

Storage Systems Standards Working Group

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SSSWG

- Storage Systems Standards Working Group
 - Founded in 1990, Continuously Active Since
 - Open To All Interested People
- IEEE → ANSI → ISO path
 - IEEE is accredited by ANSI to develop standards
 - ANSI is the official USA participant in ISO
 - Endgame more formal than IETF standards path
 - Development process roughly the same as IETF

Major Work Areas

- **Mass Storage Systems Reference Model**
- Media Management System Standard
- Common Tape Driver Semantics Standard
- Integration with SNIA

Mass Storage Systems Reference Model

- A guide for designing mass storage systems
 - PVL – Physical Volume Library (tape catalog)
 - PVR – Physical Volume Repository (robot)
 - MVR – Mover (data path access to the media)
- Started in 1990, version 5 released in 1994
 - Available online at www.ssswg.org
- Influenced most major applications of today

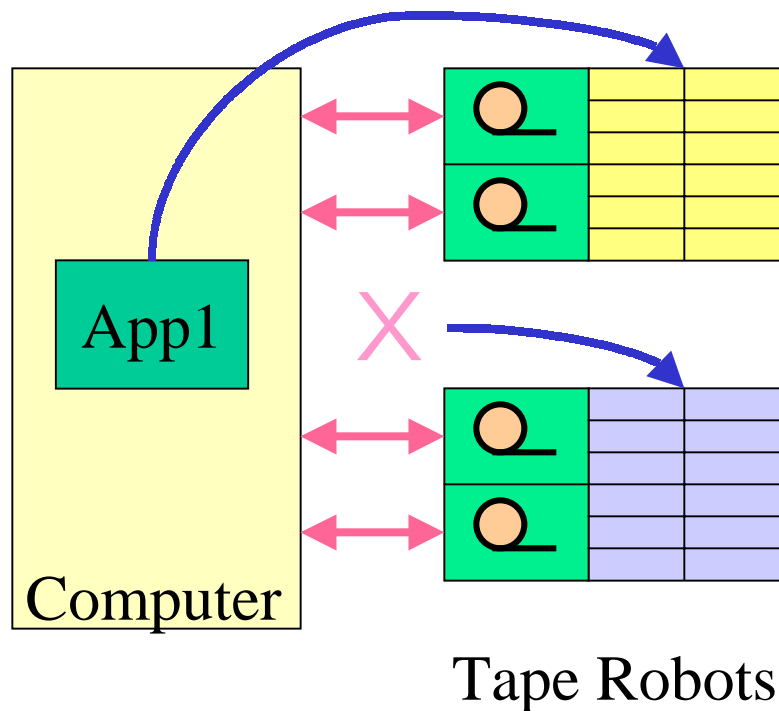
Mass Storage Systems Reference Model

- Time for a new revision
 - New hardware and software technologies
 - New "best practices" techniques
 - Customers/users have new goals
 - Contact me if you'd like to help
- Return to Original Name:
Guide for Storage System Design

Major Work Areas

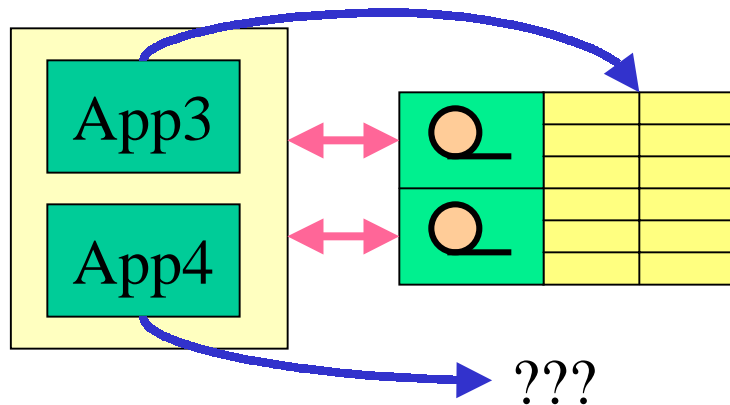
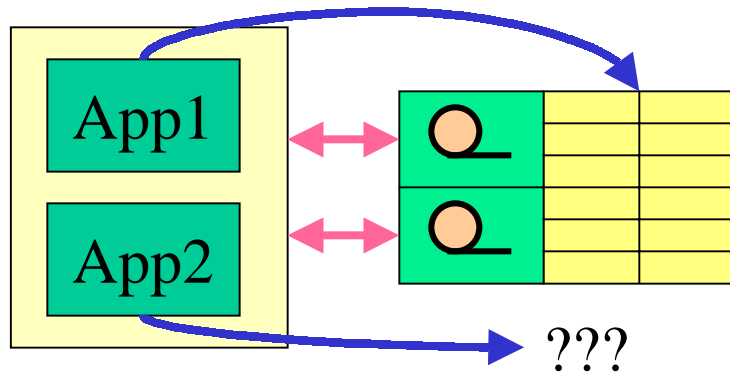
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Old Way: Direct Robotic Control



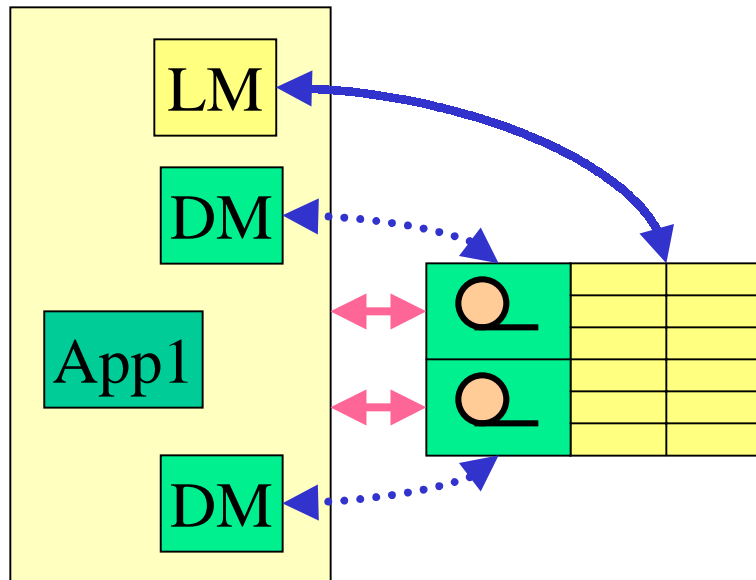
- App controls the robot
 - Build code for each make/model into app
 - New robot model? Wait for app support!
- Media is a sideline?
 - App sees media as a means to an end
 - Management of media not well supported

No Robot or Drive Sharing



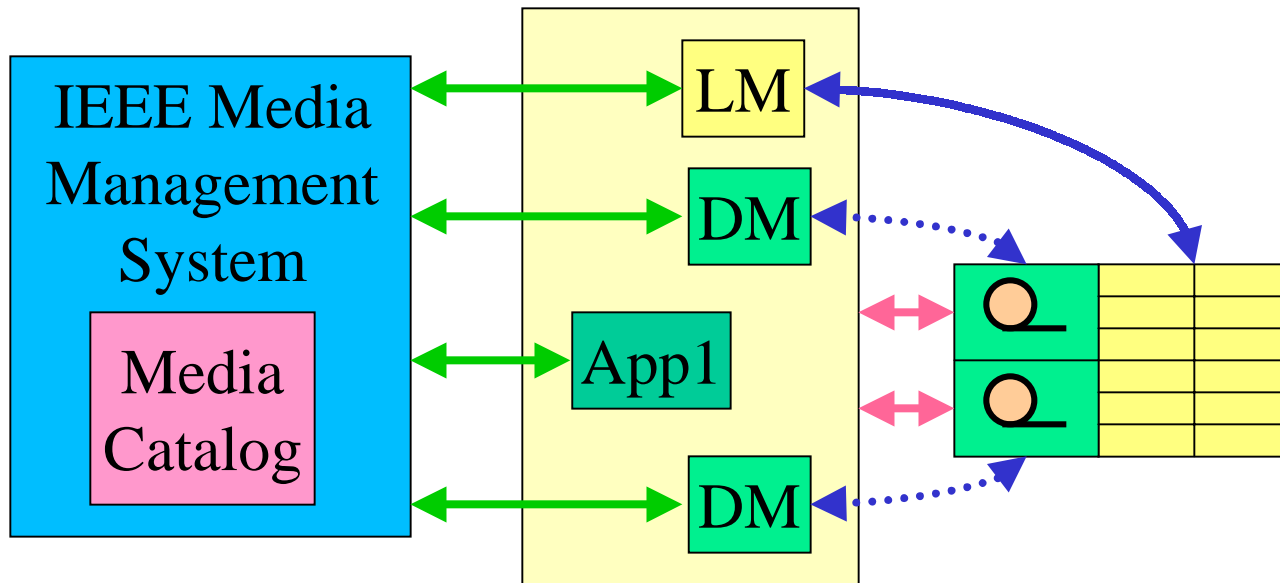
- Robots are not shared
 - Between apps
 - Between hosts
- Storage growth difficult
 - Dedicated robot per app?
 - Overbuy robot at first?
 - Buy another small robot?
- Low utilization of h/w

IEEE MMS Defines Plug-ins



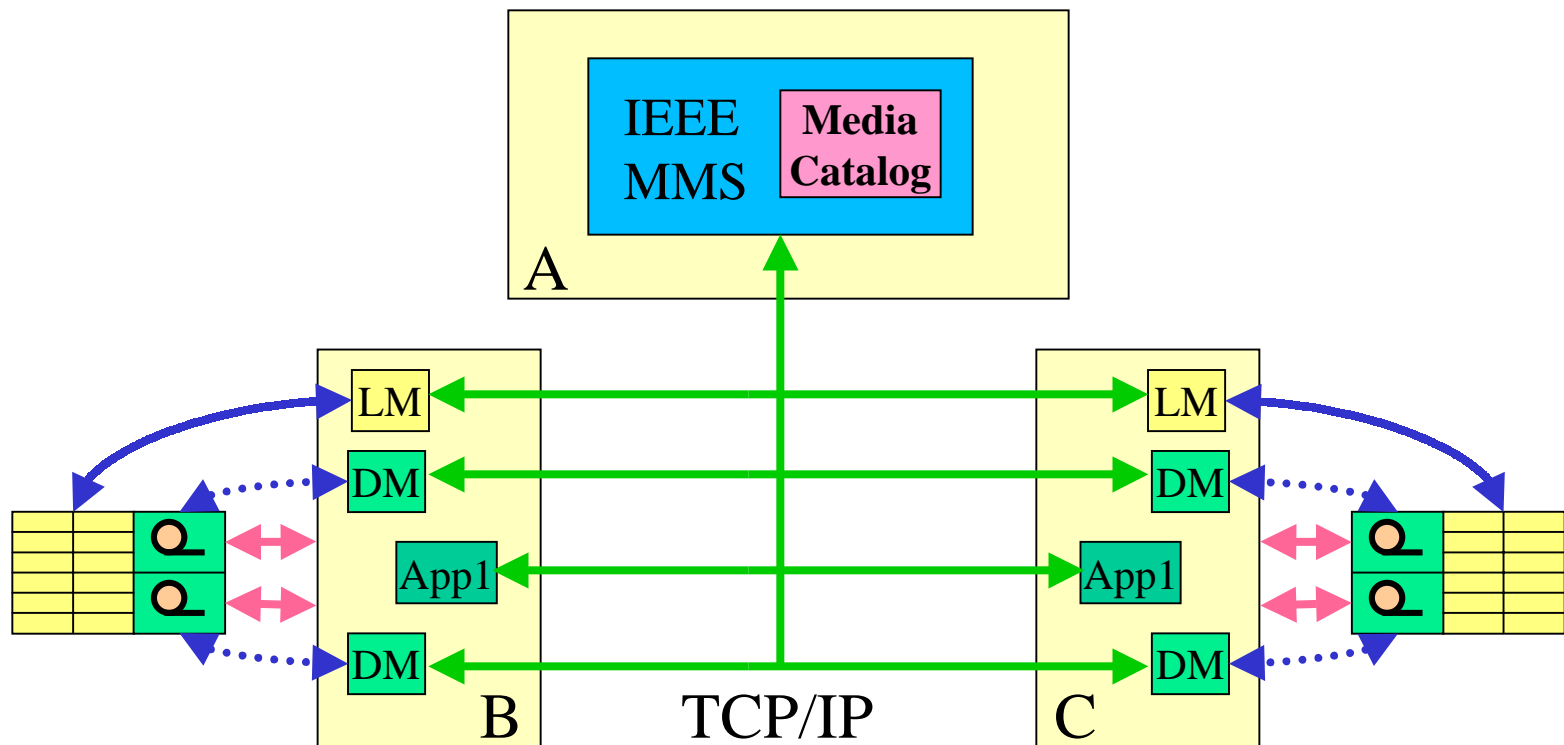
- Move code out of the app
 - Mini device drivers
 - Handles device specifics
- Library Manager
 - Controls library for MMS
 - Mount carts, list contents
- Drive Manager
 - Monitors drive for MMS
 - Verify mount, collect stats

IEEE MMS Uses Plug-ins



- App makes requests for service to the MMS
- MMS uses plug-ins to provide requested services

TCP/IP Distributed Architecture



Distributed over machines A, B, and C via TCP/IP

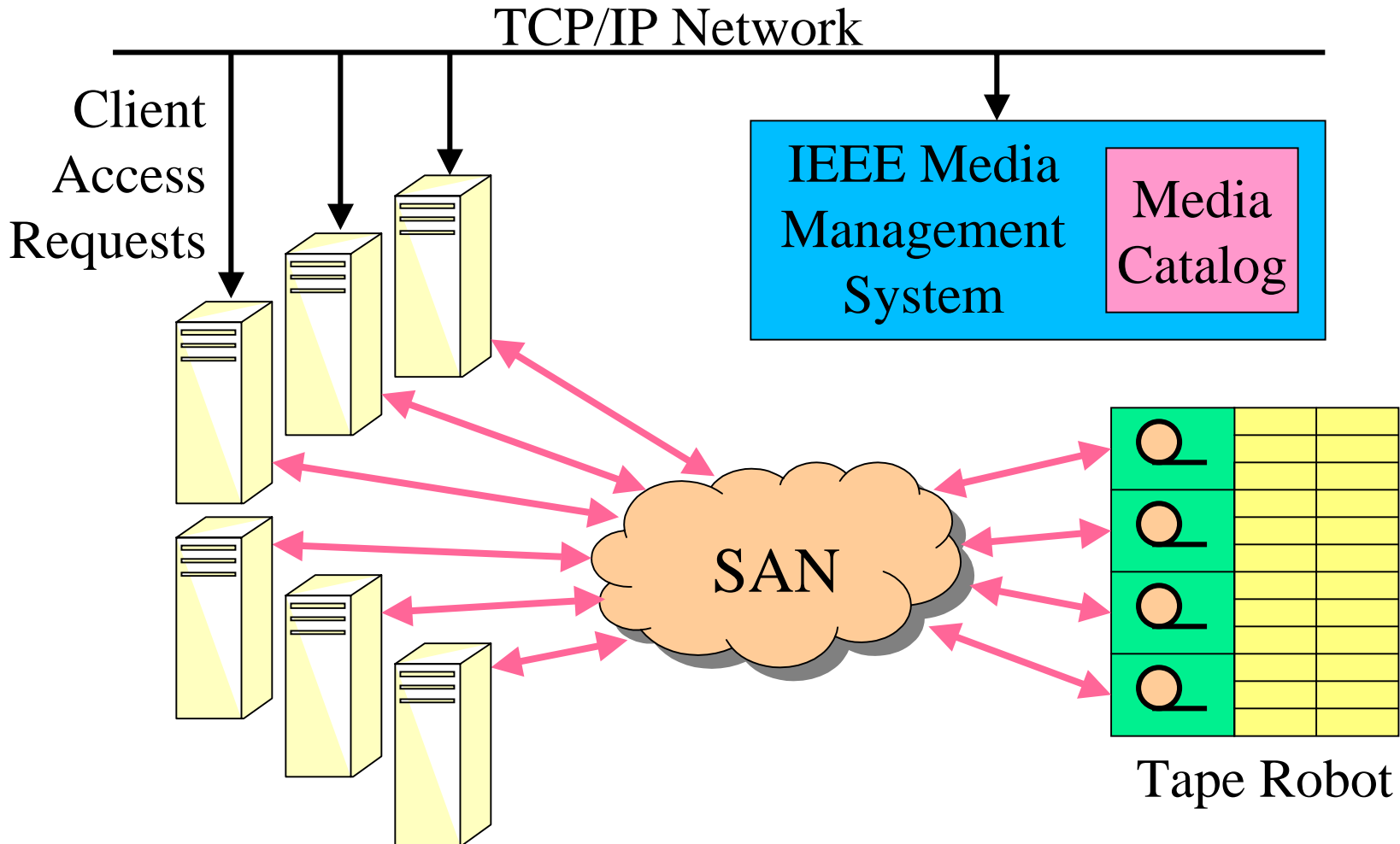
IEEE Media Management System

- Pulls the complexity of media management out of applications and into a framework
- Unify, centralize, & simplify management
- Standardize control interfaces: plug-and-play
- Sharing of resources between applications
- Approved standards: IEEE 1244

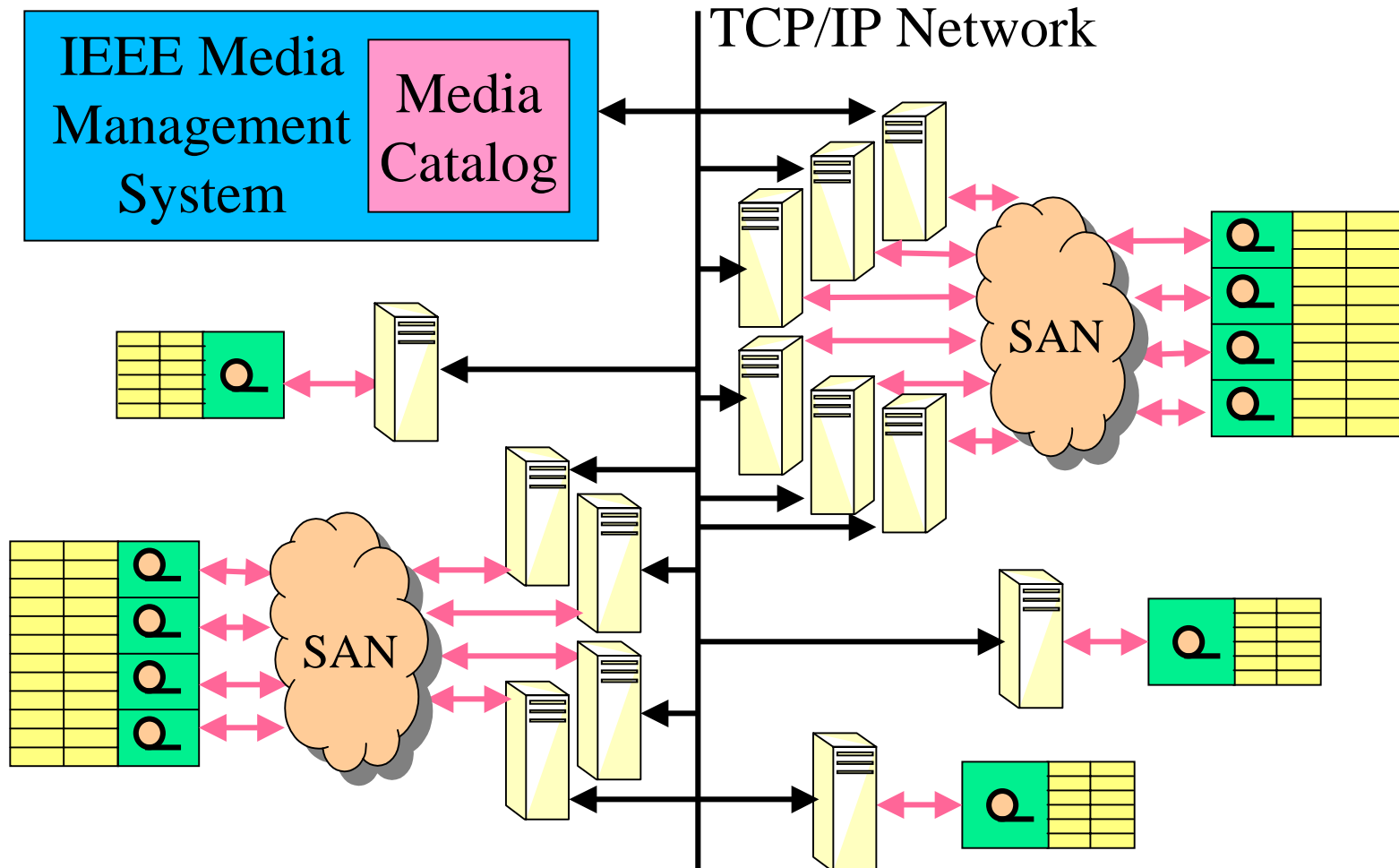
IEEE Media Management System

- Very high level application interface
 - E.g.: *mount task['12'] volname['able'];*
 - Parallel or atomic command group execution
- Cartridge/drive compatibility rule set
 - Mixed media environments
- Access control policy enforcement
- Resource usage and performance tracking

SAN Access Arbitration



Automatic Topology Detection



Major Work Areas

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- **Common Tape Driver Semantics Standard**
- Integration with SNIA

Common Tape Driver Semantics

- Tape access semantics varies across platforms
 - Affects application portability and
 - System Administration and technical support
- Desire all POSIX vendors to participate/adopt
 - Fastest route to eliminate incompatibilities
- IEEE Project 1563

Common Tape Driver Semantics

- A Standard API with Standard Semantics
 - Same Interfaces Doing Exactly the Same Things
 - On All POSIX Compliant Operating Systems
 - Which Semantic Is Much Less Important Than That It Be Common to All Platforms

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- **Integration with SNIA**

Integration with SNIA

Defining some terms:

- SNIA: Storage Networking Industry Assoc.
- CIM: Common Information Model
- DMTF: Distributed Management Task Force
- WBEM: Web Based Enterprise Management

Integration with SNIA

Storage Media Library (SML) Working Group

- SMLWG allows monitoring and management of removable media systems via a CIM interface
 - Drives, robots, software, etc
- Working with them to support an IEEE MMS
- Some CIM extensions required, being finalized
- Well established working relationship

Integration with SNIA

SNIA's IP-Tape Initiative

- Newly formed inside SNIA to ensure tapes are well supported in IP-Attached Storage standards
- SSSWG still exploring cooperative opportunities

Invitation

- Open to all interested people
- Web site: *www.ssswg.org*
- Meets six times per year, rotating between East Coast, West Coast, and Colorado
- Engineering style, low procedural content
- Contact me if you'd like to participate
 - Curtis Anderson, curtis@integratus.com