Active Wall Performance Test Report under 1000M speed network condition

Benchmarking software:
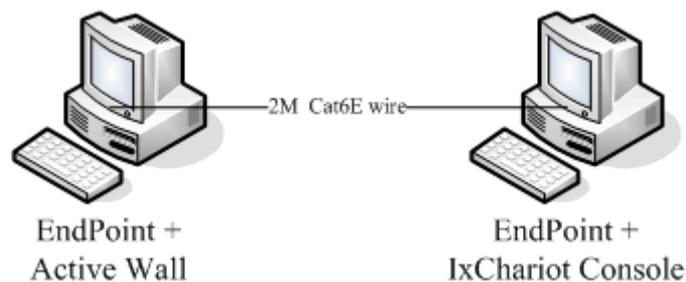
Ixia- IxChariot 5.4, which is one of the most professional software for network performance testing.

Network topology:

In order to avoid the impact from switch in network, we apply direct connection between two PCs. We used a line of twisted wire (RJ45, Cat6) with length of about 2 meters.

Here is the network diagram:

Hardware configuration:

CPU: AMD Sempron 3100+

Main Board: Colorful C51

Memory: 512MB DDR 400

Network adapter: 1, TP-Link TG-8269C   2, Intel PRO/1000 MT Desktop Adapter

(The two PCs are the same)

Software configuration:

OS: Windows XP 32bit

Software: IxChariot EndPoint

(The two PCs are the same)

Active Wall (version 2.0.2007.0828) is installed on one computer (named A), and IxChariot Console (version 5.4) is installed on the other computer (named B).

We remove the protocols except Internet protocols from the two PCs, and stop most of the ineffective services in the service management in Windows XP. We set the network adapters

parameters as default.

Script configuration:

We modified the sample script "Throughput" from IxChariot. Since there are not enough test cycles in "Throughput" script for testing in 100 MB speed network, we change the parameter "file_size" from 100,000 to 5,000,000 and the parameter "number_of_timing_records" from 100 to 500.
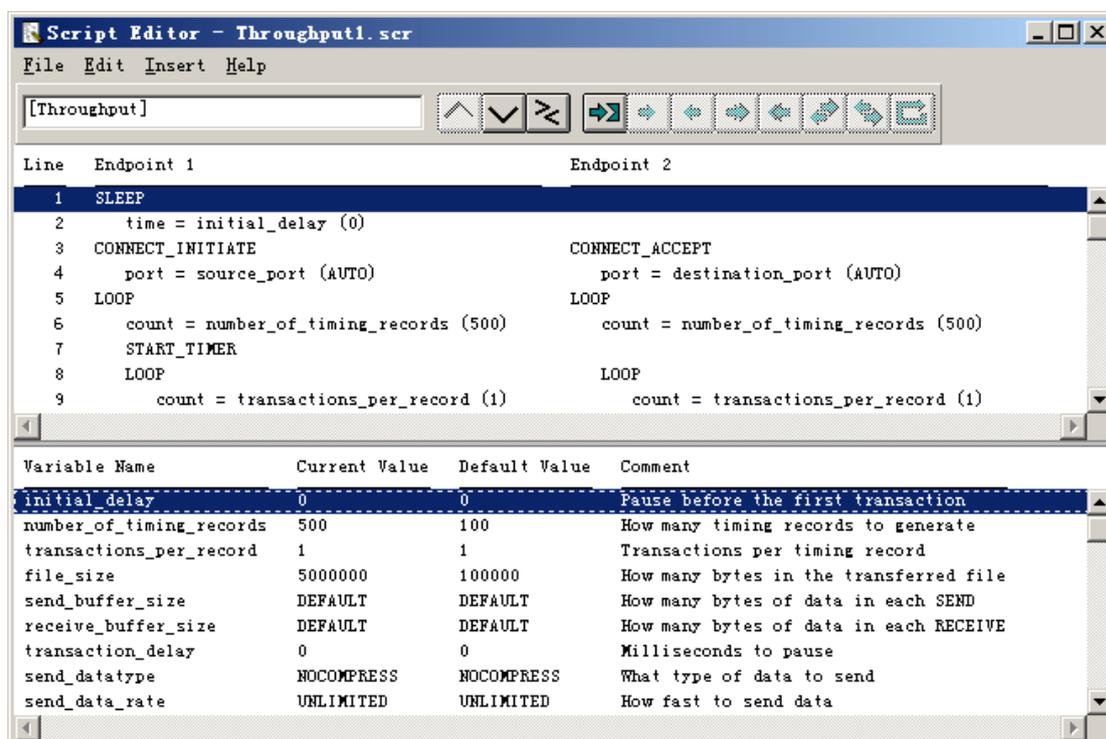
Test procedure:

The purpose of this test is to compare impacts on network transferring speed by the software Active Wall. The tests are executed under three different kinds of conditions:

1. Network without Active Wall, this condition is treated as a standard;
2. Network with Active Wall in, but Active Wall not working;
3. Network with Active Wall in, and Active Wall working well;

Because we install two kinds of network adapters on each PC, we test the same kind of adapters in one time. This means TP-Link vs TP-Link and Intel vs Intel.

We make 6 kinds of test conditions in the following list:

	Without Active Wall	Active Wall not working	Active Wall working well
TP-Link	T0	T1	T2
Intel	I0	I1	I2

We do 5 cycles of tests under each condition and we admit the best test result of the 5 cycles.

Results:

For details please go to the links:

- T0 Test results in network without Active Wall (TP-Link)
- T1 Test results in network with Active Wall in, but Active Wall not working (TP-Link)
- T2 Test results in network with Active Wall in, and Active Wall working well (TP-Link)
- I0 Test results in network without Active Wall (Intel)
- I1 Test results in network with Active Wall in, but Active Wall not working (Intel)

-

Statistics:

Throughput:

	Average(Mbps)	Minimum(Mbps)	Maximum(Mbps)
T0	833.681	727.273	851.064
T1	755.202	229.885	769.231
T2	480.850	363.636	506.329
I0	608.847	289.855	714.286
I1	548.005	254.777	625.000
I2	447.327	325.203	481.928

Response Time:

	Average(s)	Minimum(s)	Maximum(s)
T0	0.048	0.047	0.055
T1	0.053	0.052	0.174
T2	0.083	0.079	0.110
I0	0.066	0.056	0.138
I1	0.073	0.064	0.157
I2	0.089	0.083	0.123

It shows that the network with Active Wall in slows down than without Active Wall, about 90% of the standard one. The response time also increments 1.1 times. If the Active Wall worked in network, the performance falls down again, 60%~70% of the standard one.

Percentage (Average throughput speed)

	Without Active Wall	Active Wall not working	Active Wall working well
TP-Link	100%	90.59%	57.68%
Intel	100%	90.01%	73.47%

Percentage (Average response time)

	Without Active Wall	Active Wall not working	Active Wall working well
TP-Link	100%	110.42%	172.92%
Intel	100%	110.61%	134.85%

Conclusion:

The test results match what we expect before. It surprises us that Intel model of network adapters performs not very well in tests. Maybe this Intel model of adapters can not present all of the Intel models. And we can not prove Intel model is better than TP-Link model through stability tests.

1. Why does a network with Active Wall in but not working slow down 10% in tests? Because the Active Wall drivers are working in the intermediate layers and filtering the data packets sending or receiving, it may cost some CPU time and network speed to process the procedure.

2. Why does a network with Active Wall working well slow down further? When Active Wall does packets filtering, it needs lots of time to compute, and it needs high performance of CPU abilities. No doubt that this will delay the network transferring time and slow down the network speed. However, when a network with multiple points transferring, like more computers, we can not prove that time delay comes from packets filtering.

3. Since the computers hardware configuration shows low ability and low performance, we see EndPoint consumes 60%~70% of CPU time during tests, and Active Wall consumes

30%~40%. The sum of the CPU time is the whole CPU time. We believe high perform hardware configuration computers will do better than this. In the other side, network adapters which communicate on PCI bus do not work in real 1000M speed. It is strongly recommended that computers should be installed network adapters on PCI-E bus.

4. Above all, we get a clear comprehension about the software Active Wall impact on network speed and performance. Under the network of 1000M speed, AMD 3100+ CPU does not perform very well. Active Wall can only filtering 450~480 Mbps by the use of 30%~40% of AMD 3100+ CPU time. If a server machine used in enterprise is configured with higher abilities CPU than AMD 3100+, we believe Active Wall can work more efficiently. If an office or enterprise is going to monitor under 1000M speed, firstly it should purchase high ability and high performance computer machines and network adapters.