Document Number: DSP1110

Date: 2012-01-18

Version: 1.0.0

Optical Drive Diagnostics Profile

Document Type: Specification

Document Status: DMTF Standard

Document Language: en-US

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Foreword

The *Optical Drive Diagnostics Profile* (DSP1110) was prepared by the Diagnostics Working Group of the DMTF.

DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems management and interoperability. For information about the DMTF, see http://www.dmtf.org.

Acknowledgments

The DMTF acknowledges the following individuals for their contributions to this document:

- Dave Barrett – Emulex Corporation
- Rodney Brown – IBM Corporation
- Carl Chan – WBEM Solutions, Inc.
- Ken Kotyuk – Hewlett Packard Company
- Kevin Kuelbs – Hewlett Packard Company
- Peter Lamanna – EMC Corporation
- Eric Tend – Hewlett Packard Company
- Mike Walker – Storage Networking Industry Association

Introduction

A *profile* is a collection of Common Information Model (CIM) elements and behavior rules that represents a specific area of management. The purpose of the profile is to ensure interoperability of Web-Based Enterprise Management (WBEM) services for a specific subset of the CIM schema — in this case, Optical Drive diagnostics.

Diagnostics is a critical component of systems management. Diagnostic services are used in problem containment to maintain availability, achieve fault isolation for system recovery, establish system integrity during boot, increase system reliability, and perform routine proactive system verification. The goal of the Common Diagnostic Model (CDM) is to define industry-standard building blocks, based on and consistent with the DMTF CIM, that enable seamless integration of vendor-supplied diagnostic services into system management frameworks.

The goal of the *Optical Drive Diagnostics Profile* is to define industry-standard building blocks that enable seamless problem determination support for Optical Disk Drives. The *Optical Drive Diagnostics Profile* extends the *Diagnostics Profile* by identifying a base set of Optical Drive functions that should be diagnosed by provider implementations. Suppliers can differentiate their diagnostic offering by providing this base set of diagnostics and developing diagnostics to analyze proprietary features of the Optical Disk Drive.

Document conventions

Typographical conventions

The following typographical conventions are used in this document:

- Document titles are marked in *italics*.
- Important terms that are used for the first time are marked in *italics*.

ABNF usage conventions

Format definitions in this document are specified using ABNF (see RFC5234), with the following deviations:

- Literal strings are to be interpreted as case-sensitive Unicode characters, as opposed to the definition in RFC5234 that interprets literal strings as case-insensitive US-ASCII characters.

Optical Drive Diagnostics Profile

1 Scope

The *Optical Drive Diagnostics Profile* specializes the *Diagnostics Profile* by defining the diagnostic tests needed to determine the health of an Optical Disk Drive. The diagnostic tests are defined as subclasses of CIM_DiagnosticTest.

The target audience for this specification is implementers who are writing CIM-based providers or consumers of management interfaces that represent the component described in this document.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited (including any corrigenda or DMTF update versions) applies. For references without a date or version, the latest published edition of the referenced document (including any corrigenda or DMTF update versions) applies.

DMTF DSP0004, *CIM Infrastructure Specification 2.6*,
http://dmtf.org/sites/default/files/standards/documents/DSP0004_2.6.pdf

DMTF DSP0200, *CIM Operations over HTTP 1.3*,
http://dmtf.org/sites/default/files/standards/documents/DSP0200_1.3.pdf

DMTF DSP1001, *Management Profile Specification Usage Guide 1.0*,
http://dmtf.org/sites/default/files/standards/documents/DSP1001_1.0.pdf

DMTF DSP1002, *Diagnostics Profile 2.0*,
http://dmtf.org/sites/default/files/standards/documents/DSP1002_2.0.pdf

DMTF DSP1033, *Profile Registration Profile 1.0*,
http://dmtf.org/sites/default/files/standards/documents/DSP1033_1.0.pdf

IETF RFC5234, *ABNF: Augmented BNF for Syntax Specifications, January 2008*,
http://tools.ietf.org/html/rfc5234

ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*,
http://isotc.iso.org/livelink/livelink.exe?func=ll&objId=4230456&objAction=browse&sort=subtype

3 Terms and definitions

In this document, some terms have a specific meaning beyond the normal English meaning. Those terms are defined in this clause.

The terms "shall" ("required"), "shall not," "should" ("recommended"), "should not" ("not recommended"), "may," "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Annex H. The terms in parenthesis are alternatives for the preceding term, for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that ISO/IEC Directives, Part 2, Annex H specifies additional alternatives. Occurrences of such additional alternatives shall be interpreted in their normal English meaning.

The terms "clause," "subclause," "paragraph," and "annex" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 5.

The terms "normative" and "informative" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do not contain normative content. Notes and examples are always informative elements.

The terms defined in DSP0004, DSP0200, and DSP1001 apply to this document.

4 Symbols and abbreviated terms

The following symbols and abbreviations are used in this document.

4.1
CDM
Common Diagnostic Model

4.2
CIM
Common Information Model

4.3
CIMOM
CIM Object Manager

4.4
CRU
Customer Replaceable Unit

4.5
FRU
Field Replaceable Unit

4.6
HDD
Hard Disk Drive

4.7
LED
Light Emitting Diode

4.8
ME
Managed Element

4.9
MOF
Managed Object Format

4.10
ODD
Optical Disk Drive

4.11

OS
Operating System

4.12
PD
Problem Determination

4.13
PFA
Predictive Failure Analysis

4.14
POST
Power-On Self-Test

4.15
SLP
Service Location Protocol

4.16
SSD
Solid State Drive

4.17
WBEM
Web-Based Enterprise Management

5 Synopsis

Profile name: Optical Drive Diagnostics

Version: 1.0.0

Organization: DMTF

CIM schema version: 2.31

Central class: CIM_OpticalDriveDiagnosticTest

Scoping class: CIM_ComputerSystem

Specializes: Diagnostics Profile 2.0.0

The *Optical Drive Diagnostics Profile* extends the management capability of referencing profiles by adding common methods for determining that the ODD is operating in a managed system.

CIM_OpticalDriveDiagnosticTest shall be the Central Class of this profile. The instance of CIM_OpticalDriveDiagnosticTest shall be the Central Instance of this profile. CIM_ComputerSystem shall be the Scoping Class of this profile. The instance of CIM_ComputerSystem with which the Central Instance is associated through an instance of CIM_HostedService shall be the Scoping Instance of this profile.

The CIM_ManagedElement is CIM_CDROMDrive, CIM_DVDDrive, CIM_WORMDrive, a subclass of these classes, or a related peer class.

Table 1 identifies profiles on which this profile has a dependency.

257 **Table 1 – Referenced profiles**

Profile Name	Organization	Version	Description
Diagnostics	DMTF	2.0	Specializes
Profile Registration	DMTF	1.0	Mandatory

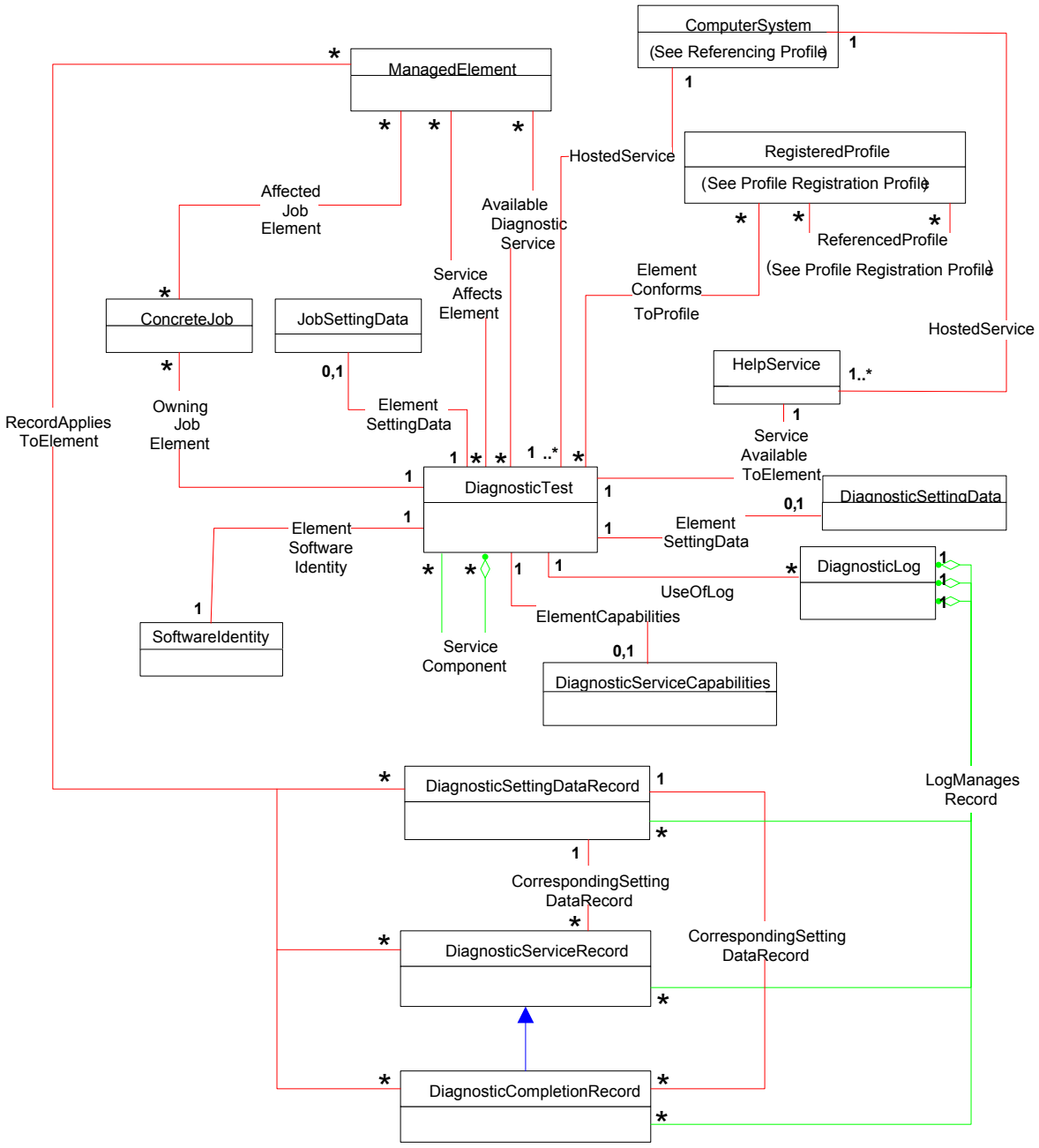
258 # 6 Description

259 Diagnostic programs can be developed to support two primary diagnostic modes.

260 One mode tests the ODD in an operational state after its operating system has started. In this mode,
261 diagnostic tests exercise various functional components or collect metrics within the context of a running
262 system. Typically, most diagnostics in this mode are launched concurrently with other user programs atop
263 a fully functioning general purpose operating system.

264 The other mode tests the ODD in a preboot state before a general purpose operating system has been
265 started. In this mode, it is understood that the system is not under normal usage. Thus, invasive and
266 destructive tests can be executed. Typically, diagnostics are launched in this environment for
267 manufacturing quality assurance to test operating system functions and other low-level components.
268 Diagnostics are also run in this mode when serious component errors are suspected in a commercial
269 environment.

270 There may also be a third type of hybrid diagnostic test that is able to provide reduced levels of coverage
271 in a normal running environment and enhanced coverage in a preboot environment.



272

273 **Figure 1 – Optical Drive Diagnostics Profile: Profile class diagram**

274

7 Implementation

This clause details the requirements related to the arrangement of instances and their properties for implementations of this profile.

7.1 Optical drive test information

Table 2 contains information about the test types.

Table 2 – Test type information

Test Name	Test Information	
Media Detection	Description	This diagnostic verifies that the ODD can properly detect whether media is present and what type of disc is inserted (for example, CD-R, CD-RW, DVD, etc.).
	Coverage Range	The entire drive is covered.
	Media Required	Yes
	User Control	The user must insert or remove media. The user must then confirm PASS or FAIL.
	Execution Time	The diagnostic runs on the order of seconds.
	Details	
Mechanical Tray	Coverage Area	This diagnostic verifies that the physical components of the optical device tray are operating properly.
	Coverage Range	The entire drive is covered.
	Media Required	No
	User Control	The user must confirm whether the tray has opened and closed.
	Execution Time	The diagnostic runs on the order of seconds.
	Details	This diagnostic differs from the Load/Eject test because it tests only the physical components and not the software interface.
Activity Indicator	Coverage Area	This diagnostic verifies that the Activity Indicator LED operates properly.
	Coverage Range	The entire drive is covered.
	Media Required	No
	User Control	User interaction is required to verify the LED activity.
	Execution Time	The diagnostic runs on the order of seconds.
	Details	The LED monitors I/O activity.
Transfer Rate	Coverage Area	This diagnostic verifies that the ODD operates properly when performing read I/O operations at all supported data transfer rates.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds or a few minutes depending on the media type (for example, CD-R, DVD, dual-layer, etc.).

Test Name	Test Information	
	Details	Transfer rates are measured in Kbytes/sec. If the ODD supports multiple transfer rates, the vendor-specific implementation will determine the supported transfer rates and test them all without user interaction.
Sequential Internal Verify	Coverage Area	This diagnostic verifies the ability to perform read and verify operations in sequential order to each sector of the media.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds.
	Details	Data is not transferred from the ODD to the host. That is, this diagnostic is internal to the ODD.
Sequential Read	Coverage Area	This diagnostic performs a read operation in sequential order from all sectors of the media.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds or a few minutes depending on the media type (for example, CD-R, DVD, dual-layer, etc.).
	Details	The ODD must have media present containing known data.
Sequential Seek	Coverage Area	This diagnostic performs a seek operation in sequential order to all sectors of the media.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds or a few minutes depending on the media type (for example, CD-R, DVD, dual-layer, etc.).
	Details	
Sequential Write	Coverage Area	This diagnostic performs a write operation in sequential order to all sectors of the media and then verifies that the data is written accurately.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	The user may specify the data pattern(s) to be written.
	Execution Time	The diagnostic runs on the order of seconds or a few minutes depending on the media type (for example, CD-R, DVD, dual-layer, etc.).
	Details	
Random Read	Coverage Area	This diagnostic performs a read operation in random order from selected sectors of the media.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	The user may specify the seed to use to generate the sequence of random numbers to be used by the diagnostic.

Test Name	Test Information	
	Execution Time	The diagnostic runs on the order of seconds or a few minutes depending on the media type (for example, CD-R, DVD, dual-layer, etc.).
	Details	The ODD must have media present with containing known data. The number of operations performed is defined by the vendor-specific implementation.
Random Seek	Coverage Area	This diagnostic performs a seek operation in random order from selected sectors of the media.
	Coverage Range	The entire drive and media is covered.
	Media Required	Yes
	User Control	The user may specify the seed to use to generate the sequence of random numbers to be used by the test.
	Execution Time	The diagnostic runs on the order of seconds or a few minutes depending on the media type (for example, CD-R, DVD, dual-layer, etc.).
	Details	The number of operations performed is defined by the vendor-specific implementation.
Status	Coverage Area	This diagnostic verifies that the ODD is ready to be tested.
	Coverage Range	The entire drive is covered.
	Media Required	No
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds.
	Details	
Reset Drive	Coverage Area	This diagnostic verifies that the ODD properly responds to a Reset command.
	Coverage Range	The entire drive is covered.
	Media Required	No
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds.
	Details	
System Interface	Coverage Area	This diagnostic verifies that all system interfaces for cables and connectors are working properly.
	Coverage Range	The entire drive is covered.
	Media Required	No
	User Control	None
	Execution Time	The diagnostic runs on the order of seconds.
	Details	
Load / Eject	Coverage Area	This diagnostic verifies that the ODD properly responds to a Load/Eject command.
	Coverage Range	The entire drive is covered.
	Media Required	No
	User Control	User interaction is required to confirm that the Load or Eject operation

Test Name	Test Information	
		completed.
	Execution Time	The diagnostic runs on the order of seconds.
	Details	This diagnostic differs from the Mechanical Tray test because it tests both the physical components and the software interface.

NOTE ODD diagnostic tests do not test selected regions of the media as some HDD diagnostic tests do because ODD media is much smaller (5GB versus 2TB or larger).

7.2 CIM_OpticalDriveDiagnosticTest

The CIM_OpticalDriveDiagnosticTest can be used for a variety of tests necessary for diagnosing ODD issues. Table 3 defines the valid property values and whether the test is mandatory or optional. An implementation may extend this class and add vendor-defined tests using the vendor-defined range of the OpticalDriveTestType valuemap.

The current values for TestType array property are: 0 (Unknown), 1 (Other), 2 (Functional), 3 (Stress), 4 (Health Check), 5 (Access Test), 6 (Media Verify), 7 (DMTF Reserved), and 8 (Vendor Reserved).

Table 3 – CIM_OpticalDriveDiagnosticTest property requirements

Test Name	Criteria	ElementName*	OpticalDriveTestType	TestType*
Media Detection	Mandatory	Optical Drive Media Detection	2	2 (Functional)
Mechanical Tray	Mandatory	Optical Drive Mechanical Tray	3	2 (Functional)
Activity Indicator	Optional	Optical Drive Activity Indicator	4	2 (Functional)
Transfer Rate	Optional	Optical Drive Transfer Rate	5	2 (Functional)
Sequential Internal Verify	Optional	Optical Drive Sequential Internal Verify	6	2 (Functional)
Sequential Read	Optional	Optical Drive Sequential Read	7	2 (Functional) 6 (Media Verify)
Sequential Seek	Optional	Optical Drive Sequential Seek	8	2 (Functional) 6 (Media Verify)
Sequential Write	Optional	Optical Drive Sequential Write	9	2 (Functional) 6 (Media Verify)
Random Read	Optional	Optical Drive Random Read	10	2 (Functional) 6 (Media Verify)
Random Seek	Optional	Optical Drive Random Seek	11	2 (Functional) 6 (Media Verify)
Status	Mandatory	Optical Drive Status	12	4 (Health Check)
Reset Drive	Optional	Optical Drive Reset Drive	13	2 (Functional)

Test Name	Criteria	ElementName*	OpticalDriveTestType	TestType*
System Interface	Optional	Optical Drive System Interface	14	2 (Functional)
Load/Eject	Optional	Optical Drive Load/Eject	15	2 (Functional)

An asterisk (*) indicates that the property is inherited from the parent class CIM_DiagnosticTest.

The current values for the Characteristics array property inherited from the CIM_DiagnosticTest parent class are: 0 (Unknown), 1 (Other), 2 (Is Exclusive), 3 (Is Interactive), 4 (Is Destructive), 5 (Is Risky), 6 (Is Package), 7 (Reserved), 8 (Is Synchronous), 9 (Media Required), and 10 (Additional Hardware Required). The OtherCharacteristicsDescription property is used to provide additional information about the nature of the test. The content of the OtherCharacteristicsDescription property is vendor-specific.

The Characteristics property shall contain the value 4 (Is Destructive) for the Sequential Write test. The property can be NULL for the other tests.

7.3 CIM_OpticalDriveDiagnosticSettingData

One or more instances of CIM_OpticalDriveDiagnosticSettingData may be implemented. They are associated to CIM_OpticalDriveDiagnosticTest using CIM_ElementSettingData. The vendor-defined default values may be specified and advertised using an instance of CIM_OpticalDriveDiagnosticSettingData that is referenced by the instance of CIM_ElementSettingData whose value for the IsDefault property is 1 (Is Default).

A diagnostic test may require parameters to run. Some parameters may affect how the test is run, while other parameters provide the values to be used by the test.

CIM_DiagnosticSettingData contains properties that affect how a diagnostic test is run (for example, LoopControl, QuickMode), how errors are handled (for example, HaltOnError), or how results are logged (for example, LogOptions). CIM_DiagnosticSettingData is an argument to the CIM_DiagnosticTest.RunDiagnosticService( ) extrinsic method. If additional properties are needed that control the behavior of the diagnostic test, they should be defined in a subclass of CIM_DiagnosticSettingData.

The client may use the vendor-defined default CIM_OpticalDriveDiagnosticSettingData instance as an argument to the CIM_OpticalDriveDiagnosticTest.RunDiagnosticService( ) extrinsic method. Alternatively, the client may create its own instance of CIM_OpticalDriveDiagnosticSettingData and use it instead.

The CIM_OpticalDriveDiagnosticSettingData class defines the parameters that may be used by some of the ODD tests. Table 4 lists these test parameters and shows which tests might use them. An implementation may extend this class and define additional parameters for any other vendor-defined tests.

Table 4 – CIM_OpticalDriveDiagnosticSettingData parameters used by tests

Test Name	ElementName*	Seed	DataPatterns
Media Detection	Optical Drive Media Detection		
Mechanical Tray	Optical Drive Mechanical Tray		
Activity Indicator	Optical Drive Activity Indicator		
Transfer Rate	Optical Drive Transfer Rate		
Sequential Internal Verify	Optical Drive Sequential Internal Verify		
Sequential Read	Optical Drive Sequential Read		

Test Name	ElementName*	Seed	DataPatterns
Sequential Seek	Optical Drive Sequential Seek		
Sequential Write	Optical Drive Sequential Write		Used
Random Read	Optical Drive Random Read	Used	
Random Seek	Optical Drive Random Seek	Used	
Status	Optical Drive Status		
Reset Drive	Optical Drive Reset Drive		
System Interface	Optical Drive System Interface		
Load/Eject	Optical Drive Load/Eject		

An asterisk (*) indicates that the property is inherited from the parent class CIM_DiagnosticSettingData.

7.3.1 CIM_OpticalDriveDiagnosticSettingData.Seed

This property allows one to specify the seed that initiates the random number sequence used by the tests shown in Table 4. In order to replicate the same random number sequence for successive tests, one should use the same seed value. If this property is NULL, then the diagnostic randomly selects its own seed using a vendor-specific algorithm.

7.3.2 CIM_OpticalDriveDiagnosticSettingData.DataPatterns

This array property allows one to specify the data pattern(s) to be written by the tests shown in Table 4. If this property is NULL, then the vendor-specific data patterns are used. A data pattern is a string interpreted as a 16-digit hex value. For example, a data pattern of all ones would be FFFFFFFFFFFFFFFF, while alternating ones and zeros would be 5555555555555555 or AAAAAAAAAAAAAAAA. The pattern is replicated as needed to fill the specified data size.

7.4 CIM_OpticalDriveDiagnosticServiceCapabilities

The CIM_OpticalDriveDiagnosticServiceCapabilities class defines the parameters that may be used by some of the ODD tests. Table 5 lists these test parameters and shows which tests might use them.

Table 5 – CIM_OpticalDriveDiagnosticServiceCapabilities parameters used by tests

Test Name	ElementName*	SeedSupported	DataPatternsSupported
Media Detection	Optical Disk Media Detection		
Mechanical Tray	Optical Disk Mechanical Tray		
Activity Indicator	Optical Disk Activity Indicator		
Transfer Rate	Optical Disk Transfer Rate		
Sequential Internal Verify	Optical Disk Sequential Internal Verify		
Sequential Read	Optical Disk Sequential Read		
Sequential Seek	Optical Disk Sequential Seek		
Sequential Write	Optical Disk Sequential Write		Used
Random Read	Optical Disk Random Read	Used	
Random Seek	Optical Disk Random Seek	Used	

Test Name	ElementName*	SeedSupported	DataPatternsSupported
Test Unit Ready	Optical Disk Test Unit Ready		
Reset Drive	Optical Disk Reset Drive		
System Interface	Optical Disk System Interface		
Load/Eject	Optical Disk Load/Eject		

337 An asterisk (*) indicates that the property is inherited from the parent class CIM_DiagnosticServiceCapabilities.

338 ### 7.4.1 CIM_OpticalDriveDiagnosticServiceCapabilities.SeedSupported

339 This property is used by a provider to define whether the client can specify the seed for the tests defined
340 in Table 5 that generate a random number sequence for testing.

341 If this property is TRUE, then the provider uses the value of
342 CIM_OpticalDriveDiagnosticSettingData.Seed to initiate the random number sequence generation.

343 ### 7.4.2 CIM_OpticalDriveDiagnosticServiceCapabilities.DataPatternsSupported

344 This array property is used by a provider for the tests shown in Table 5 to specify the list of data patterns
345 supported by the test.

346 A data pattern is a string interpreted as a 16-digit hex value. For example, a data pattern of all ones would
347 be FFFFFFFFFFFFFFFF, while alternating ones and zeros would be 5555555555555555 or
348 AAAAAAAAAAAAAAAA. The pattern is repeated as necessary to fill the specified data size.

349 # 8 Methods

350 This clause details the requirements for supporting intrinsic operations and extrinsic methods for the CIM
351 elements defined by this profile.

352 ## 8.1 CIM_OpticalDriveDiagnosticTest.RunDiagnosticService( )

353 The RunDiagnosticService( ) method shall return one of the return code values defined in “Table 2 –
354 RunDiagnosticsService( ) Method: Return Code Values” of the *Diagnostics Profile*.

355 When failures occur during the execution of a diagnostic test, the failure shall be recorded in the instance
356 of CIM_DiagnosticServiceRecord associated with the test. The reason for the failure shall be recorded in
357 CIM_DiagnosticServiceRecord.ErrorCode[ ], and the corresponding
358 CIM_DiagnosticServiceRecord.ErrorCount[ ] shall be incremented. Other occurrences of the same failure
359 during the same test shall not create additional entries in CIM_DiagnosticServiceRecord.ErrorCode[ ], but
360 shall cause the corresponding CIM_DiagnosticServiceRecord.ErrorCount[ ] to be incremented.

361 ## 8.2 Profile conventions for operations

362 Support for operations for each profile class (including associations) shall be as mandated in the
363 *Diagnostics Profile*, subclauses 8.5 through 8.29.

364 ### 8.2.1 CIM_OpticalDriveDiagnosticTest

365 All operations are supported as for CIM_DiagnosticTest in the *Diagnostics Profile*.

366 ### 8.2.2 CIM_OpticalDriveDiagnosticSettingData

367 All operations are supported as for CIM_DiagnosticSettingData in the *Diagnostics Profile*.

8.2.3 CIM_OpticalDriveDiagnosticServiceCapabilities

All operations are supported as for CIM_DiagnosticServiceCapabilities in the *Diagnostics Profile*.

9 Use cases

This clause contains use cases for the *Optical Drive Diagnostics Profile*.

How to discover, configure and run the individual diagnostic tests is detailed in the *Diagnostics Profile*. This clause focuses on how to use the Optical Drive diagnostic tests to diagnose common memory issues.

9.1 Use case summary

Table 6 summarizes the use cases that are described in this section. The use cases are categorized and named, and references are provided to the subclause that describes the use case.

NOTE Although use case names follow the convention for naming classes, properties, and methods in the schema, this naming was done for readability only and does not imply any functionality attached to the name.

The CIM_ prefix has been omitted from the class names in the use cases for readability.

Table 6 – Optical Disk Diagnostics Profile use cases

Category	Tests	Description
Quick Functional Verification	Sequential Internal Verify, Status, Reset Drive, System Interface	The tests provide quick verification that the device is operating properly with no to minimal user interaction required. See 9.2.
Data Operation Verification	Transfer Rate, Sequential Read, Sequential Seek, Sequential Write, Random Read, Random Seek	The tests verify that the device can properly perform all I/O operations. See 9.3.
Non-Data Operation Verification	Media Detection, Mechanical Tray, Activity Indicator, Load/Eject	The tests verify that the device can properly perform mechanical operations. See 9.4.

Before performing the use cases in this profile, it is assumed that a client has already utilized the use case methodology defined in the *Diagnostics Profile* to discover the following instances:

- ManagedSystemElement (that is, the optical disk drive instance(s) to be tested)
- OpticalDriveDiagnosticTest instance(s) to be used by this profile
- OpticalDriveDiagnosticSettingData instance(s) to be used by this profile that will be passed to the OpticalDriveDiagnosticTest.RunDiagnosticService( ) extrinsic method

9.2 Quick functional verification

To quickly verify that the optical drive is operating at a minimal functional level on a running system, a client performs the following steps:

1) Select the ManagedSystemElement instance to be tested.
2) Initialize the property values of OpticalDriveDiagnosticSettingData as desired (for example, HaltOnError, LogOptions, etc.).

3) Initialize the OpticalDriveDiagnosticTest instance to select the test to run as defined in Table 6, for example, OpticalDriveTestType = 2 (Status).

4) Invoke the OpticalDriveDiagnosticTest.RunDiagnosticService( ) extrinsic method using the instances from steps 1 and 2 as arguments.

5) Repeat steps 2, 3, and 4 for running other tests defined in Table 6.

9.3 Data operation verification

The use case in this clause describes how the client can use the diagnostic tests to verify that the Optical Drives can properly perform all data transfer operations.

To more completely verify the proper operation of a disk on a running system, a client performs the following steps:

1) Select the ManagedSystemElement instance to be tested.

2) Initialize the property values of DiagnosticSettingData as desired (for example, HaltOnError, LogOptions, etc.).

3) Initialize the OpticalDiskDriveDiagnosticTest instance to select the test to run as defined in Table 6,for example, OpticalDiskDriveTestType = 5 (Transfer Rate).

4) Invoke the OpticalDiskDriveDiagnosticTest.RunDiagnosticService( ) extrinsic method using the instances from steps 1 and 2 as arguments.

5) Repeat steps 2, 3, and 4 for running other tests in Table 6.

9.4 Mechanical operation verification

The use case in this clause describes how the client can use the diagnostic tests to verify that the Optical Drives can properly perform all mechanical operations.

To more completely verify the proper operation of a disk on a running system, a client performs the following steps:

1) Select the ManagedSystemElement instance to be tested.

2) Initialize the property values of DiagnosticSettingData as desired (for example, HaltOnError, LogOptions, etc.).

3) Initialize the OpticalDiskDriveDiagnosticTest instance to select the test to run, for example, OpticalDiskDriveTestType = 1 (Media Detection).

4) Invoke the OpticalDiskDriveDiagnosticTest.RunDiagnosticService( ) extrinsic method using the instances from steps 1 and 2 as arguments.

5) Repeat steps 2, 3, and 4 for running other tests defined in Table 6.

10 CIM elements

Table 7 shows the instances of CIM elements for this profile. Instances of the CIM elements shall be implemented as described in Table 7. Clause 7 (“Implementation”) and Clause 8 (“Methods”) may impose additional requirements on these elements.

Table 7 – CIM Elements: Optical Drive Diagnostics Profile

Element Name	Requirement	Description
Classes		
CIM_OpticalDriveDiagnosticTest	Mandatory	See 10.1.
CIM_OpticalDriveDiagnosticSettingData	Optional	See 10.2.
CIM_OpticalDriveDiagnosticServiceCapabilities	Optional	See 10.3.
CIM_RegisteredProfile	Mandatory	See 10.4.
CIM_AffectedJobElement	Optional	See 10.5.
CIM_AvailableDiagnosticService	Mandatory	See 10.6.
CIM_ElementCapabilities	Optional	See 10.7.
CIM_ElementSettingData (DiagnosticSettingData)	Optional	See 10.8.
CIM_ElementSettingData (JobSettingData)	Optional	See 10.9.
CIM_ElementSoftwareIdentity	Mandatory	See 10.10.
CIM_HostedService	Mandatory	See 10.11.
CIM_OwningJobElement	Mandatory	See 10.12.
CIM_RecordAppliesToElement	Optional	See 10.13.
CIM_ServiceAffectsElement	Mandatory	See 10.14.
CIM_ServiceAvailableToElement	Optional	See 10.15.
CIM_ServiceComponent	Optional	See 10.16.
CIM_UseOfLog	Mandatory	See 10.17.
Indications		
None defined in this profile		

10.1 CIM_OpticalDriveDiagnosticTest

CIM_OpticalDriveDiagnosticTest is used to represent the Diagnostic Testing for an ODD. This class specializes CIM_DiagnosticTest as defined in the *Diagnostics Profile*. The constraints listed in Table 8 are in addition to those specified in the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory elements that must be implemented.

435 **Table 8 – Class: CIM_OpticalDriveDiagnosticTest**

Properties	Requirement	Notes
ElementName	Mandatory	See 7.2.
Characteristics	Mandatory	See 7.2.
OtherCharacteristicsDescriptions	Conditional	If Characteristics includes the value of 1 (Other), this property is Mandatory.
OpticalDriveTestType	Mandatory	See 7.2.
OtherOpticalDriveTestTypeDescription	Conditional	If OpticalDriveTestType has a value of 1 (Other), this property is Mandatory.
TestType	Optional	See 7.2.

436 ## 10.2 CIM_OpticalDriveDiagnosticSettingData

437 CIM_OpticalDriveDiagnosticSettingData is used to pass in test parameters and to specify other test
438 control parameters. This class specializes CIM_DiagnosticSettingData as defined in the *Diagnostics*
439 *Profile*. The constraints listed in Table 9 are in addition to those specified in the *Diagnostics Profile*. See
440 the *Diagnostics Profile* for other mandatory elements that must be implemented.

441 **Table 9 – Class: CIM_OpticalDriveDiagnosticSettingData**

Elements	Requirement	Notes
ElementName	Mandatory	See 7.3.
Seed	Optional	See 7.3.1.
DataPatterns	Optional	See 7.3.2.

442 ## 10.3 CIM_OpticalDriveDiagnosticServiceCapabilities

443 CIM_OpticalDriveDiagnosticServiceCapabilities is used to provide information on the capabilities for the
444 System Memory Diagnostic Service. This class specializes CIM_DiagnosticServiceCapabilities as defined
445 in the *Diagnostics Profile*. The constraints listed in Table 10 are in addition to those specified in the
446 *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory elements that must be implemented.

447 **Table 10 – Class: CIM_OpticalDriveDiagnosticServiceCapabilities**

Elements	Requirement	Notes
ElementName	Mandatory	See 7.4.
SeedSupported	Optional	See 7.4.1.
DataPatternsSuppoted	Optional	See 7.4.2.

448 ## 10.4 CIM_RegisteredProfile

449 The CIM_RegisteredProfile class is defined by the *Profile Registration Profile*. The requirements denoted
450 in Table 11 are in addition to those mandated by the *Profile Registration Profile*. See the *Profile*
451 *Registration Profile* for the other mandatory elements that must be implemented.

452 **Table 11 – Class: CIM_RegisteredProfile**

Elements	Requirement	Notes
RegisteredName	Mandatory	The value of this property shall be “Optical Disk Diagnostics”.
RegisteredVersion	Mandatory	The value of this property shall be “1.0.0”.
RegisteredOrganization	Mandatory	The value of this property shall be 2 (DMTF).

453 ## 10.5 CIM_AffectedJobElement

454 Although defined in the *Diagnostics Profile*, the CIM_AffectedJobElement class is listed here because the
455 AffectedElement reference is scoped down to a subclass of CIM_ManagedElement as specified in clause
456 5. The constraints listed in Table 12 are in addition to those specified in the *Diagnostics Profile*. See the
457 *Diagnostics Profile* for other mandatory properties of CIM_AffectedJobElement that must be
458 implemented.

459 **Table 12 – Class: CIM_AffectedJobElement**

Properties	Requirement	Notes
AffectedElement (overridden)	Mandatory	The property shall be a reference to an instance of the CIM_ManagedElement subclass specified in clause 5.
AffectingElement	Mandatory	The property shall be a reference to an instance of CIM_ConcreteJob.

460 ## 10.6 CIM_AvailableDiagnosticService

461 Although defined in the *Diagnostics Profile*, the CIM_AvailableDiagnosticService class is listed here
462 because the ServiceProvided reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a
463 subclass of CIM_DiagnosticTest, and the UserOfService reference is scoped down to a subclass of
464 CIM_ManagedElement as specified in clause 5. The constraints listed in Table 13 are in addition to those
465 specified in the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of
466 CIM_AvailableDiagnosticService that must be implemented.

467 **Table 13 – Class: CIM_AvailableDiagnosticService**

Properties	Requirement	Notes
ServiceProvided (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.
UserOfService (overridden)	Mandatory	The property shall be a reference to an instance of the CIM_ManagedElement subclass specified in clause 5.

468 ## 10.7 CIM_ElementCapabilities

469 Although defined in the *Diagnostics Profile*, the CIM_ElementCapabilities class is listed here because the
470 ManagedElement reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of
471 CIM_DiagnosticTest, and the Capabilities reference is scoped down to
472 CIM_OpticalDriveDiagnosticServiceCapabilities, which is a subclass of
473 CIM_DiagnosticServiceCapabilities. The constraints listed in Table 14 are in addition to those specified in

474 the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of
475 CIM_ElementCapabilities that must be implemented.

476 **Table 14 – Class: CIM_ElementCapabilities**

Properties	Requirement	Notes
ManagedElement (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.
Capabilities (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticServiceCapabilities.

477 10.8 CIM_ElementSettingData (DiagnosticSettingData)

478 Although defined in the *Diagnostics Profile*, the CIM_ElementSettingData class is listed here because the
479 ManagedElement reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of
480 CIM_DiagnosticTest, and the SettingData reference is scoped down to
481 CIM_OpticalDriveDiagnosticSettingData, which is a subclass of CIM_DiagnosticSettingData. The
482 constraints listed in Table 15 are in addition to those specified in the *Diagnostics Profile*. See the
483 *Diagnostics Profile* for other mandatory properties of CIM_ElementSettingData that must be implemented.

484 **Table 15 – Class: CIM_ElementSettingData (DiagnosticSettingData)**

Properties	Requirement	Notes
ManagedElement (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.
SettingData (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticSettingData.
IsDefault	Mandatory	If the instance of CIM_OpticalDriveDiagnosticSettingData is the default setting, this property shall have the value of TRUE.

485 10.9 CIM_ElementSettingData (JobSettingData)

486 Although defined in the *Diagnostics Profile*, the CIM_ElementSettingData class is listed here because the
487 Dependent reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of
488 CIM_DiagnosticTest, and the SettingData reference is scoped down to CIM_JobSettingData, which is a
489 subclass of CIM_SettingData. The constraints listed in Table 16 are in addition to those specified in the
490 *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of
491 CIM_ElementSettingData that must be implemented.

492 **Table 16 – Class: CIM_ElementSettingData (JobSettingData)**

Properties	Requirement	Notes
ManagedElement (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.
SettingData (overridden)	Mandatory	The property shall be a reference to an instance of CIM_JobSettingData.
IsDefault	Mandatory	If the instance of CIM_JobSettingData is the default setting, this property shall have the value of TRUE.

10.10 CIM_ElementSoftwareIdentity

Although defined in the *Diagnostics Profile*, the CIM_ElementSoftwareIdentity class is listed here because the Dependent reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of CIM_DiagnosticTest. The constraints listed in Table 17 are in addition to those specified in the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of CIM_ElementSoftwareIdentity that must be implemented.

Table 17 – Class: CIM_ElementSoftwareIdentity

Properties	Requirement	Notes
Antecedent	Mandatory	The property shall be a reference to an instance of CIM_SoftwareIdentity.
Dependent (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

10.11 CIM_HostedService

Although defined in the *Diagnostics Profile*, the CIM_HostedService class is listed here because the Dependent reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of CIM_DiagnosticTest. The constraints listed in Table 18 are in addition to those specified in the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of CIM_HostedService that must be implemented.

Table 18 – Class: CIM_HostedService

Properties	Requirement	Notes
Antecedent	Mandatory	The property shall be a reference to an instance of CIM_ComputerSystem.
Dependent (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

10.12 CIM_OwningJobElement

Although defined in the *Diagnostics Profile*, the CIM_OwningJobElement class is listed here because the OwningElement reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of CIM_DiagnosticTest. The constraints listed in Table 19 are in addition to those specified in the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of CIM_OwningJobElement that must be implemented.

Table 19 – Class: CIM_OwningJobElement

Properties	Requirement	Notes
OwningElement (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.
OwnedElement	Mandatory	The property shall be a reference to an instance of CIM_ConcreteJob.

10.13 CIM_RecordAppliesToElement

Although defined in the *Diagnostics Profile*, the CIM_RecordAppliesToElement class is listed here because the Dependent reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a

517 subclass of CIM_DiagnosticTest. The constraints listed in Table 20 are in addition to those specified in
518 the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of
519 CIM_RecordAppliesToElement that must be implemented.

520 **Table 20 – Class: CIM_RecordAppliesToElement**

Properties	Requirement	Notes
Antecedent	Mandatory	The property shall be a reference to an instance of CIM_RecordForLog.
Dependent (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

521 10.14 CIM_ServiceAffectsElement

522 Although defined in the *Diagnostics Profile*, the CIM_ServiceAffectsElement class is listed here because
523 the AffectedElement reference is scoped down to a subclass of CIM_ManagedElement as specified in
524 clause 5, and the AffectingElement reference is scoped down to CIM_OpticalDriveDiagnosticTest, which
525 is a subclass of CIM_DiagnosticTest. The constraints listed in Table 21 are in addition to those specified
526 in the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of
527 CIM_ServiceAffectsElement that must be implemented.

528 **Table 21 – Class: CIM_ServiceAffectsElement**

Properties	Requirement	Notes
AffectedElement (overridden)	Mandatory	The property shall be a reference to an instance of the CIM_ManagedElement subclass specified in clause 5.
AffectingElement (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

529 10.15 CIM_ServiceAvailableToElement

530 Although defined in the *Diagnostics Profile*, the CIM_ServiceAvailableToElement class is listed here
531 because the UsersOfService reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a
532 subclass of CIM_DiagnosticTest. The constraints listed in Table 22 are in addition to those specified in
533 the *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of
534 CIM_ServiceAvailableToElement that must be implemented.

535 **Table 22 – Class: CIM_ServiceAvailableToElement**

Properties	Requirement	Notes
ServiceProvided	Mandatory	The property shall be a reference to an instance of CIM_HelpService.
UsersOfService (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

536 10.16 CIM_ServiceComponent

537 Although defined in the *Diagnostics Profile*, the CIM_ServiceComponent class is listed here because the
538 GroupComponent reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of
539 CIM_DiagnosticTest, and the PartComponent reference is scoped down to
540 CIM_OpticalDriveDiagnosticTest, which is a subclass of CIM_DiagnosticTest. The constraints listed in

541 Table 23 are in addition to those specified in the *Diagnostics Profile*. See the *Diagnostics Profile* for other
542 mandatory properties of CIM_ServiceComponent that must be implemented.

543 **Table 23 – Class: CIM_ServiceComponent**

Properties	Requirement	Notes
GroupComponent (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.
PartComponent (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

544 10.17 CIM_UseOfLog

545 Although defined in the *Diagnostics Profile*, the CIM_UseOfLog class is listed here because the
546 Dependent reference is scoped down to CIM_OpticalDriveDiagnosticTest, which is a subclass of
547 CIM_DiagnosticTest. The constraints listed in Table 24 are in addition to those specified in the
548 *Diagnostics Profile*. See the *Diagnostics Profile* for other mandatory properties of CIM_UseOfLog that
549 must be implemented.

550 **Table 24 – Class: CIM_UseOfLog**

Properties	Requirement	Notes
Antecedent	Mandatory	The property shall be a reference to an instance of CIM_DiagnosticLog.
Dependent (overridden)	Mandatory	The property shall be a reference to an instance of CIM_OpticalDriveDiagnosticTest.

Annex A
(informative)

Change log

Version	Date	Description
0.1	2010-12-05	Initial Version
1.0.0a	2011-04-06	Work In Progress version
1.0.0	2011-10-07	DMTF Draft Standard
1.0,0	2012-01-18	DMTF Standard