

## XproTel L2-L7 Network Simulator

**The XproTel Network Simulator is the industry-leading test solution for seamless L2-L7 testing. It streamlines the testing process by integrating all testing components for L2-L7 testing onto a single platform, eliminating the need for separate L4-L7 and L2-L3 simulation testing instruments.**

Utilizing XproTel's innovative hardware solution, Network Simulator offers seamless L2-L3 testing capabilities. Switching between different hardware testing platforms is no longer required to perform RFC2544 testing. For L4-L7 testing, XproTel's application testing solution excels, with the ability to simulate a wide array of standard protocols and applications like TCP, UDP, HTTP, HTTPS, FTP, DNS, SIP, RTSP, RTP, SMTP, POP3, IMAP, IMAP4, and IPsec. Robust network attack simulation offers common L2-L7 DDoS incidents and replicates vulnerability attacks at the L7 application layer. XproTel's advanced security attack orchestrator delivers unparalleled flexibility, enabling intricate processes and modeling attack behaviors. Network Simulator's cutting-edge network attack behavior simulation is designed to ensure preparedness and security defenses against emerging threats.

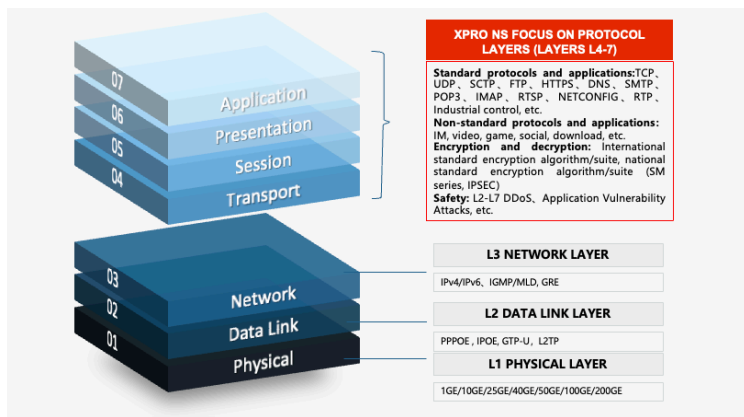
Unlike traditional dedicated hardware architectures, XproTel harnesses the flexibility of the x86 platform with a robust simulative protocol stack and packet construction engine to achieve remarkable performance levels. The Network Simulator can generate up to three million new TCP sessions per second on a single dual-CPU hardware. It efficiently handles over a hundred million concurrent TCP sessions and 100Gbps throughput. Combined with a flexible traffic engine and modeling components, XproTel can simulate realistic network environments for accurate and valuable testing results. With our innovative stateful playback engine and the x86 platform's flexibility, XproTel enables the simulation of wide range of non-standard protocols and applications.

### Highlights

- Enable seamless simulation of L2-L7 protocols. With unique L7 stateful playback engine offers simulation of private protocols and applications.
- Superb performance and support a wide range of network interfaces from 1 GbE to 100 GbE.
- Harnesses the flexibility of the x86 platform with a robust simulative protocol stack and packet construction engine.
- Robust network attack simulation offers common L2-L7 DDoS attacks and replicates vulnerability attack behaviors at the L7 application layer.
- Testing results and report generation. Generation of statistical reports, including application type, network interface, testing cases, and URL.
- Support RFC2544 tests, with high-precise delay



XproTel Network Simulator offers extensive support for a broad range of network interfaces, spanning from 1 GbE to 100 GbE. By leveraging universal network interface cards based on PCIe interface and using either Intel or Mellanox network controller chips, XproTel eliminates the need for specialized testing network cards. This versatility empowers businesses with the freedom to select and utilize different universal network interface cards that align precisely with their specific testing requirements.



## Feature List

Feature	Description
Interface	• 10/100/1000 Copper
	• 10/100/1000 SFP Fiber
	• 10GbE Copper (10GBASE-T)
	• 10GbE SFP+ Fiber (10GBASE-SR/10GBASE-LRM/10GBASE-LR/10GBASE-ER)
	• 25GbE SFP28 Fiber (25GBASE-SR)
	• 40GbE QSFP Fiber (40GBASE-SR4/40GBASE-LR4/40GBASE-ER4)
Network encryption protocol	• 100GbE QSFP28 Fiber (100GBASE-SR10/100GBASE-SR4/100GBASE-LR4/100GBASE-ER4)
	• Support HTTPS/SSLv2/TLS v1.1/TLS v1.2
	• Support commercial cryptographic algorithm SM2/SM3/SM4
Network behavior simulation	• Support IPSec, IKEv1/v2, site to site mode and remote access mode
	• Control packet rate control
	• Control L7 business latency control
IP protocol version	• Control new or concurrent connection control
	• Support throughput control
	• Support IPv4 protocols
	• Support IPv6 protocol, IPv4 to IPv6 NAT
L2 encapsulation protocol	• Support IP TOS settings
	• Support IP fragmentation, fragmentation out-of-order or incomplete sending
	• Support 802.1Q
Transport layer protocol	• Support PPPOE
	• Support IPOE
Application layer protocol	• Support TCP, UDP
	• Support HTTP, HTTPS
	• Support FTP (Active/Passive)
	• Support DNS
	• Support IGMP/MLD
	• Support RTSP
	• Support SIP
	• Support POP3/SMTP
	• Support NETCONFIG
	• Support CUSP
	• Support Industrial Internet Protocol: Modbus, OPCUA, HANDLE, MQTT, COAP
Extended protocol (Traffic replay)	• Support mixed replay of L7 services according to the newly-created model, and replay PCAP traffic on the TCP protocol stack
	• Support L7 replay with status (WeChat, Internet common application protocols etc)
	• Support the original PCAP traffic replay without changing the load information of IP layer and above
	• Support acceleration, deceleration and original speed replay
RFC2544 Test	• Support continuous replay of multiple large PCAP files, the single file size can be as high as 4GB, the total file size exceeds 10TB
	• Support standard 2544 test, including throughput, loss rate and latency
Deployment characteristics	• Support nanosecond precision forwarding delay measurement (additional order of FPGA NIC is required)
	• Provide physical hardware integrated instruments
	• Support X86 architecture software deployment and cloud deployment
	• Support autonomous and controllable ARM architecture software deployment
	• Support packet capture on the traffic generation port to perform self-checking
Security characteristics	• Support the easy-to-use deployment with one meter per tester
	• Support L3-7 DDoS network attack behavior simulation and user-defined DDOS traffic
	• Support fuzzification of malformed traffic construction (IPv4/IPv6/TCP/UDP) and user-defined malformed packet construction engine for fuzzy modification of L7 traffic
	• Support L7 Web attack behavior simulation and provide CVE attack behavior library
Data analysis and report	• Support escape flow structure
	• Support real-time graphical presentation of test data
System management	• Support test report generation and export (PDF&CSV)
	• Web-based graphical management interface
	• Real-time monitoring and warning of system status
	• Support JSON API for automated testing