

APS-100 / 400GE Series

Modular, Hyperscale Application and Network Security Test Platform

Problem: Quantify Unknowns in a Hyperscale World

Data center operators, service providers, and enterprises face exponential growth in encrypted traffic volumes and continually expanding attack surfaces driven by artificial intelligence, machine learning, cloud computing, and an explosion of IoT devices. These shifts impact organizations of all sizes and they are accompanied by industry moves to 400GE, putting further demands on network infrastructure like next generation firewalls and application delivery controllers by delivering traffic at unprecedented speed - making it more critical than ever that data center network equipment manufacturers (NEMs) and operators validate that their solutions can support these hyperscale loads without compromising security or usability.

Solution: Modular and Flexible Hyperscale Testing

The Keysight APS Series next-generation application and security test platforms — including the APS-M8400 8x400GE QSFP-DD appliance, the APS-M1010 controller, and the APS-ONE-400 and APS-ONE-100 appliances — leverage a modular, ‘pay-as-you-grow’ approach capable of generating hyperscale traffic loads while offering right- sized solutions to meet an array of testing needs and budget requirements.

The APS-ONE-400 and APS-ONE-100 appliances can be used individually, or multiple appliances can be stacked, scaling up to meet even the biggest application and security test demands. When stacked, the APS-ONE-400 and APS-ONE-100 appliances function as ‘compute nodes’ that can be managed by the APS-M1010 controller, which supports up to 10 compute node appliances, or the APS-M8400 appliance which features ultrafast 8x400GE QSFP-DD native I/O and supports up to 16 compute node appliances. The powerful APS-100/400GE series test platform enables NEMs to shorten their development cycles and help data center operators protect their critical infrastructure while delivering hyperscale end-user application performance.

Highlights

Centralized 'single pane of glass' management of up to 16 APS-ONE-400 or APS-ONE-100 compute appliances simplifies testing and software upgrades, providing one IP address for the entire system.

Flexible 'pay-as-you-grow' model to maximize your test budget: run the APS-ONE-400 or APS-ONE-100 appliance in standalone mode, or build a stacked system with the APS-M8400 appliance to aggregate up to 16 appliances as 'compute nodes.'

Unified application and security test platform with support for BreakingPoint, CyPerf, and IxLoad test applications.

- Get unrivaled elephant flow performance of up to 97 Gbps per single TCP connection.
- Unparalleled encrypted traffic performance capabilities, generating up to 3.6 Tbps TLS throughput, 6.4M TLS connections per second and 72M TLS concurrent connections.
- Generate hyperscale performance under realistic traffic conditions with Keysight's industry-leading application and security test tools.
- Future-proof your investment with an upgrade path to 8x400GE QSFP-DD and support for 400/100/50/40/25/10GE multi-speed modes through APS-M8400.



Figure 1. APS-ONE-400 appliance



Figure 2. APS-M8400 appliance

The APS-100 / 400GE platform is driven by Keysight BreakingPoint, CyPerf, and IxLoad test applications, industry leading test solutions for application delivery and security resiliency testing.

A single APS-ONE-400 appliance can actively use up to four QSFP28 100GE interfaces per single test configuration to deliver unparalleled TLS performance of up to 400k TLS connections per second¹, 6M TLS concurrent connections² and 360 Gbps of encrypted throughput¹ powered by hardware-based TLS acceleration, significantly improving the transmission of realistic application mixes over TLS connections.

Use the APS-M1010 controller to scale up to 10 APS-ONE-400 appliances as compute nodes to drive hyperscale loads like 4M TLS connections per second³, 60M TLS concurrent connections⁴ and 3.6 Tbps of encrypted throughput.³

Need even more test capacity? Leverage the APS-M8400 appliance and its 8x400GE QSFP-DD native I/O to aggregate up to 16 APS-ONE-400 appliances as compute nodes and harness the industry's most powerful application and security test platform, capable of generating 6.4M TLS connections per second⁵, 72M concurrent TLS connections⁵, and 3.2 Tbps of encrypted throughput.⁶

- ¹ APS-ONE-400 with IxLoad
- ² APS-ONE-400 with CyPerf
- ³ APS-M1010 + 10x APS-ONE-400 with IxLoad
- ⁴ APS-M1010 + 10x APS-ONE-400 with CyPerf
- ⁵ APS-M8400 + 16x APS-ONE-400 with IxLoad
- ⁶ APS-M8400 + 16x APS-ONE-400 with BreakingPoint or IxLoad

Product Capabilities

The APS Series of next-generation application and security test platforms make up a hyperscale Layer 4–7 test solution for validating devices and systems under real-world conditions, helping users to identify performance and interoperability issues quickly and easily. The flexible, modular architecture allows linear performance scaling to multi-terabit levels by stacking up to 10 x APS-ONE-400 or APS-ONE-100 appliances as in a single system controlled by the APS-M1010 controller, or up to 16 x APS-ONE-400 or APS-ONE-100 appliances controlled by the APS-M8400 400GE QSFP-DD appliance.

The APS-M1010 controller and APS-M8400 appliance deliver centralized management and software updates for up to 10 compute nodes (APS-M1010) and 16 compute nodes (APS-M8400) respectively, both via dedicated management ports, enabling fast uplink connectivity and direct access to each APS-ONE-400 or APS-ONE-100 appliance, eliminating the need for intermediary Layer 2 switches and providing a single management IP address for the entire cluster.



Figure 3. Hyperscale testing with up to 5.1 billion concurrent sessions, 88 million CPS, and 3.6 Tbps encrypted TLS throughput.

The growing complexity and volume of network loads driven by AI and machine learning - including legitimate and malicious traffic, Post Quantum Cryptography (PQC) encrypted traffic, and Elephant Flows, coupled with industry moves to 400GE I/O and the shift to Zero-Trust Network Access (ZTNA) require NEMs, service providers, and data center operators to validate that their solutions can withstand these demands prior to deployment. However, this validation often requires multiple specialized test tools that can drive up costs and consume limited lab resources.

The Keysight APS Series of application and security test devices allow future-proof validation of hyperscale data center infrastructures and service provider networks with the capacity to generate up to 3.8 Tbps L47 throughput, 5.1 billion concurrent TCP sessions, 88 million HTTP connections per second, and 3.6 Tbps of TLS encrypted traffic from a fully populated system. And the APS-100 / 400GE series underlying management operating system has been purpose built with a cloud-native architecture for improved scalability, security, and resilience.

Hardware

The APS-ONE-400 and APS-ONE-100 appliances feature powerful multi-core processors with dedicated memory and crypto accelerators backing a cloud-native software implementation to generate realistic, hyperscale-volume traffic. They can be used in a standalone mode or stacked together with other appliances in a system controlled by a dedicated APS-M1010 system controller (supports up to 10 APS-ONE-400 or APS-ONE-100 appliances) or a dedicated APS-M8400 appliance with 8x400GE QSFP-DD (supports up to 16 APS-ONE-400 or APS-ONE-100 appliances).

This flexible, modular approach reduces CAPEX and simplifies the management of the test system while allowing for higher test port densities. The APS-ONE-400 and APS-ONE-100 appliances support 100/25/10GE on the same port, while the APS-M8400 supports 400 / 200 / 100 / 50 / 40 / 25 / 10GE on the same port, further reducing CAPEX by eliminating the need to buy different hardware for each speed and increasing test platform efficiency.

Software Applications

The APS-100 / 400GE series platform is driven by Keysight BreakingPoint, CyPerf, and IxLoad and test applications, industry leading test solutions for application delivery and security resiliency testing. In stand-alone mode, APS-ONE-400 and APS-ONE-100 support the BreakingPoint test application. By adding an APS-M1010 controller, users have the option to enable support for BreakingPoint, CyPerf, or IxLoad on up to 10 x APS-ONE-400 or APS-ONE-100 appliances. APS-M8400 currently supports running BreakingPoint or IxLoad on up to 16 x APS-ONE-400 or APS-ONE-100 appliances.

Specifications

Performance Metric	APS-ONE-400 Appliance
Applications Support	
KCOS	Yes
BreakingPoint	Yes, except Bit Blaster, Routing Robot/Adv Routing Robot, Live AppSim
TCL API	Yes
REST API	Yes
Hardware Specifications	
Physical interfaces	Front I/O: 4-port 100GE QSFP28 per appliance for test traffic Rear I/O: (1) 10GE management network port for fast uplink network connectivity

	(2) Dedicated RJ-45 BMC port for IMPI (3) Dedicated RJ-45 Serial port for serial connection (4) 10GE network port for future expandability (5) Dual USB port for future expandability
Physical test interfaces	Up to 4 x 100GE QSFP28 interfaces per test configuration
Fanout modes	8 x 10GE per appliance (BreakingPoint and IxLoad) 8 x 25GE per appliance (BreakingPoint and IxLoad)
Transceiver support	QSFP28 SR4 and CR4 (pluggable transceivers)
Hardware encryption offload	Yes
Traffic Capture	Software-based
Capture memory	Maximum between 2GB or 2 million packets, per interface
IPv4, IPv6, UDP, TCP	Hardware checksum generation
Dimensions	31.5" (L) x 19" (W) x 1.75" (H) 800 mm (L) x 482.6 mm (W) x 44.5 mm (H)
Operating temperature	32 °F to 95 °F (0 °C to 35 °C), ambient air
Weight	40.50 lbs 18.3 kgs

Performance Metric APS-ONE-100 Appliance

Applications Support	
KCOS	Yes
BreakingPoint	Yes, except Bit Blaster, Routing Robot/Adv Routing Robot, Live AppSim
TCL API	Yes
REST API	Yes
Hardware Specifications	
Physical interfaces	Front I/O: 4-port 100GE QSFP28 per appliance for test traffic Rear I/O: (1) Dual 1GE management network ports for fast uplink network connectivity and BMC management over NCSI (2) Dual 10GE management network ports for future expandability (3) Dedicated BMC management port
Physical test interfaces	Up to 4 x 100GE QSFP28 interfaces per test configuration
Fanout modes	8 x 10GE per appliance (BreakingPoint and IxLoad) 8 x 25GE per appliance (BreakingPoint and IxLoad)
Transceiver support	QSFP28 SR4 and CR4 (pluggable transceivers)
Hardware encryption offload	Yes
Traffic Capture	Software-based
Capture memory	Maximum between 2GB or 2 million packets, per interface
IPv4, IPv6, UDP, TCP	Hardware checksum generation
Dimensions	30" (L) x 19" (W) x 1.7" (H) 762 mm (L) x 482 mm (W) x 43.65 mm (H)
Operating temperature	41 °F to 95 °F (5 °C to 35 °C), ambient air
Weight	36.06 lbs 15.9 kgs

Performance Metric APS-M1010 Controller

Applications Support	
KCOS	Yes
BreakingPoint	Yes, except Bit Blaster, Routing Robot/Adv Routing Robot, Live AppSim
IxLoad	Yes
CyPerf	Yes
TCL API	Yes
REST API	Yes
Hardware Specifications	
Physical interfaces	Rear I/O: 10-port (active), 10GE RJ45 cluster management ports (1) 10GE management network port for fast uplink network connectivity (2) Dedicated RJ-45 BMC port for IMPI (3) Dedicated RJ-45 Serial port for serial connection (4) 10GE network port for future expandability (5) Dual USB port for future expandability
Transceiver support	N/A
Dimensions	31.5" (L) x 19" (W) x 1.75" (H) 800 mm (L) x 482.6 mm (W) x 44.5 mm (H)
Operating temperature	32 °F to 95 °F (0 °C to 35 °C), ambient air
Weight	38.10 lbs 17.28 kgs
System Capacity	
Appliances per system	Up to 10 x APS-ONE-400, APS-ONE-100

Specification	Description
Input voltage	100-127VAC/200-240VAC, 50-60Hz, 15/10A (x2)
Power supply operating mode ¹	Dual Supply PSU: 100-127VAC/200-240VAC Single Supply PSU: 200-240VAC
Power cords	15A, 250V, C13 TO C14, 6 FT (x2)—Included
Max power requirement	947-4077, 947-4080 (APS-ONE-400) —1600W 941-0110, 941-0114 (APS-ONE-100)—1200W 941-0116 (APS-M1010)—1600W

1. Appliance can operate with one active power supply if (a) receiving 200-240VAC and (b) both power supplies are physically present in the system chassis

Performance Metric APS-M8400 Appliance

Applications Support	
KCOS	Yes
BreakingPoint	Yes, except for Live AppSim, Stack Scrambler
IxLoad	Yes
TCL API	Yes
REST API	Yes
Hardware Specifications	
Physical interfaces	Front I/O: 8-port 400GE QSFP-DD per appliance for test traffic Rear I/O:

Performance Metric	APS-M8400 Appliance
	(1) 16-port 400GE QSFP-DD per appliance for compute node test traffic aggregation (2) 16-port 10GE per appliance for compute node networking (3) 16-port RJ45 per appliance for compute node networking management
Physical test interfaces	Up to 8 x 400GE QSFP-DD interfaces per test configuration
Fanout modes	8 x 10GE per port 8 x 25GE per port 2 x 40GE per port 8 x 50GE per port 4 x 100GE per port 2 x 200GE per port
Transceiver support	QSFP-DD, QSFP56, QSFP28
Traffic Capture	4 x 400GE hardware based
Capture memory	Maximum between 2GB or 2 million packets, per interface
IPv4, IPv6, UDP, TCP	Hardware checksum generation
Dimensions	31" (L) x 16.7" (W) x 3.4" (H) 788.2 mm (L) x 425.2 mm (W) x 87.6 mm (H)
Operating temperature	41 °F to 86 °F (5 °C to 30 °C), ambient air
Weight	56.22 lbs 25.5 kgs
System Capacity	
Appliances per system	Up to 16 x APS-ONE-400, APS-ONE-100

Specification	Description
Input voltage	100-127VAC/200-240VAC, 50-60Hz, 15/10A (x2)
Power supply operating mode ¹	Dual Supply PSU: 100-127VAC/200-240VAC Single Supply PSU: 200-240VAC
Power cords	15A, 250V, C13 TO C14, 6 FT (x2)—Included
Max power requirement	947-4077, 947-4080 (APS-ONE-400) —1600W 941-0110 & 941-0114 (APS-ONE-100)—1200W 941-0111 (APS-M8400)—1800W

1. Appliance can operate with one active power supply if (a) receiving 200-240VAC and (b) both power supplies are physically present in the system chassis

BreakingPoint Performance (APS-ONE-400)

Performance numbers generated in a back-to-back test scenario using an APS-M1010 management controller or APS-M8400 appliance, and APS-ONE-400 appliance(s) as indicated.

Performance Metric	M1010 Controller with Single APS-ONE-400 Appliance	M1010 Controller with 10-Unit APS-ONE-400 System
Application throughput	398 Gbps	3.9 Tbps
HTTP Connection Rate (CPS)	5.5 million	55 million
HTTP Concurrent Connections (CC)	320 million	3200 million
TLS throughput	349 Gbps	3.4 Tbps

(TLS1_2_ECDHE_ECDSA_AES128_GCM_SHA256_2K_key, 256 P 1MB page)		
TLS Connection Rate (CPS) (TLS1_2_ECDHE_ECDSA_AES128_GCM_SHA256_2K_key, 256 P 1B page)	182k	1.8 million
TLS Concurrent Connections (CC)	3.2 million	32 million
IPsec Performance	2M concurrent tunnels 108 Gbps 5.4k tunnels/sec	20M concurrent tunnels 1 Tbps 54k tunnels/sec
Unidirectional HTTP bandwidth (HTTP GET with 64KB response size)	398 Gbps	3.9 Tbps

Performance Metric	APS-M8400 Appliance with 16-Unit APS-ONE-400 System	
Application throughput	3.2 Tbps	
HTTP Connection Rate (CPS)	88 million	
HTTP Concurrent Connections (CC)	5100 million	
TLS throughput (TLS1_2_ECDHE_ECDSA_AES128_GCM_SHA256_2K_key, 256 P 1B page)	3.2 Tbps	
TLS Connection Rate (CPS) (TLS1_2_ECDHE_ECDSA_AES128_GCM_SHA256_2K_key, 256 P 1B page)	2.9 million	
TLS Concurrent Connections (CC)	51 million	
Elephant flow	97 Gbps @ 9200B 27 Gbps @ 1500B	
IPsec performance	32M concurrent tunnels 1.7 Tbps 86k tunnels/sec	
Unidirectional HTTP bandwidth (HTTP GET with 64KB response size)	3.2 Tbps	

BreakingPoint Performance (APS-ONE-100)

Performance numbers generated in a back-to-back test scenario using an APS-M1010 management controller or APS-M8400 appliance, and APS-ONE-100 appliance(s) as indicated.

Performance Metric	M1010 Controller with Single APS-ONE-100 Appliance	M1010 Controller with 10-Unit APS-ONE-100 System
Application throughput	190 Gbps	1.90 Tbps
HTTP Connection Rate (CPS)	3.5 million	35 million
HTTP Concurrent Connections (CC)	320 million	3200 million
TLS throughput (TLS1_2_ECDHE_RSA_AES128_GCM_SHA256_2K_key, 256 P 1MB page)	170 Gbps	1.7 Tbps

TLS Connection Rate (CPS) (ECDHE RSA 2k key, 256 P 1B page)	100k	1 million
TLS Concurrent Connections (CC)	3.2 million	32 million
IPsec Performance	2M concurrent tunnels 80 Gbps 4k tunnels/sec	20M concurrent tunnels 800 Gbps 40k tunnels/sec
Unidirectional HTTP Bandwidth (HTTP GET with 64KB response size)	190 Gbps	1.90 Tbps

Performance Metric	APS-M8400 Appliance with 16-Unit APS-ONE-100 System	
Application throughput	3.2 Tbps	
HTTP Connection Rate (CPS)	56 million	
HTTP Concurrent Connections (CC)	5100 million	
TLS throughput (TLS1_2_ECDHE_RSA_AES128_GCM_SHA256_2K_key, 256 P 1MB page)	2.7 Tbps	
TLS Connection Rate (CPS) (ECDHE RSA 2k key, 256 P 1B page)	1.6 million	
TLS Concurrent Connections (CC)	51 million	
Elephant flow	65 Gbps @ 9200B 27 Gbps @ 1500B	
IPsec performance	32M concurrent tunnels 1.2 Tbps 64k tunnels/sec	
Unidirectional HTTP bandwidth (HTTP GET with 64KB response size)	3.2 Tbps	

IxLoad Performance (APS-ONE-400)

Performance numbers generated in a back-to-back test scenario using an APS-M1010 management controller or APS-M8400 appliance, and APS-ONE-400 appliance(s) as indicated.

Performance Metric	M1010 Controller with single APS-ONE-400 Appliance	M1010 Controller with 10-Unit APS-ONE-400 System
Application throughput	387 Gbps	3.8 Tbps
HTTP Connection Rate (CPS)	5.5 million	55 million
HTTP Concurrent Connections (CC)	160 million	1600 million
TLS throughput (TLS 1.2, ECDHE ECDSA, 256 P, 1MB page)	360 Gbps	3.6 Tbps
TLS Connection Rate (CPS) (TLS 1.2, ECDHE ECDSA, 256 P, 1B page)	400k	4 million
TLS Concurrent Connections (CC) (TLS 1.2, ECDHE ECDSA, 256 P)	4.5 million	45 million

IPsec Performance	1 million conc. tunnels	10 million conc. tunnels
	380 Gbps (UDP)	3.8 Tbps (UDP)
	20k tunnels/sec	200k tunnels/sec
	Single tunnel 20 Gbps (UDP)	

Performance Metric	APS-M8400 Appliance with 16-Unit APS-ONE-400 System
Application throughput	3.2 Tbps
HTTP Connection Rate (CPS)	88 million
HTTP Concurrent Connections (CC)	2500 million
TLS throughput (TLS 1.2, ECDHE ECDSA, 256 P, 1MB page)	3.2 Tbps
TLS Connection Rate (CPS) (TLS 1.2, ECDHE ECDSA, 256 P, 1B page)	6.4 million
TLS Concurrent Connections (CC) (TLS 1.2, ECDHE ECDSA, 256 P)	72 million
IPsec performance	16M concurrent tunnels 3.2 Tbps 320k tunnels/sec

IxLoad Performance (APS-ONE-100)

Performance numbers generated in a back-to-back test scenario using an APS-M1010 management controller or APS-M8400 appliance, and APS-ONE-100 appliance(s) as indicated.

Performance Metric	M1010 Controller with single APS-ONE-100 Appliance	M1010 Controller with 10-Unit APS-ONE-100 System
Application throughput	193 Gbps	1.93 Tbps
HTTP Connection Rate (CPS)	4.8 million	48 million
HTTP Concurrent Connections (CC)	160 million	1.6 billion
TLS throughput (TLS 1.2, ECDHE ECDSA, 256 P, 1MB page)	178 Gbps	1.78 Tbps
TLS Connection Rate (CPS) (TLS 1.2, ECDHE ECDSA, 256 P, 1B page)	340k	3.4 million
TLS Concurrent Connections (CC) (TLS 1.2, ECDHE ECDSA, 256 P)	4.5 million	45 million
IPsec performance	1 million conc. tunnels 180 Gbps (UDP) 20k tunnels/sec Single tunnel 20 Gbps (UDP)	10 million conc. tunnels 1.8 Tbps (UDP) 200k tunnels/sec

Performance Metric	APS-M8400 Appliance with 16-Unit APS-ONE-100 System
Application throughput	3.0 Tbps
HTTP Connection Rate (CPS)	76 million

Performance Metric	APS-M8400 Appliance with 16-Unit APS-ONE-100 System
HTTP Concurrent Connections (CC)	2500 million
TLS throughput (TLS 1.2, ECDHE ECDSA, 256 P, 1MB page)	2.8 Tbps
TLS Connection Rate (CPS) (TLS 1.2, ECDHE ECDSA, 256 P, 1B page)	5.0 million
TLS Concurrent Connections (CC) (TLS 1.2, ECDHE ECDSA, 256 P)	72 million
IPsec performance	16M concurrent tunnels 2.9 Tbps 320k tunnels/sec

IxLoad Application Support

IxLoad Application Support	APS-ONE-100 Appliance
Application delivery	• HTTP • HTTPS • HTTP/2 • HTTP/3 • DNS • Application replay • Stateless peer • FTP
IPsec	• IKEv1, IKEv2, IPsec Suites B • IPsec Quick Tests
Stack manager	• Static ARP • GratARP • IPv4 / IPv6 • DNS • DHCPv4 • DHCPv6

CyPerf Performance (APS-ONE-400)

Performance numbers generated in a back-to-back test scenario using an APS-M1010 controller and APS-ONE-400 appliance(s) as indicated

Performance Metric	M1010 Controller with Single APS-ONE-400 Appliance	M1010 Controller with 10-Unit APS-ONE-400 System
Application throughput	393 Gbps	3.9 Tbps
HTTP Connection Rate (CPS)	5.3 million	53 million
HTTP Concurrent Connections (CC)	45 million	450 million

TLS throughput (TLS 1.2, ECDHE ECDSA, 256 P, 1MB page)	331 Gbps	3.3 Tbps
TLS Connection Rate (CPS) (TLS 1.2, ECDHE ECDSA, 256 P, 1B page)	224k	2.2 million
TLS Concurrent Connections (CC) (TLS 1.2, ECDHE ECDSA, 256 P)	6 million	60 million

CyPerf Performance (APS-ONE-100)

Performance numbers generated in a back-to-back test scenario using an APS-M1010 controller and APS-ONE-100 appliance(s) as indicated

Performance Metric	M1010 Controller with Single APS-ONE-100 Appliance	M1010 Controller with 10-Unit APS-ONE-100 System
Application throughput	190 Gbps	1.90 Tbps
HTTP Connection Rate (CPS)	4.8 million	48 million
HTTP Concurrent Connections (CC)	45 million	450 million
TLS throughput (TLS 1.2, ECDHE ECDSA, 256 P, 1MB page)	185 Gbps	1.85 Tbps
TLS Connection Rate (CPS) (TLS 1.2, ECDHE ECDSA, 256 P, 1B page)	165k	1.65 million
TLS Concurrent Connections (CC) (TLS 1.2, ECDHE ECDSA, 256 P)	6 million	60 million

Product Ordering Information for BreakingPoint

Part Number	Description
947-4077	APS-ONE-400 Fusion Compute Node with 4x100GE. Compatible for use in stand-alone mode (BreakingPoint only), with APS-M1010 Management Controller (BreakingPoint, CyPerf, or IxLoad) (941-0116), or with APS-M8400, 8-port 400GE QSFP-DD appliance (BreakingPoint or IxLoad) (941-0111). Requires ONE of the following options (sold separately at the time of purchase): (1) BreakingPoint Application & Threat Intelligence (ATI) (909-0856); (2) CyPerf perpetual software license for a single APS-ONE appliance, floating license (per controller) TAA Compliant (938-2001); (3) CyPerf and BreakingPoint software license bundle for a single APS-ONE appliance. TAA Compliant (938-2003)
941-0110	APS-ONE-100 Fusion Compute Node with 4x100GE. Compatible for use in stand-alone mode (BreakingPoint only), with APS-M1010 Management Controller (BreakingPoint, IxLoad or CyPerf) (941-0116), or with APS-M8400, 8-port 400GE QSFP-DD appliance (BreakingPoint or IxLoad) (941-0111). Requires ONE of the following options (sold separately at the time of purchase): (1) BreakingPoint Application & Threat Intelligence (ATI) (909-0856); (2) CyPerf perpetual software license for a single APS-ONE appliance, floating license (per controller) TAA Compliant (938-2001); (3) CyPerf and BreakingPoint software license bundle for a single APS-ONE appliance. TAA Compliant (938-2003)

Part Number	Description
941-0116	APS-M1010 Management Controller. Supports BreakingPoint, IxLoad, and CyPerf applications. This controller can manage up to 10 x APS-ONE-400 (947-4077, 947-4080) or APS-ONE-100 (941-0110, 941-0114) Compute Nodes. Note: APS-ONE-400 and APS-ONE-100 Compute Nodes are purchased separately.
941-0111	APS-M8400, 8-port 400GE QSFP-DD appliance Supports BreakingPoint and IxLoad applications. This appliance can manage up to 16 x APS-ONE-400 (947-4077, 947-4080) or APS-ONE-100 (941-0110, 941-0114) Compute Nodes. Note: APS-ONE-400 and APS-ONE-100 Compute Nodes are purchased separately.
909-0856	BreakingPoint Application and Threat Intelligence (ATI) Subscription Program
938-2003	CyPerf and BreakingPoint software license bundle for a single APS-ONE-400 or APS-ONE-100 appliance. TAA Compliant (938-2003)
QSFP28-SR4-XCVR	QSFP28 100GBASE-SR4 100GE pluggable optical transceiver, MMF (multimode), 850 nm, 100 m reach
QSFP-DD-SR8-XCVR	QSFP-DD-SR8-XCVR 400GBASE-SR8 400GE pluggable optical transceiver, MMF (multimode), 850nm, 100m reach
QSFP-DD-DR4-XCVR	QSFP-DD-DR4-XCVR 400GBASE-DR4 400GE pluggable optical transceiver, SMF (singlemode), 1310nm, 500-meter reach
QSFP-DD-FR4-XCVR	QSFP-DD-FR4-XCVR QSFP-DD 400GBASE-FR4 400GE pluggable optical transceiver, SMF (singlemode), 1310nm, 2km reach
QSFP-DD-LR4-XCVR	QSFP-DD-LR4-XCVR 400GBASE-LR4 400GE pluggable optical transceiver, SMF (singlemode), 1310nm, 10km reach
942-0138	QSFP-DD-DR4-CBL MT-to-4x100GE LC fan-out, SMF, 3-meter cable for 100GE fan-out (QSFP-DD-DR4-CBL)
942-0140	QSFPDD4XQ56-1-5M-CBL 400GBASE-R Direct Attached Copper cable (DAC), 1.5-meter length
942-0141	QSFPDD2XQ56-2-5M-CBL 400GBASE-R Direct Attached Copper cable (DAC), 2.5-meter length
942-0142	QSFPDD8XQ56-1-5M-CBL 400GBASE-R Direct Attached Cable (DAC), 1.5-meter length
942-0139	QSFP-DD-to-4xQSFP28 400GBASE-R Active Electrical fan-out Cable (AEC), for 400GE to 4x100GE fan-out, 3-meter length
942-0088	QSFP28 passive, copper, Direct Attach Cable (DAC), 3-meter length
942-0067	Ixia, MT-4 x LC, 10GE, and 25 fan-out cable, MMF (multimode), 3-meter length for 4 x 10GE, 4 x 25GE fan-out
942-0109	Ixia, QSFP-DD-2M-CBL 400GE 400GBASE-R passive copper, Direct Attach Cable, 2-meter length
942-0160	Ixia, QSFP-DD-to-4xQSFP28 400GBASE-R Active Electrical fan-out Cable (AEC), for 400GE to 4x100GE fan-out, 3-meter length (942-0160) for connecting APS-ONE-100 compute nodes to APS-M8400 backplane. ONLY COMPATIBLE WITH APS-M8400

Product Ordering Information for BreakingPoint TAA-Compliant Parts

Part Number	Description
941-0110-T	TAA Compliant, APS-ONE-100 Fusion Compute Node with 4x100GE
QSFP28-SR4-XCVR-T	TAA compliant, QSFP28 100GBASE-SR4 100GE pluggable optical transceiver, MMF (multimode fiber), 850 nm, 100 m reach (995-8040)

Product Ordering Information for IxLoad

Part Number	Description
947-4080	APS-ONE-400, Compute Node for IxLoad with 4x100GE front I/O ports for the APS-M1010 Management Controller (941-0116) or APS-M8400 appliance (941-0111).
941-0114	APS-ONE-100, Compute Node for IxLoad with 4x100GE front I/O ports for the APS-M1010 Management Controller (941-0116) or APS-M8400 appliance (941-0111).
941-0116	APS-M1010 Management Controller. Supports BreakingPoint, IxLoad, and CyPerf applications. This controller can manage up to 10 x APS-ONE-400 (947-4077, 947-4080) or APS-ONE-100 (941-0110, 941-0114) Compute Nodes. Note: APS-ONE-400 and APS-ONE-100 Compute Nodes are purchased separately.
941-0111	APS-M8400, 8-port 400GE QSFP-DD appliance Supports BreakingPoint and IxLoad applications. This appliance can manage up to 16 x APS-ONE-400 (947-4077, 947-4080) or APS-ONE-100 (941-0110, 941-0114) Compute Nodes. Note: APS-ONE-400 and APS-ONE-100 Compute Nodes are purchased separately.
925-6201	Ixia, IxLoad-DATA Perpetual License Bundle for a single APS-ONE-400 or APS-ONE-100 appliance, floating license (per controller) (925-6201). The license enables IxLoad-DATA functionality on a single APS-ONE-400 or APS-ONE-100 appliance (compute node). It can be used with any single appliance managed by an APS-M1010 management controller or APS-M8400 appliance. It includes an IxLoad Framework license and support for the DATA traffic activities (HTTP, HTTPS, DNS, AppReplay, FTP, IPSec). TAA compliance is determined by the hardware on which the license is enabled.
QSFP28-SR4-XCVR	QSFP28 100GBASE-SR4 100GE pluggable optical transceiver, MMF (multimode), 850 nm, 100 m reach
QSFP-DD-SR8-XCVR	QSFP-DD-SR8-XCVR 400GBASE-SR8 400GE pluggable optical transceiver, MMF (multimode), 850nm, 100m reach
QSFP-DD-DR4-XCVR	QSFP-DD-DR4-XCVR 400GBASE-DR4 400GE pluggable optical transceiver, SMF (singlemode), 1310nm, 500-meter reach
QSFP-DD-FR4-XCVR	QSFP-DD-FR4-XCVR QSFP-DD 400GBASE-FR4 400GE pluggable optical transceiver, SMF (singlemode), 1310nm, 2km reach
QSFP-DD-LR4-XCVR	QSFP-DD-LR4-XCVR 400GBASE-LR4 400GE pluggable optical transceiver, SMF (singlemode), 1310nm, 10km reach
942-0138	QSFP-DD-DR4-CBL MT-to-4x100GE LC fan-out, SMF, 3-meter cable for 100GE fan-out (QSFP-DD-DR4-CBL)
942-0140	QSFPDD4XQ56-1.5M-CBL 400GBASE-R Direct Attached Copper cable (DAC), 1.5-meter length
942-0141	QSFPDD2XQ56-2.5M-CBL 400GBASE-R Direct Attached Copper cable (DAC), 2.5-meter length
942-0142	QSFPDD8XQ56-1.5M-CBL 400GBASE-R Direct Attached Cable (DAC), 1.5-meter length
942-0139	QSFP-DD-to-4xQSFP28 400GBASE-R Active Electrical fan-out Cable (AEC), for 400GE to 4x100GE fan-out, 3-meter length

Part Number	Description
942-0088	QSFP28 passive, copper, Direct Attach Cable (DAC), 3-meter length
942-0067	Ixia, MT-4 x LC, 10GE, and 25 fan-out cable, MMF (multimode), 3-meter length for 4 x 10GE, 4 x 25GE fan-out
942-0109	Ixia, QSFP-DD-2M-CBL 400GE 400GBASE-R passive copper, Direct Attach Cable, 2-meter length
942-0160	Ixia, QSFP-DD-to-4xQSFP28 400GBASE-R Active Electrical fan-out Cable (AEC), for 400GE to 4x100GE fan-out, 3-meter length (942-0160) for connecting APS-ONE-100 compute nodes to APS-M8400 backplane. ONLY COMPATIBLE WITH APS-M8400
983-2401	Field HW Upgrade for APS-ONE-100 (941-0114) to add BreakingPoint Perpetual Software License, TAA Compliant
983-2403	Field HW Upgrade Bundle for APS-ONE-100 (941-0114) to add BreakingPoint and CyPerf Perpetual Software Licenses, TAA Compliant
938-2003	CyPerf and BreakingPoint perpetual software license bundle for a single APS-ONE-100 appliance. TAA Compliant.

Product Ordering Information for CyPerf

Part Number	Description
947-4077	APS-ONE-400 Fusion Compute Node with 4x100GE. Compatible for use in stand-alone mode (BreakingPoint only), with APS-M1010 Management Controller (BreakingPoint, IxLoad or CyPerf) (941-0116), or with APS-M8400, 8-port 400GE QSFP-DD appliance (BreakingPoint or IxLoad) (941-0111). Requires ONE of the following options (sold separately at the time of purchase): (1) BreakingPoint Application & Threat Intelligence (ATI) (909-0856); (2) CyPerf perpetual software license for a single APS-ONE appliance, floating license (per controller) TAA Compliant (938-2001); (3) CyPerf and BreakingPoint software license bundle for a single APS-ONE appliance. TAA Compliant (938-2003)
941-0110	APS-ONE-100 Fusion Compute Node with 4x100GE. Compatible for use in stand-alone mode (BreakingPoint only), with APS-M1010 Management Controller (BreakingPoint, IxLoad or CyPerf) (941-0113), or with APS-M8400, 8-port 400GE QSFP-DD appliance (BreakingPoint only) (941-0111). Requires ONE of the following options (sold separately at the time of purchase): (1) BreakingPoint Application & Threat Intelligence (ATI) (909-0856); (2) CyPerf perpetual software license for a single APS-ONE-100 appliance, floating license (per controller) TAA Compliant (938-2001); (3) CyPerf and BreakingPoint software license bundle for a single APS-ONE-100 appliance. TAA Compliant (938-2003)
941-0116	APS-M1010 Management Controller. Supports BreakingPoint and IxLoad applications. This controller can manage up to 10 x APS-ONE-100 Compute Nodes (941-0110, 941-0114). Note: APS-ONE-100 Compute Nodes are purchased separately.
QSFP28-SR4-XCVR	QSFP28 100GBASE-SR4 100GE pluggable optical transceiver, MMF (multimode), 850 nm, 100 m reach
942-0088	QSFP28 passive, copper, Direct Attach Cable (DAC), 3-meter length
942-0067	Ixia, MT-4 x LC, 10GE, and 25 fan-out cable, MMF (multimode), 3-meter length for 4 x 10GE, 4 x 25GE fan-out
938-2001	CyPerf software license for a single APS-ONE-400 or APS-ONE-100 appliance, floating license. TAA Compliant. (938-2001)
938-2002	CyPerf software license add-on for a single APS-ONE-400 or APS-ONE-100 appliance with an active BreakingPoint - Application & Threat Intelligence subscription (floating license). TAA Compliant.
938-2003	CyPerf and BreakingPoint software license bundle for a single APS-ONE-400 or APS-ONE-100 appliance. TAA Compliant (938-2003)
909-6001	CyPerf software license Renewal for CyPerf licenses on APS-100/400GE series. TAA Compliant.

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