PA-5450

PA-5450

The Palo Alto Networks PA-5450 ML-Powered Next-Generation Firewall (NGFW) platform is designed for hyperscale data center, internet edge, and campus segmentation deployments. Delivering incredible performance—189 Gbps of Threat Prevention throughput with security services enabled—it is based on a scalable, modular design that enables you to increase performance as your needs increase. The PA-5450 offers simplicity defined by a single-system approach to management and licensing.

The world's first ML-Powered NGFW enables you to prevent unknown threats, see and secure everything—including the internet of things (IoT)—and reduce errors with automatic policy recommendations. The controlling element of the PA-5450 is PAN-OS®, the same software that runs all Palo Alto Networks NGFWs. PAN-OS natively classifies all traffic, inclusive of applications, threats, and content, and then ties that traffic to the user regardless of location or device type. The applications, content, and users—the elements that run your business—serve as the basis of your security policies, resulting in an improved security posture and reduced incident response times.

Highlights

- Powered by Precision AI®, a groundbreaking AI-driven engine that analyzes and prevents threats in real time.
- Built with a single-pass architecture to deliver predictable performance.
- Delivers Palo Alto Networks 5G-Native Security with 5G identifier-based visibility and enforcement capabilities.
- Supports high availability with active/active and active/passive modes.
- Managed with Strata™ Cloud Manager, the industry's first AI-powered unified management and operations solution for network security.
- Leader in the 2025 Gartner® Magic Quadrant™ for Hybrid Mesh Firewall.
- Leader in The Forrester Wave™: Enterprise Firewall Solutions, Q4 2024.

ML-Powered Next-Generation Firewall

- Embeds machine learning (ML) in the core of the firewall to provide inline signatureless attack prevention for file-based attacks while identifying and immediately stopping never-before-seen phishing attempts.
- Leverages cloud-based ML processes to push zero-delay signatures and instructions back to the NGFW.
- Uses behavioral analysis to detect IoT devices and make policy recommendations; is a cloud-delivered and natively integrated service on the NGFW.
- Automates policy recommendations that save time and reduce the chance of human error.

Identifies and Categorizes All Applications, on All Ports, All the Time, with Full Layer 7 Inspection

- Identifies the applications traversing your network irrespective of port, protocol, evasive techniques, or encryption (SSL/TLS). In addition, it automatically discovers and controls new applications to keep pace with the SaaS explosion with SaaS Security subscription.
- Uses the application, not the port, as the basis for all your safe enablement policy decisions: allow, deny, schedule, inspect, and apply traffic shaping.
- Offers the ability to create custom App-ID™ tags for proprietary applications or request App-ID development for new applications from Palo Alto Networks.
- Identifies all payload data within the application (e.g., files and data patterns) to block malicious files and thwart data exfiltration attempts.
- Creates standard and customized application usage reports, including software-as-a-service (SaaS) reports that provide insight into all sanctioned and unsanctioned SaaS traffic on your network.
- Enables safe migration of legacy Layer 4 rule sets to rules based on App-ID with Policy Optimizer built in, giving you a rule set that is more secure and easier to manage.

Check out the App-ID tech brief for more information.

Enforces Security for User Devices Anywhere While Adapting Policies Based on User Activity

- Enables visibility, security policies, reporting, and forensics based on users and groups—not just IP addresses.
- Easily integrates with a wide range of repositories to leverage user information: wireless LAN controllers, VPNs, directory servers, SIEMs, proxies, and more.
- Allows you to define Dynamic User Groups (DUGs) on the firewall to take time-bound security actions without waiting for changes to be applied to user directories.
- Applies consistent policies irrespective of users' locations (office, home, travel, etc.) and devices (iOS and Android mobile devices; macOS, Windows, and Linux desktops and laptops; Citrix and Microsoft VDI; and terminal servers).
- Prevents corporate credentials from leaking to third-party websites and prevents reuse of stolen credentials by enabling multifactor authentication (MFA) at the network layer for any application without any application changes.
- Provides dynamic security actions based on user behavior to restrict suspicious or malicious users.
- Consistently authenticates and authorizes your users, regardless of location and where user identity stores live, to move quickly toward a zero trust security posture with Cloud Identity Engine—an entirely new cloud-based architecture for identity-based security.

Check out the Cloud Identity Engine solution brief for more information.

Prevents Malicious Activity Concealed in Encrypted Traffic

- Inspects and applies policy to SSL/TLS-encrypted traffic, both inbound and outbound, including for traffic that uses TLSv1.3 and HTTP/2.
- Offers rich visibility into TLS traffic, such as the amount of encrypted traffic, SSL/TLS versions, cipher suites, and more, without decrypting.
- Enables control over use of legacy TLS protocols, insecure ciphers, and misconfigured certificates to mitigate risks.
- Facilitates easy deployment of decryption and lets you use built-in logs to troubleshoot issues, such as applications with pinned certificates.
- Lets you enable or disable decryption flexibly—based on, for example, URL category, source and destination zone, address, user, user group, device, and port—for privacy and regulatory compliance purposes.
- Allows you to create a copy of decrypted traffic from the firewall (i.e., decryption mirroring) and send it to traffic collection tools for forensics, historical purposes, or data loss prevention (DLP).
- Allows you to intelligently forward all traffic (decrypted TLS, undecrypted TLS, and non-TLS) to third-party security tools with a network packet broker and optimize your network performance and reduce operating expenses.

Read the Decryption: Why, Where, and How whitepaper to learn about decryption to prevent threats and secure your business

AI-Powered Unified Management and Operations with Strata Cloud Manager

Manage your PA-5450 with Strata Cloud Manager, which enables you to:

- **Gain complete visibility across your network security estate**: Achieve real-time, comprehensive visibility of your entire network security landscape, including all users, applications, devices, and the most critical threats that need attention through a unified interface.
- **Enable simple and consistent network security lifecycle management**: Manage configuration and policy management across all enforcement points, including SASE, hardware and software firewalls, as well as all security services to ensure consistency and reduce operational overhead.
- **Strengthen security posture in real time**: Leverage AI-powered analysis to detect, resolve, and optimize policy anomalies like shadow and redundant policies and overly permissive or unused rules. Improve your security posture with integrated best practice recommendations and maintain compliance with industry and InfoSec standards.
- **Proactively resolve network disruptions and enhance user experience**: Predict, diagnose, and resolve network health issues—such as user experience problems, capacity bottlenecks, CVE vulnerabilities, service connection issues, and 130 other categories of issues—up to 90 days in advance to ensure smooth operations.
- **Resolve issues fast with instant knowledge at your fingertips**: With Strata Copilot™, our AI-powered assistant features a natural language interface so you can quickly find, understand, and address security and operational challenges before they escalate. Plus, with its streamlined case creation capabilities, you get rapid support when you need it most.

Native Web Proxy Support for the Next-Generation Firewall

- Ability to consolidate firewall and proxy into a single platform while managing capabilities through a centralized management platform to build policies.
- Ability to support explicit proxy through PAC files and transparent proxy.
- Explicit proxy can help with no-default route architectures with on-premises proxy deployments.
- Explicit proxy supports authentication with Kerberos and SAML.
- Transparent proxy setup is simplified without the need for WCCP or authentication.
- Web proxy on the PA-5450 supports throughput of up to 26 Gbps and can handle up to 1.28 million concurrent sessions.

Best-in-Class Cloud-Delivered Security Services Powered by Precision AI

The PA-5450 provides best-in-class security with Cloud-Delivered Security Services (CDSS). At the heart of our CDSS is Precision AI. Unlike traditional reactive tools, Precision AI empowers your defenses with proactive threat detection, inline prevention, and automated response—stopping even the most evasive, never-before-seen attacks before they cause damage. Backed by threat intelligence from our over 70,000 customers globally, our cloud-delivered services continuously learn, adapt, and evolve. Integrated seamlessly with our NGFW and SASE platforms, CDSS deliver unified protection across web, DNS, email, applications, and more—no matter where your users or data reside.

Whether you're navigating hybrid work, embracing cloud transformation, or defending against sophisticated adversaries, CDSS powered by Precision AI gives you the visibility, automation, and confidence to stay ahead.

Advanced Threat Prevention

Analyze up to 673 million new sessions daily and proactively block 28.2 billion threats in real time—including zero-day exploits, malware, command-and-control (C2) traffic, and evasive techniques—to deliver cutting-edge security at unprecedented scale.

Advanced WildFire

Proactively stop up to 450,000 new threats every day with the industry's most powerful malware prevention engines. Advanced WildFire® identifies and blocks a wide range of advanced threats, including zero-day malware, ransomware, remote access Trojans (RATs), weaponized documents, and other evasive attack techniques—before they impact your organization.

Advanced URL Filtering

Safeguard web access by blocking up to 151 million threats inline every day, while analyzing 3.8 billion new URLs daily. Advanced URL Filtering protects against phishing, malware, ransomware, C2 communications, and evasive web-based attacks.

Advanced DNS Security

Advanced DNS Security delivers real-time protection that instantly blocks sophisticated DNS request and response-based threats—including DNS hijacking, domain generation algorithms (DGA), DNS tunneling, and C2 callbacks. It analyzes over 1.1 billion new domains daily and identifies up to 7.7 million newly malicious domains, preventing more than 2 billion threats inline. This powerful first line of defense identifies and stops threats at the DNS layer—whether they originate from outside or within the network.

Device Security

Secure every connected device with a solution tailored to the industry (including manufacturing, retail, healthcare, high tech, and general enterprise), and achieve a 90% device discovery rate within 48 hours—providing prioritized vulnerability and risk assessments. Also, identify anomalies, get least-privileged access control security policy recommendations, and virtually patch vulnerabilities all in one single NetSec platform.

SaaS Security

Discover and control all SaaS consumption with visibility into over 75,000 SaaS apps and DLP controls for more than 150 SaaS apps. Prevent SaaS misconfigurations with posture management for over 117 SaaS apps, as well as SaaS inline tenancy control for 39 apps.

AI Access Security

Enable the safe use of GenAI with real-time visibility into GenAI apps, user access controls, data protection, and continuous risk monitoring. AI Access Security™ provides an industry-leading catalog of over 2,500 GenAI apps, including over 15 GenAI-specific application attributes to accurately identify and mitigate risk. It includes posture management for more than 13 GenAI apps and SaaS inline tenancy control for 11 apps.

Advanced SD-WAN

Easily adopt SD-WAN by simply enabling it on your existing firewalls with integrated security. Get an exceptional end-user experience and ensure SLAs by using SD-WAN path measurements and application steering capabilities to intelligently steer applications to the best performing paths.

Delivers a Unique Approach to Packet Processing with Single-Pass Architecture

- Performs networking, policy lookup, application and decoding, and signature matching—for all threats and content—in a single pass. This significantly reduces the amount of processing overhead required to perform multiple functions in one security device.
- Avoids introducing latency by scanning traffic for all signatures in a single pass, using stream-based, uniform signature matching.
- Enables consistent and predictable performance when security subscriptions are enabled. (In table 1, "Threat Prevention throughput" is measured with multiple subscriptions enabled.)

PA-5450 Architecture

The PA-5450 is powered by a scalable architecture for the purposes of applying the appropriate type and volume of processing power to the key functional tasks of networking, security, and management. The device is managed as a single unified system, enabling you to easily direct all available resources to protect your data. The PA-5450 intelligently distributes processing demands across three subsystems, each with massive amounts of computing power and dedicated memory: the Networking Card (NC), the Data Processing Card (DPC), and the Management Processing Card (MPC).

The PA-5450 offers a total of six slots for NCs and DPCs.

Networking Cards

For network connectivity, the PA-5450 requires at least one NC (PA-5400-NC-A). A second NC requires a minimum of two DPCs installed in the system. A maximum of two NCs can be installed. NCs are dedicated to executing packet ingress and egress tasks.

Each PA-5400-NC-A offers multiple connectivity ports as listed in table 3: 100/1000/10G Cu (4), 1G/10G SFP/SFP+ (12), and 40G/100G QSFP28 (2).

Data Processing Cards

For packet and security processing, the PA-5450 uses DPCs (PA-5400-DPC-A) with a minimum of one DPC and up to five DPCs that can be placed in the six slots.

Management Processing Cards

The MPC subsystem (PAN-PA-5400-MPC-A) acts as a dedicated point of contact for controlling all aspects of the PA-5450.

Table 1. PA-5450 Performance and Capacities

	Single PA-5400-DPC-A	PA-5450 Configured System*
Firewall throughput (appmix)†	75 Gbps	200 Gbps
Threat Prevention throughput (appmix)‡	55 Gbps	189 Gbps
IPsec VPN throughput§	17 Gbps	85 Gbps‖
Max concurrent sessions#	20M	100M‖
New sessions per second**	725,000	3.6M‖
Virtual systems (base/max)††	—	25/225

Note: Results were measured on PAN-OS 11.2.

* All tests performed with 2 Networking Cards + 4 Data Processing Cards populated, unless otherwise noted.

† Firewall throughput is measured with App-ID and logging enabled, utilizing appmix transactions.

‡ Threat Prevention throughput is measured with App-ID, IPS, antivirus, antispyware, WildFire, file blocking, and logging enabled, utilizing appmix transactions.

§ IPsec VPN throughput is measured with 64 KB HTTP transactions and logging enabled.

‖ This test performed with 1 Networking Card + 5 Data Processing Cards populated.

Max concurrent sessions are measured utilizing HTTP transactions.

** New sessions per second is measured with application override, utilizing 1 byte HTTP transactions.

†† Adding virtual systems over base quantity requires a separately purchased license.

Table 2. PA-5450 Networking Features
Interface Modes
L2, L3, tap, virtual wire (transparent mode)
Routing
OSPFv2/v3 with graceful restart, BGP with graceful restart, RIP, static routing
Policy-based forwarding
Point-to-Point Protocol over Ethernet (PPPoE) and DHCP supported for dynamic address assignment
Multicast: PIM-SM, PIM-SSM, IGMP v1, v2, and v3
Bidirectional Forwarding Detection (BFD)
SD-WAN
Path quality measurement (jitter, packet loss, latency)
Initial path selection (PBF)
Dynamic path change
IPv6
L2, L3, tap, virtual wire (transparent mode)
Features: App-ID, User-ID™, Content-ID™, WildFire, and SSL decryption
SLAAC
IPsec and SSL VPN
Key exchange: Manual key, IKEv1 and IKEv2 (pre-shared key, certificate-based authentication)
Encryption: 3des, AES (128-bit, 192-bit, 256-bit)
Authentication: MD5, SHA-1, SHA-256, SHA-384, SHA-512
GlobalProtect® Large Scale VPN for simplified configuration and management*
Secure access over IPsec and SSL VPN tunnels using GlobalProtect Gateway and Portals*
VLANs
802.1Q VLAN tags per device/per interface: 4,094/4,094
Aggregate interfaces (802.3ad), LACP
Network Address Translation
NAT modes (IPv4): Static IP, Dynamic IP, Dynamic IP and Port (port address translation)
NAT64, NPTv6
Additional NAT features: Dynamic IP reservation, tunable Dynamic IP and Port oversubscription
High Availability
Modes: Active/active, active/passive, HA clustering
Failure detection: Path monitoring, interface monitoring
Mobile Network Infrastructure†
5G Security
GTP Security
SCTP Security

* Requires GlobalProtect License.

† For additional information, refer to our ML-Powered NGFWs for 5G datasheet.

Table 3. PA-5450 Hardware Specifications
PA-5400-NC-A Networking I/O
100/1000/10G Cu (4), 1G/10G SFP/SFP+ (12), 40G/100G QSFP28 (2); minimum 1 NC and maximum 2 NCs per system; 2 NCs require 2 or more DPCs installed
PAN-PA-5400-MPC-A Management I/O
SFP/SFP+ MGT (2), SFP/SFP+ HA1 (2), HSCI HA2/HA3 QSFP+/QSFP28 (2), RJ45 serial console (1), Micro USB serial console (1)
Storage Capacity
480 GB SSD, RAID1, system storage 4 TB SSD, log storage (optional)
Trusted Platform Module (TPM)
Integrated with TPM for secure boot, hardware root of trust, and securing system secrets.
Max BTU/hr
8,828
Power Supplies (Base/Max)
2/4
AC Input Voltage (Input Frequency)
100–120 VAC & 200–240 VAC (50–60 Hz)
AC Power Supply Output
2,200 watts/power supply
Max Current Consumption
AC: 100–120 VAC, ~14 A max. per input 200–240 VAC, ~12.5 A max. per input
DC: 48–60 VDC, 52 A max. per input
Max Inrush Current
AC: 35 A @ 230 VAC, 35 A @ 120 VAC
DC: 50 A @ 72 VDC
Rack Mount (Dimensions)
5U, 19" standard rack (8.75" H x 30.25" D x 17.38" W)
Maximum Time Between Failure (MTBF)
Configuration dependent; contact your Palo Alto Networks representative for MTBF details.
Safety
cTUVus, CB
EMI
FCC Class A, CE Class A, VCCI Class A, KCC Class A, BSMI Class A
Certifications
See paloaltonetworks.com/company/certifications.html
Environment
Operating temperature: 32°F to 122°F, 0°C to 50°C
Nonoperating temperature: -4°F to 158°F, -20°C to 70°C

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