

Center for Information Technology Integration
Memorandum of Understanding
October 2, 2003

This memorandum of understanding constitutes the joint understanding of CITI and ITCOM in pursuing a continuing research and development partnership.

Statement of Work

CITI's previous work, performed under a CITI/ITCOM MOU dated October 2, 2002, provided a successful Network Testing and Deployment (NTAP) testbed for the deployment of secure network testing and performance tools, using Globus/GARA, KX509, KeyNote, AFS PTS for group membership, and policy-based packet routing, to allow secure invocation of network testing tools on remote platforms (for a summary of this work see <http://www.citi.umich.edu/projects/ntap/>).

The primary goals of the partnership for FY 2003-2004 are to

- Add automatic mapping of network test segments to the appropriate PMPs
- Harden the testbed code for production use.
- Deploy and measure performance of the NTAP code in the ITCOM lab.
- Record test results in a central database.
- Investigate host endpoint testing.

Task 1: Segment Mapping

Network path-discovery tools such as `traceroute` discover the path between two hosts. To test this path, it is necessary to split it into individual network segments, locate an appropriate pair of PMPs, and test each segment. In this task, CITI will implement an automated tool that uses existing network maps or databases (where possible) to map pairs of network addresses to PMPs. The primary criterion for this mapping will be the minimization of network hops between PMP and host.

Task 2: Production Hardening

While the testbed code fully performs its required functions, several steps are necessary to turn the testbed into production code. These include identifying memory leaks, adding production-level error handling and recovery code to NTAP, improving log file management, and automated cleanup and restart after failures.

In addition, CITI will investigate eliminating memory leaks by coalescing layers of Globus/GARA code. For this work, CITI will consult with Trond Myklebust, who has implemented such simplifications at NorduGrid and is currently resident at CITI.

CITI will supply the production code in the form of Linux RPMs suitable for installation via UpdateRPM or equivalent.

Task 3: Deployment/Performance

CITI will deploy NTAP code to the ITCCom lab environment for performance evaluation using simultaneous data sources and sinks over multiple physical interfaces and multiple PMPs. This will also expose issues in deploying to production environments.

Task 4: Output Database

The current NTAP code accumulates results from individual tool executions in local files on the PMPs and copies them to a browser for display. CITI will implement a means of recording these test results permanently and securely in a centralized database, to support searches and aggregation of past results. An output tool will display a matrix of throughput and latency results between a group of hosts.

Initially, results will be stored in flat file databases. It is anticipated that CITI will investigate the replacement of the flat files with an appropriate database and schema in follow-in work.

Task 5: Investigate Host Endpoint Testing

Shawn McKee (smckee@umich.edu) is the chairman of the Internet2 End-to-end Technical Advisory Group (TAG), which is working with developers from CalTech to write a Java applet to run network tests between hosts. As a start, they have implemented a Java applet that runs Iperf against a server that has the Web100 kernel patch to expose details of the network stack to the OS. CITI will investigate the use of their applet in testing the "last mile" segment from PMP to destination host.

Milestones and Deliverables

October 2003

Task 1 begin

Task 2 begin

January 2004

Task 1 deliverable: Mapping in ITCCom local environment.

February 2004

Task 3 begin

Task 4 begin

March 2004

Task 2 deliverable: Hardened product (except output database)

Task 2 end

Task 5 begin

May 2004

Task 1 deliverable: Mapping on paths between end-organizations.

Task 5 deliverable: Endpoint testing

Task 1 end

Task 5 end

June 2004

Task 4 deliverable: Output database

Task 4 end

July 2004

Task 3 deliverable: Output/performance

Task 3 end