



# **SNIA Cloud Storage TWG**

## **Cloud Data Management Interface (CDMI)**

Overview of Standardization Activities

David Slik, Co-Chair



**Cloud Storage TWG**

## SNIA at a glance – [www.snia.org](http://www.snia.org)

- ◆ Voice of the storage industry representing approximately \$50-60B in worldwide revenue for hardware and software
- ◆ Founded in 1997 as a non-profit trade association
- ◆ SNIA is an international consortia with affiliates world-wide
  - ◆ ANZ, Brazil, China, Europe, India, Japan Malaysia, South Asia
- ◆ Technology Center activities in Colorado and Beijing
- ◆ Focus on education, conferences, specifications / standards, software, industry alliances, best practices, plug-fests, and conformance testing for SNIA specifications
- ◆ Co-owner of Storage Networking World (SNW) conference with Computerworld/IDG Enterprise
- ◆ Produces annual Storage Developer Conference
- ◆ A collaborative environment and serves as global contributors toward the advancement of standards, education, and innovation in the storage and information management industry

- ◆ The Cloud Storage Technical Work Group was formed in 2009 for the purpose of developing SNIA Architecture and Software related to system implementations of Cloud Storage technology. The TWG:
  - ◆ Acts as the primary technical entity for the SNIA to identify, develop, and coordinate systems standards for Cloud Storage.
  - ◆ Produces a comprehensive set of specifications and drives consistency of interface standards and messages across the various Cloud Storage related efforts.
  - ◆ Produces a set of reference implementation SNIA Software that complements the specifications and aids adoption of cloud storage standards.
  - ◆ Documents system-level requirements and shares these with other Cloud Storage standards organizations under the guidance of the SNIA Technical Council and in cooperation with the SNIA Strategic Alliances Committee.

# Cloud Data Management Interface

- ◆ CDMI is the first standard developed by the SNIA Cloud Storage TWG
  - ◆ <http://cdmi.sniacloud.com/>
- ◆ Over two hundred vendor, end-user, and academic members belong to the Cloud Technical Working Group, many who have made significant contributions to the CDMI standard
- ◆ Key contributors include:
  - ◆ Bycast, Cisco, Cleversafe, Dell, EMC, HP, HDS, IBM, IRM, Mezeo, NetApp, Oracle, Sun and VMWare
- ◆ Open Source CDMI Reference Implementation
  - ◆ Java language, filesystem based (plus several CDMI tools on github)

# What problems does CDMI solve?

- ▶ CDMI addresses the lack of standardization in the three key problem areas related to cloud storage:
  1. Client controlled client-to-cloud data transfer
  2. Client controlled cloud data management
  3. Client controlled cloud-to-cloud data transfer
  
- ▶ Currently there are no de jure standards in this area.

# What problems does CDMI solve?

## ➤ Client to Cloud Interactions – CDMI provides a standard way to:

- ◆ Use a simple approach based on HTTP to communicate with a cloud storage server
- ◆ Establish secure and insecure connections
- ◆ Discover the capabilities of a CDMI server
- ◆ Walk a directory tree of stored objects
- ◆ Create, modify, retrieve and delete stored objects
- ◆ Attach structured metadata to stored objects
- ◆ Query for objects with matching metadata
- ◆ Receive notifications when objects are created, modified, retrieved and deleted

# What problems does CDMI solve?

## ➤ Cloud Data Management – CDMI provides a standard way to:

- ◆ Express desired quality of service for stored objects, such as latency, throughput, data protection, RPO, RTO, etc.
- ◆ Discover actual provided quality of service
- ◆ Receive notifications when a provided quality of service changes
- ◆ Restrict geographic placement of objects
- ◆ Specify retention and place legal holds on objects
- ◆ Specify encryption and verify integrity of objects

# What problems does CDMI solve?

- Cloud to Cloud Interactions – CDMI provides a standard way to:
  - ◆ Serialize and deserialize objects
  - ◆ Preserve global object identifiers across clouds
  - ◆ Create a global object namespace that spans clouds
  - ◆ Map user credentials across clouds
  - ◆ Allow a client to initiate a server-side transfer from one cloud to another
  - ◆ Allow a client to initiate a server-side transfer from a web resource into a CDMI cloud
  - ◆ Allow a cloud to redirect a client from one cloud to another



## Ongoing and Upcoming Initiatives

- ▶ The SNIA Cloud Storage TWG has released the 1.0 CDMI specification in late 2010. A 1.0.1 errata release is currently nearing completion.
- ▶ Work on CDMI 1.1 started in early 2011 and is anticipated to run through early 2012.
- ▶ Areas of work identified include:
  - ◆ Formalizing federation and peering relationships between clouds
  - ◆ Integrating with cloud identity management systems
  - ◆ Extending CDMI to key/value stores and other cloud data types.

# Questions & Discussion

➤ Thank you!