

A Performance Milestone for the 100G Era

Hillstone SG-6000-X6150 Firewall Testing Report



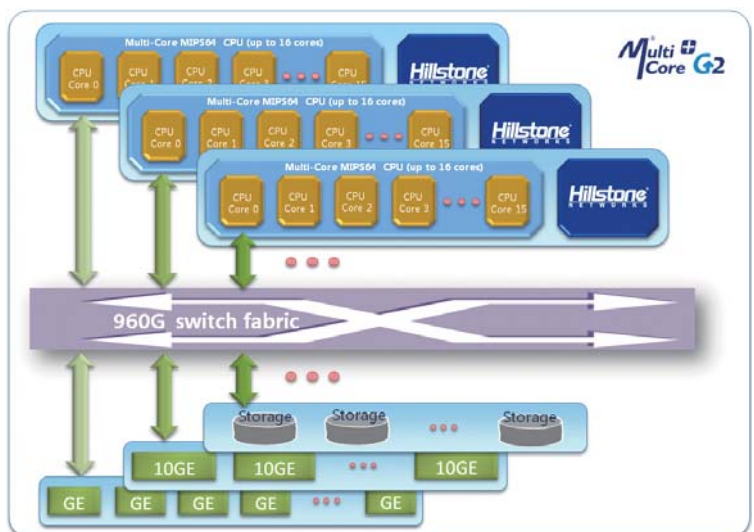
Computer World Testing Lab



Hillstone Networks recently introduced its latest firewall product developed to address the cloud computing security needs of the 100G transport era. The new SG-6000-X6150 (X6150) Firewall is designed to meet the growing requirements of large data centers and provide the backbone firewall environment typically required by carriers, finance institutions and large enterprises. The Computer World Testing Lab conducted the first independent firewall performance evaluation of the Hillstone Networks X6150 high performance firewall.

Hillstone Advanced Multi-Core Plus™ G2 Architecture

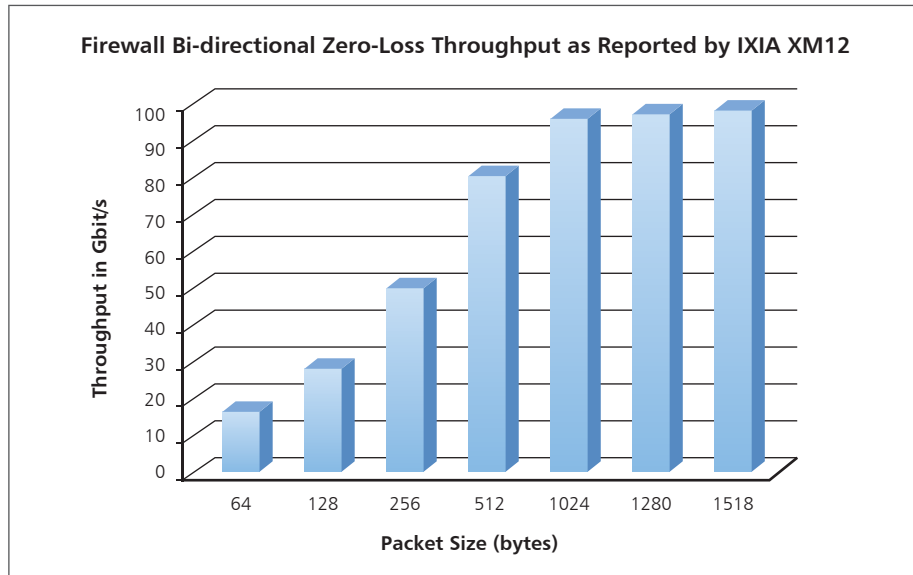
Based on Hillstone proprietary Multi-Core Plus™ G2 architecture and a new generation, fully parallel stream based engine, the X6150 is a chassis based system. The X6150 supports four types of hot swappable hardware modules: the System Control Module (SCM), the Security Service Module (SSM), the QoS Service Module (QSM) and the I/O Module (IOM). All these modules are connected via the high performance switch fabric without any hardwired pairing between the SSM and I/O modules. We found that the X6150 offers great balance between system performance, capacity, port density and configuration flexibility.



Performance

For our X6150 performance test, we strictly followed the benchmarking methodologies in accordance with the RFC 2544 and RFC 3511 standards. Our results show that the X6150 achieves a forwarding rate of 16.47 Gbps

for 64-byte Ethernet frames with 1 permit policy configured under NAT mode. For 1024-, 1280- and 1518-byte Ethernet frames, the X6150 achieves its advertized 100Gbps forwarding rate. To test latency we used seven different Ethernet frames with throughput load set at 90%. Under these conditions average latencies of less than 20us were measured in all cases.



We used two methods to test TCP new connection rate of X6150. The first test used the TCP “No Close” mode and yielded a 1M/s new connection rate. For the HTTP 1.1 new connections test the X6150 demonstrated a 760K/s new connection rate. Note: These values do not represent the full maximum connection rate capability of X6150 as our own IXIA testing equipment could not generate the sufficient number of connection requests to reach the limit of X6150.

Hillstone SG-6000-X6150 Performance Test (RFC 3511)		
	NAT	Hardware Configurations
TCP new connection rate (TCP No Close) (Connections/Second)	1008656*	7 SSM + 3 IOM
HTTP new connection rate** (Transactions/Second)	765244*	7 SSM + 3 IOM
Maximum Concurrent Sessions	50996928	6 SSM + 4 IOM

* Reach testing equipment’s performance limitation

**HTTP 1.1 (1 Transaction = 1 Connection)

Reliability and Scalability

Beside its superior performance results, X6150 also demonstrated its unique reliability and scalability during our performance testing. We configured a X6150 system with 7 SSMs and fed it with HTTP traffic at the rate of 600K connections per second. The CPU load on each SSM was measured at 65%. We then removed one SSM from the system without stopping the HTTP traffic. We did not measure any interruption in the HTTP traffic and but detected that the CPU load of the remaining 6 SSMs increased to 70%. We then re-inserted the SSM back to the system and determined that the CPU load of each SSM returned to the original level of 65% without any measurable traffic interruption.

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