Center for Information Technology Integration
Proposal to Network Appliance, Inc.

NFSv4 Performance and Scalability Test Bed

November 1, 2007 – April 30, 2008

Statement of work

CITI proposes to continue to design, implement, maintain, and distribute PyNFS, an open source, platform-independent, Python-based framework for evaluating NFSv4 and NFSv4.1 client and server performance, correctness, and scalability.

CITI proposes a six-month project with a start date of November 1, 2007. At a later date, CITI will propose a six-month extension, to begin May 1, 2008, to complete the effort.

Task

The NFSv4.1 PyNFS is based on draft-ietf-nfsv4-minorversion1-13.txt. Draft 17 is current; draft 18 is in preparation. CITI will update PyNFS to the latest draft and track future draft updates.

Task

CITI will implement PyNFS server support for delegation and callback handling.

Task

To allow comprehensive client-side testing of pNFS file layouts, CITI will develop PyNFS server support for processing layout requests from pNFS clients and a data service that supports I/O for pNFS file layouts.

We expect this development to be an invaluable tool for testing potential race conditions between LAYOUTGET, CB_LAYOUTRECALL, and LAYOUTRETURN. CITI will target this task for completion in time for use at the Austin Bakeathon in February 2008.

Task

CITI will enhance the PyNFS GSS-API wrapper to support the NFSv4.1 SSV GSS (secret state verifier) mechanism.

Task

CITI will extend PyNFS to support DEVICEID RECALL, anticipated in draft 18.

Task

In the last round of funding, CITI implemented a Python wrapper for C language GSS-API libraries and integrated the wrapper into the PyNFS NFSv4.1 client and server. In this round, CITI will implement access control functionality on the PyNFS server, allowing comprehensive client-side testing of access control with mode bits and ACLs, and AUTH_SYS and AUTH_GSS principals.

Task

PyNFS scripts are controlled through command line options. This becomes unwieldy for complex testing, especially those that require precise specification of AUTH_SYS and AUTH_GSS principals.

To simplify script control, CITI will implement a mechanism that stores complex values and options in configuration files.

Task

CITI will enhance the PyNFS server to use a configuration file (similar to /etc/exports) to describe the exported local file systems.

Task

The NFSv4.0 and NFSv4.1 versions of PyNFS constitute completely separate packages. CITI will merge the two into a single package and CVS tree.