

BIOS and Boot Management Profile

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1. Scope

The BIOS and Boot Management Profile extends the management capabilities of referencing profiles by adding the capability to represent the configuration of the system BIOS setup and to manage the boot of the system. The system BIOS setup is modeled with multiple attributes that allow configuration of the BIOS.

2. Normative References

Refer to the following documents for more information.

Note: For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- DMTF DSP1033, Profile Registration Profile 1.0.0
- DMTF DSP1061, Management Profile 1.0.0
- DMTF DSP0200, CIM Operations over HTTP 1.2.0
- DMTF DSP0004, CIM Infrastructure Specification 2.3.0
- DMTF DSP1000, Management Profile Specification Template
- DMTF DSP1001, Management Profile Specification Usage Guide
- DMTF DSP0226, Web Services for Management (WS-Management) Specification 1.1.0
- DMTF DSP0227, WS-Management CIM Binding Specification 1.0.0
- 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>
- Unified Modeling Language (UML) from the Open Management Group (OMG), <http://www.uml.org>
- *BIOS Boot Specification v1.01* (January 11, 1996), <http://www.phoenix.com/NR/rdonlyres/56E38DE2-3E6F-4743-835F-B4A53726ABED/0/specsbbs101.pdf>
- DCIM LC Management Profile 1.2.0
- Dell Lifecycle Controller Best Practices Guide 1.0, http://en.community.dell.com/techcenter/extras/m/white_papers/20066173.aspx
- Dell WSMAN Licenses and Privileges 1.0
- *Advanced Configuration and Power Interface (ACPI) Specification v4.0*, <http://www.acpi.info/DOWNLOADS/ACPIspec40a.pdf>
- Dell Tech Center MOF Library: <http://www.delltechcenter.com/page/DCIM.Library.MOF>
- Related Managed Object Format (MOF) files:
 - DCIM_BootConfigSetting.mof
 - DCIM_BootSourceSetting.mof
 - DCIM_BIOSEnumeration.mof
 - DCIM_BIOSInteger.mof
 - DCIM_BIOSService.mof
 - DCIM_BIOSString.mof
 - DCIM_BIOSPassword.mof
 - DCIM_LCElementConformsToProfile
 - DCIM_LCRegisteredProfile

3. Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1. Can

Used for statements of possibility and capability, whether material, physical, or causal

3.2. Cannot

Used for statements of possibility and capability, whether material, physical, or causal.

3.3. Conditional

Indicates requirements to be followed strictly in order to conform to the document when the specified conditions are met.

3.4. Mandatory

Indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted.

3.5. May

Indicates a course of action permissible within the limits of the document.

3.6. Optional

Indicates a course of action permissible within the limits of the document.

3.7. Need not

Indicates a course of action permissible within the limits of the document.

3.8. Referencing profile

Indicates a profile that owns the definition of this class and can include a reference to this profile in its “Related Profiles” table.

3.9. Shall

Indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted.

3.10. Shall not

Indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted.

3.11. Should

Indicates that among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.

3.12. Should not

Indicates that a certain possibility or course of action is deprecated but not prohibited.

3.13. FQDD

Fully Qualified Device Descriptor is used to identify a particular component in a system.

3.14. Interop Namespace

Interop Namespace is where instrumentation instantiates classes to advertise its capabilities for client discovery.

3.15. Implementation Namespace

Implementation Namespace is where instrumentation instantiates classes relevant to executing core management tasks.

3.16. ENUMERATE

Refers to WS-MAN `ENUMERATE` operation as described in Section 8.2 of DSP0226_V1.1 and Section 9.1 of DSP0227_V1.0

3.17. GET

Refers to WS-MAN `GET` operation as defined in Section 7.3 of DSP0226_V1.1 and Section 7.1 of DSP0227_V1.0

4. Symbols and Abbreviated Terms

4.1. CIM

Common Information Model

4.2. iDRAC

Integrated Dell Remote Access Controller – management controller for blades and monolithic servers

4.3. CMC

Chassis Manager Controller – management controller for the modular server chassis

4.4. iSCSI

Internet Small Computer System Interface, an Internet Protocol (IP)-based storage networking standard for linking data storage facilities.

4.5. WBEM

Web-Based Enterprise Management

4.6. IPL

Initial Program Load, refers to the IPL list (an initial priority list of boot devices). An Initial Program Load Device is any device in the system that can boot and load an operating system. In standard AT machines, this is the floppy drive or hard drive. See *BIOS Boot Specification*.

4.7. BCV

A Boot Connection Vector is a pointer that points to code inside the option ROM that performs device initialization, detect if a peripheral (such as a SCSI hard drive) is attached, and optionally hook INT 13h. The BCV resides in a PnP option ROM Expansion Header. An example of an option ROM with a BCV is a PnP ISA SCSI controller. See *BIOS Boot Specification*.

5. Synopsis

Profile Name: BIOS and Boot Management

Version: 4.0.0

Organization: Dell Inc.

CIM Schema Version: 2.41 Final

Central Class: DCIM_BIOSService

Scoping Class: CIM_ComputerSystem

The BIOS and Boot Management Profile extends the management capability of the referencing profiles by adding the capability to describe BIOS attributes, each BIOS configuration item is represented by an instance one of these classes DCIM_BIOSEnumeration, DCIM_BIOSString, DCIM_BIOSInteger and boot management where each boot list is represented by DCIM_BootConfigSetting and each boot source device by DCIM_BootSourceSetting. DCIM_BIOSService shall be the Central Class. CIM_ComputerSystem shall be the Scoping Class. The instance of DCIM_BIOSService shall be the Central Instance. The instance of CIM_ComputerSystem shall be the Scoping Instance.

Table 1 lists profiles that are related to this profile.

Table 1. Related Profiles

Profile Name	Organization	Version	Relationship
Profile Registration Profile	DMTF	1.1.0	Mandatory

6. Description

The BIOS and Boot Management Profile describes the BIOS setup configuration that includes boot management. The profile also describes the relationship of the BIOS classes to the DMTF and Dell profile version information.

Figure 1 shows the BIOS and Boot Management Profile.

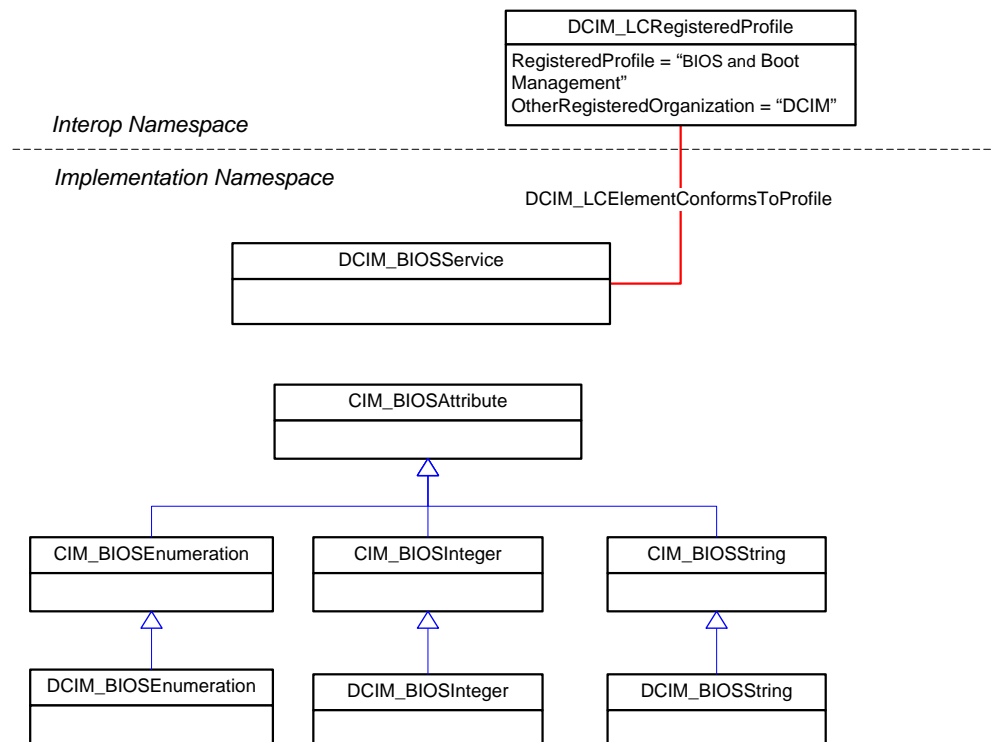


Figure 1. BIOS and Boot Management Profile: Class Diagram – BIOS Management

Each of the CIM_BIOSAttribute sub-classes (DCIM_BIOSEnumeration, DCIM_BIOSString, DCIM_BIOSInteger) represent a configurable attribute in BIOS. Depending on the data type of the attribute the BIOS configuration attribute is either instantiated as DCIM_BIOSEnumeration, DCIM_BIOSString, or DCIM_BIOSInteger instance.

The DCIM_BIOSService class is used to configure the BIOS attributes. The SetAttribute() and SetAttributes() methods on the DCIM_BIOSService class configure BIOS attributes, DCIM_BIOSAttribute subclass instances.

The BIOS and Boot Management Profile information is represented with the instance of CIM_RegisteredProfile.

Figure 2 shows the object diagram schema for the boot management feature of the BIOS and Boot Management Profile. For simplicity, the prefix CIM_ has been removed from the class names.

DCIM_BootConfigSetting represents each boot list. DCIM_BootSourceSetting represents each of the boot list boot devices or sources that are shown under their corresponding boot list.

Note: the InstanceID property value prefix of the DCIM_BootSourceSetting instance matches the InstanceID of the DCIM_BootConfigSetting. IPL boot list contains a BCV boot list. For example, IPL list may contain CDROM, Floppy and Hard Disk. Hard Disk may represent a BCV list that contains multiple BCV devices such as multiple RAID or SCSI controllers that are arranged in a boot priority list. For more details on IPL and BCV, see *BIOS Boot Specification*.

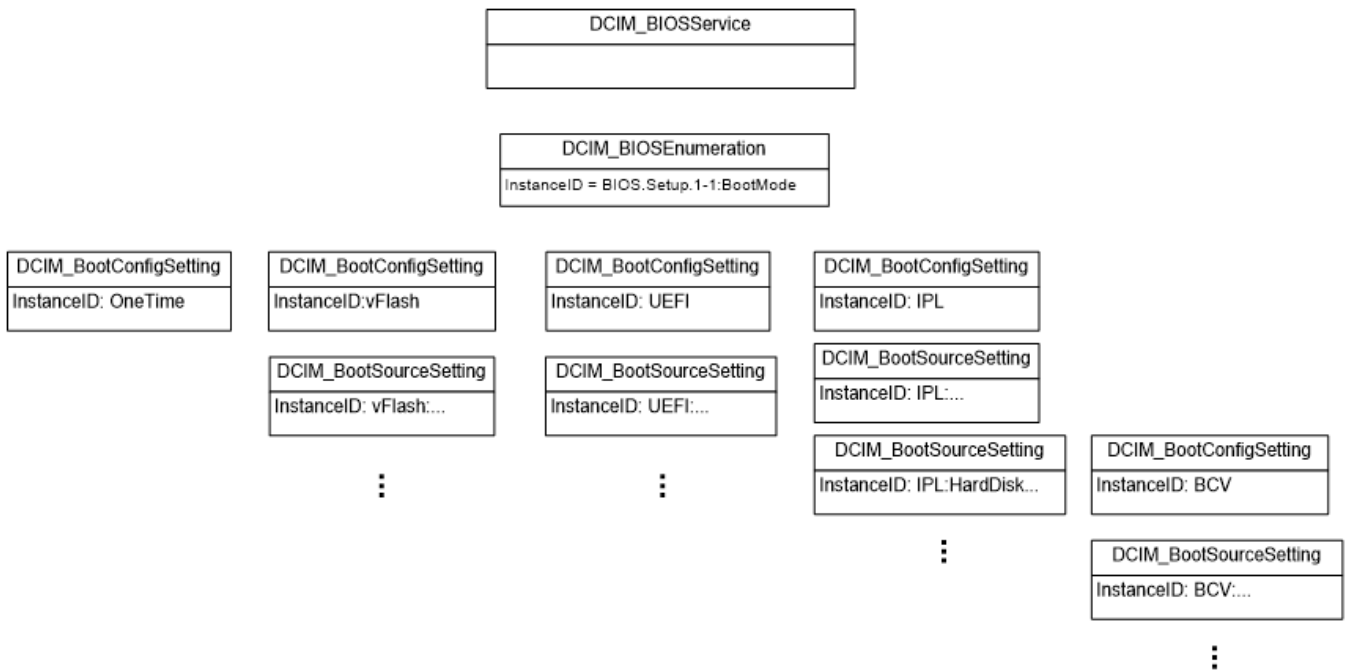


Figure 2. BIOS and Boot Management Profile: Boot Management

7. Implementation Requirements

This section provides the requirements and guidelines to implement the properties of the classes. Methods are listed in section 8. Table 2 provides the instances of CIM Elements for this profile. Instances of the CIM Elements shall be implemented as described in Table 2.

Table 2. CIM Elements: BIOS and Boot Management Profile

Element Name	Requirement	Description
Classes		
DCIM_BIOSEnumeration	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.1.1

Element Name	Requirement	Description
DCIM_BIOSInteger	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.1.3
DCIM_BIOSString	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.1.2
DCIM_BIOSPassword	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.1.4
DCIM_BootConfigSetting	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.2.1
DCIM_BootSourceSetting	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.2.2
DCIM_BIOSService	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> . See section 7.3.1
DCIM_LCElementConformsToProfile	Mandatory	The class shall be implemented in the <i>Implementation Namespace</i> .
DCIM_LCElementConformsToProfile	Mandatory	The class shall be implemented in the <i>Interop Namespace</i> .
DCIM_LCRegisteredProfile	Mandatory	The class shall be implemented in the <i>Interop Namespace</i> . See section 7.4.1
DCIM_BiosCertService	Manadatory	The class shall be implemented in the <i>Interop Namespace</i> . See section 7.5.
DCIM_BiosCertView	Manadatory	The class shall be implemented in the <i>Interop Namespace</i> . See section 7.6

7.1. BIOS Management

7.1.1. DCIM_BIOSEnumeration

This section describes the implementation of the DCIM_BIOSEnumeration class that represents an enumeration type BIOS attribute. This class shall be instantiated in the Implementation Namespace.

7.1.1.1. Resource URIs for WinRM®

The class resource URI shall be “http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSEnumeration?__cimnamespace=root/dcim”

The key property shall be the InstanceID.

The instance Resource URI for DCIM_BIOSEnumeration instance shall be:

[http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSEnumeration?__cimnamespace=root/dcim+InstanceID= BIOS.Setup.1-1:<AttributeName>](http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSEnumeration?__cimnamespace=root/dcim+InstanceID=BIOS.Setup.1-1:<AttributeName>), where <AttributName> is the AttributeName property value.

7.1.1.2. Operations

The following table details the operations implemented on the DCIM_BIOSEnumeration class

Table 3. DCIM_BIOSEnumeration - Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI

Operation Name	Requirements	Required Input
DCIM_BIOSService.SetAttribute()	Mandatory	See section 8.1
DCIM_BIOSService.SetAttributes()	Mandatory	See section 8.2

7.1.1.3. Properties

The following table lists the properties implemented for the DCIM_BIOSEnumeration instance representing a BIOS controller enumeration attribute. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 4. Class: DCIM_BIOSEnumeration

Properties	Type	Requirements	Additional Requirements
InstanceID	String	Mandatory	The property value shall be formed as follows: “BIOS.Setup.1-1:<AttributeName property value>”.
AttributeName	String	Mandatory	The property value shall be from the “AttributeName” column in Tables in section 7.1.5.
AttributeDisplayName	String	Mandatory	The property value shall be from the “AttributeDisplayName” column in Tables in section 7.1.5.
GroupID	String	Mandatory	See section 7.1.5.
GroupDisplayName	String	Mandatory	See section 7.1.5.
CurrentValue[]	String	Mandatory	The property value shall be one of the values in the “PossibleValues” column in Tables in section 7.1.5.
PendingValue[]	String	Mandatory	The property value shall be one of the values in the “PossibleValues” column in Tables in section 7.1.5.
IsReadOnly	Boolean	Mandatory	The property value shall be the value in the “IsReadOnly” column in Tables in section 7.1.5.
FQDD	String	Mandatory	The property shall be set to “BIOS.Setup.1-1”.
DisplayOrder	uint16	Mandatory	The property shall represent the sequence number denoting the preferred placement of the attribute in the list of all BIOS attributes.
Dependency	String	Optional	The property shall be formatted as XML describing the attributes dependence on other attribute(s).
PossibleValues[]	String	Mandatory	The property value shall be equal to the array of the values in “PossibleValues” column at the corresponding row in in Tables in section 7.1.5.
PossibleValuesDescription[]	String	Mandatory	The array property’s each value shall represent the description of the value in the PossibleValue array property at the corresponding index.

7.1.2. DCIM_BIOSString

This section describes the implementation for the DCIM_BIOSString class that represents a string type BIOS attribute. This class shall be instantiated in the Implementation Namespace.

7.1.2.1. Resource URIs for WinRM®

The class Resource URI shall be “http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSString?__cimnamespace=root/dcim”

The key property shall be the InstanceID.

The instance Resource URI for DCIM_BIOSString instance shall be: http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSString?__cimnamespace=root/dcim+InstanceID= BIOS.Setup.1-1:<AttributeName>, where <AttributeName> is the AttributeName property value.

7.1.2.2. Operations

The following table details the implemented operations on DCIM_BIOSString.

Table 5. DCIM_BIOSString - Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
DCIM_BIOSService.SetAttribute()	Mandatory	See section 8.1
DCIM_BIOSService.SetAttributes()	Mandatory	See section 8.2

7.1.2.3. Properties

The following table details the properties implemented for DCIM_BIOSString instance representing a BIOS string attribute. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 6. Class: DCIM_BIOSString

Properties	Type	Requirements	Additional Requirements
InstanceID	String	Mandatory	The property value shall be formed as follows: “BIOS.Setup.1-1:<AttributeName property value>”.
AttributeName	String	Mandatory	The property value shall be from the “AttributeName” column in tables in section 7.1.5.
AttributeDisplayName	String	Mandatory	The property value shall be from the “AttributeDisplayName” column in Tables in section 7.1.5.
GroupID	String	Mandatory	See section 7.1.5.
GroupDisplayName	String	Mandatory	See section 7.1.5.
CurrentValue[]	String	Mandatory	If the ValueExpression property is non-NULL non-blank value, the the property value shall match the Regex format described in the ValueExpression property value.
PendingValue[]	String	Mandatory	If the ValueExpression property is non-NULL non-blank value, the the property value shall match the Regex format described in the ValueExpression property value.

Properties	Type	Requirements	Additional Requirements
IsReadOnly	Boolean	Mandatory	The property value shall be the value in the “IsReadOnly” column at the corresponding row in Tables in section 7.1.5.
FQDD	String	Mandatory	The property shall be set to “BIOS.Setup.1-1”.
DisplayOrder	uint16	Mandatory	The property shall represent the sequence number denoting the preferred placement of the attribute in the list of all BIOS attributes.
Dependency	String	Optional	The property shall be formatted as XML describing the attributes dependence on other attribute(s). See <i>Lifecycle Controller (LC) Integration Best Practices Guide</i> for details.
MinLength	uint64	Mandatory	The property value shall be the value in the “MinLength” column at the corresponding row in in tables in section 7.1.5. The omission or NULL shall denote that no known constraint exists on the CurrentValue and PendingValue properties.
MaxLength	uint64	Mandatory	The property value shall be the value in the “MaxLength” column at the corresponding row in in Tables in section 7.1.5. The omission or NULL shall denote that no known constraint exists on the CurrentValue and PendingValue properties.
ValueExpression	String	Conditional	The property value shall be implemented if the IsReadOnly property has value FALSE. The property shall a Perl-compatible regular expression (PCRE) syntax to use in validating Attribute values.

7.1.3. DCIM_BIOSInteger

This section describes the implementation of the DCIM_BIOSInteger class that represents an integer type BIOS attribute. This class shall be instantiated in the Implementation Namespace.

7.1.3.1. Resource URIs for WinRM®

The class resource URI shall be “http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSInteger?__cimnamespace=root/dcim”

The key property shall be the InstanceID.

The instance Resource URI for DCIM_BIOSInteger instance shall be:

“http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSInteger?__cimnamespace=root/dcim+InstanceID= BIOS.Setup.1-1:<AttributeName>”, where <AttributeName> is the AttributeName property value.

7.1.3.2. Operations

The following table details the implemented operations on DCIM_BIOSInteger.

Table 7. DCIM_BIOSInteger - Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
DCIM_BIOSService.SetAttribute()	Mandatory	See section 8.1
DCIM_BIOSService.SetAttributes()	Mandatory	See section 8.2

7.1.3.3. Properties

The following table details the properties implemented for the DCIM_BIOSInteger instance representing a BIOS integer attribute. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 8. Class: DCIM_BIOSInteger

Properties	Type	Requirements	Additional Requirements
InstanceID	String	Mandatory	The property value shall be formed as follows: “BIOS.Setup.1-1:<AttributeName property value>”.
AttributeName	String	Mandatory	The property value shall be from the “AttributeName” column in Tables in section 7.1.5.
AttributeDisplayName	String	Mandatory	The property value shall be from the “AttributeDisplayName” column in Tables in section 7.1.5.
GroupID	String	Mandatory	See section 7.1.5.
GroupDisplayName	String	Mandatory	See section 7.1.5.
CurrentValue[]	String	Mandatory	The property value shall match the format described in “Value Expression” column at the corresponding row in Tables in section 7.1.5.
PendingValue[]	String	Mandatory	The property value shall match the format described in “Value Expression” column at the corresponding row in Tables in section 7.1.5.
IsReadOnly	Boolean	Mandatory	The property value shall be the value in the “IsReadOnly” column at the corresponding row in Tables in section 7.1.5.
FQDD	String	Mandatory	The property shall be set to “BIOS.Setup.1-1”.
DisplayOrder	uint16	Mandatory	The property shall represent the sequence number denoting the preferred placement of the attribute in the list of all BIOS attributes.
Dependency	String	Optional	The property shall be formatted as XML describing the attributes dependence on other attribute(s). See <i>Lifecycle Controller (LC) Integration Best Practices Guide</i> for details.
LowerBound	uint64	Mandatory	The property value shall be the value in the “LowerBound” column at the corresponding row in Tables in section 7.1.5.
UpperBound	uint64	Mandatory	The property value shall be the value in the “UpperBound” column at the corresponding row in Tables in section 7.1.5.

7.1.4. DCIM_BIOSPassword

This section describes the implementation for the DCIM_BIOSPassword class that represents a string type BIOS attribute. This class shall be instantiated in the Implementation Namespace.

7.1.4.1. Resource URIs for WinRM®

The class resource URI shall be “http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSPassword?__cimnamespace=root/dcim”

The key property shall be the InstanceID.

The instance Resource URI for DCIM_BIOSPassword instance shall be:

<http://schemas.dell.com/wbem/wscim/1/cim->

[schema/2/DCIM_BIOSPassword?__cimnamespace=root/dcim+InstanceID= BIOS.Setup.1-1:<AttributeName> ,](http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSPassword?__cimnamespace=root/dcim+InstanceID= BIOS.Setup.1-1:<AttributeName> ,)
where <AttributeName> is the AttributeName property value.

7.1.4.2. Operations

The following table details the operations implemented on the DCIM_BIOSPassword class.

Note: The.SetAttribute() and SetAttributes() methods of the DCIM_BIOSService class are NOT supported for DCIM_BIOSPassword class.

Table 9. DCIM_BIOSPassword - Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
DCIM_BIOSService.ChangeBIOSPassword()	Mandatory	See section 8.1

7.1.4.3. Properties

The following table details the properties implemented for the DCIM_BIOSPassword instance representing a BIOS string attribute. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 10. Class: DCIM_BIOSPassword

Properties	Type	Requirements	Additional Requirements
InstanceID	String	Mandatory	The property value shall be formed as follows: “BIOS.Setup.1-1:<AttributeName property value>”.
AttributeName	String	Mandatory	The property value shall be from the “AttributeName” column in Tables in section 7.1.5.8.
AttributeDisplayName	String	Mandatory	The property value shall be from the “AttributeDisplayName” column in Tables in section 7.1.5.8.
GroupID	String	Mandatory	See section 7.1.5.8.
GroupDisplayName	String	Mandatory	See section 7.1.5.8.
CurrentValue[]	String	Mandatory	The property value shall match the format described in “Value Expression” column at the corresponding row in Tables in section 7.1.5.8.
PendingValue[]	String	Mandatory	The property value shall match the format described in “Value Expression” column at the corresponding row in Tables in section 7.1.5.8.
IsReadOnly	Boolean	Mandatory	The property value shall be the value in the “IsReadOnly” column at the corresponding row in Tables in section 7.1.5.8.
FQDD	String	Mandatory	The property shall be set to “BIOS.Setup.1-1”.
DisplayOrder	uint16	Mandatory	The property shall represent the sequence number denoting the preferred placement of the attribute in the list of all BIOS attributes.

Properties	Type	Requirements	Additional Requirements
Dependency	String	Optional	The property shall be formatted as XML describing the attributes dependence on other attribute(s). See <i>Lifecycle Controller (LC) Integration Best Practices Guide</i> for details.
MinLength	uint64	Mandatory	The property value shall be the value in the “MinLength” column at the corresponding row in in Tables in section 7.1.5.80. The omission or NULL shall denote that no known constraint exists on the CurrentValue and PendingValue properties.
MaxLength	uint64	Mandatory	The property value shall be the value in the “MaxLength” column at the corresponding row in in Tables in section 7.1.5.8 The omission or NULL shall denote that no known constraint exists on the CurrentValue and PendingValue properties.
IsSet	Boolean	Mandatory	This property shall return TRUE if the PasswordState property has value 2 (Installed), otherwise this property shall be set to FALSE.
PasswordState	Uint16	Mandatory	The property shall represent the current state of the password that the attribute represents. The property shall have one of the following values: <ul style="list-style-type: none"> • 0 (Unknown) password state is not available • 2 (Installed) password is currently set or installed • 3 (Uninstalled) password is currently not set or is uninstalled • 4 (Hardware Disabled) password is disabled by hardware jumper

7.1.5. BIOS Attributes

This section lists and describes the attributes and their logical grouping.

Note: The BIOS attributes listed in this section may not be applicable for all Dell systems. A particular attribute is applicable based on the model of a Dell system, the features available in the system and the BIOS version of the system.

7.1.5.1. Processor Settings

This section describes the attributes for Processor Settings configuration.

For the DCIM_BIOSEnumeration, DCIM_BIOSString, and DCIM_BIOSInteger:

- GroupID property shall be “ProcSettings”
- GroupDisplayName property shall be “Processor Settings”

The following table provides the values for the DCIM_BIOSEnumeration class of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 11. DCIM_BIOSEnumeration Processor Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
LogicalProc	Logical Processor	FALSE	<ul style="list-style-type: none"> • Disabled • Enabled
ProcHyperTransport	HyperTransport Technology	FALSE	<ul style="list-style-type: none"> • HT1 • HT3

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
ProcHtAssist	HT Assist	FALSE	<ul style="list-style-type: none"> Disabled Enabled
QpiSpeed ¹	QPI Speed	FALSE	MaxDataRate:,8GTps,7GTps, and 6GTps
ProcVirtualization	Virtualization Technology	FALSE	<ul style="list-style-type: none"> Disabled Enabled
DmaVirtualization ²	DMA Virtualization	Attribute Value Dependant ²	<ul style="list-style-type: none"> Disabled Enabled
ProcDramPrefetcher	DRAM Prefetcher		<ul style="list-style-type: none"> Disabled Enabled
ProcAdjCacheLine	Adjacent Cache Line Prefetch	FALSE	<ul style="list-style-type: none"> Disabled Enabled
ProcSoftwarePrefetcher	Hardware Prefetch Training on Software Prefetch		<ul style="list-style-type: none"> Disabled Enabled
ProcHwPrefetcher	Hardware Prefetcher	FALSE	<ul style="list-style-type: none"> Disabled Enabled
DcuStreamerPrefetcher	DCU Streamer Prefetcher	FALSE	<ul style="list-style-type: none"> Disabled Enabled
DataReuse	Data Reuse	FALSE	<ul style="list-style-type: none"> Disabled Enabled
QpiBandwidthPriority ¹	Intel(R) QPI Bandwidth Priority	FALSE	<ul style="list-style-type: none"> InputOutput Compute
ProcExecuteDisable	Execute Disable	FALSE	<ul style="list-style-type: none"> Disabled Enabled
ProcC1E ³	C1E	FALSE	<ul style="list-style-type: none"> Disabled Enabled
ProcCores	Number of Cores per Processor	FALSE	<ul style="list-style-type: none"> All Dual Quad 1 2 4 6 8 10 12 14 16
ProcTurboMode	Processor Turbo Mode	FALSE	<ul style="list-style-type: none"> Disabled Enabled
ProcCStates ³	Processor C States	FALSE	<ul style="list-style-type: none"> Disabled Enabled
CorePerfBoost	Core Performance Boost	FALSE	<ul style="list-style-type: none"> Disabled Enabled
ProcConfigTdp	Configurable TDP	FALSE	<ul style="list-style-type: none"> Nominal Level1

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
Proc1ControlledTurbo	Processor 1 Controlled Turbo	TRUE	<ul style="list-style-type: none"> • Disabled • Controlled Turbo Limit • Controlled Turbo Limit Minus 1 Bin • Controlled Turbo Limit Minus 2 Bin2 • Controlled Turbo Limit Minus 3 Bins
Proc2ControlledTurbo	Processor 2 Controlled Turbo	TRUE	<ul style="list-style-type: none"> • Disabled • Controlled Turbo Limit • Controlled Turbo Limit Minus 1 Bin • Controlled Turbo Limit Minus 2 Bin2 • Controlled Turbo Limit Minus 3 Bins
Proc3ControlledTurbo	Processor 3Controlled Turbo	TRUE	<ul style="list-style-type: none"> • Disabled • Controlled Turbo Limit • Controlled Turbo Limit Minus 1 Bin • Controlled Turbo Limit Minus 2 Bin2 • Controlled Turbo Limit Minus 3 Bins
Proc4ControlledTurbo	Processor 4 Controlled Turbo	TRUE	<ul style="list-style-type: none"> • Disabled • Controlled Turbo Limit • Controlled Turbo Limit Minus 1 Bin • Controlled Turbo Limit Minus 2 Bin2 • Controlled Turbo Limit Minus 3 Bins
ProcX2Apic	X2Apic Mode	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
DynamicCoreAllocation	Logical Processor Idling	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
DculpPrefetcher	DCU IP Prefetcher	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
RtidSetting	Alternate RTID (Requestor Transaction ID) Setting	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
ControlledTurboExtended	Dell Controlled Turbo Extended		<ul style="list-style-type: none"> • Dell Controlled Turbo Limit Minus 1 Bin • Dell Controlled Turbo Limit Minus 2 Bin • Disabled
PerfMonitorDevices	Performance Monitor Devices		<ul style="list-style-type: none"> • Enabled • Disabled
Proc1Cores	Number of Cores for Processor 1		<ul style="list-style-type: none"> • All;1;2;4;6;8;10;12;14;16;18
Proc2Cores	Number of Cores for Processor 2		<ul style="list-style-type: none"> • All;1;2;4;6;8;10;12;14;16;18
Proc3Cores	Number of Cores for Processor 3		<ul style="list-style-type: none"> • All;1;2;4;6;8;10;12;14;16;18

Note: 1 – Intel® QuickPath Interconnect is a point-to-point processor interconnect developed by Intel that replaces the Front Side Bus (FSB).

Note: 2 – The DmaVirtualization is read-only (IsReadOnly=TRUE) and shall have value “Disabled”, if the ProcVirtualization attribute is set to “Disabled”.

Note: 3 – Processor C states are used to adjust the power consumption of the processor as described by Advanced Configuration and Power Interface (ACPI) Specification.

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 12. DCIM_BIOSString Processor Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
Proc64bit	Processor 64-bit Support	TRUE	0	4
ProcCoreSpeed	Processor Core Speed	TRUE	0	16
ProcBusSpeed	Processor Bus Speed	TRUE		
Proc1Id	Family-Model-Stepping	TRUE	0	8
Proc1Brand	Brand	TRUE	0	80
Proc1L2Cache	Level 2 Cache	TRUE	0	16
Proc1L3Cache	Level 3 Cache	TRUE	0	16
Proc2Id	Family-Model-Stepping	TRUE	0	8
Proc2Brand	Brand	TRUE	0	80
Proc2L2Cache	Level 2 Cache	TRUE	0	16
Proc2L3Cache	Level 3 Cache	TRUE	0	16
Proc3Id	Family-Model-Stepping	TRUE	0	8
Proc3Brand	Brand	TRUE	0	80
Proc3L2Cache	Level 2 Cache	TRUE	0	16
Proc3L3Cache	Level 3 Cache	TRUE	0	16
Proc4Id	Family-Model-Stepping	TRUE	0	8
Proc4Brand	Brand	TRUE	0	80
Proc4L2Cache	Level 2 Cache	TRUE	0	16
Proc4L3Cache	Level 3 Cache	TRUE	0	16

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 13. DCIM_BIOSInteger Processor Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
Proc1NumCores	Number of Cores	TRUE	0	65535
Proc2NumCores	Number of Cores	TRUE	0	65535
Proc3NumCores	Number of Cores	TRUE	0	65535
Proc4NumCores	Number of Cores	TRUE	0	65535

7.1.5.2. SATA Settings

This section describes the attributes for SATA Settings configuration.

For the DCIM_BIOSEnumeration and DCIM_BIOSString:

- GroupID property shall be "SataSettings"
- GroupDisplayName property shall be "SATA Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. Each of the column headings correspond to a property name on the DCIM_BIOSEnumeration class. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 14. DCIM_BIOSEnumeration SATA Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
EmbSata	Embedded SATA	FALSE	<ul style="list-style-type: none"> • AtaMode • AhciMode • RaidMode • Off
SataPortA	Port A	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortB	Port B	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortC	Port C	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortD	Port D	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortE	Port E	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortF	Port F	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortG	Port G	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortH	Port H	FALSE	<ul style="list-style-type: none"> • Auto • Off
eSataPort1	eSATA Port	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortI	Port I	FALSE	<ul style="list-style-type: none"> • Auto • Off
EmbSataShadow	Embedded SATA Shadow		<ul style="list-style-type: none"> • ATA Mode • AHCI Mode • RAID Mode;Off
WriteCache	Write Cache	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
SecurityFreezeLock	Security Freeze Lock	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
SataPortIModel	Model		<ul style="list-style-type: none"> •
SataPortIDriveType	Drive Type		<ul style="list-style-type: none"> •
SataPortICapacity	Capacity		<ul style="list-style-type: none"> •
SataPortJ	Port J	FALSE	<ul style="list-style-type: none"> • Auto • Off
SataPortJModel	Model		<ul style="list-style-type: none"> •
SataPortJDriveType	Drive Type		<ul style="list-style-type: none"> •
SataPortJCapacity	Capacity		<ul style="list-style-type: none"> •

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 15. DCIM_BIOSString SATA Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
SataPortAModel	Model	TRUE	0	40
SataPortADriveType	Drive Type	TRUE	0	20
SataPortACapacity1	Capacity	TRUE	0	18
SataPortBModel	Model	TRUE	0	40
SataPortBDriveType	Drive Type	TRUE	0	20
SataPortBCapacity1	Capacity	TRUE	0	18
SataPortCModel	Model	TRUE	0	40
SataPortCDriveType	Drive Type	TRUE	0	20
SataPortCCapacity1	Capacity	TRUE	0	18
SataPortDModel	Model	TRUE	0	40
SataPortDDriveType	Drive Type	TRUE	0	20
SataPortDCapacity1	Capacity	TRUE	0	18
SataPortEModel	Model	TRUE	0	40
SataPortEDriveType	Drive Type	TRUE	0	20
SataPortECapacity1	Capacity	TRUE	0	18
SataPortFModel	Model	TRUE	0	40
SataPortFDriveType	Drive Type	TRUE	0	20
SataPortFCapacity1	Capacity	TRUE	0	18
SataPortGModel	Model	TRUE	0	40
SataPortGDriveType	Drive Type	TRUE	0	20
SataPortGCapacity1	Capacity	TRUE	0	18
SataPortHModel	Model	TRUE	0	40
SataPortHDriveType	Drive Type	TRUE	0	20
SataPortHCapacity1	Capacity	TRUE	0	18
SataPortIModel	Model	TRUE	0	40
SataPortIDriveType	Drive Type	TRUE	0	20
SataPortICapacity1	Capacity	TRUE	0	18
SataPortJModel	Model	TRUE	0	40
SataPortJDriveType	Drive Type	TRUE	0	20
SataPortJCapacity1	Capacity	TRUE	0	18
eSataPort1Model	Model	TRUE	0	40
eSataPort1DriveType	Drive Type	TRUE	0	20
eSataPort1Capacity1	Capacity	TRUE	0	18

Note: 1 – Capacity of the of a hard-disk drive where units are embedded in the string itself.

7.1.5.3. Boot Settings

This section describes the attributes for Boot Settings configuration.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "BootSettings".
- GroupDisplayName property shall be "Boot Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 16. DCIM_BIOSEnumeration Boot Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
BootMode	Boot Mode	FALSE	<ul style="list-style-type: none">• Bios• Uefi
BootSeqRetry	Boot Sequence Retry	FALSE	<ul style="list-style-type: none">• Disabled• Enabled
HddFailover	Hard-Disk Failover		<ul style="list-style-type: none">• Disabled• Enabled

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 17. DCIM_BIOSString Boot Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
SetBootOrderFqdd1<x>, where 'x' is 1 to 16	Set Boot Order Fqdd<x>, where 'x' is 1 to 16	FALSE	0	255
SetLegacyHddOrderFqdd<x>, where 'x' is 1 to 16	Set Legacy Hdd Order Fqdd<x>, where 'x' is 1 to 16	FALSE	0	100
SetBootOrder<x>, where 'x' is 1 to 16	Set Boot Order<x>, where 'x' is 1 to 16	FALSE	0	256
SetBcvOrder<x>, where 'x' is 1 to 16	Set Bcv Order<x>, where 'x' is 1 to 16	FALSE	0	256

7.1.5.4. Slot Disablement

This section describes the attributes for Slot Disablement configuration.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "SlotDisablement".
- GroupDisplayName property shall be "Slot Disablement".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 18. DCIM_BIOSEnumeration Slot Disablement

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
Slot1	Slot 1	TRUE	<ul style="list-style-type: none">• Disabled• Enabled• BootDriverDisabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
Slot2	Slot 2	TRUE	<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot3	Slot 3	TRUE	<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot4	Slot 4	TRUE	<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot5	Slot 5	FALSE	<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot6	Slot 6	FALSE	<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot7	Slot 7	FALSE	<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot8	Slot 8		<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot9	Slot 9		<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled
Slot10	Slot 10		<ul style="list-style-type: none"> Disabled Enabled BootDriverDisabled

7.1.5.5. Serial Communication

This section describes the attributes for Serial Communication configuration.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "SerialCommSettings".
- GroupDisplayName property shall be "Serial Communication".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 19. DCIM_BIOSEnumeration Serial Communication

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
SerialComm	Serial Communication	FALSE	<ul style="list-style-type: none"> OnNoConRedir OnConRedirCom1 OnConRedirCom2 Off OnConRedirAuto OnConRedir

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
SerialPortAddress	Serial Port Address	FALSE	<ul style="list-style-type: none"> Serial1Com1Serial2Com2 Serial1Com2Serial2Com1 Com1 Com2
ExtSerialConnector	External Serial Connector	FALSE	<ul style="list-style-type: none"> Serial1 Serial2 RemoteAccDevice
FailSafeBaud	Failsafe Baud Rate	FALSE	<ul style="list-style-type: none"> 115200 57600 19200 9600
ConTermType	Remote Terminal Type	FALSE	<ul style="list-style-type: none"> Vt100Vt220 Ansi
RedirAfterBoot	Redirection After Boot	FALSE	<ul style="list-style-type: none"> Enabled Disabled

7.1.5.6. System Profile Settings

This section describes the attributes for System Profile Settings configuration.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "SysProfileSettings".
- GroupDisplayName property shall be "System Profile Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 20. DCIM_BIOSEnumeration System Profile Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
SysProfile	System Profile	FALSE	<ul style="list-style-type: none"> PerfPerWattOptimizedOs PerfPerWattOptimizedDapc PerfOptimized Custom DenseCfgOptimized
ProcPwrPerf	CPU Power Management	TRUE	<ul style="list-style-type: none"> MaxPerf MinPwr SysDbpm OSDbpm
MemFrequency	Memory Frequency	TRUE	<ul style="list-style-type: none"> MaxPerf 1333MHz 1067MHz 800MHz
ProcTurboMode	Turbo Boost	TRUE	<ul style="list-style-type: none"> Disabled Enabled
ProcC1E	C1E	TRUE	<ul style="list-style-type: none"> Disabled Enabled
ProcCStates	C States	TRUE	<ul style="list-style-type: none"> Disabled Enabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
MemPwrMgmt	Memory Power Management	TRUE	<ul style="list-style-type: none"> • Enabled • Disabled
MemPatrolScrub	Memory Patrol Scrub	TRUE	<ul style="list-style-type: none"> • Extended • Standard • Disabled
PowerDelivery	Power Delivery	TRUE	<ul style="list-style-type: none"> • MaxReliability • MinPwr
MemRefreshRate	Memory Refresh Rate	TRUE	<ul style="list-style-type: none"> • 1x • 2x
EnergyEfficientTurbo	Energy Efficient Turbo		<ul style="list-style-type: none"> • Enabled • Disabled
EnergyPerformanceBias	Energy Efficient Policy		<ul style="list-style-type: none"> • Performance • Balanced Performance • Balanced Energy • Energy Efficient
UncoreFrequency	Uncore Frequency		<ul style="list-style-type: none"> • Dynamic • Maximum
MemVolt	Memory Operating Voltage		<ul style="list-style-type: none"> • Auto • 1.35 V • 1.5 V
MonitorMwait	Monitor/Mwait	TRUE	<ul style="list-style-type: none"> • Enabled • Disabled
CollaborativeCpuPerfCtrl	Collaborative CPU Performance Control		<ul style="list-style-type: none"> • Enabled • Disabled
Proc0TurboCoreNum	Number of Turbo Boost Enabled Cores for Processor 0		<ul style="list-style-type: none"> • All • 1 • 2 • 4 • 6 • 8 • 10 • 12 • 14 • 16 • 18
Proc1TurboCoreNum	Number of Turbo Boost Enabled Cores for Processor 1		<ul style="list-style-type: none"> • All • 1 • 2 • 4 • 6 • 8 • 10 • 12 • 14 • 16 • 18

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
Proc2TurboCoreNum	Number of Turbo Boost Enabled Cores for Processor 2		<ul style="list-style-type: none"> • All • 1 • 2 • 4 • 6 • 8 • 10 • 12 • 14 • 16 • 18
Proc3TurboCoreNum	Number of Turbo Boost Enabled Cores for Processor 3		<ul style="list-style-type: none"> • All • 1 • 2 • 4 • 6 • 8 • 10 • 12 • 14 • 16 • 18

7.1.5.7. Integrated Devices

This section describes the attributes for Integrated Devices configuration.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “IntegratedDevices”.
- GroupDisplayName property shall be “Integrated Devices”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under thInternalSdCardPrimaryCarde PossibleValues header is an element of an array.

Table 21. DCIM_BIOSEnumeration Integrated Devices

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
IntegratedRaid	Integrated RAID Controller	FALSE	<ul style="list-style-type: none"> • Disabled • Enabled
UsbPorts	User Accessible USB Ports	FALSE	<ul style="list-style-type: none"> • AllOn • OnlyBackPortsOn • AllOff
InternalUsb1	Internal USB Port 1	FALSE	<ul style="list-style-type: none"> • On • Off
InternalUsb2	Internal USB Port 2	FALSE	<ul style="list-style-type: none"> • On • Off
InternalUsb	Internal USB Port	FALSE	<ul style="list-style-type: none"> • On • Off
OsWatchdogTimer	OS Watchdog Timer	FALSE	<ul style="list-style-type: none"> • Disabled • Enabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
EmbVideo	Embedded Video Controller	Feature Dependant ¹	<ul style="list-style-type: none"> Disabled Enabled
SriovGlobalEnable ²	SR-IOV Global Enable	FALSE ²	<ul style="list-style-type: none"> Disabled Enabled
IntegratedSas	Integrated SAS Controller	FALSE	<ul style="list-style-type: none"> Enabled Disabled
InternalSdCard	Internal SD Card Port	Feature Dependant ³	<ul style="list-style-type: none"> On Off
InternalSdCardRedundancy	Internal SD Card Redundancy	Attribute Value Dependant ³	<ul style="list-style-type: none"> Mirror Disabled
EmbNic1Nic2	Embedded NIC1 and NIC2	FALSE	<ul style="list-style-type: none"> Enabled DisabledOs Disabled
EmbNic1	Embedded Gb NIC1	FALSE	<ul style="list-style-type: none"> Enabled EnabledPxe EnablediScsi Disabled
EmbNic2	Embedded Gb NIC2	FALSE	<ul style="list-style-type: none"> Enabled EnabledPxe EnablediScsi Disabled
EmbNic3Nic4	Embedded NIC3 and NIC4	FALSE	<ul style="list-style-type: none"> Enabled DisabledOs Disabled
EmbNic3	Embedded Gb NIC3	FALSE	<ul style="list-style-type: none"> Enabled EnabledPxe EnablediScsi Disabled
EmbNic4	Embedded Gb NIC4	FALSE	<ul style="list-style-type: none"> Enabled EnabledPxe EnablediScsi Disabled
IntegratedNetwork1	Integrated Network 1	FALSE	<ul style="list-style-type: none"> DisabledOs Enabled
IntegratedNetwork2	Integrated Network 2	FALSE	<ul style="list-style-type: none"> DisabledOs Enabled
InternalSdCardPrimaryCard	Internal SD Primary Card		<ul style="list-style-type: none"> SD Card 1 SD Card 2
I/OatEngine	I/OAT DMA Engine		<ul style="list-style-type: none"> Enabled Disabled
MmioAbove4Gb	Memory Mapped I/O above 4GB		<ul style="list-style-type: none"> Enabled Disabled
Usb3Setting	USB 3.0 Settings		<ul style="list-style-type: none"> Auto Enabled Disabled

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 22. DCIM_BIOSString Integrated Devices

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
CurrentEmbVideoState	Current State of Embedded Video Controller	TRUE	0	9

Note: 1 – The attribute's read-only status (IsReadOnly property value) depends on the particular platform model, or platform features, or the platform's bios version.

Note: 2 – Single Root I/O Virtualization.

Note: 3 – The InternalSdCardRedundancy is read-only (IsReadOnly=TRUE) and shall have value "Disabled", if the InternalSdCard attribute is set to "Disabled".

7.1.5.8. System Security

This section describes the attributes for System Security configuration.

For the DCIM_BIOSEnumeration, DCIM_BIOSPassword, and DCIM_BIOSInteger:

- GroupID property shall be "SysSecurity".
- GroupDisplayName property shall be "System Security".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 23. DCIM_BIOSEnumeration System Security

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
IntelTxtResetAux ¹	Intel TXT Reset Aux	TRUE	<ul style="list-style-type: none"> • NoResetAuxReq • ResetAuxReq • ResetAuxPreqAttempted
IntelTxt	Intel(R) TXT	TRUE	<ul style="list-style-type: none"> • On • Off
PasswordStatus	Password Status	FALSE	<ul style="list-style-type: none"> • Unlocked • Locked
TpmSecurity	TPM Security	FALSE	<ul style="list-style-type: none"> • Off • OnPbm • OnNoPbm
TpmActivation	TPM Activation	TRUE	<ul style="list-style-type: none"> • NoChange • Activate • Deactivate
TpmClear	TCM Clear	TRUE	<ul style="list-style-type: none"> • Yes • No
TcmSecurity	TCM Security	FALSE	<ul style="list-style-type: none"> • Off • OnPbm • OnNoPbm
TcmActivation	TCM Activation	Attribute Value Dependant ^{2,3}	<ul style="list-style-type: none"> • NoChange • Activate • Deactivate
TcmClear	TPM Clear	Attribute Value Dependant ^{2,4}	<ul style="list-style-type: none"> • Yes • No
PwrButton	Power Button	FALSE	<ul style="list-style-type: none"> • Disabled • Enabled
NmiButton	NMI Button	Attribute Value Dependant ^{5,6}	<ul style="list-style-type: none"> • Disabled • Enabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
AcPwrRcvry	AC Power Recovery	Attribute Value Dependant ^{5,7}	<ul style="list-style-type: none"> • Last • On • Off
AcPwrRcvryDelay	AC Power Recovery Delay	FALSE	<ul style="list-style-type: none"> • Immediate • Random • User
SignedFirmwareUpdate	Signed BIOS Update		<ul style="list-style-type: none"> • Enabled • Disabled
TpmCommand	TPM Command	TRUE	<ul style="list-style-type: none"> • None, • Activate • Deactivate • Clear
UefiVariableAccess	UEFI Variable Access		<ul style="list-style-type: none"> • Standard • Controlled
BiosUpdateControl	BIOS Update Control		<ul style="list-style-type: none"> • Unlocked • Limited • Locked
SecureBoot	Secure Boot	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
SecureBootPolicy	Secure Boot Policy	FALSE	<ul style="list-style-type: none"> • Standard, • Custom
SecureBootMode	Secure Boot Mode	FALSE	<ul style="list-style-type: none"> • SetupMode • UserMode • AuditMode • DeployedMode

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 24. DCIM_BIOSString System Security

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
TpmInfo	TPM Information		0	50
SysPassword	System Password			
SHA256SystemPassword	SHA256 hash of the System password	TRUE	64	64
SHA256SystemPasswordSalt	Salt string appended to the System password prior to hash	TRUE	32	32
SetupPassword	Setup Password			
SHA256SetupPassword	SHA256 hash of the Setup password	TRUE	64	64
SHA256SetupPasswordSalt	Salt string appended to the Setup password prior to hash	TRUE	32	32
TpmStatus	TPM Status	TRUE	0	24
AesNi	Intel(R) AES-NI	TRUE	0	8
NewSetupPassword	New Setup Password			
OldSetupPassword	Old Setup Password			
OldSysPassword	Old System Password			

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
NewSysPassword	New System Password			

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 25. DCIM_BIOSInteger System Security

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
AcPwrRcvryUserDelay	User Defined Delay	TRUE	60	240

Note: 1 – Intel© Trusted Execution Technology.

Note: 2 – The TpmActivation, TpmClear attributes are settable (IsReadOnly=FALSE), if the TpmSecurity attribute is NOT set to “Off”; otherwise those attributes are read-only (IsReadOnly=TRUE).

Note: 3 – The TpmActivation shall have value “NoChange”, if TpmSecurity is set to “Off”.

Note: 4 – The TpmClear shall have value “No”, if TpmSecurity is set to “Off”.

Note: 5 – The TcmActivation, TcmClear attributes are settable (IsReadOnly=FALSE), if the SysProfile attribute is set to “Custom”; otherwise those attributes are read-only (IsReadOnly=TRUE).

Note: 6 – The TcmActivation shall have value “NoChange”, if TcmSecurity is set to “Off”.

Note: 7 – The TcmClear shall have value “No”, if TcmSecurity is set to “Off”.

The following table describes the values for the DCIM_BIOSPassword of this group. The column headers represent the properties of the DCIM_BIOSPassword class. Each of the cells represent the values of the properties.

Table 26. DCIM_BIOSPassword System Security

AttributeName	AttributeDisplayName	IsReadOnly	MinLength	MaxLength
SysPassword	System Password	TRUE (but may be changed through the DCIM_BIOSService.ChangePassword() method.	0	32
SetupPassword	Setup Password	TRUE (but may be changed through the DCIM_BIOSService.ChangePassword() method.	0	32

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 27. DCIM_BIOSInteger System Security

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
AcPwrRcvryUserDelay	User Defined Delay (30s to 240s)	TRUE	30	240

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of DCIM_BIOSString class. Each of the cells represent the vlues of the properties.

Table 28. DCIM_BIOSString System Security

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
AesNi	Intel(R) AES-NI	TRUE	0	8
SHA256SystemPassword	SHA256 hash of the System password	TRUE	64	64

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
SHA256SystemPasswordSalt	Salt string appended to the System password prior to hash	TRUE	32	32
SHA256SetupPassword	SHA256 hash of the Setup password	TRUE	64	64
SHA256SetupPasswordSalt	Salt string appended to the Setup password prior to hash	TRUE	32	32
TpmInfo	TPM Information	TRUE	0	50
TpmStatus	TPM Status	TRUE	0	24

Note 1: If the SHA256SystemPassword, SHA256SystemPasswordSalt, SHA256SetupPassword, SHA256SetupPasswordSalt variables are not set then these will have null value.

Note 2: The SHA256SystemPasswordSalt, SHA256SetupPasswordSalt strings are optional when generating the hash.

Note 3: If the salt string is used then it should be set along with corresponding SHA256 password.

Note 4: The plain text password (system & setup) can't be set at the same time as the salt.

7.1.5.9. Memory Settings

This section describes the attributes for Memory Settings configuration.

For the DCIM_BIOSEnumeration and DCIM_BIOSString:

- GroupID property shall be "MemSettings".
- GroupDisplayName property shall be "Memory Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 29. DCIM_BIOSEnumeration Memory Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
MemTest	System Memory Testing	FALSE	<ul style="list-style-type: none"> • Disabled • Enabled
MemOptimizer	Memory Optimizer Technology	Feature Dependant1	<ul style="list-style-type: none"> • Disabled • Enabled
MemOpMode	Memory Operating Mode	TRUE	<ul style="list-style-type: none"> • OptimizerMode • AdvEccMode • SpareMode • MirrorMode
RedundantMem	Redundant Memory	TRUE	<ul style="list-style-type: none"> • Disabled • Mirror • IntraNodeMirror • DimmSpare • Dddc
SnoopFilter	Snoop Filter	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
NodeInterleave	Node Interleaving	Feature Dependant1	<ul style="list-style-type: none"> • Disabled • Enabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
MemLowPower	Low Power Mode	TRUE	<ul style="list-style-type: none"> Disabled Enabled
MemOpVoltage	Memory Operating Voltage	TRUE	<ul style="list-style-type: none"> AutoVolt Volt15V
RedundantMemInUse	Redundant Memory Configuration In Use	TRUE	<ul style="list-style-type: none"> NotInUse InUse
RedundantMemCfgValid	Redundant Memory Configuration Valid	TURE	<ul style="list-style-type: none"> Invalid Valid
SnoopMode	Snoop Mode	FALSE	<ul style="list-style-type: none"> Disabled HomeSnoop EarlySnoop ClusterOnDie
ClusterOnDie	Cluster On Die		<ul style="list-style-type: none"> Enabled Disabled
CorrEccSmi	Correctable Memory ECC SMI	FALSE	<ul style="list-style-type: none"> Enabled Disabled

Note: 1 – The attribute's read-only status (IsReadOnly property value) depends on the particular platform model, or platform features, or the platform's bios version.

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 30. DCIM_BIOSString Memory Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
SysMemSize	System Memory Size	TRUE	0	20
SysMemType	System Memory Type	TRUE	0	16
SysMemSpeed	System Memory Speed	TRUE	0	16
SysMemVolt	System Memory Voltage	TRUE	0	8
VideoMem	Video Memory	TRUE	0	16

7.1.5.10. Miscellaneous Settings

This section describes the attributes for miscellaneous settings configuration.

For the DCIM_BIOSEnumeration and DCIM_BIOSString:

- GroupID property shall be "MiscSettings".
- GroupDisplayName property shall be "Miscellaneous Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 31. DCIM_BIOSEnumeration Miscellaneous Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
NumLock	Keyboard NumLock	FALSE	"On", "Off"
ReportKbdErr	Report Keyboard Errors	FALSE	"Report", "NoReport"
ErrPrompt	F1/F2 Prompt on Error	FALSE	"Disabled", "Enabled"

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
SystemUefiShell	System UEFI Shell	FALSE	"Disabled", "Enabled"
ForceInt10	Load Legacy Video Option ROM	FALSE	"Disabled", "Enabled"
InSystemCharacterization	In-System Characterization	FALSE	"Disabled", "Enabled"

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties..

Table 32. DCIM_BIOSString Miscellaneous Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
AssetTag	Asset Tag	FALSE	0	64

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties..

Table 33. DCIM_BIOSInteger Miscellaneous Settings

AttributeName	Attribute Description	IsReadOnly	LowerBound	UpperBound
SysMgmtNVByte1	System Management NVRAM Byte 1			
SysMgmtNVByte2	System Management NVRAM Byte 2			

7.1.5.11. System Information

This section describes the attributes for System Information.

For the DCIM_BIOSString:

GroupID property shall be "SysInformation".

GroupDisplayName property shall be "System Information".

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 34. DCIM_BIOSString System Information

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
SystemModelName	System Model Name	TRUE	0	40
SystemBiosVersion	System BIOS Version	TRUE	0	48
SystemServiceTag	System Service Tag	TRUE	0	7
SystemManufacturer	System Manufacturer	TRUE	0	32
SysMfrContactInfo	System Manufacturer Contact Information	TRUE	0	32
SystemMeVersion	System Management Engine Version		0	48
SystemCpldVersion	System CPLD Version	TRUE	0	8
UefiComplianceVersion	UEFI Compliance Version	TRUE	0	14

7.1.5.12. BIOS Boot Settings

This section describes the attributes for BIOS Boot Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "BIOSBootSettings".
- GroupDisplayName property shall be "BIOS Boot Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 35. DCIM_BIOSEnumeration BIOS Boot Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
BiosBootSeq	Boot Sequence	FALSE	
BootSeq	Boot Sequence	FALSE	
HddSeq	Hard-Disk Drive Sequence		

7.1.5.13. Debug Menu

This section describes the attributes for Debug Menu.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “DebugMenuSetting”.
- GroupDisplayName property shall be “Debug Menu”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 36. DCIM_BIOSEnumeration Debug Menu

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
BugChecking	Check for software bugs	FALSE	<ul style="list-style-type: none"> • Auto • Enabled • Disabled
RebootTestMode	Reboot Test Mode	FALSE	<ul style="list-style-type: none"> • RebootTestModeOff • RebootTestModeCold • RebootTestModePowerCycle
RebootTestPoint	Reboot Test Point	TRUE	<ul style="list-style-type: none"> • RebootTestPointMemInit • RebootTestPointPciInit
EmbSataTestMode	Embedded Sata Test Mode	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
SccDebugEnabled	Spread Spectrum	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
EmbSataRSTeDebug	Embedded Sata RSTe Debug	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
ClpOutput	CLP String Output during POST	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
MRCSerialDbgOut	MRC Serial Debug Output	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
Dfx	DFx Margining	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
TXEQWA	TXEQ PCIe Workaround	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
DeviceUnhide	Misc. Device Unhide	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled
MemoryRmt	Memory RMT	FALSE	<ul style="list-style-type: none"> • Enabled • Disabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
MemoryMultiThread	Memory Multi Thread	FALSE	<ul style="list-style-type: none"> Enabled Disabled
MemoryFastBootCold	Memory Fast Boot Cold	FALSE	<ul style="list-style-type: none"> Enabled Disabled
MemoryPerBitMargin	Memory Per Bit Margin	FALSE	<ul style="list-style-type: none"> Enabled Disabled
IdracDebugMode	iDRAC IPMI SMA Debug Mode	FALSE	<ul style="list-style-type: none"> Enabled Disabled

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 37. DCIM_BIOSString Debug Menu

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
DebugErrorLevel	Debug Print Level (80000042 recommended)	FALSE	0	8

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 38. DCIM_BIOSInteger Debug Menu

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
RebootTestCount	Reboot Test Count	TRUE	0	65535

7.1.5.14. Embedded Server Management

This section describes the attributes for Embedded Server Management.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “EmbServerMgmt”.
- GroupDisplayName property shall be “Embedded Server Management”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 39. DCIM_BIOSEnumeration Embedded Server Management

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
FrontLcd	Front-Panel LCD Options	FALSE	<ul style="list-style-type: none"> None UserDefined ModelNum Advanced

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 40. DCIM_BIOSString Embedded Server Management

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
UserLcdStr	User-Defined LCD String			

7.1.5.15. iSCSI Device1 Connection1 Settings

This section describes the attributes for iSCSI Device1 Connection1 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "IscsiDevice1Connection1Settings".
- GroupDisplayName property shall be "iSCSI Device1 Connection1 Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 41. DCIM_BIOSEnumeration iSCSI Device1 Connection1 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
IscsiDev1con1Auth	Authentication Type		<ul style="list-style-type: none"> • None • Chap
IscsiDev1Con1ChapType	CHAP Type		<ul style="list-style-type: none"> • OneWay • Mutual
IscsiDev1Con1DhcpEnDis	DHCP		<ul style="list-style-type: none"> • Enabled • Disabled
IscsiDev1Con1Interface	Interface		
IscsiDev1Con1Protocol	Protocol		<ul style="list-style-type: none"> • IPv4 • IPv6
IscsiDev1Con1TgtDhcpEnDis	Target Info via DHCP		<ul style="list-style-type: none"> • Enabled;Disabled
IscsiDev1Con1VlanEnDis	VLAN		<ul style="list-style-type: none"> • Enabled;Disabled

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 42. DCIM_BIOSString iSCSI Device1 Connection1 Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
IscsiDev1Con1ChapName	Chap Name			
IscsiDev1Con1ChapSecret	Chap Secret			
IscsiDev1Con1Gateway	Initiator Gateway			
IscsiDev1Con1Ip	Initiator IP Address			
IscsiDev1con1Mask	Initiator Subnet Mask			
IscsiDev1Con1RevChapName	Reverse Chap Name			
IscsiDev1Con1RevChapSecret	Reverse Chap Secret			
IscsiDev1Con1TargetIp	Target IP Address			
IscsiDev1Con1TargetName	Target Name			

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 43. DCIM_BIOSInteger iSCSI Device1 Connection1 Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
IscsiDev1Con1Lun	Target Boot LUN			
IscsiDev1Con1Port	Target Port			
IscsiDev1Con1Retry	Retry Count			
IscsiDev1Con1Timeout	Timeout			
IscsiDev1Con1VlanId	VLAN ID			

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
IscsiDev1Con1VlanPriority	VLAN Priority			

7.1.5.16. iSCSI Device1 Connection2 Settings

This section describes the attributes for iSCSI Device1 Connection2 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "IscsiDevice1Connection2Settings".
- GroupDisplayName property shall be "iSCSI Device1 Connection2 Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 44. DCIM_BIOSEnumeration iSCSI Device1 Connection2 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
IscsiDev1con2Auth	Authentication Type		<ul style="list-style-type: none"> • None • Chap
IscsiDev1Con2ChapType	CHAP Type		<ul style="list-style-type: none"> • OneWay • Mutual
IscsiDev1Con2DhcpEnDis	DHCP		<ul style="list-style-type: none"> • Enabled • Disabled
IscsiDev1Con2Interface	Interface		
IscsiDev1Con2Protocol	Protocol		<ul style="list-style-type: none"> • IPv4 • IPv7
IscsiDev1Con2TgtDhcpEnDis	Target Info via DHCP		<ul style="list-style-type: none"> • Enabled • Disabled
IscsiDev1Con2VlanEnDis	VLAN		<ul style="list-style-type: none"> • Enabled • Disabled

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 45. DCIM_BIOSString iSCSI Device1 Connection2 Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
IscsiDev1Con2ChapName	Chap Name			
IscsiDev1Con2ChapSecret	Chap Secret			
IscsiDev1Con2Gateway	Initiator Gateway			
IscsiDev1Con2Ip	Initiator IP Address			
IscsiDev1con2Mask	Initiator Subnet Mask			
IscsiDev1Con2RevChapName	Reverse Chap Name			
IscsiDev1Con2RevChapSecret	Reverse Chap Secret			
IscsiDev1Con2TargetIp	Target IP Address			
IscsiDev1Con2TargetName	Target Name			

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 46. DCIM_BIOSInteger iSCSI Device1 Connection2 Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
IscsiDev1Con2Lun	Target Boot LUN			
IscsiDev1Con2Port	Target Port			
IscsiDev1Con2Retry	Retry Count			
IscsiDev1Con2Timeout	Timeout			
IscsiDev1Con2VlanId	VLAN ID			
IscsiDev1Con2VlanPriority	VLAN Priority			

7.1.5.17. iSCSI Device1 Settings

This section describes the attributes for iSCSI Device1 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "IscsiDevice1Settings".
- GroupDisplayName property shall be "iSCSI Device1 Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 47. DCIM_BIOSEnumeration iSCSI Device1 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
IscsiDev1Con1EnDis	Connection 1		<ul style="list-style-type: none"> • Enabled • Disabled
IscsiDev1Con2EnDis	Connection 2		<ul style="list-style-type: none"> • Enabled • Disabled
IscsiDev1ConOrder	Connection Order		

7.1.5.18. Network Settings

This section describes the attributes for Network Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "NetworkSettings".
- GroupDisplayName property shall be "Network Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 48. DCIM_BIOSEnumeration Network Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
IscsiDev1EnDis	iSCSI Device1		<ul style="list-style-type: none"> • Enabled • Disabled
PxeDev1EnDis	PXE Device 1		<ul style="list-style-type: none"> • Enabled • Disabled
PxeDev2EnDis	PXE Device 2		<ul style="list-style-type: none"> • Enabled • Disabled
PxeDev3EnDis	PXE Device 3		<ul style="list-style-type: none"> • Enabled • Disabled

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
PxeDev4EnDis	PXE Device 4		<ul style="list-style-type: none"> Enabled Disabled

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 49. DCIM_BIOSString Network Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
IsCsiInitiatorName	ISCSI Initiator Name			

7.1.5.19. One-Time Boot

This section describes the attributes for One-Time Boot.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "OneTimeBoot".
- GroupDisplayName property shall be "One-Time Boot".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 50. DCIM_BIOSEnumeration One-Time Boot

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
OneTimeBootMode	One-Time Boot Device List	FALSE	<ul style="list-style-type: none"> Disabled OneTimeBootSeq OneTimeHddSeq OneTimeUefiBootSeq OneTimeCustomBootSeqStr OneTimeCustomHddSeqStr OneTimeCustomUefiBootSeqStr
OneTimeBootSeqDev	BIOS Boot Sequence Device	TRUE	<ul style="list-style-type: none"> HardDisk.List.1-1 Unknown.Unknown.2-1 Unknown.Unknown.3-1
OneTimeHddSeqDev	BIOS Hard-Disk Drive Sequence Device	TRUE	<ul style="list-style-type: none"> Disk.SATAEmbedded.A-1
OneTimeUefiBootSeqDev	UEFI Boot Sequence Device		
OneTimeBootModeSeq	One-Time Boot Device List		
OneTimeHddSeq	BIOS Hard-Disk Drive Sequence Device		
OneTimeUefiBootSeq	UEFI Boot Sequence Device		
OneTimeBiosBootSeq	BIOS Boot Sequence Device		

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 51. DCIM_BIOSString One-Time Boot

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
OneTimeCustomBootStr	Custom Boot String			

7.1.5.20. Power Management

This section describes the attributes for Power Management.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “PowerMgmtSettings”.
- GroupDisplayName property shall be “Power Management”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 52. DCIM_BIOSEnumeration Power Management

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
WorkloadProfile	Workload Profile		<ul style="list-style-type: none">• NotAvailable• WorkloadProfile1• WorkloadProfile2
PowerMgmt	Power Management		<ul style="list-style-type: none">• OsCtrl• ActivePwrCtrl• Custom;MaxPerf
FanPwrPerf	Fan Power and Performance Management		<ul style="list-style-type: none">• MaxPerf• MinPwr
MemPwrPerf	Memory Power and Performance Management		<ul style="list-style-type: none">• MaxPerf• 1333Mhz• 1067Mhz• 978Mhz• 800Mhz• MinPwr
MemDynamicPwr	Dynamic Memory Power Management		<ul style="list-style-type: none">• Enabled• Disabled

7.1.5.21. Proxy Attributes

This section describes the attributes for Proxy Attributes.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “ProxyAttributes”.
- GroupDisplayName property shall be “Proxy Attributes”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 53. DCIM_BIOSEnumeration Proxy Attributes

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
EmbNicPort1BootProto	Embedded NIC Port 1 Boot Protocol		<ul style="list-style-type: none">• Unknown• None• Pxe• Iscsi
EmbNicPort2BootProto	Embedded NIC Port 2 Boot Protocol		<ul style="list-style-type: none">• Unknown• None• Pxe• Iscsi

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
EmbNicPort3BootProto	Embedded NIC Port 3 Boot Protocol		<ul style="list-style-type: none"> Unknown None Pxe Iscsi
EmbNicPort4BootProto	Embedded NIC Port 4 Boot Protocol		<ul style="list-style-type: none"> Unknown None Pxe Iscsi
IntNic1Port1BootProto	Integrated Network Card 1 Port 1 Boot Protocol		<ul style="list-style-type: none"> Unknown None Pxe Iscsi
IntNic1Port2BootProto	Integrated Network Card 1 Port 2 Boot Protocol		<ul style="list-style-type: none"> Unknown None Pxe Iscsi
IntNic1Port3BootProto	Integrated Network Card 1 Port 3 Boot Protocol		<ul style="list-style-type: none"> Unknown None Pxe Iscsi
IntNic1Port4BootProto	Integrated Network Card 1 Port 4 Boot Protocol		<ul style="list-style-type: none"> Unknown None Pxe Iscsi

7.1.5.22. PXE Device1 Settings

This section describes the attributes for PXE Device1 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "PxeDevice1Settings".
- GroupDisplayName property shall be "PXE Device1 Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 54. DCIM_BIOSEnumeration PXE Device1 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
PxeDev1Interface	Interface		
PxeDev1Protocol	Protocol		IPv4;IPv6
PxeDev1VlanEnDis	VLAN		Enabled;Disabled

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 55. DCIM_BIOSInteger PXE Device1 Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
PxeDev1VlanId	VLAN ID			

7.1.5.23. PXE Device2 Settings

This section describes the attributes for PXE Device2 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "PxeDevice2Settings".
- GroupDisplayName property shall be "PXE Device2 Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 56. DCIM_BIOSEnumeration PXE Device2 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
PxeDev2Interface	Interface		
PxeDev2Protocol	Protocol		IPv4;IPv6
PxeDev2VlanEnDis	VLAN		Enabled;Disabled

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 57. DCIM_BIOSInteger PXE Device2 Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
PxeDev2VlanId	VLAN ID			
PxeDev2VlanPriority	VLAN Priority			

7.1.5.24. PXE Device3 Settings

This section describes the attributes for PXE Device3 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be "PxeDevice3Settings".
- GroupDisplayName property shall be "PXE Device3 Settings".

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 58. DCIM_BIOSEnumeration PXE Device3 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
PxeDev3Interface	Interface		
PxeDev3Protocol	Protocol		IPv4;IPv6
PxeDev3VlanEnDis	VLAN		Enabled;Disabled

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 59. DCIM_BIOSInteger PXE Device3 Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
PxeDev3VlanId	VLAN ID			
PxeDev3VlanPriority	VLAN Priority			

7.1.5.25. PXE Device4 Settings

This section describes the attributes for PXE Device4 Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “PxeDevice4Settings”.
- GroupDisplayName property shall be “PXE Device4 Settings”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 60. DCIM_BIOSEnumeration PXE Device4 Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
PxeDev4Interface	Interface		
PxeDev4Protocol	Protocol		IPv4;IPv6
PxeDev4VlanEnDis	VLAN		Enabled;Disabled

The following table describes the values for the DCIM_BIOSInteger of this group. The column headers represent the properties of the DCIM_BIOSInteger class. Each of the cells represent the values of the properties.

Table 61. DCIM_BIOSInteger PXE Device4 Settings

AttributeName	AttributeDisplayName	IsReadOnly	LowerBound	UpperBound
PxeDev4VlanId	VLAN ID			
PxeDev4VlanPriority	VLAN Priority			

7.1.5.26. UEFI Boot Settings

This section describes the attributes for UEFI Boot Settings.

For the DCIM_BIOSEnumeration:

- GroupID property shall be “UefiBootSettings”.
- GroupDisplayName property shall be “UEFI Boot Settings”.

The following table describes the values for the DCIM_BIOSEnumeration of this group. The column headers represent the properties of the DCIM_BIOSEnumeration class. Each of the cells represent the values of the properties. Each of the listed values under the PossibleValues header is an element of an array.

Table 62. DCIM_BIOSEnumeration UEFI Boot Settings

AttributeName	AttributeDisplayName	IsReadOnly	PossibleValues
UefiBootSeq	UEFI Boot Sequence		N/A
UefiPxelpVersion	UEFI PXE boot protocol		<ul style="list-style-type: none">• IPv4• IPv6

The following table describes the values for the DCIM_BIOSString of this group. The column headers represent the properties of the DCIM_BIOSString class. Each of the cells represent the values of the properties.

Table 63. DCIM_BIOSString UEFI Boot Settings

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
SetBootOrderFqdd1<x>, where 'x' is 1 to 16	Set Boot Order Fqdd<x>, where 'x' is 1 to 16	FALSE	0	255

AttributeName	Attribute Description	IsReadOnly	MinLength	MaxLength
SetLegacyHddOrderFqdd<x>, where 'x' is 1 to 16	Set Legacy Hdd Order Fqdd<x>, where 'x' is 1 to 16	FALSE	0	100
SetBootOrder<x>, where 'x' is 1 to 16	Set Boot Order<x>, where 'x' is 1 to 16	FALSE	0	256

7.2. Boot Management

Each of DCIM_BootConfigSetting instances shall represent a boot list, and each boot list can be enabled to be used in the next boot using the algorithm in “Boot State Enablement” column. The following boot lists shall be implemented:

Table 64. Boot Lists

Boot Lists	DCIM_BootConfigSetting.InstanceID	Boot State Enablement	Description
IPL/BIOS	IPL	SetAttribute() or SetAttributes() method with AttributeName “BootMode” and AttributeValue “Bios”	IPL, that is defined in the BIOS Boot Specification, lists the traditional BIOS boot sources.
BCV	BCV	SetAttribute() or SetAttributes() method with AttributeName “BootMode” and AttributeValue “Bios”	BCV, that is defined in the BIOS Boot Specification, usually lists the storage controllers for booting from a particular hard drive. Note: BCV is nested within the IPL. Selecting “Hard drive C” in IPL, selects the BCV list for booting. Note: The BCV list corresponds to an IPL boot device represented with DCIM_BootSourceSetting.InstanceID property value “IPL:HardDisk”.
UEFI	UEFI	SetAttribute() or SetAttributes() method with AttributeName “BootMode” and AttributeValue “Uefi”	List of UEFI devices for boot.
vFlash Partition	vFlash	ChangeBootOrderByInstanceID() on DCIM_BootConfigSetting with InstanceID “OneTime” and source[] containing a single vFlash DCIM_BootSourSetting InstanceID	vFlash partitions to boot from.
One Time Boot	OneTime	ChangeBootOrderByInstanceID() on DCIM_BootConfigSetting with InstanceID “OneTime” and source[] containing a single DCIM_BootSourSetting InstanceID from any boot list.	One time boot list contains a single boot device selected for one time boot. After the reboot, the boot list reverts to the original boot list.

DCIM_BootConfigSetting shall represent a collection of DCIM_BootSourceSetting instances; where the DCIM_BootSourceSetting.InstanceID substring that prefixes the first colon shall match the DCIM_BootConfigSetting.InstanceID value. For more information, see Figure 2.

For example, DCIM_BootSourceSetting.InstanceID with value of “**vFlash**:LABEL1:1” belongs to DCIM_BootConfigSetting boot list with InstanceID “**vFlash**”.

All the boot devices within the list may be sorted using the `ChangeBootOrderByInstanceID()` method (section 8.7) and may be enabled or disabled using the `ChangeBootSourceState()` method (see section 8.6).

The state of the boot list for the next boot shall be changed through the `DCIM_BIOSEnumeration` with AttributeName “BootMode” (section 7.1.5.3) or through execution of `ChangeBootOrderByInstanceID()` method on the `DCIM_BootConfigSetting` instance with InstanceID “OneTime” with the source[] parameter having a single `DCIM_BootSourceSetting` InstanceID from any of the lists including vFlash.

Each boot list contains boot devices that shall be represented by `DCIM_BootSourceSetting`.

7.2.1. DCIM_BootConfigSetting

This section describes the implementation for the `DCIM_BootConfigSetting` class that represents a particular boot list.

This class shall be instantiated in the Implementation Namespace.

7.2.1.1. Resource URIs for WinRM®

The class Resource URI shall be “`http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BootConfigSetting?__cimnamespace=root/dcim`”

The key property shall be the InstanceID.

The instance Resource URI for `DCIM_BootConfigSetting` instance shall be:

“`http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BootConfigSetting?__cimnamespace=root/dcim+InstanceID=<a value from Table 64 DCIM_BootConfigSetting.InstanceID column>`”

7.2.1.2. Operations

The following table details the implemented operations on `DCIM_BootConfigSetting`.

Table 65. `DCIM_BootConfigSetting` – Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
Invoke	Mandatory	Instance URI
<code>DCIM_BIOSService.SetAttribute()</code>	Mandatory	See section 8.1 with AttributeName = “BootMode”
<code>DCIM_BIOSService.SetAttributes()</code>	Mandatory	See section 8.2 with AttributeName = “BootMode”

7.2.1.3. Properties

The table lists the properties implemented for `DCIM_BootConfigSetting`. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 66. Class: `DCIM_BootConfigSetting`

Properties	Type	Requirement	Additional Requirements
InstanceID	string	Mandatory	The property value shall be from Table 64 “ <code>DCIM_BootConfigSetting.InstanceID</code> ” column.
ElementName	string	Mandatory	
IsCurrent	uint8	Mandatory	Values of: <ul style="list-style-type: none"> • 1 = Is Current (Is the current boot configuration), • 2 = Is Not Current (Is not the current boot configuration)

Properties	Type	Requirement	Additional Requirements
IsDefault	uint8	Mandatory	The property shall have Is Not Default (is not the default boot configuration). No default boot configurations are supported.
IsNext	uint8	Mandatory	Values of: <ul style="list-style-type: none"> • 1 = Is Next (is the next boot configuration the system will use for booting) • 2 = Is Not Next (is not the next boot configuration the system will use for booting) • 3= Is Next For Single Use (is the next boot configuration the system will use for booting for single use, one time boot only)

The DCIM_BootConfigSetting.IsCurrent, IsNext and IsDefault properties shall represent the current state of the boot list.

- The IsNext property set to 1(Is Next) shall represents that the boot list is configured to be used for the next boot. vFlash boot list shall not have this value.
- The IsNext property set to 3(Is Next for Single Use) shall represent that the boot list is configured to be used ONLY for the next boot. Only the OneTime boot list may have this value for the IsNext property.

7.2.2. DCIM_BootSourceSetting

This section describes the implementation for the DCIM_BootSourceSetting class that represents a boot device.

This class shall be instantiated in the Implementation Namespace.

7.2.2.1. Resource URIs for WinRM®

The class Resource URI shall be “http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BootSourceSetting?__cimnamespace=root/dcim”

The key property shall be the InstanceID.

The instance Resource URI for DCIM_BootSourceSetting instance shall be:

“http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BootSourceSetting?__cimnamespace=root/dcim+InstanceID=<InstanceID see Table 68>”

7.2.2.2. Operations

The following table lists the operations implemented on DCIM_BootSourceSetting.

Table 67. DCIM_BootSourceSetting – Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
DCIM_BootConfigSetting. ChangeBootSourceState()	Mandatory	See section 8.6.
DCIM_BootConfigSetting. ChangeBootOrderByInstanceID	Mandatory	See section 8.7.

7.2.2.3. Properties

The following table lists the properties implemented for DCIM_BootSourceSetting. The table lists the properties implemented for DCIM_BootSourceSetting. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 68. Class: DCIM_BootSourceSetting

Properties	Type	Requirement	Additional Requirements
InstanceID	string	Mandatory	<p>The property value shall have prefix from Table 64 “DCIM_BootConfigSetting.InstanceID” column followed by a unique ID representing the boot source.</p> <p>For example:</p> <p>UEFI:Disk.USBFront.2-1:3156051d1529b8f4f88c99f54b895350 (boot source belongs to UEFI bootlist)</p> <p>IPL:NIC.Slot.4-2:d0f2c6c736adb8c2238153293a0c026c (boot source belongs to IPL bootlist)</p> <p>BCV:RAID.Integrated.1-1:b84a10539d2ccaca5e86b7de3cae08a8 (boot source belongs to BCV bootlist)</p>
BIOSBootString	string	Mandatory	The property shall represent the boot source name
BootString	string	Mandatory	The property shall represent the boot source name
BootSourceType	string	Mandatory	The property shall represent the boot configuration that the boot source belongs to, and shall match the values in Table 64 “DCIM_BootConfigSetting.InstanceID” column.
PendingAssignedSequence	uint8	Mandatory	The property value shall be set through the successful execution of the ChangeBootOrderByInstanceID() method, and shall indicate the pending assigned sequence of the boot source.
CurrentAssignedSequence	uint8	Mandatory	The property shall represent the boot order in the zero-based indexed boot sequence.
PendingEnabledStatus	uint8	Mandatory	<p>The property value shall be set through the successful execution of the ChangeBootSourceState () method, and shall indicate the pending enabled status of the boot source. The property shall have one of the following values:</p> <ul style="list-style-type: none"> • 0 = Disabled • 1 = Enabled
CurrentEnabledStatus		Mandatory	<p>The property shall represent the current status of the boot source. If the property value is 0 (Disabled), the boot source shall not be used during boot. The property shall have one of the following values:</p> <ul style="list-style-type: none"> • 0 = Disabled • 1 = Enabled
ElementName		Mandatory	
FailThroughSupported		Mandatory	<p>The property shall indicate the behavior of the boot source failure. The property shall have one of the following values:</p> <ul style="list-style-type: none"> • 0 = Unknown • 1 = Is Supported indicates that the next boot source in the boot order shall be used. • 2 = Is Not Supported indicates that the boot order is terminated and no other boot sources shall be used.

7.3. Service for Method Invocations

7.3.1. DCIM_BIOSService

This section describes the implementation for the DCIM_BIOSService class that represents the BIOS and boot management service.

This class shall be instantiated in the Implementation Namespace.

The DCIM_LCElementConformsToProfile association(s) shall reference the DCIM_BIOSService instance(s).

7.3.1.1. Resource URIs for WinRM®

The class Resource URI shall be “http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSService?__cimnamespace=root/dcim”

The key properties shall be SystemCreationClassName, CreationClassName, SystemName and Name.

The instance Resource URI for DCIM_BIOSService instance shall be:

“http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSService?__cimnamespace=root/dcim+SystemCreationClassName=DCIM_ComputerSystem+CreationClassName=DCIM_BIOSService+SystemName=DCIM:ComputerSystem+Name=DCIM:BIOSService”

7.3.1.2. Operations

The following table lists the operations implemented on DCIM_BIOSService.

Table 69. DCIM_BIOSService – Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
Invoke	Mandatory	Instance URI

7.3.1.3. Properties

The following table lists the implemented properties for DCIM_BIOSService instance representing a system in a system. The “Requirements” column shall denote whether the property is implemented (for requirement definitions, see section 3). The “Additional Requirements” column shall denote either possible values for the property, or requirements on the value formulation.

Table 70. Class: DCIM_BIOSService

Properties	Type	Requirement	Description
SystemCreationClassName	string	Mandatory	The property value shall be “DCIM_ComputerSystem”.
CreationClassName	string	Mandatory	The property value shall be “DCIM_BIOSService”.
SystemName	string	Mandatory	The property value shall be “DCIM:ComputerSystem”.
Name	string	Mandatory	The property value shall be “DCIM:BIOSService”
ElementName	string	Mandatory	The property value shall be “BIOS Service”.

7.4. Profile Registration

7.4.1. BIOS and Boot Management Profile Registration

This section describes the implementation for the DCIM_LCRegisteredProfile class.

This class shall be instantiated in the Interop Namespace.

The DCIM_ElementConformsToProfile association(s) shall reference the DCIM_LCRegisteredProfile instance.

7.4.1.1. Resource URIs for WinRM®

The class Resource URI shall be "http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_RegisteredProfile?__cimnamespace=root/interop"

The key property shall be the InstanceID property.

The instance Resource URI shall be: "http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_LCRegisteredProfile?__cimnamespace=root/interop+InstanceID=DCIM:BIOSandBootManagement:1.0.0"

7.4.1.2. Operations

The following table details the operations implemented on DCIM_LCRegisteredProfile.

Table 71. DCIM_LCRegisteredProfile - Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI

7.4.1.3. Properties

The following table details the implemented properties for DCIM_LCRegisteredProfile instance representing BIOS and Boot Management Profile implementation. The "Requirements" column shall denote whether the property is implemented (for requirement definitions, see section 3.3, 3.4, and 3.6). The "Additional Requirements" column shall denote either possible values for the property, or requirements on the value formulation.

Table 72. Class: DCIM_LCRegisteredProfile

Properties	Requirement	Type	Additional Requirements
InstanceID	Mandatory	String	The property value shall be "DCIM:BIOSandBootManagement:4.0.0".
RegisteredName	Mandatory	String	This property shall have a value of "BIOS and Boot Management".
RegisteredVersion	Mandatory	String	This property shall have a value of "4.0.0".
RegisteredOrganization	Mandatory	String	This property shall have a value of 1 (Other).
OtherRegisteredOrganization	Mandatory	String	This property shall match "DCIM"
AdvertisedTypes[]	Mandatory	Uint16	This property array shall contain [1(Other), 1 (Other)].
AdvertiseTypeDescriptions[]	Mandatory	String	This property array shall contain ["WS-Identify", "Interop Namespace"].

7.5. DCIM_BIOSCertService

This section describes the implementation for the DCIM_BIOSCerService class that represents the Secure boot certificate management.

This class shall be instantiated in the Implementation Namespace.

7.5.1.1. Resource URIs for WinRM®

The class Resource URI shall be "http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSCertService?__cimnamespace=root/dcim"

The key properties shall be SystemCreationClassName, CreationClassName, SystemName and Name.

The instance Resource URI for DCIM_BIOSService instance shall be:

"http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSCertService?__cimnamespace=root/dcim+SystemCreationClassName=DCIM_ComputerSystem+SystemName=DCIM:ComputerSystem+CreationClassName=DCIM_BIOSCertService+Name=DCIM:BIOSCertService"

7.5.1.2. Operations

The following table lists the operations implemented on DCIM_BIOSCertService.

Table 73. DCIM_BIOSService – Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI
Invoke	Mandatory	Instance URI

7.5.1.3. Properties

The following table lists the implemented properties for DCIM_BIOSCertService instance representing a system in a system. The "Requirements" column shall denote whether the property is implemented (for requirement definitions, see section 3). The "Additional Requirements" column shall denote either possible values for the property, or requirements on the value formulation.

Table 74. Class: DCIM_BIOSService

Properties	Type	Requirement	Description
SystemCreationClassName	string	Mandatory	The property value shall be "DCIM_ComputerSystem".
CreationClassName	string	Mandatory	The property value shall be "DCIM_BIOSCertService".
SystemName	string	Mandatory	The property value shall be "DCIM:ComputerSystem".
Name	string	Mandatory	The property value shall be "DCIM:BIOSCertService"
ElementName	string	Mandatory	The property value shall be "BIOS Cert Service".

7.6. DCIM_BIOSCertView

This section describes the implementation of the DCIM_BIOSCertView class that represents an enumeration type BIOS Certificate details.

This class shall be instantiated in the Implementation Namespace.

7.6.1.1. Resource URIs for WinRM®

The class resource URI shall be http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSCertView?__cimnamespace=root/dcim

The key property shall be the InstanceID.

The instance Resource URI for DCIM_BIOSEnumeration instance shall be:

http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_BIOSEnumeration?__cimnamespace=root/dcim+InstanceID=iDRAC.Embedded.1#<policy>.<CertNumber> , where <policy> is the policy type StdSecbootpolicy or CustSecbootpolicy

<CertNumber> is the record number.

7.6.1.2. Operations

The following table details the operations implemented on the DCIM_BIOSCertView class

Table 75. DCIM_BIOSCertView - Operations

Operation Name	Requirements	Required Input
Get	Mandatory	Instance URI
Enumerate	Mandatory	Class URI

7.6.1.3. Properties

The following table lists the properties implemented for the DCIM_BIOSCertView instance

Table 76. Class: DCIM_BIOSCertView

Properties	Requirements	Type	Description
InstanceID	Mandatory	string	A string containing the user-friendly name for the object. and its key properties.
SerialNumber	Mandatory	String	Record number.
CertificateType	Mandatory	uint16	<ul style="list-style-type: none"> • 1 – PK • 2 - Kek • 3 - DB • 4 - DBX
CertificateSubType	Mandatory	uint16	<ul style="list-style-type: none"> • 1 – certificate • 2 - SHA256 • 3 - SHA384 • 4 - SHA512
CertificateIdentifier	Mandatory	String	Unique identifier for a particular certificate(Thumbprint).Or Hash of the file, which can be of type SHA-256, SHA-384, SHA-512
Subject	optional	String	A string combining subject CN , State,Locality,Organization,Organizational Unit and Common Name, Applicable only if the CertificateSubType is certificate.
Issuer	Optional	String	A string combining issuer CN , State,Locality,Organization,Organizational Unit and Common Name. Applicable only if the CertificateSubType is certificate.
ValidFrom	optional	String	A string providing the validity start date Applicable only if the CertificateSubType is certificate.
ValidTo	optional	String	A string providing the validity end date Applicable only if the CertificateSubType is certificate.

8. Methods

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

8.1. DCIM_BIOSService.SetAttribute()

The SetAttribute() method is used to set or change the value of a BIOS attribute.

Invoking the SetAttribute() method shall change the value of the attribute's CurrentValue or attribute's PendingValue property to the value specified by the AttributeValue parameter if the attribute's IsReadOnly

property is FALSE. Invoking this method when the attribute's IsReadOnly property is TRUE shall result in no change to the value of the attribute's CurrentValue property. The results of changing this value are described with the SetResult parameter.

Return code values for the SetAttribute() method are specified in Table 77 and parameters are specified in Table 78.

Note: Invoking the SetAttribute() method multiple times can result in the earlier requests being overwritten or lost.

Table 77. SetAttribute() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 78. SetAttribute() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	Target	String	Shall be set to "BIOS.Setup.1-1"
IN, REQ	AttributeName	String	Shall contain the AttributeName property value for the attribute to be modified.
IN, REQ	AttributeValue[]	String	Shall contain the desired attribute value. If the value is valid, the CurrentValue or PendingValue property of the specified attribute shall be modified.
OUT	SetResult	String	Returns: <ul style="list-style-type: none"> • "Set CurrentValue" when the attribute's current value is set. • "Set PendingValue" when the attribute's pending value is set.
OUT	RebootRequired	String	Returns: <ul style="list-style-type: none"> • "Yes" if reboot is required. • "No" if reboot is not required.
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 79. SetAttribute() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS001	The command was successful	
BIOS002	Resource allocation failure	
BIOS003	Missing required parameter	
BIOS004	Invalid parameter value for <parameter name>	Parameter
BIOS005	Mismatch in AttributeName and AttributeValue count	
BIOS006	Configuration job already created, cannot set attribute on specified target until existing job is completed or is cancelled	
BIOS007	Configuration job already created, cannot create another config job on specified target until existing job is completed or is cancelled	
BIOS008	No pending data is present to create a Configuration job	

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS009	System Services is currently in use, cannot create Configuration job	
BIOS010	System Services is disabled, cannot create Configuration job	
BIOS011	Configuration job already created, pending data cannot be deleted	
BIOS012	No pending data present to delete	
BIOS013	Invalid AttributeName %s	Attribute Name
BIOS014	Invalid AttributeValue for AttributeName %s	Attribute Name
BIOS015	AttributeValue cannot be changed for ReadOnly AttributeName %s	Attribute Name
BIOS016	AttributeValue cannot be changed for Disabled AttributeName %s	Attribute Name
BIOS017	Unable to delete vFlash pending one-time boot configuration	
LC062	An instance of Export or Import System Configuration is already running.	

8.2. DCIM_BIOSService.SetAttributes()

The SetAttributes() method is used to set or change the values of a group of attributes.

Invoking the SetAttributes() method shall change the values of the attribute's CurrentValue or PendingValue properties that correspond to the names specified by the AttributeName parameter and the values specified by the AttributeValue parameter if the respective attribute's IsReadOnly property is FALSE. Invoking this method when the respective attribute's IsReadOnly property is TRUE shall result in no change to the corresponding value of the attribute's CurrentValue property.

Return code values for the SetAttributes() method are specified in Table 80, and parameters are specified in Table 81.

Note: Invoking the SetAttributes() method multiple times can result in the earlier requests being overwritten or lost.

Table 80. SetAttributes() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 81. SetAttributes() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	Target	String	Shall be set to "BIOS.Setup.1-1"
IN, REQ	AttributeName[]	String	The array parameter shall contain the AttributeName property values for the attributes to be modified.
IN, REQ	AttributeValue[]	String	The array parameter shall contain the desired attribute values. If the value is valid, the CurrentValue or PendingValue property of the specified attribute will be modified.
OUT	SetResult[]	String	Returns: <ul style="list-style-type: none"> "Set CurrentValue" when the attribute's current value is set. "Set PendingValue" when the attribute's pending value is set.

Qualifiers	Name	Type	Description/Values
OUT	RebootRequired[]	String	Returns: <ul style="list-style-type: none"> • “Yes” if reboot is required. • “No” if reboot is not required.
OUT	MessageID[]	String	Error MessageID
OUT	Message[]	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 82. SetAttributes() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS001	The command was successful	
BIOS002	Resource allocation failure	
BIOS003	Missing required parameter	
BIOS004	Invalid parameter value for <parameter name>	Parameter
BIOS005	Mismatch in AttributeName and AttributeValue count	
BIOS013	Invalid AttributeName %s	Attribute Name
BIOS014	Invalid AttributeValue for AttributeName %s	Attribute Name
BIOS015	AttributeValue cannot be changed for ReadOnly AttributeName %s	Attribute Name
BIOS016	AttributeValue cannot be changed for Disabled AttributeName %s	Attribute Name
LC062	An instance of Export or Import System Configuration is already running.	

The SetAttribute() method is used to set or change the value of a BIOS attribute.

Invoking the SetAttribute() method shall change the value of the attribute's CurrentValue or attribute's PendingValue property to the value specified by the AttributeValue parameter if the attribute's IsReadOnly property is FALSE. Invoking this method when the attribute's IsReadOnly property is TRUE shall result in no change to the value of the attribute's CurrentValue property. The results of changing this value are described with the SetResult parameter.

Return code values for the SetAttribute() method are specified in Table 83 and parameters are specified in Table 84.

Note: Invoking the SetAttribute() method multiple times can result in the earlier requests being overwritten or lost.

Table 83. SetAttribute() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 84. SetAttribute() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	Target	String	Shall be set to “BIOS.Setup.1-1”
IN, REQ	AttributeName	String	Shall contain the AttributeName property value for the attribute to be modified.

Qualifiers	Name	Type	Description/Values
IN, REQ	AttributeValue[]	String	Shall contain the desired attribute value. If the value is valid, the CurrentValue or PendingValue property of the specified attribute will be modified.
OUT	SetResult	String	Returns: <ul style="list-style-type: none"> • "Set CurrentValue" when the attribute's current value is set. • "Set PendingValue" when the attribute's pending value is set.
OUT	RebootRequired	String	Returns: <ul style="list-style-type: none"> • "Yes" if reboot is required. • "No" if reboot is not required.
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

8.3. DCIM_BIOSService.ChangePassword ()

The ChangePassword() method is used to set or change the value of a BIOS attribute.

Invoking the ChangePassword() method shall change the value of the password attribute's PendingValue property to the value specified by the AttributeValue.

Return code values for the ChangePassword() method are specified in Table 85 and parameters are specified in Table 86.

Note: Invoking the ChangePassword() method multiple times can result in the earlier requests being overwritten or lost.

Table 85. ChangePassword() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 86. ChangePassword() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	Target	String	Shall be set to "BIOS.Setup.1-1"
IN, REQ	PasswordType	Uint16	Shall be one of the following values: <ul style="list-style-type: none"> • 1 = System Password • 2 = Setup Password
IN, REQ	OldPassword	String	Shall contain the old password string: If the PasswordType parameter has the value 1(System Password) , the OldPassword shall have the current value of SysPassword attribute or SetupPassword attribute, else the method shall return 2(Failed). If the PasswordType parameter has the value 2(Setup Password) , the OldPassword shall have the current value of SetupPassword attribute, else the method shall return 2(Failed).

Qualifiers	Name	Type	Description/Values
IN, REQ	NewPassword	String	Shall be set to new password string. NewPassword may be set to NULL (or omitted) in order to clear the old password. Clearing the password may succeed even if the password was previously cleared.
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 87. ChangePassword() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS001	The command was successful	
BIOS002	Resource allocation failure	
BIOS003	Missing required parameter	
BIOS004	Invalid parameter value for <parameter name>	Parameter
BIOS024	BIOS password authentication failed	
BIOS025	Unable to set BIOS password. Password is disabled by Jumper	

8.4. DCIM_BIOSService.CreateTargetedConfigJob()

The CreateTargetedConfigJob() method is used to apply the pending values created by the SetAttribute, SetAttributes, ChangePassword, ChangeBootSourceState, and ChangeBootOrderByInstanceID methods. The successful execution of this method creates a job for application of pending values.

Note: This method only creates the RebootJob and does not schedule it.

Note: If CreateTargetedConfigJob method is executed without the three optional input parameters, configuration job is created but not scheduled. However, you can schedule this configuration job later using the DCIM_JobService.SetupJobQueue () method from the "Job Control Profile". You can run the DCIM_JobService.SetupJobQueue () to schedule several configuration jobs including the reboot job. Refer to "Job Control Profile" for more details.

Return code values for the CreateTargetedConfigJob() method are specified in Table 88, and parameters are specified in Table 89.

Subsequent calls to CreateTargetedConfigJob after the first CreateTargetedConfigJob will result in error until the first job is completed."

Table 88. CreateTargetedConfigJob() Method: Return Code Values

Value	Description
2	Failed
40961	Job Created1

Table 89. CreateTargetedConfigJob() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	Target	String	Shall be set to "BIOS.Setup.1-1"

Qualifiers	Name	Type	Description/Values
IN	RebootJobType	Uint16	Shall contain the requested reboot type: <ul style="list-style-type: none"> • 1 - PowerCycle • 2 - Graceful Reboot without forced shutdown • 3 - Graceful Reboot with forced shutdown.
IN	ScheduledStartTime	String	Schedules the “configuration job” and the optional “reboot job” at the specified start time in the format: yyyyymmddhhmmss. A special value of “TIME_NOW” schedules the job(s) immediately.
IN	UntilTime	String	End time for the job execution in format: yyyyymmddhhmmss. : If this parameter is not NULL, then ScheduledStartTime parameter shall also be specified. Note: This parameter has a dependency on “ScheduledStartTime” parameter. Both “ScheduledStartTime” and “UntilTime” parameters define a time window for scheduling the job(s). After scheduling, jobs are executed within the time window.
OUT	Job1	CIM_ConcreteJob REF	Reference to the newly created pending value application job.1
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Note: 1 – If return code is 4096 (Job Created), the newly created job does not execute if the LC core services are not running. Verify that DCIM_LCEnumeration with AttributeName equal to “LifecycleControllerState” has the CurrentValue property equal to “Enabled”. For more information, see DCIM LC Management Profile.

Table 90. CreateTargetedConfigJob() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS001	The command was successful	
BIOS002	Resource allocation failure	
BIOS003	Missing required parameter	
BIOS004	Invalid parameter value for <parameter name>	Parameter
BIOS007	Configuration job already created, cannot create another config job on specified target until existing job is completed or is cancelled	
BIOS008	No pending data is present to create a Configuration job	
BIOS009	System Services is currently in use, cannot create Configuration job	
BIOS010	System Services is disabled, cannot create Configuration job	
BIOS011	Configuration job already created, pending data cannot be deleted	
BIOS012	No pending data present to delete	
BIOS017	Unable to delete vFlash pending one-time boot configuration	
LC062	An instance of Export or Import System Configuration is already running.	

8.5. DCIM_BIOSService.DeletePendingConfiguration()

The DeletePendingConfiguration() method is used to cancel the pending values created by the SetAttribute and SetAttributes methods. The DeletePendingConfiguration() method cancels the pending configuration changes made before the configuration job is created with CreateTargetedConfigJob(). This method only operates on the pending changes prior to CreateTargetedConfigJob() being called. After the configuration job is created, use the DeleteJobQueue() method in the Job Control profile to cancel the pending changes.

Return code values for the DeletePendingConfiguration() method are specified in Table 91, and parameters are specified in Table 92.

Table 91. DeletePendingConfiguration() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 92. DeletePendingConfiguration() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	Target	String	FQDD of the BIOS
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 93. DeletePendingConfiguration() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS001	The command was successful	
BIOS002	Resource allocation failure	
BIOS003	Missing required parameter	
BIOS004	Invalid parameter value for <parameter name>	Parameter
BIOS011	Configuration job already created, pending data cannot be deleted	
BIOS012	No pending data present to delete	
BIOS017	Unable to delete vFlash pending one-time boot configuration	
LC062	An instance of Export or Import System Configuration is already running.	

8.6. DCIM_BootConfigSetting.ChangeBootSourceState()

The ChangeBootSourceState() method is used change the enabled or disabled state of a single or multiple boot devices.

Invoking the ChangeBootSourceState() method shall change the boot sources state and affect DCIM_BootSourceSetting.PendingEnabledStatus properties. Upon the successful invocation, the DCIM_BootSourceSetting.PendingEnabledStatus shall have the value specified by the EnabledState parameter for the DCIM_BootSourceSetting instances with the InstanceID property matching the InstanceID parameter value(s).

Note: Invoking the `ChangeBootSourceState()` method multiple times can result in the earlier requests being overwritten or lost.

Upon the successful completion of the returned job, the `CurrentEnabledStatus` shall have the same value as the `PendingEnabledStatus`.

Return code values for the `ChangeBootSourceState()` method are specified in Table 94 and parameters are specified in Table 95.

Table 94. `ChangeBootSourceState()` Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 95. `ChangeBootSourceState()` Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	EnabledState	String	Shall contain the requested state for the boot device.
IN, REQ	source[]	String	Shall contain the InstanceID value(s) for DCIM_BootSourceSetting instances to be affected.
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 96. `ChangeBootSourceState()` Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BOOT001	The command was successful	
BOOT002	Resource allocation failure	
BOOT003	Method not supported	
BOOT004	Invalid number of Boot Source arguments	
BOOT005	Missing required parameter	
BOOT006	Invalid Boot Source InstanceID	
BOOT007	Boot Source does not belong to specified Boot Configuration	
BOOT008	Source argument contains more devices than are present on the system	
BOOT009	Boot Sources cannot be found for this Boot Configuration	

8.7. DCIM_BootConfigSetting.ChangeBootOrderByInstanceID()

The `ChangeBootOrderByInstanceID()` method is used to change the order of boot devices within the boot list.

Invoking the `ChangeBootOrderByInstanceID()` method shall order the boot devices in the list in accordance to the corresponding array element in the `Source` parameter array. The omitted boot devices in the `Source` parameter array shall be omitted in the boot list ordering.

Each element of the `Source` parameter array shall have value of a `DCIM_BootSourceSetting.InstanceID` property.

Upon successful completion of this method, the value of the `PendingAssignedSequence` property on each instance of `CIM_BootSourceSetting` shall be updated such that the values are monotonically increasing in

correlation with the position the “source” input parameter array. That is, the first position in the array shall have the lowest non-zero value for PendingAssignedSequence. The second position will have the second lowest value, and so on.

Upon successful completion of this method, the value of the PendingAssignedSequence property on each instance of DCIM_BootSourceSetting, that relates to the target DCIM_BootConfigSetting instance that is not present in the input array, shall be assigned a value of 0.

Note: Invoking the ChangeBootOrderByInstanceID() method multiple times can result in the earlier requests being overwritten or lost.

Upon the successful completion of the returned job, the CurrentAssignedSequence shall have the same value as the PendingAssignedSequence.

Return code values for the ChangeBootOrderByInstanceID() method are specified in Table 97 and parameters are specified in Table 98.

Table 97. ChangeBootOrderByInstanceID() Method: Return Code Values

Value	Description
0	Completed with no error
1	Not Supported
2	Failed
40961	Job Created1

Table 98. ChangeBootOrderByInstanceID() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	source[]	String	Shall contain the InstanceID value(s) for DCIM_BootSourceSetting instances to change the order of.
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Note: 1 – 4096(Job Created) shall be returned, only and only if the source parameter array contains boot source reference for an unattached vFlash partition. If return code is 4096 (Job Created), the newly created job does not execute if the LC core services are not running. Verify that DCIM_LCEnumeration with AttributeName equal to “LifecycleControllerState” has the CurrentValue property equal to “Enabled”. For more information, see DCIM LC Management Profile.

Table 99. ChangeBootOrderByInstanceID() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
BOOT001	The command was successful	
BOOT002	Resource allocation failure	
BOOT003	Method not supported	
BOOT004	Invalid number of Boot Source arguments	
BOOT005	Missing required parameter	
BOOT006	Invalid Boot Source InstanceID	
BOOT007	Boot Source does not belong to specified Boot Configuration	

MessageID (OUT parameter)	Message	MessageArguments[]
BOOT008	Source argument contains more devices than are present on the system	
BOOT009	Boot Sources cannot be found for this Boot Configuration	
BOOT010	Could not locate vFlash partition index	
BOOT011	Failed to set vFlash partition for one time boot	
BOOT012	Job started to attach and set vFlash partition for one time boot	
BOOT014	Virtual media not ready	
BOOT015	Job to attach and set vFlash partition for one time boot completed successfully	

8.8. DCIM_BIOSCertService. ExportBootCertificate ()

The ExportBootCertificate() method is used to export the secure boot certificate to the given share location.

Return code values for the ExportBootCertificate() method are specified in Table 100 and parameters are specified in Table 101.

Table 100. ExportBootCertificate() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 101. ExportBootCertificate() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	UserName	String	User name for CIFS share authentication
IN, REQ	Password	String	Password for CIFS share authentication
IN	Workgroup	String	Name of the workgroup for CIFS share authentication
IN, REQ	ShareType	Uint16	Type of network share. 0 = NFS , 2 = CIFS, 5= HTTP, 6=HTTPS
IN, REQ	ShareName	String	CIFS or NFS Share details
IN, REQ	IPAddress	String	IP Address of the machine hosting the CIFS/NFS/HTTP/HTTPS.
IN	ProxySupport	uint16	It Specifies if proxy is to be used or not. <ul style="list-style-type: none"> • 1 – OFF • 2 – ON-Use user default proxy settings. • 3 – On-Use passed in parameters for proxy.
IN	ProxyType	uint16	It specifies the proxy type of the proxy server. Default is 0 (HTTP) <ul style="list-style-type: none"> • 0 – HTTP • 1 – HTTPS
IN	ProxyUname	string	This string represents the username for proxy server
IN	ProxyPasswd	string	This string represents the password to login into proxy server

Qualifiers	Name	Type	Description/Values
IN	IgnoreCertWarning	uint16	Specifies if certificate warning is to be ignored when HTTPS is specified <ul style="list-style-type: none"> • 1 – OFF • 2 – ON
IN	ProxyServer	string	This string represents the IP Address of the proxy server
IN	ProxyPort	string	
IN,REQ	FileName	String	The file name of the certificate file to be exported.
IN, REQ	CertificateType	Uint16	Certificate Type. <ul style="list-style-type: none"> • PK • KeK • DB • DBX
IN,REQ	CertificateSubType	Uint16	Certificate Sub Type. <ul style="list-style-type: none"> • 1 – certificate • 2 - SHA256 • 3 - SHA384 • 4 - SHA512
IN, REQ	CertificateIdentifier	String	Unique identifier for a particular certificate to be exported
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 102. ExportBootCertificate() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
RAC095	Unable to start the configuration operation because the System Lockdown mode is enabled.	
RAC003	Missing required parameter %s.	Missed input parameter name
RAC004	Invalid parameter value for %s	Invalid Input parameter name
BIOS032	Unable to access the network share because incorrect network share identify information is entered.	
BIOS033	"Unable to write to the network share either because the network share is read-only or sufficient disk space is unavailable for the export operation.	
BIOS034	Unable to retrieve the record information because the requested record is not available.	
BIOS035	Unable to start the operation because invalid hash signature parameter is entered.	
BIOS036	Unable to start the import operation because the public key (PK) certificate is already available	

MessageID (OUT parameter)	Message	MessageArguments[]
BIOS037	Unable to start the import operation either because the file name entered : %s is invalid, file is corrupted, or the file encoding format is incorrect.	
BIOS038	Unable to read the SecureBoot policy because of unknown issues.	
BIOS039	Unable to start the operation because invalid parameters are entered.	
BIOS040	Unable to import the SecureBoot certificate data because of insufficient disk space to store the certificate data.	
BIOS041	Operation not allowed because hash is not supported in PK&KeK	
SWC9011	The SecureBoot Certificate Export operation is successfully completed.	

8.9. DCIM_BIOSCertService.ImportBootCertificate ()

The ImportBootCertificate() method is used to import the secure boot certificate from the given share location.

Return code values for the ImportBootCertificate() method are specified in Table 103 and parameters are specified in Table 104.

Table 103. ImportBootCertificate() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 104. ImportBootCertificate() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	UserName	String	User name for CIFS share authentication
IN, REQ	Password	String	Password for CIFS share authentication
IN	Workgroup	String	Name of the workgroup for CIFS share authentication
IN, REQ	ShareType	UInt16	Type of network share. 0 = NFS , 2 = CIFS, 5= HTTP, 6=HTTPS
IN, REQ	ShareName	String	CFS or NFS Share details
IN, REQ	IPAddress	String	IP Address of the machine hosting the CIFS/NFS/HTTP/HTTPS.
IN	ProxySupport	uint16	It Specifies if proxy is to be used or not. <ul style="list-style-type: none"> • 1 – OFF • 2 – ON-Use user default proxy settings. • 3 – On-Use passed in parameters for proxy.
IN	ProxyType	uint16	It specifies the proxy type of the proxy server. Default is 0 (HTTP) <ul style="list-style-type: none"> • 0 – HTTP • 1 – HTTPS
IN	ProxyUname	string	This string represents the username for proxy server
IN	ProxyPasswd	string	This string represents the password to login into proxy server

Qualifiers	Name	Type	Description/Values
IN	IgnoreCertWarning	uint16	Specifies if certificate warning is to be ignored when HTTPS is specified <ul style="list-style-type: none"> • 1 – OFF • 2 – ON
IN	ProxyServer	string	This string represents the IP Address of the proxy server
IN	ProxyPort	string	
IN,REQ	FileName	String	The file name of the certificate file to be exported.
IN, REQ	CertificateType	Uint16	Certificate Type. <ul style="list-style-type: none"> • PK • KeK • DB • DBX
IN,REQ	CertificateSubType	Uint16	Certificate Sub Type. <ul style="list-style-type: none"> • 1 – certificate • 2 - SHA256 • 3 - SHA384 • 4 - SHA512
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 105. ImportBootCertificate () Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
RAC095	Unable to start the configuration operation because the System Lockdown mode is enabled.	
RAC003	Missing required parameter %s.	Missed input parameter name
RAC004	Invalid parameter value for %s	Invalid Input parameter name
BIOS032	Cannot access network share.	
BIOS035	Operation failed because the hash is invalid	
BIOS036	Certificate type PK is already available, So import not allowed	
BIOS037	Invalid file so import not allowed, file could be corrupt or encoding format is incorrect	
BIOS038	unable to read secure boot policy run CSIOR and retry the operation.	
BIOS039	Invalid Parameters	
BIOS040	Insufficient memory to store the certificate	
BIOS041	Operation not allowed because hash is not supported in PK&KeK	
SWC9010	The SecureBoot Certificate Import operation is successfully completed. Restart the host server for the changes to take effect.	

8.10. DCIM_BIOSCertService.ResetBootCertificate ()

The ResetBootCertificate() method is used to reset the secure boot certificate to standard.

Return code values for the ResetBootCertificate() method are specified in Table 106 and parameters are specified in Table 107.

Table 106. ResetBootCertificate() Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 107. ResetBootCertificate() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	CertificateType	UInt16	Certificate Type. <ul style="list-style-type: none">• 0 – ALL• PK• KeK• DB• DBX
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 108. ResetBootCertificate() Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
RAC095	Unable to start the configuration operation because the System Lockdown mode is enabled.	
RAC003	Missing required parameter %s.	Certificate Type
RAC004	Invalid parameter value for %s	Certificate Type
BIOS034	Unable to retrieve the record information because the requested record is not available.	
BIOS038	Unable to read the SecureBoot policy because of unknown issues.	
SWC9008	The SecureBoot Certificate Reset operation is successfully completed. Restart the host server for the changes to take effect.	
SWC9009	The SecureBoot Certificate ResetAll operation is successfully completed. Restart the host server for the changes to take effect.	
BIOS041	Operation not allowed because hash signature is not supported in Platform Key (PK) and Key Exchange (KEK).	

8.11. DCIM_BIOSCertService.DeleteBootCertificate ()

The DeleteBootCertificate() method is used to delete the secure boot certificate.

Return code values for the DeleteBootCertificate() method are specified in Table 109 and parameters are specified in Table 110.

Table 109. DeleteBootCertificate () Method: Return Code Values

Value	Description
0	Completed with no error
2	Failed

Table 110. DeleteBootCertificate () Method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	CertificateType	UInt16	Certificate Type. <ul style="list-style-type: none"> • 0 – ALL • PK • KeK • DB • DBX
IN	CertificateSubType	UInt16	Certificate Sub Type. <ul style="list-style-type: none"> • 1 – certificate • 2 - SHA256 • 3 - SHA384 • 4 - SHA512
IN	CertificateIdentifier	String	This string represents the Unique identifier for a particular certificate
OUT	MessageID	String	Error MessageID
OUT	Message	String	Error Message
OUT	MessageArguments[]	String	Error MessageArguments

Table 111. DeleteBootCertificate () Method: Standard Messages

MessageID (OUT parameter)	Message	MessageArguments[]
RAC095	Unable to start the configuration operation because the System Lockdown mode is enabled.	
RAC003	Missing required parameter %s.	Missed input parameter name
RAC004	Invalid parameter value for %s	Invalid Input parameter name
BIOS034	Unable to retrieve the record information because the requested record is not available.	
BIOS038	Unable to read the SecureBoot policy because of unknown issues.	
BIOS041	Operation not allowed because hash is not supported in PK&KeK.	
SWC9012	The SecureBoot Certificate Delete operation is successfully completed. Restart the host server for the changes to take effect.	
SWC9007	The SecureBoot Certificate DeleteAll operation is successfully completed. Restart the host server for the changes to take effect.	

9. Use Cases

See *Lifecycle Controller (LC) Integration Best Practices Guide*.

10. CIM Elements

No additional requirements are specified.

11. Privilege and License Requirement

The following table describes the privilege and license requirements for the listed operations. For the detailed explanation of the privileges and licenses, refer to the Dell WSMAN Licenses and Privileges specification.

Table 112. Privilege and License Requirements

Class and Method	Operation	User Privilege Required	License Required
DCIM_BIOSService	ENUMERATE, GET	Login	None.
DCIM_BIOSPassword	ENUMERATE, GET	Login, Server Control	LM_REMOTE_CONFIGURATION
DCIM_BIOSService.SetAttribute()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION
DCIM_BIOSService.SetAttributes()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION
DCIM_BIOSService.CreateTargetedConfigJob()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION
DCIM_BIOSService.DeletePendingConfiguration()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION
DCIM_BIOSService.ChangePassword()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION
DCIM_BIOSEnumeration	ENUMERATE, GET	Login	LM_REMOTE_CONFIGURATION
DCIM_BIOSInteger	ENUMERATE, GET	Login	LM_REMOTE_CONFIGURATION
DCIM_BIOSString	ENUMERATE, GET	Login	LM_REMOTE_CONFIGURATION
DCIM_BootSourceSetting	ENUMERATE, GET	Login	LM_REMOTE_CONFIGURATION, LM_VIRTUAL_FLASH_PARTITIONS ¹
DCIM_BootConfigSetting	ENUMERATE, GET	Login	LM_REMOTE_CONFIGURATION, LM_VIRTUAL_FLASH_PARTITIONS ¹
DCIM_BootConfigSetting.ChangeBootOrderByInstanceID()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION, LM_VIRTUAL_FLASH_PARTITIONS ¹
DCIM_BootConfigSetting.ChangeBootSourceState()	INVOKE	Login, Server Control	LM_REMOTE_CONFIGURATION, LM_VIRTUAL_FLASH_PARTITIONS ¹
DCIM_LCElementConformsToProfile	ENUMERATE, GET	Login	None.
DCIM_BIOSCertService.ExportBootCertificate()	INVOKE	Login	None
DCIM_BIOSCertService.ImportBootCertificate ()	INVOKE	Login, system Control	None
DCIM_BIOSCertService.ResetBootCertificate ()	INVOKE	Login , system Control	None

Class and Method	Operation	User Privilege Required	License Required
DCIM_BIOSCertService. DeleteBootCertificate ()	INVOKE	Login, system Control	None
DCIM_LCRegisteredProfile	ENUMERATE, GET	Login	None.

Note: 1 – For vFlash boot representation and configuration the requester needs to have LM_VIRTUAL_FLASH_PARTITIONS license. For NON-vFlash boot representation and configuration, LM_VIRTUAL_FLASH_PARTITIONS is NOT necessary.

12. Change log

Version	Date	Description
4.0.0	20-Jun-2017	Added new classes for Secure Boot feature: <ul style="list-style-type: none"> • DCIM_BIOSCertView • DCIM_BIOSCertService