Aspera Evaluation Report

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Version 1.1

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An evaluation of the *Aspera* high speed file transfer software (server versions 3.3.4~3.4.3) was performed by an Technology Investigation Service (TIS) evaluation team. Aspera is a commercial suite of Client/Server, UDP-based Internet data transfer solutions with SSH-based authentication and *rsync*-like data replication capability. Aspera is widely used by commercial Internet services and by the Genomics Data community. It is supported on most common operating systems, including Linux, Apple Mac OS X and Microsoft Windows. Licensing fees are based on the volume of clients served; various demand-based subscriptions are also available.

The Aspera suite currently includes transfer servers, web applications, transfer clients, embedded clients, mobile apps, file transfer management and centralized workflow automation tools, and remote file synchronization tools. All Aspera file transfers employ Aspera's proprietary and patented *fasp* technology to maximize throughput for data transfers over the Internet, which includes a UDP-based file transfer protocol and logic to maximize throughput through congested networks.

Aspera components tested included Aspera Enterprise Server (Linux), Aspera Connect Server (Linux), Aspera Point-to-Point (GUI) clients (Linux, Mac OSX and Microsoft Windows), Aspera Connect browser plugins (Chrome, Safari, Firefox and Internet Explorer), and Aspera commandline clients (ascp on Linux). These components may best serve as an alternative to GridFTP-based file transfers, and in campus-bridging environments where multi-platform support for users is essential.

Several additional modes of file transfer management and operation in Cloud environments are available in the Aspera suite of software and services. An Aspera Software Development Kit (SDK) is available with application programmer interfaces (APIs) for various programming languages and service integrations employing Aspera-mediated file transfers. These additional functionalities were not evaluated at this time, but may be of future interest to XSEDE and computational science community.

Aspera performs well as a flexible, multi-platform, client/server and peer-to-peer file transfer solution. The proprietary Aspera FASP protocol overcomes several well-known file transfer obstacles that affect common TCP-based file transfer solutions, including buffer size management relative to transfer distance and mitigation for network congestion. Aspera transfers are able to achieve near-full-bandwidth file transfer efficiency between endpoints over uncongested networks.

We can recommend Aspera as an alternative file transfer solution (comparable to Globus GridFTP) with additional file transfer modes and flexibility not currently available in the XSEDE environment.

Improvements to Aspera software that we would like to see include correction of unexpected behavior encountered in transfers of file hierarchies, error messages that provide better guidance to users, faster response in graphical user interfaces, and support for 3rd-party transfers.