Fluke Networks - Network Time Machine™

Capture-to-Disk Test Results

The Network Time Machine Network Recorder captures-to-disk at a sustained rate of 10.5Gbps with zero dropped packets while providing vital network statistics

Fluke Networks Network Time Machine is a high performance Network Recorder that continually captures traffic to its disk array for network forensic analysis, such as network and application performance troubleshooting. The Network Time Machine Premium3 supports dual 10Gbps monitoring interfaces and is available in 6TB, 12TB and 18TB storage configurations.

NTT Advanced Technology (NTT-AT) conducted a stress test of the Network Time Machine Premium3 to verify its capability before applying it to our own and our customers' networks. It was found that the Network Time Machine was able to sustain 10.5Gbps capture-to-disk throughput which was higher than its published specification of 10Gbps. During the test, the Network Time Machine maintained real-time monitoring of vital network health statistics through its intuitive UI without negative impact to the capture-to-disk performance.

Test Method and Results

Test was conducted on a Network Time Machine Premium3 unit running V7.1 system firmware with 6TB of packet storage.

The test was performed using a Spirent Test Center running V3.51 system software with a MSA2002A card. Two streams of traffic at 10Gbps at pre-programmed throughput rates were sent to the two 10Gbps monitor ports of the Network Time Machine. The traffic was composed of an equal number of packets at 3 different packet sizes: 64, 512, and 1518 byte packets.

The following procedure was used to verify the highest capture-to-disk rate that the Network Time Machine could handle:

1. Program the Test Center to start with aggregated traffic rate of 10Gbps.
2. Run a 3-hour test at the test rate (see below)
   a. Clear any NTM capture records from previous tests.
   b. Start a new NTM Capture.
   c. Start traffic generation from the Spirent test center.
   d. While the test is running, observe the capture tab/statistics section for dropped frames (see screen capture below). If packets have been dropped, the test can be terminated with a failed result.
   e. Let the test run for 3 hours (so long as the dropped frames counter is 0)
   f. If the dropped frames counter is still zero at the end of 3 hours, and the packet received count equals the packet transmitted count on the Spirent Test Center, the test is successful.
3. If dropped packets were observed, test again at a lower rate in 0.5Gbps steps, otherwise test again at a higher rate. Repeat until maximum rate is determined.

Based on the above procedure, we confirmed that the Network Time Machine Premium3 can sustain a capture-to-disk throughput of 10.5Gbps without dropping any packets over a minimum of a 3 hour period. The table below shows the frame counts sent from the Spirent Test Center (STC) and the number of packets received by the Network Time Machine (NTM).

Frame size = 1518 Bytes

Equipment	Port A		Port B		Port C	
	observed	captured	observed	captured	observed	captured
NTM	4,825,732,194	4,825,732,194	4,388,796,336	4,388,796,336	9,214,528,530	9,214,528,530
STC	4,825,732,194		4,388,796,336		9,214,528,530	

Frame size = 512 Bytes

Equipment	Port A		Port B		Port C	
	observed	captured	observed	captured	observed	captured
NTM	13,946,035,686	13,946,035,686	12,687,914,242	12,687,914,242	26,633,949,928	26,633,949,928
STC	13,946,035,686		12,687,914,242		26,633,949,928	

Frame size = 64 Bytes

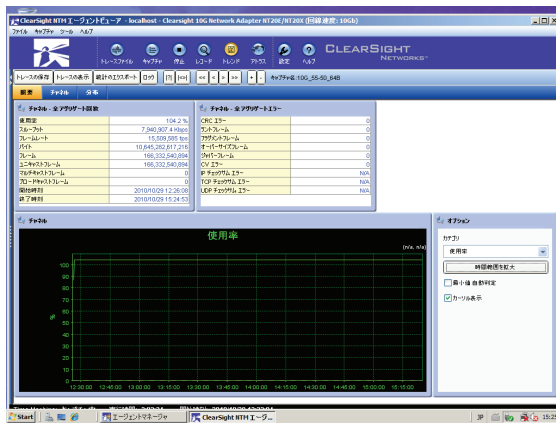| Equipment	Port A		Port B		Port C	
	observed	captured	observed	captured	observed	captured
NTM	87,146,357,803	87,146,357,803	80,356,782,505	80,356,782,505	167,503,140,308	167,503,140,308
STC	87,146,357,803		80,356,782,505		167,503,140,308	

Figure 1: Trend chart showing a 3 hour sustained rate of 10.5Gbps and the average utilization at 105% while 512 byte frames were sent
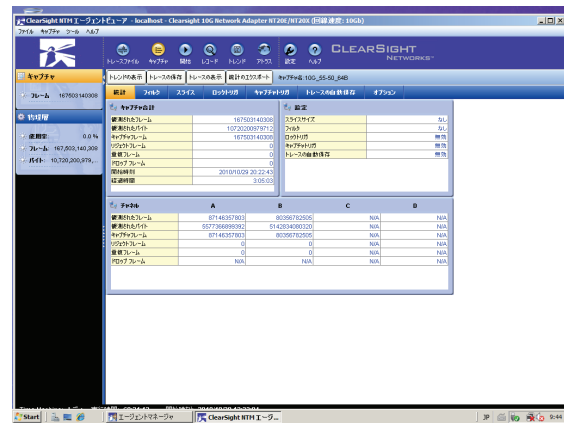

Figure 2: Table showing the number of packets captured and the statistics on each of the two monitor ports while the capture is in progress.

About NTT Advanced Technology

Conclusion

It is very important for a Network Recorder to capture all traffic without dropping packets. The fact that the Network Time Machine exceeded the claimed technical specification during the verification test that lasted for 3 hours is strong proof of its quality. This test result offers a peace of mind to NTT AT that the unit can be trusted to provide the "back in time" data for network forensic analysis when it is needed.