Project Title: Development of an iSCSI Storage Manager with Virtualization for eLinux on Intel 80321 I/O Processor

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Abstract

The objective of this research project is the design and implementation of an *iSCSI Storage Manager* that will run on *XSCALE embedded Linux* on *Intel 80321 I/O Processor*. The iSCSI Storage Manager will interface with user level application programs that require file accesses on remote iSCSI devices. In the layered view of the protocol stack, the iSCSI manager appears above the *iSCSI driver* level and below the *file system*. Any disk access request issued by the file system is transmitted over the Internet as *iSCSI commands*. The retrieved data is returned to the file system. By this mechanism, the iSCSI Storage Manager offers *file system level virtualization,* which provides the greatest benefit of virtualization, as it enables the clients to share, allocate and protect data sets or files. It also introduces global data-spaces, which can be viewed as remote disk storage devices and can be mounted on the file system just like any other disk connected to the host machine. The end result is a scalable, managed and distributed file system with integrated security, data integrity and continuous availability.

As the iSCSI Storage Manager will run on the Xscale embedded Linux on the Intel 80321 I/O Processor, the I/O Processor can be used to offload TCP/IP and iSCSI protocol processing that needs to be performed on the host CPU. The I/O processor uses the gigabit Ethernet controller to transmit and receive data across the Internet that can be forwarded to the file system. When a file has to be accessed from a remote iSCSI device, the file system driver will communicate with the iSCSI manager providing it with the requisite action. The virtualization module of the iSCSI Manager will first find out the relevant information regarding the location of the remote device and then communicate with the iSCSI driver to retrieve the data. When it receives the data, it will notify the file system driver of its availability.