

Tutorial M3 Outline

This tutorial on Lustre would consist of presentation accompanied with demonstrations and hands-on exercises.

1. Object-Based Storage Devices and a discussion on Intelligent Storage Devices: (1 hour)
 - a. Brief History of Device Interfaces and Storage Technologies
 - b. Motivation behind OSD
 - c. DAS/NAS/SAN Basic Architectures
 - d. OSD Architecture
 - e. DAS/NAS/SAN to OSD Comparison in terms of:
 - i. Storage Management
 - ii. Security
 - iii. Device and Data Sharing
 - iv. Performance
 - v. Scalability
 - vi. Functionality
 - vii. File systems
2. Concepts of object, overview of Lustre, subsystems, modules that build the subsystems, interaction between the subsystems, networking infrastructure, deployment goals (using commodity hardware or specialized storage targets). Lustre internals – discussion of how the various devices and drivers are organized and managed, API stacking (3/4 hour)
3. Available Lustre features – description of the various features currently supported in Lustre: intent-based metadata operations, distributed locking protocol, extent-based file locking, file striping, failover and redundancy and write-back caching. This would be accompanied with some design detail and their implications on the file system (3/4 hour)
4. Demonstration of Object Storage Target (OST) failover support in Lustre (3/4 hour)
5. Lustre configuration management utilities – available tools, techniques along with examples on using these to configure and manage the file system. Understanding Lustre testing and debugging infrastructure – tools available, techniques to use them effectively in troubleshooting (1 hour)
6. Hands-on to allow participants to familiarize with the configuration tools, bring up and configure a small Lustre cluster and some other simple exercises. (1.5 hours)

7. Discussion of some upcoming Lustre features – collaborative cache, clustered metadata servers, metadata writeback cache, global namespace management, advanced security protocols, hot data migration, growing the filesystem, snapshot support. A highlight on the open source development technique used for Lustre development, a summary on where Lustre is today in terms of performance, scalability, availability. (1/4 hour)