



# **Imminent Challenges for the Cloud Storage Industry and the Solution**

**Mark Carlson, SNIA TC Chair**  
**Udayan Singh, Head SPE-Storage**  
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# Agenda

**01 Cloud Storage; Vendor Lock-In Challenges**

**02 SNIA CDMI Conformance Test Program**

**03 Overall CTP Engagement Process**

**04 TCS CDMI Conformance Assurance Solution**

**05 Test Execution Process**

**06 Benefits for You**

# Customer Challenges | Cloud Storage

Security

01

Control/  
Vendor Lock-in/  
Interoperability  
Issues

02

Performance

03

Manageability

04

Costs

05

# Challenges of Cloud | Interoperability

01

Data Lock-in



02

Seamless Adoptability



Windows Azure

03

Focus on enterprise level feature



04

Market Pace

05

Agility and flexibility



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# Cloud Storage Initiative Members



# The SNIA Cloud Data Management Interface (CDMI) Specification

- An ISO/IEC international standard for cloud data interoperability
- Provides an industry standard to move metadata from cloud to cloud
- Validates interoperability and portability of data stored in public, private or hybrid clouds
- Enables end users to control the destiny of their data
- CDMI is a maturing standard now available in more than 20 products ([List of CDMI compliant products](#))

# Benefits of CDMI

## ➤ Data Portability Standard

- ◆ Move Data (and most importantly - Metadata) from cloud to cloud
- ◆ Now ALSO via LTFS Tape (SNIA standard)

## ➤ Advanced Cloud Services

- ◆ Data System Metadata allows cloud vendors to up-sell!
- ◆ Specialized storage clouds for specific use cases

## ➤ Logging, Security, Audit Trails

## ➤ Extensible to accommodate rapid innovation in cloud market

- ◆ Proposed Extensions - CIMI/OVF, Versioning, Jobs

## ➤ Shrink-to-fit

- ◆ Only implement what makes sense for your cloud
- ◆ Profiles - Simple Storage (i.e. S3), Simple Storage Management (NAS)

# Data System Metadata Capabilities

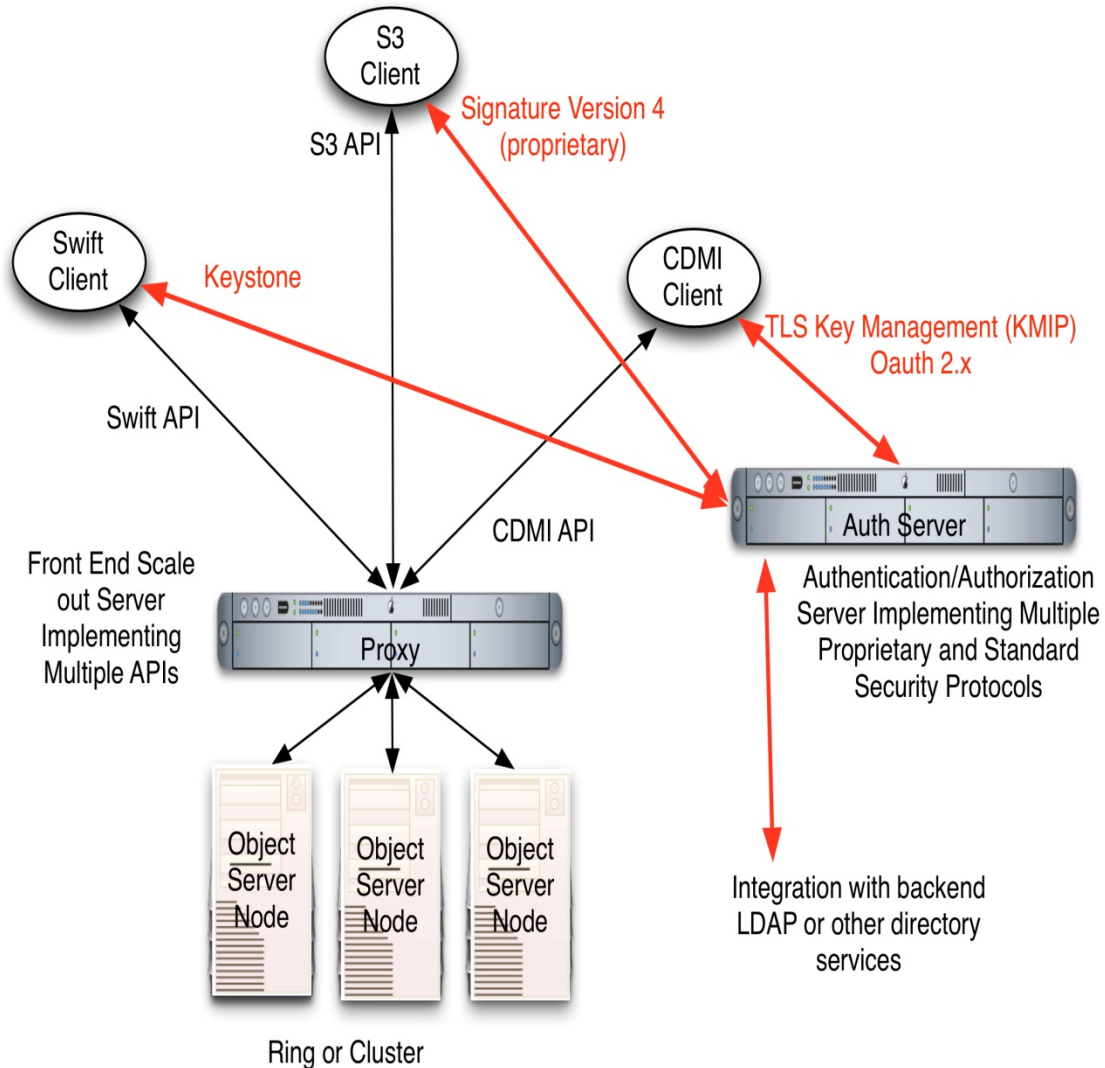
- ❑ `cdmi_data_redundancy`
  - ❑ If present, this capability specifies the maximum number of redundancy copies that may be specified. If absent, redundancy copies specified shall be ignored.
- ❑ `cdmi_infrastructure_redundancy`
  - ❑ If present, this capability specifies the maximum number of infrastructure redundancy copies that may be specified. If absent, infrastructure redundancy copies specified shall be ignored.
- ❑ `cdmi_data_dispersion`
  - ❑ If present and “true”, indicates that the cloud storage system shall disperse data. If absent, redundancy copies specified shall be ignored.
- ❑ `cdmi_data_retention`
  - ❑ If present and "true", indicates that the cloud storage system shall support retention.



# Data System Metadata Capabilities

- ❑ `cdmi_value_hash`
  - ❑ This metadata is used to indicate if the object data is to be hashed and indicates the desired hash algorithm and length. Supported algorithm/length values are provided by the `cdmi_value_hash` capability.
- ❑ `cdmi_latency`
  - ❑ If present and "true", indicates that the cloud storage system shall tier data based on desired latency. If absent, the max latency specified shall be ignored.
- ❑ `cdmi_throughput`
  - ❑ If present and "true", indicates that the cloud storage system shall tier data based on desired throughput. If absent, the max throughput specified shall be ignored.

# Multi-Protocol in the Cloud



# Introducing the CDMI Conformance Test Program (CTP)

- CTP offers 3rd-party unbiased validation of CDMI conformance
- Tests for conformance against the CDMI specification 1.0.2
- Builds on SNIA's proven track record of offering CTPs for SMI-S and KMIP standards
- Ensures data storage interoperability across a wide range of cloud storage solutions

“SNIA's CDMI Conformance Test Program is a great step forward helping IT customers, VARs or others in the industry navigate their way through the fog of cloud interoperability requirements in a streamlined fashion.”

**Greg Schulz, Founder of StorageIO**

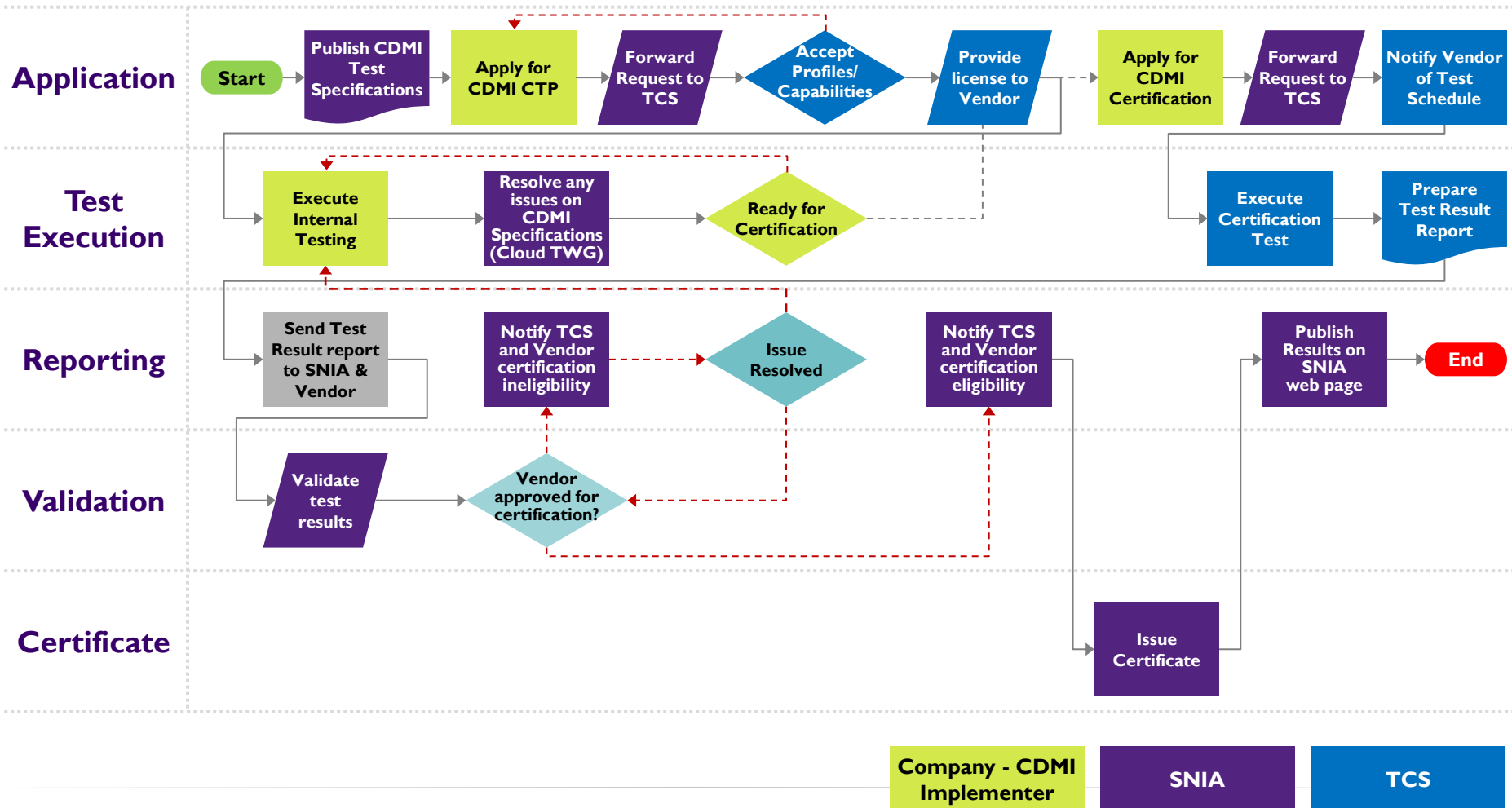


# Getting Started with CTP

- SNIA has appointed TCS as SNIA Authorized Certification Services and Test Provider for CDMI Conformance Test Program
- CDMI CTP executed through Tata Consultancy Services (TCS)
- TCS is a global IT services, consulting and business solutions organization
- TCS offers an automated testing suite compliant with the SNIA CDMI CTP
- SNIA and non-SNIA member companies can validate cloud solutions for CDMI conformance.



# Overview of the CTP Process | 3 Phases



# What will you get ?

## TCS CDMI Conformance Assurance Solution (CAS) (Approved by SNIA)

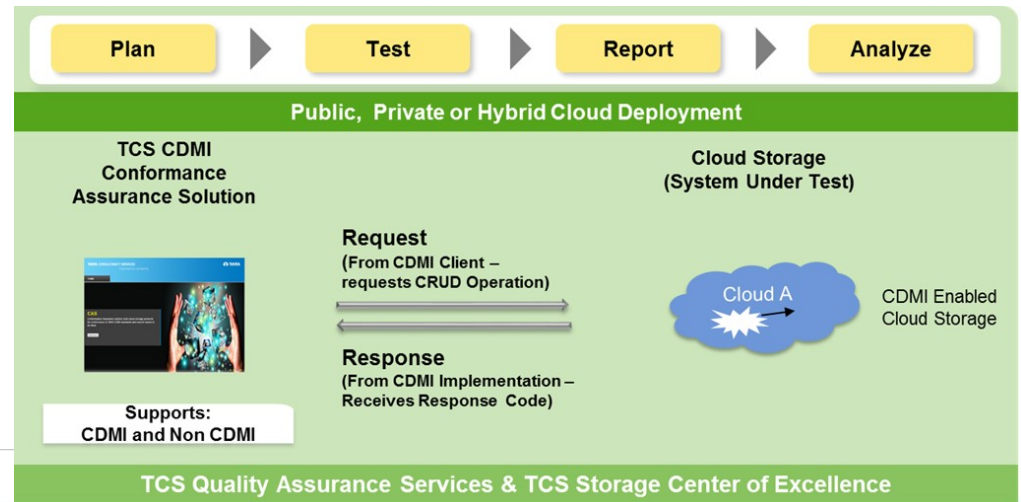
First solution that enables storage & cloud storage companies to

- ◆ Test conformance to CDMI specifications by Storage Networking Industry Association's (SNIA)
- ◆ Based on CDMI Conformance Test Specification

### Test Software As a Service

Web based Interface where user (vendor) can login can execute the following

- **User Profile** - Create/Manage
- **Configure** - Add/Edit CDMI Servers
- **Execute** - Perform new RUN on added servers
- **Report** - Generate detailed report in PDF/Excel format for any particular RUN
- **Monitor**
  - Track on RUN History
  - Summary dashboard for latest user runs



# What will you get?

## TCS CDMI Conformance Assurance Solution (CAS) - Functionality

### Following features are supported as per CDMI CTP Test Specifications

- Coverage of Capability, Container and Data Object CRUD operations
- Collection of 128 Test Scenarios which cover
  - Capability - Read/Update/Delete
  - Container - Create/Read/Update/Delete
  - Data Object - Create/Read/Update/Delete
- Profile Based support
  - Basic Service-Based Profile
  - Self -Storage Management Profile
- Coverage of CDMI and Non-CDMI based operations
- Authentication and Security
  - Basic and Digest Authentication
  - Support for TLS enabled CDMI Server

### Additional details

- CDMI Version Supported: Based on CDMI v1.0.2  
<http://snia.org/sites/default/files/CDMI%20v1.0.2.pdf>
- CDMI Test Specifications (WIP) against which the conformance testing will be executed  
[http://snia.org/sites/default/files/CDM\\_Test\\_Spec\\_v1.0a.pdf](http://snia.org/sites/default/files/CDM_Test_Spec_v1.0a.pdf)

Name of Deliverables	Responsibility	Format/Location
Conformance Test specifications	SNIA (TCS is editor)	Available at snia.org
CDMI Conformance Assurance Solution	TCS	Web based access
CDMI CAS Report	Vendor (through TCS CAS)	PDF/Excel
CDMI Conformance CAS Report	TCS	PDF/Excel
SNIA CTP Logo award for Vendor's product for the applicable scenarios	SNIA	Snia.org & certificate

# What is the future?

## CDMI Specifications\*

### New Test Scenarios based on following areas

- Nameless (POST) Data and Queue Object operations
- Domain & Queue CRUD Operations
- Serialization and De-Serialization
- Hold and Retention
- Exported Protocols

## New CDMI Versions

- Upgrade to CDMI v1.1.1 & future versions

## CDMI Extensions\*

### Following extensions will be supported as per CDMI v1.1.1 Specifications

- Summary Metadata for Bandwidth
- Expiring Access Control Entries
- Group Storage system Metadata
- Versioning

\*As per requirement from SNIA

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# Benefits for you

## Comprehensive testing - specifications, execution, reports and analysis.

Our exhaustive test reports detail the product testing outcome, with clear identification of noncompliant instances/defects. Report which consist of Server details, test case summaries and object summaries pinpoint the exact issues, and enable defect correction early in the PDLC.



## Quicker time-to-market

Accelerate product launch with our easy to use and round the clock available (as Test Software as a Service) automated testing solution with comprehensive test coverage.



## Reduced cost of testing

Through optimal fixed price engagement model that utilizes TCS' assurance expertise, you would get regular upgrades to TCS CDMI Conformance Assurance Solution as per the CDMI Specifications and CDMI Test Specifications. Hence you do not need to invest in internal Testing Framework and administration overhead.



## Ensured CDMI conformance and display SNIA CDMI CTP logo your product

Leverage SNIA verified TCS CDMI Conformance Assurance Solution, to conform your product with CDMI functionality through multiple rounds of internal testing and fixing issues.



## Increased market share by meeting growing CDMI compliance requirements of cloud consumers

Deliver an interoperable solution based on industry standard specifications and include CTP logo while responding to RFPs. Certify your products for greater credibility, and capture larger market share through the SNIA CDMI Conformance Test Program



# SNIA CDMI CTP

## Questions?

<http://snia.org/content/cdmi-ctp>

# CDMI Conformance Test Program (CTP) Announcement

**22 April 2014 - Press Release**

## **SNIA's Cloud Interoperability Conformance Test Program Now Available for Cloud Solution Vendors**

*Program Validates Interoperability Standard for Data Stored in Public,  
Private and Hybrid Cloud Environments*

**DSI, Santa Clara, CA (April 22, 2014)** — The Storage Networking Industry Association (SNIA), today announced the launch of a Cloud Data Management Interface (CDMI) Conformance Test Program (CTP) that validates cloud products' conformance to the ISO/IEC CDMI standard for cloud data interoperability (ISO catalog number ISO/IEC 17826:2012). Cloud solutions that pass the CDMI CTP offer cloud consumers assurance that the CDMI standard has been properly implemented and that data stored in any conformant implementation will be transportable to any other conformant implementation.

# THANK YOU