

November 15-18, 2010



Santa Clara Marriott
Santa Clara, CA

Commodity-specific Diagnostic Profiles

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Disclaimer

- The information in this presentation represents a snapshot of work in progress within the DMTF.
- This information is subject to change. The Standard Specifications remain the normative reference for all information.
- For additional information, see the Distributed Management Task Force (DMTF) Web site.



Introduction

- Session on commodity-based diagnostic profiles
- Definition
 - A specialization of the Diagnostics Profile (DSP 1002) that introduces additional class definitions and guidelines for testing specific classes of components
- What is the session about?
 - Quality and interoperability
 - Let's talk about the commodity profiles
 - We need your help

Quality
Interoperability



Common Diagnostics Model

CDM v1

- Defines a common interface for detecting diagnostics, initiating diagnostics and collecting diagnostic results
- Defines a mechanism to describe diagnostic capabilities and characteristics

CDM v2

- Aligns logging mechanism with current DMTF strategies
- Clarifies use cases introduced in CDM v1
- Basis for commodity-based CIM profiles
- Aligns CDM with introduced CIM_Error strategies and Standard Messaging

Standards are not enough

- **Diagnostics** provide the greatest **value** when they are able to provide the right test results to determine and remediate a perceived failure.
- **Diagnostic quality** can be perceived as the degree to which an implementation combines an appropriate mixture of tests, behaviors and results.

The right set of diagnostics



The right set of behaviors

The right set of results

Consistency Matters

Enable diagnostic clients to diagnose hardware in a homogenous fashion

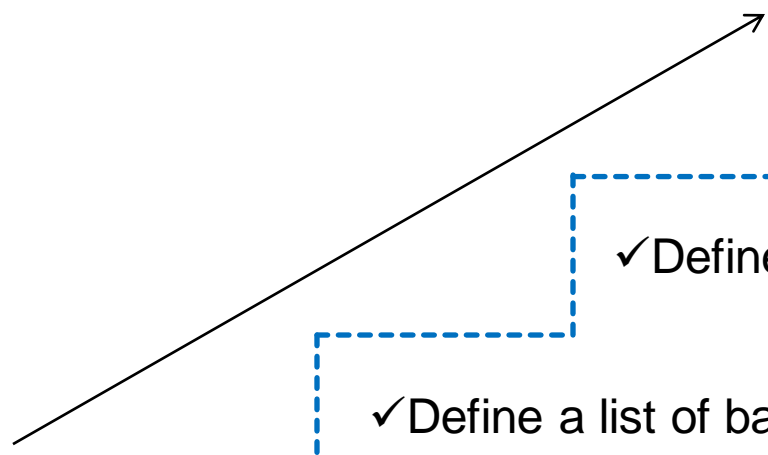
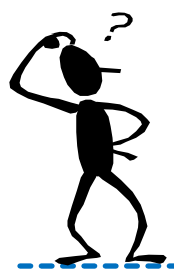
- Consumers understand what hardware failures can be detected so that code can be completed to articulate what do when hardware failures are detected
- Consistent/default actions can be created for specific hardware failures, regardless of hardware vendor
- UIs can be homogenized so that they look and feel the same independent of the diagnostics below, because certain aspects of the UI can be assumed

Enable implementers to predict high-value diagnostics

- There is a sense in which the implementer understands what diagnostics should be provided from a supplier point of view. but we need to understand what is required from the end users point of view
- If multiple components are supplied across the vendor, by different developers, a standard helps to provide a more consistent set of diagnostics across the portfolio. Breaks down silos of development and helps develop along the lines of commonality

Validation

Conformance Testing



✓ Define a list of required classes and properties (characteristics)

✓ Define a list of basic tests

✓ Define a list of behaviors

✓ Define the set of appropriate messages

Conformance Testing

- Increase interoperability between multiple clients
- Provides means to check CDM implementations to conformance with DSP1002 standard
- Increases market visibility to certified and conforming products in the market place
- Promotes further industry adoption
- Strengthens confidence in DMTF standards

CDM Conformance Program

CDM Conformance Program version 1

- Based on CDM v1 (DSP 1002 v1.0.1)
- Validates the compliance of a provider implementation against the profile

CDM Conformance Program version 2

- Introduce validation against commodity based CDM profiles

Commodity-based Diagnostic Profiles

- Focus on defining the right set of diagnostics
- Standards are not enough. Even with standard interfaces, clients cannot predict the coverage of the diagnostics provided by an implementer
- The right set of diagnostics to detect a failure are often the same, independent of commodity supplier
 - In the very least case, there is a lowest common denominator among suppliers
- Consistent diagnostic coverage and consistent diagnostic results help clients provide a common user experience independent of commodity supplier
- The next level of diagnostic standardization centers around providing the right diagnostics (which tests), which the right behavior (consistent coverage) and the right results (standard messages) relative to the device under test

Commodity-based Diagnostic Profiles

- Commodity-based Diagnostic Profiles are sub-profiles of DSP 1002 used to provide further specification relative to a particular commodity
- The profiles focus on the following areas:
 - Diagnostic tests that comprise the right set of diagnostics for the device
 - Test characteristics that describe the capabilities of the diagnostic
 - Coverage Area
 - Coverage Range
 - User Control
 - Built into device
- A clarification of the use cases for the defined diagnostics
 - Stress testing
 - Pre-boot testing
 - Full functional verification
 - Quick functional verification
- Standard Errors
- Standard Messages

Commodity CIM profiles in development

The Diagnostic SIG Work Group under the Schema Sub-committee has worked to develop the following commodity sub-profiles. The following profiles are either in member-review or listed as Work In Progress. This work represents a collaboration between OEMs and suppliers to define the right set of diagnostics and characteristics for each test.

- CPU profile
- Ethernet profile
- Disk Drive profile
- FCHBA profile

CPU profile

Test Name	Criteria	ElementName	CPUTestType	TestType *
Register	Optional	CPU Register Test	2	(2) Functional
Instruction	Optional	CPU Instruction Test	3	(2) Functional
FPU Instruction	Optional	CPU FPU Instruction Test	4	(2) Functional
Mixed Instruction Width	Mandatory	CPU Mixed Instruction Width Test	5	(2) Functional
Paging and Protected Mode Entry	Mandatory	CPU Paging and Protected Mode Entry Test	6	(2) Functional
Virtual Machine	Mandatory	CPU Virtual Machine Test	7	(2) Functional
Exceptions	Optional	CPU Exceptions Test	8	(2) Functional
Status	Mandatory	CPU Status Test	9	(2) Functional (4) Health Check
Power Management	Mandatory	CPU Power Management Test	10	(2) Functional
Speed	Mandatory	CPU Speed Test	11	(2) Functional
Voltage	Optional	CPU Voltage Test	12	(2) Functional
Stress	Mandatory	CPU Stress Test	13	(3) Stress
Cache	Mandatory	CPU Cache Test	14	(2) Functional
IPC	Optional	CPU IPC Test	15	(2) Functional

Ethernet profile

Test Name	Criteria	ElementName	EthernetNICTestType	TestType
MAC Register	Mandatory	Ethernet NIC MAC Register Test	2	(2) Functional
Physical Register	Mandatory	Ethernet NIC Physical Register Test	3	(2) Functional
Internal Loopback	Optional	Ethernet NIC Internal Loopback Test	4	(2) Functional
External Loopback	Mandatory	Ethernet NIC External Loopback Test	5	(5) Access Test
Beacon	Optional	Ethernet NIC Beacon Test	6	(2) Functional
Self	Optional	Ethernet NIC Self Test	7	(2) Functional
Status	Optional	Ethernet NIC Status Test	8	(4) Health Check
Ping	Optional	Ethernet NIC Ping Test	9	(5) Access Test
Embedded Processor	Optional	Ethernet NIC Embedded Processor Test	10	(2) Functional
IRQ	Mandatory	Ethernet NIC IRQ Test	11	(2) Functional

Disk Drive profile

Test Name	Criteria	ElementName	RAIDTestType	TestType
Stress	Mandatory	HDD Stress Test	2	(3) Stress
Status	Mandatory	HDD Status Test	3	(2) Functional

FCHBA profile

Test Name	Criteria	ElementName	FCHBATESTType	TestType
Beacon	Optional	FC HBA Beacon Test	2	(2) Functional
Echo	Mandatory	FC HBA Echo Test	3	(3) Stress (5) Access Test
External Loopback	Mandatory	FC HBA External Loopback Test	4	(2) Functional (5) Access Test
Host Bus Loopback	Optional	FC HBA Host Bus Loopback Test	5	(2) Functional
Internal Loopback	Mandatory	FC HBA Internal Loopback Test	6	(2) Functional
Ping	Mandatory	FC HBA Ping Test	7	(5) Access Test
Reset	Mandatory	FC HBA Reset Test	8	(2) Functional
Self	Mandatory	FC HBA Self Test	9	(2) Functional
Status	Mandatory	FC HBA Status Test	10	(4) Health Check



Roadmap of conformance program development

➤ On the horizon (RAID, sensors, fans, optical drives etc.)

Item	MileStone	Target Completion Date
DSP1002 v2.0.0	DMTF Standard	October (COMPLETED)
CPU	DM TF Standard (working CRs)	End of January
FCHBA	DMTF Standard (working CRs)	End of January
Ethernet NIC	DMTF Standard (working CRs)	End of January
RAID Controller	WIP	End of January
Hard Disk Drive	WIP	End of January
System Memory	WIP	End of January
Graphics Processing	WIP	TBD
Optical Drive	WIP	TBD
Fan	WIP	TBD
Alarm Device	WIP	TBD

What else folks?

- Q&A
- Opportunities for involvement
- Request for assistance in development the commodity profiles

Review & Conclusion

- Interoperability is important for consumers and suppliers
- Quality is by-product of interoperable solutions that behave in a consistent manner
- The CDM conformance program is used to validate the consistency of a provider implementation with the CDM standard, in order to promote interoperability
- The commodity profiles take the standard definition to the next level, by defining the specific diagnostics that should be provided by every type of commodity diagnostic



Links

- CDM Standard - <http://dmf.org/standards/cdm>
- CDM Conformance Program - <http://dmf.org/conformance/cdm>