telehealth, user experience has never been more important. Consistently exceptional application experiences for your team, your customers, and your partners start with exceptional application performance management.

Application Performance Control

ExtremeCloud SD-WAN enables organizations to control performance relative to intended outcomes with Dynamic WAN Selection and Application Performance algorithms. At the session level, enabling high quality of service and high performance of critical applications.

- When congestion occurs between sites, the SD-WAN appliances coordinate to protect critical applications.
- Each session, depending on its designated criticality, is allocated the bandwidth necessary to achieve specified performance without impacting the next user.
- Application Control is a global, dynamic and session-based QoS solution.
- Dynamic bandwidth allocation based on real-time bandwidth availability and application demand measurement across the network for critical application sessions supports performance goals during periods of network congestion.

Dynamic traffic steering across a maximum of three different transport networks (MPLS-MPLS, MPLS- Internet, or Internet-Internet) to ensure resilience, application performance, and cost optimization enables:

- Selection of the best network access for each application session to maximize application performance and continuity of service while optimizing network utilization
- Real-time determination of best access for each application session by end-to-end characteristics of each available network (quality and bandwidth)
- Enforced, company-specific policy supported by several selection strategies (fully automated, partially, or totally limited).

Application Performance Visibility

ExtremeCloud SD-WAN automatically recognizes applications and analyzes each packet to measure end-to-end performance and monitoring, accelerating issue resolution.

- Ingested netflow data from the LAN and WAN enables detection and location of network and application performance issues.
- Visualization of key network metrics, such as packet loss, delay, and delay variation, and application metrics, such as TCP RTT (Round Trip Time), TCP SRT (Server Response Time), and TCP retransmission rate enables quick troubleshooting.
- Deep Packet Inspection, Experience Quality Score, and Application Flow Details support accelerated troubleshooting, root cause analysis, and mean time to repair.
- Experience Quality Score (EQS) measures traffic in real time or on a consolidated basis, with a 0 to 10 score.
- EQS provides at-a-glance understanding of the performance of a given application, a site, or a link.
- Diagnostic tools visualize the real-time connectivity status of any paths between sites in the networks.
- Troubleshooting tools expedite incident resolution via drilldown.

Application Performance Reporting

ExtremeCloud SD-WAN's reporting capabilities enable data-driven decisions and takes the guesswork out of performance management.

- Compare performance objectives defined by the orchestrator against actual performance as measured on the network.
- Schedule PDFs reports for easy dissemination.
- Enhanced Reporting option enables Application Reporting to collect data and aggregate it for up to 13 months.

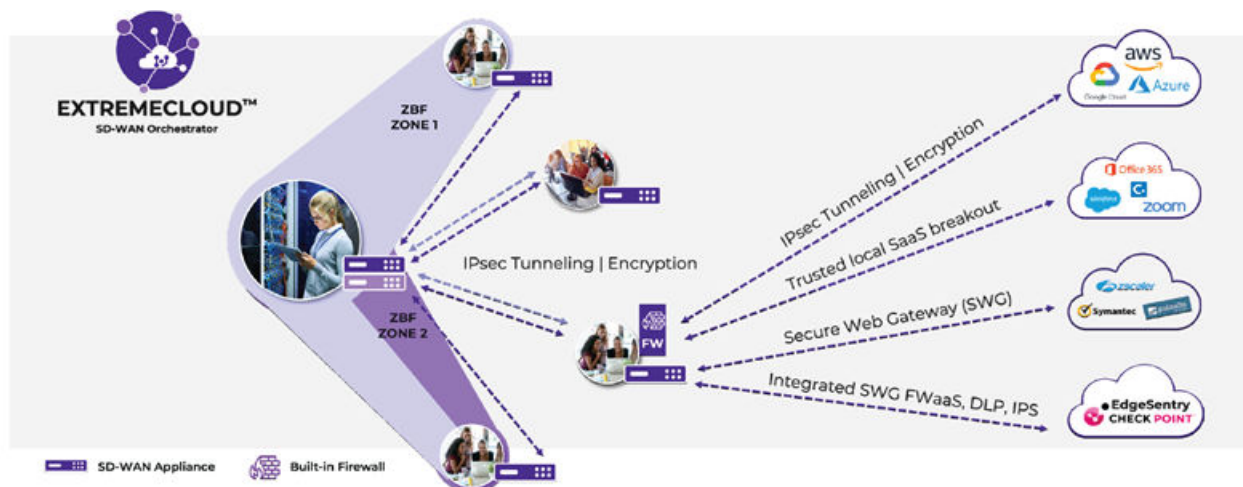
Security and Segmentation

Simplify security across your network.

New network edges increase the attack surface, and the threat landscape is rapidly escalating. At the same time, many organizations are struggling with security skills gaps, multiple point solutions, and NOC SOC integration challenges. ExtremeCloud SD-WAN provides a secure, flexible solution that reduces complexity, while helping protect users, applications, and data from attackers.

- A built-in zone-based firewall, configured at the domain level, implements VPN traffic segmentation.
- Optional EdgeSentry (powered by Check Point) add-on provides integrated, advanced cloud-based security and threat prevention capabilities, such as firewalls as a service (FWaaS), secure web gateway (SWG), web application control (HTTPS inspection), URL filtering, data loss prevention (DLP), intrusion prevention system (IPS), antivirus, sandboxing, and more.

- Optional traffic direction to leading security solutions from Palo Alto, Zscaler, Symantec, and other vendors enables a customers to take advantage of their current security investments.



ExtremeCloud SD-WAN Subscriptions, Appliances and Licensing

ExtremeCloud SD-WAN enables risk-free, financially efficient SD-WAN, with flexible packages, terms, and add-ons that reduce purchase risk.

Our commercial offering includes:

- An Enterprise Package, which provides the foundation for enterprise-grade SD-WAN
- A range of add-on packages

Enterprise Packages

Each Enterprise Package represents an SD-WAN Site and includes an appropriate SD-WAN appliance and access to our support and maintenance services and Customer Success Program.

A single SD-WAN domain can have multiple Enterprise Packages with different Service Levels, different SD-WAN appliances, and different terms. An Enterprise Package can be upgraded to a higher Service Level by ordering a new Enterprise Package, but an Enterprise Package cannot be downgraded.

Enterprise Package Descriptions

Service Subscription SKU	SD-WAN Service Level/BW	Subscription Type	New Subscription Term	Renewal Term	Associated HW
ENT-Branch-XS	XS/250Mbps	Site	1, 3, or 5 years	Flexible (minimum of 1 year)	ipe-30so
ENT-Branch-S	S/500Mbps	Site			ipe-30ax
ENT-Branch-M	M/750Mbps	Site			ipe-40ax-v2
ENT-DC-S	L/1000Mbps	Site			ipe-420ax
ENT-DC-M	XL/2Gbps	Site			ipe-2200ax-T
ENT-DC-L	XXL/10Gbps	Site			ipe-2200ax-10G-SR or ipe-2200ax-10G-LR

SD-WAN Appliance Specifications

SD-WAN appliances provide a common set of software capabilities, differentiated by performance metrics and connectivity capabilities. Appliances are divided into two primary usage groups based on the designation of either Branch or Data Center.

SD-WAN Appliance for Branch Offices - Technical Specifications

Model	ipe-30so	ipe-30ax	ipe-40ax-v2
WAN Interfaces	3xGE 10/100/1000Base-TX		
LAN Interfaces	1xGE 10/100/1000Base-TX		2xGE 10/100/1000Base-TX
Bypass (Fail-to-wire)	1 interface pair		2 interface pairs
Link State Propagation	Yes		
WAN Interface Operation	Bridged (802.3), Routed		
Application Performance	Visibility, Control, Dynamic WAN Selection, Cloud Application Database (more than 5000 Applications)		
WAN Optimization	Compression, Deduplication, including HTTPS		
Network and Routing	IPv4: Static, BGP, BFD, local preferences, OSPF, DHCP Relay, DHCP Client, NAT		
Security	Full internet security (with EdgeSentry), Direct-to-Internet, Stateful Firewall, Zone Based Firewall, Secure Web Gateways		
Overlay	IPsec based, Full-mesh, automated Hub and Spoke topology with manual Spoke-to-Spoke and Hub-to-Hub shortcuts, external VPN Gateway support		
High Availability	VRRP for routed mode, proprietary for hybrid and bridge mode		
Recommended Users	up to 100	up to 100	up to 300

SD-WAN Appliance for Data Center - Technical Specifications

Model	ipe-420ax	ipe-2200ax-T	ipe-2200ax-SR-10G ipe-2200ax-LR-10G
WAN Interfaces	3xGE 10/100/1000Base-TX	3xGE 10/100/1000Base-TX	3x GE 10GBase-SR/LR LC
LAN Interfaces	2xGE 10/100/1000Base-TX	2xGE 10/100/1000Base-TX	2x 10GBase-SR/LR LC
Bypass (Fail-to-wire)	2 interface pairs	No	No
Link State Propagation	Yes		
WAN Interface Operation	Bridged (802.3), Routed		
Application Performance	Visibility, Control, Dynamic WAN Selection, Cloud Application Database (5000+ Applications)		
WAN Optimization	Compression, Deduplication, including HTTPS		
Network and Routing	IPv4:Static, BGP, BFD, local preferences, OSPF, DHCP Relay, DHCP Client, NAT		
Security	Full internet security (with EdgeSentry), Direct-to-Internet, Stateful Firewall, Zone Based Firewall, Web Security Gateways		
Overlay	IPsec based, Full-mesh, automated Hub and Spoke topology with manual Spoke-to-Spoke and Hub-to-Hub shortcuts, external VPN Gateway support		

Model	ipe-420ax	ipe-2200ax-T	ipe-2200ax-SR-10G ipe-2200ax-LR-10G
High Availability	VRRP for routed mode, proprietary for hybrid and bridge mode		
Recommended Users	up to 5,000	up to 50,000	up to 50,000

Feature availability in Enterprise Package and Add-on Packages

Feature	XSD-WAN Enterprise
SD-WAN Service Level	·
Cloud Orchestration, ZTP	·
SD-WAN Appliance (Branch or DC)	·
Basic AppPerf	·
Remote V+C	···
Cloud Application Database	·
Advanced App Perf/WAN opt	·
High Availability (Site Resiliency)	·
Hybrid of full-stack deployments (bridge+routed, or fully-routed)	·
Basic Security (ZBF)	·
Advanced Security (EdgeSentry)	···
Enhanced Reporting	·

- Included per Site
- Optional per Site
- Optional Multisite

Choice of Add-Ons

A choice of add-ons increases the value of an Enterprise Package with high availability, security, and other add-ons. The rule and terms for add-on licenses are:

- New Subscription Term: Flexible (min 1 year)
- Renewal Term: Flexible (min 1 year)
- License Type: Per-site or per-domain (licensed functionality will be available to all sites in an SD-WAN domain).
- Stackable licenses: per-domain licenses are stackable, which means that to increase capacity of a certain licensed feature, more than one can be assigned to a SD-WAN domain

High Availability Add-on Subscription

In addition to the Enterprise Package Service License, a High Availability Add-on License provides the Site Resiliency functionality, forming a High Availability pair. A High Availability Service License and license term must match the paired Enterprise Package Service License (for example, ENT-HA-Branch-S can be paired only with ENT-Branch-S).

Service Subscription	Subscr. Type	New Subscr. Term	Renewal Term	HW included
ENT-HA-Branch-XS	Site	1, 3, or 5 years	Flexible (minimum 1 year)	Yes
ENT-HA-Branch-S	Site			Yes
ENT-HA-Branch-M	Site			Yes
ENT-HA-DC-S	Site			Yes
ENT-HA-DC-M	Site			Yes
ENT-HA-DC-L	Site			Yes

Other Add-on Subscriptions

Service Subscription	Subscription Type	Service Level
ENT-Remote-VandC-5	Domain	Stackable license enabling 5 RVC destinations within a domain with Remote V+C functionality. Licensed per number of configurable RVC destinations.
ENT-EdgeSentry-10	Domain	Stackable 10 users license to reach desired # of concurrent users of EdgeSentry functionality in a domain. Licensed per users accessing EdgeSentry inside a domain. Must be at least 50 users per domain.

Support, Service, and Customer Success

ExtremeCloud SD-WAN subscriptions include industry-leading 7x24x365 global technical support, access to our Technical Support portal, Next Business Day Advance Hardware Replacement (NBD AHR) services, and Customer Success resources.

Our Customer Success program provides:

- On-demand training and onboarding guidance to speed time to value
- A templated success plan to help you bridge the gaps between knowledge and best practices
- Self-Serve technical audit to help anticipate future issues
- Best practice tips to help you manage your solution
- Periodic reviews with a customer success advocate to ensure you are on the best path to success for your organization



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