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NFS 4.1/pNFS, the final step

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With the introduction of clustered storage, combining a set of hosts to a single storage system, a very successful standard data access protocol, NFS2/3 became obsolete. One of the reasons was that NFS 2/3 assumes the name service part of the protocol being severed from the same host as the actual data, which is of course no longer true for clustered systems. As a result, high performance storage systems e.g. Panasas, GPFS, Lustre and many more, designed their own file system network protocols, with the obvious advantage of an extremely optimized use of the underlying network and storage resources, as the server and client software are provided by the same source. The drawbacks however were that proprietary software had to be installed on all client machines, with the hassle of kernel and driver dependencies and maintenance issues, particularly annoying when operating large compute farms. In order to catch up on that development, well-known storage providers decided to invest into a standard network file system protocol supporting clustered storage services, the Parallel Network File System (pNFS). The activity is organized by the Center for Information Technology Integration (CITI) at the University of Michigan. At the time being, all partners in this group have the NFS 4.1/pNFS server software integrated into their storage systems, however, except for dCache.org, companies seem to be reluctant making it available to customers. NFS 4.1/pNFS client drivers are available for the Linux 2.6.38 kernel and are slowly approaching standard Linux distributions. This presentation will elaborate on the advantages of NFS 4.1/pNFS as well as on the availability of the different components and possibly on missing bits and pieces. Furthermore it will provide details on the stability and performance evaluation done in the context of the European Middleware Initiative (EMI) and at dCache.org.

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