Digest of Draft MSS Requirements

1.0 Introduction and Background
(1) Equipment will be shared. MSS shall provide a priority and quota system.

2.0 Managing Experiment Data Files
(2) Files located on tape to optimize access.
(3) Files located on tape to allow tapes to be removed to vault.
(4) Tape drive activity shall be optimized.
(5) Tape mounts shall be minimized.
(6) Unattended operations (8 hr/day).
(7) Robotic arm and storage slots use shall be optimized.
(8) Recording to tape of raw data shall have the highest priority and continue for 30 days.

2.1.1 Storage Class
(14) Files appended to tapes so that all the media is used.
(15) Files may span tapes.

2.1.2 File Family
(16) Each tape shall only contain files belonging to a single file family.
(17) There shall be up to (TBD) different file families.
(20) Users should be able to list, add, and manage files in file families.
(21) A file family shall have the property of "width".
(23) User shall be able to specify the family name or ID.

2.1.3 Storage Hierarchy, Class of Service
(24) Users shall be able to write directly to a tape media.

2.1.4 Mapping of Namespace Objects
(26) Namespace objects need to be mapped to physical tape volumes.

2.1.5 Read Only Access for Groups of tapes (and Files)
(27) Be able to mark and unmark a tape volume as "Read Only".

2.1.6 Mapping of Files to Tapes.
(31) Tools so that users can determine the mapping of files to tapes.

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2.2 Ejecting and Retrieving Tapes from the MSS Tape Library.
(32) Possible to eject/return tapes without interfering with normal operation.
(33) Ejected tapes could also remain in the tape library.

2.2.1 Ejecting Tape Volumes
(34) Owners can specify which volumes to eject/return to library.
(35) Accessing vaulted volumes should be possible via operators or else a failure status must be returned to user.
(37) Users can change the file access behavior of an ejected tape.
(38) Tools needed to identify tapes for removal from the tape library.
(44) Ejected tapes must also have an associated set of exported metadata.
(47) Exchange (total of eject/export and re–insert/import) 200 tapes/day.

2.3 Reading/Writing Tapes Outside the MSS.
(49) "Open" tape and metadata format shall be provided.
(50) The open formats shall allow other methods to read/write compatible tapes

2.4 Importing/Exporting Tapes To/From
2.4.1 Importing Tapes (Files and Metadata) into the MSS.
(57) It shall be possible to import tapes (and metadata) into the MSS.

2.4.2 Exporting Tapes (Files and Metadata)
(58) It shall be possible to export data from the MSS

3.0 Access and Interface Methods
(60) An (API) for client access is needed for client access.
(61) API shall execute on the client processor, shall provide C++ language interfaces, and shall not require MSS infrastructure software (DCE, Encina, SFS, SAMMI) on the client processor.
(62) API shall be available in source and binary on Run II platforms.

4.0 Availability and Scalability Functions
(63) MSS shall be scalable so as to provide the anticipated performance.

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4.1 Prioritization of Resources

4.1.1 Tape Drives.

(64) Possible to allocate tape drives for writing privileged data to tape.

4.2.2 Robot Arms

(65) Possible to optimize the use of multiple robotic libraries and arms so as to maximize the capacity of the system to perform tape cartridge movement. It shall be possible to queue up requests to move tape volumes.

4.1.3 File System Requests

(66) Capability to limit requests so resources will not be exhausted.

4.1.4 Quotas for Storage Space

(68) Flexible Quotas for storage resources needed.

4.1.5 Gatekeeper Function.

(71) Temporarily suspend access to allow maintenance activities.

4.2.2 Component Fail–Over Capability

(74) System shall have a fail–over capability such that if a component fails, file access services shall continue at reduced capacity.
(80) Repaired components should be brought back on–line without service disruption.

Tape Drives

(76) System shall retry read/write error TBD times and shall log error counts.
(77) Failed operations due to tape drive should be retried on other drives.

4.3 MSS Performance Requirements

4.3.1 Data Acquisition

(82) Raw Rate = 35 MB/s, sustained for 30 days.
(83) 5 TB/day – equivalent to adding 700 blank volumes/week.
(84) Loading, labeling and allocating the blanks are background tasks and shall not interfere with the other MSS operations.

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5.0 System Administration, Monitoring, and Control

5.1.2 File Undelete Function

(88) Deleted file go into a trash basket. The trash basket is emptied when the tapes are repacked.

5.2 System Administration and Management Functions:

(90) Administrative and system management functions shall work through command interfaces and will not interfere with normal operations. The complete list of functions is TBD.

5.3 System Monitoring Functions

5.3.1 Health and Status

(92) System monitor shall provide displays of health/status of all components.
(95) Capability to issue alarms under the following conditions: below a TBD threshold capacity or performance; critical work cannot be completed.
(96) Alarms capable of being intercepted for automatic repair.

5.3.2 Fault Analysis

(97) Explicitly determine where occurred.

5.3.3 Use of Storage Resources

(98) Number of read/write error for each tape drive.
(99) Tape drive use
(100) Number of read/write errors for each tape.