Initiative, a Technical Discussion

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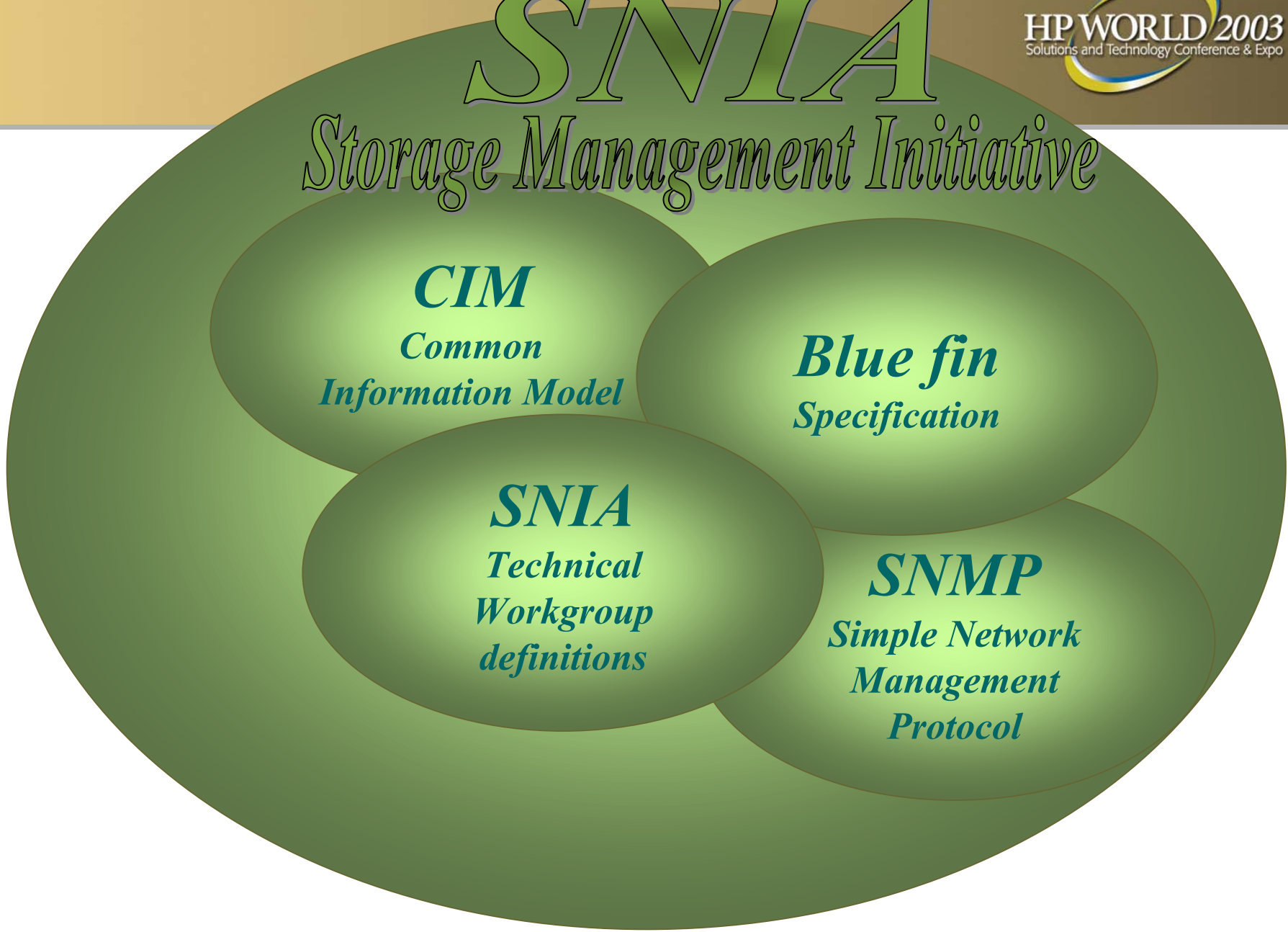
HP WORLD 2003
Solutions and Technology Conference & Expo

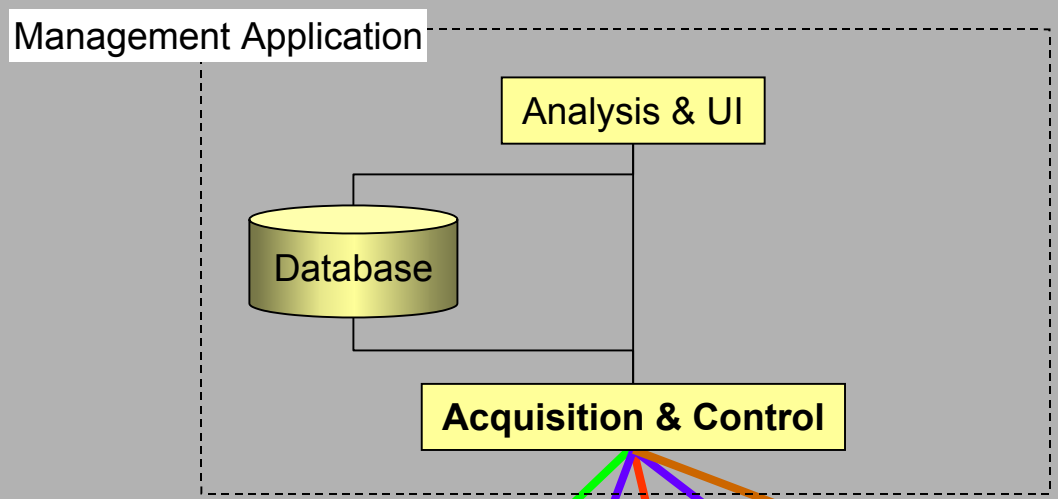
The SNIA Storage Management Initiative (SMI)

- The Storage Network Industry Association (SNIA) is creating and driving to broad adoption a highly functional and interoperable management interface for multi-vendor storage networking products.
- The SMI is:
  - Enabling the integration of larger and more diverse multi-vendor storage networks.
  - Creating a new class of more powerful management applications.
- In support of these goals the SNIA is now working toward the strategic imperative of: *"All storage managed by the SMI Interface in 2005".*

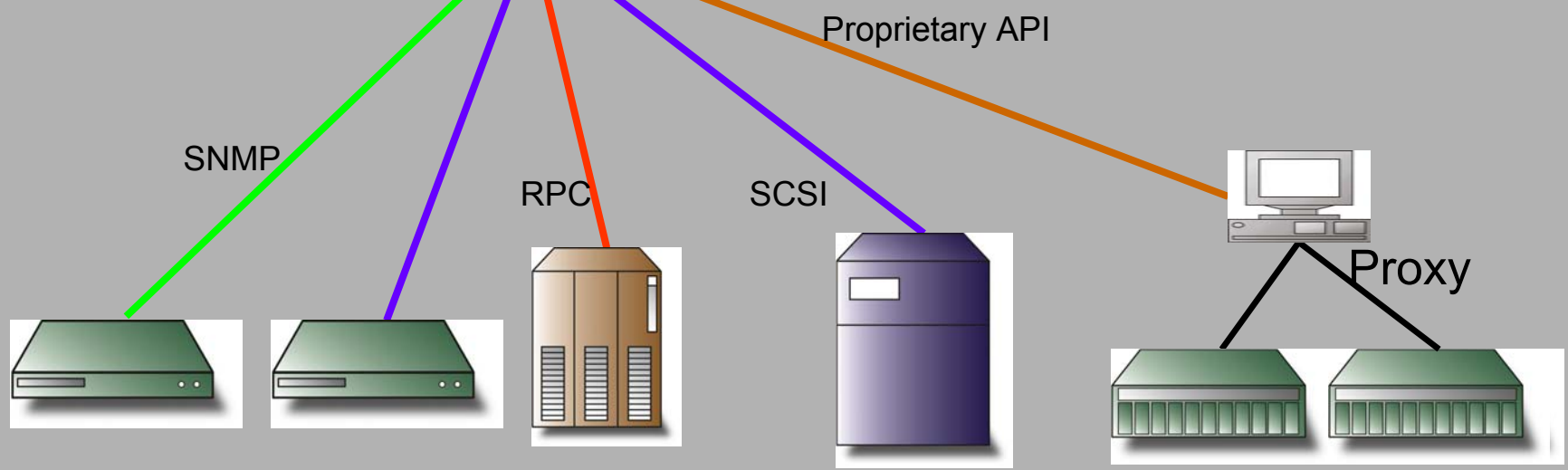
SNIA
Storage Management Initiative



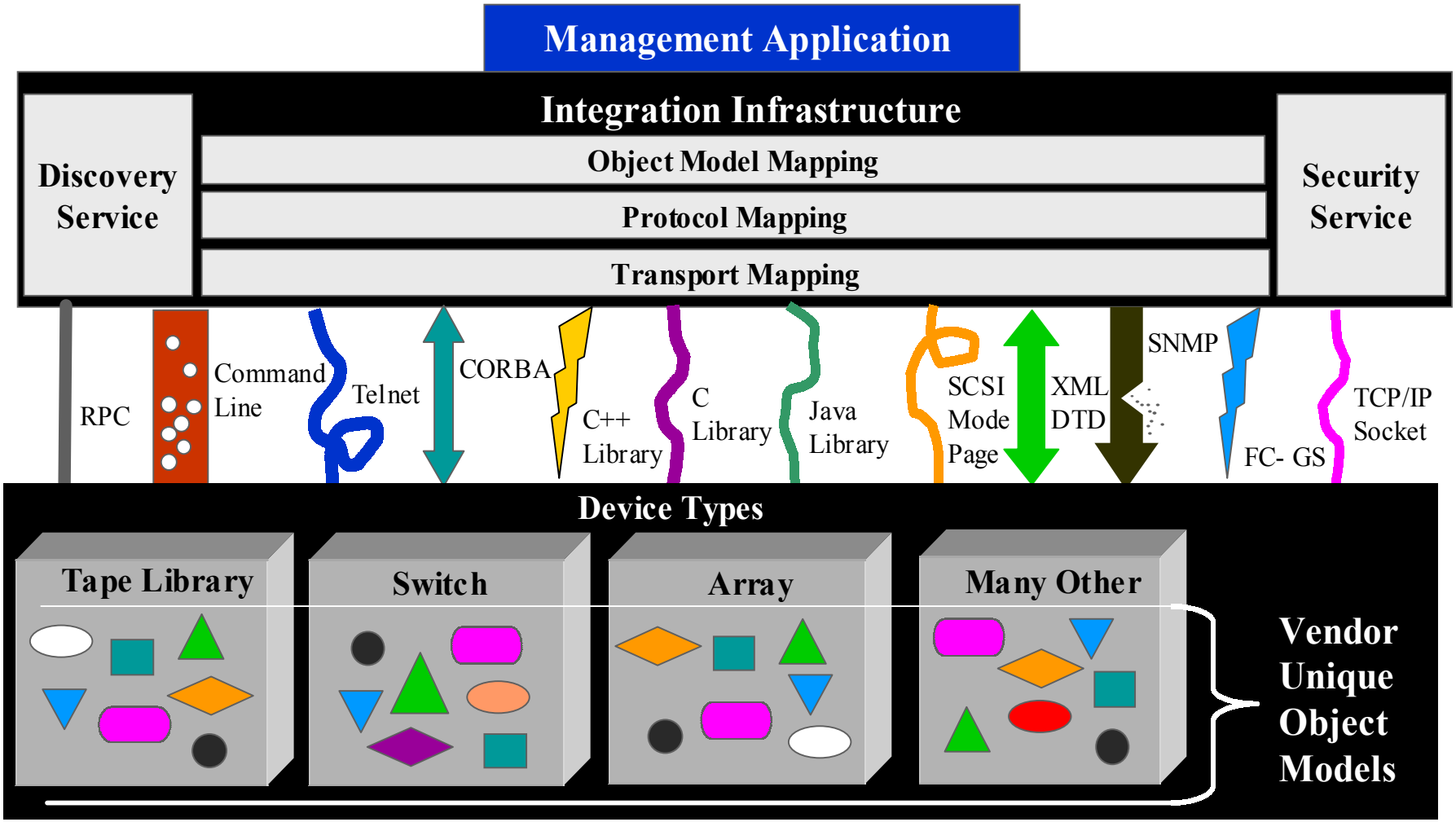
Storage Management Environment Today



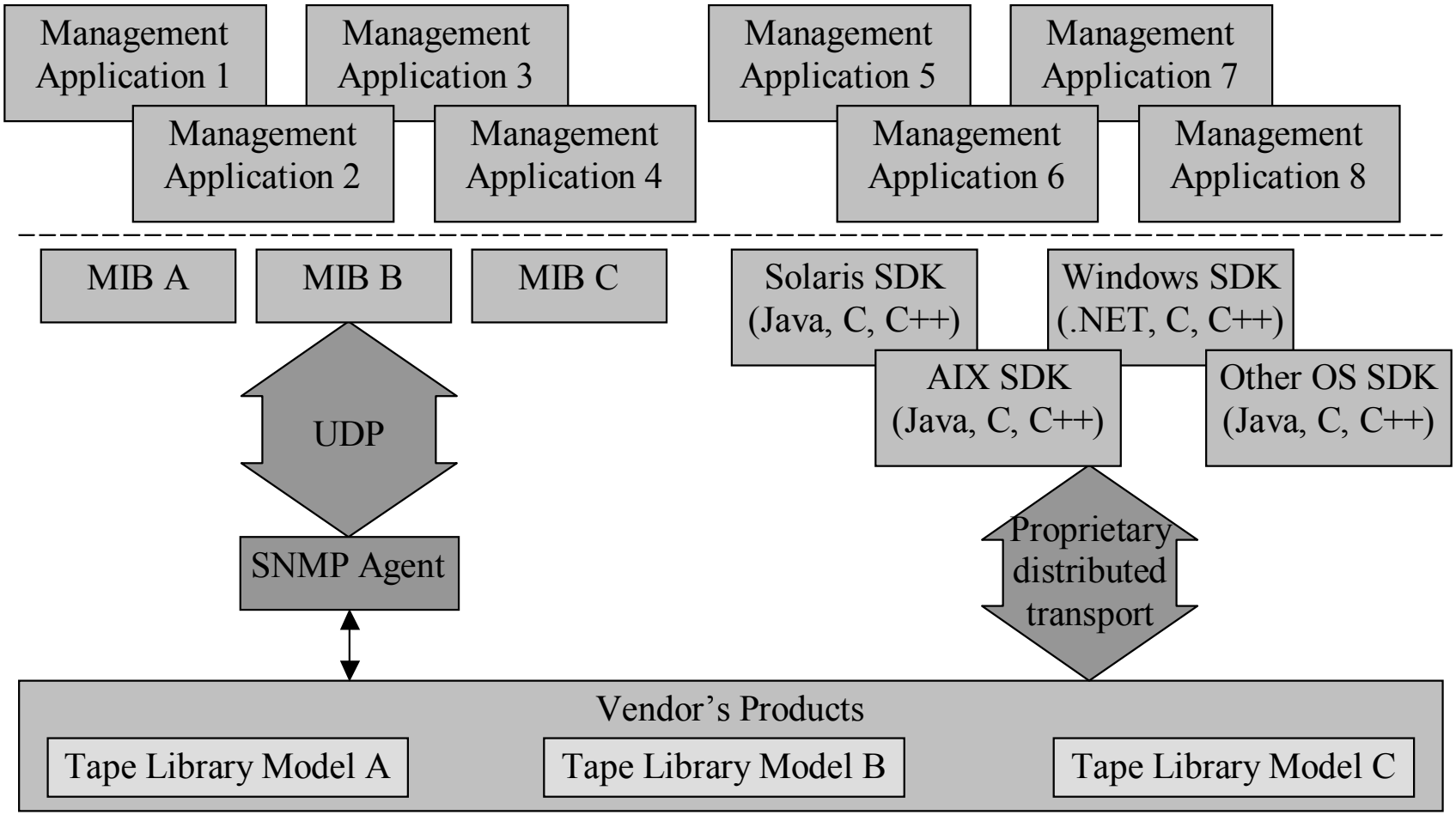
- Difficult to Manage
  - Different data standards (SNMP, DMI, SES, …)
  - Different terminology
  - Proprietary MIBs
  - Missing data (topologies and dependencies)



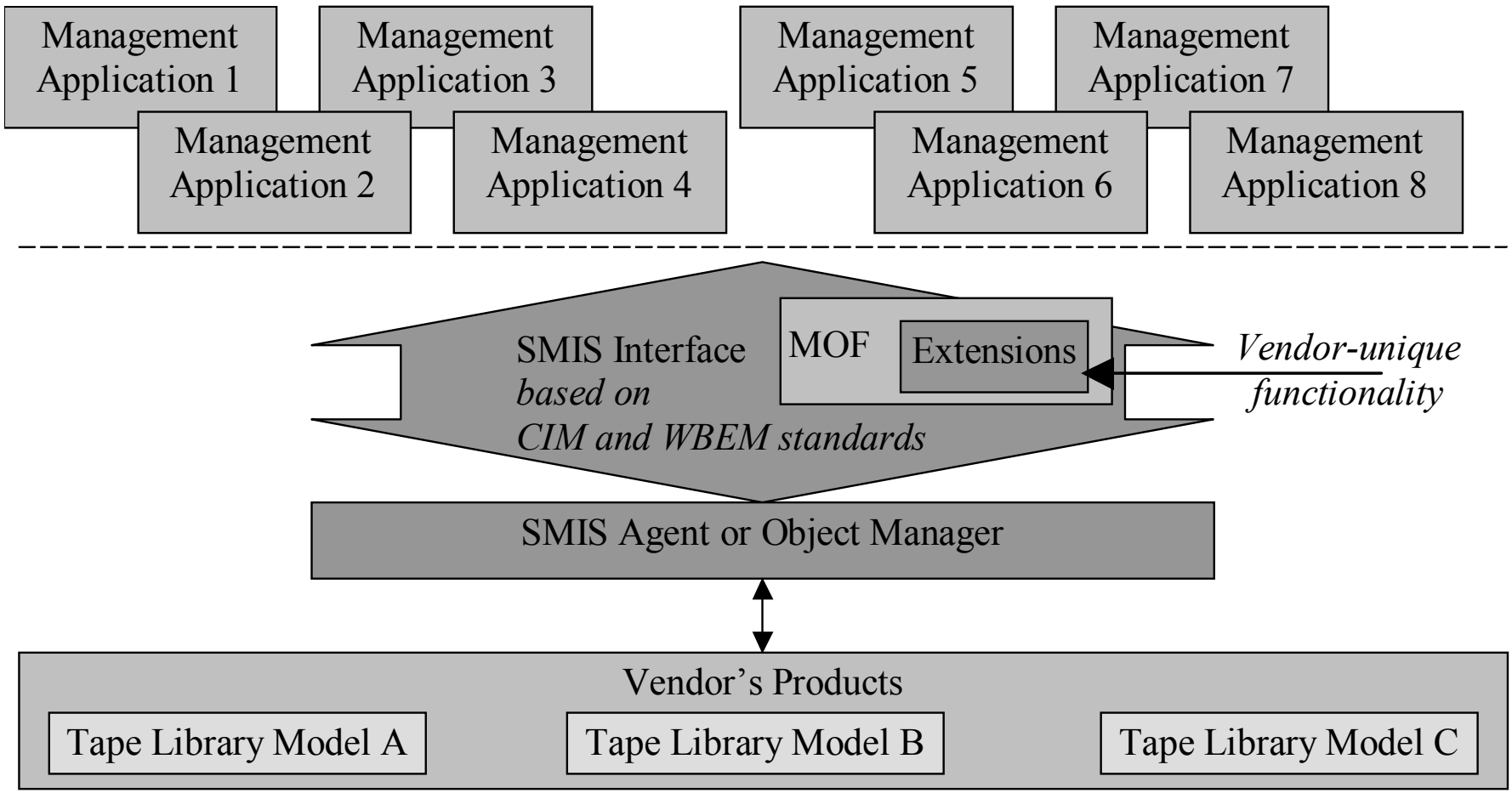
Management Applications Today



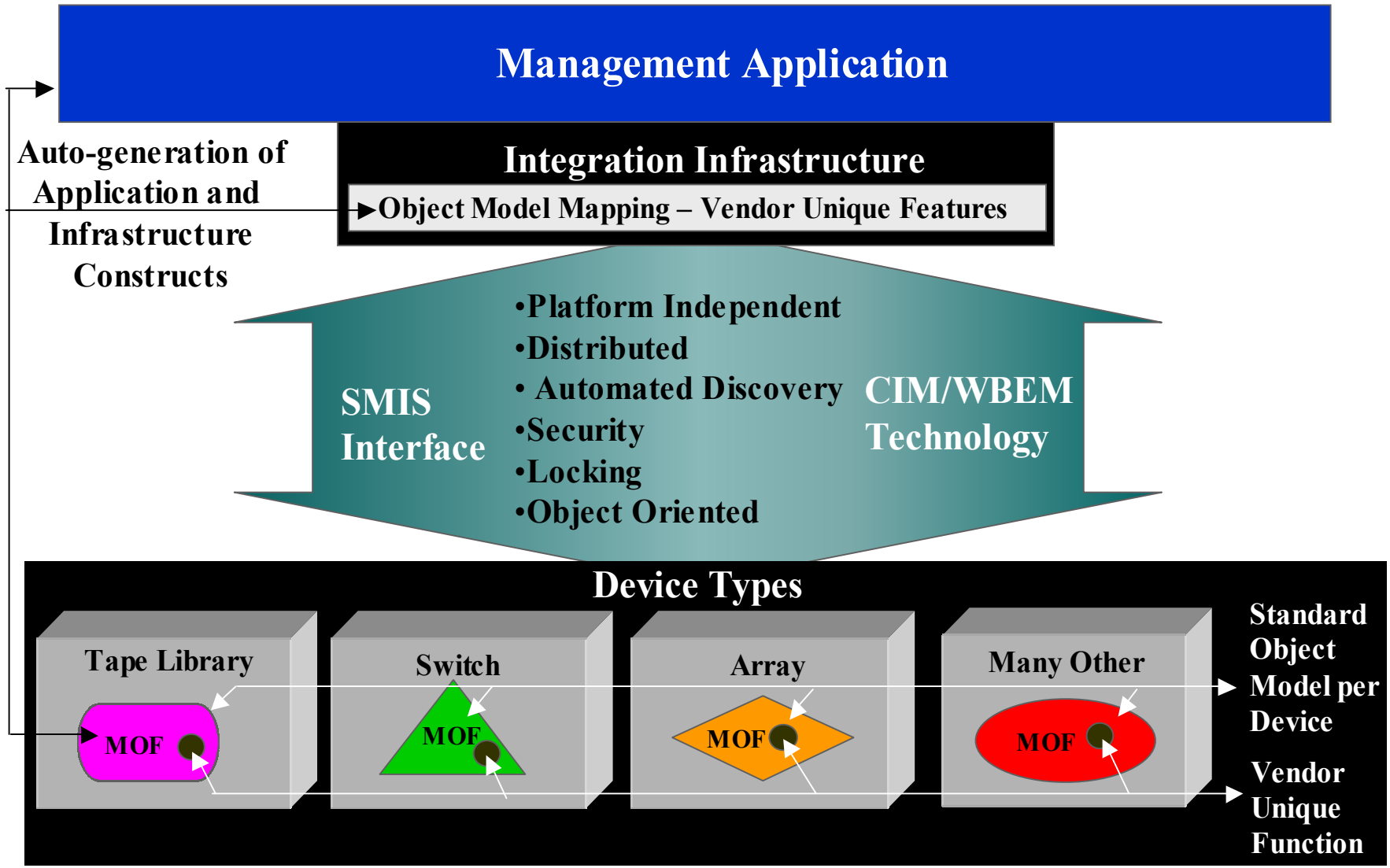
Component Developer's Point of View



SMI Developer's Advantage



Storage Management Applications with SMIS



SNIA Shared Storage Model

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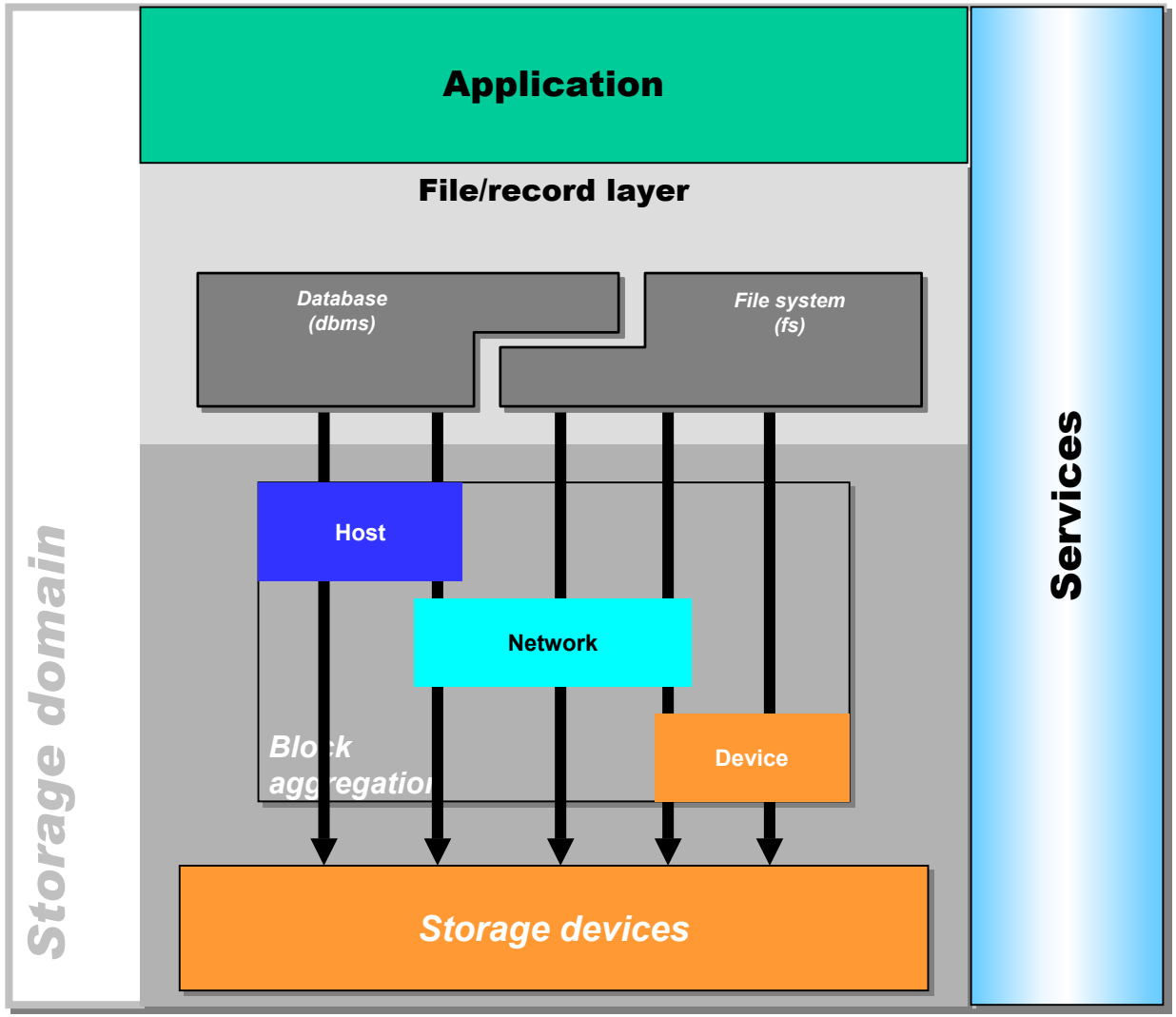
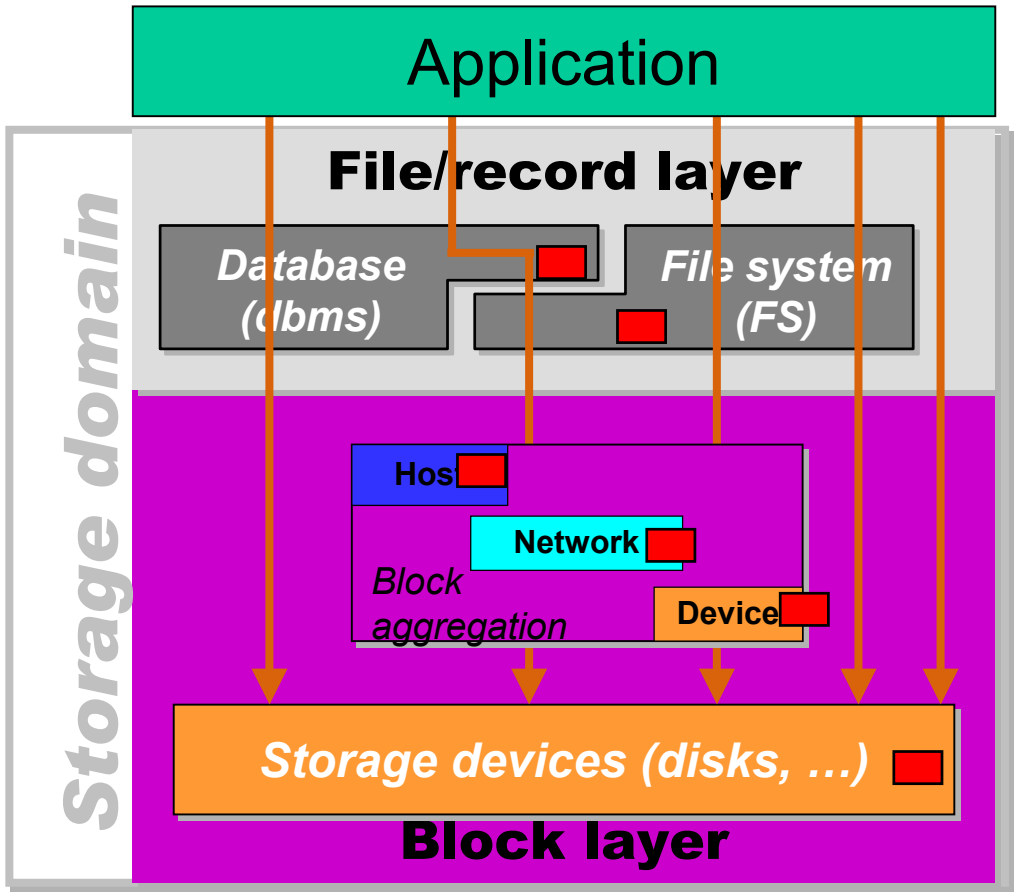
- Application
- File/record layer
  - Database
  - File system
- Block aggregation
  - Host
  - Network
  - Device
- Storage devices



The Data Path



Native Control Functions

Real time requirement

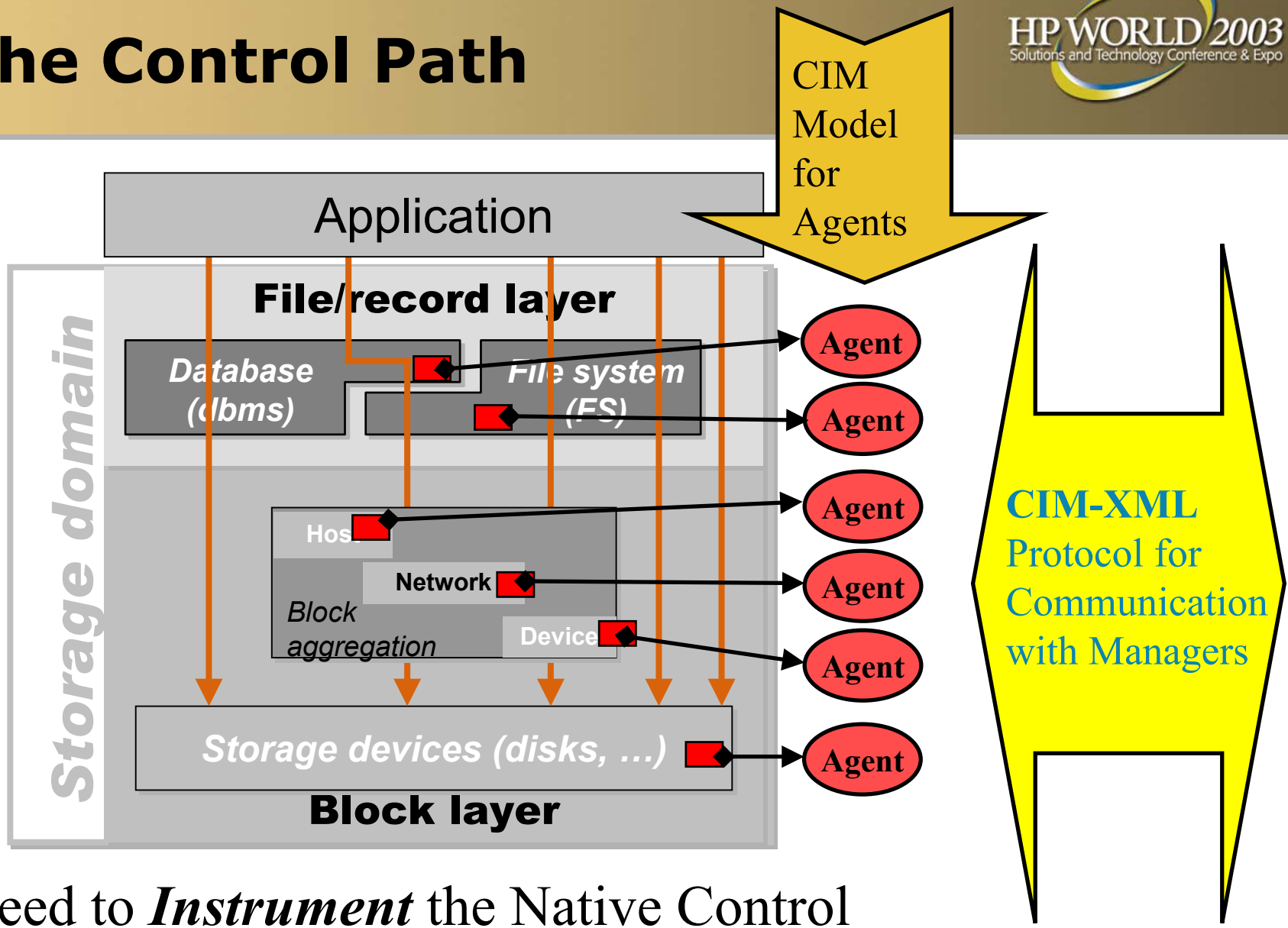
Functional API/Protocol

- Used to transfer Data
- open/close/read/write
- Already Standardized
  - POSIX
  - SCSI
  - etc.

Administrative API/Protocol

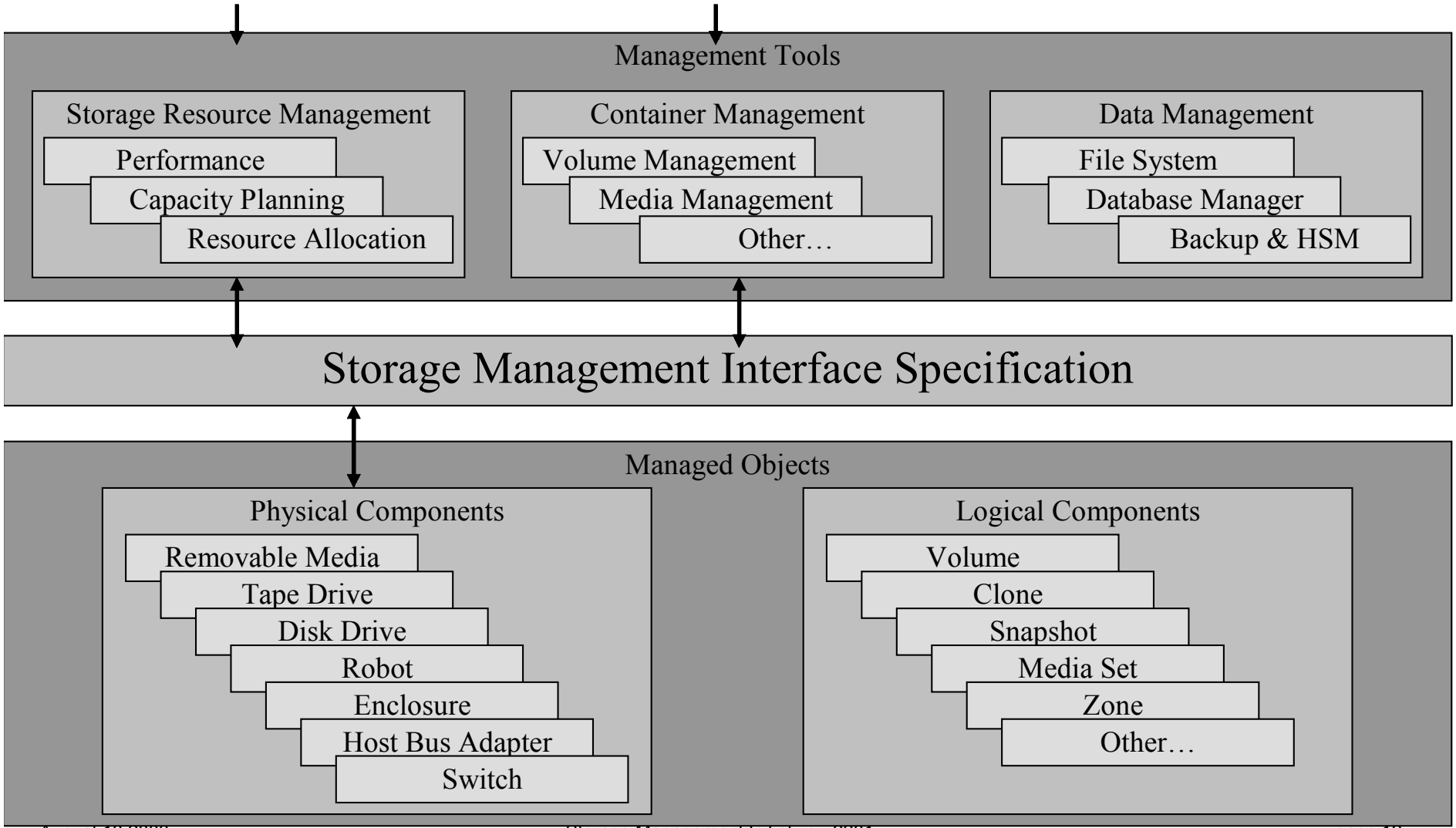
- Used for metadata control
- Configuration
- Monitoring Status
- Control Operations
- Few Standards
  - SNMP MIBs rare
  - CIM/WBEM better

The Control Path

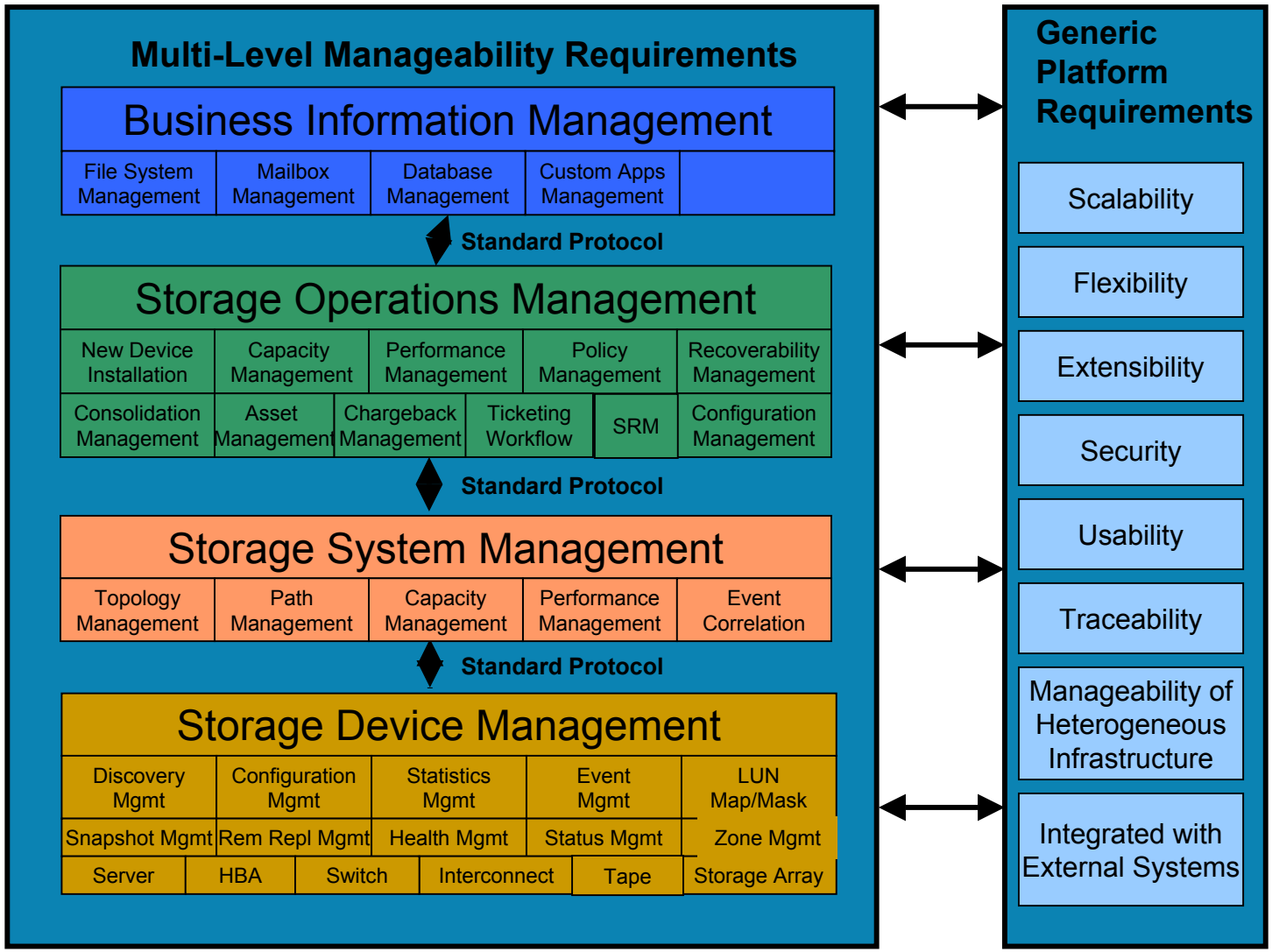


Need to ***Instrument*** the Native Control Functions with SMI Management ***Agents***

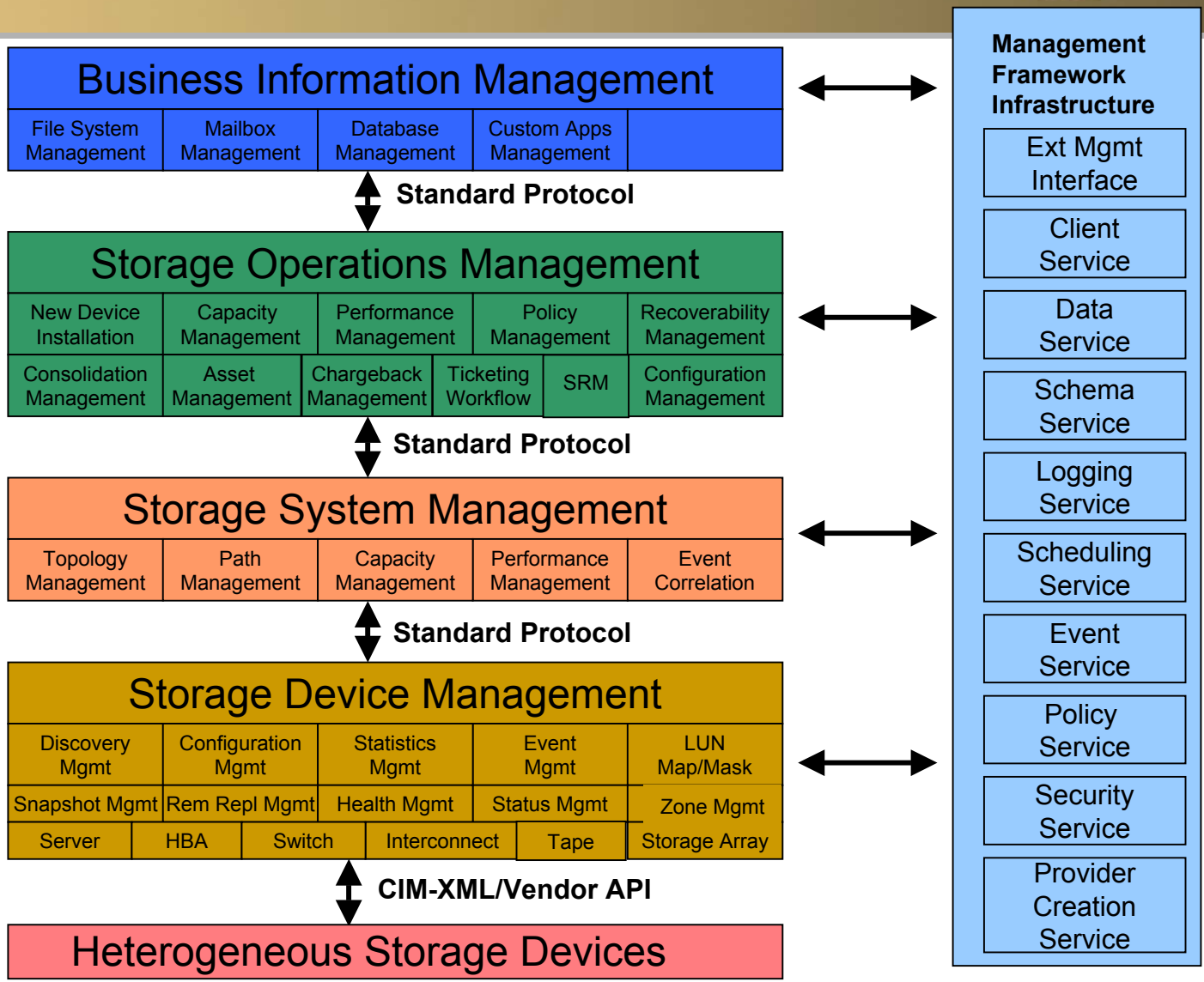
Architectural Vision of Standardized Management



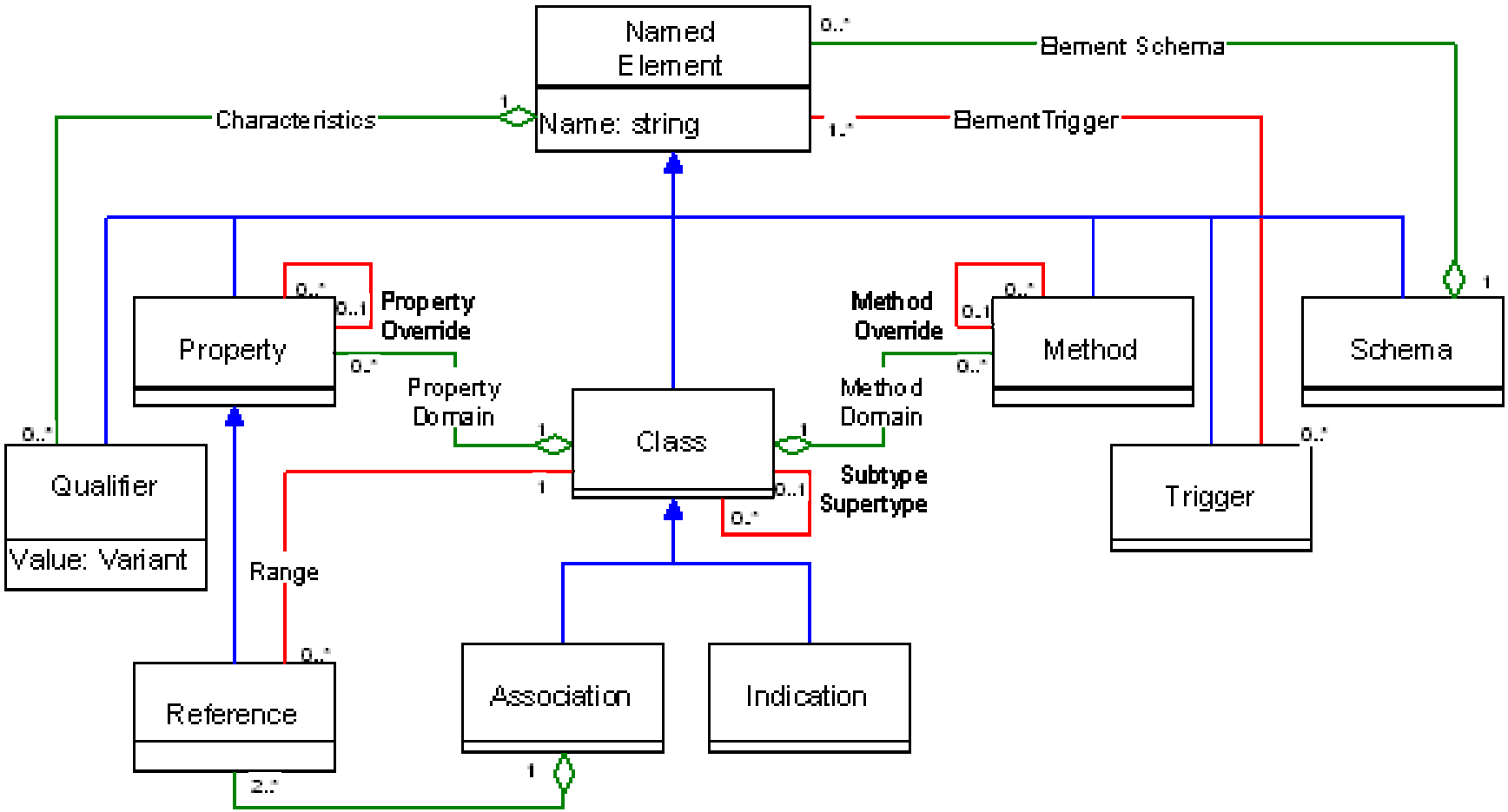
Management Model Requirements



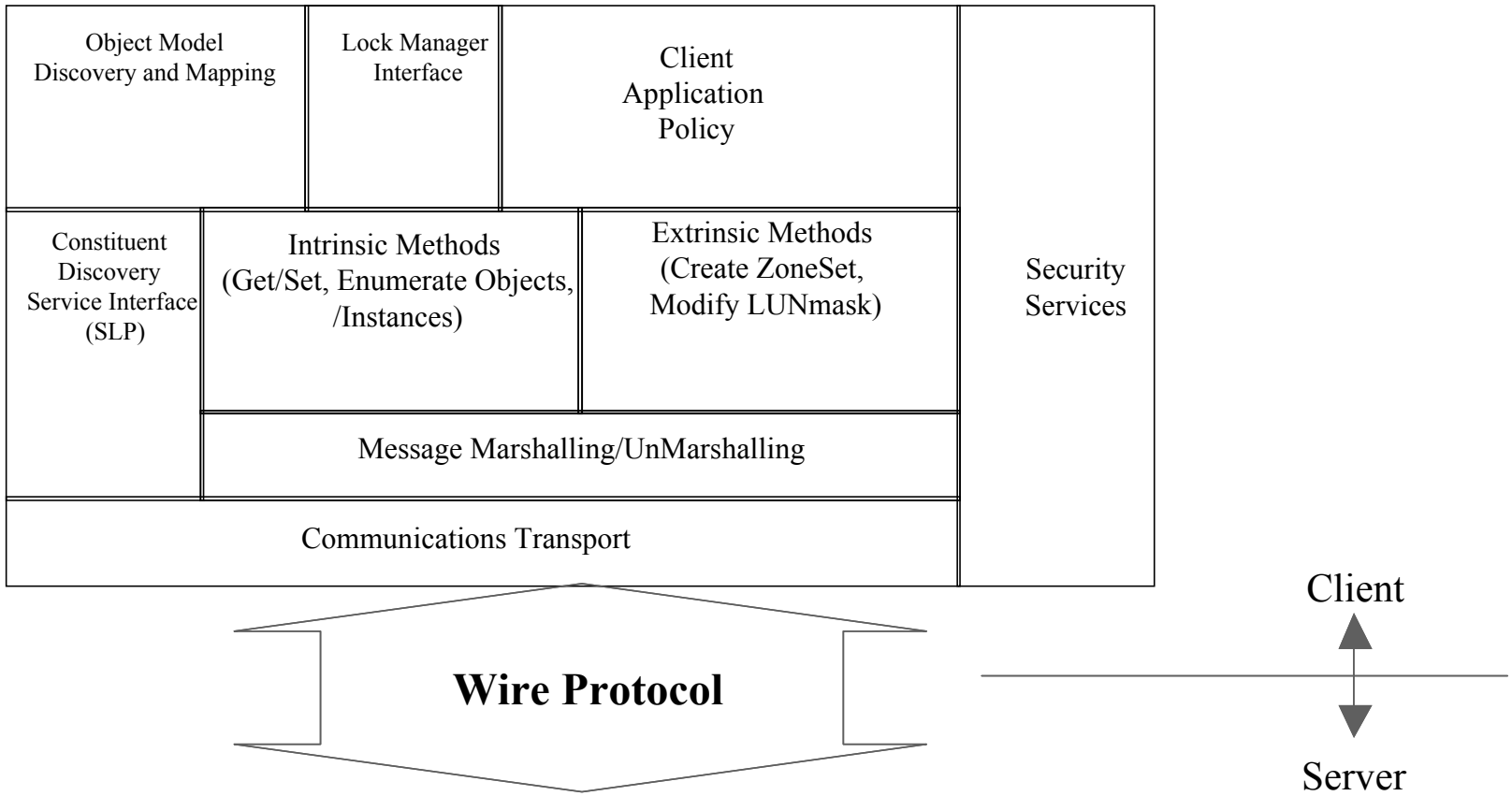
Storage Management Model



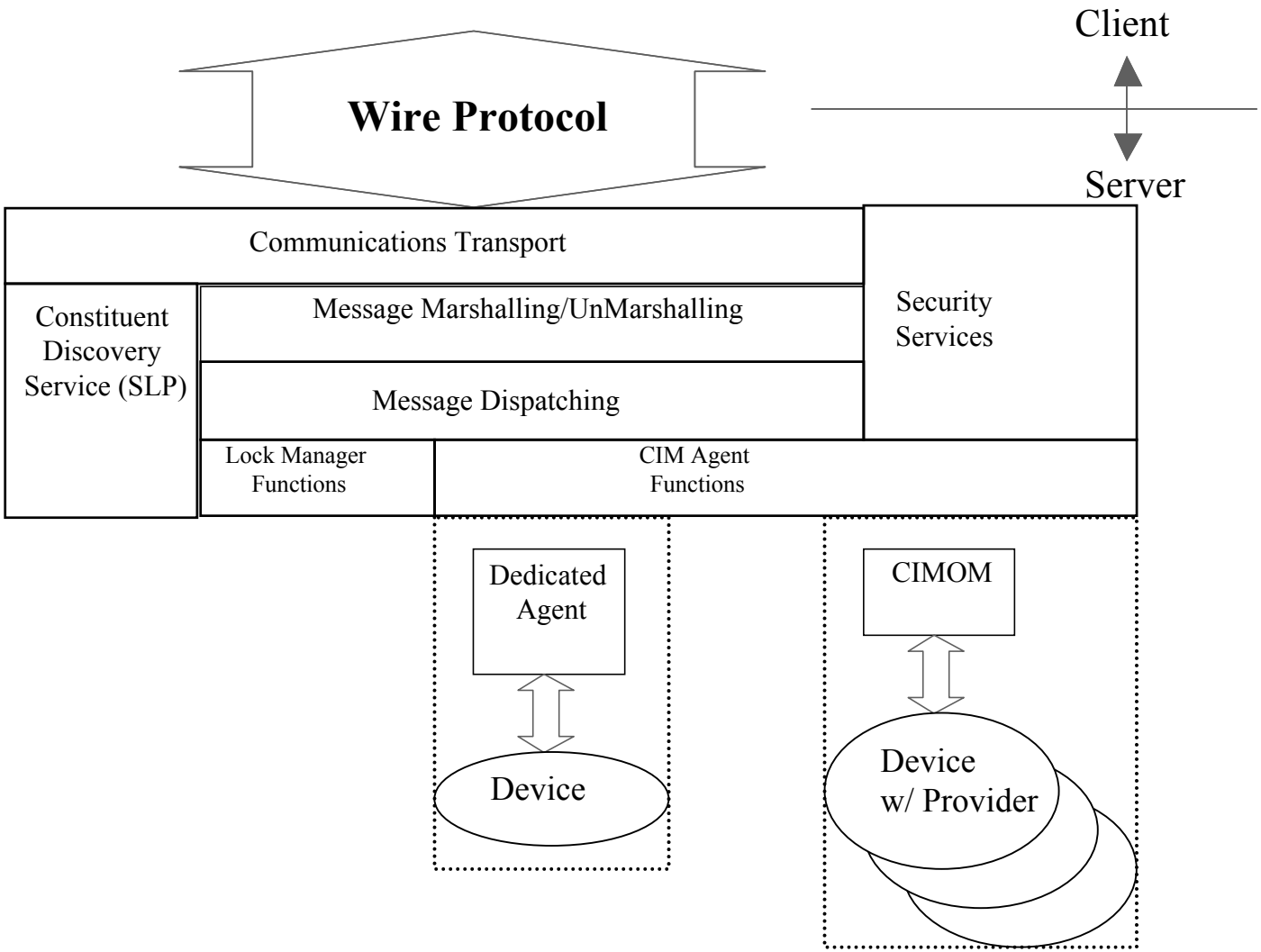
Common Information Model (CIM)



Layers (Client)

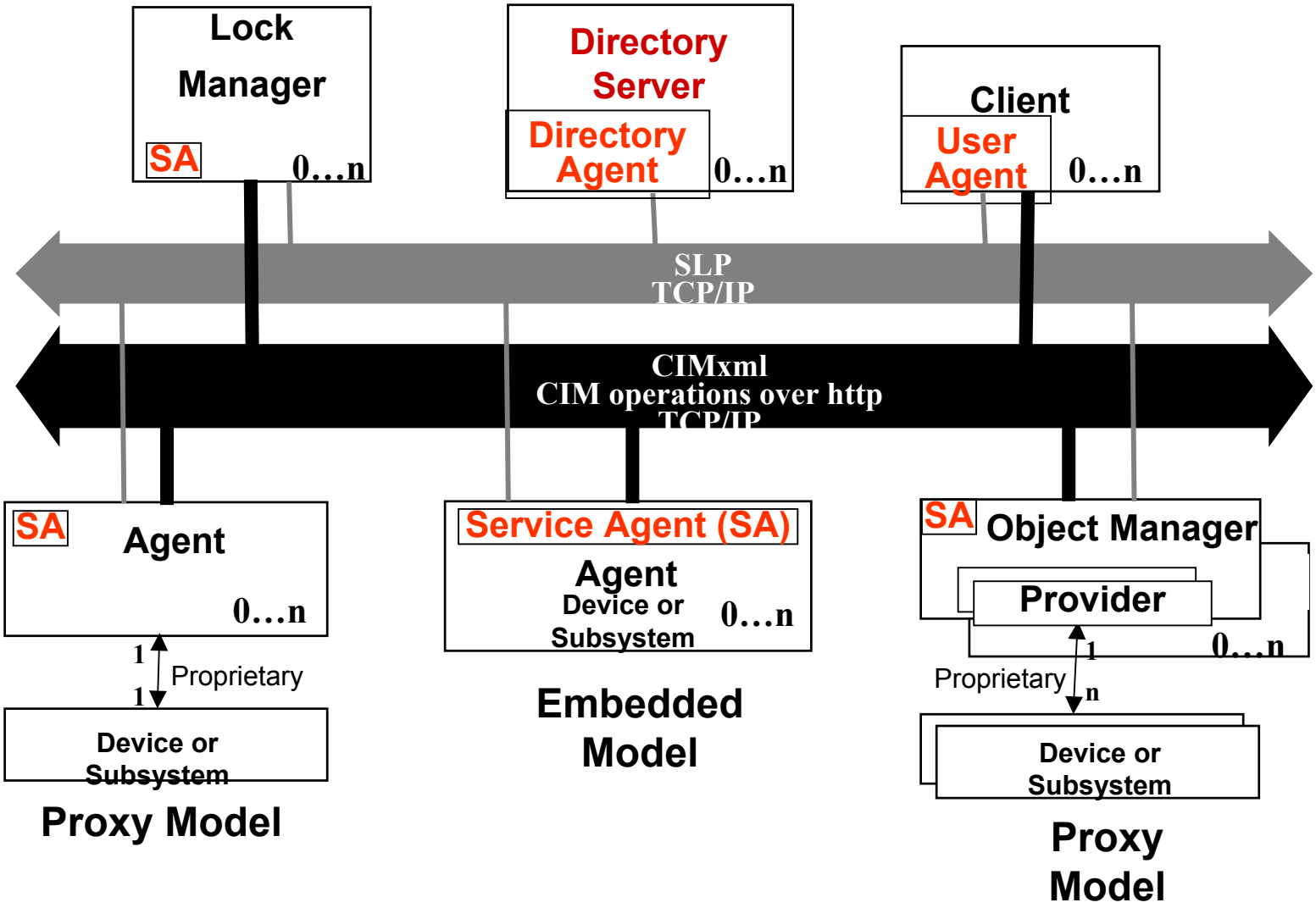


Layers (Server)



Profile Content

Profile Element	Goal
Description	A textual introduction to the SAN entity being profiled. It provides a high-level foundation for the more detailed descriptions to follow.
Schema Diagram	A diagram of the subset of the PDP Object Model that is most concerned with the SAN entity being described.
Instance Diagrams	One or more instance diagrams to highlight common implementations that employ this section of the Object Model.
Client Considerations	This section summarizes the implementation concerns that will be encountered by products and services that rely on the SAN entity being described.
Agent Considerations	This section summarized the implementation concerns that must be accounted for by agent implementations (either embedded or proxy) that provide information from one or more of the SAN entities to PDP clients.
Indications	This section details any indications that have been defined in conjunction with this SAN entity.
Classes	This section provides a list of the classes upon which this class of SAN entity relies, information on whether the class is required for the particular profile, and profile-specific notes. Each class reference includes a cross-reference to the detailed definition of the class.


Lock Manager
SA
0…n
Directory Server
Directory Agent
0…n
Client
User Agent
0…n
SLP
TCP/IP
CIMxml
CIM operations over http
TCP/IP
SA
Agent
0…n
1
1
Proprietary
Device or Subsystem
Proxy Model
Service Agent (SA)
Agent
Device or Subsystem
0…n
Embedded Model
SA
Object Manager
Provider
1
0…n
Proprietary
n
Device or Subsystem
Proxy Model

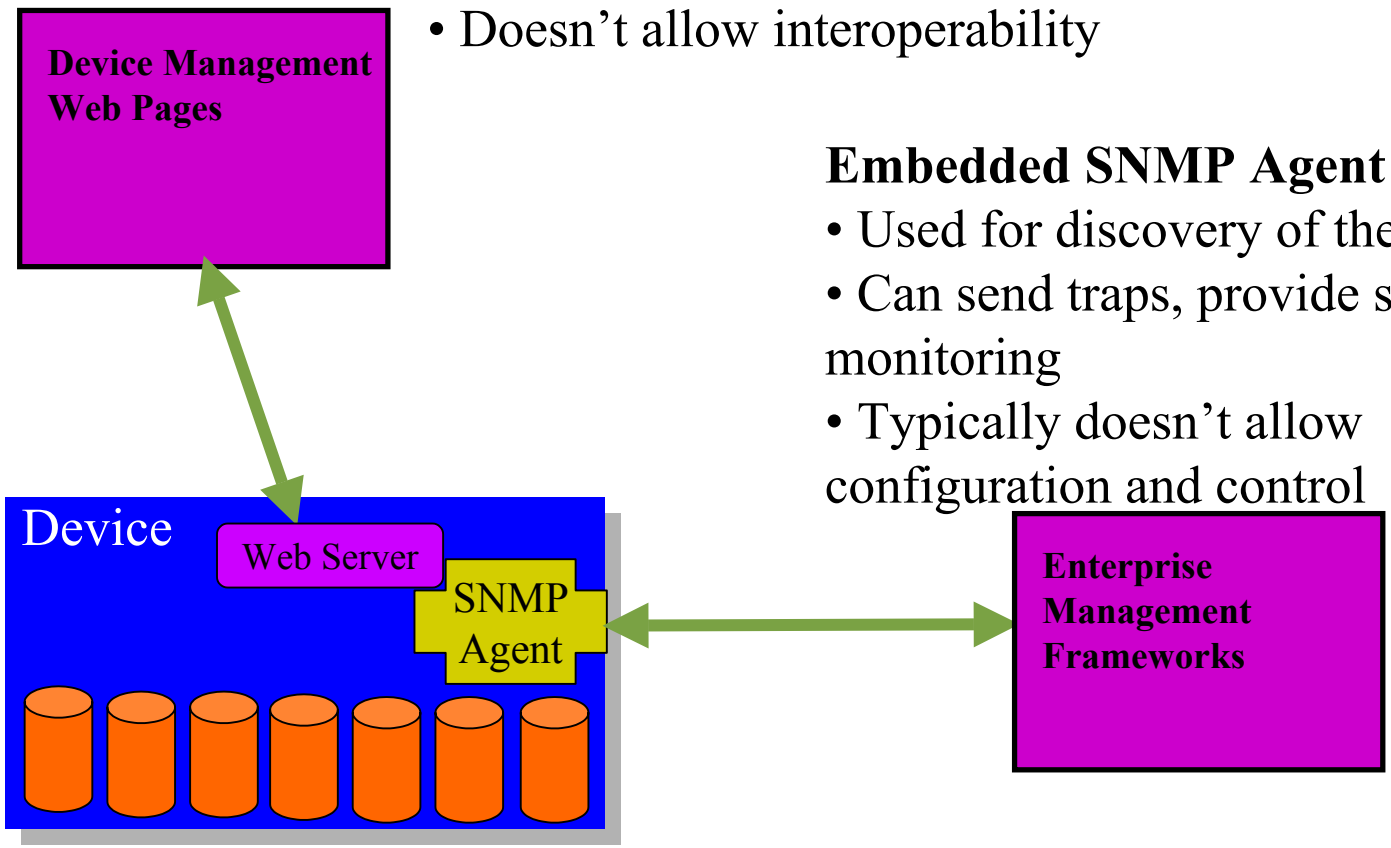
Existing Vendor Instrumentation

Device Management Web Pages

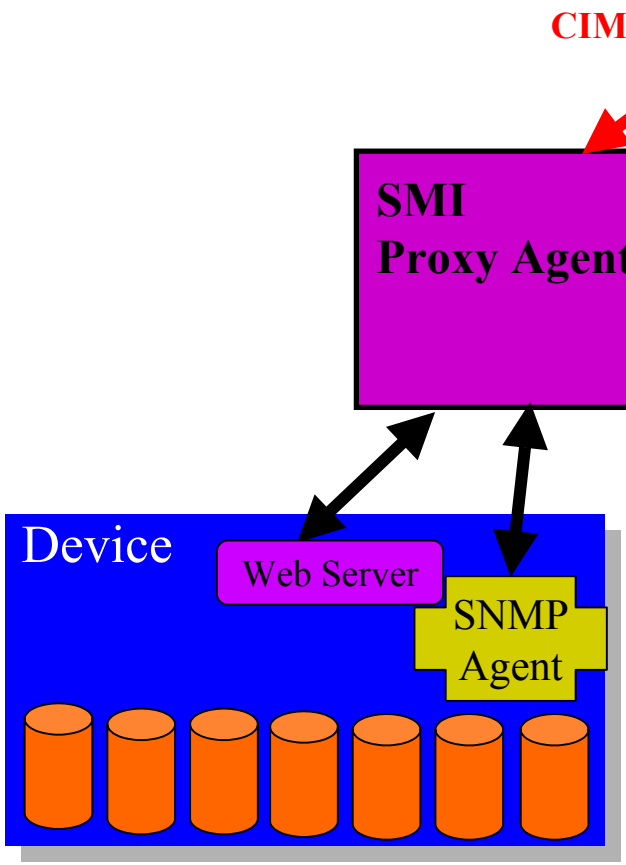
- Allows configuration of the device
- Doesn't scale for monitoring
- Doesn't allow interoperability

Embedded SNMP Agent

- Used for discovery of the device
- Can send traps, provide status for monitoring
- Typically doesn't allow configuration and control



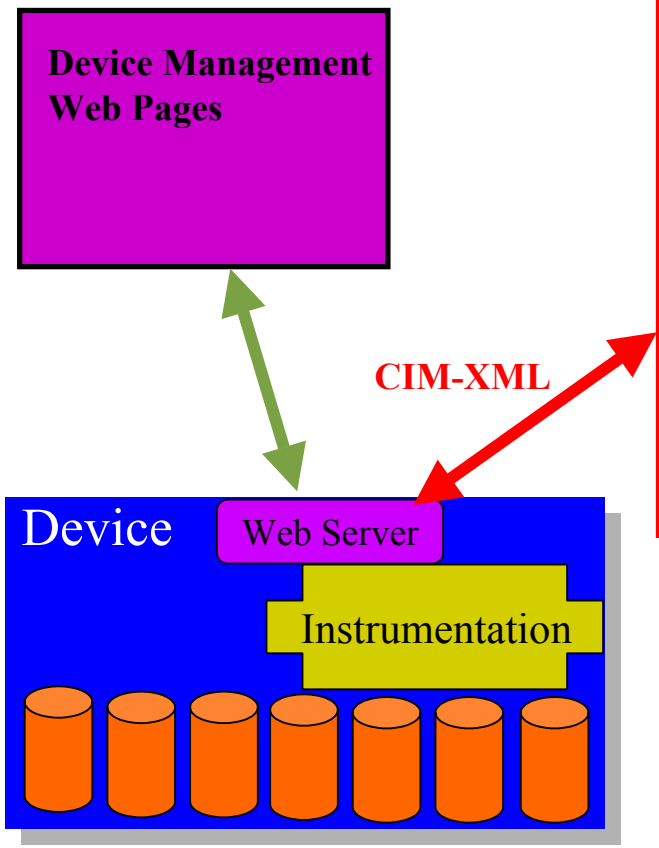
Legacy/Installed Base Proxy



SMI Proxy Agent

- Works with legacy, installed base
- Can use existing proprietary protocols
- Upgrades device to new standard
- Can run on an attached host, or plug into existing infrastructure

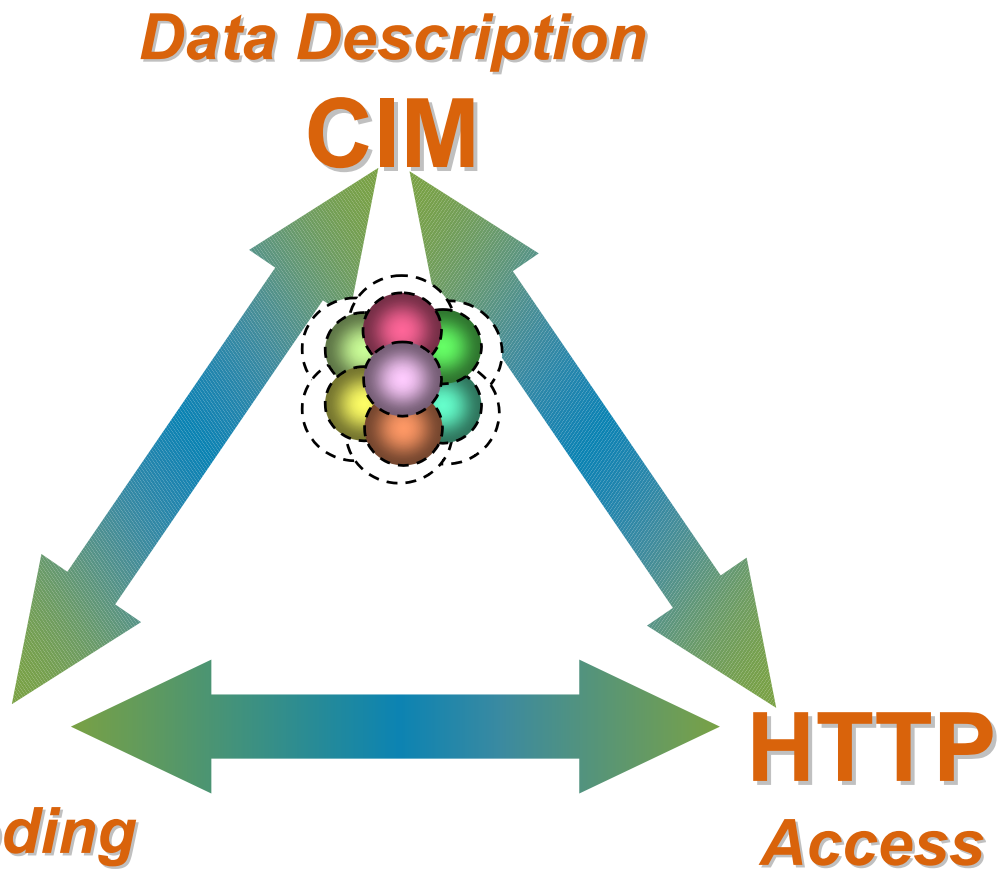
Embedded Instrumentation



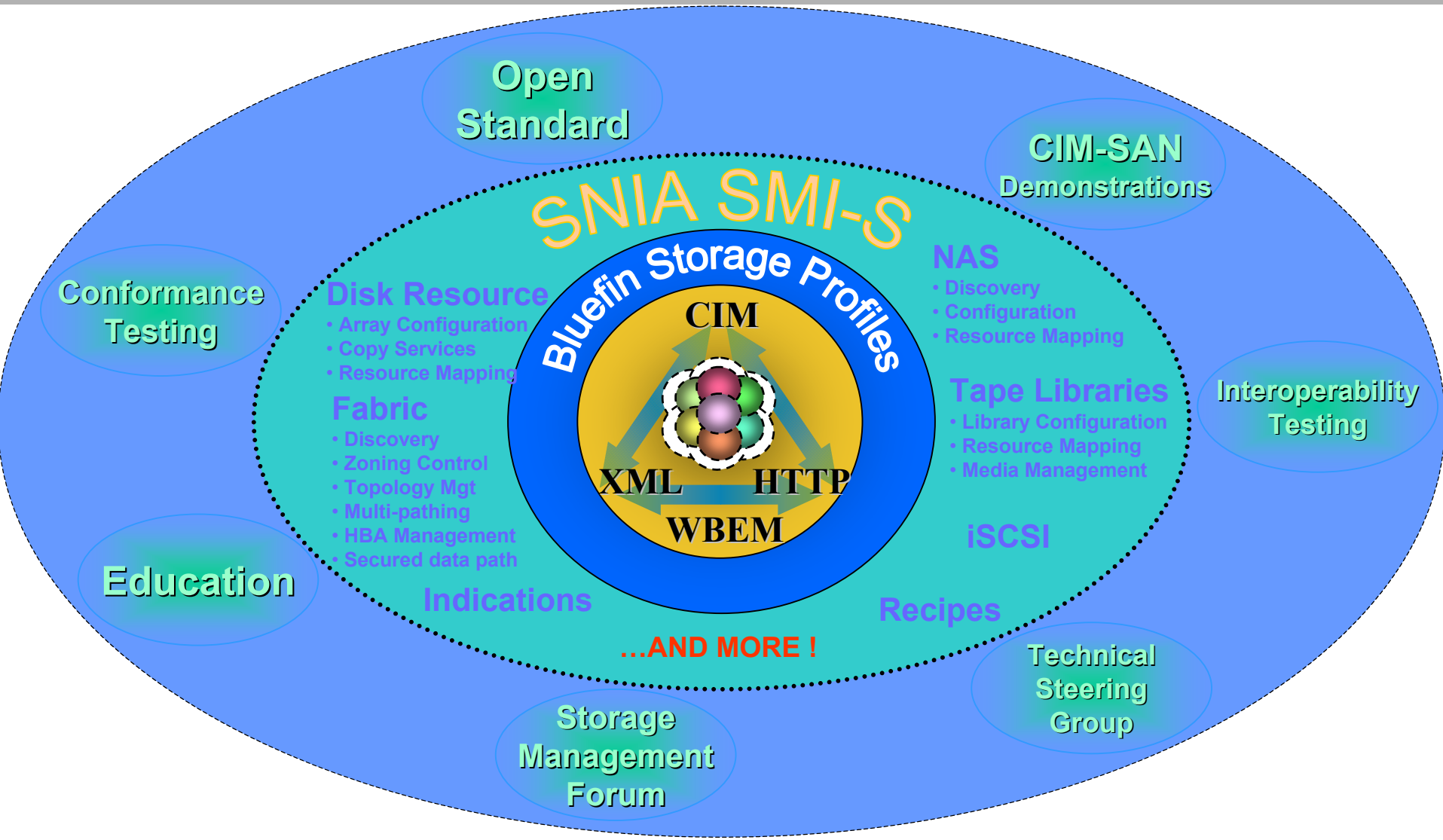
SMI Agent Instrumentation

- Used for discovery of the device
- Can send events, provide status for monitoring
- Allows interoperable configuration and control
- Integrates with management frameworks
- Supports locking, transactions for consistency

SMI Builds off of Web-Based Enterprise Management



Storage Management Initiative



Storage Management: SNIA Current Strategic Focus

- Storage Management Initiative (SMI)
  - *Shifts* **the development model for the Storage Industry (single standard interface)**
  - *Enables* **vendor efficiencies and cooperation**
  - *Accelerates* **the delivery of interoperable and manageable storage networking solutions**

- All Storage Managed by the SM-S

" All new storage networking products containing SMI-S Object models that GA after 2005 from SNIA member companies will use the SM-I interface for management"

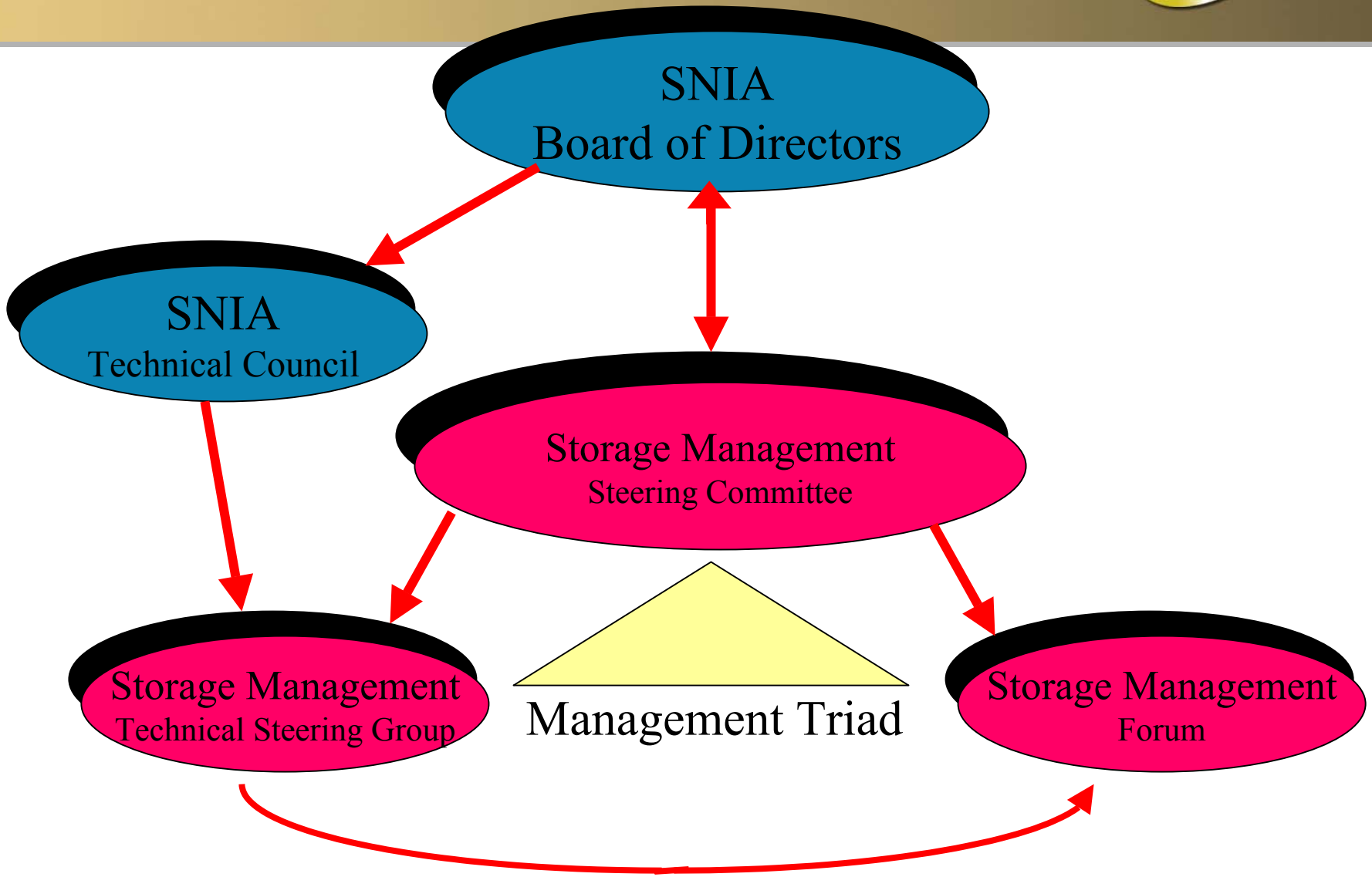
Strategic Questions

- How does the SNIA:
  - successfully augment/complete the Bluefin SAN management specification?
  - drive vendor implementation of the interface?
  - create multi-vendor interoperability for vendors who implement the interface?
  - move from SAN management into Storage Management?

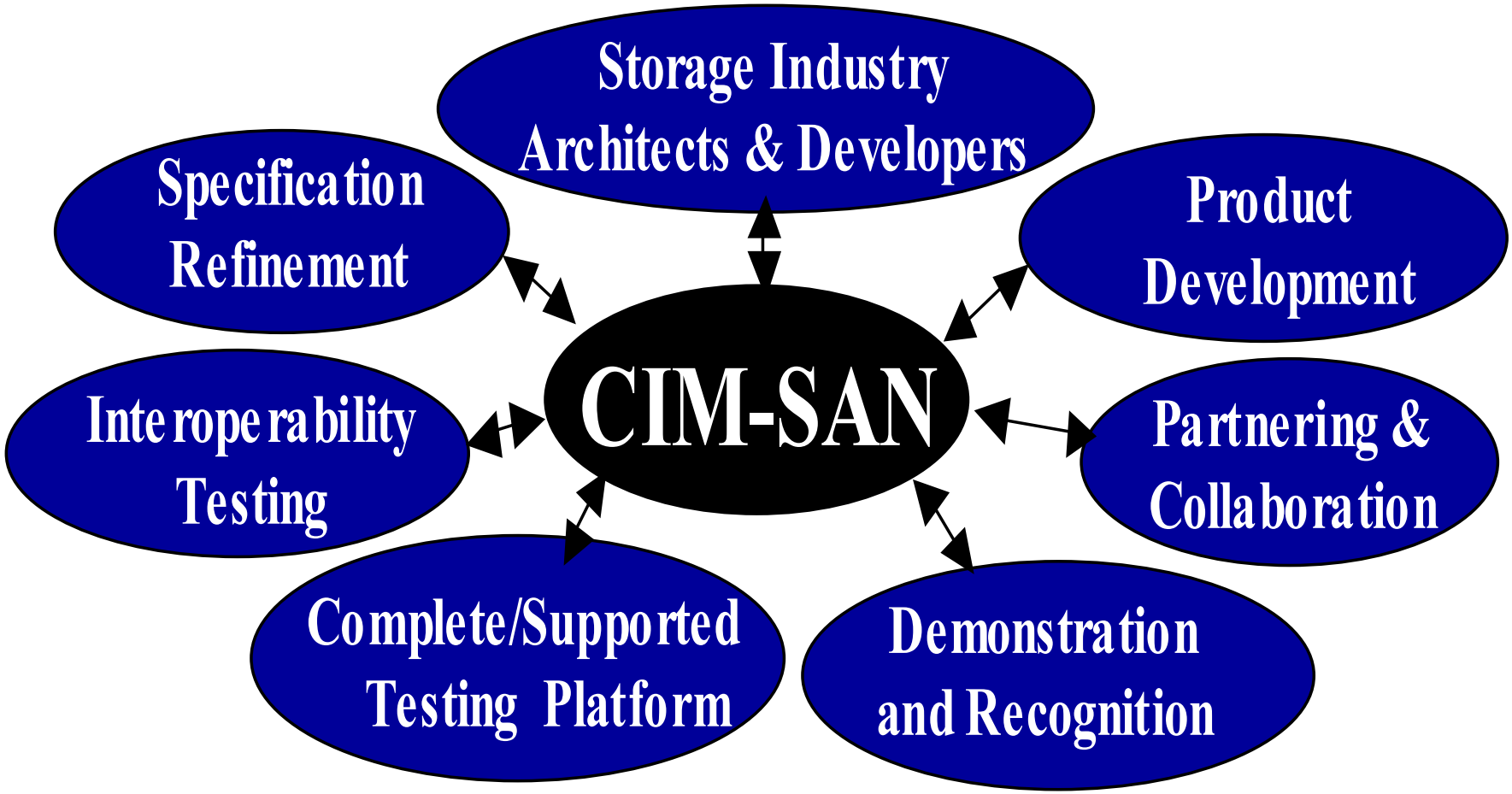
SNIA Resources

- The SMI brings together the vast and unique resources of the SNIA including:
  - Education, Interoperability, Technical Work Groups, Marketing, Conferences, and the Technology Center to deliver this technology to the industry.
  - In immediate support of the SMI's strategic imperative the SNIA has launched the CIM-SAN-1 demonstration to be displayed at the upcoming Storage Networking World Conference. CIM-SAN-1 will publicly demonstrate vendor adoption of the SMI Interface for the management of Storage Area Networks.

SMI Infrastructure Development

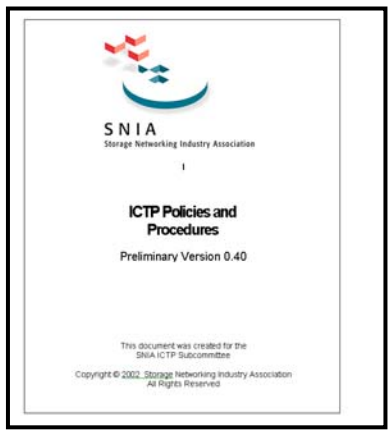


CIM-SAN Plugfest



Interoperability Conformance Test Program (ICTP)

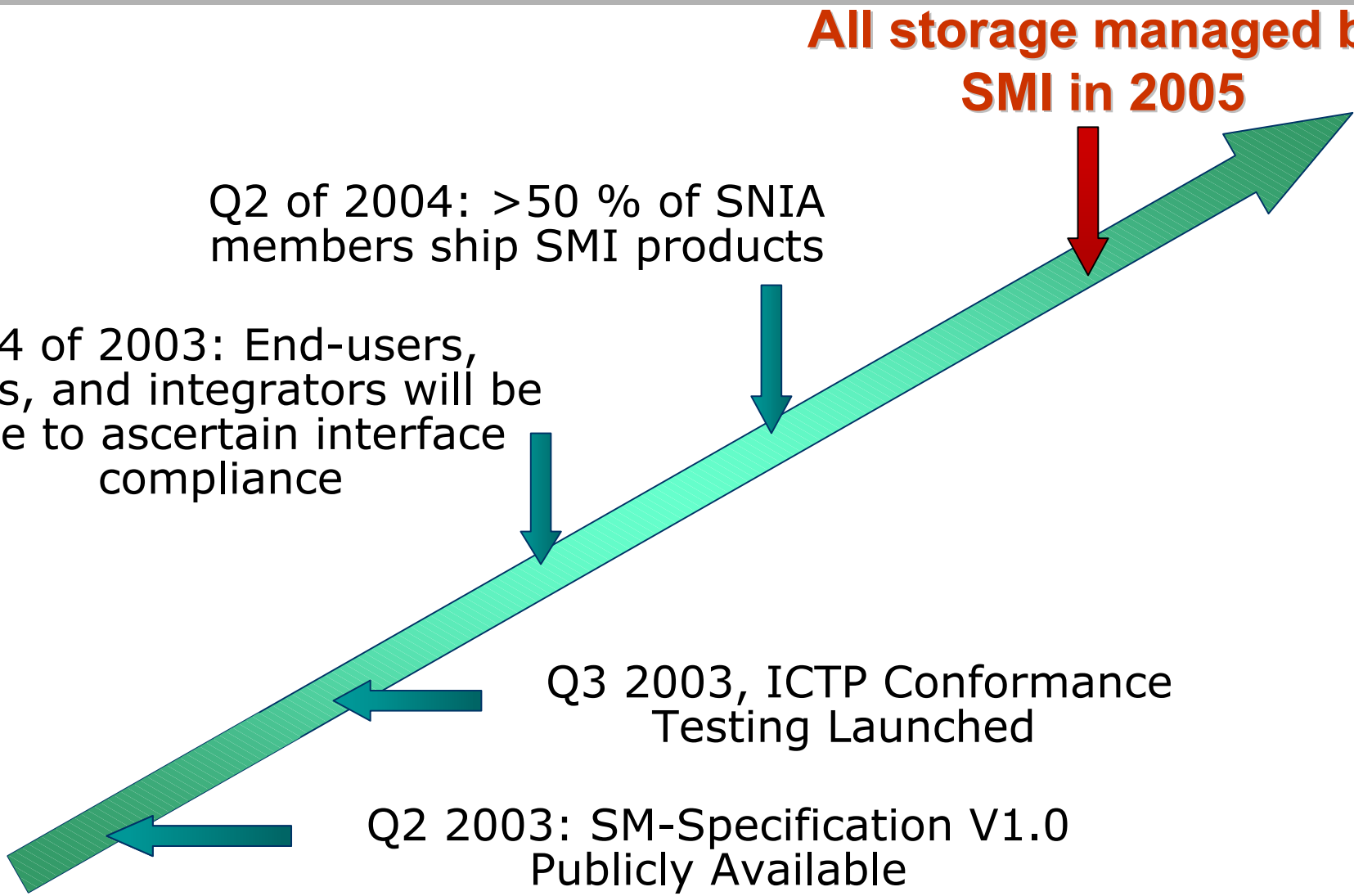
- The SNIA Interoperability Committee has developed an automated test suite certification program to ensure conformance to industry standard specifications
- The SMI Technical Steering Group is working with the individual Technical Working Groups to develop ICTP Test Specifications for each release of the SMIS



SNIA as a Standards Body

- The SNIA Board has passed a motion to formally become an accredited Standards Body
- Investigations into the process have led SNIA to pursue accreditation through the *InterNational Committee for Information Technology Standards* (INCITS).
- The processes are in place to submit completed SNIA Specifications on the *fast track* process.
- The motivation was to create a home for standards that do not fit well into other existing standards bodies
- Management Interfaces and APIs will be the initial area of focus
- The SMIS and the iSCSI Management API (IMA) are the initial projects for SNIA standardization

SNIA SMI Road Map



Storage Management Automation

In the old days airplanes were a very hands-on activity…

…today commercial Aircrafts can be monitored rather than flown

Complex but easy to use

questions?

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