MBNI Network Performance: Initial Report

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This document is an initial report of the network performance observed during the first round of testing on the MBNI Network. The results are not definitive and further testing is required. The best results obtained with iperf TCP testing and simplified network paths are shown on the included diagram. Several window sizes were used to determine the optimum TCP window size for each segment.

A laptop running Windows XP was connected directly to the switch and assigned an IP on the private network behind the Checkpoint firewall. Elvis Jakupovic and I conducted an iperf TCP test with the Windows 2000 server that is used to transfer data to Stanford and the best results were 715 Mbps. The next test was from the Windows server to a Mac mini test machine which is outside the firewall, has a public IP and is connected to directly the switch in the MBNI machine room. The best throughput we obtained was 47.1 Mbps which is 6.6% of the throughput observed when both machines were behind the firewall.

To establish some data points for comparison, I ran some tests between the Mac mini and machines on other networks. The throughput between my desktop machine running Linux and the Mac mini was 619 Mbps. We saw a significant decrease in performance when testing against a machine located at Merit’s Ann Arbor Gigapop (ntap1.merit.edu). The maximum throughput from the Mac mini to the Gigapop was 311 Mbps whereas I got 329 Mbps from my Linux desktop to ntap1.merit.edu. While the throughput to Merit is lower than desired and warrants further investigation, this link does not appear to be the bottleneck. Currently the slowest segment is between machines on either side of the Checkpoint firewall in the MBNI machine room.

The data we have is not sufficient to make any concrete recommendations, but the low throughput when traversing the firewall currently seems to be the link that requires the most investigation to determine the bottleneck. A more complete set of iperf throughput tests using both TCP and UDP protocols combined with timed CIFS data transfers is necessary to optimize the throughput to Abilene. Bob Riddle and I are quite confident that the Abilene backbone has sufficient capacity to transfer data at the highest rate possible with the current hardware. Conducting similar tests at Stanford is also very important since similar conditions on that end may compound the problem and further decrease the observed performance.