The Premier Advanced Recording Technology Forum

THIC Inc.

Status of IEEE SSSWG and ANSI/AIIM MS71 Standards

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Proposed Standards

IEEE P1244.1 - P1244.5

Media Management System

and

New SSSWG Work

January 2000

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Background: IEEE SSSWG

- Storage System Standards Working Group (SSSWG) has a long history

  - Previous accomplishments were the development and maintenance of the Reference Model for Storage Systems

  - Current proposed standards are an outgrowth of that work

  - Basis for the current standards is the Open Vault implementation from Silicon Graphics Inc

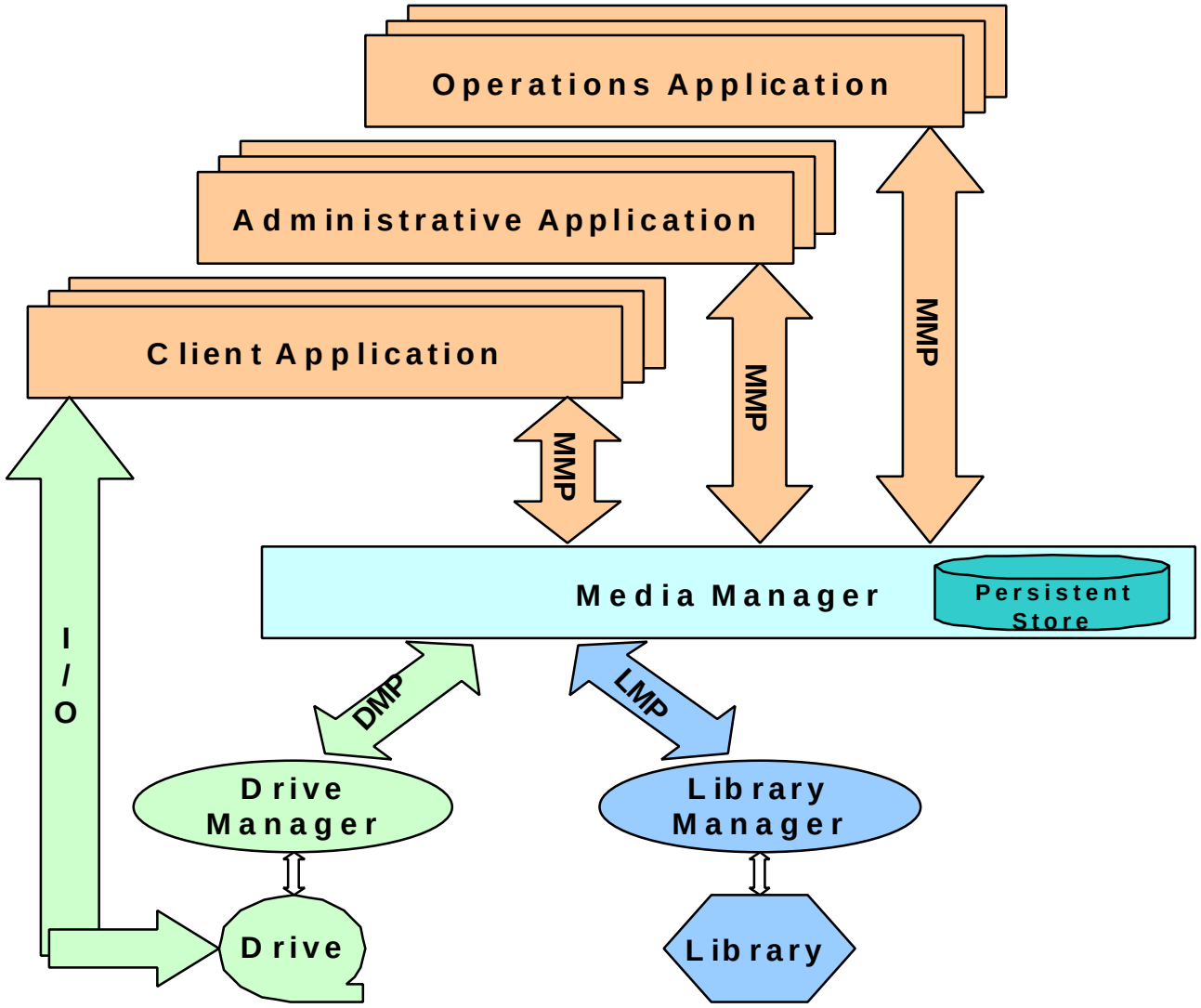
Storage System Architecture

- Central core is the Media Manager
- Receives client requests
- Communicates with the Drive and Library Managers as needed to mount tapes and configure drives
- Two types of clients: application and administrative, with administrative clients essentially acting as "super-user"
- Drive Manager configures the drive, advertises drive capabilities, loads tapes
- Library Manager runs the robotic library, mounting tapes, etc.
- Central database maintains the state of the system

Protocol

- Earlier SSSWG architectures were based on DCE RPCs
- Current architecture is based on text messages sent over TCP/IP, and is much more simple
- The Media Manager (MM) accepts connections from the Library Manager (LM) and Drive Manager (DM). There is a LM for each library, and a DM for each drive. Also, the MM accepts connections from approved Clients.
- There is no direct connection between a Client and the LMs or DMs - everything goes through the MM
- Protocol is peer-to-peer in that either entity may initiate a request (but no request from MM to Client is yet defined).
- Request - Acknowledge - Reply sequence allows for flow control

Architecture Diagram



Documents up for Ballot

- Architecture Document: Description of the overall system, and common elements
- Structure of the Protocol
- Database definition: Essentially a table-based model, but a relational implementation is not required
- Session Initiation and Security: Security model and protocol for initiation of a session with the MM
- MM protocol: description of the protocol between the MM and a Client
- LM, DM protocol: description of the protocol between an LM or DM and the MM
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Implementations

- **Both SGI and Legato are working on implementations, and the SGI implementation is expected to be part of the Open Source collection of code**
- **The original SGI implementation did not have all of the capabilities described in the standard**

Additional P1244 Standards

- Data Mover - actually perform I/O for the Client
- C-language interface
- Media Manager Interchange Protocol - communication between two MMs
- Media Manager Control Protocol - interface with existing library management systems
- User Mount commands - command line interface for the user
- Administrative Operational Commands - standard administrative commands

Additional P1563 Standards - New SSSWG Activity (1)

- 1563.1 Recommended Practice: Portable Tape Driver Architecture
- Scope: To provide a reference model for tape driver architectures that is portable across multiple operating system environments, fully featured, and high performance.
- Purpose: To provide a fully realized architecture that industry can base their implementations on that will reduce the effort required to support a new tape device on a given platform and thereby increase the available choice of drives on any given platform. This will benefit the application vendor and the end customer.

Additional P1563 Standards - Also SSSWG Activity (2)

- 1563.2 Standard: Common Tape Driver Semantics

- Scope: To define a common set of operations and semantics for access to tape drives across multiple operating systems platforms.

- Purpose: To ease the task of porting and supporting applications that use tape storage across multiple operating system environments. This will enable application vendors to port to more platforms and thereby increase the end customer's available choices.

Additional P1563 Standards - Also SSSWG Activity (3)

- **1563.3 Standard: Common Format For Data On Tape**
- **Scope: To define a self-identifying format and record structure for the storage of data and meta-data on tapes, a structure that contains the key to understanding the format of the data stream as well the data itself. An analogue would be the Document Type Definition (DTD) structure used to describe documents in XML.**
- **Purpose: To enable data written by one application to be accessible by other applications without those applications having to know how each other encodes data written to tape.**

Next Meeting

The next SSSWG meeting is expected to be the first week in February in San Jose. See

http://www.ssswg.org

for final arrangements and details.

Meetings are generally held every other month

Proposed Standard

ANSI/AIIM MS71

Conformance Tests for ANSI/AIIM MS66

Metadata for Exchange of Files on Sequential Storage Media between File Storage Management Systems

January 2000

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Background

- File Storage Management Systems, such as AMASS and HPSS, write files to tapes in proprietary formats
- Not all tape marks represent end of file
- Not all files end with a tape mark
- Files broken up into file segments
  - Control blocks embedded in the file segments

- Changing from one FSMS to another currently requires that the files be copied to a standard format and then ingested by the new FSMS

The MS66 Standard

- Provides a standard, non-proprietary way of representing the proprietary format of an FSMS, so as to avoid the copy and ingest operations when changing FSMS vendors
- Provides in addition, a representation of the directory and file structure, so that it may be transferred also
- No conformance test as part of the standard

History

- After some preliminary discussions, a study group started April 1, 1996 at the AIIM conference in Chicago
- The study group became a standards committee, AIIM C21.1
- Chairman is Fernando Podio, Project Editor is Joel Williams
- MS66 Standard has been approved by AIIM and ANSI
- Current activity of the C21.1 committee is to develop a standard for compliance testing

Description of the Metadata Export

Four parts:

- **Description of the metadata export itself**
- **Description of the cartridges**
- **Description of the file segments**
- **Description of the directory and file structure**
- **Collection of records, in Unicode or ASCII each named, and with named fields in some cases**
- **Some records are selectable, and not all record types apply to all implementations**
- **Using named records and named fields makes it easy to add additional records to extend the metadata to cover some practice that may be implemented in the future**

Conformance Test Levels

Test	Nature of Test
Metadata Export	(1) Conformance of the metadata export syntax (2) Correctness, completeness and internal consistency of the metadata export.
Generating System	Ability of the generating system to provide complete and consistent metadata which correctly describes the set of files and cartridges being exported.
Receiving System	Ability of the receiving system to correctly read the metadata and to reconstruct the files it describes, thereby providing access to those files. The receiving system may differ from the generating system with respect to its FSMS vendor, its hardware, or its operating system software. If the receiving system does not differ in any of those respects, the test is referred to as a homogeneous test. If the receiving system differs in one or more of those respects, it is called a heterogeneous test.

Flexibility in Devising and Running Tests (1)

- Vendors have the ability to run their own tests, and to claim conformance at one or more of the levels; hence they have to be able to generate test cases
- Metadata Source
- Real metadata, taken from actual system
- Made-up metadata, representing hypothetical system or systems

Flexibility in Devising and Running Tests (2)

- File Source
- Real files copied from existing system
- Made-up files, representing hypothetical system or systems

- Documentation of the source of all files and metadata is

Current Testing Efforts

- NASA Ames and NASA Goddard each have proprietary systems
- Metadata has been generated that describes files in these systems
- Next step is to exchange files and metadata

Draft standard document

The draft document is available at the URL

http://kobler.gsfc.nasa.gov/