

BENCHMARK-XP SERIES L2-7 NETWORK TEST PLATFORM

The Benchmark-XP is a next generation test platform for the performance benchmarking of networks, systems, and underlying devices that forward traffic and ensure quality of service and reliability. Utilizing an easy-to-use UI, integrated test methodologies and simplified automation, Benchmark was specifically designed for engineers and operators for the testing of high-performance routers, data center switches and application layer devices.

With Benchmark-XP's modular design and robust architecture, each chassis can house up to 12 independent test modules and support many simultaneous users via the Renix user interface and a comprehensive and integrated API. Benchmark supports numerous variants of high-speed Ethernet technologies with a chassis ready to support the future, emerging requirements of 800GB 1.6TB standards.

The Benchmark-XP is a unified, Layer 2-7 test platform with the ability to emulate a compressive spectrum of protocols and applications needed for functional and performance testing. It is used extensively in R&D by Network Equipment and Component Manufacturers to ensure design and system performance and by Enterprises, Cloud Providers, Carriers, and Government Agencies to validate vendor performance prior to selection and deployment into their networks.

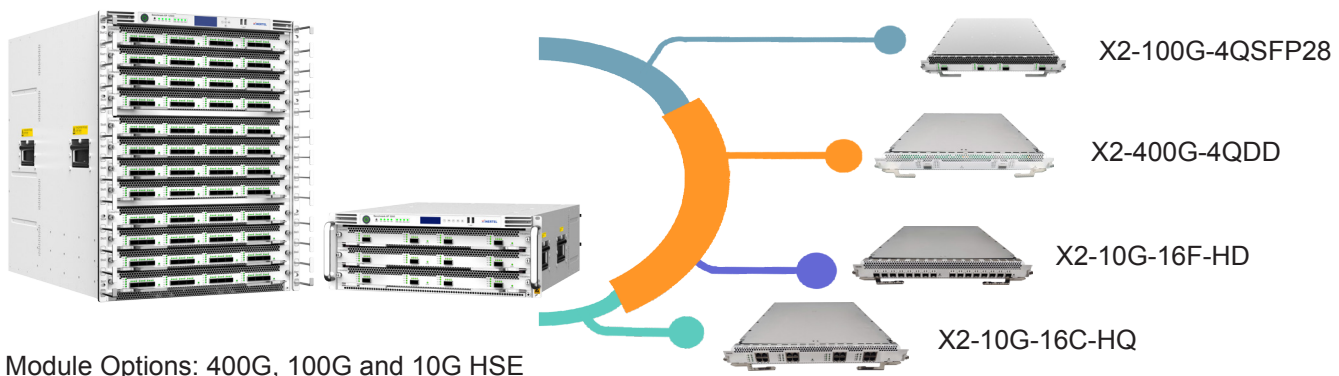
With the ever-increasing demand for bandwidth driven by both commercial and business OTT applications, services and expansion of remote user access, the need for speed and ensured QoS has never been greater. The Benchmark-XP platform is ready to support the complex test demands of today as evolving needs of the business world tomorrow.

Features

- S12 slots per chassis within a 14U footprint
- Chassis can be fully populated and cascaded together for a larger, seamless, and synchronized test environment
- Speeds Supported: 400G, 100G, 50G, 40G, 25G, 10G, 5G, 2.5G
- Multi-user system allowing for independent test configuration and port reservation
- Emulation of complex network topologies, protocols and industry benchmark test scenarios
- GUI to script automation with support of TCL & Python

Benefits

- Cost reduction with single platform capable of testing Layer 2-7
- Investment protection with platform that is able support emerging technologies
- Enhanced user productivity with simplified automation
- Robust, 24/7 operation with ability to hot swap line cards without interruption to other users



Test Modules	X2-400G-4QDD-HQ	X2-100G-4QSFP28-HQ
Speed	4*400/200/100/50GbE with high performance	4* 100/40/25/10GbE with high performance
Port Density	4	4
MSA Interface	QSFP-DD	QSFP28
Operational Modes	PAM4: 50/100/200/400G NRZ: 10/25/40/50/100G	100GbE: 100GBASE-SR4, 100GBASE-LR4; 40GbE: 40GBASE-SR4, 40GBASE-LR4; 25GbE: 25GBASE-SR; 10GbE: 10GBASE-SR; QSFP28 to SFP28 breakout cable options; Clause 74 BASE-R FEC, Clause 91 RS-FEC and Clause 108 RS-FEC
Port CPU	Multi-core CPU	multi-core CPU
User Reservation	Per port	Per port
Test Port Speed Config	2 test port speed groups per rack mount unit	2 test port speed groups per rack mount unit
Operating temperature range	Supported for 32°F to 95°F (0°C to 35°C) ambient temperature; 20% to 85% relative humidity	Supported for 32°F to 95°F (0°C to 35°C) ambient temperature; 20% to 85% relative humidity
Max power draw	400 watts	400 watts
Product Dimensions	437mm×45.32mm×468.746mm (17.2ins×1.8ins×18.5ins)	437mm×45.32mm×468.746mm (17.2ins×1.8ins×18.5ins)

Technical Specifications

BENCHMARK-XP 12000/3000 400G, 100G Appliances	
Slots	BENCHMARK-XP 12000:12 BENCHMARK-XP 3000:3
Size	BENCHMARK-XP12000: 442mm ×622.3mm ×815mm (17.4inches×24.5inches×32inches) BENCHMARK-XP 3000: 482.6mm×178mm×686mm (19 inches×7 inches×27 inches)
Weight	BENCHMARK-XP12000: 108kg (238 lbs) BENCHMARK-XP 3000 : 25 kg (55.1lbs)
Generator and Analyzer	
Number of Streams	<ul style="list-style-type: none"> Stats/Streams @400/200/100/50/40/25/10GbE: Tx=32K, Rx=32K Stats/Stream: Tx Count (frames),Rx Count(frames), Tx Rate (fps), Rx Rate (fps), Tx Rate (bps), Rx Rate (bps), Rx Sig Count (Frames), Avg Latency (us), Min Latency (us), Max Latency (us)
Number of Paths/Raw Streamblocks	512
Frame Transmit Modes	Port-based: Continuous, Burst and Time Stream-based: Continuous, Burst
Min/max Frame Size (w/CRC)	58-16000 bytes
Real-time Tx Stream Adjustments Per-stream Statistics Analyzed in Real Time	Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis <ul style="list-style-type: none"> Tx and Rx frame counts and rates Out of sequence errors, frame statistics, real-time packet loss statistics, out-of-order statistic FCS errors and rate Rx Filter Frames and custom statistics Real Time Dropped Frame count
Flow Control	Full duplex flow control
Per-port Statistics Analyzed in Real Time Transmit Timestamp Resolution	Tx and Rx frame counts and rates <ul style="list-style-type: none"> Tx and Rx Layer 1 byte counts and rates Out of sequence errors, frame statistics, real-time packet loss statistics, out-of-order statistic PRBS errors FCS errors and rate
Transmit Timestamp Resolution	2.5ns
Supported Encapsulations	<ul style="list-style-type: none"> Layer 2: Ethernet II, 802.1Q, 802.1ad, FCoE Layer 3/4: IPv4, IPv6, TCP, UDP
Supported Tx Signature Capability	Fully compatible with hardware; contains sequence number and highly accurate timestamp
Capture Buffer Size	8 MB per port
Capture Buffer Controls	Capture the Rx frame of data and control plane Capture Tx and Rx frame of control plane Capture frame based on filter template Capture frame based on error message Support loopback capture Support downloading a specified number of captured message
Latency Modes	Benchmark tests support LIFO, LILO, FIFO or FILO latency calculation methods Route Insertion Table (RIT) 1M 4-byte entries for dynamic label or random IP/MAC address assignments entries per port
VFD Entries per Stream	6 VFD insertions per stream
Layer 2-3 Additional Specs	
Routing and MPLS	RIPv1v2, RIPvng, OSPFv2, OSPFv3, ISISv4, ISISv6, BGP, BGP4+, LDP, MPLS L3VPN, VPLS, VLL, 6VPE and 6PE
Access	PPPoE Client/Server, DHCPv4 Client/Server, DHCPv6 Client/Server, DHCPv6 PD Client/Server, L2TPv2 and 802.1x
Multicast	IGMPv1/v2/v3, MLDv1/v2, IGMP/MLD Querier and PIM-SM
Data Center	VXLAN, OpenFlow, OVSDb, EVPN and LACP
Test suite	RFC2544, RFC2889, RFC3918, asymmetrical test and Smart Scripter
Other	BFD, 802.1ag, 802.3ah and IPv6
Layer 4-7 Application and Security	
IP Version	IPv4 and IPv6
Transport Protocols	TCP, UDP
Data Protocols	HTTP, HTTPS, TCP, FTP, DNS, Mail(SMTP/POP3/IMAP), SSH, TFTP, Telnet
Network Access Protocols	DHCP and PPPoE
Software	
Renix Test Platform: L2-3 traffic test and protocol emulation	Renix is Windows-based software that offers L2-3 efficient and convenient configuration wizards, statistical result views, test result analysis and supports TCL/Python automation test API
ALPS Software Platform: L4-7 application protocol emulation	ALPS has Web UI, L4-7 application protocol emulation and network security test platform