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Subject: 402-Information Storage Management

Unit: IV

Topic: *Industry management standards (SMI-S & CIM)*

Storage Management Initiative Specification (SMI-S):

SMI-S defines CIM management profiles for storage systems. The entire SMI Specification is categorized in profiles and subprofiles. A profile describes the behavioral aspects of an autonomous, self-contained management domain. SMI-S includes profiles for Arrays, Switches, Storage Virtualizers, Volume Management and several other management domains. In DMTF parlance, an SMI-S provider is an implementation for a specific profile or set of profiles. A subprofile describes a part of a management domain, and can be a common part in more than one profile.

At a very basic level, SMI-S entities are divided into two categories:

- **Clients** are management software applications that can reside virtually anywhere within a network, provided they have a communications link (either within the data path or outside the data path) to providers.
- **Servers** are the devices under management. Servers can be disk arrays, virtualization engines, host bus adapters, switches, tape drives, etc.

Storage Management Initiative Specification (SMI-S) is a universal standard for managing data devices within an enterprise on a storage area network (SAN) that can encompass multiple devices from multiple vendors. SMI-S is based on the Common Information Model (CIM) as well as Web-Based Enterprise Management standards as defined by the Distributed Management Task Force.

SMI-S is principally designed to provide broad interoperability among heterogeneous (widely dissimilar) storage vendors' systems.

SMI-S is a standard that defines attributes for each data storage component in an SAN. It is

platform independent and is extensible, which means that new devices may be easily added to the SAN. Managers can also access and control all aspects of a network remotely.

Other SMI-S functions include automated discovery (a process that relies on collecting data over time) and resource locking (a synchronized methodology for putting limits on a resource, in this case a storage solution).

At a very basic level, SMI-S entities can be classified into two categories: clients and servers. Clients manage software applications residing anywhere on the SAN, but they must have a communication link to providers (sources of data). Servers are managed devices like host bus adapters, switches, disk arrays, virtualization engines and magnetic tape drives.

SMI-S was developed in 2002 and is maintained by the Storage Networking Industry Association (SNIA).

Common Information Model

DMTF's Common Information Model (CIM) is developed and maintained by the CIM Forum. It provides a common definition of management information for systems, networks, applications and services, and allows for vendor extensions.

The CIM standard includes a Specification and a Schema, as well as a Metamodel:

CIM Management Schema

The CIM Schema provides the actual model descriptions. Management schemas are the building-blocks for management platforms and management applications, such as device configuration, performance management, and change management. CIM structures the managed environment as a collection of interrelated systems, each composed of discrete elements.

Supplying a set of classes with properties and associations that provide a well-understood conceptual framework, CIM organizes information about the managed environment. The CIM Schema is structured into these distinct layers: core model, common model, extension schemas.

If you would like to download HTML or XML versions of the CIM Schema please select the version you would like here.

CIM Specification

CIM can be used in many ways, and the CIM Specification defines the details for integration with other management models. An information model requires a set of legal statement types or syntax and a collection of expressions to manage common aspects of the domain (in this case, complex computer systems). In CIM, the information for performing tasks is organized so that disparate groups of people can use it.

CIM Metamodel

The CIM Metamodel defines the semantics for the construction of *new* conformant models and the schema that represents those models. Modeling requirements and environments are often different and change over time. The metamodel is further enhanced with the capability of extending its elements through the use of qualifiers.

DMTF welcomes feedback on our standards, but requires that individuals submitting comments first agree to our Feedback Policy.

Assignment:

Que-1. Explain the SMI-S & CIM for Industry management standards in details.