

PerfectStorm® ONE

10GE/40GE Appliance

Enterprise-Scale Application and Security Testing – Anywhere, Anytime

Building upon the terabit-scale PerfectStorm platform, PerfectStorm ONE™ appliances offers enterprises, service providers, and technology vendors a revolutionary solution for generating stateful applications and malicious traffic, simulating millions of real-world end-user environments to test and validate infrastructure, a single device, or an entire system.

PerfectStorm ONE's unique combination of portability, performance, and cost-effectiveness allows any organization to perform enterprise-scale performance and security testing anywhere, at any time, using the exact application, attack, and load behavior needed to optimize and harden any IT infrastructure.

PerfectStorm ONE facilitates network and security proof-of-concepts (POCs) and assessments, all in a compact device. This POC-in-a-box enables enterprises and service providers to select optimal devices and right-size data centers, as well as providing device vendors with a platform to fully showcase their product's performance, resiliency, and throughput under real-world traffic loads.

The proliferation of dynamic and evolving applications, along with an increase in advanced malicious attacks, has created a dangerous lack of control and visibility into both the performance and security of IT infrastructures.

By seamlessly unifying the IxLoad and BreakingPoint software applications into a single enterprise-ready system, the PerfectStorm ONE solution now enables

Highlights

- Enterprise-scale applications and security testing, anywhere, anytime
- Enterprise's maximize investments in security devices and data center consolidation with POC testing
- Equipment vendors establish a scalable and transportable POC lab for customer evaluations using custom traffic scenarios
- Unified architecture supports BreakingPoint and IxLoad applications
- Native 40GE QSFP+ interfaces with 4 x 10GE fan-out option
- Compact form factor and reduced power requirements for customers that have a need for high performance, yet are constrained by lab space and power availability
- High-performance with hardware-based acceleration for SSL and IPsec



PerfectStorm ONE 40GE (PS40GE2) and PerfectStorm ONE Fusion 40GE (PS40GE2NG) appliance

enterprises to take advantage of the performance and functionality service providers and equipment manufacturers use to test large network infrastructures.

The Ixia PerfectStorm ONE is the essential solution to:

- Evaluate network equipment to choose the right device for your unique network
- Right-size data centers and virtualized infrastructures for peak performance and capacity use
- Perform on-the-go cyber security research and simulations to keep ahead of the latest threats
- Deploy global compact cyber ranges to harden critical communication infrastructures
- Train and certify cyber warriors to predict and prevent attack
- Reduce time-to-test to minimize costs and accelerate development of network and data center devices

Key Features

Large capacity and performance – small footprint and power needs

The world is becoming an always-connected, mobile environment, with massive volumes of traffic flowing through WANs, LANs, and data centers. The increase in network traffic scale, complexity, and types is causing a huge upswing in data center port counts and technology diversity.

Equipped with powerful multi-core, multi-threaded network processors, PerfectStorm ONE uses Ixia's next-generation architecture designed to satisfy high-throughput testing needs. Due to its compact form factor and reduced power requirements, the PerfectStorm ONE is a great option for customers that have a need for high performance, yet are constrained by the space and power availability in their lab.

A single appliance allows control of up to 80Gbps of blended application traffic, 60 million concurrent connections, and new TCP connection rates of up to 2 million/sec. The hardware-based acceleration supports massive encryption levels with up to 40Gbps encrypted throughput per system. The system uses inline field programmable gate arrays (FPGAs) for enhanced accuracy pertaining to latency measurements with a resolution of 10ns and to deliver line-rate performance, including small 64-byte packets. Both IxLoad and BreakingPoint software solutions allow customers to increase the scalability by combining multiple appliances to the same test to drive operations, reporting, and results analysis from a single, unified user interface.

Flexible operation modes

The advanced aggregation capabilities of the PerfectStorm ONE 40GE appliances allow them to operate in two different modes, providing extra flexibility and performance:

Non-Aggregated, Mode: In this mode, each 40GE port uses of ½ of the network processor and memory resources available on the load module, allowing delivery of application traffic at wire-speeds for each port, with up to 80 Gbps per module.

40GE Aggregated, Mode: This mode provides extra flexibility to allocate all network processor and memory resources available on a load module to a single 40GE port, doubling the performance the performance achieved per 40GE port. Ixia test applications transparently configure the allocation of NP resources to achieve the maximum performance.

40GE QSFP+ to 4x10GE SFP+, Mode: This mode provides additional flexibility in connecting to 10GE devices using 40GE to 4 x 10GE fan-out cables. In fan-out mode, the appliance provides access to 8 x 10GE SFP+ interfaces.

Hardware variants

The PerfectStorm ONE 40GE appliance consists of 2-port 40GE QSFP+ interfaces, and is available in two variants:

- PerfectStorm ONE, 2-port 40GE QSFP+ appliance
- PerfectStorm ONE Fusion, 2-port 40GE QSFP+ appliance

Both variants provide support for 8 x 10GE SFP+ via fan-out cable (MT-to-4x10GE LC fan-out, MMF, 3-meter or 5-meter cables) and QSFP+ 40GE optical transceiver, MMF, 850nm (948-0031).

Specifications

PerfectStorm ONE 10GE/40GE appliance specifications

| Specification | PerfectStorm ONE Fusion PS40GE2NG | PerfectStorm ONE Standard PS40GE2 |
|--|---|-----------------------------------|
| IxOS | Yes | Yes |
| IxExplorer | No | No |
| IxLoad | Yes | Yes |
| IxNetwork | No | No |
| BreakingPoint | Yes | No |
| TCL API | Yes | Yes |
| Hardware, Load Module Specifications | | |
| Physical Interfaces | 2-port, 40GE QSFP+ (native) | |
| | 8-port, 10GE SFP+ via fan-out cable | |
| Transceiver Support | QSFP+, 40GBASE-SR4 (pluggable transceivers) | |
| Memory | 64GB | 64GB |
| Hardware-Based Traffic Capture (available in BreakingPoint) | 1GB per 40GE interface 256 MB per 10GE interface | N/A |

| Specification | PerfectStorm ONE Fusion PS40GE2NG | PerfectStorm ONE Standard PS40GE2 |
|--|--|---|
| Software-Based Traffic Capture Buffer (available in IxLoad) | Maximum between 2GB or 2 Million packets, per interface | Maximum between 2GB or 2 Million packets, per interface |
| FPGA Offload | Yes | Yes |
| IPv4, IPv6, UDP, TCP | Hardware checksum generation | |
| Appliance Dimensions | Length (Depth) – 17.1 inches (43.43 cm) Width – 13.23 inches (33.60 cm) Height – 3.12 inches (7.93 cm) | |
| Appliance Weight | 21 lbs. (9.52 Kg) | |
| Operating Temperature Range | 41°F to 95°F (5°C to 35°C), ambient air | |
| Power | Input Voltage: 90V to 264V Total Max Power: 750W | |
| Integrated System Controller | | |
| CPU | Quad-Core, Intel Processor | |
| HDD | 1 TB, Enterprise Class, High MTBF | |
| Operating System | Native IxOS | |
| Rack Mount (included with Appliance) | | |
| Rack Mount Dimensions: | 2U rackmount, 19.0 x 17.15 x 3.46 inches | |
| Rack Mount Weight: | 4.1 lbs. | |

PerfectStorm ONE 40GE Fusion appliance, BreakingPoint performance

Performance numbers provided back-to-back using a single appliance. Published SSL metrics were measured with 2K key-size in ideal test configurations to maximize performance.

| Performance Metric | PerfectStorm ONE Fusion PS40GE2NG |
|-----------------------------------|-----------------------------------|
| Applications Throughput | 80Gbps |
| TCP Connections per Second | 2M |

| Performance Metric | PerfectStorm ONE Fusion PS40GE2NG |
|--|-----------------------------------|
| Applications Concurrent Flows | 60 Million |
| SSL Bandwidth | 20Gbps |
| SSL Connection Rates | 200,000 |
| SSL Concurrent Flows | 1 Million |
| Applications Throughput over SCTP | 10Gbps |
| Applications Throughput over IPsec | 25Gbps |
| IPsec, Concurrent Tunnels | 500,000 |
| IPsec, Tunnel Setup Rates | 2,000 |
| Applications Throughput over GTP (IPv4) | 40Gbps |
| GTP, UE Attachment Rate (per second) | 450K |
| GTP, Tunnels | 6M |

PerfectStorm ONE 40GE Fusion appliance, BreakingPoint mobility

| BreakingPoint | PerfectStorm ONE Fusion (PS40GE2NG) |
|-------------------------|---|
| Mobility (3G/4G) | <p>Interfaces Supported</p> <ul style="list-style-type: none"> • S1-U (eNodeB and SGW sides) • S1-MME (eNodeB side) • SGi (PDN side) • S5/8 (SGW and PGW sides) • S11 (MME and SGW sides) • Gn (SSGN and GGSN sides) <p>Wireless Protocols Supported</p> <ul style="list-style-type: none"> • S1AP • GTP-C v1, GTP-C v2, GTP-U v1 • SCTP (over UDP or IP) <p>3G/4G Operational Modes</p> <ul style="list-style-type: none"> • eNodeBs + UEs • PDN • MME • SGW + PGW + PDN |

| BreakingPoint | PerfectStorm ONE Fusion (PS40GE2NG) |
|---------------|---|
| | <ul style="list-style-type: none"> • eNodeBs + UEs + MME, SGW + PGW + PDN • SGSN + UEs • GGSN + PDN • UE/eNB/MME/SGW • PGW/PDN • UE/eNB vs. MME/SGW/PGW/PDN |

PerfectStorm ONE 40GE Fusion appliance, BreakingPoint test components

| BreakingPoint | PerfectStorm ONE Fusion (PS40GE2NG) |
|------------------------|---|
| Test Components | <ul style="list-style-type: none"> • Bit Blaster • Routing Robot • Application Simulator • Session Sender • Security • Security NP • Recreate • Stack Scrambler • Hardware-Based Packet Capture (1GE per 40GE Interface) |
| Labs | <ul style="list-style-type: none"> • RFC 2544 • Resiliency Score • Session Sender • Lawful Intercept • Multicast • LTE |

PerfectStorm ONE 40GE appliance, IxLoad performance

Performance numbers provided back-to-back using a single appliance. Published SSL metrics were measured with 2K key-size in ideal test configurations to maximize performance.

| Performance Metric | PerfectStorm ONE Fusion PS10GE8NG | PerfectStorm ONE PS10GE8 |
|---|-----------------------------------|--------------------------|
| Applications Throughput | 64Gbps | 64Gbps |
| HTTP Throughput (Uni-Directional/Bi-Directional) | 40Gbps / 76Gbps | 40Gbps / 76Gbps |

| Performance Metric | PerfectStorm ONE Fusion PS10GE8NG | PerfectStorm ONE PS10GE8 |
|------------------------------------|-----------------------------------|--------------------------|
| HTTP Connections per Second | 1.5M | 1.5M |
| HTTP Concurrent Connections | 30M | 30M |
| SSL Throughput | 20Gbps | 20Gbps |
| SSL Connection Rates | 200,000 | 200,000 |
| SSL Concurrent Flows | 1 Million | 1 Million |
| IPsec, Concurrent Tunnels | 500,000 | 500,000 |
| IPsec, Tunnel Setup Rates | 10,000 | 10,000 |

PerfectStorm ONE 40GE appliance, IxLoad, application support

| IxLoad Application Support | PerfectStorm ONE (PS40GE2 and PS40GE2NG) |
|-----------------------------|---|
| Application Delivery | <ul style="list-style-type: none"> • AppLibrary • TCP Plugin • Application Replay • HTTP • HTTPS • FTP • SMTP • POP3 • DNS • TFTP • IMAP • Stateless Peer |
| Video Delivery | <ul style="list-style-type: none"> • VoD (RTSP, QoE) • RTSP (RTP/TCP) • IPTV Multicast IPv4 • Silverlight • Adobe HDS • Apple HLS • Flash Player • MPEG DASH • Video Quality |

| IxLoad Application Support | PerfectStorm ONE (PS40GE2 and PS40GE2NG) |
|----------------------------|---|
| VoIP | <ul style="list-style-type: none"> • Advanced SIP • SIP Cloud/SIP Proxy • RTP/RTCP • SRTP & TLS • Audio, Voice, Video • Video Telepresence • MSRP • Voice Quality / Video Quality |
| IPsec | <ul style="list-style-type: none"> • IKEv1, IKEv2, IPsec Suites B • IPsec Quick Tests |
| Storage | <ul style="list-style-type: none"> • CIFSv1 • SMB 2.1 • SMB 3.0 • iSCSI • NFS v3, NFS v4, NFS v4.1 |
| Stack Manager | <ul style="list-style-type: none"> • Static ARP • GratARP • IPv4 / IPv6 • PPP • L2TP • DNS • DHCPv4 • DHCPv6 • IPv6 SLAAC • 6rd • DSLite • 802.1x • WebAuth • EAPoUDP |

Hardware Ordering Information

PerfectStorm ONE 40GE appliance Fusion

| Part Number | Description |
|-------------|---|
| 941-0028 | <p>PerfectStorm ONE 40GE Fusion 2-port appliance (PS40GE2NG), 40GE 2-port QSFP+. Requires BreakingPoint Application & Threat Intelligence (ATI) (909-0856), sold separately, at time of purchase. Requires: One or more QSFP+ 40GBASE-SR4 optical transceivers (948-0031) and MT 12-fiber MMF cable, 3-meter length (942-0041).</p> <p>Supports up to 4-ports of 10GE per 40GE port via fan-out cables, sold separately - requires MT-to-4x10GE LC fan-out, MMF, 3-meter (942-0067) or MT-to-4x10GE LC fan-out, MMF, 5-meter (942-0068) cables to support the fan-out option.</p> |

PerfectStorm ONE 10GE appliance (standard)

| Part Number | Description |
|-------------|--|
| 941-0036 | <p>PerfectStorm ONE 40GE 2-port standard appliance (PS40GE2), 40GE 2-port QSFP+. Requires: One or more QSFP+ 40GBASE-SR4 optical transceivers (948-0031) and MT 12-fiber MMF cable, 3-meter length (942-0041).</p> <p>Supports up to 4-ports of 10GE per 40GE port via fan-out cables, sold separately - requires MT-to-4x10GE LC fan-out, MMF, 3-meter (942-0067) or MT-to-4x10GE LC fan-out, MMF, 5-meter (942-0068) cables to support the fan-out option.</p> |

Transceivers and cables

| Part Number | Description |
|-------------|--|
| 948-0028 | QSFP+ 40GBASE-SR4 optical transceivers (incompatible with fan-out) |
| 948-0031 | QSFP+ 40GBASE-SR4 optical transceivers (required for fan-out) |
| 942-0041 | MT 12-fiber MMF cable, 3-meter length |
| 942-0067 | MT-to-4x10GE LC fan-out, MMF, 3-meter |
| 942-0068 | MT-to-4x10GE LC fan-out, MMF, 5-meter |

BreakingPoint Ordering Information

| Part Number | Description |
|-------------|---|
| 909-0856 | BreakingPoint - Application & Threat Intelligence Program |

IxLoad Ordering Information

| Part Number | Description |
|-------------|---|
| 925-6321 | <p>IxLoad, PerfectStorm ONE Multiplay, Software Bundle, Layer 4-7 Performance Test Application; Data, Storage, Voice, Video and Access & VPN bundle for PerfectStorm ONE appliances; includes:</p> <ul style="list-style-type: none"> • 925-6121 IxLoad PerfectStorm ONE DATA • 925-6112 IxLoad PerfectStorm ONE VIDEO • 925-6113 IxLoad PerfectStorm ONE VOICE • 925-6117 IxLoad PerfectStorm ONE Access & VPN |
| 925-6104 | <p>IxLoad PerfectStorm ONE Basic, Optional Software, Layer 4-7 Performance Test Application. Includes: HTTP, HTTPS, DNS, ADVNET-DHCP, WAP, Stateless Peer</p> |
| 925-6121 | <p>IxLoad PerfectStorm ONE Data, Software, Layer 4-7 Performance Test Application; includes:</p> <ul style="list-style-type: none"> • 925-6104 IxLoad PerfectStorm ONE BASIC (HTTP, HTTPS, DNS, ADVNET-DHCP, Stateless Peer) • FTP, DHCP, IMAP, POP3, SMTP, TFTP, App-Replay, TCPsession HTTP Quick Test, RFC 3511 Quick Test • Storage: NFSv3, NFSv4, NFSv4.1, SMBv3, CIFS, CIFSv2 iSCSI, iSCSI Quick Test |
| 925-6112 | <p>IxLoad PerfectStorm ONE VIDEO, Software Bundle, Layer 4-7 Performance Test Application; includes:</p> <ul style="list-style-type: none"> • RTSP, IPTV, Video-ADVANCED • FLASH, APPLE HLS, Silverlight, Adobe HDS, MPEG-DASH • Video Quality VQMON engine for up to 10Gbps • TCP VQ – Video quality for TCP video traffic for up to 10 Gbps |
| 925-6113 | <p>IxLoad PerfectStorm ONE VOICE, Software Bundle, Layer 4-7 Performance Test Application; includes:</p> <ul style="list-style-type: none"> • Advanced SIP, SIP endpoint, Proxy and Cloud emulation • TLS, SRTP • Audio, Video Conference, Telepresence, MSRP • Voice Quality engine for up to 10Gbps • Video Quality engine for up to 10Gbps video conversation traffic |

| Part Number | Description |
|-------------|--|
| 925-6117 | <p>IxLoad PerfectStorm ONE ACCESS + VPN, Software, Layer 4-7 Performance Test Application. Includes:</p> <ul style="list-style-type: none"> • 925-6104 IxLoad PerfectStorm ONE BASIC (HTTP, HTTPS, DNS, ADVNET-DHCP, Stateless Peer) • IPsec, IPsec SUITES B, IPsec Quick Tests, PPP, L2TP, L2TP/IPsec • IPv6 Transitioning: SLAAC, 6rd, DSLite • ADVNET: DHCP, DHCPv6 (client & server), RADIUS; ADVNET-802.1X, ADVNET-NAC, ADVNET-WEBAUTH |
| 925-3461 | <p>IxLoad AppLibrary Slot Bundle, Software Bundle, Layer 4-7 Performance Test Application; Enables support for AppLibrary on a single load module. It includes AppLibrary Slot Feature (925-3462) and Slot Subscription service (925-3460) to access new application flows for one year; Requires previous purchase of 925-3040 (IXLOAD Base) or higher bundle.</p> |

For more information, see www.ixiacom.com/products/perfectstorm

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