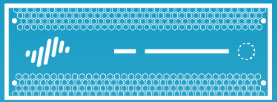
SECURITY OPERATING PLATFORM AND ARCHITECTURE



EDU-210 Version A
PAN-OS® 9.0

PREVENTION EVERYWHERE

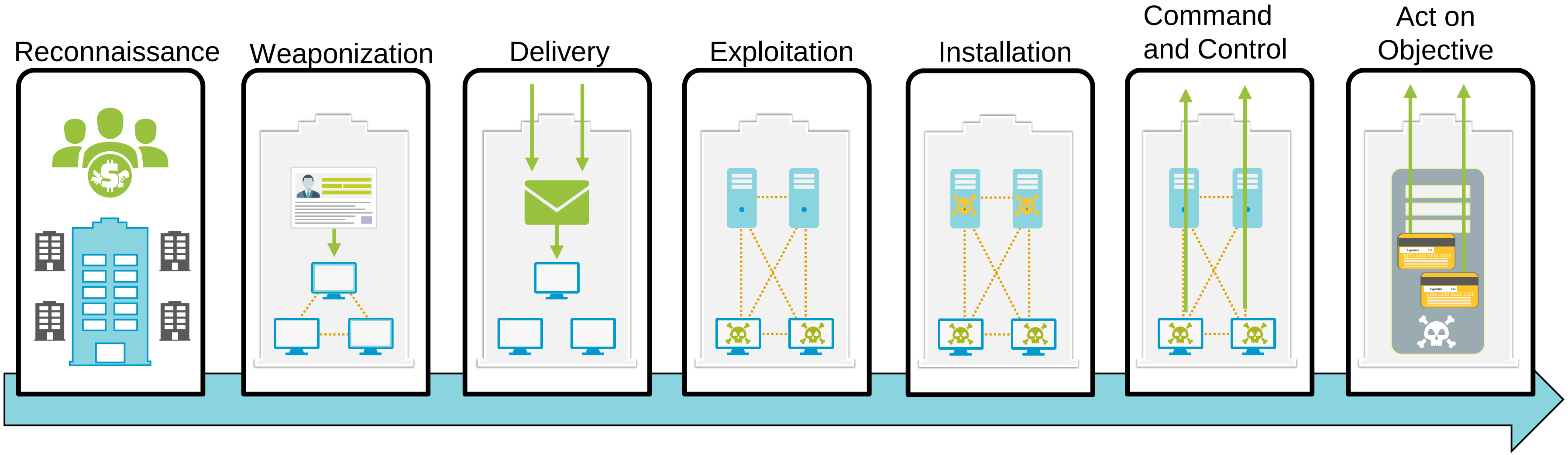
- Security platform overview
- Next-generation firewall architecture
- Zero Trust security model
- Firewall offerings

Learning Objectives

After you complete this module,
you should be able to:

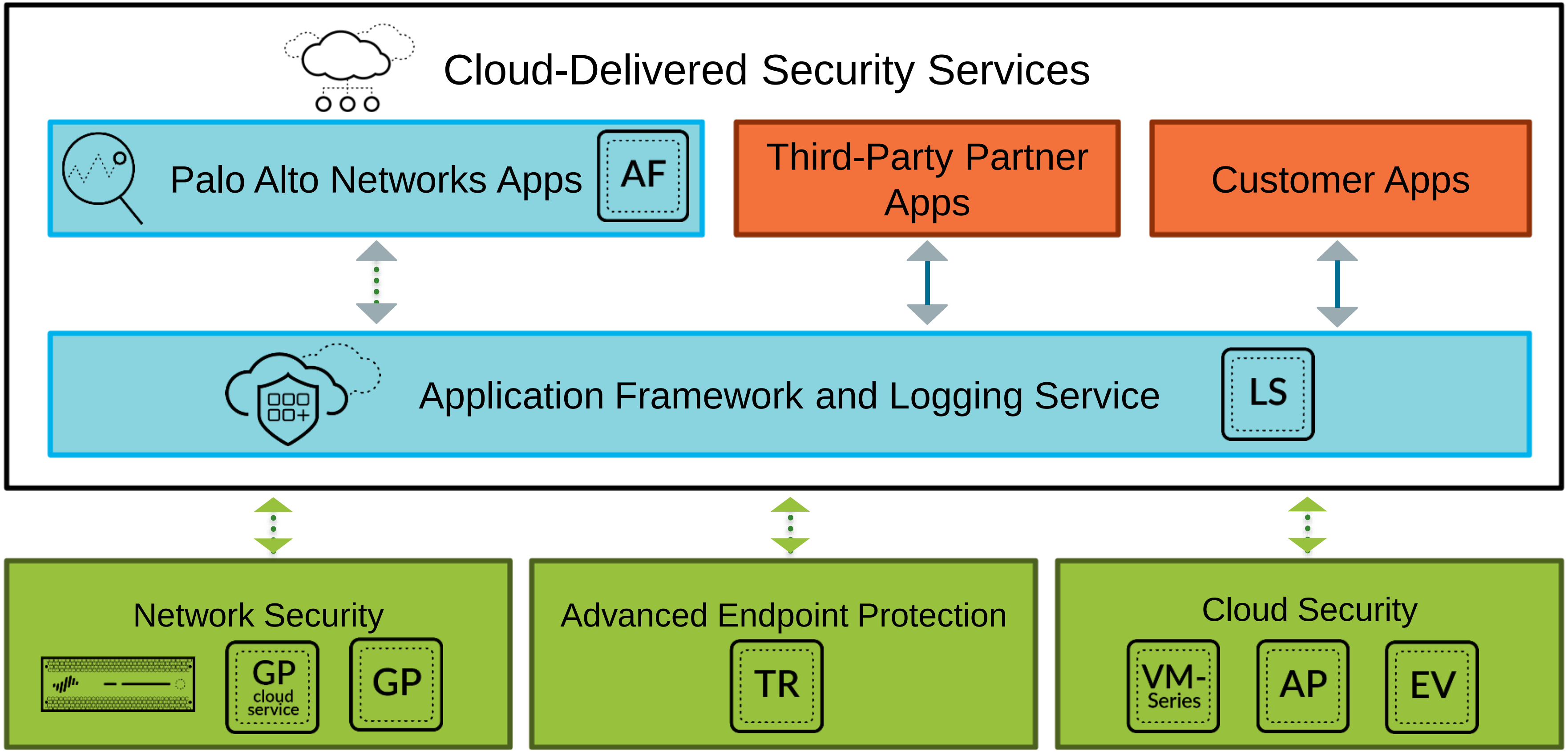
- Describe the characteristics of the Security Operating Platform
- Describe the single-pass architecture
- Describe the Zero Trust security model and how it relates to traffic moving through your network

Cyber-attack Lifecycle



Stop the attack at any point!

Security Operating Platform



Cloud-Delivered Security Services

Palo Alto Networks Apps

Third-Party Partner Apps

Customer Apps

Application Framework and Logging Service

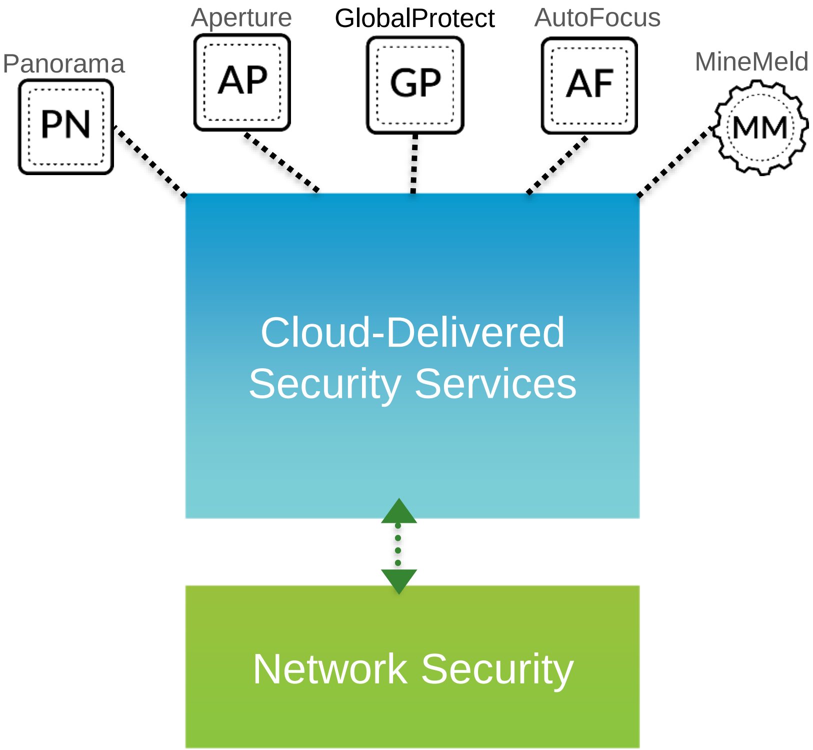
Network Security

Advanced Endpoint Protection

Cloud Security

Security Operating Platform (Cont.)

- Panorama: Management and reporting
- Aperture: Software-as-a-service (SaaS) security
- GlobalProtect: Extend platform externally
- AutoFocus: Threat intelligence that can be acted on
- MineMeld: Aggregate threat intelligence



Security platform overview

Next-generation firewall architecture

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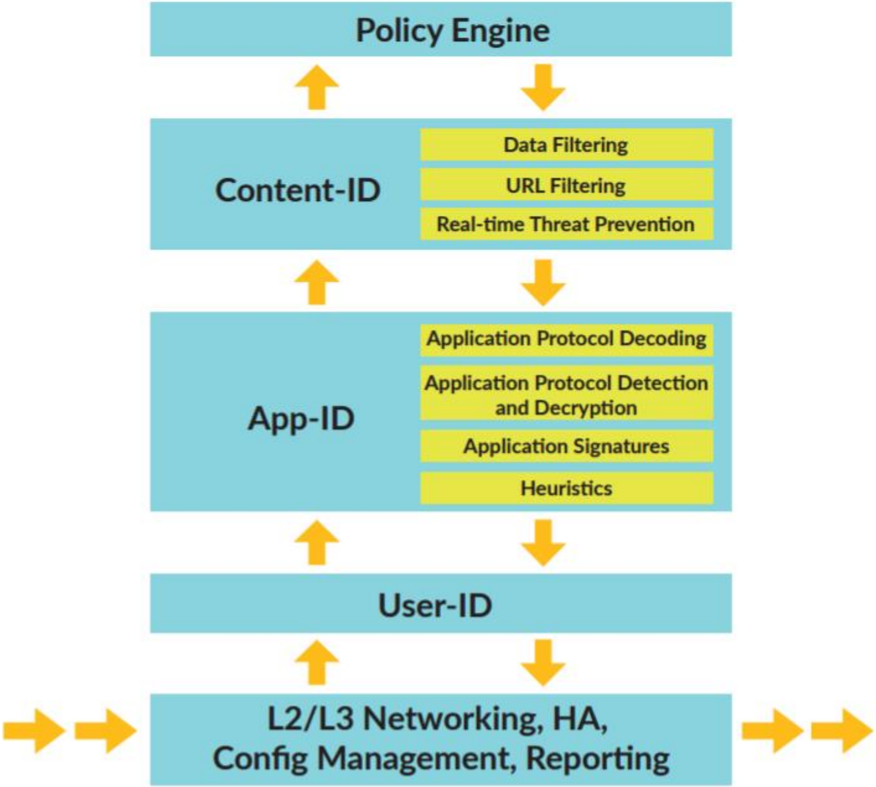
Palo Alto Networks Single-Pass Architecture

Single pass:

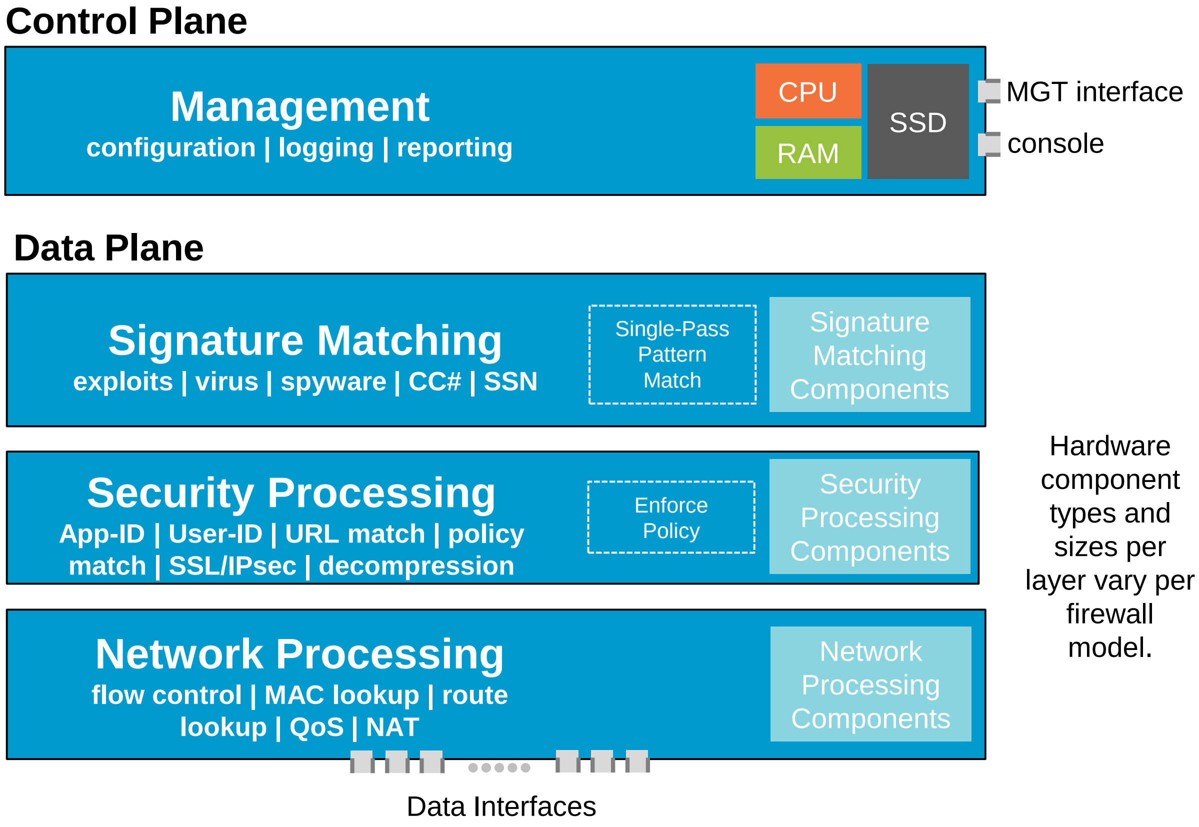
- Operations per packet:
  - Traffic classification with App-ID technology
  - User or group mapping
  - Content scanning: threats, URLs, confidential data
- One single policy (per type)

Parallel processing:

- Function-specific parallel processing hardware engines
- Separate data and control planes


Policy Engine
Content-ID
Data Filtering
URL Filtering
Real-time Threat Prevention
App-ID
Application Protocol Decoding
Application Protocol Detection and Decryption
Application Signatures
Heuristics
User-ID
L2/L3 Networking, HA, Config Management, Reporting

Palo Alto Networks Firewall Architecture


Control Plane
Management
configuration | logging | reporting
CPU
RAM
SSD
MGT interface
console
Data Plane
Signature Matching
exploits | virus | spyware | CC# | SSN
Single-Pass Pattern Match
Signature Matching Components
Security Processing
App-ID | User-ID | URL match | policy match | SSL/IPsec | decompression
Enforce Policy
Security Processing Components
Network Processing
flow control | MAC lookup | route lookup | QoS | NAT
Network Processing Components
Data Interfaces

Hardware component types and sizes per layer vary per firewall model.

Control Plane | Management
Provides configuration, logging, and reporting functions on a separate processor, RAM, and hard drive

Signature Matching
Stream-based, uniform signature match including vulnerability exploits (IPS), virus, spyware, CC#, and SSN

Security Processing
High-density parallel processing for flexible hardware acceleration for standardized complex functions

Network Processing
Front-end network processing, hardware-accelerated per-packet route lookup, MAC lookup, and NAT

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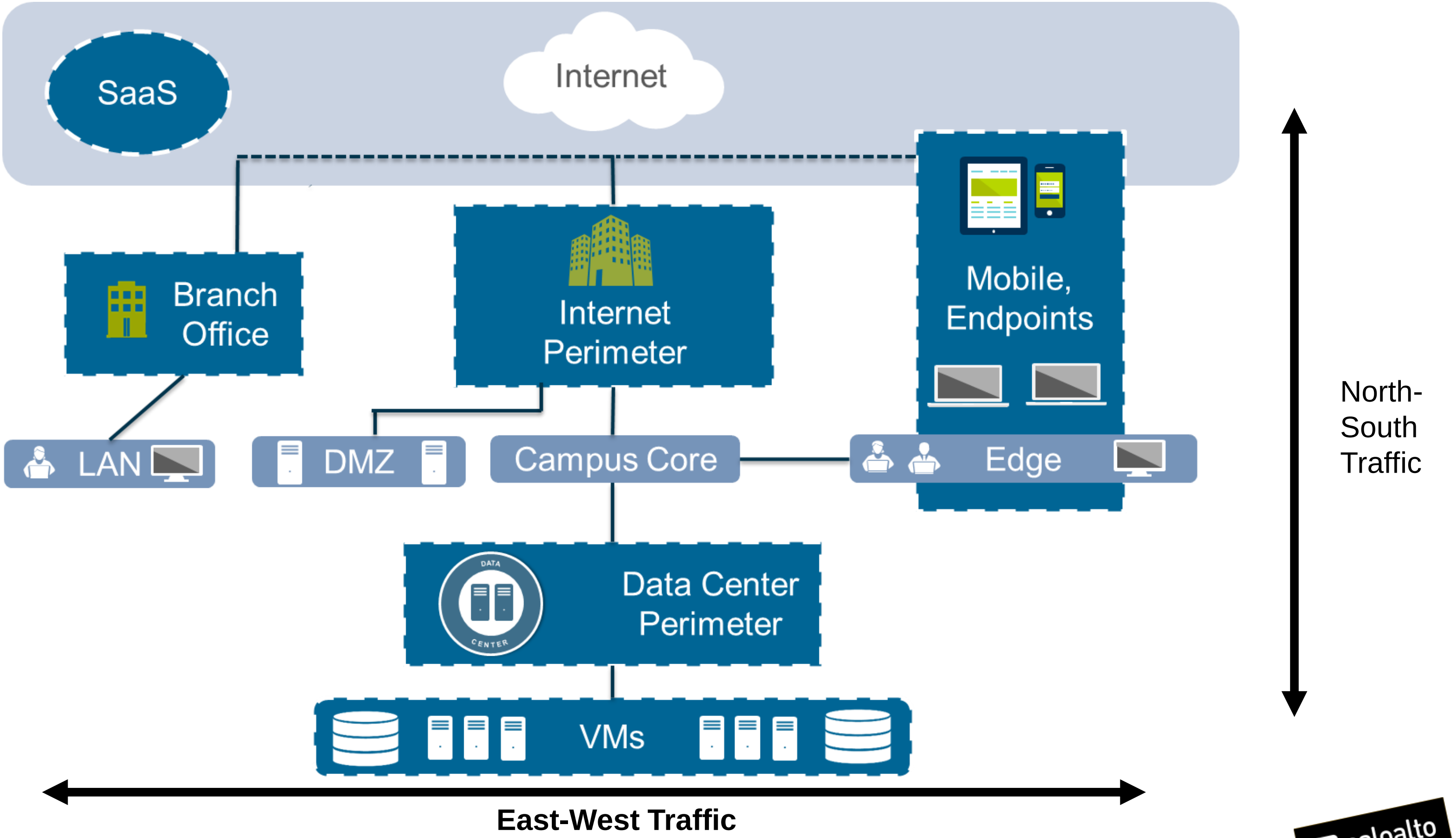
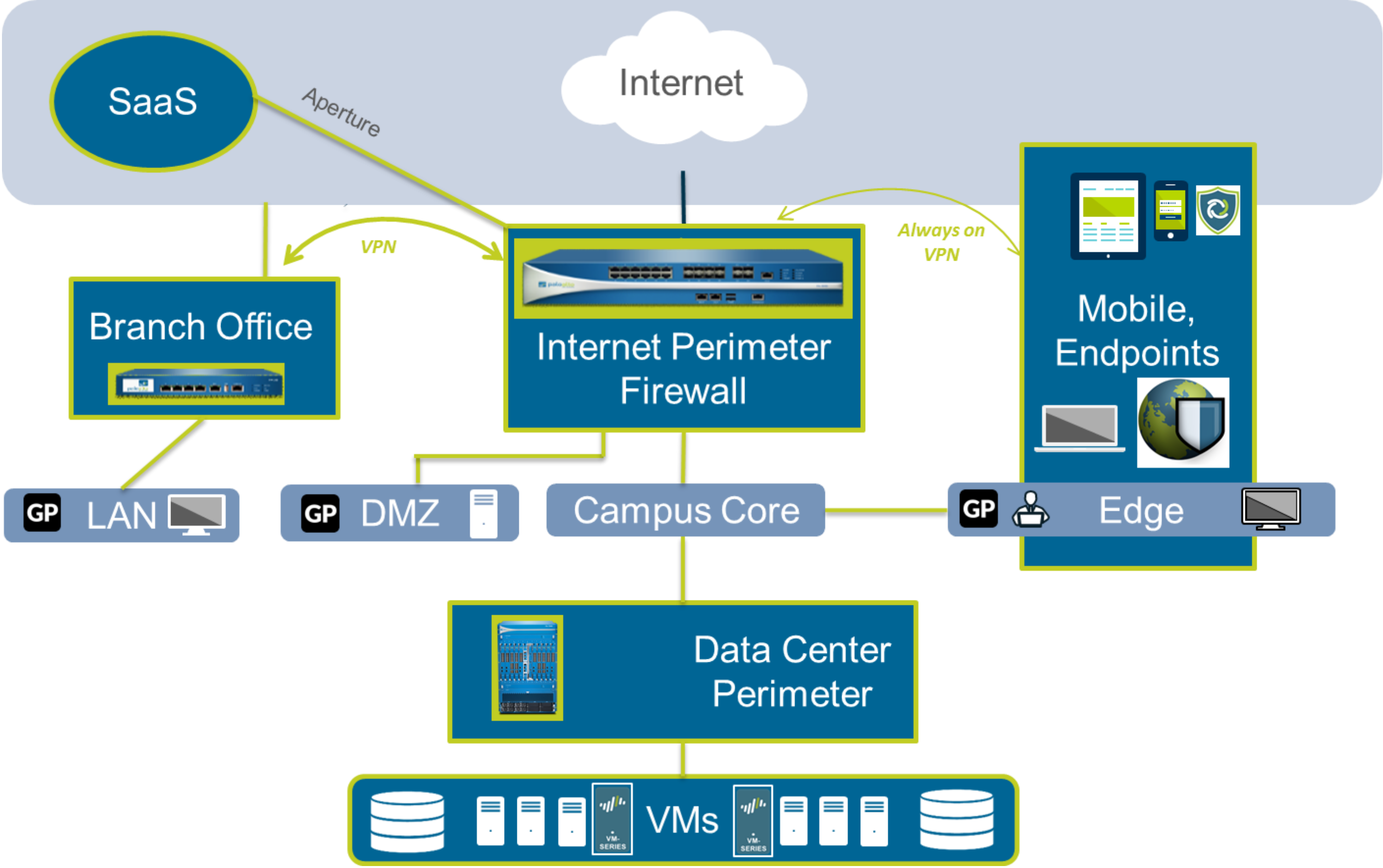
Data Flows in an Open Network



Data Flows Secured by Palo Alto Networks Solution



Integrated Approach to Threat Prevention

	Delivery	Exploitation	Installation	C2	Act on Objective
App-ID	Block high-risk applications			Block C2 on non-standard ports	Prevent exfiltration and lateral movement
URL Filtering	Block known malware sites			Block malware, fast-flux domains	
Vulnerability		Block the exploit			Prevent lateral movement
Anti-spyware				Block spyware, C2 traffic	
Antivirus			Block malware		Prevent lateral movement
Traps	Monitor allowed processes and executables	Prevent the exploit	Prevent malicious .exe from running		
File Blocking			Prevent drive-by downloads		Prevent exfiltration and lateral movement
DoS and/or Zone		Prevent evasions			Prevent DoS attacks
WildFire®	Identify malware		Detect unknown malware	Detect new C2 traffic	

Security platform overview

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Physical Platforms

Next-Generation Firewalls

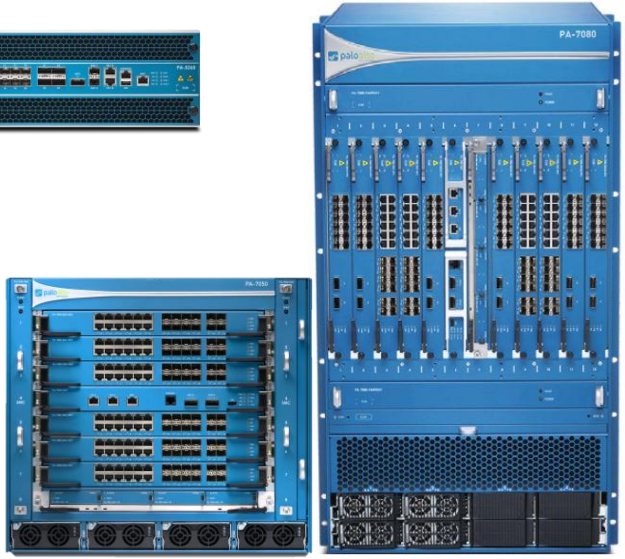
PA-5200 Series

PA-3200 Series

PA-800 Series

PA-220R

PA-220



PA-7000 Series

Panorama

M-200

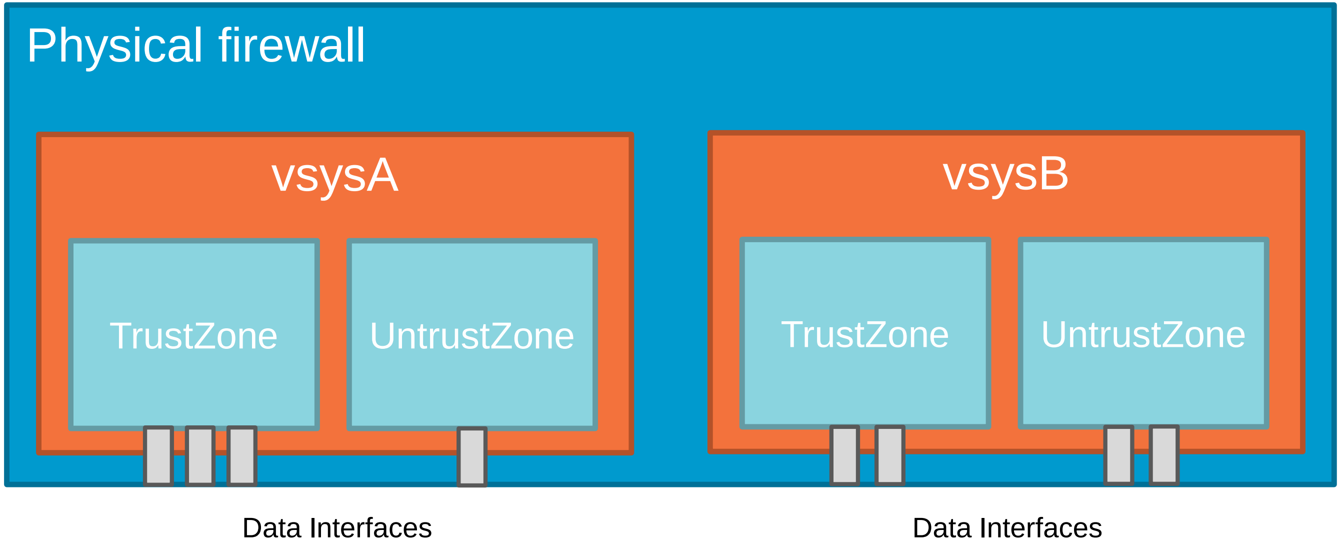
M-500/WF-500/600

VM-Series Models and Capacities

Performance and Capacities	VM-700	VM-500	VM-300	VM-100/ VM-200	VM-50 /Lite
Firewall throughput (App-ID enabled)	**16Gbps**	**8Gbps**	**4Gbps**	**2Gbps**	**200Mbps**
Threat prevention throughput	**8Gbps**	**4Gbps**	**2Gbps**	**1Gbps**	**100Mbps**
New sessions per second	120,000	60,000	30,000	15,000	3,000
Dedicated CPU cores	2, 4, 8, 16	2, 4, 8	2, 4	2	2
Dedicated memory (minimum)	56GB	16GB	9GB	6.5GB	4.5GB/4GB
Dedicated disk drive capacity (minimum)	60GB	60GB	60GB	60GB	32GB

Virtual Systems

- Separate, logical firewalls within a single physical firewall
- Creates an administrative boundary
- Use case: multiple customers or departments



Module Summary

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Questions?

PROTECTION. DELIVERED.

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