

IBM TotalStorage SAN Volume Controller



CIM Agent Developer's Reference

Version 2.1.0

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About this guide

This publication introduces the Common Information Model (CIM) Agent for the IBM® TotalStorage™ SAN Volume Controller.

This section describes:

- Content and intended audience of this book
- Typefaces that are used to show emphasis
- Information that is related to this book
- How to order IBM publications
- How to send in your feedback on this book
- Web sites that provide information about the SAN Volume Controller or related products or technologies

Who should use this guide?

This reference book is for application programmers who are developing with the Common Information Model (CIM).

This reference book is for CIM-based application programmers who want to do the following tasks:

- Understand the CIM Agent for the SAN Volume Controller
- Discover and connect to the CIM Agent service
- Retrieve and extract the CIM Agent object classes, attributes, and methods
- Create new object instances for basic storage configuration, LUN masking, and copy services on the SAN Volume Controller.

Summary of changes

This document contains terminology, maintenance, and editorial changes.

Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change. This summary of changes describes new functions that have been added to this release.

Summary of changes for SC26-7545-03 SAN Volume Controller CIM Agent Developer's Reference

The Summary of changes provides a list of new, modified, and changed information since the last version of the guide.

New information

This topic describes the changes to this guide since the previous edition, SC26-7545-02. The following sections summarize the changes that have since been implemented from the previous version.

This version includes the following new information:

- Added the following new chapter:
 - Return codes
 - Using the problem determination tool

- Added the following new CIM Agent Core object classes:
 - IBMTSSVC_FlashCopyJob
 - IBMTSSVC_FormatVolumeJob
 - IBMTSSVC_MigrateVolumeJob
 - IBMTSSVC_SyncCopyJob
- Added the following new CIM Agent Security object classes:
 - IBMTS_Certificate
 - IBMTS_CertificateSetting
 - IBMTS_Truststore
 - IBMTS_TruststoreManagementService
- Added the following new Association classes:
 - IBMTSSVC_HostedFlashCopyJob
 - IBMTSSVC_HostedFormatVolumeJob
 - IBMTSSVC_HostedSyncCopyJob
 - IBMTSSVC_HostedMigrateVolumeJob
 - IBMTS_ContainsTruststore
 - IBMTS_HasCertificate
 - IBMTS_HostsTruststoreManager
 - IBMTS_ManagesTruststore
- Added the following new CIM Agent Extrinsic methods:
 - CheckValidity()
 - DeleteCertificate()
 - DisableAutoGeneration()
 - EnableAutoGeneration()
 - GenerateCIMOMCertificate()
 - SetDefaultValidity()
 - MigrateVolumeToImageMode()

Changed information

This section lists the updates that were made in this document.

- SMI-S/CIM secure port is now 5999.
- Two different uninterruptible power supplies are supported.
- Added new properties to the following CIM Agent core object classes:
 - IBMTSSVC_StorageHardwareID
 - IBMTSSVC_StorageVolume
 - IBMTSSVC_HardwareIdCollection

Deleted information

No deletions were made in this version of the guide.

Summary of changes for SC26-7545-02 SAN Volume Controller CIM Agent Developer's Reference

The Summary of Changes provides a list of new, modified, and changed information since the last version of the reference

New information

This topic describes the changes to this reference since the previous edition, SC26-7545-01.

- Full list of attributes provided through the Service Location Protocol (SLP)
- Manual CIMOM IP registration
- Manual setting of the RemoteServiceAccessPoint connection data

Changed information

No information has been changed in this version.

Deleted information

No deletions were made in this version of the reference.

Emphasis

Different typefaces are used in this guide to show emphasis.

The following typefaces are used to show emphasis:

Boldface	Text in boldface represents menu items and command names.
<i>Italics</i>	Text in <i>italics</i> is used to emphasize a word. In command syntax, it is used for variables for which you supply actual values, such as a default directory or the name of a cluster.
Monospace	Text in monospace identifies the data or commands that you type, samples of command output, examples of program code or messages from the system, or names of command flags, parameters, arguments, and name-value pairs.

SAN Volume Controller library and related publications

A list of other publications that are related to this product are provided to you for your reference.

The tables in this section list and describe the following publications:

- The publications that make up the library for the IBM TotalStorage SAN Volume Controller
- Other IBM publications that relate to the SAN Volume Controller

SAN Volume Controller library

The following table lists and describes the publications that make up the SAN Volume Controller library. Unless otherwise noted, these publications are available in Adobe portable document format (PDF) on a compact disc (CD) that comes with the SAN Volume Controller. If you need additional copies of this CD, the order number is SK2T-8811. These publications are also available as PDF files from the following Web site:

<http://www-1.ibm.com/servers/storage/support/virtual/2145.html>

Title	Description	Order number
<i>IBM TotalStorage SAN Volume Controller: CIM Agent Developer's Reference</i>	This reference guide describes the objects and classes in a Common Information Model (CIM) environment.	SC26-7590
<i>IBM TotalStorage SAN Volume Controller: Command-Line Interface User's Guide</i>	This guide describes the commands that you can use from the SAN Volume Controller command-line interface (CLI).	SC26-7544
<i>IBM TotalStorage SAN Volume Controller: Configuration Guide</i>	This guide provides guidelines for configuring your SAN Volume Controller.	SC26-7543
<i>IBM TotalStorage SAN Volume Controller: Host Attachment Guide</i>	This guide provides guidelines for attaching the SAN Volume Controller to your host system.	SC26-7575
<i>IBM TotalStorage SAN Volume Controller: Installation Guide</i>	This guide includes the instructions the service representative uses to install the SAN Volume Controller.	SC26-7541
<i>IBM TotalStorage SAN Volume Controller: Planning Guide</i>	This guide introduces the SAN Volume Controller and lists the features you can order. It also provides guidelines for planning the installation and configuration of the SAN Volume Controller.	GA22-1052
<i>IBM TotalStorage SAN Volume Controller: Service Guide</i>	This guide includes the instructions the service representative uses to service the SAN Volume Controller.	SC26-7542
<i>IBM TotalStorage SAN Volume Controller: Translated Safety Notices</i>	This guide contains the danger and caution notices for the SAN Volume Controller. The notices are shown in English and in numerous other languages.	SC26-7577
<i>IBM TotalStorage Master Console Installation and User's Guide</i>	This guide includes the instructions on how to install and use the SAN Volume Controller Console	

Other IBM publications

The following table lists and describes other IBM publications that contain additional information related to the SAN Volume Controller.

Title	Description	Order number
<i>IBM TotalStorage Enterprise Storage Server, IBM TotalStorage SAN Volume Controller, IBM TotalStorage SAN Volume Controller for Cisco MDS 9000, IBM TotalStorage Multipath Subsystem Device Driver: User's Guide</i>	This guide describes the IBM TotalStorage Multipath Subsystem Device Driver Version 1.5 for TotalStorage Products and how to use it with the SAN Volume Controller. This publication is referred to as the <i>IBM TotalStorage Multipath Subsystem Device Driver: User's Guide</i> .	SC26-7608

Related Web sites

The following Web sites provide information about the SAN Volume Controller or related products or technologies.

Type of information	Web site
SAN Volume Controller support	http://www-1.ibm.com/servers/storage/support/virtual/2145.html
Technical support for IBM storage products	http://www.ibm.com/storage/support/

How to order IBM publications

The publications center is a worldwide central repository for IBM product publications and marketing material.

The IBM publications center

The IBM publications center offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download free of charge. You can also order publications. The publications center displays prices in your local currency. You can access the IBM publications center through the following Web site:

www.ibm.com/shop/publications/order/

Publications notification system

The IBM publications center Web site offers you a notification system for IBM publications. Register and you can create your own profile of publications that interest you. The publications notification system sends you a daily e-mail that contains information about new or revised publications that are based on your profile.

If you want to subscribe, you can access the publications notification system from the IBM publications center at the following Web site:

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Fill out the Readers' Comments form (RCF) at the back of this book. If the RCF has been removed, you can address your comments to:

International Business Machines Corporation
RCF Processing Department
Department 61C
9032 South Rita Road
Tucson, Arizona 85775-4401
U.S.A.

Chapter 1. Introduction

This chapter introduces the Common Information Model (CIM) Agent for the SAN Volume Controller.

It provides overviews of the:

- Storage Management Initiative Specification (SMI-S)
- CIM
- CIM-related concepts
- CIM Agent
- SAN Volume Controller
- CIM Agent for the SAN Volume Controller

This chapter also presents functional views of the CIM Agent object models.

Storage Management Initiative Specification

The Storage Management Initiative Specification (SMI-S) is a design specification of the Storage Management Initiative (SMI) launched by the Storage Networking Industry Association (SNIA).

The SMI-S specifies a secure and reliable interface that allows storage management systems to identify, classify, monitor, and control physical and logical resources in a storage area network (SAN). The interface is intended as a solution that integrates the various devices to be managed in a SAN and the tools used to manage them.

SMI-S is based on a number of existing technologies or industry standards that include the following:

Common Information Model (CIM)

An object model for data storage and management developed by the Distributed Management Task Force (DMTF). CIM makes it possible to organize devices and components of devices in an object-oriented pattern.

Web-Based Enterprise Management (WBEM)

A tiered enterprise management architecture also developed by the DMTF. This architecture provides the management design framework that consists of devices, device providers, the object manager, and the messaging protocol for the communication between client applications and the object manager. In the case of the CIM, the object manager is the CIMOM and the messaging protocol is the CIM over HTTP technology. The CIM over HTTP approach specifies that the CIM data is encoded in XML and sent in specific messages between the client applications and the CIMOM over the TCP/IP network in a SAN.

Service Location Protocol (SLP)

A directory service that the client application calls to locate the CIMOM.

Intended to be an industry standard, SMI-S extends the generic capabilities of the CIM, the WBEM, and the SLP to implement storage networking interoperability. For example, the WBEM is expanded to provide provisions for security, resource-locking management, event notification, and service discovery.

Common Information Model

The Common Information Model (CIM) is a set of standards developed by the Distributed Management Task Force (DMTF).

The CIM provides an open approach to the design and implementation of storage systems, applications, databases, networks, and devices.

The CIM specifications provide the language and the methodology for describing management data. For example, CIM Schema 2.7 for Managing Storage Arrays specifies how the management environment should be enabled for data management in a common way. Specifically, the CIM defines common object classes, associations, and methods. Member vendors can use those objects and extend them to specify how data should be processed and organized in a specific managed environment.

Common Information Model concepts

There are several concepts used to describe the Common Information Model. You must familiarize yourself with these concepts to understand the object models.

The Common Information Model (CIM) specifications use the following concepts and terminology to describe the object models:

Association

A class that contains two references that define a relationship between two referenced objects.

Class The definition of an object within a specific hierarchy. An object class can have properties and methods and serve as the target of an association.

Indication

An object representation of an event.

Instance

An individual object that is the member of some class. In object-oriented programming, an object created by instantiating a class.

Method

A way to implement a function on a class.

Namespace

The scope within which a CIM schema applies.

Object path

An object that consists of a namespace path and a model path. The namespace path provides access to the CIM implementation managed by the CIM Agent, and the model path provides navigation within the implementation.

Property

An attribute that is used to characterize instances of a class.

Qualifier

A value that provides additional information about a class, association, indication, method, method parameter, instance, property, or reference.

Reference

A pointer to another instance that defines the role and scope of an object in an association.

Schema

A group of object classes defined for and applicable to a single namespace. Within the CIM Agent, the supported schemas are the ones that are loaded through the managed object format (MOF) compiler.

CIM agent

With a Common Information Model (CIM) agent, programmers can use common building blocks rather than proprietary software or device-specific programming interfaces to manage CIM-compliant devices. Standardization of the way applications handle storage provides easier storage management.

Components

A CIM agent typically involves the following components:

agent code

An open-systems standard that interprets CIM requests and responses as they transfer between the client application and the device.

CIM object manager (CIMOM)

The common conceptual framework for data management that receives, validates, and authenticates the CIM requests from the client application. It then directs the requests to the appropriate component or device provider.

client application

A storage management program that initiates CIM requests to the CIM agent for the device.

device

The storage server that processes and hosts the client application requests.

device provider

A device-specific handler that serves as a plug-in for the CIM. That is, the CIMOM uses the handler to interface with the device.

Service Location Protocol (SLP)

A directory service that the client application calls to locate the CIMOM.

CIM agent at work

Figure 1 on page 4 shows the way a typical CIM agent works. The client application locates the CIMOM by calling an SLP directory service. When the CIMOM is first invoked, it registers itself to the SLP Service Agent and supplies its location, IP address, port number, and the type of service it provides. A string describing the CIM Agents access point is registered. The following provides an example of the registered string:

```
service:wbem:https://<CIM Agent IP>:<port number>
```

Note: The standard secure port is 5999.

The SLP provides the following attributes:

```
service:wbem:https://<CIM Agent IP>:5999
```

```
service-hi-name=SVC CIM Agent 1.2.1.0
```

```
service-hi-description=IBM SAN Volume Controller CIM Agent Version 1.2.1
```

```
service-location-tcp=https://<CIM Agent IP>:5999
```

```

service-id=IBM_CIMOM_1094736587984_1108027145
template-url-syntax=https://<CIM Agent IP>
CommunicationMechanism=cim-xml
InteropSchemaNamespace=/root/ibm
FunctionalProfilesSupported=Basic Read, Basic Write, Instance Manipulation,
Association Traversal, Query Execution, Qualifier Declaration, Indications
MultipleOperationsSupported=false
ProtocolVersion=1
AuthenticationMechanismSupported=Basic
Namespace=/root/ibm

```

With this information, the client application starts to directly communicate with the CIMOM.

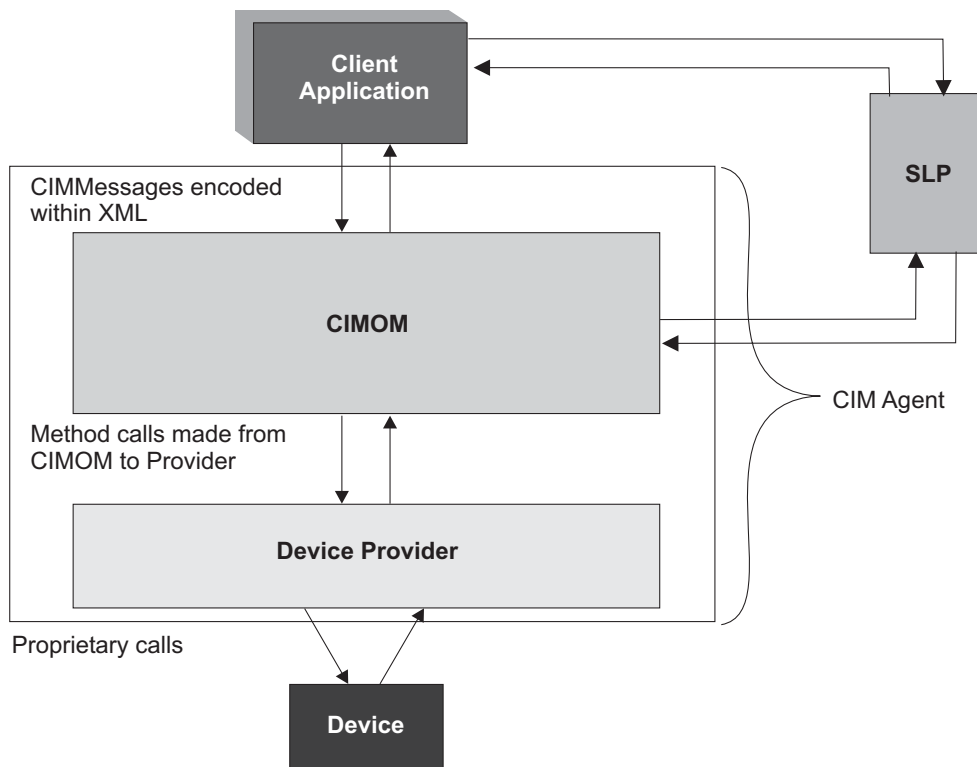


Figure 1. A typical CIM Agent at work

The client application then sends CIM requests to the CIMOM. As requests arrive, the CIMOM validates and authenticates each request. It then directs the requests to the appropriate functional component of the CIMOM or to a device provider. The provider makes calls to a device-unique programming interface on behalf of the CIMOM to satisfy client application requests.

The management application can obtain an instance of the RemoteServiceAccessPoint from the CIMOM. This instance allows the management application to access the Web User Interface.

SAN Volume Controller

The SAN Volume Controller is a SAN appliance that attaches open-systems storage devices to supported open-systems hosts.

The IBM TotalStorage SAN Volume Controller provides symmetric virtualization by creating a pool of managed disks from the attached storage subsystems, which are then mapped to a set of virtual disks for use by attached host computer systems. System administrators can view and access a common pool of storage on the SAN, which enables them to use storage resources more efficiently and provides a common base for advanced functions.

The SAN Volume Controller is analogous to a logical volume manager (LVM) on a SAN. It performs the following functions for the SAN storage that it is controlling:

- Creates a single pool of storage
- Logical unit virtualization
- Manages logical volumes
- Provides advanced functions for the SAN, such as:
 - Large scalable cache
 - Copy services
 - FlashCopy® (point-in-time copy)
 - Metro Mirror (synchronous copy)
 - Data migration
 - Space management
 - Mapping that is based on desired performance characteristics
 - Quality of service metering

A *node* is a single storage engine. Figure 2 on page 6 provides an illustration of a node. The storage engines are always installed in pairs with one to four pairs of nodes constituting a *cluster*. Each node in a pair is configured to back up the other. Each pair of nodes is known as an *I/O group*. All I/O operations that are managed by the nodes in an I/O group are cached on both nodes for resilience. Each virtual volume is defined to an I/O group. To avoid any single point of failure, the nodes of an I/O group are protected by independent uninterruptible power supply (UPS) 5115 or uninterruptible power supply (UPS) 5125 units.

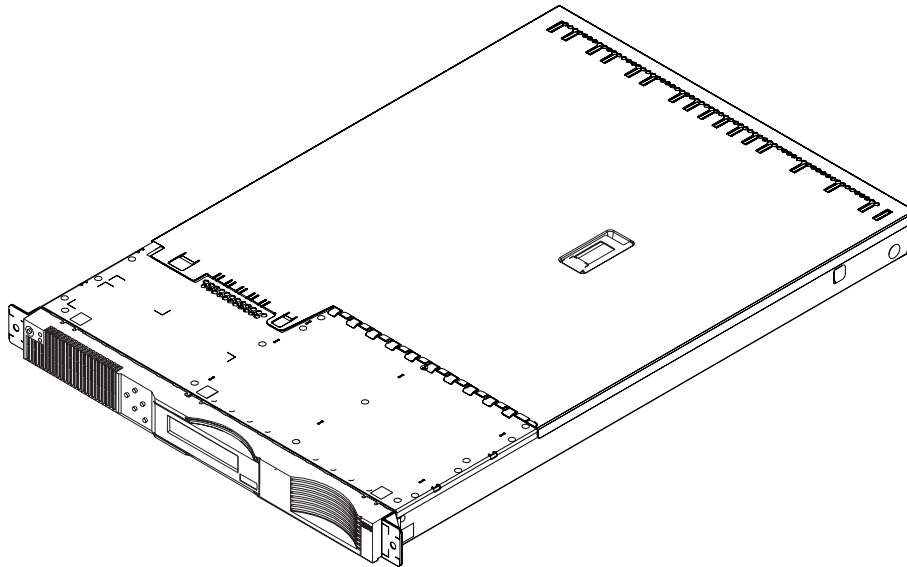


Figure 2. A SAN Volume Controller node

The SAN Volume Controller I/O groups recognize the storage presented to the SAN by the backend controllers as a number of disks known as *managed disks*. The application servers do not recognize these managed disks. Instead they see a number of logical disks, known as *virtual disks*, that are presented to the SAN by the SAN Volume Controller. Each node must be in only one I/O group and provide access to the virtual disks in the I/O group.

The SAN Volume Controller helps to provide continuous operations and can also optimize the data path to ensure performance levels are maintained. Ensure that you use IBM TotalStorage Multiple Device Manager performance manager to analyze the performance statistics. See *IBM TotalStorage Multiple Device Manager Configuration and Installation Guide* and *IBM TotalStorage Multiple Device Manager CLI Guide* for more information.

The fabric contains two distinct zones: a host zone and a disk zone. In the host zone, the host systems can identify and address the nodes. You can have more than one host zone. Generally, you will create one host zone per operating system type. In the disk zone, the nodes can identify the disk drives. Host systems cannot operate on the disk drives directly; all data transfer occurs through the nodes. Figure 3 on page 7 shows that several host systems can be connected to a SAN fabric. A cluster of SAN Volume Controller nodes is connected to the same fabric and presents virtual disks to the host systems. You create these virtual disks from units of space within a managed disk group. A managed disk group is a collection of managed disks presented by the back-end RAID controllers, providing a storage pool. You choose how each group is made up, and you can combine managed disks from different manufacturers' controllers in the same managed disk group if required.

Note: Some operating systems cannot tolerate other operating systems in the same zone.

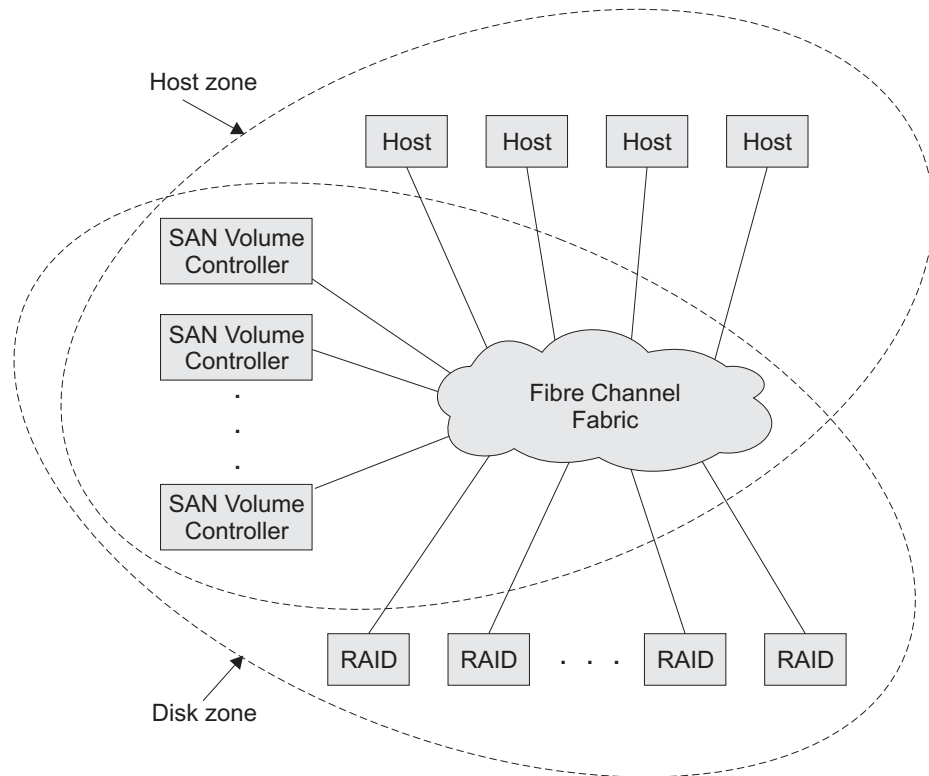


Figure 3. Example of a SAN Volume Controller in a fabric

You can remove one node in each I/O group from a cluster when hardware service or maintenance is required. After you remove the node, you can replace the field replaceable units (FRUs) in the node. All disk drive communication and communication between nodes is performed through the SAN. All SAN Volume Controller configuration and service commands are sent to the cluster through an Ethernet network.

Each node contains its own vital product data (VPD). Each cluster contains VPD that is common to all the nodes on the cluster, and any system connected to the Ethernet network can access this VPD.

Cluster configuration information is stored on every node that is in the cluster to allow concurrent replacement of FRUs. An example of this information might be information that is displayed on the menu screen of the SAN Volume Controller. When a new FRU is installed and when the node is added back into the cluster, configuration information that is required by that node is read from other nodes in the cluster.

SAN Volume Controller operating environment

- Minimum of one pair of SAN Volume Controller nodes
- Minimum of two uninterruptible power supplies
- One master console is required per SAN installation for configuration

Features of a SAN Volume Controller node

- 19-inch rack mounted enclosure
- 4 fibre channel ports
- 2 fibre channel adapters

- 4 GB cache memory

Supported hosts

For a list of supported operating systems, see the IBM TotalStorage SAN Volume Controller Web site at:

<http://www-1.ibm.com/servers/storage/support/virtual/2145.html>

Multipathing software

- IBM Subsystem Device Driver (SDD)
- Redundant Dual Active Controller (RDAC)

Note: Directly-attached hosts that share a back-end storage controller with a SAN Volume Controller can run multipath drivers SDD and RDAC simultaneously. Other multipath drivers running with SDD are not supported.

Check the following Web site for the latest support and coexistence information:

<http://www-1.ibm.com/servers/storage/support/virtual/2145.html>

User interfaces

The SAN Volume Controller provides the following user interfaces:

- IBM TotalStorage SAN Volume Controller Console, a Web-accessible graphical user interface (GUI) that supports flexible and rapid access to storage management information
- A command-line interface (CLI) using Secure Shell (SSH)

Application programming interfaces

The SAN Volume Controller provides the following application programming interface:

- IBM TotalStorage Common Information Model (CIM) Agent for the SAN Volume Controller, which supports the Storage Management Initiative Specification of the Storage Network Industry Association.

Common Information Model Agent for the SAN Volume Controller

The Common Information Model (CIM) Agent for the SAN Volume Controller serves as a configuration interface to the SAN Volume Controller.

It consists of the following main components:

- CIM object manager (CIMOM)
- Service Location Protocol (SLP) Agent
- SAN Volume Controller provider

The SAN Volume Controller Console is configured to locate the CIMOM through its IP address. When the CIMOM is started, it registers itself with the SLP directory service by supplying its IP address, port number, and service type information. With the location information secured, the SAN Volume Controller Console begins to communicate directly with the CIMOM and the SAN Volume Controller provider. The provider knows how to use functionality provided by the SAN Volume Controller upon the requests from the CIMOM.

Validating the truststore certificate expiration

In order to successfully log onto the master console, you must ensure that you have a valid truststore certificate.

When signing onto the master console, you might receive a message similar to the following:

CMMUI8304E The Administrative server is unable to find a valid certificate in the truststore file.

This message is displayed when a certificate in the truststore file expires. The Administrative server uses the certificates in the truststore file to create a secure connection with the CIM agent. Because the Administrative server cannot find a valid certificate for the CIM agent in the truststore file, no authentication can occur.

To resolve the problem, you must verify that the truststore file was created correctly. If you have any problems, contact your service representative.

Perform the following steps to regenerate a truststore certificate:

1. Go to the C:\Program Files\IBM\svccconsole\cimom directory.
2. Double-click on the **mkcertificate.bat** file. A "Generating Certificates" message is displayed. The new certificate is generated and stored in the C:\Program Files\IBM\svccconsole\cimom directory.
3. Copy the truststore file to the following sub directories:

Note: Each directory begins with C:\Program Files\IBM\svccconsole\console\embeddedWAS...

C:\...\config\cells\DefaultNode\applications\
ICAConsole.ear\deployments\ICAConsole\ICAConsole.war\
WEB-INF

C:\...\config\cells\DefaultNode\applications\
SVCConsole.ear\deployments\SVCConsole\SVCConsole.war\
WEB-INF

C:\...\config\installedApps\DefaultNode\
ICAConsole.ear\ICAConsole.war\WEB-INF

C:\...\config\installedApps\DefaultNode\
SVCConsole.ear\SVCConsole.war\WEB-INF

4. Stop and then restart the following applications. The following services are located in **Start ► Settings ► Control Panel ► Administrative Tools ► Component Services**.

- IBM CIM Object Manager
- IBM WebSphere Application Server V5 - SVC

To stop and then restart the services, right-click on the application and select **Stop**, then **Start**.

Note: If the stop command times-out in the IBM WebSphere application, you can restart the master console because this restarts the application, as well.

5. Ensure that both applications are running again. Launch the SAN Volume Controller Console and logon.

Functional views of the Common Information Model Agent

Functional views of the Common Information Model (CIM) Agent object model.

The following topics provide functional views of the Common Information Model (CIM) Agent object model. These diagrams show specific functionality that the CIM Agent provides, including storage configuration service, Copy Services, LUN masking, and security, and illustrate the architecture of the CIM Agent for the SAN Volume Controller.

Profile Overview

The Common Information Model (CIM) Agent for the SAN Volume Controller supports several SMI-S profiles and subprofiles.

Figure 4 on page 11 shows the SMI-S profiles and subprofiles supported.

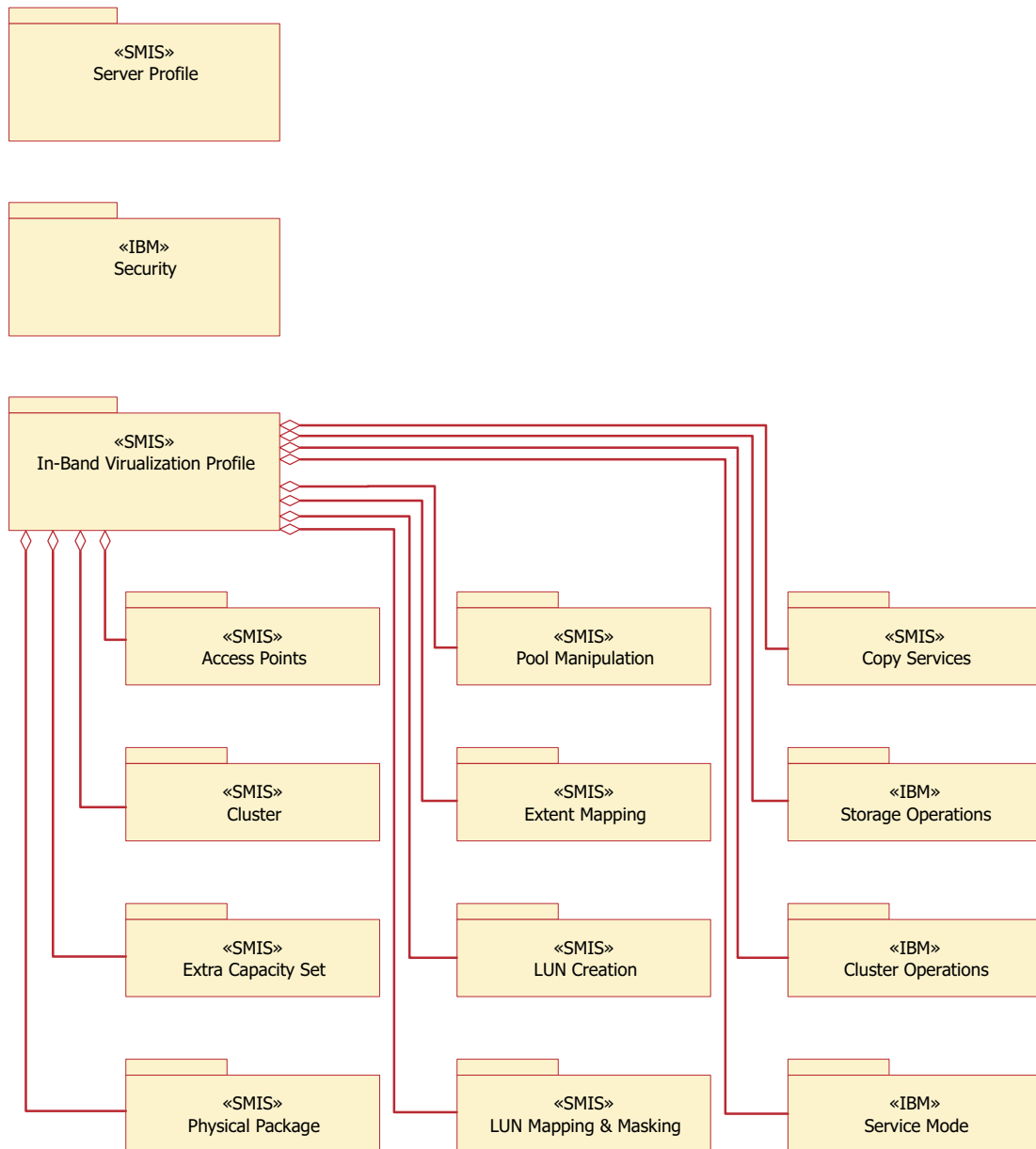


Figure 4. High-level overview of the CIM Agent for the SAN Volume Controller.

Physical Package

The physical package of the Common Information Model (CIM) Agent for the SAN Volume Controller is comprised of three basic classes.

Figure 5 on page 12 shows the basic classes (building blocks) for the model.

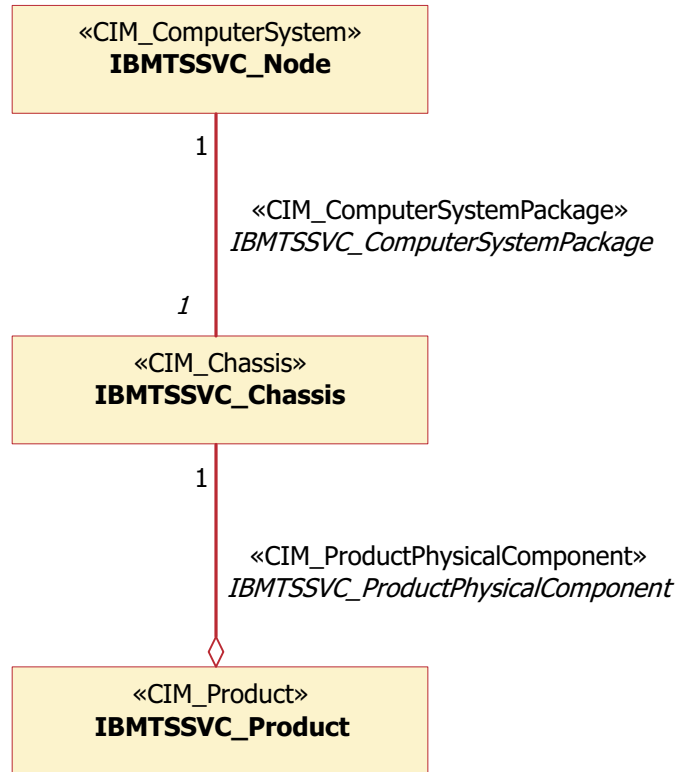


Figure 5. High-level overview of the physical package of the CIM Agent for the SAN Volume Controller.

Server Profile

The server profile of the Common Information Model (CIM) Agent for the SAN Volume Controller is comprised of several basic classes.

Figure 6 on page 13 shows the basic classes (building blocks) for the model.

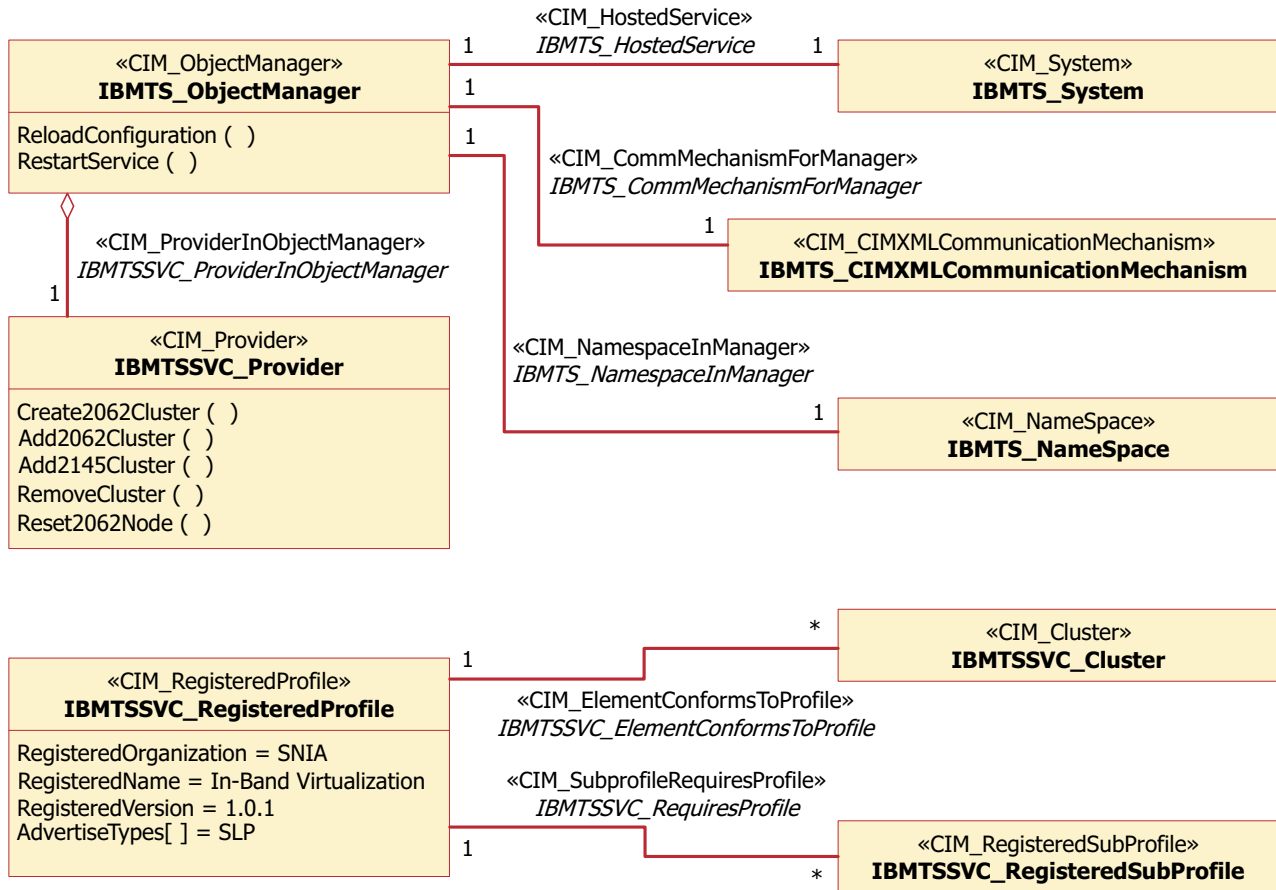


Figure 6. High-level overview of the server profile of the CIM Agent for the SAN Volume Controller.

Extent mapping subprofile

The extent mapping subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller is comprised of several basic classes.

Figure 7 on page 14 shows the basic classes (building blocks) for the model.

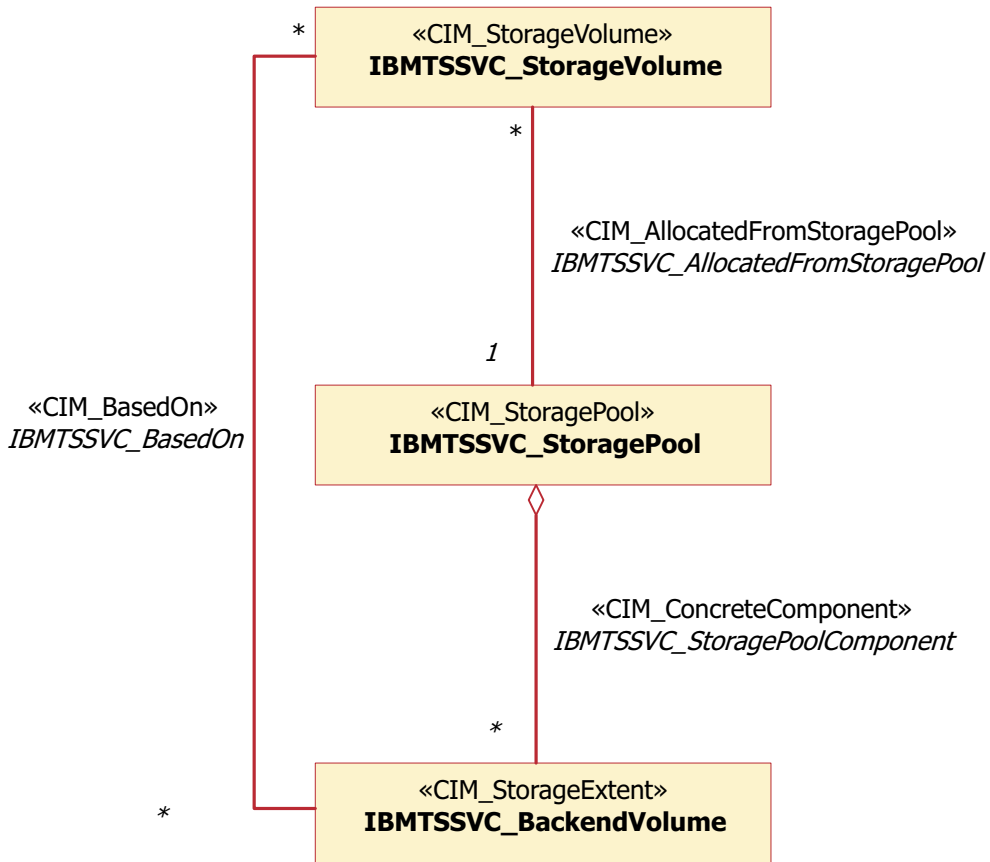


Figure 7. High-level overview of the extent mapping subprofile of the CIM Agent for the SAN Volume Controller.

ExtraCapacitySet subprofile

The ExtraCapacitySet subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller is comprised of several basic classes.

Figure 8 on page 15 shows the basic classes (building blocks) for the model.

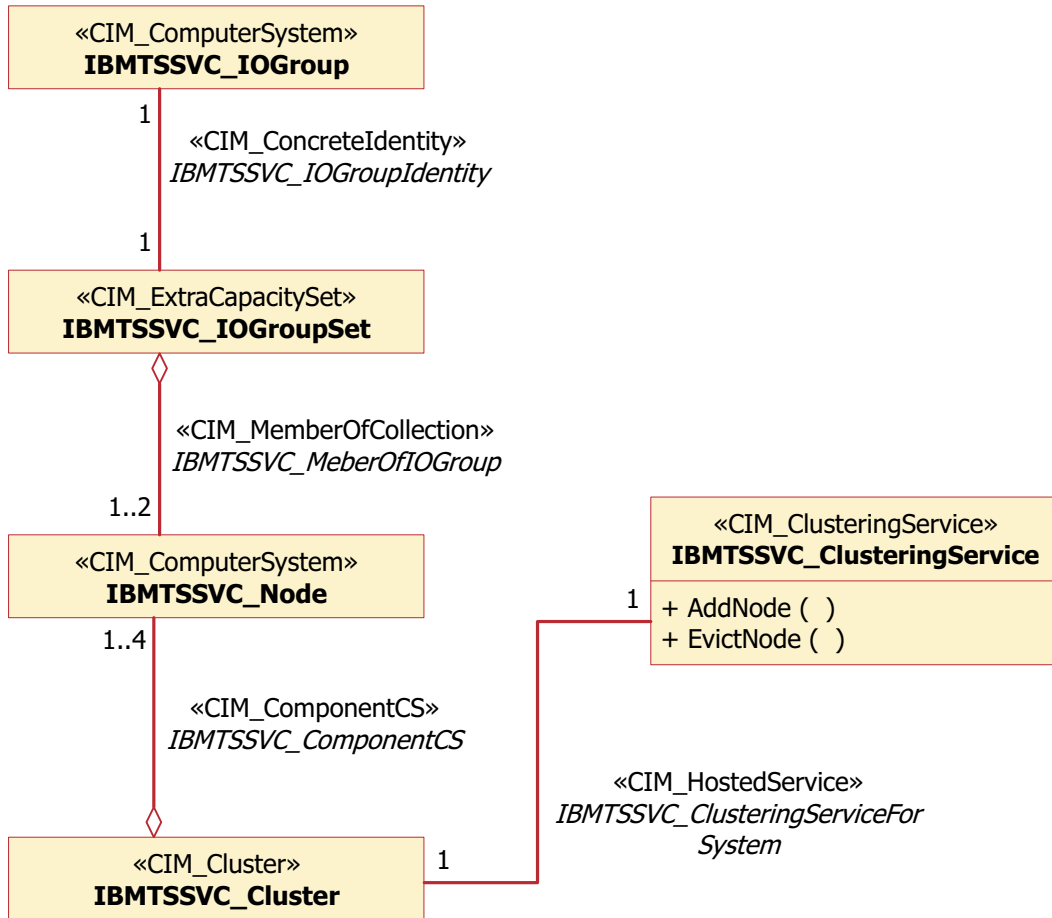


Figure 8. High-level overview of the ExtraCapacitySet subprofile of the CIM Agent for the SAN Volume Controller.

Access point subprofile

The access point subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller is comprised of several basic classes.

Figure 9 on page 16 shows the basic classes (building blocks) for the model.

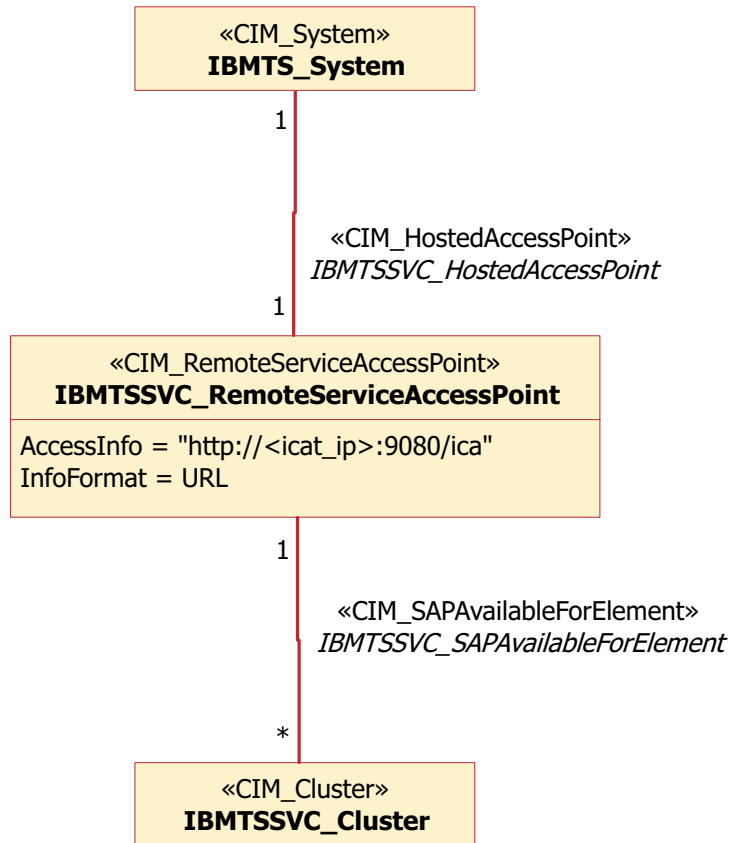


Figure 9. High-level overview of the access point subprofile of the CIM Agent for the SAN Volume Controller.

Cluster subprofile

There are several classes and associations that provide the functionality of a clustering service.

Figure 10 on page 17 shows the classes and associations that are important for providing the functionality of a clustering service.

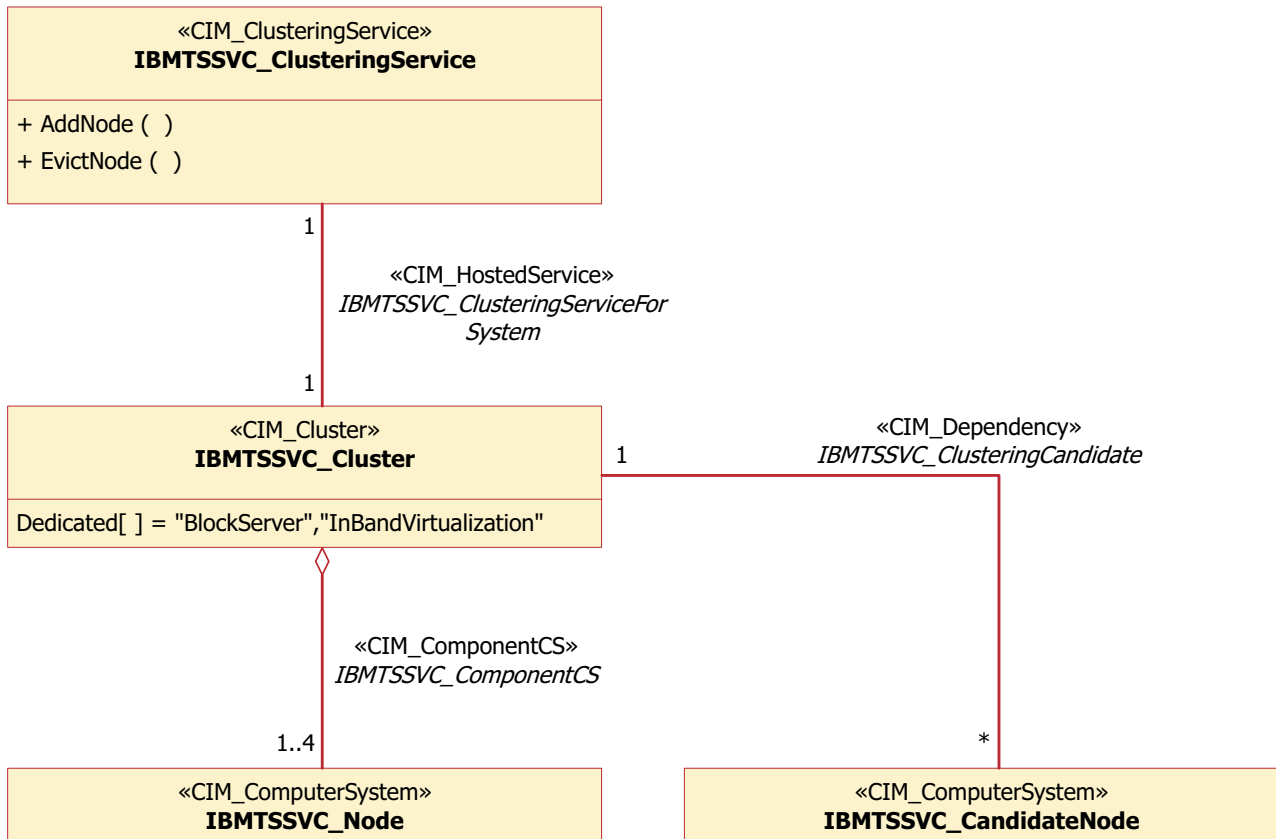


Figure 10. Class diagram of Clustering instance

Vendor-specific storage configuration operations

The StorageConfiguration instance uses several object classes.

Figure 11 on page 18 shows the object classes that are important to implement basic storage configuration.

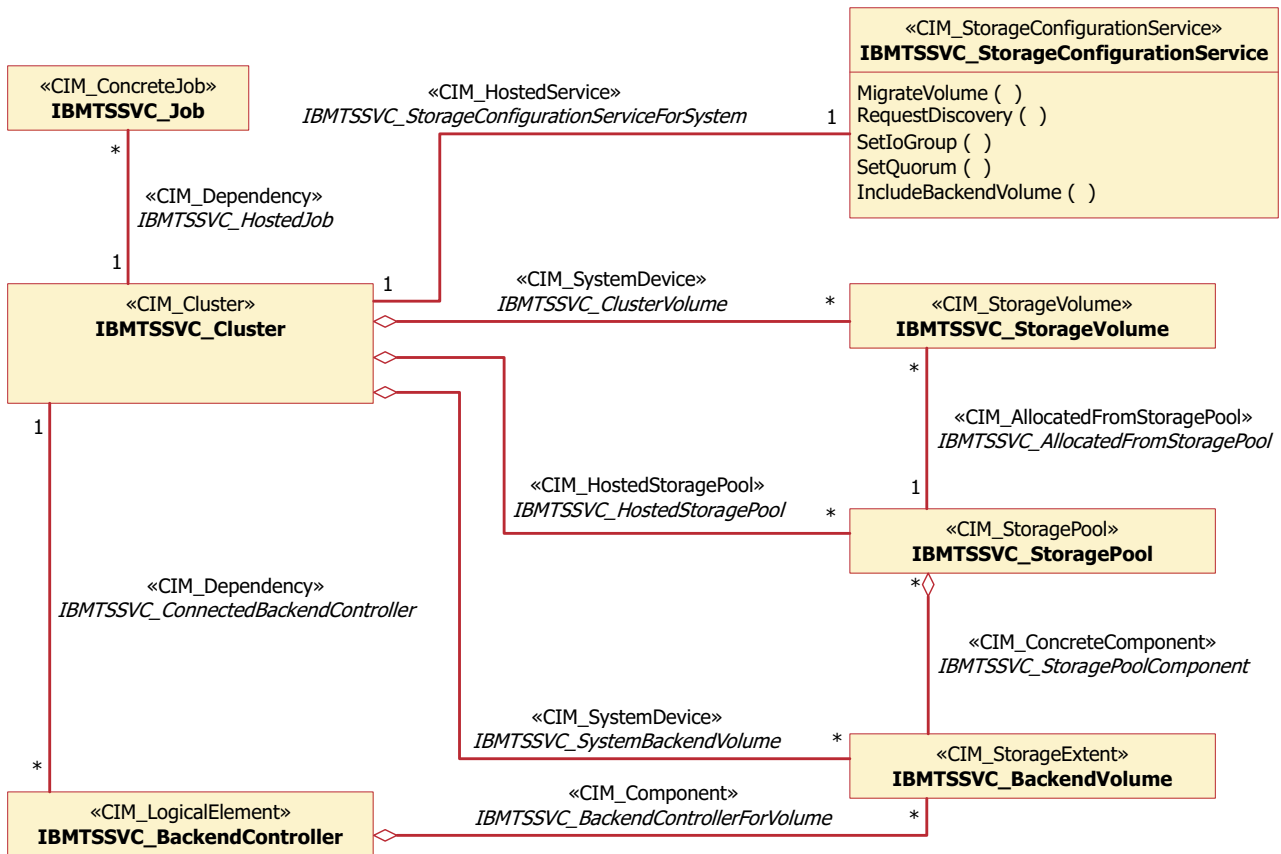


Figure 11. Class diagram of StorageConfiguration instance

LUN masking

A LUN masking instance uses several object classes.

Figure 12 on page 19 shows the object classes that are important to run LUN masking. In the CIM Agent for the SAN Volume Controller, the `IBMTSSVC_StorageHardwareIdManagementService`, `IBMTSSVC_PrivilegeManagementService`, and `IBMTSSVC_ControllerConfigurationService` classes provide the methods to map an `IBMTSSVC_StorageVolume` instance to an `IBMTSSVC_HardwareIdCollection` instance of an `IBMTSSVC_StorageHardwareId` instance.

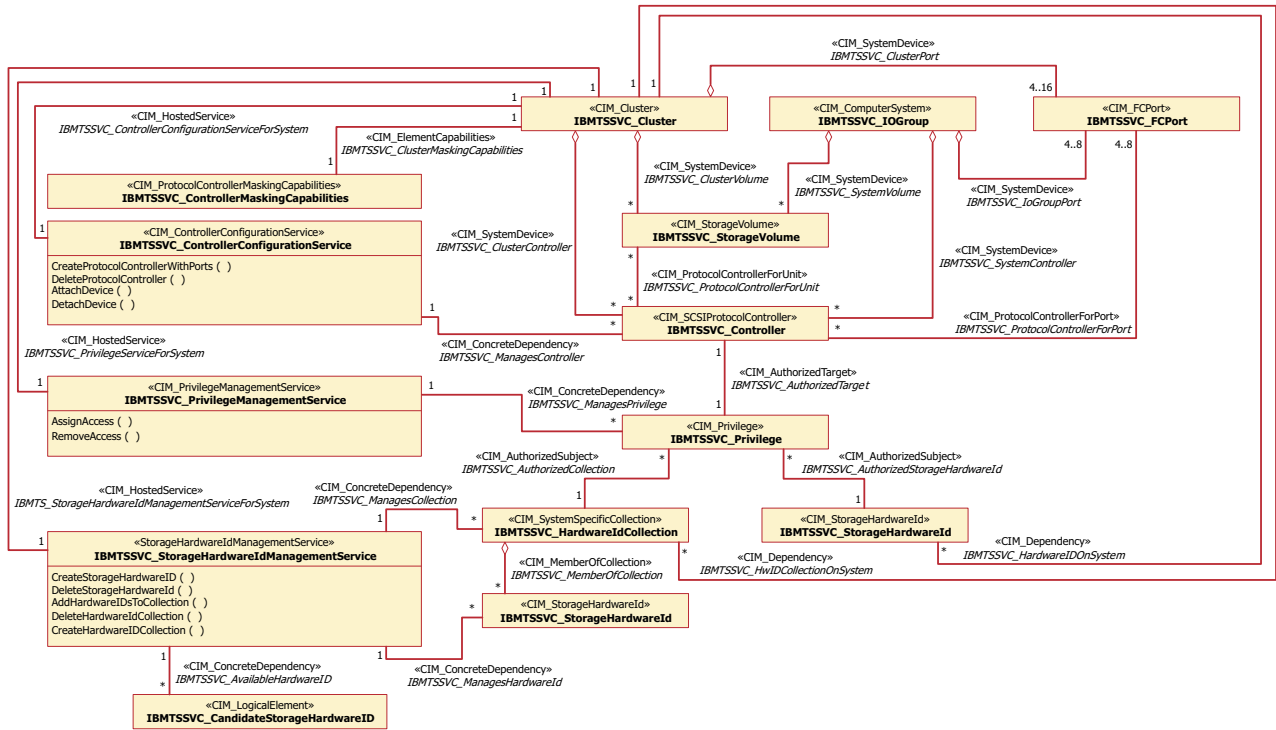


Figure 12. Class diagram for LUN masking instances

Related concepts

“LUN masking” on page 37

The SAN Volume Controller provides logical unit number (LUN) masking capability.

LUN creation subprofile

The LUN creation subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller is comprised of several basic classes.

Figure 13 on page 20 shows the basic classes (building blocks) for the model.

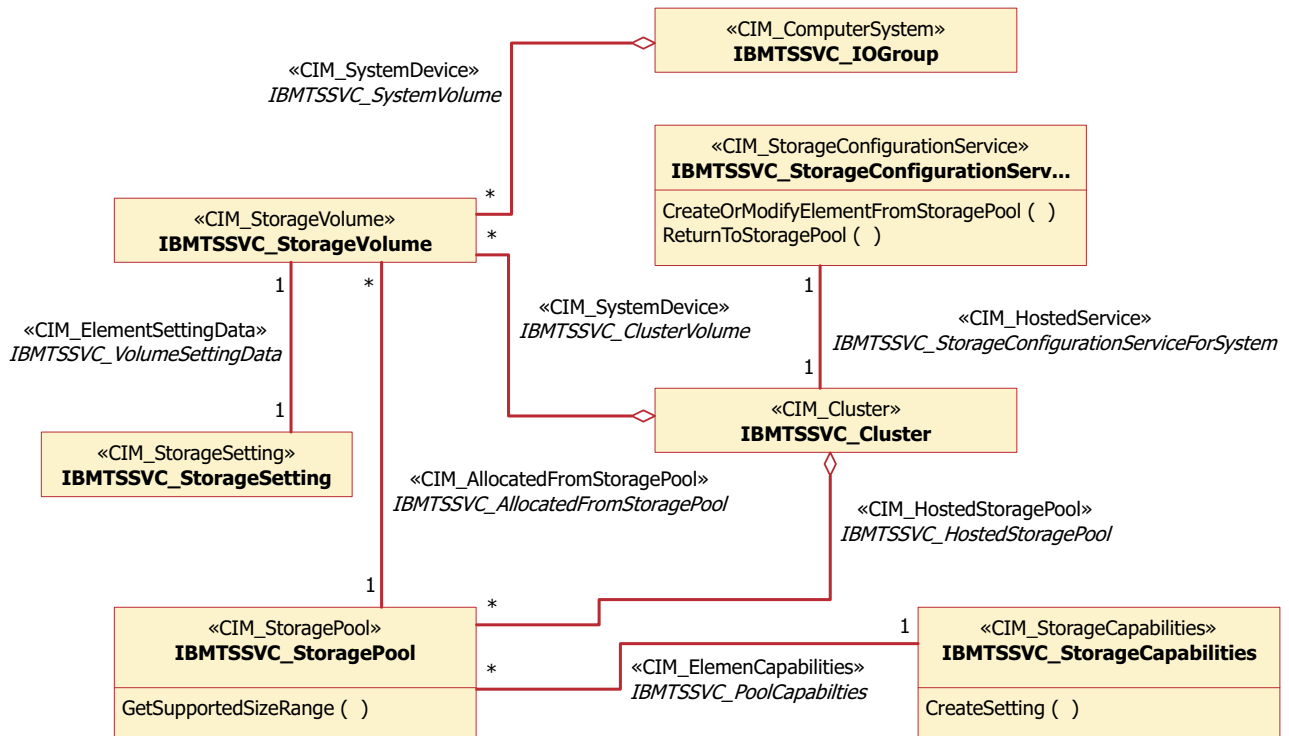


Figure 13. High-level overview of the LUN creation subprofile of the CIM Agent for the SAN Volume Controller.

Copy services

The IBMTSSVC_StorageConfigurationService class provides the methods to create copy relationships.

| Figure 14 on page 21 shows the object classes that are important to provide
 | FlashCopy, Metro Mirror, and synchronous copy services. In the Common
 | Information Model (CIM) Agent for the SAN Volume Controller, the
 | IBMTSSVC_StorageConfigurationService class provides the methods to create copy
 | relationships. An IBMTSSVC_StorageConfigurationService instance is always
 | associated with an IBMTSSVC_Cluster instance.

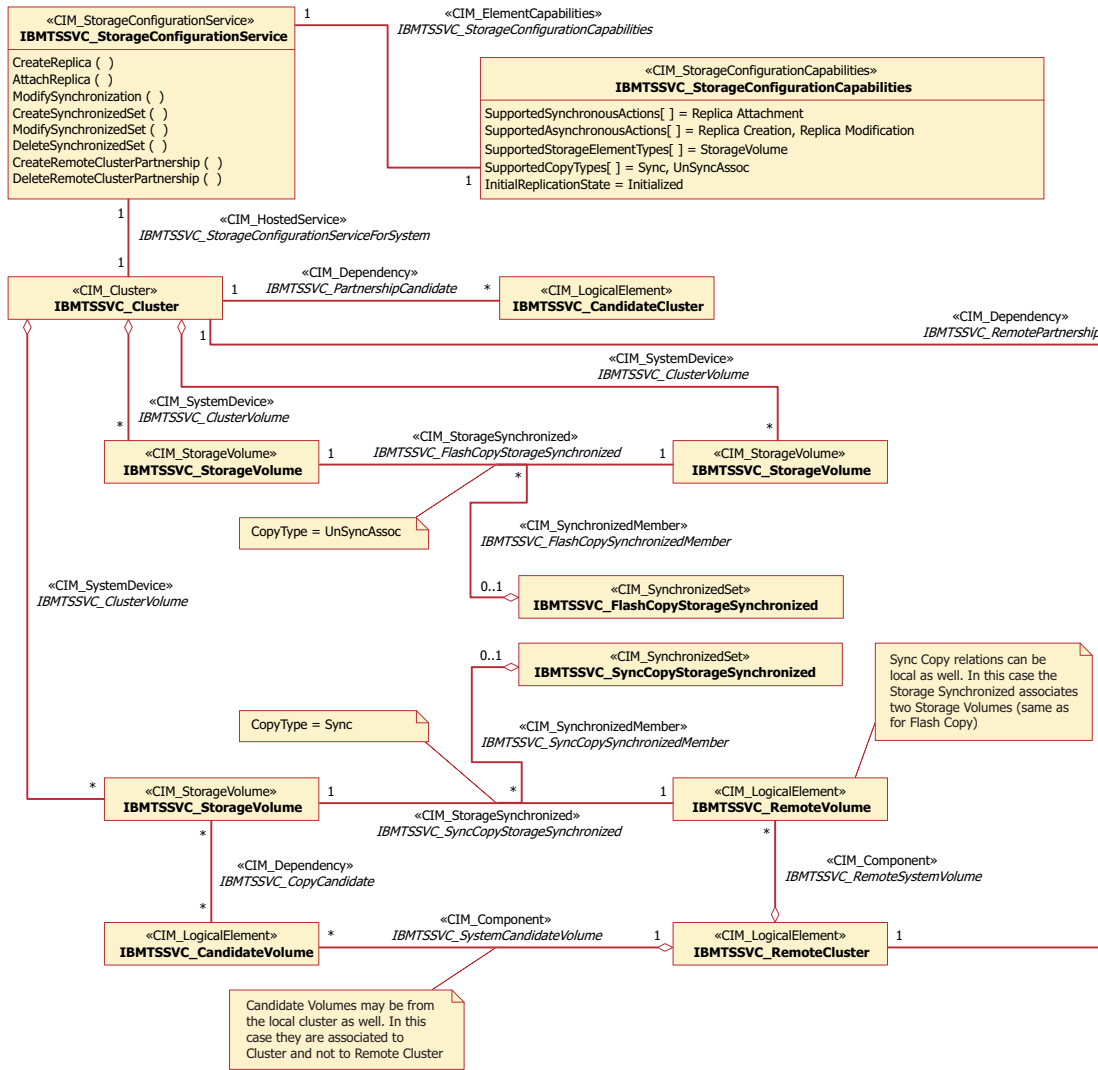


Figure 14. Class diagram of copy services instances

Vendor-specific service mode subprofile

The vendor-specific service mode subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller uses several basic classes.

The service mode subprofile is supported for Blade SAN Volume Controllers (model 2062) only. Figure 15 on page 22 shows the basic classes (building blocks) for the model.

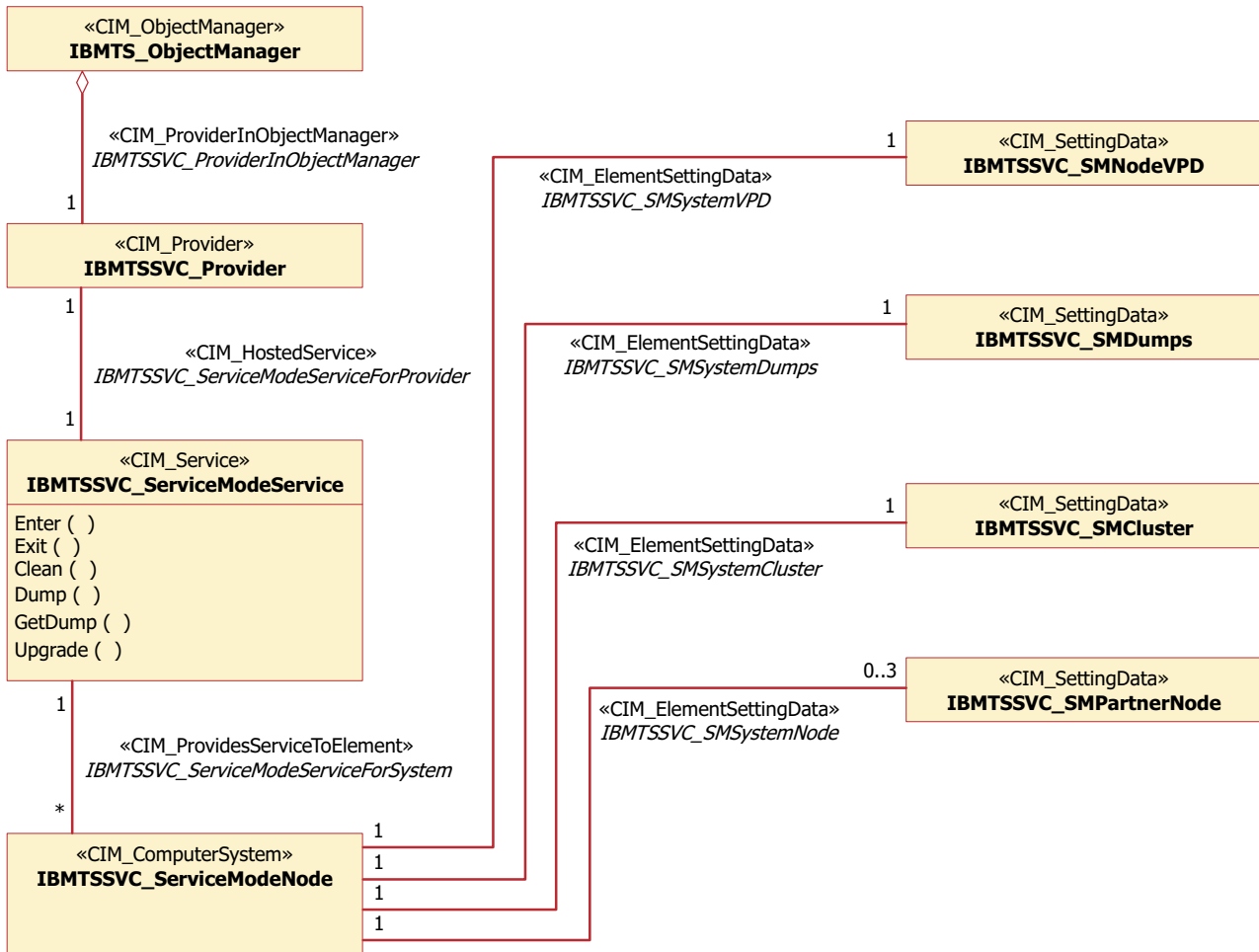


Figure 15. High-level overview of the vendor-specific service mode subprofile of the CIM Agent for the SAN Volume Controller.

Vendor-specific cluster operations

The vendor-specific cluster operations of the Common Information Model (CIM) Agent for the SAN Volume Controller uses several basic classes.

Figure 16 on page 23 shows the basic classes (building blocks) for the model.

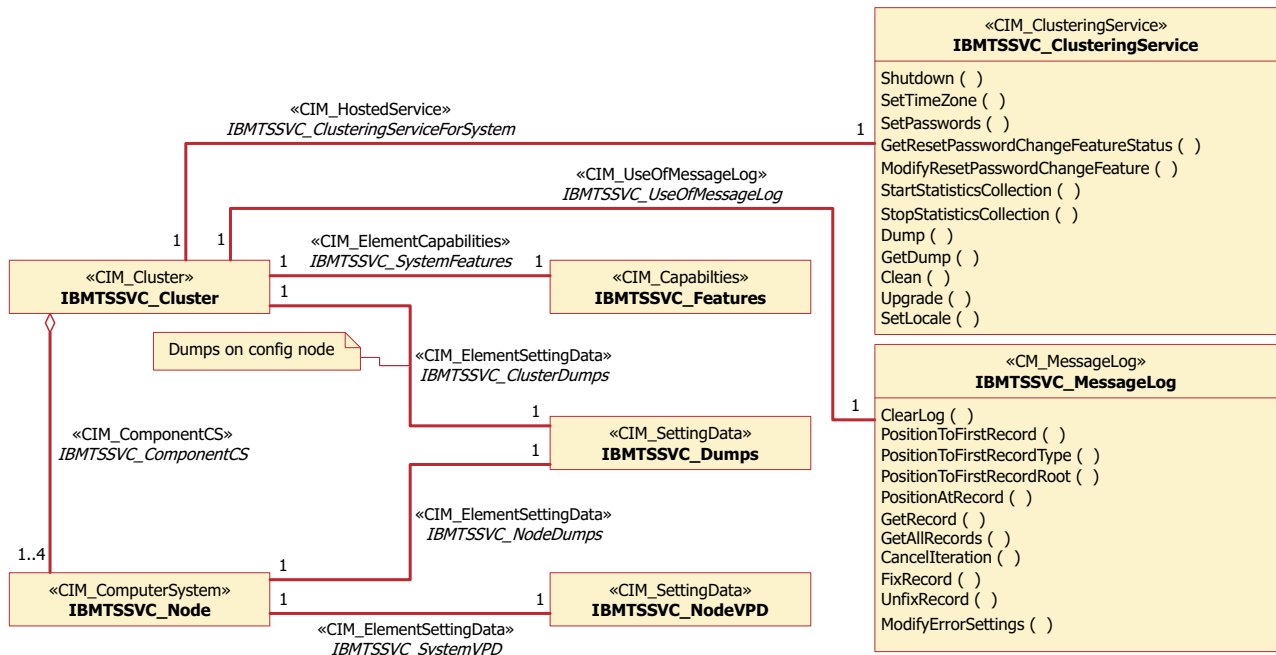


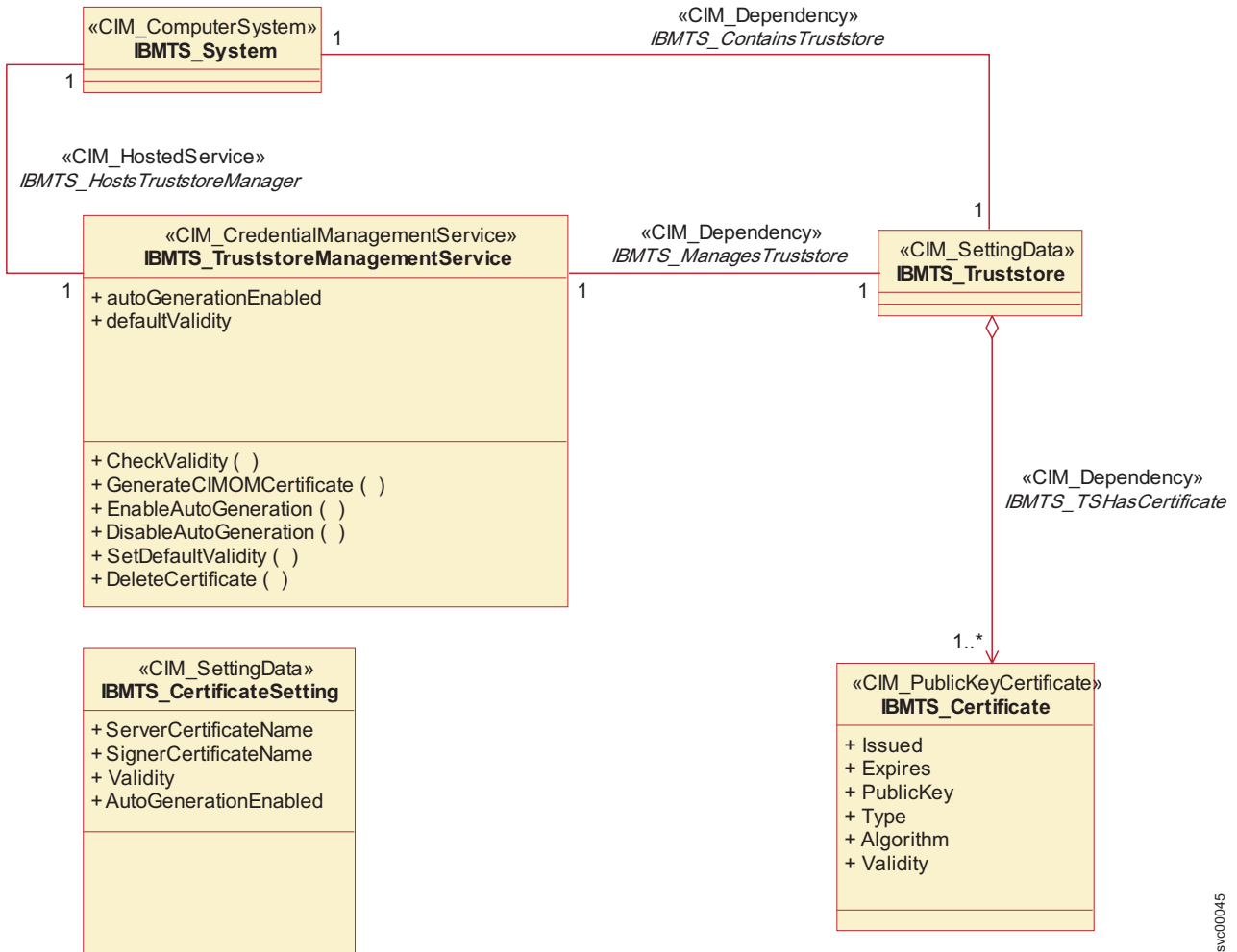
Figure 16. High-level overview of the vendor-specific cluster operations of the CIM Agent for the SAN Volume Controller.

Security service

There are several object classes you can use to manage user accounts and access rights on the Common Information Model Object Manager (CIMOM) and clusters.

- The `IBMTS_AccountManagementService` class provides the methods to create, delete, and modify `IBMTS_Account` instances, that represent a user.
- The `IBMTS_TruststoreManagementService` class generates new server certificates.
- The `IBMTS_AccountOnSystem` class connects an `IBMTS_Account` instance with an `IBMTSSVC_Host` instance.
- The `IBMTS_AccountOnCIMOM` class connects an `IBMTS_Account` instance with the `IBMTS_ObjectManager` instance.
- The `IBMTS_ObjectManager` class represents the actual Common Information Model Object Manager (CIMOM).
- The `IBMTS_Account` class stores the authentication (user name and password) and authorization (global and system roles) information.

Figure 17 on page 24 provides a diagram of these object classes.



svc00045

Figure 17. Class diagram of security instances

Pool Manipulation

You can use several object classes to manipulate storage pools.

Figure 18 on page 25 provides a high-level overview of the object classes you can use for pool manipulation of the CIM Agent for the SAN Volume Controller.

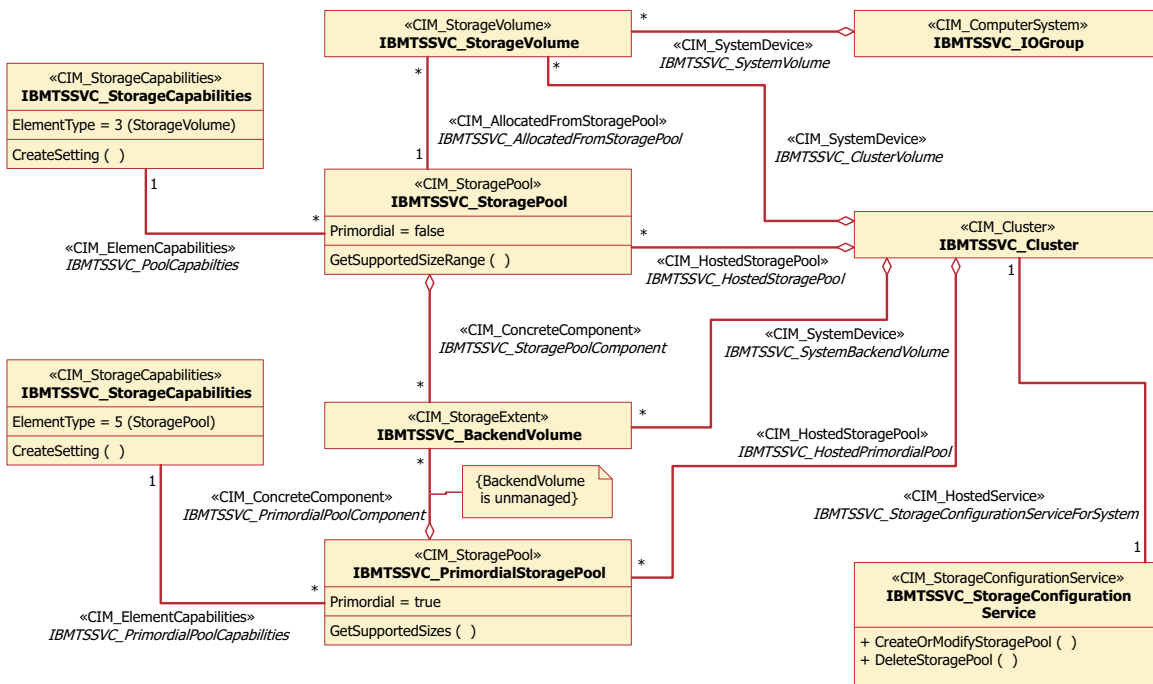


Figure 18. High-level overview of pool manipulation of the CIM Agent for the SAN Volume Controller.

Chapter 2. Performing storage configuration

The following sections describe how to use the Common Information Model (CIM) Agent object class instances to complete basic storage configuration tasks.

The following basic storage configuration tasks are discussed:

- Add a node to a cluster
- Create or modify a storage pool
- Create a storage volume

Storage configuration

Storage configuration refers to the mapping of the back-end storage to the storage pools and the allocation of volumes from the pools.

In the Common Information Model (CIM) Agent for the SAN Volume Controller, storage configuration involves three layers of objects. The objects in the back-end layer contain the back-end controllers and volumes, those in the middle layer contain the storage pools, and those in the front-end layer contain the storage volumes that are exposed to the hosts.

Performing basic storage configuration

The `IBMTSSVC_StorageConfigurationService` class provides the `CreateOrModifyStoragePool()` and `CreateOrModifyElementFromStoragePool()` methods for performing basic storage configuration.

You can use the `CreateOrModifyStoragePool()` method to create an `IBMTSSVC_StoragePool` and add or remove an `IBMTSSVC_BackendVolume`. You can use the `CreateOrModifyElementFromStoragePool()` method to allocate, expand, or shrink an `IBMTSSVC_StorageVolume` from an `IBMTSSVC_StoragePool`.

You must complete the initial setup of the SAN Volume Controller. That means, you have already created and added clusters to the Common Information Model Object Manager (CIMOM) configuration file of the CIM Agent, and as a result, the Common Information Model (CIM) Agent has discovered all the back-end volumes required for the storage configuration.

Perform the following tasks to complete basic storage configuration:

1. Add a node to the cluster.
2. Create a storage pool.
3. Modify the storage pool.
4. Create a storage volume.

Adding a candidate node to a cluster

You can add an `IBMTSSVC_CandidateNode` to an existing `IBMTSSVC_Cluster`.

Perform the following steps to add an `IBMTSSVC_CandidateNode` to an existing `IBMTSSVC_Cluster`:

1. Obtain the reference (`CIMObjectPath`) of the `IBMTSSVC_Cluster` to which you want to add an `IBMTSSVC_CandidateNode`.

2. Locate the `IBMTSSVC_ClusteringService` instance that is associated with the `IBMTSSVC_Cluster` by traversing the `IBMTSSVC_ClusteringServiceForSystem` association.
3. Invoke the `IBMTSSVC_ClusteringService.AddNode()` method while specifying the node and panel names and the references to the `IBMTSSVC_CandidateNode`.

Creating a new storage pool

The `IBMTSSVC_StorageConfigurationService` class provides the methods for creating a new `IBMTSSVC_StoragePool`.

You must include an `IBMTSSVC_StorageConfigurationService` instance in each cluster before you create a new `IBMTSSVC_StoragePool` instance.

Perform the following steps to create a new `IBMTSSVC_StoragePool` instance:

1. Obtain the reference (CIMObjectPath) of an `IBMTSSVC_StorageConfigurationService` instance that is associated with the `IBMTSSVC_Cluster` in which you will create the new storage pool by traversing the `IBMTS_StorageConfigurationServiceForSystem` association.
2. Invoke the `IBMTSSVC_StorageConfigurationService.CreateOrModifyStoragePool` method while specifying the `Extent[]` parameter with a list of `IBMTSSVC_BackendVolume` instances.

The `Extent[]` parameter is a string array that contains the representation of the CIMObjectPath to an `IBMTSSVC_BackendVolume`.

Modifying a storage pool

You can modify an `IBMTSSVC_StoragePool` instance by changing the pool name and adding or removing an `IBMTSSVC_BackendVolume` instance from the pool.

1. Perform the following steps to modify an `IBMTSSVC_StoragePool` instance:
 - a. Select the `IBMTSSVC_StoragePool` instance that you want to modify from an `IBMTSSVC_Cluster`.
 - b. Identify the `IBMTSSVC_StorageSettingPool` instance that contains the parameter settings of the `IBMTSSVC_StoragePool` instance.
 - c. Invoke the `IBMTSSVC_StoragePool.SetProperty()` method to change the name of the selected `IBMTSSVC_StoragePool` instance.
2. If necessary, you can further modify the `IBMTSSVC_StoragePool` by adding or removing an `IBMTSSVC_BackendVolume` instance to the pool:
 - a. Invoke the `IBMTSSVC_StorageSettingPool.CreateOrModifyStoragePool` method while specifying the `Extent[]` parameter with information about the `IBMTSSVC_BackendVolume` to be added or removed from the pool. The `Extent[]` parameter is a string array that contains the representation of the CIMObjectPath to an `IBMTSSVC_BackendVolume`.

BackendVolumes in `Extent[]` that are in the pool will be removed, and BackendVolumes that are not in the pool will be added. Also, you can specify the property `Force of StorageSettingPool` to remove BackendVolumes from the pool even if there is data on these disks. This will trigger the migration process that moves data from the removed volumes to the remaining ones.

Creating a new storage volume

The `IBMTSSVC_StorageConfigurationService` class provides all the methods required for creating, modifying, and deleting an `IBMTSSVC_StorageVolume`.

In the Common Information Model (CIM) Agent for the SAN Volume Controller, the `IBMTSSVC_StorageConfigurationService` class provides all the methods required for creating, modifying, and deleting an `IBMTSSVC_StorageVolume`.

Perform the following steps to create a new `IBMTSSVC_StorageVolume` instance:

1. Obtain the reference (`CIMObjectPath`) of the `IBMTSSVC_StorageConfigurationService` instance that is associated with the `IBMTSSVC_Cluster` to which you will assign the new volume.
2. Invoke the `IBMTSSVC_StorageConfigurationService.CreateOrModifyElementFromStoragePool()` method to create the new `IBMTSSVC_StorageVolume` with the following parameter specifications:
 - a. Set `ElementType` to 2.
 - b. Set `Size` to the desired volume size in megabytes.
 - c. Obtain the reference (`CIMObjectPath`) of the `IBMTSSVC_StoragePool` instance from which you will allocate an `IBMTSSVC_StorageVolume`.
 - d. Set `InPool` to the reference (obtained in the previous step) of the pool from which the volume will be allocated.

Chapter 3. Performing Copy Services

This chapter describes how you can use the Common Information Model Agent object class instances to establish new Copy Services relationships.

It provides step-by-step procedures for you to perform the following Copy Services tasks:

1. “Creating a new FlashCopy relationship between storage volumes”
2. “Creating a FlashCopy relationship for a synchronized set” on page 32
3. “Creating a synchronous copy relationship between volumes in the same cluster” on page 33
4. “Creating a synchronous copy relationship between volumes in different clusters” on page 33

Copy Services

FlashCopy and Metro Mirror are the copy services provided by the SAN Volume Controller.

These copy services are available to all supported hosts that are connected to the SAN Volume Controller.

The FlashCopy service enables you to make an instant, point-in-time copy of a source IBMTSSVC_StorageVolume to a target IBMTSSVC_StorageVolume. The synchronous copy service provides a consistent copy of the source IBMTSSVC_StorageVolume on the target IBMTSSVC_StorageVolume. Data is written to the target volume synchronously after it is written to the source volume, both of which can belong to the same IBMTSSVC_Cluster or different IBMTSSVC_Clusters.

Creating a new FlashCopy relationship between storage volumes

The IBMTSSVC_StorageConfigurationService class provides the methods for establishing a FlashCopy relationship between two IBMTSSVC_StorageVolume instances that are the same size and belong to the same IBMTSSVC_Cluster.

Perform the following steps to create a FlashCopy relationship between two IBMTSSVC_StorageVolume instances:

1. Select an IBMTSSVC_StorageVolume instance as the source volume for the desired FlashCopy relationship.
2. Select an associated IBMTSSVC_CandidateVolume instance as the target volume.

Make sure that the source IBMTSSVC_StorageVolume and target IBMTSSVC_CandidateVolume instances belong to the same IBMTSSVC_Cluster.

3. Retrieve the IBMTSSVC_StorageConfigurationService instance associated with the IBMTSSVC_Cluster to which the selected IBMTSSVC_StorageVolume instances belong.
4. Invoke the IBMTSSVC_StorageConfigurationService.AttachReplica() method with the following parameter specifications:
 - a. Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume.

- b. Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_CandidateVolume.
- c. Optionally set ElementName to the name of the synchronization.
- d. Optionally set BackgroundCopyRate to the desired priority of the background copy rate in percent (0-100%).
- e. Optionally specify Set to add the newly created FlashCopySynchronization to the set. If you specify a null value, the newly created FlashCopySynchronization will not be a member of a synchronized set.
- f. Set CopyType to 4.

The source IBMTSSVC_StorageVolume and target IBMTSSVC_CandidateVolume instances are now connected through the IBMTSSVC_FlashCopyStorageSynchronized association.

Creating a FlashCopy relationship for a synchronized set

The IBMTSSVC_StorageConfigurationService class provides the methods for establishing a FlashCopy relationship between two IBMTSSVC_StorageVolume instances and then adding it to an IBMTSSVC_FlashCopySynchronizedSet.

Perform the following steps to create a FlashCopy relationship between two IBMTSSVC_StorageVolume instances and add it to an IBMTSSVC_FlashCopySynchronizedSet:

1. Select an IBMTSSVC_StorageVolume instance as the source volume for the desired FlashCopy relationship.
2. Select an associated IBMTSSVC_CandidateVolume instance as the target volume.

Make sure that the source IBMTSSVC_StorageVolume and target IBMTSSVC_CandidateVolume instances are the same size.

3. Retrieve the IBMTSSVC_StorageConfigurationService instance associated with the IBMTSSVC_Cluster to which the selected IBMTSSVC_StorageVolume instances belong.
4. Invoke the IBMTSSVC_StorageConfigurationService.AttachReplica() method with the following parameter specifications:
 - a. Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume.
 - b. Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_CandidateVolume.
 - c. Optionally set ElementName to the name of the synchronization.
 - d. Optionally set BackgroundCopyRate to the desired priority of the background copy rate in percent (0-100%).
 - e. Set CopyType to 4.

The source IBMTSSVC_StorageVolume and target IBMTSSVC_CandidateVolume instances are now connected through the IBMTSSVC_FlashCopyStorageSynchronized association.

5. Create an IBMTSSVC_FlashCopySynchronizedSet instance by invoking the IBMTSSVC_StorageConfigurationService.CreateSynchronizedSet() method with the following parameter specifications:
 - a. Set CopyType to 4 (flash).
 - b. Optionally set ElementName to the name of the newly created IBMTSSVC_FlashCopySynchronizedSet.

6. Add the `IBMTSSVC_FlashCopyStorageSynchronized` instance to the `IBMTSSVC_FlashCopySynchronizedSet` by invoking the `IBMTSSVC_StorageConfigurationService.ModifySynchronizedSet()` method with the `Operation` parameter set to 0 (add).

The synchronization must belong to the same cluster as the hosting service.

Creating a synchronous copy relationship between volumes in the same cluster

The `IBMTSSVC_StorageConfigurationService` class provides the methods for creating a synchronous copy relationship between a source `IBMTSSVC_StorageVolume` and a target `IBMTSSVC_StorageVolume` or a source `IBMTSSVC_StorageVolume` and a target `IBMTSSVC_CandidateVolume` in the same `IBMTSSVC_Cluster`.

Perform the following steps to create the synchronous copy relationship:

1. Select an `IBMTSSVC_StorageVolume` instance as the source volume for the desired synchronous copy relationship.
2. Select an `IBMTSSVC_StorageVolume` instance or an `IBMTSSVC_CandidateVolume` instance as the target volume.
3. Obtain the reference (CIMObjectPath) of the `IBMTSSVC_StorageConfigurationService` instance associated with the `IBMTSSVC_Cluster` to which the selected volumes belong.
4. Invoke the `IBMTSSVC_StorageConfigurationService.AttachReplica()` method with the following parameter specifications:
 - a. Set `SourceElement` to the reference (CIMObjectPath) of the source `IBMTSSVC_StorageVolume` instance.
 - b. Set `TargetElement` to the reference (CIMObjectPath) of the target `IBMTSSVC_StorageVolume` or `IBMTSSVC_CandidateVolume` instance.
 - c. Optionally set `ElementName` to the name of the synchronization.
 - d. Set `CopyType` to 3.

The source `IBMTSSVC_StorageVolume` instance and the target `IBMTSSVC_StorageVolume` or `IBMTSSVC_CandidateVolume` instance (whichever you selected) are now connected through the `IBMTSSVC_SyncCopyStorageSynchronized` association.

Creating a synchronous copy relationship between volumes in different clusters

The `IBMTSSVC_StorageConfigurationService` class provides the methods for creating a synchronous copy relationship between a source `IBMTSSVC_StorageVolume` instance and a target `IBMTSSVC_CandidateVolume` instance belonging to different `IBMTSSVC_Cluster` instances.

Perform the following steps to create a synchronous copy relationship between two volumes with the source located in a local cluster and the target located in a remote cluster:

1. Identify an `IBMTSSVC_Cluster` as the source cluster for the desired synchronous copy relationship.

2. Obtain the reference (CIMObjectPath) of the IBMTSSVC_StorageConfigurationService instance associated with the source cluster.
3. Identify the IBMTSSVC_CandidateCluster on which you want the synchronous copy to reside by traversing the IBMTSSVC_ClusterScopeRemoteCluster association.
4. Invoke the IBMTSSVC_StorageConfigurationService.CreateRemoteClusterPartnership() method with the following parameter specifications:
 - a. Set RemoteCluster to the reference (CIMObjectPath) of the IBMTSSVC_CandidateCluster.
 - b. Optionally set Bandwidth to the desired bandwidth in megabytes (MB).
Make sure to issue the method from both the source and candidate clusters to establish a fully configured partnership; otherwise, the synchronous copy relationship cannot be established.
5. Select an IBMTSSVC_StorageVolume as the source volume from the source IBMTSSVC_Cluster.
6. Select an IBMTSSVC_CandidateVolume as the target volume from the IBMTSSVC_RemoteCluster. (IBMTSSVC_StorageVolumes on the remote cluster are seen on the local cluster as IBMTSSVC_CandidateVolumes).
7. Invoke the IBMTSSVC_StorageConfigurationService.AttachReplica() method with the following parameter specifications:
 - a. Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume instance.
 - b. Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_StorageVolume or IBMTSSVC_CandidateVolume instance.
 - c. Optionally set ElementName to the name of the synchronization.
 - d. Set CopyType to 3.

The source IBMTSSVC_StorageVolume instance and the target IBMTSSVC_StorageVolume or IBMTSSVC_CandidateVolume instance (whichever you selected) are now connected through the IBMTSSVC_SyncCopyStorageSynchronized association.

Flash Copy state diagram

The graphic below provides a high-level overview of the Flash Copy state diagram of the Common Information Model (CIM) Agent for the SAN Volume Controller.

Figure 19 on page 35 shows the supported states and transitions for Flash Copy relationships.

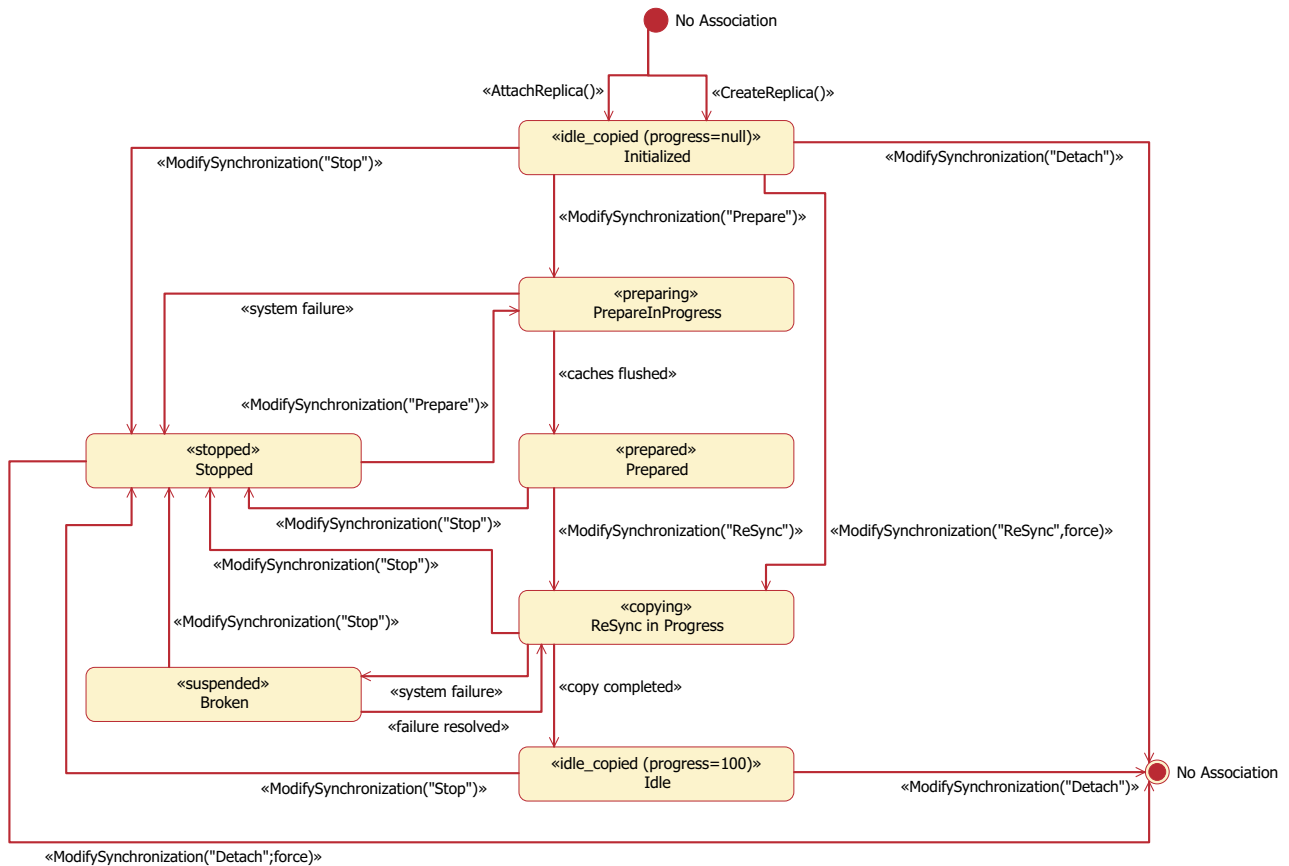


Figure 19. Flash Copy state diagram of the CIM Agent for the SAN Volume Controller.

Sync Copy state diagram

The graphic below provides a high-level overview of the Sync Copy state diagram of the Common Information Model (CIM) Agent for the SAN Volume Controller.

Figure 20 on page 36 shows the supported states and transitions for Flash Copy relationships.

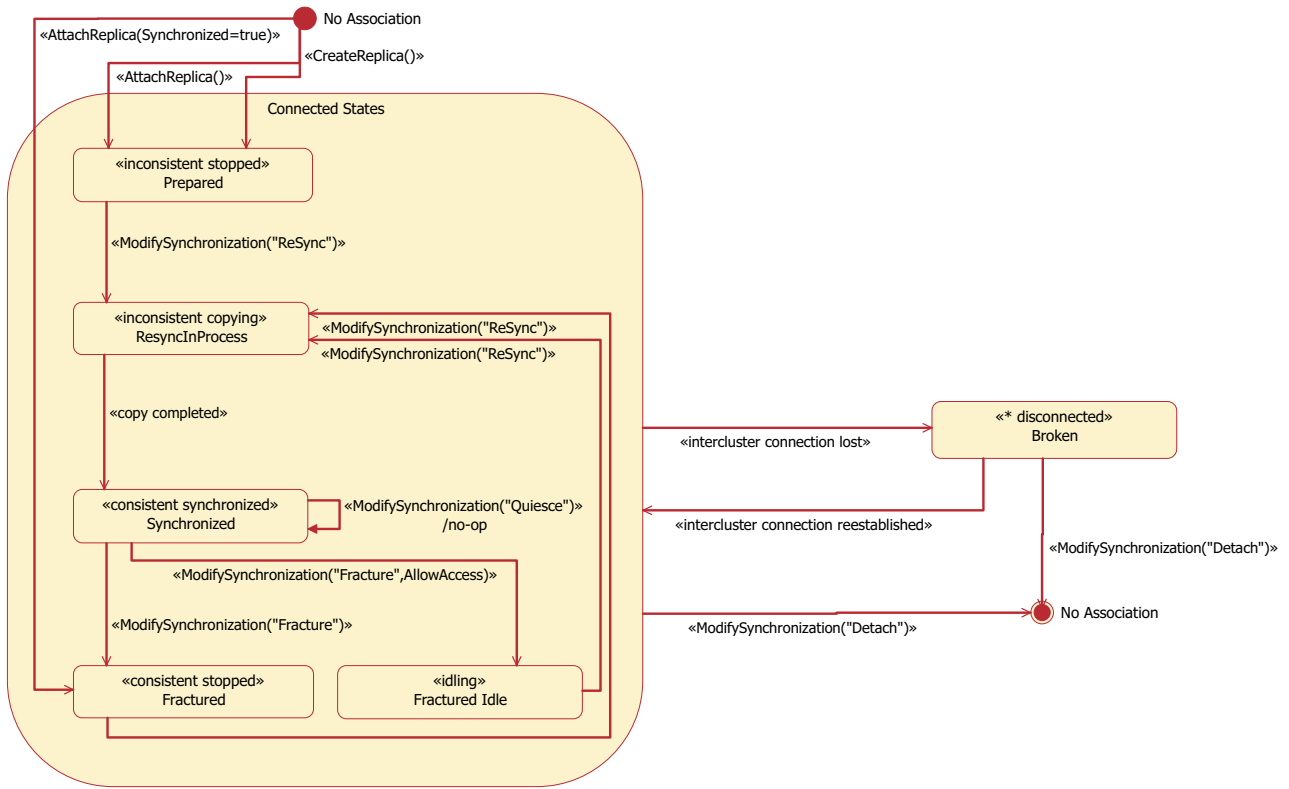


Figure 20. High-level overview of the Sync Copy state diagram of the CIM Agent for the SAN Volume Controller.

Chapter 4. Performing LUN masking

This chapter describes how you can use the CIM Agent object class instances to perform logical unit number (LUN) masking.

LUN masking

The SAN Volume Controller provides logical unit number (LUN) masking capability.

This allows you to associate or dissociate a storage volume with a fibre-based host initiator through the worldwide port numbers (WWPNs).

Performing LUN masking

To perform logical unit number (LUN) masking, you first need a volume to map, which is represented by an instance of `IBMTSSVC_StorageVolume`.

You may map host ports as well as entire hosts to a volume:

- Host = `IBMTSSVC_HardwareIdCollection`
- Port = `IBMTSSVC_StorageHardwareID`

`IBMTSSVC_HardwareIdCollection` aggregates instances of `IBMTSSVC_StorageHardwareID`.

Before performing LUN masking, you need instances of the following services (the cluster is the referenced object). Both are available within a cluster scope (`IBMTSSVC_Cluster`).

- `IBMTSSVC_ControllerConfigurationService` (association `IBMTSSVC_ControllerConfigurationServiceForSystem`)
 - `IBMTSSVC_StorageHardwareIdManagementService` (association `IBMTSSVC_StorageHardwareIdManagementServiceForSystem`)
1. Select an `IBMTSSVC_StorageVolume` (LUN) instance and either an `IBMTSSVC_HardwareIdCollection` (Host) instance or an `IBMTSSVC_StorageHardwareID` (Port) instance (these are associated with each other). The association between the two instances is `IBMTSSVC_MemberOfCollection`.

Note: If you wish to work with the host and host ports, obtain the reference of `IBMTSSVC_StorageHardwareIdManagementService` by traversing either `IBMTSSVC_ManagesCollection` or `IBMTSSVC_ManagesHardwareID`.

2. Obtain the reference (CIMObjectPath) of both instances.
3. Traverse the `IBMTSSVC_SystemVolume` association from the `StorageVolume` to obtain the reference of the scoping `IBMTSSVC_IOGroup`.
4. If starting from `IBMTSSVC_StorageHardwareID`, optionally traverse `IBMTSSVC_HardwareIdCollection` to get the `IBMTSSVC_HardwareIdCollection`. This is necessary in order to check the associated instance of `IBMTSSVC_Privilege` in a later step. It is also possible to directly traverse the association `IBMTSSVC_AuthorizedStorageHardwareId` to get to the associated instance of `IBMTSSVC_Privilege`.
5. Check to see if a controller already exists for the Host. This can be done by traversing the `IBMTSSVC_AuthorizedCollection` to obtain the reference of the `IBMTSSVC_Privilege` instance. If starting from `IBMTSSVC_StorageHardwareID`,

you can traverse the `IBMTSSVC_AuthorizedStorageHardwareID` to obtain the reference of the `IBMTSVC_Privilege` instance. If a controller does not already exist for the Host, a new controller needs to be created using the `ControllerConfigurationService`. A privilege has a 1:1 relation to the controller.

6. If a privilege is already associated, obtain the reference of the `IBMTSSVC_Controller` instance by traversing the association: `IBMTSSVC_AuthorizedTarget`. If there is no controller, see step 11.
7. Check to make sure that the `IOGroup` of the volume (LUN) and the `IOGroup` of the controller are the same.
8. Traverse the `IBMTSSVC_SystemController` association to obtain the reference of the scoping `IOGroup`.
9. Select the Controller which belongs to the same `IOGroup` as the `StorageVolume`.
10. Call the method `AttachDevice()` on that Controller instance. Make sure to set the `Device` parameter to the reference of the `StorageVolume`.
11. If no controller is available, use the `IBMTSSVC_ControllerConfigurationService` to create one. This class offers you a method called `"CreateProtocolControllerWithPorts()"`. In order to invoke this method, you need the `FCPorts` and the `Host`. A more comfortable way to use this method is to use the reference of the `IOGroup` rather than the `FCPorts`. The methods automatically detects the belonging `FCPorts`.

Related reference

`"IBMTSSVC_StorageHardwareIDManagementService"` on page 219
This service provides extrinsic methods to manage `HardwareAccounts` and `Hosts` for the SAN Volume Controller.

Chapter 5. Network considerations

This chapter describes the two methods ICAT uses to publish its services. The CIM Agent service can be published through SLP based discovery. The user interface connection information is published by an instance of the RemoteServiceAccessPoint provided by the CIM Agent.

SLP based discovery

The CIMOM automatically registers its IP address with the SLP; however, you can manually modify the registration.

In an environment with multiple network adapters, the SLP Service Agent might register the CIM Agent with the IP of a network adapter in a different subnet than the management application. As a result, the management application cannot discover the CIM Agent.

The example below illustrates why this occurs:

- The management application runs in subnet A.
- The CIM Agent machine has adapters for subnet A and subnet B.
- Using SLP based discovery, the CIM Agent is registered for subnet B.
- When the management application runs discovery, it detects the CIM Agent SLP registration with the IP of subnet B.
- The management application's connection attempt to the CIM Agent fails because the IP of subnet B cannot be reached from subnet A.

To correct this issue, you can manually register the IP with the SLP. To manually register the IP with the SLP, you must set an attribute within the **cimom.properties** file.

Perform the following steps to set the attribute:

1. Go to the CIM Agent installation directory.
2. Open the cimom.properties file.
3. Find the attribute: `iPToRegisterWithSLP=Off`.

With this attribute set to off, the CIM Agent automatically detects the primary network card.

4. Set `iPToRegisterWithSLP=<Network Adapter's IP Address>`.

This changes the IP address to the correct network adapter and allows the management application to discover the CIM Agent.

RemoteServiceAccessPoint

In an environment with multiple network cards, it might be necessary to manually set the connection data of the RemoteServiceAccessPoint (RSAP).

The `IBMTSSVC_RemoteServiceAccessPoint` class hosts the information necessary for connection to the Web user interface. Management applications can obtain an instance of the RSAP from the CIMOM to launch the user interface through the Web.

You can manually set the connection data of the RSAP. This is helpful in an environment with multiple network cards.

Perform the following steps to set the connection data:

1. Obtain the instance of `IBMSVC_Cluster`.
2. Use the intrinsic method `SetProperty()`, to modify the properties `ConsoleIP` and `ConsolePort`.

The CIM Agent automatically updates the RSAP.

Chapter 6. Using the problem determination tool

This chapter describes the Reliability, Availability and Serviceability (RAS) Problem Determination Collection Tool.

The RAS Problem Determination Collection Tool is a batch file that provides you with a convenient way to collect all of the log and trace files relevant to ICAT problem determination.

The default settings allow you to collect the following files:

- CIM Agent log and trace files.
- User interface log and trace files.
- Installation log files.
- Vital product data text files.

You can change the default settings by editing the properties file that is referenced by the RAS Problem Determination Collection Tool.

Starting the tool

You can start the Reliability, Availability and Serviceability (RAS) Problem Determination Collection Tool using the `collectLogs` batch file. The `collectLogs` batch file allows you to zip all of the log and trace files generated by the ICAT and user interface. You can move the log and trace files to a default location or a location that you specify.

Perform the following steps to start the RAS Problem Determination Collection Tool:

1. Go to the `<CIM Agent installation directory>/svconconsole/cimom/support` directory.
2. Find the batch file name `collectLogs.bat`.
3. The `collectLogs.bat` batch file zips all of the `".log"` files found in the CIM Agent directory and its subdirectories. To run the batch file issue the following command:

```
collectLogs.bat <target directory>
```

Note: If you do not specify a target directory, the zip file is created in the default directory, `<CIM Agent installation directory>/svconconsole/cimom/support`. Target directories that do not exist are created.

4. Verify the zip file `collectedLogs.zip` is created in the target or default directory.

Editing the properties file

The `raspd.properties` file allows you to specify the file extension types that you want the Reliability, Availability and Serviceability (RAS) Problem Determination Collection Tool to collect.

The `raspd.properties` file provides the following information:

- The default location where the zip file is created.
- The location of the CIMOM log files and the file extension types that are collected.

- The location of the user interface log files and the file extension types that are collected.
- The location of the installation log files and the file extension types that are collected.
- The location of the vital product data text files and the file extension types that are collected.

By default only log files for the CIMOM, the user interface and installation are collected. Only text files for the vital product data are collected. You can collect additional file extension types by editing the **raspd.properties** file.

Perform the following steps to edit the **raspd.properties** file:

1. Go to the <CIM Agent installation directory>/svconconsole/cimom/support directory. Find the **raspd.properties** file and open it using a text editor.
2. Find the keys you want to edit and append the additional file extension types. Each entry must be separated by a comma.

Note: The **raspd.properties** file does not need to be edited unless you want to collect additional file extension types.

The following example shows the format for an entry in the **raspd.properties** file on a Windows platform:

```
#Zip file destination
DefaultZipFileDest=C:/<CIM Agent installation directory>/svconconsole/cimom/support
#
#Logfile locations with the file extension types that are to be collected,
appended at the end and SEPARATED by a comma
#
CIMAgentLogDir=C:/<CIM Agent installation directory>/svconconsole/cimom, log, txt
```

Chapter 7. CIM Agent object classes

Object classes are the building blocks of the CIM Agent and provide functionality such as storage configuration, Copy Services, and LUN masking.

Core object classes

The following section describes the CIM Agent's core classes and their properties for the SAN Volume Controller.

IBMTSSVC_BackendController

The IBMTSSVC_BackendController class extends the CIM_SCSIController class.

Properties

The IBMTSSVC_BackendController class represents a RAID adapter on the back end of the SAN Volume Controller. The adapters control the IBMTSSVC_BackendVolumes that the SAN Volume Controller uses to store data. The IBMTSSVC_BackendController class extends the CIM_SCSIController class and has the properties shown in Table 1.

Table 1. IBMTSSVC_BackendController properties

Property	Type	Qualifier	Description
AccessGranted	Boolean	ModelCorrespondence (CIM_Controller. AuthorizationView)	Unsupported property.

Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description																																												
AdditionalAvailability	Uint16[]	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_Managed SystemElement. OperationalStatus CIM_Enabled LogicalElement.EnabledStatus) ModelCorrespondence (CIM_LogicalDevice.Availability)	Additional availability and status of the device, beyond that specified in the Availability property. <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>Unknown</td></tr> <tr><td>3</td><td>Running/ Full Power</td></tr> <tr><td>4</td><td>Warning</td></tr> <tr><td>5</td><td>In Test</td></tr> <tr><td>6</td><td>N/A</td></tr> <tr><td>7</td><td>Power Off</td></tr> <tr><td>8</td><td>Off Line</td></tr> <tr><td>9</td><td>Off Duty</td></tr> <tr><td>10</td><td>Degraded</td></tr> <tr><td>11</td><td>Not Installed</td></tr> <tr><td>12</td><td>Install Error</td></tr> <tr><td>13</td><td>Power Save - Unknown</td></tr> <tr><td>14</td><td>Power Save - Low Power Mode</td></tr> <tr><td>15</td><td>Power Save - Standby</td></tr> <tr><td>16</td><td>Power Cycle</td></tr> <tr><td>17</td><td>Power Save - Warning</td></tr> <tr><td>18</td><td>Paused</td></tr> <tr><td>19</td><td>Not Ready</td></tr> <tr><td>20</td><td>Not Configured</td></tr> <tr><td>21</td><td>Quiesced</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	Unknown	3	Running/ Full Power	4	Warning	5	In Test	6	N/A	7	Power Off	8	Off Line	9	Off Duty	10	Degraded	11	Not Installed	12	Install Error	13	Power Save - Unknown	14	Power Save - Low Power Mode	15	Power Save - Standby	16	Power Cycle	17	Power Save - Warning	18	Paused	19	Not Ready	20	Not Configured	21	Quiesced
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Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
Availability	Uint16	Deprecated(CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledStatus), ModelCorrespondence (CIM_LogicalDevice.AdditionalAvailability), Expensive(TRUE)	The primary availability and status of the device. Code Semantics 1 Other 2 Unknown 3 Running/ Full Power 4 Warning 5 In Test 6 N/A 7 Power Off 8 Off Line 9 Off Duty 10 Degraded 11 Not Installed 12 Install Error 13 Power Save - Unknown 14 Power Save - Low Power Mode 15 Power Save - Standby 16 Power Cycle 17 Power Save - Warning 18 Paused 19 Not Ready 20 Not Configured 21 Quiesced
Caption	String	MaxLen(64)	Unsupported property.
Controlled	Boolean		Unsupported property.
CreationClassName	String	MaxLen(256)	The name of the class or subclass used to create an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
DeviceID	String	MaxLen(64)	An address or other identifying information to uniquely name the LogicalDevice.
Description	String		A textual description of the object.
Element Name	String		Unsupported property.

Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled 3 Disabled 5 N/A 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>Integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 N/A 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
ErrorCleared	Boolean	Deprecated (CIM_ManagedSystemElement)	Unsupported property.
ErrorDescription	String	Deprecated (CIM_DeviceErrorData.ErrorDescription)	Unsupported property.

Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description																																								
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	An array of free-form strings providing explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.																																								
InstallDate	Date-time		Unsupported property.																																								
LastErrorCode	UInt32	Deprecated(CIM_DeviceError.Data.LastErrorCode)	Unsupported property.																																								
MaxQuiesceTime	UInt64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.																																								
Name	String	MaxLen(1024), Write(TRUE), WriteRole(Administrator)	The unique label, in the context of the hosting system, by which the controller is known.																																								
Operational Status	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions), Expensive(TRUE)	Indicates the current status of the element. <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType (Indexed), ModelCorrespondence (CIM_LogicalDevice.IdentifyingDescriptions)	Captures additional data, beyond DeviceID information, that could be used to identify a LogicalDevice. For example, you can use this property to hold the OperatingSystem's user-friendly name for the device.
PowerManagementCapabilities	Uint16[]	Deprecated(CIM_PowerManagementCapabilities.PowerCapabilities)	An enumerated array that describes the power management capabilities of the device. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagementCapabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Automatically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported
PowerManagementSupported	Boolean	Deprecated(CIM_PowerManagementCapabilities)	Indicates that the device can be power-managed.
PowerOnHours	Uint64	Deprecated(CIM_PoweredStatisticalData.PowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
ProductIdHigh	String		The higher part of the controller's product id.
ProductIdLow	String		The lower part of the controller's product id.

Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
ProductRevision	String	Expensive(TRUE)	The controller's product revision.
ProductSerial Number	String		The controller's product serial number.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration indicator. This property is provided to compare Requested and current Enabledstatus. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed.</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shut Down</p> <p>5 No Change</p> <p>6 Offline</p> <p>7 Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement. OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
StatusInfo	Uint16	Deprecated (CIM_EnabledLogical Element.EnabledState)	<p>The state (enabled or disabled) of the Logical Device. Since this property does not apply to the Controller, the value "Not Applicable" is always reported.</p> <p>Code Semantics</p> <p>1 Other</p> <p>2 Unknown</p> <p>3 Enabled</p> <p>4 Disabled</p> <p>5 Not Applicable</p>
SystemCreation ClassName	String	Propagated (CIM_System.Creation ClassName), MaxLen(256)	The scoping system's CreationClassName.

Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastStateChange	Date-time		Unsupported property.
TotalPowerOnHours	Uint64	Deprecated (CIM_PoweredStatisticalData.TotalPowerOnHours), Units (Hours), Counter(TRUE)	Unsupported property.
VendorID	String		The ID of the controller's vendor.
VolumeLinkCount	Uint32	Expensive(TRUE)	The number of links to the BackendVolumes.
VolumeMaxLinkCount	Uint32	Expensive(TRUE)	The maximum number of links to the BackendVolumes.
WWNN	String	Expensive(TRUE)	The worldwide network name (WWNN) of the controller.
Wwpn	String[]	ModelCorrespondence (IBMTSSVC_BackendController.WwpnPathCount), Expensive(TRUE)	The WWPN of the controller.
WwpnMaxPathCount	Uint64[]	ModelCorrespondence (IBMTSSVC_BackendController.Wwpn), Expensive(TRUE)	The maximum path count to the corresponding WWPN.
WwpnPathCount	Uint64[]	ModelCorrespondence (IBMTSSVC_BackendController.Wwpn), Expensive(TRUE)	The path count to the corresponding WWPN.

IBMTSSVC_BackendVolume

The IBMTSSVC_BackendVolume class represents a SCSI LUN that a storage controller in the fibre-channel SAN exposes to the SAN Volume Controller.

Properties

The IBMTSSVC_BackendVolume class extends the CIM_StorageExtent class and has the properties shown in Table 2.

Table 2. IBMTSSVC_BackendVolume properties

Property	Type	Qualifier	Description												
Access	Uint16		<p>The access levels, as defined below:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Readable</td> </tr> <tr> <td>2</td> <td>Writeable</td> </tr> <tr> <td>3</td> <td>Read/Write Supported</td> </tr> <tr> <td>4</td> <td>Write Once</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Readable	2	Writeable	3	Read/Write Supported	4	Write Once
Code	Semantics														
0	Unknown														
1	Readable														
2	Writeable														
3	Read/Write Supported														
4	Write Once														

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
Additional Availability	Uint16[]	ModelCorrespondence (CIM_LogicalDevice.Availability)	<p>The availability and status of the device in addition to what is specified in the Availability property. The Availability property denotes the primary status and availability of the device. In cases where this will not be sufficient to denote the complete status of the device, the AdditionalAvailability property provides further information.</p> <p>Code Semantics</p> <p>1 Other</p> <p>2 Unknown</p> <p>3 Running/Full Power</p> <p>4 Warning</p> <p>5 In Test</p> <p>6 Not Applicable</p> <p>7 Power Off</p> <p>8 Off Line</p> <p>9 Off Duty</p> <p>10 Degraded</p> <p>11 Not Installed</p> <p>12 Install Error</p> <p>13 Power Save - Unknown</p> <p>14 Power Save - Low Power Mode</p> <p>15 Power Save - Standby</p> <p>16 Power Cycle</p> <p>17 Power Save - Warning</p> <p>18 Paused</p> <p>19 Not Ready</p> <p>20 Not Configured</p> <p>21 Quiesced</p>

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
Availability	Uint16	Deprecated(CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState) ModelCorrespondence (CIM_LogicalDevice.AdditionalAvailability)	The primary availability and status of the device. Code Semantics 1 Other 2 Unknown 3 Running/Full Power 4 Warning 5 In Test 6 Not Applicable 7 Power Off 8 Off Line 9 Off Duty 10 Degraded 11 Not Installed 12 Install Error 13 Power Save - Unknown 14 Power Save - Low Power Mode 15 Power Save - Standby 16 Power Cycle 17 Power Save - Warning 18 Paused 19 Not Ready 20 Not Configured 21 Quiesced
BlockSize	Uint64	Units(bytes), Expensive(TRUE)	The size (bytes) of the blocks that form this StorageExtent. If variable block size, then the maximum block size in bytes must be specified. If the block size is unknown or if a block concept is not valid, enter a 1.
Capacity	Uint64	Units(Bytes)	The total capacity of the BackendVolume.
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short (one-line string) textual description of the object.
CreationClassName	String	MaxLen(256)	The name of the class or subclass used to create an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description												
ConsumableBlocks	UInt64	Expensive(TRUE)	The maximum number of blocks, of size BlockSize, that are available for consumption when layering StorageExtents using the BasedOn association.												
ControllerName	String		The name of the volume's backend controller.												
DataOrganization	UInt16		The type of data organization techniques: <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Other</td> </tr> <tr> <td>1</td> <td>Unknown</td> </tr> <tr> <td>2</td> <td>Fixed Block</td> </tr> <tr> <td>3</td> <td>Variable Block</td> </tr> <tr> <td>4</td> <td>Count Key Data</td> </tr> </tbody> </table>	Code	Semantics	0	Other	1	Unknown	2	Fixed Block	3	Variable Block	4	Count Key Data
Code	Semantics														
0	Other														
1	Unknown														
2	Fixed Block														
3	Variable Block														
4	Count Key Data														
DataRedundancy	UInt16	ModelCorrespondence (CIM_StorageSetting. DataRedundancyGoal CIM_StorageSetting. DataRedundancyMax CIM_StorageSetting. DataRedundancyMin)	The number of complete copies of data maintained.												
DeltaReservation	UInt8	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageSetting. DeltaReservationGoal CIM_StorageSetting. DeltaReservationMax CIM_StorageSetting. DeltaReservationMin)	The current value for the Delta reservation.												
Description	String		A textual description of the object.												
DeviceID	String	MaxLen(64)	The ID of the BackendVolume. A numerical value which is unique inside the BackendVolume class only.												
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The BackendVolume's user-friendly name												

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration that indicates if the element is currently shutting down or is in an enabled or disabled state.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
ErrorCleared	Boolean	Deprecated(CIM_ManagedSystemElement.OperationalStatus)	Unsupported property.
ErrorDescription	String	Deprecated(CIM_DeviceErrorData.ErrorDescription)	Unsupported property.
ErrorMethodology	String		Unsupported property.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
ExtentStatus	Uint16[]		<p>Records status information in addition to what is captured in the Availability and StatusInfo properties, inherited from ManagedSystemElement.</p> <p>Code Semantics</p> <p>0 Other</p> <p>1 Unknown</p> <p>2 None/Not Applicable</p> <p>3 Broken</p> <p>4 Data Lost</p> <p>5 Dynamic Reconfig</p> <p>6 Exposed</p> <p>7 Fractionally Exposed</p> <p>8 Partially Exposed</p> <p>9 Protection Disabled</p> <p>10 Reaying</p> <p>11 Rebuild</p> <p>12 Recalculate</p> <p>13 Spare in Use</p> <p>14 Verify In Progress</p> <p>15..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.Other IdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo which is located in the same index.
InstallDate	Date-time		Unsupported property.
IsBasedOn Underlying Redundancy	Boolean		If set to true, indicates that the underlying StorageExtent participates in a StorageRedundancy Group.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
LastErrorCode	Uint32	Deprecated(CIM_Device ErrorData.LastErrorCode)	Unsupported property.
MaxPathCount	Uint32	Counter(TRUE), Expensive(TRUE)	The maximum fibre-channel path count to the BackendVolume.
MaxQuiesceTime	Uint64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.
Mode	Uint32	ValueMap, Values	The mode of the BackendVolume: Code Semantics 0 Unmanaged 1 Router restricted 2 Managed 3 Image 4 for future use 5 for future use 6 Router config 7 Remote copy 8 for future use
Name	String	MaxLen(1024)	The unique label by which the object is known.
NativeStatus	Uint16		The back-end volume's native operational status. Code Semantics 0 Offline 1 Online 2 Degraded 3 Excluded
NoSinglePointOfFailure	Boolean	ModelCorrespondence (CIM_StorageSetting. NoSinglePointOfFailure)	Indicates if the no-single-point-of-failure feature exists.
NumberOfBlocks	Uint64	Expensive(TRUE)	The total number of logically contiguous blocks that form the extent. The total size of the extent can be calculated by multiplying BlockSize by NumberOfBlocks. If the BlockSize is 1, this property is the total size of the extent.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The status of the volume. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled or disabled state when EnabledStatus is set to 1. The state is NULL when EnabledStatus is set to a value other than 1.
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions), Expensive(TRUE)	Captures additional data, beyond DeviceID information, that could be used to identify a LogicalDevice. For example, you can hold the OperatingSystem's user-friendly name for the device in this property.
Package Redundancy	Uint16	ModelCorrespondence (CIM_StorageSetting. PackageRedundancyGoal CIM_StorageSetting.Package RedundancyMax CIM_StorageSetting. PackageRedundancyMin)	The number of disk spindles that can fail without data loss.
PathCount	Uint32	Counter(TRUE), Expensive(TRUE)	The current counts of fibre-channel paths to the BackendVolume.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
PoolID	String		The identifier of the associated storage pool.
PoolName	String		The name of the associated storage pool.
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	<p>An enumerated array that describes the power management capabilities of the device. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class must be used.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Not Supported</p> <p>2 Disabled</p> <p>3 Enabled</p> <p>4 Power Saving Modes Entered Automatically</p> <p>5 Power State Settable</p> <p>6 Power Cycling Supported</p> <p>7 Timed Power On Supported</p>
PowerManagement Supported	Boolean	Deprecated (CIM_PowerManagement Capabilities)	Indicates that the device can be power-managed. The use of this property is deprecated. Instead, the existence of an associated PowerManagement Capabilities class (associated using the ElementCapabilities relationship) indicates that power management is supported.
PowerOnHours	Uint64	Deprecated (CIM_PoweredStatistical Data.PowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
Primordial	Boolean		If true, this property indicates that the containing system does not have the ability to create or delete this operational element.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
Purpose	String		A free form string that describes the media and/or its use.
QuorumIndex	Uint8	Expensive(TRUE)	The quorum index of the BackendVolume; valid indexes are 0, 1, 2 while an index of 3 indicates that this volume is not used as a quorum disk.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	<p>An Integer enumeration indicator. This property is provided to compare Requested and current Enabledstatus. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed.</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shut Down</p> <p>5 No Change</p> <p>6 Offline</p> <p>7 Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
SequentialAccess	Boolean		If set to true, indicates that the storage is sequentially accessed by a MediaAccessDevice. A TapePartition is an example of a sequentially accessed StorageExtent. StorageVolumes, DiskPartitions and LogicalDisks are examples of randomly accessed extents.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
StatusInfo	Uint16	Deprecated (CIM_EnabledLogicalElement.EnabledState)	Deprecated property. Code Semantics 1 Other 2 Unknown 3 Enabled 4 Disabled 5 Not Applicable
SystemCreationClassName	String	Propagated, Key, MaxLen(256)	The scoping system's CreationClassName.
SystemName	String	Propagated, Key, MaxLen(256)	The scoping cluster's IP address.
TimeOfLastStateChange	Date-time		Unsupported property.
TotalPowerOnHours	Uint64	Deprecated (CIM_PoweredStatisticalData.TotalPowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.

IBMTSSVC_CandidateCluster

The IBMTSSVC_CandidateCluster class extends the CIM_LogicalElement class.

Properties

The IBMTSSVC_CandidateCluster class represents other IBMTSSVC_Cluster instances that are visible in the fibre-channel SAN and potential candidates for creating a synchronous copy partnership. The IBMTSSVC_CandidateCluster class extends the CIM_LogicalElement class and has the properties shown in Table 3.

Table 3. IBMTSSVC_CandidateCluster properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String		The name of the cluster.
InstallDate	Date-time		Unsupported property.
IsConfigured	Boolean		The partnership configuration state.

Table 3. IBMTSSVC_CandidateCluster properties (continued)

Property	Type	Qualifier	Description
Name	String	MaxLen(1024)	The label by which the object is known. Format: cluster_ip: candidate_id
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The current status of the element.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").

IBMTSSVC_CandidateNode

The IBMTSSVC_CandidateNode class extends the CIM_ComputerSystem class.

Properties

The IBMTSSVC_CandidateNode class represents a single SAN Volume Controller node in a fibre-channel SAN that is not a member of a cluster, but is available to be a member. The IBMTSSVC_CandidateNode class extends the CIM_ComputerSystem class and has the properties shown in Table 4.

Table 4. IBMTSSVC_CandidateNode properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the ComputerSystem is a special-purpose system (dedicated to a particular use), or a general purpose system.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Not Dedicated</td></tr> <tr><td>1</td><td>Unknown</td></tr> <tr><td>2</td><td>Other</td></tr> <tr><td>3</td><td>Storage</td></tr> <tr><td>4</td><td>Router</td></tr> <tr><td>5</td><td>Switch</td></tr> <tr><td>6</td><td>Layer 3 Switch</td></tr> <tr><td>7</td><td>Central Office Switch</td></tr> <tr><td>8</td><td>Hub</td></tr> <tr><td>9</td><td>Access Server</td></tr> <tr><td>10</td><td>Firewall</td></tr> <tr><td>11</td><td>Print</td></tr> <tr><td>12</td><td>I/O</td></tr> <tr><td>13</td><td>Web Caching Management</td></tr> <tr><td>14</td><td>Block Server</td></tr> <tr><td>15</td><td>File Server</td></tr> <tr><td>16</td><td>Mobile User Device</td></tr> <tr><td>17</td><td>Repeater</td></tr> <tr><td>18</td><td>Bridge/Extender</td></tr> <tr><td>19</td><td>Gateway</td></tr> <tr><td>20</td><td>Gateway</td></tr> </tbody> </table>	Code	Semantics	0	Not Dedicated	1	Unknown	2	Other	3	Storage	4	Router	5	Switch	6	Layer 3 Switch	7	Central Office Switch	8	Hub	9	Access Server	10	Firewall	11	Print	12	I/O	13	Web Caching Management	14	Block Server	15	File Server	16	Mobile User Device	17	Repeater	18	Bridge/Extender	19	Gateway	20	Gateway
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6	Layer 3 Switch																																														
7	Central Office Switch																																														
8	Hub																																														
9	Access Server																																														
10	Firewall																																														
11	Print																																														
12	I/O																																														
13	Web Caching Management																																														
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17	Repeater																																														
18	Bridge/Extender																																														
19	Gateway																																														
20	Gateway																																														
Description	String		A textual description of the object.																																												
ElementName	String		A user-friendly name for the object.																																												

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration that indicates if the element is currently shutting down (value = 4), or in an enabled (value = 2) or disabled (value = 3) state.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>

Table 4. *IBMTSSVC_CandidateNode* properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.
InstallDate	Date-time		Unsupported property.
Name	String	MaxLen(256)	The label by which the object is known. Format: cluster_ip:node_id.
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated, using a heuristic. The heuristic is outlined, in detail, in the CIM V2 System Model specification.

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>Indicates the current status(es) of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. Dedicated)	Describes how or why the system is dedicated when the Dedicated array includes the value 2, "Other".																																								
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	Describes the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																								

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. IdentifyingDescriptions)	Captures additional data, beyond System Name information, that can be used to identify a ComputerSystem. For example, you can use the Fibre Channel World-Wide Name (WWN) of a node to identify the ComputerSystem. If only the Fibre Channel name is available and is unique (able to be used as the System key), then this property would be NULL and the WWN becomes the System key. The WWN's data is then placed in the Name property.
PowerManagementCapabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	An enumerated array that describes the power management capabilities of the ComputerSystem. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Automatically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported
PrimaryOwnerContact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwnerName	String	MaxLen(64), Write(TRUE)	Unsupported property.

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	An integer enumeration that indicates if the element must be shut down (value = 4), enabled (2), disabled (3), taken offline (6) or tested (7) at the next opportunity. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
ResetCapability	Uint16		If enabled, the ComputerSystem can be reset through hardware (e.g. the power and reset buttons). If disabled, hardware reset is not allowed. Code Semantics 1 Other 2 Unknown 3 Disabled 4 Enabled 5 Not Implemented
Roles	String[]	Write(TRUE)	Unsupported property.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Date- time		Unsupported property.

IBMTSSVC_CandidateStorageHardwareID

The IBMTSSVC_CandidateStorageHardwareID extends the CIM_LogicalElement class.

Properties

The IBMTSSVC_CandidateStorageHardwareID extends the CIM_LogicalElement class and has the properties shown in Table 5.

Table 5. IBMTSSVC_CandidateStorageHardwareID properties

Property	Type	Qualifier	Description																																												
Caption	String	MaxLen(64)	Unsupported property.																																												
Description	String		A textual description of the object.																																												
ElementName	String		Unsupported property.																																												
InstallDate	Datetime		Indicates when the object was installed. A lack of a value does not indicate that the object is not installed.																																												
Name	String	MaxLen(1024)	The label by which the object is known. When subclassed, the Name property can be overridden to be a key property.																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The current status of the element.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000..</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode	..	DMTF Reserved	0x8000..	Vendor Reserved
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Table 5. IBMTSSVC_CandidateStorageHardwareID properties (continued)

Property	Type	Qualifier	Description
Status	String	Deprecated (CIM_ManagedSystem Element.OperationalStatus), MaxLen(10)	The current status of the object.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	The various OperationalStatus array values.
StorageID	String	ModelCorrespondence (CIM_StorageHardware ID.IDType)	The unique ID of the candidate port.
SystemName	String		The IP address of the candidate HWID's cluster.

IBMTSSVC_CandidateVolume

The IBMTSSVC_CandidateVolume class represents a potential volume for a synchronous copy relationship.

Properties

The IBMTSSVC_CandidateVolume class extends the CIM_LogicalElement class and has the properties shown in Table 6.

Table 6. IBMTSSVC_CandidateVolume properties

Property	Type	Qualifier	Description
AuxClusterID	String		The ID of this volume's cluster.
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.
ElementName	String		A user-friendly name for the object.
InstallDate	Datetime		Unsupported property.
Name	String	MaxLen(1024)	The label by which the object is known.

Table 6. IBMTSSVC_CandidateVolume properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The current status of the element. Various health and operational statuses are defined. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
SourceVolumeID	String		The ID of the potential master StorageVolume.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
SystemName	String		The IP address of the scoping cluster.

IBMTSSVC_Chassis

The IBMTSSVC_Chassis class represents the physical frame that contains other elements and provides definable functionality for a product.

Properties

The IBMTSSVC_Chassis class extends the CIM_Chassis class and has the properties shown in Table 7 on page 71.

Table 7. IBMTSSVC_Chassis properties

Property	Type	Qualifier	Description																																																										
AudibleAlarm	Boolean		Indicates if the Frame is equipped with an audible alarm.																																																										
BreachDescription	String	ModelCorrespondence (CIM_PhysicalFrame.SecurityBreach)	Unsupported property.																																																										
CableManagementStrategy	String		Unsupported property.																																																										
CanBeFRUed	Boolean		Unsupported property.																																																										
Caption	String	MaxLen(64)	A short textual description (one-line String) of the object.																																																										
ChassisPackageType	Uint16	Experimental(TRUE), ModelCorrespondence (CIM_Chassis.ChassisTypeDescription)	<p>The physical form factor for the type of Chassis.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>SMBIOS Reserved</td></tr> <tr><td>3</td><td>Desktop</td></tr> <tr><td>4</td><td>Low Profile Desktop</td></tr> <tr><td>5</td><td>Pizza Box</td></tr> <tr><td>6</td><td>Mini Tower</td></tr> <tr><td>7</td><td>Tower</td></tr> <tr><td>8</td><td>Portable</td></tr> <tr><td>9</td><td>LapTop</td></tr> <tr><td>10</td><td>Notebook</td></tr> <tr><td>11</td><td>Hand Held</td></tr> <tr><td>12</td><td>Docking Station</td></tr> <tr><td>13</td><td>All in One</td></tr> <tr><td>14</td><td>Sub Notebook</td></tr> <tr><td>15</td><td>Space-Saving</td></tr> <tr><td>16</td><td>Lunch Box</td></tr> <tr><td>17</td><td>Main System Chassis</td></tr> <tr><td>18</td><td>Expansion Chassis</td></tr> <tr><td>19</td><td>SubChassis</td></tr> <tr><td>20</td><td>Bus Expansion Chassis</td></tr> <tr><td>21</td><td>Peripheral Chassis</td></tr> <tr><td>22</td><td>Storage Chassis</td></tr> <tr><td>23</td><td>SMBIOS Reseved</td></tr> <tr><td>24</td><td>Sealed-Case PC</td></tr> <tr><td>25</td><td>SMBIOS Reserved</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000..0xFFFF</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	SMBIOS Reserved	3	Desktop	4	Low Profile Desktop	5	Pizza Box	6	Mini Tower	7	Tower	8	Portable	9	LapTop	10	Notebook	11	Hand Held	12	Docking Station	13	All in One	14	Sub Notebook	15	Space-Saving	16	Lunch Box	17	Main System Chassis	18	Expansion Chassis	19	SubChassis	20	Bus Expansion Chassis	21	Peripheral Chassis	22	Storage Chassis	23	SMBIOS Reseved	24	Sealed-Case PC	25	SMBIOS Reserved	..	DMTF Reserved	0x8000..0xFFFF	Vendor Reserved
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Table 7. IBMTSSVC_Chassis properties (continued)

Property	Type	Qualifier	Description
ChassisType Description	String	Experimental(TRUE), ModelCorrespondence (CIM_Chassis.Chassis PackageType)	Provides more information on the ChassisPackageType.
ChassisTypes	Uint16[]	Deprecated (CIM_Chassis.Chassis PackageType CIM_Chassis.Multiple SystemSupport), ArrayType(Indexed), ModelCorrespondence (CIM_Chassis.Type Descriptions)	An enumerated, integer-valued array that indicates the type of Chassis. Code Semantics 1 Other 2 Unknown 3 Desktop 4 Low Profile Desktop 5 Pizza Box 6 Mini Tower 7 Tower 8 Portable 9 LapTop 10 Notebook 11 Hand Held 12 Docking Station 13 All in One 14 Sub-Notebook 15 Space-Saving 16 Lunch Box 17 Main System Chassis 18 Expansion Chassis 19 SubChassis 20 Bus Expansion Chassis 21 Peripheral Chassis 22 Storage Chassis 23 Rack Mount Chassis 24 Sealed-Case PC 25 Multi-system Chassis
CreationClassName	String	MaxLen(256)	The name of the class or subclass used in the creation of an instance. When used with the other key properties of this class, this allows all instances of this class and its subclasses to be uniquely identified.
CurrentRequired OrProduced	Uint16	Units(Amps at 120 Volts)	Unsupported property.
Depth	Real32	Units(Inches)	The depth of the PhysicalPackage in inches.

Table 7. IBMTSSVC_Chassis properties (continued)

Property	Type	Qualifier	Description
Description	String		A textual description of the object.
ElementName	String		The Chassis' user-friendly name.
HeatGeneration	Uint16	Units(BTU per Hour)	Unsupported property.
Height	Real32	Units(Inches)	The height of the PhysicalPackage in inches.
HotSwappable	Boolean	Deprecated(PhysicalPackage. RemovalConditions)	A PhysicalPackage is HotSwappable if it is possible to replace the element with a physically different but equivalent element while the containing Package has power applied to it.
InstallDate	Date-time		Unsupported property.
IsLocked	Boolean		Unsupported property.
LockPresent	Boolean		Indicates if the Frame is protected with a lock.
ManufactureDate	Date-time		Unsupported property.
Manufacturer	String	MaxLen(256)	The name of the organization responsible for producing the PhysicalElement. This may be the entity from whom the element is purchased, but this is not necessarily true. The latter information is contained in the Vendor property of CIM_Product.
Model	String	MaxLen(256)	The name by which the PhysicalElement is generally known.
MultipleSystem Support	Uint16	Experimental(TRUE)	Indicates if the Chassis supports multiple systems. An example is the support of server blades. Code Semantics 0 Unknown 1 True 2 False
Name	String	MaxLen(1024)	The label by which the object is known. When subclassed, the Name property can be overridden to be a key property.

Table 7. IBMTSSVC_Chassis properties (continued)

Property	Type	Qualifier	Description																																								
NumberOfPowerCords	Uint16		An integer that indicates the number of power cords which must be connected to the Chassis, for all of the components to operate.																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The current status of the element. Various health and operational statuses are defined.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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16	Supporting Entity in Error																																										
17	Completed																																										
18	Power Mode																																										
OtherIdentifyingInfo[]	String	Write(TRUE)	Captures additional data, beyond that of Tag information, that could be used to identify a PhysicalElement.																																								
PartNumber	String	MaxLen(256)	The part number assigned by the organization responsible for producing or manufacturing the PhysicalElement.																																								
PoweredOn	Boolean		Unsupported property.																																								
RackMountable	Uint16	Experimental(TRUE)	<p>Indicates if the Chassis is Rack Mountable.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>True</td></tr> <tr><td>2</td><td>False</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	True	2	False																																
Code	Semantics																																										
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2	False																																										

Table 7. IBMTSSVC_Chassis properties (continued)

Property	Type	Qualifier	Description
Removable	Boolean	Deprecated(PhysicalPackage. RemovalConditions)	A PhysicalPackage is Removable if it is designed to be taken in and out of the physical container in which it is normally found, without impairing the function of the overall packaging.
RemovalConditions	Uint16		The conditions under which a PhysicalPackage can be removed. Code Semantics 0 Unknown 2 Not Applicable 3 Removable when off 4 Removable when on or off
Replaceable	Boolean	Deprecated(No Value)	A PhysicalPackage is Replaceable if it is possible to replace (FRU or upgrade) the element with a physically different one.
SecurityBreach	Uint16	ModelCorrespondence (CIM_PhysicalFrame. BreachDescription)	An enumerated, integer-valued property: Code Semantics 1 Other 2 Unknown 3 No Breach 4 Breach Attempted 5 Breach Successful
SerialNumber	String	MaxLen(256)	A manufacturer-allocated number used to identify the PhysicalElement.
ServiceDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_PhysicalFrame. ServicePhilosophy)	Unsupported property.

Table 7. IBMTSSVC_Chassis properties (continued)

Property	Type	Qualifier	Description
ServicePhilosophy	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_PhysicalFrame.ServiceDescriptions)	Unsupported property. Code Semantics 0 Unknown 1 Other 2 Service From Top 3 Service From Front 4 Service From Back 5 Service From Side 6 Sliding Trays 7 Removable Sides 8 Moveable
SKU	String	MaxLen(64)	Unsupported property.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for information.
StatusDescriptions[]	String	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
Tag	String	MaxLen(256)	An arbitrary string that uniquely identifies the PhysicalElement and serves as the Element's key.
TypeDescriptions	String[]	Deprecated (CIM_Chassis.ChassisTypeDescription), ArrayType(Indexed), ModelCorrespondence (CIM_Chassis.ChassisTypes)	Unsupported property.
UserTracking	String	Write(TRUE)	Unsupported property.
VendorEquipmentType	String		Unsupported property.
Version	String	MaxLen(64)	The version of the PhysicalElement.
VisibleAlarm	Boolean		Indicates that the equipment includes a visible alarm.
Weight	Real32	Units(Pounds)	The weight of the PhysicalPackage in pounds.
Width	Real32	Units(Inches)	The width of the PhysicalPackage in inches.

IBMTSSVC_Cluster

The IBMTSSVC_Cluster class represents a single SAN Volume Controller cluster, with up to four node pairs.

Properties

The IBMTSSVC_Cluster class extends the IBMTSSVC_AbstractCluster class and has the properties shown in Table 8.

Table 8. IBMTSSVC_Cluster properties

Property	Type	Qualifier	Description
AllocatedCapacity	Uint64	Units(Bytes), Expensive(TRUE)	The total capacity of all StorageVolumes in the cluster.
AvailableCapacity	Uint64	Units(Bytes), Expensive(TRUE)	The approximate amount of available capacity in the cluster. This amount describes both BackendStorage Capacity and AllocatedCapacity.
Backendstorage Capacity	Uint64	Units(Bytes), Expensive(TRUE)	The total capacity of all backend storage connected to the cluster.
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator), ReadRole(None)	A short textual description (one-line string) of the object.
ClusterState	Uint16		The state of the Cluster. Code Semantics 0 Unknown 1 Other 2 On-line 3 Off-line 4 Degraded 5 Unavailable
CodeLevel	String	Expensive(TRUE)	The code level of the cluster.
ConsoleIP	String	Expensive(TRUE), Write(TRUE), WriteRole(Administrator), ReadRole(None)	The IP address of the management console.
ConsolePort	String	Expensive(TRUE), Write(TRUE), WriteRole(Administrator), ReadRole(None)	The port address of the management console.
CreationClassName	String	MaxLen(256), ReadRole(None)	The name of the class or subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the ComputerSystem is a special-purpose system (dedicated to a particular use), or a general purpose system. The SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server")</p> <p>Code Semantics</p> <p>0 Not Dedicated</p> <p>1 Unknown</p> <p>2 Other</p> <p>3 Storage</p> <p>4 Router</p> <p>5 Switch</p> <p>6 Layer 3 Switch</p> <p>7 Central Office Switch</p> <p>8 Hub</p> <p>9 Access Server</p> <p>10 Firewall</p> <p>11 Print</p> <p>12 I/O</p> <p>13 Web Caching</p> <p>14 Management</p> <p>15 Block Server</p> <p>16 File Server</p> <p>17 Mobile User Device</p> <p>18 Repeater</p> <p>19 Bridge/Extender</p> <p>20 Gateway</p>
Description	String		A textual description of the object.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator), ReadRole(None)	The cluster's user-friendly name
EmailSetting	String	Expensive(TRUE)	The email setting.

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE),	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator. In various situations, an element that is being tested is neither enabled nor disabled — this is addressed by the value "In Test" (7). If this property does not apply to an instance of EnabledLogical Element, the value 5 is used.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
FcPortSpeed	Uint64	Units(GigaBit per second), Expensive(TRUE)	The transmission speed of the attached Fibre-Channel.

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifying Info array. Each entry of this array is related to the entry in OtherIdentifying Info that is located at the same index.
InstallDate	Date-time		Unsupported property.
Interconnect	String		Unsupported property.
InterconnectAddress	String		Unsupported property.
Locale	String	Expensive(TRUE)	The current locale setting of the cluster.
MaxNumberOfNodes	UInt32		The maximum number of nodes that may participate in the Cluster. If unlimited, enter 0.
Name	String	MaxLen(256), ReadRole(None)	The label by which the object is known. Format: cluster_ip:object_id
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated. SAN Volume Controller returns the cluster's id as Name, therefore this attribute is set to "Other."

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The cluster's operational status.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherDedicatedDescriptions	String[]	ModelCorrespondence (CIM_ComputerSystem.Dedicated), ArrayType(Indexed)	Describes how or why the system is dedicated when the Dedicated array includes the value 2, "Other."																																								
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																								
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.IdentifyingDescriptions), Write(TRUE), WriteRole(Service), Expensive(TRUE)	The cluster's IP Address, Subnet Mask, Default Gateway and Service IP Address.																																								
PoolCapacity	UInt64	Units(Bytes), Expensive(TRUE)	The total capacity of all StoragePools in the cluster.																																								

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	An enumerated array that describes the power management capabilities of the ComputerSystem. The use of this property is deprecated. Instead, the Power Capabilities property in an associated PowerManagement Capabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Automatically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE), Expensive(TRUE)	The email address of the primary contact person for this cluster.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE),	Unsupported property.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	An integer enumeration value. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
RequiredMemory	Uint32	Units(MegaBytes), Expensive(TRUE)	The amount of required memory for a cluster.

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
ResetCapability	Uint16		If enabled (value = 4), the ComputerSystem can be reset through hardware (the power and reset buttons). If disabled (value = 3), hardware reset is not allowed. Code Semantics 1 Other 2 Unknown 3 Disabled 4 Enabled 5 Not Implemented
Roles	String[]	Write(TRUE)	Unsupported property.
SNMPCommunity	String	Expensive(TRUE)	The SNMP community.
SNMPServerIP	String	Expensive(TRUE)	The SNMP server IP address.
SNMPSetting	String	Expensive(TRUE)	The SNMP setting of the cluster.
StatisticsFrequency	Uint32	Units(Seconds), Expensive(TRUE)	The update interval for the cluster statistics.
StatisticsStatus	Boolean	Expensive(TRUE)	Indicates if statistics collection is active. When set to true, statistics collection is active.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	The status of the cluster. The status can be either "OK," "Key Refused," "Invalid Fingerprint," "Cluster Interface Not Available," "CLI Error rc," "Connection Lost," or "No Contact."
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
TimeOfLastStateChange	Date-time		Unsupported property.
TimeZone	String	Expensive(TRUE)	The timezone setting of the cluster.

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
Types	Uint16[]		<p>The cluster types. This specifies if the cluster is for failover (value=2), performance (3), etc. The values which can be specified are not mutually exclusive. Thus, Types is an array.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Failover</p> <p>3 Performance</p> <p>4 Distributed OS</p> <p>5 Node Grouping</p> <p>6 SysPlex</p>

IBMTSSVC_Controller

The IBMTSSVC_Controller class extends the CIM_SCSIController class.

Properties

The IBMTSSVC_Controller class represents the logical SAN Volume Controller used for modeling the authorization path from host ports to storage volumes. The IBMTSSVC_Controller class has the properties shown in Table 9.

Table 9. IBMTSSVC_Controller properties

Property	Type	Qualifier	Description
AccessGranted	Boolean	ModelCorrespondence (CIM_Controller. AuthorizationView)	<p>A quick interface for finding devices with no Authorization Subject association to an AccessControl Information instance; either directly, or through a controller. True indicates that the device has granted access to some consumer. False indicates that no access has been granted.</p>

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
Additional Availability	Uint16[]	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_ManagedSystem Element.OperationalStatus CIM_EnabledLogical Element.EnabledStatus), ModelCorrespondence (CIM_LogicalDevice. Availability)	Additional availability and status of the device, beyond that specified in the Availability property. Code Semantics 1 Other 2 Unknown 3 Running/ Full Power 4 Warning 5 In Test 6 Not Applicable 7 Power Off 8 Off Line 9 Off Duty 10 Degraded 11 Not Installed 12 Install Error 13 Power Save - Unknown 14 Power Save - Low Power Mode 15 Power Save - Standby 16 Power Cycle 17 Power Save - Warning 18 Paused 19 Not Ready 20 Not Configured 21 Quiesced

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
Availability	Uint16	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_ManagedSystem Element.OperationalStatus CIM_EnabledLogical Element.EnabledStatus), ModelCorrespondence (CIM_LogicalDevice. AdditionalAvailability)	The primary availability and status of the device. Code Semantics 1 Other 2 Unknown 3 Running/ Full Power 4 Warning 5 In Test 6 Not Applicable 7 Power Off 8 Off Line 9 Off Duty 10 Degraded 11 Not Installed 12 Install Error 13 Power Save - Unknown 14 Power Save - Low Power Mode 15 Power Save - Standby 16 Power Cycle 17 Power Save - Warning 18 Paused 19 Not Ready 20 Not Configured 21 Quiesced
Caption	String	MaxLen(64)	Unsupported property.
ConnectionRole	Uint16[]		The role of the protocol controller in a connection. A protocol controller can have one or more of several roles in a connection. In certain applications, a controller can have both functions (providing and consuming the connection). For example, a HBA can be a 'client,' a front end controller on a RAID array can be a 'server,' and a SCSI Extended Copy controller can be both. Code Semantics 0 Unknown 2 Server 3 Client
Controlled	Boolean		Unsupported property.

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
CreationClassName	String	MaxLen(256)	The name of the class or subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
DeviceID	String	MaxLen(64)	An address or other identifying information to uniquely name the LogicalDevice.
ElementName	String		Unsupported property.
EnabledDefault	Uint16	Write(TRUE)	An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2). Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	An integer enumeration. In various situations, an element that is tested is neither enabled nor disabled - this is addressed by the value "In Test" (7). If this property does not apply to an instance of EnabledLogical Element, the value 5 ("Not Applicable") is used. Code Semantics 0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved
ErrorCleared	Boolean	Deprecated(CIM_Managed SystemElement. OperationalStatus)	Unsupported property.
ErrorDescription	String	Deprecated(CIM_Device ErrorData.ErrorDescription)	Unsupported property.
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifying Info that is located at the same index.
InstallDate	Date- time		Unsupported property.
LastErrorCode	Uint32	Deprecated(CIM_Device ErrorData.LastErrorCode)	Unsupported property.
MaxQuiesce Time	Uint64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description																																								
MaxUnits Controlled	UInt32		The maximum number of units that can be controlled by or accessed through this protocol controller.																																								
Name	String	MaxLen(1024)	The label by which the object is known. Format: RedundancyGroup_id: Host_id.																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>The current status of the element. This property always reports "Unknown."</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non- Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non- Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																								
OtherIdentifying Info	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions)	Captures additional data, beyond DeviceID information, that can be used to identify a LogicalDevice.																																								

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
Power Management Capabilities	Uint16[]	Deprecated(CIM_Power ManagementCapabilities.PowerCapabilities)	The use of this property is deprecated. PowerCapabilites property in an associated Power Management Capabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Automatically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported
Power Management Supported	Boolean	Deprecated(CIM_Power ManagementCapabilities)	Indicates that the device can be power managed.
PowerOnHours	Uint64	Deprecated(CIM_Powered StatisticalData.PowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	An integer enumeration indicator. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Status	String	MaxLen(10), Deprecated(CIM_Managed SystemElement.Operational Status)	Deprecated property; set to "Unknown."
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status — used when the OperationalStatus property is set to 1 ("Other")

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
StatusInfo	Uint16	Deprecated(CIM_EnabledLogicalElement.EnabledState)	Indicates if the LogicalDevice is in an enabled or disabled state. StatusInfo does not apply to the Controller, so the value "Not Applicable" is used. Code Semantics 1 Other 2 Unknown 3 Enabled 4 Disabled 5 Not Applicable
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The scoping System's CreationClassName.
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The scoping System's Name.
TimeOfLastStateChange	Date-time		Unsupported property.
TotalPowerOnHours	Uint64	Deprecated(CIM_PoweredStatisticalData.TotalPowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.

IBMTSSVC_ControllerConfigurationService

The IBMTSSVC_ControllerConfigurationService class extends the CIM_ControllerConfigurationService.

Properties

The IBMTSSVC_ControllerConfigurationService class has the properties shown in Table 10.

Table 10. IBMTSSVC_ControllerConfigurationService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64),	Unsupported property.
CreationClassName	String	MaxLen(256)	Indicates the name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.

Table 10. IBMTSSVC_ControllerConfigurationService properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled."</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
InstallDate	Date-time		Unsupported property.
Name	String	MaxLen(256)	The label by which the object is known.

Table 10. IBMTSSVC_ControllerConfigurationService properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The operational status of the service. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherEnabled State	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled/disabled state when the EnabledStatus property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledStatus is any value other than 1.
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Unsupported property.

Table 10. IBMTSSVC_ControllerConfigurationService properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	An integer enumeration indicator. When EnabledStatus is set to 5 ("Not Applicable"), writing this property has no effect. By default, the element's RequestedStatus is set to "No Change." Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Started	Boolean		Indicates if this service is started.
StartMode	String	MaxLen(10), Deprecated(CIM_Service.EnabledDefault)	Indicates if this service is started manually or automatic.
Status	String	MaxLen(10), Deprecated(CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastStateChange	Date-time		Unsupported property.

IBMTSSVC_ControllerMaskingCapabilities

The IBMTSSVC_ControllerMaskingCapabilities class extends the CIM_ProtocolControllerMaskingCapabilities class.

Properties

The IBMTSSVC_ControllerMaskingCapabilities class has the properties shown in Table 11.

Table 11. IBMTSSVC_ControllerMaskingCapabilities properties

Property	Type	Qualifier	Description
AttachDevice Supported	Boolean		Set to true if this storage system supports the AttachDevice method.
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
ClientSelectable DeviceNumbers	Boolean		Set to true if this storage system allows the client to specify the DeviceNumber parameter when calling ControllerConfiguration Service.AttachDevice() and Controller Configuration Service.AttachDevice(). Set to false if the implementation does not allow unit numbers to vary for a Protocol Controller.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of Capabilities.
InstanceID	String		Opaquely and uniquely identifies an instance of this class.
OneHardware IDPerView	Boolean		Set to true if this storage system limits configurations to a single subject hardware ID per view. Otherwise, multiple hardware ID types can be used. The default is false, in that multiple ID types may be used in a single view.
OtherValid HardwareID Types	String[]	ArrayType(Indexed)	An array of strings that describe types for valid Storage HardwareID.IDType. Used when the ValidHardwareIdTypes includes 1 ("Other").

Table 11. IBMTSSVC_ControllerMaskingCapabilities properties (continued)

Property	Type	Qualifier	Description
PortsPerView	Uint16		<p>An integer enumeration that indicates the way that ports per view (ProtocolController) are managed by the underlying storage system.</p> <p>Code Semantics</p> <p>2 One Port per View</p> <p>3 Multiple Ports per View</p> <p>4 All Ports share the same View</p>
PrivilegeDenied Supported	Boolean		Set to true if this storage system allows a client to create a Privilege instance with PrivilegeGranted set to false.
Protocol Controller Requires AuthorizedIdentity	Boolean		If true, this property indicates that at least one Privilege/Identity pair must be specified when CreateProtocol Controller() is called.
Protocol Controller Supports Collections	Boolean		If true, this property indicates that the Identity parameter of CreateProtocol ControllerWithPorts() <i>must</i> contain a reference to a CIM_Collection (or subclass) or to a CIM_Identity (or subclass).
UniqueUnit NumbersPerPort	Boolean		When set to false, different Protocol Controllers attached to a LogicalPort can expose the same unit numbers. If true, then this storage system requires unique unit numbers across all of the Protocol Controllers connected to a LogicalPort.

Table 11. IBMTSSVC_ControllerMaskingCapabilities properties (continued)

Property	Type	Qualifier	Description
ValidHardware IdTypes	Uint16[]	ArrayType(Indexed)	A list of the valid values for StorageHardware ID.IDType. Code Semantics 1 Other 2 Port WWN 3 Node WWN 4 Host Name

IBMTSSVC_Dumps

The IBMTSSVC_Dumps class extends the CIM_SettingData class.

Properties

The IBMTSSVC_Dumps class has the properties shown in Table 12.

Table 12. IBMTSSVC_Dumps properties

Property	Type	Qualifier	Description
Admin	String[]		An array of admin log file names.
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Configs	String[]		An array of config dump file names.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of SettingData.
Elogs	String[]		An array of error log file names.
Feature	String[]		An array of feature log file names.

Table 12. IBMTSSVC_Dumps properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of SettingData. The InstanceID must be unique within a namespace. In order to ensure this, the value of InstanceID must be constructed in the following manner: (Vendor ID)(ID) (Vendor ID) <i>must</i> include a copyrighted, trademarked or otherwise unique name that is owned by the business entity or a registered ID that is assigned to the business entity that is defining the InstanceID.
lostats	String[]		An array of iostats log file names.
lotrace	String[]		An array of lotrace log file names.

IBMTSSVC_FCPort

The IBMTSSVC_FCPort class represents a fibre-channel port of a SAN Volume Controller node.

Properties

Generally, all fibre-channel ports of a SAN Volume Controller pair are connected to the same devices. The IBMTSSVC_FCPort class extends the CIM_FCPort class and has the properties shown in Table 13.

Table 13. IBMTSSVC_FCPort properties

Property	Type	Qualifier	Description
ActiveCOS	Uint16[]	ModelCorrespondence (CIM_FCPort.SupportedCOS)	An array of integers that indicates the Classes of Service (COS) that are active. The Active COS is indicated in ActiveCOS. Code Semantics 0 Unknown 1 1 2 2 3 3 4 4 5 5 6 6 7 F

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																																						
ActiveFC4Types	Uint16[]	ModelCorrespondence (CIM_FCPort.Supported FC4Types)	<p>An array of integers that indicates the Fibre Channel FC-4 protocols currently running. A list of all protocols supported is indicated in the Supported FC4Types property.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>4</td> <td>ISO/IEC 8802 - 2 LLC</td> </tr> <tr> <td>5</td> <td>IP over FC</td> </tr> <tr> <td>8</td> <td>SCSI - FCP</td> </tr> <tr> <td>9</td> <td>SCSI - GPP</td> </tr> <tr> <td>17</td> <td>IPI - 3 Master</td> </tr> <tr> <td>18</td> <td>IPI - 3 Slave</td> </tr> <tr> <td>19</td> <td>IPI - 3 Peer</td> </tr> <tr> <td>21</td> <td>CP IPI - 3 Master</td> </tr> <tr> <td>22</td> <td>CP IPI - 3 Slave</td> </tr> <tr> <td>23</td> <td>CP IPI - 3 Peer</td> </tr> <tr> <td>25</td> <td>SBCCS Channel</td> </tr> <tr> <td>26</td> <td>SBCCS Control Unit</td> </tr> <tr> <td>27</td> <td>FC-SB-2 Channel</td> </tr> <tr> <td>28</td> <td>FC-SB-2 Control Unit</td> </tr> <tr> <td>32</td> <td>Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)</td> </tr> <tr> <td>34</td> <td>FC-SW</td> </tr> <tr> <td>36</td> <td>FC - SNMP</td> </tr> <tr> <td>64</td> <td>HIPPI - FP</td> </tr> <tr> <td>80</td> <td>BBL Control</td> </tr> <tr> <td>81</td> <td>BBL FDDI Encapsulated LAN PDU</td> </tr> <tr> <td>82</td> <td>BBL 802.3 Encapsulated LAN PDU</td> </tr> <tr> <td>88</td> <td>FC - VI</td> </tr> <tr> <td>96</td> <td>FC - AV</td> </tr> <tr> <td>255</td> <td>Vendor Unique</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	4	ISO/IEC 8802 - 2 LLC	5	IP over FC	8	SCSI - FCP	9	SCSI - GPP	17	IPI - 3 Master	18	IPI - 3 Slave	19	IPI - 3 Peer	21	CP IPI - 3 Master	22	CP IPI - 3 Slave	23	CP IPI - 3 Peer	25	SBCCS Channel	26	SBCCS Control Unit	27	FC-SB-2 Channel	28	FC-SB-2 Control Unit	32	Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)	34	FC-SW	36	FC - SNMP	64	HIPPI - FP	80	BBL Control	81	BBL FDDI Encapsulated LAN PDU	82	BBL 802.3 Encapsulated LAN PDU	88	FC - VI	96	FC - AV	255	Vendor Unique
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ActiveMaximumTransmissionUnit	Uint64	Units(Bytes),	Unsupported property.																																																						

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Additional Availability	Uint16[]	Deprecated (CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState), ModelCorrespondence (CIM_LogicalDevice.Availability)	Additional availability and status of the device, beyond that specified in the Availability property. The SAN Volume Controller always reports this property as "Unknown."
AutoSense	Boolean		Indicates if the NetworkPort is capable of automatically determining the speed or other communications characteristics of the attached network media.
Availability	Uint16	Deprecated (CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState) ModelCorrespondence (CIM_LogicalDevice.AdditionalAvailability)	The primary availability and status of the device. The SAN Volume Controller always reports this property as "Unknown."
Caption	String	MaxLen(64)	Unsupported property.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
DeviceID	String	MaxLen(64), Expensive(TRUE)	An address or other identifying information to uniquely name the LogicalDevice.
ElementName	String		Unsupported property.

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled."</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
ErrorCleared	Boolean	Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Unsupported property.
ErrorDescription	String	Deprecated (CIM_DeviceErrorData.ErrorDescription)	Unsupported property.
FullDuplex	Boolean		Indicates if the port is operating in full duplex mode.

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifying Info array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.
InstallDate	Datetime		Unsupported property.
LastErrorCode	UInt32	Deprecated (CIM_DeviceErrorData.LastErrorCode)	Unsupported property.
LinkTechnology	UInt16	ModelCorrespondence (CIM_NetworkPort.OtherLinkTechnology)	An enumeration of the types of links. When set to 1 ("Other"), the related property OtherLinkTechnology contains a string description of the link's type. Code Semantics 0 Unknown 1 Other 2 Ethernet 3 IB 4 FC 5 FDDI 6 ATM 7 Token Ring 8 Frame Relay 9 Infrared 10 BlueTooth 11 Wireless LAN
MaxQuiesceTime	UInt64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.
MaxSpeed	UInt64	Units(Bits per Second)	The maximum speed of the port in bits per second.
Name	String	MaxLen(1024)	Unsupported property.
NetworkAddresses	String[]	MaxLen(64)	Unsupported property.

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions), Expensive(TRUE)	<p>The current status of the port.</p> <table border="0"> <tr> <td>Code</td> <td>Semantics</td> </tr> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>2</td> <td>OK</td> </tr> <tr> <td>3</td> <td>Degraded</td> </tr> <tr> <td>4</td> <td>Stressed</td> </tr> <tr> <td>5</td> <td>Predictive Failure</td> </tr> <tr> <td>6</td> <td>Error</td> </tr> <tr> <td>7</td> <td>Non-Recoverable Error</td> </tr> <tr> <td>8</td> <td>Starting</td> </tr> <tr> <td>9</td> <td>Stopping</td> </tr> <tr> <td>10</td> <td>Stopped</td> </tr> <tr> <td>11</td> <td>In Service</td> </tr> <tr> <td>12</td> <td>No Contact</td> </tr> <tr> <td>13</td> <td>Lost Communication</td> </tr> <tr> <td>14</td> <td>Aborted</td> </tr> <tr> <td>15</td> <td>Dormant</td> </tr> <tr> <td>16</td> <td>Supporting Entity in Error</td> </tr> <tr> <td>17</td> <td>Completed</td> </tr> <tr> <td>18</td> <td>Power Mode</td> </tr> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																								
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.IdentifyingDescriptions)	Captures additional data, beyond DeviceID information, that could be used to identify a LogicalDevice.																																								
OtherLinkTechnology	String	ModelCorrespondence (CIM_NetworkPort.LinkTechnology)	Describes LinkTechnology when it is set to "Other."																																								
OtherNetworkPortType	String	ModelCorrespondence (CIM_NetworkPort.PortType)	Describes the type of module, when PortType is set to "Other."																																								
PermanentAddress	String	MaxLen(64), Expensive(TRUE)	The network address hardcoded into a port. This 'hardcoded' address may be changed through firmware upgrade or software configuration.																																								

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
PortNumber	Uint16	Expensive(TRUE)	NetworkPorts are often numbered relative to either a logical module or a network element.
PortType	Uint16	ModelCorrespondence (CIM_NetworkPort. OtherNetworkPortType)	The specific mode currently enabled for the port. Code Semantics 0 Unknown 1 Other 10 N 11 NL 12 F/NL 13 Nx 14 E 15 F 16 FL 17 B 18 G 16000..65535 Vendor Reserved
Power Management Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.Power Capabilities)	The power management capabilities of the device. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated Power Management Capabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Automatically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Power Management Supported	Boolean	Deprecated (CIM_PowerManagement Capabilities)	Indicates if the device can be power managed. The use of this property is deprecated. Instead, the existence of an associated Power Management Capabilities class (associated using the Element Capabilities relationship) indicates that power management is supported.
PowerOnHours	Uint64	Deprecated (CIM_PoweredStatistical Data.PowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
RequestedSpeed	Uint64	Write(TRUE), Units(Bits per Second), ModelCorrespondence (CIM_LogicalPort.Speed)	Unsupported property.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration indicator. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed.</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shut Down</p> <p>5 No Change</p> <p>6 Offline</p> <p>7 Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
Speed	Uint64	Units(Bits per Second)	An estimate of the current bandwidth in bits per second. For ports that vary in bandwidth or for those where no accurate estimation can be made, this property contains the nominal bandwidth.

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to "Other."
StatusInfo	Uint16	Deprecated (CIM_EnabledLogical Element.EnabledState)	Indicates if the LogicalDevice is in an enabled, disabled, or other state. Since this property is deprecated, the value "Unknown" is always reported.
SupportedCOS	Uint16[]		An array of integers that indicates the Fibre Channel Classes of Service (COS) that are supported. The active COS are indicated in ActiveCOS. Code Semantics 0 Unknown 1 1 2 2 3 3 4 4 5 6 6 F

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																																						
SupportedFC4Types	Uint16[]		<p>An array of integers that indicates the Fibre Channel FC-4 protocols that are supported. The protocols that are active and running are indicated in the ActiveFC4 Types property.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>4</td><td>ISO/IEC 8802 - 2 LLC</td></tr> <tr><td>5</td><td>IP over FC</td></tr> <tr><td>8</td><td>SCSI - FCP</td></tr> <tr><td>9</td><td>SCSI - GPP</td></tr> <tr><td>17</td><td>IPI - 3 Master</td></tr> <tr><td>18</td><td>IPI - 3 Slave</td></tr> <tr><td>19</td><td>IPI - 3 Peer</td></tr> <tr><td>21</td><td>CP IPI - 3 Master</td></tr> <tr><td>22</td><td>CP IPI - 3 Slave</td></tr> <tr><td>23</td><td>CP IPI - 3 Peer</td></tr> <tr><td>25</td><td>SBCCS Channel</td></tr> <tr><td>26</td><td>SBCCS Control Unit</td></tr> <tr><td>27</td><td>FC-SB-2 Channel</td></tr> <tr><td>28</td><td>FC-SB-2 Control Unit</td></tr> <tr><td>32</td><td>Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)</td></tr> <tr><td>34</td><td>FC-SW</td></tr> <tr><td>36</td><td>FC - SNMP</td></tr> <tr><td>64</td><td>HIPPI - FP</td></tr> <tr><td>80</td><td>BBL Control</td></tr> <tr><td>81</td><td>BBL FDDI Encapsulated LAN PDU</td></tr> <tr><td>82</td><td>BBL 802.3 Encapsulated LAN PDU</td></tr> <tr><td>88</td><td>FC - VI</td></tr> <tr><td>96</td><td>FC - AV</td></tr> <tr><td>255</td><td>Vendor Unique</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	4	ISO/IEC 8802 - 2 LLC	5	IP over FC	8	SCSI - FCP	9	SCSI - GPP	17	IPI - 3 Master	18	IPI - 3 Slave	19	IPI - 3 Peer	21	CP IPI - 3 Master	22	CP IPI - 3 Slave	23	CP IPI - 3 Peer	25	SBCCS Channel	26	SBCCS Control Unit	27	FC-SB-2 Channel	28	FC-SB-2 Control Unit	32	Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)	34	FC-SW	36	FC - SNMP	64	HIPPI - FP	80	BBL Control	81	BBL FDDI Encapsulated LAN PDU	82	BBL 802.3 Encapsulated LAN PDU	88	FC - VI	96	FC - AV	255	Vendor Unique
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SupportedMaximumTransmissionUnit	Uint64	Units(Bytes)	Unsupported property.																																																						
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's CreationClass Name.																																																						

Table 13. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's Name.
TimeOfLastStateChange	Datetime		Unsupported property.
TotalPowerOnHours	Uint64	Deprecated (CIM_PoweredStatistical Data.TotalPowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
UsageRestriction	Uint16		Indicates if the port is restricted for front- or back-end use. Code Semantics 0 Unknown 2 Front-end only 3 Back-end only 4 Not restricted

IBMTSSVC_Features

The IBMTSSVC_Features class specifies the enabled capabilities of the SAN Volume Controller.

Properties

The IBMTSSVC_Features instance corresponds with the associated IBMTSSVC_Cluster instance. The IBMTSSVC_Features class extends the CIM_Capabilities class and has the properties shown in Table 14.

Table 14. IBMTSSVC_Features properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	Unsupported property.
FlashCopy	Boolean	Write(TRUE), WriteRole(Administrator)	Specifies if the FlashCopy feature is enabled for the cluster.

Table 14. IBMTSSVC_Features properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of Capabilities. The InstanceID <i>must</i> be unique within a namespace. To ensure this, the value of InstanceID must be constructed in the following manner: (VendorID)(ID).
MaximumCapacity	Uint64	Units	The maximum capacity of the cluster.
RemoteCopy	Boolean	Write(TRUE), WriteRole(Administrator)	Specifies if the RemoteCopy feature is enabled for the cluster.

IBMTSSVC_FlashCopyJob

IBMTSSVC_FlashCopyJob class instances show the percentage of all flash copies in the "copying" state.

Properties

A job instance is used to monitor asynchronous Flash Copy operations on the device. The IBMTSSVC_FlashCopyJob class has the properties shown in Table 15.

Table 15. IBMTSSVC_FlashCopyJob properties

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID must be unique within a namespace. In order to ensure that the name is unique, the value of InstanceID <i>must</i> be constructed in the following manner: (Vendor ID)(ID)
Caption	String	MaxLen(64),	Unsupported property.
DeleteOnCompletion	Boolean	Write(TRUE),	Indicates if the job is automatically deleted after completion. If this property is set to false and the job completes, the extrinsic method DeleteInstance <i>must</i> be used to delete the job.

Table 15. IBMTSSVC_FlashCopyJob properties (continued)

Property	Type	Qualifier	Description
Description	String		A textual description of the object.
Elapsed Time	Datetime		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	Uint16	ModelCorrespondence (CIM_Job.Error Description)	Unsupported property.
ErrorDescription	String	ModelCorrespondence (CIM_Job.ErrorCode),	Unsupported property.
InstallDate	Datetime		Unsupported property.
JobRunTimes	Uint32	Write(TRUE),	
JobState	Uint16		An integer enumeration that indicates the operational state of a job. Code Semantics 2 New 3 Starting 4 Running 5 Suspended 6 Shutting Down 7 Completed 8 Terminated 9 Killed 10 Exception 11 Service 12..32767 DMTF Reserved 32768..65535 Vendor Reserved
JobStatus	String	ModelCorrespondence (ManagedSystem Element)	Unsupported property.
LocalOrUtcTime	Uint16	Write(TRUE),	Code Semantics 1 Local Time 2 UTC Time
Name	String	Required(TRUE), MaxLen(1024)	The user friendly name for this instance of the job.
Notify	String	Write(TRUE),	Unsupported property.

Table 15. IBMTSSVC_FlashCopyJob properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_Managed SystemElement)	Indicates the current status of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communi- cation 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherRecoveryAction	String	ModelCorrespondence (CIM_Job.Recovery Action)	Describes the recovery action when the instance's RecoveryAction property is 1 ("Other").
Owner	String	ModelCorrespondence (CIM_OwningJob Element)	Unsupported property.
PercentComplete	Uint16	MaxValue(101), MinValue(0), Units(Percent),	The percentage of the job that is complete at the time of the request.
Priority	Uint32	Write(TRUE),	Unsupported property.

Table 15. IBMTSSVC_FlashCopyJob properties (continued)

Property	Type	Qualifier	Description
RecoveryAction	Uint16	ModelCorrespondence (CIM_Job.Other RecoveryAction)	<p>Describes the recovery action for an unsuccessfully run job. A return code of "Other" indicates that the recovery action will be specified in the OtherRecovery Action property.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Do Not Continue</p> <p>3 Continue With Next Job</p> <p>4 Re-run Job</p> <p>5 Run Recovery Job</p>
RunDay	Sint8	Write(TRUE), MinValue(-31), MaxValue(31), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDay OfWeek CIM_Job.Run StartInterval)	
RunDayOfWeek	Sint8	Write(TRUE), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunStart Interval)	<p>Code Semantics</p> <p>-7 -Saturday</p> <p>-6 -Friday</p> <p>-5 -Thursday</p> <p>-4 -Wednesday</p> <p>-3 -Tuesday</p> <p>-2 -Monday</p> <p>-1 -Sunday</p> <p>0 ExactDayOf Month</p> <p>1 Sunday</p> <p>2 Monday</p> <p>3 Tuesday</p> <p>4 Wednesday</p> <p>5 Thursday</p> <p>6 Friday</p> <p>7 Saturday</p>
RunMonth	Uint8	Write(TRUE), ModelCorrespondence (CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	<p>Code Semantics</p> <p>0 January</p> <p>1 February</p> <p>2 March</p> <p>3 April</p> <p>4 May</p> <p>5 June</p> <p>6 July</p> <p>7 August</p> <p>8 September</p> <p>9 October</p> <p>10 November</p> <p>11 December</p>

Table 15. IBMTSSVC_FlashCopyJob properties (continued)

Property	Type	Qualifier	Description
RunStartInterval	Datetime	Write(TRUE), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	
ScheduledStartTime	Datetime	Deprecated (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval), Write(TRUE),	Unsupported property.
StartTime	Datetime		Unsupported property.
Status	String	MaxLen(10), Deprecated(CIM_ ManagedSystem Element)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_Managed System Element)	Describes the status. Use this property when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Datetime		Unsupported Property.
TimeSubmitted	Datetime		Unsupported Property.
UntilTime	Datetime	Write(TRUE), ModelCorrespondence (CIM_Job.LocalOr UtcTime)	Unsupported Property.

IBMTSSVC_FlashCopySynchronizedSet

The IBMTSSVC_FlashCopySynchronizedSet class aggregates multiple IBMTSSVC_StorageSynchronized instances to ensure consistent copying.

Properties

The IBMTSSVC_FlashCopySynchronizedSet class extends the CIM_SynchronizedSet class and has the properties shown in Table 16.

Table 16. IBMTSSVC_FlashCopySynchronizedSet properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short (one-line string) textual description.

Table 16. IBMTSSVC_FlashCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
CopyType	Uint16	Experimental(TRUE)	<p>The replication policy of the SynchronizedSet. Values are:</p> <ul style="list-style-type: none"> • Async - create and maintain an asynchronous copy of the source. • Sync - create and maintain a synchronized copy of the source. • UnSyncAssoc - create an unsynchronized copy and maintain an association to the source. <p>Code Semantics 2 Async 3 Sync 4 UnSyncAssoc .. DMTF Reserved 0x8000.. Vendor Specific</p>
Description	String		A textual description of the object.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator), Experimental(TRUE)	The user-friendly name for this instance of SynchronizedSet.
InstanceID	String	Key	Opaquely identifies a unique instance that is scoped (contained) by a System. The InstanceID <i>must</i> be unique within a namespace. In order to ensure this, the value of InstanceID must be constructed in the following manner: (Vendor ID)(ID).
Status	Uint32		<p>The status of the SynchronizedSet.</p> <p>Code Semantics 2 Initialized 3 PrepareInProgress 4 Prepared 5 ResyncInProgress 11 Idle 12 Broken 0x1000 Empty 0x8001 Stopped</p>

IBMTSSVC_FormatVolumeJob

IBMTSSVC_FormatVolumeJob class instances show the percentage of all virtual disks (VDisks) in the "formatting" state.

Properties

A job instance is used to monitor asynchronous format volume operations on the device. The IBMTSSVC_FormatVolumeJob class has the properties shown in Table 17.

Table 17. IBMTSSVC_FormatVolumeJob properties

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID <i>must</i> be unique within a namespace. In order to ensure that the name is unique, the value of InstanceID must be constructed in the following manner: (Vendor ID)(ID).
Caption	String	MaxLen(64),	Unsupported property.
DeleteOnCompletion	Boolean	Write(TRUE),	Indicates if the job is automatically deleted after completion. If this property is set to false and the job completes, the extrinsic method DeleteInstance <i>must</i> be used to delete the job.
Description	String		A textual description of the object.
Elapsed Time	Datetime		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	UInt16	Model Correspondence (CIM_Job.Error Description)	Unsupported property.
ErrorDescription	String	Model Correspondence (CIM_Job.ErrorCode),	Unsupported property.
InstallDate	Datetime		Unsupported property.
JobRunTimes	UInt32	Write(TRUE),	
JobState	UInt16		An integer enumeration that indicates the operational state of a job. Code Semantics 2 New 3 Starting 4 Running 5 Suspended 6 Shutting Down 7 Completed 8 Terminated 9 Killed 10 Exception 11 Service 12..32767 DMTF Reserved 32768..65535 Vendor Reserved

Table 17. IBMTSSVC_FormatVolumeJob properties (continued)

Property	Type	Qualifier	Description
JobStatus	String	Model Correspondence (ManagedSystem Element)	Unsupported property.
LocalOrUtcTime	Uint16	Write(TRUE),	Code Semantics 1 Local Time 2 UTC Time
Name	String	Required(TRUE), MaxLen(1024)	The user friendly name for this instance of the job.
Notify	String	Write(TRUE),	Unsupported property.
OperationalStatus	Uint16[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	The current status of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communi- cation 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherRecoveryAction	String	Model Correspondence (CIM_Job.Recovery Action)	Describes the recovery action when the instance's RecoveryAction property is 1 ("Other").
Owner	String	Model Correspondence (CIM_OwningJob Element)	Unsupported property.
PercentComplete	Uint16	MaxValue(101), MinValue(0), Units(Percent),	The percentage of the job that is complete at the time of the request.
Priority	Uint32	Write(TRUE),	Unsupported property.

Table 17. IBMTSSVC_FormatVolumeJob properties (continued)

Property	Type	Qualifier	Description
RecoveryAction	Uint16	Model Correspondence (CIM_Job.Other RecoveryAction)	The recovery action for an unsuccessfully run job. A return code of "Other" indicates that the recovery action will be specified in the OtherRecovery Action property. Code Semantics 0 Unknown 1 Other 2 Do Not Continue 3 Continue With Next Job 4 Re-run Job 5 Run Recovery Job
RunDay	Sint8	Write(TRUE), MinValue(-31), MaxValue(31), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay OfWeek CIM_Job.Run StartInterval)	
RunDayOfWeek	Sint8	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	Code Semantics -7 -Saturday -6 -Friday -5 -Thursday -4 -Wednesday -3 -Tuesday -2 -Monday -1 -Sunday 0 ExactDayOf Month 1 Sunday 2 Monday 3 Tuesday 4 Wednesday 5 Thursday 6 Friday 7 Saturday
RunMonth	Uint8	Write(TRUE), Model Correspondence (CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	Code Semantics 0 January 1 February 2 March 3 April 4 May 5 June 6 July 7 August 8 September 9 October 10 November 11 December

Table 17. IBMTSSVC_FormatVolumeJob properties (continued)

Property	Type	Qualifier	Description
RunStartInterval	Datetime	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	
ScheduledStartTime	Datetime	Deprecated (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval), Write(TRUE),	Unsupported property.
StartTime	Datetime		Unsupported property.
Status	String	MaxLen(10), Deprecated(CIM_ ManagedSystem Element)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	Describes the status. Use this property when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Datetime		Unsupported Property.
TimeSubmitted	Datetime		Unsupported Property.
UntilTime	Datetime	Write(TRUE), Model Correspondence (CIM_Job.LocalOr UtcTime)	Unsupported Property.

IBMTSSVC_HardwareIdCollection

The IBMTSSVC_HardwareIdCollection class represents a host port to which volume access can be granted.

Properties

The IBMTSSVC_HardwareIdCollection class extends the CIM_SystemSpecificCollection class and has the properties shown in Table 18.

Table 18. IBMTSSVC_HardwareIdCollection properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.

Table 18. IBMTSSVC_HardwareIdCollection properties (continued)

Property	Type	Qualifier	Description
ClientType	Uint16	Expensive(TRUE), Write(TRUE), WriteRole(Administrator)	The type of client. Code Semantics 0 Generic 1 HPUX
Description	String		A textual description of the object.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A user-friendly name for the object.
InstanceID	String	MaxLen(256)	The label by which the object is known. Format: cluster_ip:object_id.
MaxPathCount	Uint32	Counter(TRUE), Expensive(TRUE)	The maximum number of FC paths to this host.
NumberOfPorts	Uint32	Counter(TRUE)	The number of FC ports registered for this host.
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement. StatusDescriptions)	The current status of the element. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
PathCount	Uint32	Counter(TRUE), Expensive(TRUE)	The current number of FC paths to this host.
PortWWN	String[]	Expensive(TRUE)	The FC ports registered for this host.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to "Other."

IBMTSSVC_IOGroup

The IBMTSSVC_IOGroup class extends the CIM_ComputerSystem class.

Properties

The IBMTSSVC_IOGroup class defines an interface for a set of volumes. All nodes and volumes are associated with exactly one IOGroup. The read and write cache provided by a node is duplicated for redundancy. When I/O is performed to a volume, the node that processes the I/O will duplicate the data on the partner node in the IOGroup. This class represents the system aspect of an I/O group, whereas IOGroupSet represents the set aspect.

The IBMTSSVC_IOGroup class extends the CIM_ComputerSystem class and has the properties shown in Table 19.

Table 19. IBMTSSVC_IOGroup properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short textual description (one-line string) of the object.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.

Table 19. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the ComputerSystem is a special-purpose system (dedicated to a particular use) or a general purpose system. The SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server").</p> <table border="0"> <tr> <td>Code</td> <td>Semantics</td> </tr> <tr> <td>0</td> <td>Not Dedicated</td> </tr> <tr> <td>1</td> <td>Unknown</td> </tr> <tr> <td>2</td> <td>Other</td> </tr> <tr> <td>3</td> <td>Storage</td> </tr> <tr> <td>4</td> <td>Router</td> </tr> <tr> <td>5</td> <td>Switch</td> </tr> <tr> <td>6</td> <td>Layer 3 Switch</td> </tr> <tr> <td>7</td> <td>Central Office Switch</td> </tr> <tr> <td>8</td> <td>Hub</td> </tr> <tr> <td>9</td> <td>Access Server</td> </tr> <tr> <td>10</td> <td>Firewall</td> </tr> <tr> <td>11</td> <td>Print</td> </tr> <tr> <td>12</td> <td>I/O</td> </tr> <tr> <td>13</td> <td>Web Caching</td> </tr> <tr> <td>14</td> <td>Management</td> </tr> <tr> <td>15</td> <td>Block Server</td> </tr> <tr> <td>16</td> <td>File Server</td> </tr> <tr> <td>17</td> <td>Mobile User Device</td> </tr> <tr> <td>18</td> <td>Repeater</td> </tr> <tr> <td>19</td> <td>Bridge/Extender</td> </tr> <tr> <td>20</td> <td>Gateway</td> </tr> </table>	Code	Semantics	0	Not Dedicated	1	Unknown	2	Other	3	Storage	4	Router	5	Switch	6	Layer 3 Switch	7	Central Office Switch	8	Hub	9	Access Server	10	Firewall	11	Print	12	I/O	13	Web Caching	14	Management	15	Block Server	16	File Server	17	Mobile User Device	18	Repeater	19	Bridge/Extender	20	Gateway
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2	Other																																														
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4	Router																																														
5	Switch																																														
6	Layer 3 Switch																																														
7	Central Office Switch																																														
8	Hub																																														
9	Access Server																																														
10	Firewall																																														
11	Print																																														
12	I/O																																														
13	Web Caching																																														
14	Management																																														
15	Block Server																																														
16	File Server																																														
17	Mobile User Device																																														
18	Repeater																																														
19	Bridge/Extender																																														
20	Gateway																																														
Description	String		A textual description of the object.																																												
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The group's user-friendly name.																																												

Table 19. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled."</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration that indicates if the element is currently shutting down or in an enabled or disabled state.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	<p>An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array.</p>
InstallDate	Datetime		Unsupported property.

Table 19. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description																																								
Name	String	MaxLen(256)	The label by which the object is known. Format: cluster_ip:object_id.																																								
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated. The SAN Volume Controller returns the node's id as Name, therefore this attribute is set to "Other."																																								
NumberOfNodes	Uint32	Counter(TRUE)	The number of nodes in the group.																																								
NumberOfVolumes	Uint32	Counter(TRUE)	The number of virtual disk offered by the group.																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>No status information is available at group level. Look for the individual nodes' status.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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5	Predictive Failure																																										
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7	Non-Recoverable Error																																										
8	Starting																																										
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15	Dormant																																										
16	Supporting Entity in Error																																										
17	Completed																																										
18	Power Mode																																										
OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.Dedicated)	Describes how or why the system is dedicated when the Dedicated array includes the value 2 ("Other").																																								

Table 19. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	Describes the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. IdentifyingDescriptions)	The node's "Redundancy Group ID," "RedundancyGroup Name," "Partner Node Name," "Partner Node ID" and "WWWN."
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	An enumerated array that describes the power management capabilities of the ComputerSystem. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Auto-matically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Unsupported property.

Table 19. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration that indicates if the element must be shut down, enabled, disabled, taken offline, or tested at the next opportunity. This property is provided to compare Requested and current Enabledstatus. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed.</p> <p>Code Semantics</p> <p>2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
ResetCapability	Uint16		<p>Allows you to reset the ComputerSystem using the power and reset buttons. If enabled, the ComputerSystem can be reset through hardware (the power and reset buttons). If disabled, hardware reset is not allowed.</p> <p>Code Semantics</p> <p>1 Other 2 Unknown 3 Disabled 4 Enabled 5 Not Implemented</p>
Roles	String[]	Write(TRUE)	Unsupported property.
Status	String	MaxLen(10), Deprecated(CIM_Managed SystemElement. OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.

Table 19. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to "Other."
TimeOfLastState Change	Datetime		Unsupported property.

IBMTSSVC_IOGroupSet

The IBMTSSVC_IOGroup class extends the CIM_ExtraCapacitySet class.

Properties

An IOGroupSet defines an interface for a set of volumes. All nodes and volumes are associated with exactly one IOGroupSet. The read and write cache provided by a node is duplicated for redundancy. When I/O is performed to a volume, the node that processes the I/O will duplicate the data on the partner node in the IOGroupSet. This class represents the set aspect of an I/O group, whereas IOGroup represents the system aspect.

The IBMTSSVC_IOGroupSet class extends the CIM_ExtraCapacitySet class and has the properties shown in Table 20.

Table 20. IBMTSSVC_IOGroupSet properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of RedundancySet. Note: InstanceName does not have to be unique within a namespace.
InstanceID	String		Within the scope of the instantiating Namespace, InstanceID opaquely and uniquely identifies an instance of this class.
LoadBalancedSet	Boolean		Indicates if load balancing is supported by the ExtraCapacitySet.

Table 20. IBMTSSVC_IOGroupSet properties (continued)

Property	Type	Qualifier	Description
MaxNumberSupported	Uint32		The largest number of elements that can participate in the ExtraCapacitySet. A value of 0 indicates there is no limit on the number of elements.
MinNumberNeeded	Uint32	MinValue(1)	The smallest number of elements that must be operational in order to function. For example, in an N+1 redundancy relationship, the MinNumberNeeded property is set equal to N.
RedundancyStatus	Uint16		Provides information on the state of the RedundancySet. Code Semantics 0 Unknown 1 Other 2 Fully Redundant 3 Degraded Redundancy 4 Redundancy Lost

IBMTSSVC_Job

The IBMTSSVC_Job class extends the CIM_ConcreteJob class.

Properties

The IBMTSSVC_Job class is used to monitor the asynchronous commands for format, migration, or copy operations on the device. The IBMTSSVC_Job class has the properties shown in Table 21.

Table 21. IBMTSSVC_Job properties

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID <i>must</i> be unique within a namespace. To ensure this, the value of InstanceID must be constructed in the following manner: (Vendor ID)(ID).

Table 21. IBMTSSVC_Job properties (continued)

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
DeleteOnCompletion	Boolean	Write(TRUE)	Indicates if the job is automatically deleted upon completion. If this property is set to false and the job completes, then the extrinsic method DeleteInstance must be used to delete the job.
Description	String		A textual description of the object.
ElapsedTime	Datetime		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	Uint16	ModelCorrespondence (CIM_Job.ErrorDescription)	Unsupported property.
ErrorDescription	String	ModelCorrespondence (CIM_Job.ErrorCode)	Unsupported property.
InstallDate	Datetime		Unsupported property.
JobRunTimes	Uint32	Write(TRUE)	
JobState	Uint16		An integer enumeration that indicates the operational state of a Job. Code Semantics 2 New 3 Starting 4 Running 5 Suspended 6 Shutting Down 7 Completed 8 Terminated 9 Killed 10 Exception 11 Service 12..32767 DMTF Reserved 32768..65535 Vendor Reserved
JobStatus	String	ModelCorrespondence (ManagedSystemElement.OperationalStatus)	Unsupported property.
LocalOrUtcTime	Uint16	Write(TRUE)	Code Semantics 1 Local Time 2 UTC Time
Name	String	Required(TRUE), MaxLen(1024)	The user-friendly name for this instance of Job.
Notify	String	Write(TRUE)	Unsupported property.

Table 21. IBMTSSVC_Job properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>The current status of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherRecoveryAction	String	ModelCorrespondence (CIM_Job.RecoveryAction)	The recovery action when the instance's RecoveryAction property is set to "Other."																																								
Owner	String	ModelCorrespondence (CIM_OwningJobElement)	Unsupported property.																																								
PercentComplete	Uint16	MaxValue(101), MinValue(0), Units(Percent)	The percentage of the job that is complete at the time of the request.																																								
Priority	Uint32	Write(TRUE)	Unsupported property.																																								

Table 21. IBMTSSVC_Job properties (continued)

Property	Type	Qualifier	Description
RecoveryAction	Uint16	ModelCorrespondence (CIM_Job.OtherRecoveryAction)	The recovery action to be taken for an unsuccessfully run job. Code Semantics 0 Unknown 1 Other 2 Do Not Continue 3 Continue With Next Job 4 Re-run Job 5 Run Recovery Job
RunDay	Uint8	Write(TRUE), MinValue(-31), MaxValue(31), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDayOfWeek CIM_Job.RunStartInterval)	
RunDayOfWeek	Uint8	Write(TRUE), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunStartInterval)	Code Semantics -7 -Saturday -6 -Friday -5 -Thursday -4 -Wednesday -3 -Tuesday -2 -Monday -1 -Sunday 0 ExactDayOf Month 1 Sunday 2 Monday 3 Tuesday 4 Wednesday 5 Thursday 6 Friday 7 Saturday
RunMonth	Uint8	Write(TRUE), ModelCorrespondence (CIM_Job.RunDay CIM_Job.RunDayOfWeek CIM_Job.RunStartInterval)	Code Semantics 0 January 1 February 2 March 3 April 4 May 5 June 6 July 7 August 8 September 9 October 10 November 11 December
RunStartInterval	Datetime	Write(TRUE), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDayOfWeek CIM_Job.RunStartInterval)	

Table 21. IBMTSSVC_Job properties (continued)

Property	Type	Qualifier	Description
ScheduledStartTime	Datetime	Deprecated (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDayOfWeek CIM_Job.RunStartInterval), Write(TRUE)	Unsupported property.
StartTime	Datetime		Unsupported property.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement. OperationalStatus)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement. OperationalStatus)	Describes the status. Use this property when the OperationalStatus property is set to 1 ("Other").
TimeOfLastStateChange	Datetime		Unsupported property.
TimeSubmitted	Datetime		Unsupported property.
UntilTime	Datetime	Write(TRUE), ModelCorrespondence (CIM_Job.LocalOrUtcTime)	Unsupported property.

IBMTSSVC_MessageLog

The IBMTSSVC_MessageLog class extends the CIM_MessageLog class.

Properties

The IBMTSSVC_MessageLog class is The IBMTSSVC_MessageLog class extends the CIM_MessageLog class and has the properties shown in Table 22 on page 132

Table 22. IBMTSSVC_MessageLog properties

Property	Type	Qualifier	Description																								
Capabilities	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_MessageLog.Capabilities Descriptions)	<p>An array of integers that indicates the Log capabilities.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>2</td> <td>Write Record Supported</td> </tr> <tr> <td>3</td> <td>Delete Record Supported</td> </tr> <tr> <td>4</td> <td>Can Move Backward in Log</td> </tr> <tr> <td>5</td> <td>Freeze Log Supported</td> </tr> <tr> <td>6</td> <td>Clear Log Supported</td> </tr> <tr> <td>7</td> <td>Supports Addressing by Ordinal Record Number</td> </tr> <tr> <td>8</td> <td>Variable Length Records Supported</td> </tr> <tr> <td>9</td> <td>Variable Formats for Records</td> </tr> <tr> <td>10</td> <td>Can Flag Records for Overwrite</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	Write Record Supported	3	Delete Record Supported	4	Can Move Backward in Log	5	Freeze Log Supported	6	Clear Log Supported	7	Supports Addressing by Ordinal Record Number	8	Variable Length Records Supported	9	Variable Formats for Records	10	Can Flag Records for Overwrite
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Capabilities Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_MessageLog.Capabilities)	<p>An array of free-form strings that provides more detailed explanations for any of the log features indicated in the Capabilities array. Each entry of this array is related to the entry in the Capabilities array that is located at the same index.</p>																								
Caption	String	MaxLen(64)	<p>A short textual description (one-line String) of the object.</p>																								

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description																										
CharacterSet	Uint16		<p>An enumeration that describes the character set used to record data in the individual Log entries.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>2</td> <td>ASCII</td> </tr> <tr> <td>3</td> <td>Unicode</td> </tr> <tr> <td>4</td> <td>ISO2022</td> </tr> <tr> <td>5</td> <td>ISO8859</td> </tr> <tr> <td>6</td> <td>Extended UNIX Code</td> </tr> <tr> <td>7</td> <td>UTF-8</td> </tr> <tr> <td>8</td> <td>UCS-2</td> </tr> <tr> <td>9</td> <td>Bitmapped Data</td> </tr> <tr> <td>10</td> <td>OctetString</td> </tr> <tr> <td>11</td> <td>Defined by Individual Records</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	ASCII	3	Unicode	4	ISO2022	5	ISO8859	6	Extended UNIX Code	7	UTF-8	8	UCS-2	9	Bitmapped Data	10	OctetString	11	Defined by Individual Records
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8	UCS-2																												
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CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.																										
CurrentNumberOfRecords	Uint64	Gauge(TRUE)	The current number of entries (records) in the log.																										
Description	String		A textual description of the object.																										
ElementName	String		A user-friendly name for the object. This property allows each instance to define a user-friendly name, in addition to its key properties/identity data, and description information.																										

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>
HeaderFormat	String		<p>If the SizeOfHeader property is non-zero, this property describes the structure and format of the log header. It is a free-form String. If the SizeOfHeader property is 0, then the information in this property is undefined.</p>

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
InstallDate	Datetime		Indicates when the object was installed. A lack of a value does not indicate that the object is not installed.
IsFrozen	Boolean		Indicates if the log is currently frozen and modifications are not allowed.
LastChange	Uint16		An enumeration that describes the last change to the MessageLog. Code Semantics 0 Unknown 1 Add 2 Delete 3 Modify 4 Log Cleared
MaxLogSize	Uint64	Units(Bytes)	The maximum size, in bytes, to which the log can grow. If there is no maximum, then MaxLogSize is set to 0.
MaxNumberOfRecords	Uint64		The maximum number of records that can be captured in the log. If undefined, a value of 0 is specified.
MaxRecordSize	Uint64	Units(Bytes)	The maximum size, in bytes, to which an individual log entry (record) can grow - if the Capabilities array includes a value of 7 ("Variable Length Records Supported"). If the Capabilities array does not include a 7, then the log only supports fixed length entries.
Name	String	MaxLen(256)	The inherited Name serves as part of the key (a unique identifier) for the MessageLog instance.

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>The current status of the element.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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17	Completed																																										
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OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.</p>																																								
OtherPolicy Description	String	ModelCorrespondence (CIM_MessageLog. OverwritePolicy)	<p>When the OverwritePolicy specifies a value of 1 ("Other"), the Log's behavior can be explained by this property. If OverwritePolicy is not 1, then this property's contents are undefined.</p>																																								

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description																		
OverwritePolicy	Uint16	ModelCorrespondence (CIM_MessageLog.OtherPolicyDescription CIM_MessageLog.TimeWhenOutdated CIM_MessageLog.PercentageNearFull)	<p>An enumeration that describes the behavior of the log when it becomes full or near full.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>2</td> <td>Wraps When Full</td> </tr> <tr> <td>3</td> <td>Clear When Near Full</td> </tr> <tr> <td>4</td> <td>Overwrite Outdated When Needed</td> </tr> <tr> <td>5</td> <td>Remove Outdated Records</td> </tr> <tr> <td>6</td> <td>Overwrite Specific Records</td> </tr> <tr> <td>7</td> <td>Never Overwrite</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	Wraps When Full	3	Clear When Near Full	4	Overwrite Outdated When Needed	5	Remove Outdated Records	6	Overwrite Specific Records	7	Never Overwrite
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5	Remove Outdated Records																				
6	Overwrite Specific Records																				
7	Never Overwrite																				
PercentageNearFull	Uint8	Units(Percent), ModelCorrespondence (CIM_MessageLog.OverwritePolicy)	If the OverwritePolicy is based on clearing records when the log is near full (value=3), this property defines the record capacity (in percentage) that is considered to be 'near full.'																		
RecordHeader Format	String		If the SizeOfRecordHeader property is non-zero, this property describes the structure and format of the record headers. It is a free-form string. If the SizeOfRecordHeader property is 0, then the information in this property is undefined.																		
RecordLast Changed	Uint64		When a change is made to the log, the record number that was modified is captured.																		

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration indicator. This property is provided to compare Requested and current Enabledstatus. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed.</p> <p>Code Semantics</p> <p>2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
SizeOfHeader	Uint64	Units(Bytes)	The size of the log header, in bytes. If there is no log header, then this property is set to 0.
SizeOfRecordHeader	Uint64	Units(Bytes)	The size of the header for the log's individual entries, in bytes. If there are no record headers, then this property is set to 0.
Status	String	MaxLen(10), Deprecated(CIM_Managed SystemElement.Operational Status)	The current status of the object. This property is deprecated in lieu of OperationalStatus, which includes the same semantics in its enumeration.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").

Table 22. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
TimeOfLastChange	Datetime		When a change is made to the log, the date/time of that modification is captured. This property can be used to event against any update to the MessageLog.
TimeOfLastState Change	Datetime		Unsupported property.
TimeWhenOutdated	Datetime	ModelCorrespondence (CIM_MessageLog. OverwritePolicy)	If the OverwritePolicy is based on 'outdated' records (values 4 or 5), this property defines when a log entry is considered to be outdated, either by time interval or at a specific date and time.

IBMTSSVC_MigrateVolumeJob

IBMTSSVC_MigrateVolumeJob class instances show the percentage of all four migration copy types in the "migrating" state.

Properties

A job instance is used to monitor asynchronous volume migration operations on the device. The IBMTSSVC_MigrateVolumeJob class has the properties shown in Table 23.

Table 23. IBMTSSVC_MigrateVolumeJob properties

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID <i>must</i> be unique within a namespace. In order to ensure that the name is unique, the value of InstanceID must be constructed in the following manner: (Vendor ID)(ID)
Caption	String	MaxLen(64),	Unsupported property.
DeleteOnCompletion	Boolean	Write(TRUE),	Indicates if the job is automatically deleted after completion. If this property is set to false and the job completes, the extrinsic method DeleteInstance <i>must</i> be used to delete the job.

Table 23. IBMTSSVC_MigrateVolumeJob properties (continued)

Property	Type	Qualifier	Description
Description	String		A textual description of the object.
Elapsed Time	Datetime		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	Uint16	Model Correspondence (CIM_Job.ErrorDescription)	Unsupported property.
ErrorDescription	String	Model Correspondence (CIM_Job.ErrorCode),	Unsupported property.
InstallDate	Datetime		Unsupported property.
JobRunTimes	Uint32	Write(TRUE),	
JobState	Uint16		An integer enumeration that indicates the operational state of a job. Code Semantics 2 New 3 Starting 4 Running 5 Suspended 6 Shutting Down 7 Completed 8 Terminated 9 Killed 10 Exception 11 Service 12..32767 DMTF Reserved 32768..65535 Vendor Reserved
JobStatus	String	Model Correspondence (ManagedSystemElement)	Unsupported property.
LocalOrUtcTime	Uint16	Write(TRUE),	Code Semantics 1 Local Time 2 UTC Time
MigrationType	String		The type of volume migration operation.
Name	String	Required(TRUE), MaxLen(1024)	The user friendly name for this instance of the job.
Notify	String	Write(TRUE),	Unsupported property.
NumberOfExtents	String		The number of extents.

Table 23. IBMTSSVC_MigrateVolumeJob properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	The current status of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherRecoveryAction	String	Model Correspondence (CIM_Job.Recovery Action)	The recovery action when the instance's RecoveryAction property is 1 ("Other").
Owner	String	Model Correspondence (CIM_OwningJob Element)	Unsupported property.
PercentComplete	Uint16	MaxValue(101), MinValue(0), Units(Percent),	The percentage of the job that is complete at the time of the request.
Priority	Uint32	Write(TRUE),	Unsupported property.

Table 23. IBMTSSVC_MigrateVolumeJob properties (continued)

Property	Type	Qualifier	Description
RecoveryAction	Uint16	Model Correspondence (CIM_Job.Other RecoveryAction)	The recovery action for an unsuccessfully run job. A return code of "Other" indicates that the recovery action is specified in the OtherRecovery Action property. Code Semantics 0 Unknown 1 Other 2 Do Not Continue 3 Continue With Next Job 4 Re-run Job 5 Run Recovery Job
RunDay	Sint8	Write(TRUE), MinValue(-31), MaxValue(31), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay OfWeek CIM_Job.Run StartInterval)	
RunDayOfWeek	Sint8	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunStart Interval)	Code Semantics -7 -Saturday -6 -Friday -5 -Thursday -4 -Wednesday -3 -Tuesday -2 -Monday -1 -Sunday 0 ExactDayOf Month 1 Sunday 2 Monday 3 Tuesday 4 Wednesday 5 Thursday 6 Friday 7 Saturday

Table 23. IBMTSSVC_MigrateVolumeJob properties (continued)

Property	Type	Qualifier	Description																										
RunMonth	Uint8	Write(TRUE), Model Correspondence (CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	<table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>January</td></tr> <tr><td>1</td><td>February</td></tr> <tr><td>2</td><td>March</td></tr> <tr><td>3</td><td>April</td></tr> <tr><td>4</td><td>May</td></tr> <tr><td>5</td><td>June</td></tr> <tr><td>6</td><td>July</td></tr> <tr><td>7</td><td>August</td></tr> <tr><td>8</td><td>September</td></tr> <tr><td>9</td><td>October</td></tr> <tr><td>10</td><td>November</td></tr> <tr><td>11</td><td>December</td></tr> </tbody> </table>	Code	Semantics	0	January	1	February	2	March	3	April	4	May	5	June	6	July	7	August	8	September	9	October	10	November	11	December
Code	Semantics																												
0	January																												
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3	April																												
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5	June																												
6	July																												
7	August																												
8	September																												
9	October																												
10	November																												
11	December																												
RunStartInterval	Datetime	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)																											
ScheduledStartTime	Datetime	Deprecated (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval), Write(TRUE),	Unsupported property.																										
SourceMDisk	String		The ID of the source BackendVolume.																										
SourceMDiskgrp	String		The ID of the source StoragePool.																										
SourceVDisk	String		The ID of the source StorageVolume.																										
StartTime	Datetime		Unsupported property.																										
Status	String	MaxLen(10), Deprecated(CIM_ ManagedSystem Element)	This property is deprecated in lieu of OperationalStatus.																										
StatusDescriptions	String[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	Describes the status. Use this property when the OperationalStatus property is set to 1 ("Other").																										
TargetMDisk	String		The ID of the target BackendVolume.																										
TargetMDiskgrp	String		The ID of the target Storagepool.																										
TargetVDisk	String		The ID of the target StorageVolume.																										

Table 23. IBMTSSVC_MigrateVolumeJob properties (continued)

Property	Type	Qualifier	Description
Threads	Uint16		The amount of threads used for the operation.
TimeOfLastState Change	Datetime		Unsupported property.
TimeSubmitted	Datetime		Unsupported property.
UntilTime	Datetime	Write(TRUE), Model Correspondence (CIM_Job.LocalOr UtcTime)	Unsupported property.

IBMTSSVC_Node

The IBMTSSVC_Node class represents a single SAN Volume Controller node that is part of a cluster.

Properties

A cluster can contain up to eight nodes or four node pairs. The IBMTSSVC_Node class extends the CIM_ComputerSystem class and has the properties shown in Table 24.

Table 24. IBMTSSVC_Node properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short textual description (one-line string) of the object.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.

Table 24. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the ComputerSystem is a special-purpose system (dedicated to a particular use) or a general purpose system. The SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server").</p> <p>Code Semantics</p> <p>0 Not Dedicated</p> <p>1 Unknown</p> <p>2 Other</p> <p>3 Storage</p> <p>4 Router</p> <p>5 Switch</p> <p>6 Layer 3 Switch</p> <p>7 Central Office Switch</p> <p>8 Hub</p> <p>9 Access Server</p> <p>10 Firewall</p> <p>11 Print</p> <p>12 I/O</p> <p>13 Web Caching</p> <p>14 Management</p> <p>15 Block Server</p> <p>16 File Server</p> <p>17 Mobile User Device</p> <p>18 Repeater</p> <p>19 Bridge/Extender</p> <p>20 Gateway</p>
Description	String		A textual description of the object.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The node's user-friendly name

Table 24. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	<p>An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.</p>
InstallDate	Datetime		Unsupported property.

Table 24. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
IsConfigNode	Boolean		Indicates if this node is the config node of its cluster. When true, the node is the config node of its cluster.
Name	String	MaxLen(256)	The label by which the object is known. Format: cluster_ip:object_id
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated. The SAN Volume Controller returns the node's id as Name, therefore this attribute is set to "Other."
NativeStatus	Uint16		The node's native operational status. Code Semantics 0 Offline 1 Online 2 Pending 3 Adding 4 Deleting
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The node's operational status. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode

Table 24. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.Dedicated)	Describes how or why the system is dedicated when the Dedicated array includes the value 2, (Other").
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. IdentifyingDescriptions), Expensive(TRUE)	The node's "Redundancy Group ID," "RedundancyGroup Name," "Partner Node Name," "Partner Node ID" and "WWWN."
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	An enumerated array that describes the power management capabilities of the ComputerSystem. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class must be used. Code Semantics 0 Unknown 1 Not Supported 2 Disabled 3 Enabled 4 Power Saving Modes Entered Automatically 5 Power State Settable 6 Power Cycling Supported 7 Timed Power On Supported
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE),	Unsupported property.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE),	Unsupported property.

Table 24. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	An integer enumeration indicator. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
ResetCapability	Uint16		If enabled (value = 4), the ComputerSystem can be reset through hardware (the power and reset buttons). If disabled (value = 3), hardware reset is not allowed. Code Semantics 1 Other 2 Unknown 3 Disabled 4 Enabled 5 Not Implemented
Roles	String[]	Write(TRUE)	Unsupported property.
Status	String	MaxLen(10), Deprecated(CIM_Managed SystemElement. OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Datetime		Unsupported property.

IBMTSSVC_NodeVPD

The IBMTSSVC_NodeVPD class contains the vital product data (VPD) of the corresponding SAN Volume Controller IBMTSSVC_Node instance.

Properties

The IBMTSSVC_NodeVPD class extends the CIM_SettingData class and has the properties shown in Table 25.

Table 25. IBMTSSVC_NodeVPD properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
Description	String		A textual description of the object
ElementName	String	Required(TRUE)	Unsupported property.
EthernetIP	String		EthernetIP of the node.
FrontPanetID	String		FrontPanelID of the node.
InstanceID	String	Key	Opaquely identifies a unique instance of SettingData. The InstanceID <i>must</i> be unique within a namespace. To ensure this, the value of InstanceID must be constructed in the following manner: (Vendor ID)(ID).
NodeVPD	String[]		Specifies the VPD of the SAN Volume Controller.

IBMTSSVC_PrimordialStoragePool

The IBMTSSVC_PrimordialStoragePool class extends the CIM_StoragePool class.

Properties

The IBMTSSVC_PrimordialStoragePool class has the properties shown in Table 26.

Table 26. IBMTSSVC_PrimordialStoragePool properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.
ElementName	String	MaxLen(15)	The pool's user-friendly name.
InstallDate	Datetime		Unsupported property.
InstanceID	String		The label by which the object is known. Format: cluster_ip:P:object_id

Table 26. IBMTSSVC_PrimordialStoragePool properties (continued)

Property	Type	Qualifier	Description																																								
Name	String	MaxLen(1024)	The pool's globally unique id. The ID format is (Vendor)(id), in case of SAN Volume Controller IBMTSSVC(id).																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>Unsupported property. Always reported as "Unknown."</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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PoolID	String	Required(TRUE), MaxLen(256)	This is numeric and only unique in terms of the hosting SAN Volume Controller cluster.																																								

Table 26. IBMTSSVC_PrimordialStoragePool properties (continued)

Property	Type	Qualifier	Description
Primordial	Boolean		If true, "Primordial" indicates that the containing system does not have the ability to create or delete this operational element. Higher-level StoragePools may be assembled using the Component or AllocatedFromStorage Pool associations. Although the higher-level abstractions can be created and deleted, the most basic (primordial) hardware-based StoragePools cannot. These StoragePools are physically realized as part of the system, or are actually managed by some other system and imported as if they were physically realized.
RemainingManagedSpace	UInt64	Units(Bytes), ModelCorrespondence (StoragePool.TotalManagedSpace AllocatedFromStoragePool.SpaceConsumed), Required(TRUE)	The remaining amount of raw storage (in bytes) from the TotalManagedSpace of this StoragePool.
Status	String	MaxLen(10), Deprecated(CIM_ManagedSystemElement.OperationaIStatus)	Deprecated property - set to "Unknown." Look to OperationalStatus for status information
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
TotalManagedSpace	UInt64	Units(Bytes), ModelCorrespondence (StoragePool.RemainingManagedSpace)	The total amount of raw storage (in bytes) managed by this StoragePool.

IBMTSSVC_Privilege

IBMTSSVC_Privilege class extends the CIM_AuthorizedPrivilege class.

Properties

The IBMTSSVC_Privilege class has the properties shown in Table 27.

Table 27. IBMTSSVC_Privilege properties

Property	Type	Qualifier	Description
Activities	UInt16[]	ModelCorrespondence (CIM_Privilege.ActivityQualifiers), ArrayType(Indexed)	<p>An array of string values that indicate the activities that are granted or denied. These activities apply to all entities specified in the ActivityQualifiers array.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Create</p> <p>3 Delete</p> <p>4 Read</p> <p>5 Write</p> <p>6 Execute</p> <p>7.. DMTF Reserved</p>
ActivityQualifiers	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_Privilege.Activities CIM_Privilege.QualifierFormats)	Unsupported property.
Caption	String	MaxLen(64)	Unsupported property.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.
InstanceID	String		<p>Opaquely identifies a unique instance of Privilege. The InstanceID <i>must</i> be unique within a namespace. To ensure this, the value of InstanceID <i>must</i> be constructed in the following manner: (Vendor/Admin ID):(ID)</p> <p>(Vendor/Admin ID) <i>must</i> include a copyrighted, trademarked or otherwise unique name that is owned by the business entity, or a registered ID.</p>
PrivilegeGranted	Boolean		Indicates if this Privilege grants (<i>true</i>) or denies (<i>false</i>) permission. The default is to grant permission.

Table 27. IBMTSSVC_Privilege properties (continued)

Property	Type	Qualifier	Description
QualifierFormats	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_Privilege.Activity Qualifiers)	Unsupported property. Code Semantics 2 Class Name 3 <Class.> Property 4 <Class.> Method 5 Object Reference 6 Namespace 7 URL 8 Directory/File Name 9 Command Line Instruction ..15999 DMTF Reserved 16000.. Vendor Reserved

IBMTSSVC_Product

The IBMTSSVC_Product class extends the CIM_Product class.

Properties

The IBMTSSVC_Product class represents a SAN Volume Controller unit and contains the ordering and version information. The Product instance aggregates the PhysicalElements, software, services and other components of the SAN Volume Controller.

The IBMTSSVC_Product class has the properties shown in Table 28.

Table 28. IBMTSSVC_Product properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String		The name of the Product.
IdentifyingNumber	String	MaxLen(64)	The Product identification, such as a serial number on software, a die-number on a hardware chip, or (for noncommercial Products) a project number.

Table 28. IBMTSSVC_Product properties (continued)

Property	Type	Qualifier	Description
Name	String	MaxLen(256), ModelCorrespondence (CIM.DMTFIPRS_Product. ProductName)	The Product name.
SKUNumber	String	MaxLen(64)	Unsupported property.
Vendor	String	MaxLen(256), ModelCorrespondence (CIM.DMTFIPRS_ Product.Vendor)	The name of the supplier, manufacturer, or reseller of the Product. Corresponds to the Vendor property in the Product object in the DMTF Solution Exchange Standard.
Version	String	MaxLen(64), ModelCorrespondence (CIM.DMTFIPRS_ Product.Version)	The version of the PhysicalElement.
WarrantyDuration	Uint32	Units(Days), ModelCorrespondence (CIM_Product.Warranty StartDate)	Unsupported property.
WarrantyStartDate	Datetime	ModelCorrespondence (CIM_Product.Warranty Duration)	Unsupported property.

IBMTSSVC_Provider

The IBMTSSVC_Provider class extends the CIM_Provider class.

Properties

The IBMTSSVC_Provider class has the properties shown in Table 29.

Table 29. IBMTSSVC_Provider properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64), ReadRole(None)	A short textual description (one-line string) of the object.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String	ReadRole(None)	A textual description of the object.

Table 29. IBMTSSVC_Provider properties (continued)

Property	Type	Qualifier	Description
ElementName	String	ReadRole(None)	A user-friendly name for the object. This property allows each instance to define a user-friendly name, in addition to its key properties/identity data and description information.
EnabledDefault	Uint16	Write(TRUE)	An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2). Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	An integer enumeration indicator. Code Semantics 0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved
Handle	String	Required(TRUE)	An implementation-specific string that identifies the handle to the provider.
InstallDate	Datetime		Unsupported property.

Table 29. IBMTSSVC_Provider properties (continued)

Property	Type	Qualifier	Description																																								
Name	String	MaxLen(256)	A user-friendly name that uniquely identifies the provider within a system.																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>The operational status of the service.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherEnabled State	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>The element's enabled/disabled state when the EnabledStatus property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledStatus is any value other than 1.</p>																																								
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	Unsupported property.																																								
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Unsupported property.																																								

Table 29. IBMTSSVC_Provider properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	An integer enumeration indicator. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Started	Boolean		Indicates if this service is started.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.EnabledDefault)	Indicates if this service is started manually or automatically.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastStateChange	Datetime		Unsupported property.

IBMTSSVC_RegisteredProfile

The IBMTSSVC_RegisteredProfile class represents a SAN Volume Controller unit and contains the ordering and version information.

Properties

The Product instance aggregates the PhysicalElements, software, services and other components of the SAN Volume Controller.

A RegisteredProfile describes a set of Common Information Model (CIM) Schema classes with required properties and/or methods, necessary to manage a real-world

entity or to support a usage scenario, in an interoperable fashion. RegisteredProfiles can be defined by the Distributed Management Task Force (DMTF) or other standards organizations.

Note: This class should not be confused with CIM_Profile, which collects SettingData instances to be applied as a "configuration profile" for an element.

The IBMTSSVC_RegisteredProfile class extends the CIM_RegisteredProfile class and has the properties shown in Table 30.

Table 30. IBMTSSVC_RegisteredProfile properties

Property	Type	Qualifier	Description
AdvertiseType Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile.AdvertiseTypes)	A free-form string that provides additional information related to the AdvertiseType. A description <i>must</i> be provided when the AdvertiseType is 1 ("Other").
AdvertiseTypes	Uint16[]	Required(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile.AdvertiseTypeDescriptions)	Signifies the advertisement for the profile information. It is used by the advertising services of the WBEM infrastructure to determine what should be advertised and what types of mechanisms should be used. The property is an array so that the profile may be advertised using several mechanisms. Note: If this property is null/uninitialized, this is equivalent to specifying the value 2, "Not Advertised." Code Semantics 1 Other 2 Not Advertised 3 SLP
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.

Table 30. IBMTSSVC_RegisteredProfile properties (continued)

Property	Type	Qualifier	Description
ElementName	String		A user-friendly name for the object. This property allows each instance to define a user-friendly name, in addition to its key properties/identity data, and description information.
InstanceID	String		Opaquely and uniquely identifies an instance of this class. In order to ensure this, the value of InstanceID <i>must</i> be constructed using the following 'preferred' algorithm: <OrgID>:<LocalID> Where <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> <i>must</i> include a copyrighted, trademarked or otherwise unique name that is owned by the business entity creating/defining the InstanceID, or is a registered ID that is assigned to the business entity by a recognized global authority.
OtherRegistered Organization	String	MaxLen(256), ModelCorrespondence (CIM_RegisteredProfile.RegisteredOrganization)	A free-form string that provides a description of the organization when 1, "Other," is specified for the Registered Organization.
RegisteredName	String	Required(TRUE), MaxLen(256)	A string to identify this RegisteredProfile. It is the responsibility of the defining organization to ensure that the profile's name is unique within the scope of the organization.

Table 30. IBMTSSVC_RegisteredProfile properties (continued)

Property	Type	Qualifier	Description																																								
Registered Organization	Uint16	Required(TRUE), ModelCorrespondence (CIM_RegisteredProfile. OtherRegisteredOrganization)	<p>The organization that defines this profile.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>DMTF</td></tr> <tr><td>3</td><td>CompTIA</td></tr> <tr><td>4</td><td>Consortium for Service Innovation</td></tr> <tr><td>5</td><td>FAST</td></tr> <tr><td>6</td><td>GGF</td></tr> <tr><td>7</td><td>INTAP</td></tr> <tr><td>8</td><td>itSMF</td></tr> <tr><td>9</td><td>NAC</td></tr> <tr><td>10</td><td>Northwest Energy Efficiency Alliance</td></tr> <tr><td>11</td><td>SNIA</td></tr> <tr><td>12</td><td>TM Forum</td></tr> <tr><td>13</td><td>The Open Group</td></tr> <tr><td>14</td><td>ANSI</td></tr> <tr><td>15</td><td>IEEE</td></tr> <tr><td>16</td><td>IETF</td></tr> <tr><td>17</td><td>INCITS</td></tr> <tr><td>18</td><td>ISO</td></tr> <tr><td>19</td><td>W3C</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	DMTF	3	CompTIA	4	Consortium for Service Innovation	5	FAST	6	GGF	7	INTAP	8	itSMF	9	NAC	10	Northwest Energy Efficiency Alliance	11	SNIA	12	TM Forum	13	The Open Group	14	ANSI	15	IEEE	16	IETF	17	INCITS	18	ISO	19	W3C
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Registered Version	String	Required(TRUE)	<p>The version of this profile. The String representing the version <i>must</i> be in the form: M + "." + N + "." + U</p> <p>Where: M stands for the major version (in numeric form) that describes the profile's creation or last modification.</p> <p>N stands for the minor version (in numeric form) that describes the profile's creation or last modification.</p> <p>U stands for the update (e.g. errata, patch, ..., in numeric form) that describes the profile's creation or last modification.</p>																																								

IBMTSSVC_RegisteredSubProfile

The IBMTSSVC_RegisteredProfile class extends the CIM_RegisteredSubProfile class.

Properties

A RegisteredSubProfile subclasses RegisteredProfile to indicate that a scoping profile is required to provide context. The latter is specified by the mandatory association, SubProfileRequiresProfile.

The IBMTSSVC_RegisteredProfile class has the properties shown in Table 31.

Table 31. IBMTSSVC_RegisteredSubProfile properties

Property	Type	Qualifier	Description
AdvertiseType Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile. AdvertiseTypes)	A free-form string that provides additional information related to the AdvertiseType. A description <i>must</i> be provided when the AdvertiseType is 1 ("Other").
AdvertiseTypes	Uint16[]	Required(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile. AdvertiseTypeDescriptions)	Signifies the advertisement for the profile information. It is used by the advertising services of the WBEM infrastructure to determine what <i>must</i> be advertised and what type of mechanisms can be used. Code Semantics 1 Other 2 Not Advertised 3 SLP
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.
ElementName	String		A user-friendly name for the object.

Table 31. IBMTSSVC_RegisteredSubProfile properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		<p>Opaquely and uniquely identifies an instance of this class. In order to ensure this, the value of InstanceID must be constructed using the following 'preferred' algorithm: <OrgID>:<LocalID></p> <p>Where <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> <i>must</i> include a copyrighted, trademarked or otherwise unique name that is owned by the business entity creating/defining the InstanceID, or is a registered ID that is assigned to the business entity by a recognized global authority.</p>
OtherRegistered Organization	String	MaxLen(256), ModelCorrespondence (CIM_RegisteredProfile. RegisteredOrganization)	A free-form string that provides a description of the organization when 1 ("Other,") is specified for the Registered Organization.
RegisteredName	String	Required(TRUE), MaxLen(256)	A string to identify this RegisteredProfile.

Table 31. IBMTSSVC_RegisteredSubProfile properties (continued)

Property	Type	Qualifier	Description																																								
Registered Organization	Uint16	Required(TRUE), ModelCorrespondence (CIM_RegisteredProfile. OtherRegisteredOrganization)	<p>The organization that defines this profile.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>DMTF</td></tr> <tr><td>3</td><td>CompTIA</td></tr> <tr><td>4</td><td>Consortium for Service Innovation</td></tr> <tr><td>5</td><td>FAST</td></tr> <tr><td>6</td><td>GGF</td></tr> <tr><td>7</td><td>INTAP</td></tr> <tr><td>8</td><td>itSMF</td></tr> <tr><td>9</td><td>NAC</td></tr> <tr><td>10</td><td>Northwest Energy Efficiency Alliance</td></tr> <tr><td>11</td><td>SNIA</td></tr> <tr><td>12</td><td>TM Forum</td></tr> <tr><td>13</td><td>The Open Group</td></tr> <tr><td>14</td><td>ANSI</td></tr> <tr><td>15</td><td>IEEE</td></tr> <tr><td>16</td><td>IETF</td></tr> <tr><td>17</td><td>INCITS</td></tr> <tr><td>18</td><td>ISO</td></tr> <tr><td>19</td><td>W3C</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	DMTF	3	CompTIA	4	Consortium for Service Innovation	5	FAST	6	GGF	7	INTAP	8	itSMF	9	NAC	10	Northwest Energy Efficiency Alliance	11	SNIA	12	TM Forum	13	The Open Group	14	ANSI	15	IEEE	16	IETF	17	INCITS	18	ISO	19	W3C
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RegisteredVersion	String	Required(TRUE)	<p>The version of this profile. The string representing the version <i>must</i> be in the form: M + "." + N + "." + U</p> <p>Where: M stands for the major version (in numeric form) that describes the profile's creation or last modification.</p> <p>N stands for the minor version (in numeric form) that describes the profile's creation or last modification.</p> <p>U stands for the update (e.g. errata, patch, ..., in numeric form) that describes the profile's creation or last modification.</p>																																								

IBMTSSVC_RemoteCluster

The IBMTSSVC_RemoteCluster class represents a separate SAN Volume Controller cluster connected through the fibre-channel network to the local cluster on which a synchronous copy partnership has been established.

Properties

The IBMTSSVC_RemoteCluster class extends the IBMTSSVC_AbstractCluster class and has the properties shown in Table 32:

Table 32. IBMTSSVC_RemoteCluster properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String		The name of the cluster.
InstallDate	Datetime		Indicates when the object was installed. A lack of a value does not indicate that the object is not installed.
IP	String		The IP address of the remote cluster.
Name	String	MaxLen(256)	The label for the new object

Table 32. IBMTSSVC_RemoteCluster properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The current status of the element. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode .. DMTF Reserved 0x8000.. Vendor Reserved
Partnership Bandwidth	String		The bandwidth used for this partnership.
PartnershipStatus	String		The status of the remote cluster partnership. Can be either "Fully_Configured," "Partly_Configured," or "Offline."
ServiceIP	String		The service IP address of the remote cluster.
Status	String	Deprecated (CIM_ManagedSystem Element.OperationalStatus), MaxLen(10)	The current status of the object. This property is deprecated in lieu of OperationalStatus, which includes the same semantics in its enumeration.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the various OperationalStatus array values.

Table 32. IBMTSSVC_RemoteCluster properties (continued)

Property	Type	Qualifier	Description
SystemName	String	MaxLen(256)	The label by which the object is known.

IBMTSSVC_RemoteServiceAccessPoint

RemoteServiceAccessPoint describes access and/or addressing information for a remote connection, that is known to a local network element.

Properties

The IBMTSSVC_RemoteServiceAccessPoint class extends the CIM_RemoteServiceAccessPoint class and has the properties shown in Table 33.

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties

Property	Type	Qualifier	Description
AccessInfo	String	ModelCorrespondence (CIM_RemoteServiceAccessPoint.InfoFormat)	Access and/or addressing information for a remote connection. This can be a host name, network address or similar information.
Caption	String	MaxLen(64)	A short textual description (one- line string) of the object.
ConsoleIP	String	Expensive(TRUE)	The IP address of the management console.
ConsolePort	String	Expensive(TRUE)	The port address of the management console.
CreationClass Name	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		A user-friendly name for the object. This property allows each instance to define a user-friendly name, in addition to its key properties/identity data, and description information.

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's Enabled State. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration that indicates the enabled/disabled states of an element.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description																																																						
InfoFormat	Uint16	ModelCorrespondence (CIM_RemoteService AccessPoint.Other InfoFormatDescription)	<p>An enumerated integer that describes the format and interpretation of the AccessInfo property.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>Host Name</td></tr> <tr><td>3</td><td>IPv4 Address</td></tr> <tr><td>4</td><td>IPv6 Address</td></tr> <tr><td>5</td><td>IPX Address</td></tr> <tr><td>6</td><td>DECnet Address</td></tr> <tr><td>7</td><td>SNA Address</td></tr> <tr><td>8</td><td>Autonomous System Number</td></tr> <tr><td>9</td><td>MPLS Label</td></tr> <tr><td>10</td><td>IPv4 Subnet Address</td></tr> <tr><td>11</td><td>IPv6 Subnet Address</td></tr> <tr><td>12</td><td>IPv4 Address Range</td></tr> <tr><td>13</td><td>IPv6 Address Range</td></tr> <tr><td>100</td><td>Dial String</td></tr> <tr><td>101</td><td>Ethernet Address</td></tr> <tr><td>102</td><td>Token Ring Address</td></tr> <tr><td>103</td><td>ATM Address</td></tr> <tr><td>104</td><td>Frame Relay Address</td></tr> <tr><td>200</td><td>URL</td></tr> <tr><td>201</td><td>FQDN</td></tr> <tr><td>202</td><td>User FQDN</td></tr> <tr><td>203</td><td>DER ASN1 DN</td></tr> <tr><td>204</td><td>DER ASN1 GN</td></tr> <tr><td>205</td><td>Key ID</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>32768..65535</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	Host Name	3	IPv4 Address	4	IPv6 Address	5	IPX Address	6	DECnet Address	7	SNA Address	8	Autonomous System Number	9	MPLS Label	10	IPv4 Subnet Address	11	IPv6 Subnet Address	12	IPv4 Address Range	13	IPv6 Address Range	100	Dial String	101	Ethernet Address	102	Token Ring Address	103	ATM Address	104	Frame Relay Address	200	URL	201	FQDN	202	User FQDN	203	DER ASN1 DN	204	DER ASN1 GN	205	Key ID	..	DMTF Reserved	32768..65535	Vendor Reserved
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InstallDate	Datetime		Indicates when the object was installed. A lack of a value does not indicate that the object is not installed.																																																						

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description																																												
Name	String	MaxLen(256)	Uniquely identifies the ServiceAccess Point and provides an indication of the functionality that is managed. This functionality is described in more detail in the object's Description property.																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The current status of the element.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000..</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode	..	DMTF Reserved	0x8000..	Vendor Reserved
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OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																												
OtherInfoFormatDescription	String	ModelCorrespondence (CIM_RemoteServiceAccessPoint.InfoFormat)	Describes the format when the property InfoFormat is set to 1 ("Other").																																												

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description																										
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration that indicates the last requested or desired state for the element. The actual state of the element is represented by EnabledState. This property is provided to compare the last requested and current enabled/disabled states. When EnabledState is set to 5 ("Not Applicable"), this property has no meaning.</p> <table border="0"> <tr> <td>Code</td> <td>Semantics</td> </tr> <tr> <td>2</td> <td>Enabled</td> </tr> <tr> <td>3</td> <td>Disabled</td> </tr> <tr> <td>4</td> <td>Shut Down</td> </tr> <tr> <td>5</td> <td>No Change</td> </tr> <tr> <td>6</td> <td>Offline</td> </tr> <tr> <td>7</td> <td>Test</td> </tr> <tr> <td>8</td> <td>Deferred</td> </tr> <tr> <td>9</td> <td>Quiesce</td> </tr> <tr> <td>10</td> <td>Reboot</td> </tr> <tr> <td>11</td> <td>Reset</td> </tr> <tr> <td>..</td> <td>DMTF Reserved</td> </tr> <tr> <td>32768..65535</td> <td>Vendor Reserved</td> </tr> </table>	Code	Semantics	2	Enabled	3	Disabled	4	Shut Down	5	No Change	6	Offline	7	Test	8	Deferred	9	Quiesce	10	Reboot	11	Reset	..	DMTF Reserved	32768..65535	Vendor Reserved
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Status	String	Deprecated (CIM_ManagedSystem Element.OperationalStatus), MaxLen(10)	The current status of the object. This property is deprecated in lieu of OperationalStatus, which includes the same semantics in its enumeration.																										
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the various OperationalStatus array values. For example, if "Stopping" is the value assigned to OperationalStatus, then this property may contain an explanation as to why an object is being stopped.																										
SystemCreation ClassName	String	Propagated (CIM_System.Creation ClassName), MaxLen(256)	The scoping System's CreationClassName.																										
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping System's Name.																										

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description
TimeOfLastStateChange	Datetime		The date/time when the element's EnabledState last changed. If the state of the element has not changed and this property is populated, then it <i>must</i> be set to a 0 interval value. If a state change was requested, but rejected or not yet processed, the property must not be updated.

IBMTSSVC_RemoteVolume

The IBMTSSVC_RemoteVolume class represents a remote volume in a synchronous copy relationship.

Properties

The IBMTSSVC_RemoteVolume class extends the CIM_LogicalElement class and has the properties shown in Table 34.

Table 34. IBMTSSVC_RemoteVolume properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one- line string) of the object.
ClusterID	String		The identifier of the remote volume's cluster.
ClusterName	String		The name of the remote volume's cluster.
Description	String		A textual description of the object.
ElementName	String		A user-friendly name for the object.
InstallDate	Datetime		Unsupported property.
Name	String	MaxLen(1024)	The identifier of the remote volume.

Table 34. IBMTSSVC_RemoteVolume properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The current status of the element. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	The current status of the object; reported as <i>Unknown</i> .
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. This property is used when the OperationalStatus property is set to 1 ("Other").
SystemName	String		The IP of the scoping cluster.

IBMTSSVC_StorageCapabilities

IBMTSSVC_StorageCapabilities class is a subclass of Capabilities that defines the capabilities of a StorageService or StoragePool.

Properties

For example, an instance of StorageCapabilities could be associated with either a StorageConfigurationService or StoragePool by using ElementCapabilities. The IBMTSSVC_StorageCapabilities class extends the CIM_StorageCapabilities class and has the properties shown in Table 35 on page 174.

Table 35. IBMTSSVC_StorageCapabilities properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line String) of the object.
DataRedundancy Default	Uint16	MinValue(1), ModelCorrespondence (CIM_StorageCapabilities. DataRedundancyMax CIM_StorageCapabilities. DataRedundancyMin)	The default number of complete copies of data that can be maintained.
DataRedundancy Max	Uint16	MinValue(1), ModelCorrespondence (CIM_StorageCapabilities. DataRedundancyMin CIM_StorageCapabilities. DataRedundancyDefault)	The maximum number of complete copies of data that can be maintained.
DataRedundancy Min	Uint16	MinValue(1), ModelCorrespondence (CIM_StorageCapabilities. DataRedundancyMax CIM_StorageCapabilities. DataRedundancyDefault)	The minimum number of complete copies of data that can be maintained.
DeltaReservation Default	Uint16	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageCapabilities. DeltaReservationMax CIM_StorageCapabilities. DeltaReservationMin)	A number between 1 (1%) and a 100 (100%) that specifies how much space must be reserved by default in a replica for caching changes.
DeltaReservation Max	Uint16	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageCapabilities. DeltaReservationMin CIM_StorageCapabilities. DeltaReservationDefault)	A number between 1 (1%) and a 100 (100%) that specifies the maximum amount of space reserved in a replica for caching changes.
DeltaReservation Min	Uint16	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageCapabilities. DeltaReservationMax CIM_StorageCapabilities. DeltaReservationDefault)	A number between 1 (1%) and a 100 (100%) that specifies the minimum amount of space that must be reserved in a replica for caching changes.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of Capabilities.

Table 35. IBMTSSVC_StorageCapabilities properties (continued)

Property	Type	Qualifier	Description																
ElementType	Uint16		<p>An enumeration that indicates the type of element to which this StorageCapabilities applies.</p> <table border="0"> <tr> <td>Code</td> <td>Semantics</td> </tr> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Reserved</td> </tr> <tr> <td>2</td> <td>Any Type</td> </tr> <tr> <td>3</td> <td>StorageVolume</td> </tr> <tr> <td>4</td> <td>StorageExtent</td> </tr> <tr> <td>5</td> <td>StoragePool</td> </tr> <tr> <td>6</td> <td>Storage Configuration Service</td> </tr> </table>	Code	Semantics	0	Unknown	1	Reserved	2	Any Type	3	StorageVolume	4	StorageExtent	5	StoragePool	6	Storage Configuration Service
Code	Semantics																		
0	Unknown																		
1	Reserved																		
2	Any Type																		
3	StorageVolume																		
4	StorageExtent																		
5	StoragePool																		
6	Storage Configuration Service																		
InstanceID	String		<p>Within the scope of the instantiating Namespace, InstanceID opaquely and uniquely identifies an instance of this class. In order to ensure this, the value of InstanceID must be constructed using the following algorithm: <OrgID>:<LocalID > Where <OrgID> and <LocalID> are separated by a colon ':'; and where <OrgID> <i>must</i> include a copyrighted, trademarked or otherwise unique name that is owned by the business entity creating/defining the InstanceID, or is a registered ID that is assigned to the business entity by a recognized global authority.</p>																
NoSinglePointOfFailure	Boolean	ModelCorrespondence (CIM_StorageCapabilities.NoSinglePointOfFailure Default)	<p>Indicates if the associated element supports no single point of failure. A value of false means the associated element does not support no single point of failure. A value of true means the associated element supports no single point of failure.</p>																

Table 35. IBMTSSVC_StorageCapabilities properties (continued)

Property	Type	Qualifier	Description
NoSinglePointOfFailureDefault	Boolean	ModelCorrespondence (CIM_StorageCapabilities.NoSinglePointOfFailure)	The default value for the NoSinglePointOfFailure property.
PackageRedundancyDefault	Uint16	ModelCorrespondence (CIM_StorageCapabilities.PackageRedundancyMin CIM_StorageCapabilities.PackageRedundancyMax)	The default number of redundant packages that will be used.
PackageRedundancyMax	Uint16	ModelCorrespondence (CIM_StorageCapabilities.PackageRedundancyMin CIM_StorageCapabilities.PackageRedundancyDefault)	The maximum number of redundant packages that can be used.
PackageRedundancyMin	Uint16	ModelCorrespondence (CIM_StorageCapabilities.PackageRedundancyMax CIM_StorageCapabilities.PackageRedundancyDefault)	The minimum number of redundant packages that can be used.

IBMTSSVC_StorageConfigurationCapabilities

IBMTSSVC_StorageConfigurationCapabilities class is a subclass of Capabilities that defines the Capabilities of a StorageConfigurationService.

Properties

An instance of StorageConfigurationCapabilities is associated with a StorageConfigurationService using ElementCapabilities. The IBMTSSVC_StorageConfigurationCapabilities class extends the CIM_StorageConfigurationCapabilities class and has the properties shown in Table 36.

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of Capabilities. In addition, the user-friendly name can be used as an index property for a query. (Note: Name does not have to be unique within a namespace.)

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description
Initial ReplicationState	Uint16	ModelCorrespondence (CIM_StorageConfigurationService.AttachReplica CIM_StorageConfigurationService.CreateReplica)	Specifies which initial Replication State is supported by a particular provider. Code Semantics 2 Initialized 3 Prepared 4 Synchronized .. DMTF Reserved 0x8000..0xFFFF Vendor Specific
InstanceID	String		Within the scope of the instantiating Namespace, InstanceID opaquely and uniquely identifies an instance of this class. In order to ensure this, the value of InstanceID <i>must</i> be constructed using the following algorithm: <OrgID>: <LocalID>. Where <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> <i>must</i> include a copyrighted, trademarked or otherwise unique name that is owned by the business entity creating/defining the InstanceID, or is a registered ID that is assigned to the business entity by a recognized global authority.

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description
Supported Asynchronous Actions	Uint16[]	ModelCorrespondence (CIM_StorageConfiguration Capabilities.Supported SynchronousActions)	<p>An enumeration that indicates what operations are run as asynchronous jobs. If an operation is included in both this and Supported Synchronous Actions, then the underlying implementation is indicating that it may or may not create a job.</p> <p>Code Semantics</p> <p>2 Storage Pool Creation</p> <p>3 Storage Pool Deletion</p> <p>4 Storage Pool Modification</p> <p>5 Storage Element Creation</p> <p>6 Storage Element Return</p> <p>7 Storage Element Modification</p> <p>8 Replica Creation</p> <p>9 Replica Modification</p> <p>10 Replica Attachment</p>
SupportedCopy Types	Uint16[]	ModelCorrespondence (CIM_StorageConfiguration Service.CreateReplica.CopyType)	<p>The replication capabilities supported by the associated Storage Configuration Services.</p> <p>Code Semantics</p> <p>2 Async</p> <p>3 Sync</p> <p>4 UnSyncAssoc</p> <p>5 UnSyncUnAssoc</p> <p>.. DMTF Reserved</p> <p>0x8000..0xFFFF Vendor Specific</p>

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description
SupportedStorageElementFeatures	Uint16[]	ModelCorrespondence (CIM_StorageConfigurationService.CreateOrModifyElementFromStoragePool.ElementType CIM_StorageConfigurationService.CreateOrModifyElementFromStoragePool.InPools)	An enumeration that indicates features supported by the Storage Element methods. Code Semantics 2 StorageExtent Creation 3 StorageVolume Creation 4 StorageExtent Modification 5 StorageVolume Modification 6 Single InPool 7 Multiple InPools .. DMTF Reserved 0x8000..0xFFFF Vendor Specific
SupportedStorageElementTypes	Uint16[]	ModelCorrespondence (CIM_StorageConfigurationService.CreateOrModifyElementFromStoragePool.ElementType)	An enumeration that indicates the type of storage elements that are supported by the associated Storage Configuration Service. Code Semantics 2 StorageVolume 3 StorageExtent .. DMTF Reserved 0x8000..0xFFFF Vendor Specific
SupportedStoragePoolFeatures	Uint16[]	ModelCorrespondence (CIM_StorageConfigurationService.CreateOrModifyStoragePool.InPools CIM_StorageConfigurationService.CreateOrModifyStoragePool.InElements)	An enumeration that indicates features supported by the StoragePool methods. Code Semantics 2 InExtents 3 Single InPool 4 Multiple InPools .. DMTF Reserved 0x8000..0xFFFF Vendor Specific

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description																				
Supported Synchronous Actions	Uint16[]	ModelCorrespondence (CIM_StorageConfiguration Capabilities.Supported AsynchronousActions)	<p>An enumeration that indicates what operations are run without the creation of a job. If an operation is included in both this and Supported Asynchronous Actions, then the underlying implementation is indicating that it may or may not create a job.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Storage Pool Creation</td> </tr> <tr> <td>3</td> <td>Storage Pool Deletion</td> </tr> <tr> <td>4</td> <td>Storage Pool Modification</td> </tr> <tr> <td>5</td> <td>Storage Element Creation</td> </tr> <tr> <td>6</td> <td>Storage Element Return</td> </tr> <tr> <td>7</td> <td>Storage Element Modification</td> </tr> <tr> <td>8</td> <td>Replica Creation</td> </tr> <tr> <td>9</td> <td>Replica Modification</td> </tr> <tr> <td>10</td> <td>Replica Attachment</td> </tr> </tbody> </table>	Code	Semantics	2	Storage Pool Creation	3	Storage Pool Deletion	4	Storage Pool Modification	5	Storage Element Creation	6	Storage Element Return	7	Storage Element Modification	8	Replica Creation	9	Replica Modification	10	Replica Attachment
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9	Replica Modification																						
10	Replica Attachment																						

IBMTSSVC_StorageHardwareID

The IBMTSSVC_StorageHardwareID class identifies the host port to which access to volumes can be granted.

Properties

The IBMTSSVC_StorageHardwareID class extends the CIM_StorageHardwareID class and has the properties shown in Table 37.

Table 37. IBMTSSVC_StorageHardwareID properties

Property	Type	Qualifier	Description
InstanceID	String	Expensive(TRUE)	Opaquely identifies a unique instance of Identity. The InstanceID <i>must</i> be unique within a namespace. In order to ensure this, the value of InstanceID must be constructed in the format: (Vendor/Admin ID):(ID).

Table 37. IBMTSSVC_StorageHardwareID properties (continued)

Property	Type	Qualifier	Description
Caption	String		A short textual description (one-line string) of the object.
ClientType	Uint16	Expensive(TRUE), Write(TRUE), WriteRole(Administrator)	The type of client. Code Semantics 0 Generic 1 HPUX
CurrentlyAuthenticated	Boolean		Indicates if the port is currently logged in to the fibre-channel network.
Description	String		A textual description of the object.
ElementName	String	Expensive(TRUE)	A user-friendly name for the object.
IDType	Uint16	Required(TRUE), ModelCorrespondence (CIM_StorageHardware ID.StorageID)	The type of ID property. Code Semantics 1 Other 2 PortWWN 3 NodeWWN 4 Hostname
OtherIDType	String	Required(TRUE), MaxLen(256), ModelCorrespondence (CIM_StorageHardwareID. IDType), Expensive(TRUE)	The ID type if IDType is set to "Other."

IBMTSSVC_StoragePool

The IBMTSSVC_StoragePool class represents a group of IBMTSSVC_BackendVolume instances that aggregate to become an IBMTSSVC_StoragePool from which IBMTSSVC_StorageVolumes can be allocated.

Properties

The IBMTSSVC_StoragePool class extends the CIM_StoragePool class and has the properties shown in Table 38.

Table 38. IBMTSSVC_StoragePool properties

Property	Type	Qualifier	Description
InstanceID	String		Labels the object instance in the format cluster_id:object_id.
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String		The name of the cluster.

Table 38. IBMTSSVC_StoragePool properties (continued)

Property	Type	Qualifier	Description
ExtentSize	Uint16	Units(megabytes)	The extent size of the pool. Volumes allocated from this pool have a space occupation that is a multiple of the extent size.
InstallDate	Datetime		Unsupported property.
Name	String	MaxLen(1024)	The globally unique ID of the pool, in the format (Vendor)(id). For the SAN Volume Controller, the ID is IBMTSSVC(id).
NativeStatus	Uint16		The native operational state of the pool. Code Semantics 1 Offline 1 Online 2 Degraded
NumberOfBackend Volumes	Uint16	Counter(TRUE)	The number of BackendVolumes that make up the pool.
NumberOfStorage Volumes	Uint16	Counter(TRUE)	The number of StorageVolumes that are allocated from the pool.

Table 38. IBMTSSVC_StoragePool properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.Status Descriptions)	<p>The pool's operational status. Values are 2 (OK) for online, 10 (Stopped) for offline, 1 (Other) for empty, or 1 (Other) for invalid.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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17	Completed																																										
18	Power Mode																																										
PoolID	String	Required(TRUE), MaxLen(256)	The ID of the pool. This ID is numeric and only unique in terms of the hosting SAN Volume Controller cluster.																																								

Table 38. IBMTSSVC_StoragePool properties (continued)

Property	Type	Qualifier	Description
Primordial	Boolean		If true, indicates that the containing system does not have the ability to create or delete this operational element. This is important because higher level StoragePools may be assembled using the Component or AllocatedFrom StoragePool associations. Although the higher level abstractions can be created and deleted, the most basic (primordial), hardware-based StoragePools cannot. They are physically realized as part of the system or are actually managed by some other system and imported as if they were physically realized.
RemainingManagedSpace	Uint64	Units(Bytes), ModelCorrespondence (StoragePool.TotalManagedSpace AllocatedFromStoragePool.SpaceConsumed), Required(TRUE)	The remaining amount of raw storage (in bytes) from the TotalManagedSpace of this StoragePool.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property set to "Unknown". Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	The status that is used when the OperationalStatus property is set to 1 (Other).
TotalManagedSpace	Uint64	Units(Bytes), ModelCorrespondence (StoragePool.RemainingManagedSpace)	The total amount of raw storage (in bytes) managed by this StoragePool.

IBMTSSVC_StorageSetting

The IBMTSSVC_StorageSetting class is roughly equivalent to a service level agreement (SLA).

Properties

It defines the characteristics, qualities of service, and goals when used in a `CreateOrModifyElementFromStoragePool` or `CreateOrModifyStoragePool` method in the `StorageConfigurationService`. It specifies a series of properties with maximum and minimum values that define the (inclusive) bounds that the object must maintain. The setting is associated to a `StorageVolume` using `ElementSetting`.

The `IBMTSSVC_StorageSetting` class extends the `CIM_StorageSetting` class and has the properties shown in Table 39.

Table 39. *IBMTSSVC_StorageSetting* properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
DataRedundancy Goal	Uint16	Write(TRUE), MinValue(1), ModelCorrespondence (CIM_StorageSetting.Data RedundancyMax CIM_StorageSetting.Data RedundancyMin)	The desired number of complete copies of data to be maintained. For example, on RAID 5 one copy is maintained and on RAID 1 two or more copies are maintained. Possible values are 1 to n. The bounds for redundancy are defined using the properties <code>DataRedundancy Max</code> and <code>DataRedundancy Min</code> .
DataRedundancy Max	Uint16	Write(TRUE), MinValue(1), ModelCorrespondence (CIM_StorageSetting.Data RedundancyMin CIM_StorageSetting.Data RedundancyGoal)	The maximum number of complete copies of data to be maintained. For example, on RAID 5 one copy is maintained and on RAID 1 two or more copies are maintained. Possible values are 1 to n.
DataRedundancy Min	Uint16	Write(TRUE), MinValue(1), ModelCorrespondence (CIM_StorageSetting.Data RedundancyMax CIM_StorageSetting.Data RedundancyGoal)	The minimum number of complete copies of data to be maintained. For example, on RAID 5 one copy is maintained and on RAID 1 two or more copies are maintained. Possible values are 1 to n.

Table 39. IBMTSSVC_StorageSetting properties (continued)

Property	Type	Qualifier	Description
DeltaReservation Goal	UInt8	Units(Percentage), MinValue(1), MaxValue(100), ModelCorrespondence (CIM_StorageSetting.Delta ReservationMinCIM_StorageSetting.Delta ReservationMax), Write(TRUE)	The amount of space that must be reserved in a replica for caching changes, specified by a number between 1 (1%) and 100 (100%). For a complete copy, use 100. The bounds for the reservation are defined using the properties DeltaReservation Max and DeltaReservation Min.
DeltaReservation Max	UInt8	Units(Percentage), MinValue(1), MaxValue(100), ModelCorrespondence (CIM_StorageSetting.Delta ReservationMinCIM_StorageSetting.Delta ReservationGoal), Write(TRUE)	The maximum amount of space that must be reserved in a replica for caching changes, specified by a number between 1 (1%) and 100 (100%). For a complete copy, use 100.
DeltaReservation Min	UInt8	Units(Percentage), MinValue(1), MaxValue(100), ModelCorrespondence (CIM_StorageSetting.Delta ReservationMaxCIM_StorageSetting.Delta ReservationGoal), Write(TRUE)	The minimum amount of space that must be reserved in a replica for caching changes, specified by a number between 1 (1%) and 100 (100%). For a complete copy, use 100.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of SettingData. In addition, the user-friendly name can be used as an index property for a search or query. The name does not have to be unique within a namespace.

Table 39. IBMTSSVC_StorageSetting properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		Within the scope of the instantiating Namespace, InstanceID uniquely identifies an instance. The ID must be constructed using the following algorithm: <OrgID>:<LocalID>. <OrgID> <i>must</i> include a copyrighted, trademarked, or otherwise unique name that is owned by the business entity that is creating or defining the ID or it must be a registered ID that is assigned by a global authority. <OrgID> must not contain a colon (:). <LocalID> is chosen by the business entity and must not be reused to identify different underlying (real-world) elements.
NoSinglePointOfFailure	Boolean	Write(TRUE)	The desired value for No Single Point of Failure. Possible values are false (single point of failure) and true (no single point of failure).
PackageRedundancyGoal	Uint16	Write(TRUE), ModelCorrespondence (CIM_StorageSetting.PackageRedundancyMax CIM_StorageSetting.PackageRedundancyMin)	The desired number of redundant packages to use. Possible values are 0 to n. For example, the storage domain package redundancy describes the number of disk spindles that can fail without data loss including, at most, one spare. A RAID 5 with a spare disk can have a PackageRedundancy of 2.
PackageRedundancyMax	Uint16	Write(TRUE), ModelCorrespondence (CIM_StorageSetting.PackageRedundancyMin CIM_StorageSetting.PackageRedundancyGoal)	The maximum number of redundant packages to use. Possible values are 0 to n.

Table 39. IBMTSSVC_StorageSetting properties (continued)

Property	Type	Qualifier	Description
PackageRedundancy Min	Uint16	Write(TRUE), ModelCorrespondence (CIM_StorageSetting. PackageRedundancyMax CIM_StorageSetting. PackageRedundancyGoal)	The minimum number of redundant packages to use. Possible values are 0 to n.

IBMTSSVC_StorageVolume

The IBMTSSVC_StorageVolume class represents a device presented by the cluster that can be mapped as a SCSI LUN to host systems on the SAN. A volume is formed by allocating a set of extents from a pool.

Properties

The IBMTSSVC_StorageVolume class extends the CIM_StorageVolume class and has the properties shown in Table 40.

Table 40. IBMTSSVC_StorageVolume properties

Property	Type	Qualifier	Description
Access	Uint16		Describes the media. Code Semantics 0 Unknown 1 Readable 2 Writeable 3 Read/Write Supported 4 Write Once
AccessGranted	Boolean	ModelCorrespondence (CIM_Controller. AuthorizationView)	A quick interface for finding devices with no AuthorizationSubject association to an AccessControl Information instance, either directly or by use of a controller. The value true indicates that the device has granted access to a consumer. False indicates that no access has been granted.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description																																												
Additional Availability	Uint16[]	Deprecated(CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState), ModelCorrespondence (CIM_LogicalDevice.Availability)	<p>Additional availability and status of the device, beyond that specified in the Availability property. The Availability property denotes the primary status and availability of the device. In some cases, it is not sufficient to denote the complete status of the device. In those cases, the AdditionalAvailability property can be used to provide further information.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>Unknown</td></tr> <tr><td>3</td><td>Running/Full Power</td></tr> <tr><td>4</td><td>Warning</td></tr> <tr><td>5</td><td>In Test</td></tr> <tr><td>6</td><td>Not Applicable</td></tr> <tr><td>7</td><td>Power Off</td></tr> <tr><td>8</td><td>Off Line</td></tr> <tr><td>9</td><td>Off Duty</td></tr> <tr><td>10</td><td>Degraded</td></tr> <tr><td>11</td><td>Not Installed</td></tr> <tr><td>12</td><td>Install Error</td></tr> <tr><td>13</td><td>Power Save - Unknown</td></tr> <tr><td>14</td><td>Power Save - Low Power Mode</td></tr> <tr><td>15</td><td>Power Save - Standby</td></tr> <tr><td>16</td><td>Power Cycle</td></tr> <tr><td>17</td><td>Power Save - Warning</td></tr> <tr><td>18</td><td>Paused</td></tr> <tr><td>19</td><td>Not Ready</td></tr> <tr><td>20</td><td>Not Configured</td></tr> <tr><td>21</td><td>Quiesced</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	Unknown	3	Running/Full Power	4	Warning	5	In Test	6	Not Applicable	7	Power Off	8	Off Line	9	Off Duty	10	Degraded	11	Not Installed	12	Install Error	13	Power Save - Unknown	14	Power Save - Low Power Mode	15	Power Save - Standby	16	Power Cycle	17	Power Save - Warning	18	Paused	19	Not Ready	20	Not Configured	21	Quiesced
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4	Warning																																														
5	In Test																																														
6	Not Applicable																																														
7	Power Off																																														
8	Off Line																																														
9	Off Duty																																														
10	Degraded																																														
11	Not Installed																																														
12	Install Error																																														
13	Power Save - Unknown																																														
14	Power Save - Low Power Mode																																														
15	Power Save - Standby																																														
16	Power Cycle																																														
17	Power Save - Warning																																														
18	Paused																																														
19	Not Ready																																														
20	Not Configured																																														
21	Quiesced																																														

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
Availability	Uint16	Deprecated(CIM_Associated PowerManagement Service.PowerState CIM_ManagedSystem Element.OperationalStatus CIM_EnabledLogical Element.EnabledStatus), ModelCorrespondence (CIM_LogicalDevice. AdditionalAvailability)	The primary availability and status of the device. Code Semantics 1 Other 2 Unknown 3 Running/Full Power 4 Warning 5 In Test 6 Not Applicable 7 Power Off 8 Off Line 9 Off Duty 10 Degraded 11 Not Installed 12 Install Error 13 Power Save - Unknown 14 Power Save - Low Power Mode 15 Power Save - Standby 16 Power Cycle 17 Power Save - Warning 18 Paused 19 Not Ready 20 Not Configured 21 Quiesced
BackendVolumeID	String	Expensive(TRUE)	The ID of the underlying BackendVolume. Only valid if Type=Image.
BackendVolume Name	String	Expensive(TRUE)	The name of the underlying BackendVolume. Only valid if Type=Image.
BlockSize	Uint64	Units(Bytes)	The size in bytes of the blocks that form this StorageExtent. If a variable block size, then the maximum block size in bytes must be specified. If the block size is unknown or if a block concept is not valid (for example, for AggregateExtents, Memory, or LogicalDisks), enter a 1.
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short textual description (one-line string) of the object.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
CacheState	Uint16	Expensive(TRUE)	The volume's cache state. Code Semantics 0 Empty 1 Not empty 2 Corrupt
ConsumableBlocks	Uint64		The maximum number of blocks, of size BlockSize, that are available for consumption when layering StorageExtents using the BasedOn association. This property is used when this StorageExtent is an Antecedent reference in a BasedOn relationship. For example, a StorageExtent can be composed of 120 blocks. However, the extent itself may use 20 blocks for redundancy data. If another StorageExtent is BasedOn this extent, only 100 blocks are available to it. This information ("100 blocks are available for consumption") is indicated in the ConsumableBlocks property.
Controlled	Boolean		A quick interface for finding devices with no ControlledBy associations to controllers. A value of true indicates that the device is connected to one or more ports by use of controllers. False indicates that the device exists but is not connected to a port.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
CreationClass Name	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
DataOrganization	Uint16		The type of data organization that is used. Code Semantics 0 Other 1 Unknown 2 Fixed Block 3 Variable Block 4 Count Key Data
DataRedundancy	Uint16	ModelCorrespondence (CIM_StorageSetting.Data RedundancyGoal CIM_StorageSetting.DataRedundancyMax CIM_StorageSetting.DataRedundancyMin)	The number of complete copies of data that are maintained.
DeltaReservation	Uint8	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageSetting.Delta ReservationGoal CIM_StorageSetting.Delta ReservationMax CIM_StorageSetting.Delta ReservationMin)	The current value for Delta reservation.
Description	String		A textual description of the object.
DeviceID	String	MaxLen(64)	The ID of the StorageVolume. A numeric value that is only unique for instances of the StorageVolume class.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The user-friendly name of the volume.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>The default or startup configuration for an element's EnabledStatus. By default, the EnabledStatus is 2 (Enabled).</p> <p>Code Semantics</p> <p>2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>The operational state of the element.</p> <p>Code Semantics</p> <p>0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved</p> <p>If an element is being tested and is neither enabled nor disabled, then In Test (7) is used. If this property does not apply to an instance of EnabledLogical Element, then Not Applicable (5) is used.</p>
ErrorCleared	Boolean	Deprecated(CIM_ManagedSystemElement.OperationalStatus)	Unsupported property.
ErrorDescription	String	Deprecated(CIM_DeviceErrorData.ErrorDescription)	Unsupported property.
ErrorMethodology	String		Unsupported property.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
ExtentStatus	Uint16[]		<p>StorageExtents have additional status information beyond that captured in the Availability and StatusInfo properties, inherited from the ManagedSystem Element. This additional information is captured in the VolumeStatus property.</p> <p>Code Semantics</p> <p>0 Other</p> <p>1 Unknown</p> <p>2 None/Not Applicable</p> <p>3 Broken</p> <p>4 Data Lost</p> <p>5 Dynamic Reconfig</p> <p>6 Exposed</p> <p>7 Fractionally Exposed</p> <p>8 Partially Exposed</p> <p>9 Protection Disabled</p> <p>10 Readyng</p> <p>11 Rebuild</p> <p>12 Recalculate</p> <p>13 Spare in Use</p> <p>14 Verify In Progress</p> <p>15..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
FCID	String		The Flash Copy ID of the volume.
FCName	String		The Flash Copy name of the volume.
GroupID	String		The ID of the scoping RedundancyGroup.
GroupName	String		The name of the scoping RedundancyGroup.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	An array of free-form Strings that provides explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.
InstallDate	Date-time		Unsupported property.
IsBasedOn Underlying Redundancy	Boolean		A value of true indicates that the underlying StorageExtent(s) participate in a StorageRedundancy Group.
IsFormatted	Boolean	Expensive(TRUE)	A value of true indicates that the volume has been formatted by the SAN Volume Controller.
LastErrorCode	Uint32	Deprecated(CIM_Device ErrorData.LastErrorCode)	Unsupported property.
MaxQuiesceTime	Uint64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.
Name	String	ModelCorrespondence (CIM_StorageVolume.NameFormat), MaxLen(1024)	A unique identifier for the volume.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description																				
NameFormat	Uint16	ModelCorrespondence (CIM_StorageVolume.Name CIM_StorageVolume. OtherNameFormat), Experimental(TRUE)	<p>Format of the Name property. For non SCSI volumes, SNVM may be the most appropriate choice.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>2</td> <td>VPD83NAA6 (VPD Page 83, NAA IEEE Registered Extended)</td> </tr> <tr> <td>3</td> <td>VPD83NAA5 (VPD Page 83, NAA IEEE Registered)</td> </tr> <tr> <td>4</td> <td>VPD83Type2 (VPD Page 83, EIU-64)</td> </tr> <tr> <td>5</td> <td>VPD83Type1 (VPD Page 83, T10 Vendor Identification)</td> </tr> <tr> <td>6</td> <td>VPD83Type0</td> </tr> <tr> <td>7</td> <td>SNVM (Serial Number/ Vendor/ Model. VPD Page 83, Vendor- Specific)</td> </tr> <tr> <td>8</td> <td>NodeWWN (Node WWN, for single LUN or controller)</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	VPD83NAA6 (VPD Page 83, NAA IEEE Registered Extended)	3	VPD83NAA5 (VPD Page 83, NAA IEEE Registered)	4	VPD83Type2 (VPD Page 83, EIU-64)	5	VPD83Type1 (VPD Page 83, T10 Vendor Identification)	6	VPD83Type0	7	SNVM (Serial Number/ Vendor/ Model. VPD Page 83, Vendor- Specific)	8	NodeWWN (Node WWN, for single LUN or controller)
Code	Semantics																						
0	Unknown																						
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7	SNVM (Serial Number/ Vendor/ Model. VPD Page 83, Vendor- Specific)																						
8	NodeWWN (Node WWN, for single LUN or controller)																						

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
NameNamespace	Uint16	ModelCorrespondence (CIM_StorageVolume.Name CIM_StorageVolume. OtherNameNamespace)	<p>The preferred source for volume names is SCSI vital product data (VPD) Page 83 responses. Page 83 returns a list of identifiers for various device elements. The metadata for each identifier includes an Association field, identifiers with association of 0 apply to volumes. Page 83 supports several namespaces specified in the Type field in the identifier metadata.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 VPD83Type3n (Page 83, Type 3 NAA. NameFormat should be NAA.)</p> <p>3 VPD83Type2 (VPD Page 83, Type 2 EU164. NameFormat EU1.)</p> <p>4 VPD83Type1 (VPD Page 83, Type 1 T10 Vendor Identification. NameFormat T10.)</p> <p>5 VPD80 (VPD page 80, Serial number. NameFormat should be Other.)</p> <p>6 NodeWWN (FC NodeWWN. NameFormat should be NAA or EU1.)</p> <p>7 SNVM (Serial Number/ Vendor/ Model. NameFormat should be SNVM.)</p>

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
NativeStatus	Uint16		The native operational status of the volume. Code Semantics 0 Offline 1 Online 2 Degraded
NoSinglePointOfFailure	Boolean	ModelCorrespondence (CIM_StorageSetting.NoSinglePointOfFailure)	Indicates if a single point of failure exists.
NumberOfBlocks	Uint64		The total number of logically contiguous blocks, of size BlockSize, that form this extent. The total size of the extent can be calculated by multiplying BlockSize by NumberOfBlocks. If the BlockSize is 1, this property is the total size of the extent.
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	The status of the volume. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The state of the element when the EnabledStatus property is set to 1 (Other). This property must be set to null when EnabledStatus is any value other than 1.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
OtherIdentifyinInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions)	Additional data, beyond DeviceID information, that can be used to identify a LogicalDevice. For example, the Operating System's user-friendly name for the device.
OtherNameFormat	String	ModelCorrespondence (CIM_StorageVolume. NameFormat)	The description of the format of the Name property when NameFormat includes the value 1 (Other).
OtherName Namespace	String	ModelCorrespondence (CIM_StorageVolume. NameNamespace)	The description of the namespace of the Name property when NameNamespace includes the value 1 (Other).
PackageRedundancy	Uint16	ModelCorrespondence (CIM_StorageSetting. PackageRedundancyGoal CIM_StorageSetting. PackageRedundancyMax CIM_StorageSetting. PackageRedundancyMin)	The number of disk spindles that can fail without data loss.
PoolID	String		The ID of the hosting storage pool.
PoolName	String		The name of the pool from which this volume was allocated.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
PowerManagement Capabilities	Uint16[]	Deprecated(CIM_Power ManagementCapabilities. PowerCapabilities)	<p>An enumerated array that describes the power management capabilities of the device. This property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class must be used.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Not Supported</p> <p>2 Disabled</p> <p>3 Enabled</p> <p>4 Power Saving Modes Entered Automatically</p> <p>5 Power State Settable</p> <p>6 Power Cycling Supported</p> <p>7 Timed Power On Supported</p>
PowerManagement Supported	Boolean	Deprecated(CIM_Power ManagementCapabilities)	Indicates if the device can be power managed. This property is deprecated. Instead, the existence of an associated PowerManagement Capabilities class (associated using the ElementCapabilities relationship) indicates that power management is supported.
PowerOnHours	Uint64	Deprecated(CIM_Powered StatisticalData.PowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
PreferredNode	String	Expensive(TRUE)	The ID of the preferred node.
Primordial	Boolean		Indicates if the containing system does not have the ability to create or delete this operational element.
Purpose	String		The description of the media and its use.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>The state change for the element that must be made at the next opportunity. The SAN Volume Controller does not evaluate this attribute and therefore no action is taken when it changes.</p> <p>Code Semantics</p> <p>2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved</p>
SCID	String		The sync copy ID of the volume.
SCName	String		The sync copy name of the volume.
SequentialAccess	Boolean		Indicates if Storage is sequentially accessed by a MediaAccessDevice. For example, a TapePartition is a sequentially accessed StorageExtent. StorageVolumes, DiskPartitions, and LogicalDisks are random-access extents.
Status	String	MaxLen(10), Deprecated(CIM_ManagedSystemElement. OperationalStatus)	Deprecated property that is set to Unknown. See OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	The description of the status that is used when the OperationalStatus property is set to 1 (Other).

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
StatusInfo	Uint16	Deprecated(CIM_Enabled LogicalElement.Enabled State)	Deprecated porperty. See CIM_Enabled LogicalElement.EnabledState instead. Code Semantics 1 Other 2 Unknown 3 Enabled 4 Disabled 5 Not Applicable
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The CreationClassName of the scoping system.
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The IP address of the scoping cluster.
Throttle	Uint64	Units(IOs per second), Write(TRUE), WriteRole(Administrator), Expensive(TRUE)	The maximum bandwidth of the volume.
TimeOfLastStateChange	Date-time		Unsupported property.
TotalPowerOnHours	Uint64	Deprecated(CIM_PoweredStatisticalData.TotalPowerOnHours), Units(Hours), Counter(TRUE)	Unsupported property.
Type	Uint32	Value(Sequential Striped Router Image)	The type of volume.

IBMTSSVC_SyncCopyJob

IBMTSSVC_SyncCopyJob class instances show the percentage of all Global Mirrors in the "inconsistent_copying" state.

Properties

A job instance is used to monitor asynchronous Global Mirror operations on the device. The IBMTSSVC_SyncCopyJob class has the properties shown in Table 41.

Table 41. IBMTSSVC_SyncCopyJob properties

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID must be unique within a namespace. In order to ensure that the name is unique, the value of InstanceID <i>must</i> be constructed in the following manner: (Vendor ID)(ID).
Caption	String	MaxLen(64),	Unsupported property.

Table 41. IBMTSSVC_SyncCopyJob properties (continued)

Property	Type	Qualifier	Description
DeleteOnCompletion	Boolean	Write(TRUE),	Indicates if the job is automatically deleted after completion. If this property is set to false and the job completes, the extrinsic method DeleteInstance <i>must</i> be used to delete the job.
Description	String		A textual description of the object.
Elapsed Time	Datetime		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	Uint16	Model Correspondence (CIM_Job.ErrorDescription)	Unsupported property.
ErrorDescription	String	Model Correspondence (CIM_Job.ErrorCode),	Unsupported property.
InstallDate	Datetime		Unsupported property.
JobRunTimes	Uint32	Write(TRUE),	
JobState	Uint16		An integer enumeration that indicates the operational state of a job. Code Semantics 2 New 3 Starting 4 Running 5 Suspended 6 Shutting Down 7 Completed 8 Terminated 9 Killed 10 Exception 11 Service 12..32767 DMTF Reserved 32768..65535 Vendor Reserved
JobStatus	String	Model Correspondence (ManagedSystemElement)	Unsupported property.
LocalOrUtcTime	Uint16	Write(TRUE),	Code Semantics 1 Local Time 2 UTC Time
Name	String	Required(TRUE), MaxLen(1024)	The user friendly name for this instance of the job.
Notify	String	Write(TRUE),	Unsupported property.

Table 41. IBMTSSVC_SyncCopyJob properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	<p>The current status of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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18	Power Mode																																										
OtherRecoveryAction	String	Model Correspondence (CIM_Job.Recovery Action)	The recovery action when the instance's RecoveryAction property is 1 ("Other").																																								
Owner	String	Model Correspondence (CIM_OwningJob Element)	Unsupported property.																																								
PercentComplete	UInt16	MaxValue(101), MinValue(0), Units(Percent),	The percentage of the job that is complete at the time of the request.																																								
Priority	UInt32	Write(TRUE),	Unsupported property.																																								

Table 41. IBMTSSVC_SyncCopyJob properties (continued)

Property	Type	Qualifier	Description
RecoveryAction	Uint16	Model Correspondence (CIM_Job.Other RecoveryAction)	The recovery action for an unsuccessfully run job. A return code of "Other" indicates that the recovery action is specified in the OtherRecovery Action property. Code Semantics 0 Unknown 1 Other 2 Do Not Continue 3 Continue With Next Job 4 Re-run Job 5 Run Recovery Job
RunDay	Sint8	Write(TRUE), MinValue(-31), MaxValue(31), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay OfWeek CIM_Job.Run StartInterval)	
RunDayOfWeek	Sint8	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunStart Interval)	Code Semantics -7 -Saturday -6 -Friday -5 -Thursday -4 -Wednesday -3 -Tuesday -2 -Monday -1 -Sunday 0 ExactDayOf Month 1 Sunday 2 Monday 3 Tuesday 4 Wednesday 5 Thursday 6 Friday 7 Saturday
RunMonth	Uint8	Write(TRUE), Model Correspondence (CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	Code Semantics 0 January 1 February 2 March 3 April 4 May 5 June 6 July 7 August 8 September 9 October 10 November 11 December

Table 41. IBMTSSVC_SyncCopyJob properties (continued)

Property	Type	Qualifier	Description
RunStartInterval	Datetime	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	
ScheduledStartTime	Datetime	Deprecated (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval), Write(TRUE),	Unsupported property.
StartTime	Datetime		Unsupported property.
Status	String	MaxLen(10), Deprecated(CIM_ ManagedSystem Element)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	Describes the status. Use this property when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Datetime		Unsupported property.
TimeSubmitted	Datetime		Unsupported property.
UntilTime	Datetime	Write(TRUE), Model Correspondence (CIM_Job.LocalOr UtcTime)	Unsupported property.

IBMTSSVC_SyncCopySynchronizedSet

The IBMTSSVC_SyncCopySynchronizedSet class aggregates multiple StorageSynchronized instances to ensure consistent copying.

Properties

The IBMTSSVC_SyncCopySynchronizedSet class extends the CIM_SynchronizedSet class and has the properties shown in Table 42.

Table 42. IBMTSSVC_SyncCopySynchronizedSet properties

Property	Type	Qualifier	Description
AuxiliaryID	String		The ID of the auxiliary cluster.
AuxiliaryName	String		The name of the auxiliary cluster.

Table 42. IBMTSSVC_SyncCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
Availability	Uint32	Expensive(TRUE)	The availability of the set. Code Semantics 0 Online 1 Primary Offline 2 Secondary Offline 3 IO Channel Offline
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short (one-line string) textual description.
Connected	Boolean		The status of the network connection.
CopyType	Uint16	Experimental(TRUE)	The replication policy of the SynchronizedSet. Code Semantics 2 Async. Create and maintain an asynchronous copy of the source. 3 Sync. Create and maintain a synchronized copy of the source. 4 UnSyncAssoc .. DMTF Reserved 0x8000.. Vendor Specific
Description	String		A textual description of the object.
ElementCount	Uint32	Counter	The number of SyncCopyStorage Synchronized in this set.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator), Experimental(TRUE)	The user-friendly name for this instance of SynchronizedSet. In addition, the user-friendly name can be used as a property for a search or query. ElementName does not have to be unique within a namespace.
FreezeTime	String	Expensive(TRUE)	The time the relationship was stopped

Table 42. IBMTSSVC_SyncCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of collection that is scoped (contained) by a system. The InstanceID must be unique within a namespace. In order to ensure uniqueness, the value of InstanceID must be constructed in the following format: (Vendor ID)(ID).
MasterID	String		The ID of the master cluster.
NativeState	UInt16	ValueMap, Values	The native state of the set. Code Semantics 0 Idling 1 Idling disconnected 2 Consistent synchronized 3 Consistent disconnected 4 Consistent stopped 5 Inconsistent copying 6 Inconsistent disconnected 7 Inconsistent disconnected 8 Empty
Primary	UInt32		Shows which side is currently the primary in the relationship. The primary volumes are the ones accessible for I/O by the clients.
Status	UInt32		The status of the SynchronizedSet. Code Semantics 4 Prepared 5 ReSyncln Progress 6 Synchronized 12 Broken 13 Fractured 0x1000 Empty 0x8101 Fractured Idle
SyncMaintained	Boolean	Expensive(TRUE)	Indicates if the synchronization relationship is maintained.

Service object classes

The service classes and their properties of the CIM Agent for the SAN Volume Controller are described in the following pages.

IBMTSSVC_ClusteringService

The IBMTSSVC_ClusteringService class provides the methods for managing the SAN Volume Controller cluster, such as adding or removing nodes.

Properties

The IBMTSSVC_ClusteringService class extends the CIM_ClusteringService class and has the properties shown in Table 43.

Table 43. IBMTSSVC_ClusteringService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
CreationClassName	String	MaxLen(256)	The name of the class or subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.
EnabledDefault	Uint16	Write(TRUE)	An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled." Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved

Table 43. IBMTSSVC_ClusteringService properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	An integer enumeration that indicates one of the following: Code Semantics 0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved
InstallDate	Datetime		Unsupported property.
Name	String	MaxLen(256)	The label by which the object is known.
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The operational status of the service. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode

Table 43. IBMTSSVC_ClusteringService properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.
PrimaryOwnerContact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwnerName	String	MaxLen(64), Write(TRUE)	Unsupported property.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	An integer enumeration that indicates if the element must be shut down, enabled, disabled, taken offline, or tested at the next opportunity. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Started	Boolean		Indicates if this service is started.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.EnabledDefault)	Indicates if this service is started manually or automatic.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	A deprecated property that is set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to "Other."
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.

Table 43. IBMTSSVC_ClusteringService properties (continued)

Property	Type	Qualifier	Description
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastState Change	Datetime		Unsupported property.

IBMTSSVC_PrivilegeManagementService

IBMTSSVC_PrivilegeManagementService class extends the CIM_PrivilegeManagementService class.

Properties

The IBMTSSVC_PrivilegeManagementService class has the properties shown in Table 44.

Table 44. IBMTSSVC_PrivilegeManagementService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.

Table 44. IBMTSSVC_PrivilegeManagementService properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>
InstallDate	Datetime		Unsupported property.
Name	String	MaxLen(256)	The label by which the object is known.

Table 44. IBMTSSVC_PrivilegeManagementService properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The operational status of the service. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherEnabled State	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled/disabled state when the EnabledStatus property is set to 1 ("Other"). This property must be set to NULL when EnabledStatus is any value other than 1.
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Unsupported property.

Table 44. IBMTSSVC_PrivilegeManagementService properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	An integer enumeration indicator. This property is provided to compare Requested and current Enabled statuses. When EnabledStatus is set to 5 ("Not Applicable"), writing this property has no effect. The default is 5 ("No Change"). Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Started	Boolean		Indicates if this service is started.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.EnabledDefault)	Indicates if this service is started manually or automatic.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	This is a deprecated property set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastStateChange	Datetime		Unsupported property.

IBMTSSVC_StorageConfigurationService

IBMTSSVC_StorageConfigurationService class provides extrinsic methods for basic storage configuration tasks.

Properties

The IBMTSSVC_StorageConfigurationService class extends the CIM_StorageConfigurationService class and has the properties shown in Table 45.

Table 45. IBMTSSVC_StorageConfigurationService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.
EnabledDefault	Uint16	Write(TRUE)	An enumerated value that indicates an administrator's default startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2). Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved

Table 45. IBMTSSVC_StorageConfigurationService properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	An integer enumeration indicator. Code Semantics 0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768..65535 Vendor Reserved
InstallDate	Datetime		Unsupported property.
Name	String	MaxLen(256)	The label by which the object is known.
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The operational status of the service. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode

Table 45. IBMTSSVC_StorageConfigurationService properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledStatus property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledStatus is any value other than 1.
PrimaryOwnerContact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwnerName	String	MaxLen(64), Write(TRUE)	Unsupported property.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	An integer enumeration indicator. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Started	Boolean		Indicates if this service is started.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.EnabledDefault)	Indicates if this service is started manually or automatic.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status. Used when the OperationalStatus property is set to 1 ("Other").
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastStateChange	Datetime		Unsupported property.

IBMTSSVC_StorageHardwareIDManagementService

This service provides extrinsic methods to manage HardwareAccounts and Hosts for the SAN Volume Controller.

Properties

The IBMTSSVC_StorageHardwareIDManagementService class extends the CIM_StorageHardwareIDManagementService class and has the properties shown in Table 46.

Table 46. IBMTSSVC_StorageHardwareIDManagementService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
CreationClass Name	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.
EnabledDefault	Uint16	Write(TRUE)	An enumerated value that indicates the default or startup EnabledStatus. By default, the element is Enabled (2). Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768..65535 Vendor Reserved

Table 46. IBMTSSVC_StorageHardwareIDManagementService properties (continued)

Property	Type	Qualifier	Description																												
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	<p>The operational state of the element.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>2</td> <td>Enabled</td> </tr> <tr> <td>3</td> <td>Disabled</td> </tr> <tr> <td>4</td> <td>Shutting Down</td> </tr> <tr> <td>5</td> <td>Not Applicable</td> </tr> <tr> <td>6</td> <td>Enabled but Offline</td> </tr> <tr> <td>7</td> <td>In Test</td> </tr> <tr> <td>8</td> <td>Deferred</td> </tr> <tr> <td>9</td> <td>Quiesce</td> </tr> <tr> <td>10</td> <td>Starting</td> </tr> <tr> <td>11..32767</td> <td>DMTF Reserved</td> </tr> <tr> <td>32768..65535</td> <td>Vendor Reserved</td> </tr> </tbody> </table> <p>If an element is being tested and is neither enabled or disabled, then In Test (7) is used. If this property does not apply to an instance of EnabledLogical Element, then Not Applicable (5) is used.</p>	Code	Semantics	0	Unknown	1	Other	2	Enabled	3	Disabled	4	Shutting Down	5	Not Applicable	6	Enabled but Offline	7	In Test	8	Deferred	9	Quiesce	10	Starting	11..32767	DMTF Reserved	32768..65535	Vendor Reserved
Code	Semantics																														
0	Unknown																														
1	Other																														
2	Enabled																														
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9	Quiesce																														
10	Starting																														
11..32767	DMTF Reserved																														
32768..65535	Vendor Reserved																														
InstallDate	Datetime		Unsupported property.																												
Name	String	MaxLen(256)	The name of the object.																												

Table 46. IBMTSSVC_StorageHardwareIDManagementService properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The operational status of the service. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The state of the element when the EnabledStatus property is set to 1 (Other). This property must be set to null when EnabledStatus is any value other than 1.
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Unsupported property.

Table 46. IBMTSSVC_StorageHardwareIDManagementService properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	<p>The state change for the element that must be made at the next opportunity. When EnabledStatus is set to 5 (No Change), then this property has no effect. By default, the RequestedStatus is 5 (No Change).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shut Down</p> <p>5 No Change</p> <p>6 Offline</p> <p>7 Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
Started	Boolean		Indicates if the service is started.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.EnabledDefault)	Indicates if the service is started manually or automatically.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	This property is deprecated and set to "Unknown." See OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	The description of the status that is used when the OperationalStatus property is set to 1 (Other).
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The name of the scoping system.
TimeOfLastStateChange	Datetime		Unsupported property.

Security object classes

This section describes the security classes and their properties of the CIM Agent for the SAN Volume Controller.

This section describes the security classes and their properties of the CIM Agent for the SAN Volume Controller.

IBMTS_Account

The IBMTS_Account class extends the CIM_Account class.

Properties

The IBMTS_Account class represents a single user account on the Common Information Model Object Model (CIMOM) and stores the authentication (user name and password) and authorization (global and system roles) information.

The IBMTS_Account class has the properties shown in Table 47.

Table 47. IBMTS_Account properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
CreationClass Name	String	MaxLen(256), ReadRole(None)	The name of the class or the subclass used in creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
Descriptions	String[]	MaxLen(1024)	Contains descriptions of the object that the user can read. In the case of an LDAP-derived instance, the description attribute might have multiple values that cannot be placed in the inherited Description property.
ElementName	String		The name of the object. This property enables each instance to define a user-friendly name in addition to its key properties or identity data, and description information.
Host	String[]		The name(s) of the system(s) to which the account applies. The host name can be a fully-qualified DNS name or it can be an unqualified host name.

Table 47. IBMTS_Account properties (continued)

Property	Type	Qualifier	Description																																								
InstallDate	Date-time		The date when the object was installed. Lack of this value does not mean that the object is not installed.																																								
LocalityName	String[]		The name of the selected locality, such as the name of a city, county or other geographic region.																																								
Name	String	MaxLen(1024) ReadRole(None)	The name of the object instance. The value of this property can be set to be the same as that of the UserID property or, in the case of an LDAP-derived instance, the Name property value can be set to the DistinguishedName of the LDAP-accessed object instance.																																								
ObjectClass	String[]		In the case of an LDAP-derived instance, this property value(s) can be set to the objectClass attribute values.																																								
Operational Status	UInt16[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>The current status of the element.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity Error</td></tr> <tr><td>17</td><td>Complete</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity Error	17	Complete	18	Power Mode
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16	Supporting Entity Error																																										
17	Complete																																										
18	Power Mode																																										

Table 47. IBMTS_Account properties (continued)

Property	Type	Qualifier	Description
Organization Name	String[]	Required(TRUE)	The name of the organization related to the account.
OU	String[]		The name of an organizational unit related to the account.
Status Descriptions	String[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The status of the element when OperationalStatus is set to 1.
SeeAlso	String[]		The distinguished Name of other Directory objects that might resemble the real-world objects.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	The current status of the object.
SystemCreation ClassName	String	Propagated (CIM_System.CreationsClassName), MaxLen(256), ReadRole(None)	The cluster configuration node (CCN) of the system.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256), ReadRole(None)	The name of the system.
UserCertificate	String[]	Octetstring(TRUE)	A public key certificate for the user.
UserID	String	MaxLen(256)	The identifier for a user of the system.
UserPassword	String[]	Octetstring(TRUE)	Contains an encrypted password for an authorized user to access the resources in a specified directory.

IBMTS_AccountManagementService

The IBMTS_AccountManagementService class provides the methods for managing the accounts on the Common Information Model Object Manager (CIMOM).

Properties

The IBMTS_AccountManagementService class extends the CIM_AccountManagementService class and has the properties shown in Table 48.

Table 48. IBMTS_AccountManagementService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64), ReadRole(None)	A short (one-line string) textual description of the object.
CreationClassName	String	MaxLen(256), ReadRole(None)	The name of the class or subclass used to create an instance.

Table 48. IBMTS_AccountManagementService properties (continued)

Property	Type	Qualifier	Description
SystemCreationClass	String	Propogated (CIM_System.Creation) MaxLen(256), ReadRole(None)	The system's creation class name.
SystemName	String	Propogated (CIM_System.Name) MaxLen(256), ReadRole(None)	The system's name.
Description	String	ReadRole(None)	A textual description of the object.
ElementName	String	ReadRole(None)	The name of the instance.
EnabledDefault	Uint16	Write(TRUE)	The administrator's default or startup configuration for an element's Enabled Status. By default, the element is Enabled (value = 2). Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8...32767 DMTF Reserved 32768... Vendor Reserved
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Indicates if the element is currently shutting down or in an enabled or disabled state. Code Semantics 0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11...32767 DMTF Reserved 32768... Vendor Reserved

Table 48. IBMTS_AccountManagementService properties (continued)

Property	Type	Qualifier	Description
InstallDate	Date-time		The date on which the CIM client created the object in the CIMOM's repository.
Name	String	MaxLen(256), ReadRole(None)	The unique label, in the context of the hosting system, by which the AccessControl Information is known.
OperationalStatus	Uint16[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The operational status of the cluster. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Complete 18 Power Mode
OtherEnabledStatus	String	ModelCorrespondence (CIM_EnabledLog)	The element's enabled or disabled state when EnabledStatus is set to 1. This value must be null when EnabledStatus is set to a value other than 1.
StatusDescriptions	String[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The status of the cluster when OperationalStatus is set to 1.
PrimaryOwnerContact	String	Experimental(TRUE), MaxLen(256), Write(TRUE)	The method of contact for the primary owner of the account, such as a phone number or e-mail address.

Table 48. IBMTS_AccountManagementService properties (continued)

Property	Type	Qualifier	Description
PrimaryOwnerName	String	Experimental(TRUE), MaxLen(64), Write(TRUE)	The name of the primary owner.
RequestedStatus	Uint16	Write(TRUE), ModelCorrespondence (CIM_EnabledLog)	Sets the state (shut down, enabled, taken offline, or tested) of the element at the next operation. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10...32767 DMTF Reserved 32768... Vendor Reserved
Started	Boolean		Indicates that the Service is started or stopped for the account.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.Enable)	Indicates if the Service is automatically started by a system, operating system, or specific user request.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	The current status of the Service instance.
TimeOfLastStateChange	Date-time	Experimental(TRUE)	The time the last change of state occurred.

IBMTS_Certificate

The SecurityProvider generates one instance of this class.

Properties

IBMTS_Certificate class has the properties shown in Table 49.

Table 49. IBMTS_Certificate properties

Property	Type	Qualifier	Description
Algorithm	String		Algorithm of the certificate.
AltSubject	String	MaxLen(256)	Alternate subject identifier for certificate.
Caption	String	MaxLen(64)	A short, textual description (one line string) of the object.

Table 49. IBMTS_Certificate properties (continued)

Property	Type	Qualifier	Description
Description	String		A textual description of the object.
ElementName	String		A name for the object. This property allows you to define a name in addition to its key properties/identity data and description information.
Expires	Datetime		The date and time the credential expires. Use a value of all nines if this information is not applicable. Note: This property does not define how the expiration is set. The property can be set to either a specific date/time or an interval.
Issued	Datetime		The date and time the credential was issued. Use a value of all zeros if this information is not applicable.
PublicKey	Uint8[]	OctetString (TRUE)	The DER-encoded raw public key.
Property	Type	Qualifier	Description.
ServiceCreation ClassName	String	Propagated(CIM_CertificateAuthority) MaxLen(256)	The scoping Service's CCN.
ServiceName	String	Propagated(CIM_CertificateAuthority. Name), MaxLen(256)	The scoping Service's Name.
Subject	String	MaxLen(256)	Certificate subject identifier.
SystemCreation ClassName	String	Propagated(CIM_CertificateAuthority. SystemCreation ClassName), MaxLen(256)	The scoping System's CCN.
SystemName	String	Propagated(CIM_CertificateAuthority. SystemName), MaxLen(256)	The scoping System's Name.
Type	String		The type of certificate.
Validity	Uint32		The validity of the certificate.

IBMTS_CertificateSetting

This class sets data to create new certificates.

Properties

IBMTS_CertificateSetting class has the properties shown in Table 50.

Table 50. IBMTS_CertificateSetting Properties

Property	Type	Qualifier	Description
AutoGeneration Enabled	Boolean		Automatically generates a new certificate after the old one expires.
Caption	String	MaxLen(64)	Unsupported property.
Description	String		A textual description of the object.
ElementName	String	Required(TRUE)	Unsupported property.
InstanceID	String		Identifies a unique instance of SettingData. The InstanceID must be unique within a namespace. Use the following algorithm to define the InstanceID: (Vendor ID)(ID)
ServerCertificate Name	String		
SignerCertificate Name	String		
Validity	UInt32		Validity of the certificate in days.

IBMTS_CIMXMLCommunicationMechanism

The IBMTS_CIMXMLCommunicationMechanism adds properties that are specific to the CIM-XML protocol.

Properties

The IBMTS_CIMXMLCommunicationMechanism properties are shown in Table 51

Table 51. IBMTS_CIMXMLCommunicationMechanism properties

Property	Type	Qualifier	Description
Authentication Mechanism Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ObjectManager)	A description of the supported mechanisms. An entry in this descriptions array must be provided when 1 = Other is specified.

Table 51. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description
Authentication Mechanisms Supported	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ObjectManager), Required(TRUE)	The type of authentication supported by the ObjectManager. Code Semantics 0 Unknown 1 Other 2 None 3 Basic 4 Digest
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
CIMValidated	Boolean	Required(TRUE)	Indicates if the CIM server is strictly validating.
CIMXMLProtocol Version	Uint16	Deprecated (CIM_CIMXML), Required(TRUE)	The CIM-XML protocol version supported by the ObjectManager. Code Semantics 0 Unknown 1 1.0
Communication Mechanism	Uint16	Required(TRUE), ModelCorrespondence (CIM_ObjectManager)	The encoding and protocol which can be used to communicate with the ObjectManager. Code Semantics 0 Unknown 1 Other 2 CIM-XML
CreationClassName	String	MaxLen(256)	The name of the class or subclass used to create an instance.
Description	String		A textual description of the object.
ElementName	String	ReadRole(None)	The name of the instance.

Table 51. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>The administrator's default or startup configuration for an element's Enabled Status. By default, the element is Enabled (value = 2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8...32767 DMTF Reserved</p> <p>32768... Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLog)	<p>Indicates if the element is currently shutting down or in an enabled or disabled state.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11...32767 DMTF Reserved</p> <p>32768... Vendor Reserved</p>
FunctionalProfile Description	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ObjectManager)	A description of the supported operations of the ObjectManager.

Table 51. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description
FunctionalProfile Supply	Uint16[]	Required(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ObjectManager)	An enumerated array that describes the types of operations supported by the ObjectManager. Code Semantics 0 Unknown 1 Other 2 Basic Read 3 Basic Write 4 Schema Manipulating Instance 5 Manipulating Associated Traversal 6 Query Execution 7 Qualifier Declaration 8 Indication 9
InstallDate	Date-time		The date on which the CIM client created the object in the CIMOM's repository.
MultipleOperation Supply	Boolean	Required(TRUE)	Indicates if the ObjectManager supports multiple operation requests (true) or only simple requests (false).
Name	String	MaxLen(256)	The unique label, in the context of the hosting system, by which the AccessControl Information is known.

Table 51. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>The operational status of the cluster.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Complete</td></tr> <tr><td>18</td><td>Power Mode</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Complete	18	Power Mode	..	DMTF Reserved	0x8000	Vendor Reserved
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OtherCommunicationMechanism	String	ModelCorrespondence (CIM_ObjectManager)	A description of the supported protocols when 1 = Other, is specified in the Communication Mechanism.																																												
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLog)	The element's enabled or disabled state when EnabledStatus is set to 1. This value must be null when EnabledStatus is set to a value other than 1.																																												

Table 51. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Sets the state (shut down, enabled, taken offline, or tested) of the element at the next operation. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10 Reboot 11 Reset .. DMTF Reserved 32768... Vendor Reserved
Status	String	Deprecated (CIM_ManagedSystem), MaxLen(10)	The current status of the Service instance.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The various OperationalStatus array values.
SystemCreationClass	String	Propogated (CIM_System.Creation) MaxLen(256)	The system's creation class name.
SystemName	String	Propogated (CIM_System.Name) MaxLen(256)	The system's name.
TimeOfLastStateChange	Date-time		The time the last change of state occurred.
Version	String	Required(TRUE)	The CIM-XML protocol version supported by the ObjectManager.

IBMTS_IndicationFilter

The IBMTS_IndicationFilter extends the CIM_IndicationFilter class.

Properties

The IBMTS_IndicationFilter has the properties shown in Table 52.

Table 52. IBMTS_IndicationFilter properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.

Table 52. *IBMTS_IndicationFilter* properties (continued)

Property	Type	Qualifier	Description
CreationClassName	String	MaxLen(256)	The name of the class or subclass used to create an instance.
SystemCreationClass	String	MaxLen(256)	The system's creation class name.
SystemName	String	MaxLen(256)	The system's name.
Description	String		A textual description of the object.
ElementName	String		The name of the instance.
Query	String	Required(TRUE), ModelCorrespondence (CIM_IndicationFilter)	A query expression that defines the condition(s) under which indications will be generated.
QueryLanguage	String	Required(TRUE)	The language in which the query is expressed.
SourceNamespace	String		The path to a local namespace where the indications originate.
Name	String	MaxLen(256)	The unique label, in the context of the hosting system, by which the AccessControl Information is known.

IBMTS_NameSpace

The *IBMTS_NameSpace* extends the *CIM_NameSpace* class.

Properties

The *IBMTS_NameSpace* has the properties shown in Table 53.

Table 53. *IBMTS_NameSpace* properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.

Table 53. IBMTS_NameSpace properties (continued)

Property	Type	Qualifier	Description
ClassInfo	UInt16	Deprecated (CIM_Namespace), Required(TRUE), Write(TRUE), ModelCorrespondence (CIM_Namespace)	The organization of the namespace. Code Semantics 0 Unknown 1 Other 2 CIM 1.0 3 CIM 2.0 4 CIM 2.1 5 CIM 2.2 6 CIM 2.3 7 CIM 2.4 8 CIM 2.5 9 CIM 2.6 10 CIM 2.7 11 CIM 2.8 200 DMI Recast 201 SNMP Recast 202 CMIP Recast
ClassType	UInt16	Write(TRUE), ModelCorrespondence (CIM_Namespace)	The schema of the namespace. Code Semantics 0 Unknown 1 Other 2 CIM 1.0 200 DMI Recast 201 SNMP Recast 202 CMIP Recast
ClassTypeVersion	String	Write(TRUE), ModelCorrespondence (CIM_Namespace)	The objects in the namespace.
CreationClassName	String	MaxLen(256)	The name of the class or subclass used to create an instance.
Description	String		A textual description of the object.
DescriptionOf ClassInfo	String	Deprecated (CIM_Namespace), Write(TRUE), ModelCorrespondence (CIM_Namespace)	Provides detailed information about the object.
DescriptionOf ClassType	String	Write(TRUE), ModelCorrespondence (CIM_Namespace)	Provides detailed information about the object.
ElementName	String		The name of the instance.
Name	String	MaxLen(256)	The unique label, in the context of the hosting system, by which the AccessControl Information is known.
ObjectManager Creation	String	Propogated (CIM_ObjectManager), MaxLen(256)	The ObjectManager's CreationClassName.

Table 53. IBMTS_NameSpace properties (continued)

Property	Type	Qualifier	Description
ObjectManagerName	String	Propogated (CIM_ObjectManager), MaxLen(256)	The ObjectManager's name.
SystemCreationClass	String	Propogated (CIM_ObjectManager), MaxLen(256)	The system's creation class name.
SystemName	String	Propogated (CIM_ObjectManager), MaxLen(256)	The system's name.

IBMTS_ObjectManager

The IBMTS_ObjectManager class represents the Common Information Model Object Manager (CIMOM) itself.

Properties

The IBMTS_ObjectManager class extends the CIM_ObjectManager class and has the properties shown in Table 54.

Table 54. IBMTS_ObjectManager properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String	ReadRole(None)	The name of the instance.
EnabledDefault	Uint16	Write(TRUE)	The administrator's default or startup configuration for an element's Enabled Status. Code Semantics 2 Enabled 3 Disabled 5 Not Applicable 6 Enabled but Offline 7 No Default 8..32767 DMTF Reserved 32768... Vendor Reserved

Table 54. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Indicates if the element is currently shutting down or in an enabled or disabled state. Code Semantics 0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11..32767 DMTF Reserved 32768... Vendor Reserved
GatherStatistical Data	Boolean	Write(TRUE)	Indicates if the CIM_CIMOM StatisticalData object has gathered statistical data and if the data is accessible.
InstallDate	Date-time		The date on which the CIM client created the object in the CIMOM's repository.
Name	String	MaxLen(256)	Identifies the Service and provides an indication of the functionality that is managed.

Table 54. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>The operational status of the cluster.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non- Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Complete</td></tr> <tr><td>18</td><td>Power Mode</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non- Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Complete	18	Power Mode	..	DMTF Reserved	0x8000	Vendor Reserved
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OtherEnabledStatus	String	ModelCorrespondence (CIM_EnabledLog)	The element's enabled or disabled state when EnabledStatus is set to 1. This value must be null when EnabledStatus is set to a value other than 1.																																												
PrimaryOwner Contact	String	Write(TRUE), MaxLen(256)	The method of contact for the primary owner of the account, such as a phone number or an e-mail address.																																												
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	The name of the primary owner.																																												

Table 54. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Sets the state (shut down, enabled, taken offline, or tested) of the element at the next operation. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10 Reboot 11 Reset .. DMTF Reserved 32768... Vendor Reserved
Started	Boolean		Indicates if the Service is started or stopped for the account.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.Enabled)	Indicates if the Service is automatically started by a system, operating system, or specific user request.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	The current status of the Service instance.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The status of the cluster when OperationalStatus is set to 1.
SystemCreation ClassName	String	MaxLen(256)	The class creation name of the scoping system.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The name of the scoping system.
SystemCreation Class	String	Propagated (CIM_System.Class), MaxLen(256)	The class creation of the scoping system.
TimeOfLast StateChange	Date- time		The date and time when the element's EnableState last changed.
Version	String	Experimental(TRUE)	The VRMF level of the Common Information Model (CIM) Agent.

IBMTS_RegisteredProfile

The IBMTS_RegisteredProfile extends the CIM_RegisteredProfile class.

Properties

The IBMTS_RegisteredProfile has the properties shown in Table 55.

Table 55. IBMTS_RegisteredProfile properties

Property	Type	Qualifier	Description
AdvertiseType Description	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile)	Provides information about the AdvertiseType.
AdvertiseTypes	UInt16[]	Required(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile)	Signifies the advertisement for the profile information. Code Semantics 1 Other 2 Not Advertise 3 SLP
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String		The name of the instance.
InstanceID	String		Identifies an instance of this class.
OtherRegistered Organization	String	ModelCorrespondence (CIM_ObjectManager), MaxLen(256)	A description of the organization when 1 equals Other is specified for the Registered Organization.
RegisteredName	String	Required(TRUE), MaxLen(256)	The name of this RegisteredProfile.

Table 55. IBMTS_RegisteredProfile properties (continued)

Property	Type	Qualifier	Description																																								
Registered Organization	Uint16	Required(TRUE), ModelCorrespondence (CIM_Namespace)	<p>The organization of the namespace.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>DMTF</td></tr> <tr><td>3</td><td>CompTIA</td></tr> <tr><td>4</td><td>Consortium for Service Innovation</td></tr> <tr><td>5</td><td>FAST</td></tr> <tr><td>6</td><td>GGF</td></tr> <tr><td>7</td><td>INTAP</td></tr> <tr><td>8</td><td>itSMF</td></tr> <tr><td>9</td><td>NAC</td></tr> <tr><td>10</td><td>Northwest Energy Efficiency Alliance</td></tr> <tr><td>11</td><td>SNIA</td></tr> <tr><td>12</td><td>TM Forum</td></tr> <tr><td>13</td><td>The Open Group</td></tr> <tr><td>14</td><td>ANSI</td></tr> <tr><td>15</td><td>IEEE</td></tr> <tr><td>16</td><td>IETF</td></tr> <tr><td>17</td><td>INCITS</td></tr> <tr><td>18</td><td>ISO</td></tr> <tr><td>19</td><td>W3C</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	DMTF	3	CompTIA	4	Consortium for Service Innovation	5	FAST	6	GGF	7	INTAP	8	itSMF	9	NAC	10	Northwest Energy Efficiency Alliance	11	SNIA	12	TM Forum	13	The Open Group	14	ANSI	15	IEEE	16	IETF	17	INCITS	18	ISO	19	W3C
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RegisteredVersion	String	Required(TRUE)	The version of this profile.																																								

IBMTS_System

The IBMTS_System extends the CIM_System class.

Properties

The IBMTS_System has the properties shown in Table 56.

Table 56. IBMTS_System properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short (one-line string) textual description of the object.
CreationClassName	String	MaxLen(256)	The name of the class used in creation of an instance.
Name	String	MaxLen(256)	Serves as key of a System instance.
Description	String		A textual description of the object.
ElementName	String	ReadRole(None)	Specifies the name of the instance.

Table 56. IBMTS_System properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>The administrator's default or startup configuration for an element's Enabled Status. By default, the element is Enabled (value = 2).</p> <p>Code Semantics</p> <p>0 Unknown 1 Other 2 Enabled 3 Disabled 4 Shutting Down 5 Not Applicable 6 Enabled but Offline 7 In Test 8 Deferred 9 Quiesce 10 Starting 11...32767 DMTF Reserved 32768... Vendor Reserved</p>
OtherEnabledState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Indicates if the element is currently shutting down or in an enabled or disabled state.
InstallDate	Date-time		The date on which the CIM client created the object in the CIMOM's repository.
NameFormat	String	MaxLen(64)	The scope for numerous components.

Table 56. IBMTS_System properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>The operational status of the cluster.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Complete</td></tr> <tr><td>18</td><td>Power Mode</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Complete	18	Power Mode	..	DMTF Reserved	0x8000	Vendor Reserved
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PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	The contact method for the primary owner of the account, such as a phone number or an e-mail address.																																												
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	The name of the primary owner.																																												

Table 56. IBMTS_System properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Sets the state (shut down, enabled, taken offline, or tested) of the element at the next operation. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10 Reboot 11 Reset .. DMTF Reserved 32768... Vendor Reserved
Roles	String[]	Write(TRUE)	Specifies the administrator defined roles.
Status	String	Deprecated (CIM_ManagedSystem), MaxLen(10)	The current status of the object.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The various OperationalStatus array values.
TimeOfLast StateChange	Date-time		The time the last change of state occurred.

IBMTS_Truststore

The Truststore class represents a container that hosts certificates. The Common Information Model (CIM) Agent uses exactly one truststore residing on the CIM Agent server.

Properties

The IBMTS_Truststore class has the properties shown in Table 57.

Table 57. IBMTS_Truststore Properties

Property	Type	Qualifier	Description
Caption	String		A short, textual description (one line string) of the object.
Description	String	MaxLen(64)	A textual description of the object.

Table 57. IBMTS_Truststore Properties (continued)

Property	Type	Qualifier	Description
ElementName	String	Required(TRUE)	<p>The name for this instance of SettingData. This name can also be used as an index property for a query.</p> <p>Note: The name does not have to be unique within a NameSpace.</p>
InstanceID	String		<p>Within the scope of the instantiating Namespace, InstanceID uniquely identifies an instance of this class. Use the following algorithm to ensure uniqueness within the NameSpace:</p> <p><OrgID>:<LocalID> Where <OrgID> includes a copyrighted, trademarked, or otherwise unique name owned by the business entity creating/defining the InstanceID. It could also be a registered ID assigned to the business entity by a recognized global authority.</p> <p>If you choose not to use this algorithm, then you must ensure that this InstanceID is not reused across any InstanceID's that are used for this instance's NameSpace.</p>

IBMTS_TruststoreManagementService

The SecurityProvider generates one instance of this class.

Properties

IBMTS_TruststoreManagementService class has the properties shown in Table 58 on page 248.

Table 58. IBMTS_TruststoreManagementService properties

Property	Type	Qualifier	Description
CreationClassName	String	MaxLen(256)	The name of the class or subclass used in the creation of an instance. When used with other key properties of this class, all instances of this class and its subclass can be uniquely identified.
Name	String	MaxLen(1024)	The label by which the object is known. When subclassed, this property can be overridden as a key property.
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The scoping system's CreationClassName.
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The scoping system's Name.
AutoGenerationEnabled	Boolean		A boolean that indicates how the automatic generation is enabled (true) or disabled (false).
Caption	String	MaxLen(64)	A short textual description (one line string) of the object.
DefaultValidity	UInt32		The set default validity.
Description	String		A textual description of the object.
ElementName	String		Allows each instance to define a unique name in addition to the key properties/identity data and description information.

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description																				
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's Enabled State. By default the element is "Enabled" (value=2).</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Enabled</td> </tr> <tr> <td>3</td> <td>Disabled</td> </tr> <tr> <td>5</td> <td>Not Applicable</td> </tr> <tr> <td>6</td> <td>Enabled but Offline</td> </tr> <tr> <td>7</td> <td>No Default</td> </tr> <tr> <td>8..32767</td> <td></td> </tr> <tr> <td></td> <td>DMTF Reserved</td> </tr> <tr> <td>32768..65535</td> <td></td> </tr> <tr> <td></td> <td>Vendor Reserved</td> </tr> </tbody> </table>	Code	Semantics	2	Enabled	3	Disabled	5	Not Applicable	6	Enabled but Offline	7	No Default	8..32767			DMTF Reserved	32768..65535			Vendor Reserved
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Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	Model Correspondence (CIM_Enabled LogicalElement)	<p>An integer enumeration that indicates the enabled/disabled states of an element. It can also indicate the transitions between these requested states. For example, shutting down (value=4) and starting (value=10) are transient states between enabled and disabled.</p> <p>Enabled: Indicates that the element either is or can be running commands. All queued commands will process and new requests will be queued.</p> <p>Disabled: Indicates that the element will not run commands and drops any new requests.</p> <p>Shutting down: Indicates that the element is in the process of going to a Disabled state.</p> <p>Not Applicable: Indicates that the element does not support being enabled or disabled.</p> <p>Enabled but Offline: Indicates that the element might be completing commands and will drop any new requests.</p> <p>Test: Indicates that the element is in a test state.</p>

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
EnabledState (continued)			<p>Deferred: Indicates that the element might be completing commands and will queue any new requests.</p> <p>Quiesce: Indicates that the element is enabled but in restricted mode. The element's behavior is similar to the Enabled state. However, only a restricted set of commands will process and all other requests are queued.</p> <p>Starting: Indicates that the element is in the process of going to an Enabled state and all new requests are queued.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767</p> <p>DMTF Reserved</p> <p>32768..65535</p> <p>Vendor Reserved</p>

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
HealthState	Uint16	Experimental(TRUE)	<p>Indicates the current health of the element, but not its subcomponents. The possible values range from 0 to 30. A 5 indicates the element is entirely healthy and a 30 means that the element is completely nonfunctional.</p> <p>Nonrecoverable Error: The element has completely failed and recovery is not possible. All functionality provided by this element has been lost.</p> <p>Critical Failure: The element is nonfunctional and recovery might not be possible.</p> <p>Major Failure: The element is failing. It is possible that some or all of the functionality of this component is degraded or not working</p> <p>Minor Failure: All functionality is available but some may be degraded.</p> <p>Degraded/Warning: The element is in working order and all functionality is provided. However, the element is not working to the best of its abilities. For example, the element might not be operating at optimal performance or it might be reporting recoverable errors.</p>

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description																						
HealthState (continued)			<p>OK: The element is fully functional and operating within normal operational parameters without error.</p> <p>Unknown: The implementation cannot report on the HealthState at this time.</p> <p>DMTF Reserved: The unused portion of the continuum has been reserved for future HealthStates.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>5</td> <td>OK</td> </tr> <tr> <td>10</td> <td></td> </tr> <tr> <td></td> <td>Degraded/ Warning</td> </tr> <tr> <td>15</td> <td>Minor Failure</td> </tr> <tr> <td>20</td> <td>Major Failure</td> </tr> <tr> <td>25</td> <td>Critical Failure</td> </tr> <tr> <td>30</td> <td></td> </tr> <tr> <td></td> <td>Non-recoverable error</td> </tr> <tr> <td>..</td> <td>DMTF Reserved</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	5	OK	10			Degraded/ Warning	15	Minor Failure	20	Major Failure	25	Critical Failure	30			Non-recoverable error	..	DMTF Reserved
Code	Semantics																								
0	Unknown																								
5	OK																								
10																									
	Degraded/ Warning																								
15	Minor Failure																								
20	Major Failure																								
25	Critical Failure																								
30																									
	Non-recoverable error																								
..	DMTF Reserved																								
InstallDate	Datetime		A datetime value that indicates when the object was installed. If there is no value, that does not mean the object is not installed.																						

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	<p>Indicates the current status(es) of the element. Various operational statuses are defined.</p> <p>Stressed: Indicates that the element is functioning, but needs attention. Examples of "Stressed" states are overload and overheated.</p> <p>Predictive Failure: Indicates that an element is functioning nominally but a failure is predicted in the near future.</p> <p>In Service: An element is being configured, maintained, cleaned or otherwise administered.</p> <p>No Contact: Indicates that the monitoring system has knowledge of this element, but has never been able to establish communications with it.</p> <p>Lost Communication: Indicates that the ManagedSystem element is known to exist and has been previously contacted, but is currently unreachable.</p> <p>Aborted: The element has abruptly stopped. The element's state and configuration might need to be updated.</p> <p>Dormant: Indicates that the element is inactive or quiesced.</p>

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
OperationalStatus (continued)			<p>Supporting Entity in Error: The element may be ok, but there is an error on an element that this element is dependent upon. For example, a network service or endpoint cannot function as a result of lower layer networking problems.</p> <p>Complete: Indicates the element has completed its operation.</p> <p>Completed and OK: The operation finished successfully.</p> <p>Completed and Error: The operation failed.</p> <p>Completed and Degraded: The operation finished, but did not complete ok or report an error.</p> <p>Power Mode: Indicates the element has additional power model information contained in the associated PowerManagement Service</p>

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus (continued)			<p>Operational Status: Replaces the Status property on the ManagedSystem Element to provide a consistent approach to enumerations, address implementation needs for an array property and provide a migration path from today's environment to the future environment.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode	..	DMTF Reserved	0x8000	Vendor Reserved
Code	Semantics																																														
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6	Error																																														
7	Non-Recoverable Error																																														
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17	Completed																																														
18	Power Mode																																														
..	DMTF Reserved																																														
0x8000	Vendor Reserved																																														
OtherEnabledState	String	Model Correspondence (CIM_EnabledLogicalElement)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																												

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
PrimaryOwner Contact	String		The contact method for the primary owner of the Service. Examples are a phone number or an email address.
PrimaryOwnerName	String		The name of the primary owner for the service. The primary owner is the initial support contact for the Service.
RequestedState	Uint16		An integer enumeration that indicates the last requested or desired state for the element. The actual state of the element is represented by EnabledState. This property is provided to compare the last requested and current enabled/disabled states. Note: When EnabledState is set to 5 ("Not Applicable"), this property has no meaning. By default, the element's RequestedState is 5 ("No Change"). Refer to the EnabledState's property description for explanations of the values in the RequestedState enumeration.
Started	Boolean		Indicates if the Service has been started (true) or stopped (false).
StartMode	String	Deprecated (CIM_Service. EnabledDefault), MaxLen(10)	Indicates if the service is started automatically or upon request.
Status	String	Deprecated (CIM_Managed SystemElement. Operational Status) MaxLen(10)	The current status of the object.
StatusDescriptions	String[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	The OperationalStatus array values.

Table 58. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description
TimeOfLastStateChange	Datetime		The date/time the element's EnabledState last changed. If the state of the element has not changed and this property is populated, it must be set to a 0 interval value. If the state change was requested, but rejected or not yet processed, the property must not be updated.

Association object classes

This section describes the association classes and their properties of the CIM Agent for the SAN Volume Controller.

IBMTSSVC_AllocatedFromStoragePool

The IBMTSSVC_AllocatedFromStoragePool class connects an IBMTSSVC_StorageVolume instance to an IBMTSSVC_StoragePool from which the volume is allocated.

References

The IBMTSSVC_AllocatedFromStoragePool class extends the CIM_AllocatedFromStoragePool class and has the references shown in Table 59.

Table 59. IBMTSSVC_AllocatedFromStoragePool references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_StoragePool		The storage pool
Dependent	IBMTSSVC_StorageVolume		The storage volume

Properties

The IBMTSSVC_AllocatedFromStoragePool class has the properties shown in Table 60.

Table 60. IBMTSSVC_AllocatedFromStoragePool properties

Property	Type	Qualifier	Description
SpaceConsumed	Uint64	Units(Bytes), Required(TRUE), ModelCorrespondence (CIM_StoragePool.TotalManagedSpace CIM_StoragePool.RemainingManagedSpace)	Unsupported property

IBMTSSVC_authorizedCollection

The IBMTSSVC_authorizedCollection class associates a Host with a Privilege. AuthorizedSubject is one of the elements in the authorization chain between a Host and a StorageVolume.

References

The IBMTSSVC_authorizedCollection class extends the CIM_AuthorizedSubject class and has the references shown in Table 61.

Table 61. IBMTSSVC_authorizedCollection references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege
Privileged Element	IBMTSSVC_HardwareId Collection		The Host

IBMTSSVC_authorizedStorageHardwareID

The IBMTSSVC_authorizedStorageHardwareID class associates a Host with a Privilege. AuthorizedSubject is one of the elements in the authorization chain between a Host and a StorageVolume.

References

The IBMTSSVC_authorizedStorageHardwareID class extends the CIM_AuthorizedSubject class and has the references shown in Table 62.

Table 62. IBMTSSVC_authorizedStorageHardwareID references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege
Privileged Element	IBMTSSVC_Storage HardwareID		The StorageHardwareID

IBMTSSVC_authorizedSubject

The IBMTSSVC_authorizedSubject class associates a Host with a Privilege. AuthorizedSubject is one of the elements in the authorization chain between a Host and a Storage Volume.

References

The IBMTSSVC_authorizedSubject class extends the CIM_AuthorizedSubject class and has the references shown in Table 63.

Table 63. IBMTSSVC_authorizedSubject references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege
Privilege Element	CIM_ManagedElement		The Host or StorageHardwareID

IBMTSSVC_authorizedTarget

The IBMTSSVC_authorizedTarget class associates an Privilege with a ProtocolController. authorizedTarget is one of the elements in the authorization chain between a StorageHardwareID and a StorageVolume.

References

The IBMTSSVC_authorizedTarget class extends the CIM_authorizedTarget class and has the references shown in Table 64.

Table 64. IBMTSSVC_authorizedTarget references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege affecting the target resource
TargetElement	IBMTSSVC_Controller		The target set of resources to which the Privilege applies

IBMTSSVC_AvailableHardwareID

The IBMTSSVC_AvailableHardwareID class associates the AccountManagementService to CandidateStorageHardwareIDs.

References

The IBMTSSVC_AvailableHardwareID class extends the CIM_ConcreteDependency class and has the references shown in Table 65.

Table 65. IBMTSSVC_AvailableHardwareID references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_StorageHardwareIDManagementService		The StorageHardwareIDManagementService
Dependent	IBMTSSVC_CandidateStorageHardwareID		The CandidateStorageHardwareID

IBMTSSVC_BackendControllerForVolume

The IBMTSSVC_BackendControllerForVolume class associates BackendControllers with their Volumes.

References

The IBMTSSVC_BackendControllerForVolume class extends the CIM_Component class and has the references shown in Table 66.

Table 66. IBMTSSVC_BackendSCSILUN references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_BackendController	Aggregate	The BackendController
Part Component	IBMTSSVC_BackendVolume		The BackendVolume controlled by the Antecedent

IBMTSSVC_BasedOn

The IBMTSSVC_BasedOn class associates StorageVolumes with the BackendVolumes where their data resides.

References

The IBMTSSVC_BasedOn class extends the CIM_BasedOn class and has the references shown in Table 67.

Table 67. IBMTSSVC_BasedOn references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_BackendVolume		The BackendVolume containing data from the Dependent
Dependent	IBMTSSVC_StorageVolume		The StorageVolume

Properties

The IBMTSSVC_BasedOn class has the properties shown in Table 68.

Table 68. IBMTSSVC_BasedOn properties

Property	Type	Qualifier	Description
EndingAddress	Uint64		Unsupported property
ExtentCount	Uint64		The number of extents that are allocated on the BackendVolume for the StorageVolume
OrderIndex	Uint64		Unsupported property
StartingAddress	Uint64		Unsupported property

IBMTSSVC_ClusterController

The IBMTSSVC_ClusterController class defines the Cluster scope of the Controller.

References

The IBMTSSVC_ClusterController class extends the CIM_SystemDevice class and has the references shown in Table 69.

Table 69. IBMTSSVC_ClusterController references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate, Min, Max	The Cluster
Part Component	IBMTSSVC_Controller	Weak	The Controller

IBMTSSVC_ClusterDumps

The IBMTSSVC_ClusterDumps class extends the CIM_ElementSettingData class.

References

The IBMTSSVC_ClusterDumps class has the references shown in Table 70.

Table 70. IBMTSSVC_ClusterDumps references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Cluster		The Cluster
SettingData	IBMTSSVC_Dumps		The Dumps

Properties

The IBMTSSVC_ClusterDumps class has the properties shown in Table 71.

Table 71. IBMTSSVC_ClusterDumps properties

Property	Type	Qualifier	Description
IsCurrent	Uint16		Indicates that the referenced setting is currently being used in the operation of the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Current 2 Is Not Current
IsDefault	Uint16		Indicates that the referenced setting is a default setting for the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Default 2 Is Not Default

IBMTSSVC_ClusteringCandidate

The IBMTSSVC_ClusteringCandidate class associates an IBMTSSVC_CandidateNode instance with an IBMTSSVC_Cluster instance.

References

The IBMTSSVC_ClusteringCandidate class extends the CIM_Dependency class and has the references shown in Table 72.

Table 72. IBMTSSVC_ClusteringCandidate references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_CandidateNode		A node that is not a member of this or any other cluster
Dependent	IBMTSSVC_Cluster		The cluster

IBMTSSVC_ClusteringServiceForSystem

The IBMTSSVC_ClusteringServiceForSystem class associates an IBMTSSVC_Cluster instance with an IBMTSSVC_ClusteringService instance.

References

The IBMTSSVC_ClusteringServiceForSystem class extends the CIM_HostedClusterService class and has the references shown in Table 73.

Table 73. IBMTSSVC_ClusteringServiceForSystem references

Name	Target	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The Cluster
Dependent	IBMTSSVC_Clustering Service	Weak	The ClusteringService that is hosted on the Cluster

IBMTSSVC_ClusterMaskingCapabilities

The IBMTSSVC_ClusterMaskingCapabilities class associates an IBMTSSVC_Cluster instance with its DeviceMaskingCapabilities.

References

The IBMTSSVC_ClusterMaskingCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 74.

Table 74. IBMTSSVC_ClusterMaskingCapabilities references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Cluster	Min, Max	The IBMTSSVC_ControllerMaskingCapabilities for this cluster
Capabilities	IBMTSSVC_ControllerMaskingCapabilities		The Capabilities object associated with the element

IBMTSSVC_ClusterPort

The IBMTSSVC_ClusterPort defines the cluster scope of the fibre-channel port.

References

The IBMTSSVC_ClusterPort class extends the CIM_SystemDevice class and has the references shown in Table 75.

Table 75. IBMTSSVC_ClusterPort references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate, Min, Max	The Cluster
Part Component	IBMTSSVC_FCPort	Weak	The fibre-channel port

IBMTSSVC_ClusterScopeCandidateVolume

The IBMTSSVC_ClusterScopeCandidateVolume class associates IBMTSSVC_Cluster instance with an IBMTSSVC_CandidateVolume instance.

References

The IBMTSSVC_ClusterScopeCandidateVolume class extends the CIM_Dependency class and has the references shown in Table 76.

Table 76. IBMTSSVC_ClusterScopeCandidateVolume references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_CandidateVolume		The CandidateVolume

IBMTSSVC_ClusterScopeChassis

The IBMTSSVC_ClusterScopeChassis class defines the cluster scope of the IBMTSSVC_Chassis instance.

References

The IBMTSSVC_ClusterScopeChassis class extends the CIM_Dependency class and has the references shown in Table 77.

Table 77. IBMTSSVC_ClusterScopeChassis references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Chassis		The Chassis

IBMTSSVC_ClusterScopeFCSet

The IBMTSSVC_ClusterScopeFCSet class defines the cluster scope of an IBMTSSVC_FlashCopySynchronizedSet instance.

References

The IBMTSSVC_ClusterScopeFCSet class extends the CIM_Dependency class and has the references shown in Table 78.

Table 78. IBMTSSVC_ClusterScopeFCSet references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_FlashCopySynchronizedSet		The FlashCopy SynchronizedSet instance

IBMTSSVC_ClusterScopeIOGroup

The IBMTSSVC_ClusterScopeIOGroup defines the cluster scope of the I/O group.

References

The IBMTSSVC_ClusterScopeIOGroup class extends the CIM_Dependency class and has the references shown in Table 79.

Table 79. IBMTSSVC_ClusterScopeIOGroup references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_IOGroup		The I/O group

IBMTSSVC_ClusterScopeNodeVPD

The IBMTSSVC_ClusterScopeNodeVPD class defines the cluster scope of an IBMTSSVC_NodeVPD instance.

References

The IBMTSSVC_ClusterScopeNodeVPD class extends the CIM_Dependency class and has the references shown in Table 80.

Table 80. IBMTSSVC_ClusterScopeNodeVPD references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_NodeVPD		The NodeVPD instance

IBMTSSVC_ClusterScopePrivilege

The IBMTSSVC_ClusterScopePrivilege class defines the cluster scope of an IBMTSSVC_Privilege instance.

References

The IBMTSSVC_ClusterScopePrivilege class extends the CIM_Dependency class and has the references shown in Table 81.

Table 81. IBMTSSVC_ClusterScopePrivilege references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Privilege		The Privilege

IBMTSSVC_ClusterScopeProduct

The IBMTSSVC_ClusterScopeProduct class defines the cluster scope of an IBMTSSVC_Product instance.

References

The IBMTSSVC_ClusterScopeProduct class extends the CIM_Dependency class and has the references shown in Table 82 on page 266.

Table 82. IBMTSSVC_ClusterScopeProduct references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Product		The Product instance

IBMTSSVC_ClusterScopeSCSet

The IBMTSSVC_ClusterScopeSCSet class defines the Cluster scope of an IBMTSSVC_SyncCopySynchronizedSet instance.

References

The IBMTSSVC_ClusterScopeSCSet class extends the CIM_Dependency class and has the references shown in Table 83.

Table 83. IBMTSSVC_ClusterScopeSCSet references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_SyncCopySynchronizedSet		The SyncCopySynchronizedSet instance

IBMTSSVC_ClusterVolume

The IBMTSSVC_ClusterVolume class defines the cluster scope of an IBMTSSVC_StorageVolume instance.

References

The IBMTSSVC_ClusterScopeVolume class extends the CIM_Dependency class and has the references shown in Table 84.

Table 84. IBMTSSVC_ClusterVolume references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_StorageVolume		The StorageVolume

IBMTSSVC_ComponentCS

The IBMTSSVC_ComponentCS class associates the cluster and its nodes.

References

The IBMTSSVC_ComponentCS class extends the CIM_ComponentCS class and has the references shown in Table 85.

Table 85. IBMTSSVC_ComponentCS references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate	The Cluster

Table 85. IBMTSSVC_ComponentCS references (continued)

Name	Reference	Qualifier	Description
Part Component	IBMTSSVC_Node		The Node

IBMTSSVC_ComputerSystemPackage

The IBMTSSVC_ComputerSystemPackage class connects an IBMTSSVC_Node instance with the corresponding IBMTSSVC_Chassis instance.

References

The IBMTSSVC_ComputerSystemPackage class extends the CIM_ComputerSystemPackage class and has the references shown in Table 86.

Table 86. IBMTSSVC_ComputerSystemPackage references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Chasis		The Chassis
Dependent	IBMTSSVC_Node		The Node

Properties

The IBMTSSVC_ComputerSystemPackage class has the properties shown in Table 87.

Table 87. IBMTSSVC_ComputerSystemPackage properties

Property	Type	Qualifier	Description
PlatformGUID	String		Unsupported property.

IBMTSSVC_ConnectedBackendController

The IBMTSSVC_ConnectedBackendController class connects an IBMTSSVC_Cluster instance to an IBMTSSVC_BackendController instance that is visible in the fibre-channel SAN.

References

The IBMTSSVC_ConnectedBackendController class extends the CIM_Dependency class and has the references shown in Table 88.

Table 88. IBMTSSVC_ConnectedBackendController references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Backend Controller		The Backend Controller that is connected to the Cluster

IBMTSSVC_ControllerConfigurationServiceForSystem

The IBMTSSVC_ControllerConfigurationServiceForSystem class connects an IBMTSSVC_Cluster instance to the corresponding IBMTSSVC_ControllerConfigurationService instance.

References

The IBMTSSVC_ControllerConfigurationServiceForSystem class extends the CIM_HostedService class and has the references shown in Table 89.

Table 89. IBMTSSVC_ControllerConfigurationServiceForSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The system that the service should be used for
Dependent	IBMTSSVC_ControllerConfigurationService	Weak	The Controller Configuration Service that provides services for the system

IBMTSSVC_ControllerConfServiceMaskingCapabilities

The IBMTSSVC_ControllerConfServiceMaskingCapabilities class associates an IBMTSSVC_ControllerConfService instance with its DeviceMaskingCapabilities.

References

The IBMTSSVC_ControllerConfServiceMaskingCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 90.

Table 90. IBMTSSVC_ControllerConfService MaskingCapabilities references

Name	Reference	Qualifier	Description
Managed Element	IBMTSSVC_ControllerConfigurationService	Min, Max	The IBMTSSVC_ControllerMaskingCapabilities for this service
Capabilities	IBMTSSVC_ControllerMaskingCapabilities		The Capabilities object associated with the element

IBMTSSVC_CopyCandidate

The IBMTSSVC_CopyCandidate class associates an IBMTSSVC_CandidateVolume instance with an IBMTSSVC_StorageVolume instance, both of which must have the same characteristics.

References

The IBMTSSVC_CopyCandidate class extends the CIM_Dependency class and has the references shown in Table 91 on page 269.

Table 91. IBMTSSVC_CopyCandidate references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Candidate Volume	Key	The Candidate Volume that is a potential auxiliary for a sync copy relationship with the Storage Volume
Dependent	IBMTSSVC_Storage Volume	Key	The Storage Volume

IBMTSSVC_ElementConformsToProfile

The IBMTSSVC_ElementConformsToProfile extends the CIM_ElementConformsToProfile class.

References

The IBMTSSVC_ElementConformsToProfile class has the references shown in Table 92.

Table 92. IBMTSSVC_ComponentCS references

Name	Reference	Qualifier	Description
Conformant Standard	IBMTSSVC_Registered Profile		The Registered Profile to which the Managed Element conforms
Managed Element	IBMTSSVC_Cluster		The Managed Element that conforms to the Registered Profile

IBMTSSVC_FlashCopyStorageSynchronized

The IBMTSSVC_FlashCopyStorageSynchronized class aggregates a source IBMTSSVC_StorageVolume instance and a target IBMTSSVC_StorageVolume for a FlashCopy relationship.

References

The source and target volumes can reside on different IBMTSSVC_RedundancyGroup instances, but must be managed by the same IBMTSSVC_Cluster instance. The IBMTSSVC_FlashCopyStorageSynchronized class extends the CIM_StorageSynchronized class and has the references shown in Table 93.

Table 93. IBMTSSVC_FlashCopyStorageSynchronized references

Name	Reference	Qualifier	Description
SystemElement	IBMTSSVC_Storage Volume	MappingStrings	The Storage Volume that is the source for the replication
SyncedElement	IBMTSSVC_Storage Volume	MappingStrings	The Storage Volume that is the target for the replication

Properties

The IBMTSSVC_FlashCopyStorageSynchronized class has the properties shown in Table 94.

Table 94. IBMTSSVC_FlashCopyStorageSynchronized properties

Property	Type	Qualifier	Description
CopyRate	Uint16	Write(TRUE), WriteRole (Administrator)	Specifies the copy rate (%) for the SAN Volume Controller
CopyType	Uint16		<p>The Replication Policy.</p> <p>Code Semantics</p> <p>2 Async. Create and maintain an asynchronous copy of the source.</p> <p>3 Sync. Create and maintain a synchronized copy of the source.</p> <p>4 UnSyncAssoc. Create an un-synchronized copy and maintain an association to the source.</p> <p>.. DMTF reserved</p> <p>0x8000.. Vendor specific</p>
ElementName	String	Write(TRUE), WriteRole (Administrator)	The user-friendly name of the association
Name	String		The name of the association
Progress	Uint32	Units(percent)	The status of the ongoing copy process

Table 94. IBMTSSVC_FlashCopyStorageSynchronized properties (continued)

Property	Type	Qualifier	Description
ReplicaType	Uint16		The type of replication relationship. The SAN Volume Controller replicas are FullCopy (0). Code Semantics 0 FullCopy 1 BeforeDelta 2 AfterDelta 3 Log 4 NotSpecified .. DMTF reserved 0x8000.. Vendor specific
SyncedElementName	String		The name of the Synced Element
SynchronizedSet	String		The name of the SynchronizedSet with which the StorageSynchronized is associated
SynchronizedSetID	String		The identifier of the SynchronizedSet with which the StorageSynchronized is associated
SyncMaintained	Boolean		Indicates if synchronization is maintained
SyncState	Uint16		The state of the synchronization Code Semantics 2 Initialized 3 PrepareIn Progress 4 Prepared 5 ResyncIn Progress 11 Idle 12 Broken 0x8000 Stopped
SystemElementName	String		The name of the SystemElement
WhenSynced	Date-time		Unsupported property

IBMTSSVC_FlashCopySynchronizedMember

The IBMTSSVC_FlashCopySynchronizedMember class associates an IBMTSSVC_FlashCopySynchronizedSet with its members, which are multiple IBMTSSVC_FlashCopySynchronization instances.

References

The IBMTSSVC_FlashCopySynchronizedMember class extends the CIM_SynchronizedMember class and has the references shown in Table 95.

Table 95. IBMTSSVC_FlashCopySynchronizedMember references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_FlashCopySynchronizedSet	Aggregate	The FlashCopySynchronized Set
Member	IBMTSSVC_FlashCopyStorageSynchronized		The member of the set

IBMTSSVC_HardwareIDOnSystem

The IBMTSSVC_HardwareIDOnSystem associates a cluster with its storage hardware IDs.

References

The IBMTSSVC_HardwareIDOnSystem class extends the CIM_Dependency class and has the references shown in Table 96.

Table 96. IBMTSSVC_HardwareIDOnSystem references

Name	Reference	Qualifier	Description
Dependent	IBMTSSVC_Cluster		The Cluster
Antecedent	IBMTSSVC_StorageHardwareID		The Storage Hardware ID

IBMTSSVC_HostedAccessPoint

The IBMTSSVC_HostedAccessPoint extends the CIM_HostedAccessPoint class.

References

The IBMTSSVC_HostedAccessPoint class has the references shown in Table 97.

Table 97. IBMTSSVC_HostedAccessPoint references

Name	Reference	Qualifier	Description
Dependent	IBMTSSVC_System	Min, Max	The hosting system
Antecedent	IBMTSSVC_RemoteServiceAccessPoint	Weak	The SAP(s) that are hosted on this system

IBMTSSVC_HostedFlashCopyJob

The IBMTSSVC_HostedFlashCopyJob class associates an IBMTSSVC_FlashCopyJob instance with the IBMTSSVC_Cluster instance on which the job is running.

References

The IBMTSSVC_HostedFlashCopyJob class extends the CIM_Dependency class and has the references shown in Table 98.

Table 98. IBMTSSVC_HostedFlashCopyJob references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_FlashCopy Job		The Job

IBMTSSVC_HostedFormatVolumeJob

IBMTSSVC_HostedFormatVolumeJob class associates an IBMTSSVC_FormatVolumeJob instance with the IBMTSSVC_Cluster instance on which the job is running.

References

IBMTSSVC_HostedFormatVolumeJob class extends the CIM_Dependency class and has the references shown in Table 99.

Table 99. IBMTSSVC_HostedFormatVolumeJob references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Format VolumeJob		The Job

IBMTSSVC_HostedJob

The IBMTSSVC_HostedJob class associates an IBMTSSVC_Job instance with the IBMTSSVC_Cluster instance on which the job is running.

References

The IBMTSSVC_HostedJob class extends the CIM_Dependency class and has the references shown in Table 100.

Table 100. IBMTSSVC_HostedJob references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Key	The Cluster
Dependent	IBMTSSVC_Job	Key	The Job

IBMTSSVC_HostedMigrateVolumeJob

IBMTSSVC_HostedMigrateVolumeJob class associates an IBMTSSVC_MigrateVolumeJob instance with the IBMTSSVC_Cluster instance on which the job is running.

References

IBMTSSVC_HostedMigrateVolumeJob class extends the CIM_Dependency class and has the references shown in Table 101 on page 274.

Table 101. IBMTSSVC_HostedMigrateVolumeJob references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_MigrateVolumeJob		The Job

IBMTSSVC_HostedPrimordialPool

The IBMTSSVC_HostedPrimordialPool associates a cluster with its primordial storage pools.

References

The IBMTSSVC_HostedPrimordialPool class extends the CIM_HostedStoragePool class and has the references shown in Table 102.

Table 102. IBMTSSVC_HostedPrimordialPool references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate, Max, Min	The Cluster
Part Component	IBMTSSVC_PrimaryStoragePool		The Primordial Storage Pool

IBMTSSVC_HostedStoragePool

The IBMTSSVC_HostedStoragePool class connects an IBMTSSVC_Cluster instance with the corresponding IBMTSSVC_StoragePool instance.

References

The IBMTSSVC_HostedStoragePool class extends the CIM_HostedStoragePool class and has the references shown in Table 103.

Table 103. IBMTSSVC_HostedStoragePool references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Min, Max, Aggregate	The Cluster
Part Component	IBMTSSVC_StoragePool		The StoragePool

IBMTSSVC_HostedSyncCopyJob

The IBMTSSVC_HostedSyncCopyJob class associates an IBMTSSVC_SyncCopyJob instance with the IBMTSSVC_Cluster instance on which the job is running.

References

The IBMTSSVC_HostedSyncCopyJob class extends the CIM_Dependency class and has the references shown in Table 104 on page 275.

Table 104. IBMTSSVC_HostedSyncCopyJob references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_SyncCopy Job		The Job

IBMTSSVC_HwIDCollectionOnSystem

The IBMTSSVC_HwIDCollectionOnSystem associates a cluster with its hardware ID.

References

The IBMTSSVC_HwIDCollectionOnSystem class extends the CIM_Dependency class and has the references shown in Table 105.

Table 105. IBMTSSVC_HwIDCollectionOnSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_HardwareId Collection		The hardware ID

IBMTSSVC_IndicationFiltersConformsToProfile

The IBMTSSVC_IndicationFiltersConformsToProfile class associates IndicationFilters and the InBand profile.

References

The IBMTSSVC_IndicationFiltersConformsToProfile class extends the CIM_ElementConformsToProfile class and has the references shown in Table 106.

Table 106. IBMTSSVC_IndicationFiltersConformsToProfile references

Name	Reference	Qualifier	Description
Conformant Standard	IBMTSSVC_RegisteredProfile		The RegisteredProfile to which the ManagedElement conforms
ManagedElement	IBMTS_IndicationFilter		The IndicationFilter that conforms to the RegisteredProfile

IBMTSSVC_IndicationFiltersConformsToSubProfile

The IBMTSSVC_IndicationFiltersConformsToSubProfile class associates IndicationFilters and the InBand subprofile.

References

The IBMTSSVC_IndicationFiltersConformsToSubProfile class extends the CIM_ElementConformsToProfile class and has the references shown in Table 107 on page 276.

Table 107. IBMTSSVC_IndicationFiltersConformsToSubProfile references

Name	Reference	Qualifier	Description
Conformant Standard	IBMTSSVC_RegisteredSubProfile		The RegisteredSub Profile to which the ManagedElement conforms
Managed Element	IBMTS_IndicationFilter		The IndicationFilter that conforms to the RegisteredProfile

IBMTSSVC_IOGroupIdentity

The IBMTSSVC_IOGroupIdentity class extends the CIM_ConcreteIdentity class.

References

The IBMTSSVC_IOGroupIdentity class has the references shown in Table 108.

Table 108. IBMTSSVC_IOGroupIdentity references

Name	Reference	Qualifier	Description
SystemElement	IBMTSSVC_IOGroup		An aspect of the ManagedElement
SameElement	IBMTSSVC_IOGroupSet		An aspect of the ManagedElement

IBMTSSVC_IOGroupPort

The IBMTSSVC_IOGroupPort associates an I/O group with its Fibre Channel ports.

References

The IBMTSSVC_IOGroupPort class extends the CIM_SystemDevice class and has the references shown in Table 109.

Table 109. IBMTSSVC_IOGroupPort references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Aggregate, Max, Min	The parent system in the Association
Part Component	IBMTSSVC_FCPort	Weak	The LogicalDevice that is a component of a System

IBMTSSVC_ManagesCollection

The IBMTSSVC_ManagesCollection associates a HardwareIdCollection with the StorageHardwareIDManagementService to indirectly manage it.

References

The IBMTSSVC_ManagesCollection class extends the CIM_ConcreteDependency class and has the references shown in Table 110 on page 277.

Table 110. IBMTSSVC_ManagesCollection references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_StorageHardwareIDManagementService		The StorageHardwareIDManagementService
Dependent	IBMTSSVC_HardwareIdCollection		The hardware ID collection

IBMTSSVC_ManagesController

The IBMTSSVC_ManagesController class associates a Controller with the ControllerConfigurationService to manage it.

References

The IBMTSSVC_ManagesController class extends the CIM_ConcreteDependency class and has the references shown in Table 111.

Table 111. IBMTSSVC_ManagesController references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_ControllerConfigurationService		The ControllerConfigurationService
Dependent	IBMTSSVC_Controller		The Controller

IBMTSSVC_ManagesHardwareID

The IBMTSSVC_ManagesHardwareID class associates a HardwareID with the StorageHardwareIDManagementService to manage it.

References

The IBMTSSVC_ManagesHardwareID class extends the CIM_ConcreteDependency class and has the references shown in Table 112.

Table 112. IBMTSSVC_ManagesHardwareID references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_StorageHardwareIDManagementService		The StorageHardwareIDManagementService
Dependent	IBMTSSVC_ControllerStorageHardwareID		The StorageHardwareID

IBMTSSVC_ManagesPrivilege

The IBMTSSVC_ManagesPrivilege class associates a Privilege with the LunMaskPrivilegeService to manage it.

References

The IBMTSSVC_ManagesPrivilege class extends the CIM_ConcreteDependency class and has the references shown in Table 113 on page 278.

Table 113. IBMTSSVC_ManagesPrivilege references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Privilege ManagementService		The Privilege Management Service
Dependent	IBMTSSVC_Privilege		The Privilege

IBMTSSVC_MemberOfCollection

The IBMTSSVC_MemberOfCollection class associates a Host with its StorageHardwareID (fibre-channel ports).

References

The IBMTSSVC_MemberOfCollection class extends the CIM_MemberOfCollection class and has the references shown in Table 114.

Table 114. IBMTSSVC_MemberOfCollection references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_Hardware IdCollection	Aggregate	The Host
Member	IBMTSSVC_Storage HardwareID		The Storage Hardware ID (fibre-channel port)

IBMTSSVC_MemberOfIOGroup

The IBMTSSVC_MemberOfIOGroup class associates a node with the IOGroupSet to which it belongs.

References

The IBMTSSVC_MemberOfIOGroup class extends the CIM_MemberOfCollection class and has the references shown in Table 115.

Table 115. IBMTSSVC_MemberOfIOGroup references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_IOGroupSet	Aggregate	The RedundancyGroup
Member	IBMTSSVC_Node		The Node

IBMTSSVC_NodeDumps

The IBMTSSVC_NodeDumps class shows the dumps found on a specific node.

References

The IBMTSSVC_NodeDumps class extends the CIM_ElementSettingData class and has the references shown in Table 116.

Table 116. IBMTSSVC_NodeDumps references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Node		The Node
SettingData	IBMTSSVC_Dumps		The Dumps

Properties

The IBMTSSVC_NodeDumps class has the properties shown in Table 117.

Table 117. IBMTSSVC_NodeDumps

Name	Type	Qualifier	Description
IsCurrent	Uint16		An enumerated integer that indicates that the referenced setting is currently being used in the operation of the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Current 2 Is Not Current
IsDefault	Uint16		An enumerated integer that indicates that the referenced setting is a default setting for the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Default 2 Is Not Default

IBMTSSVC_PartnershipCandidate

The IBMTSSVC_PartnershipCandidate class associates the Cluster with the available remote clusters.

References

The IBMTSSVC_PartnershipCandidate class extends the CIM_Dependency class and has the references shown in Table 118.

Table 118. IBMTSSVC_PartnershipCandidate references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The local Cluster
Dependent	IBMTSSVC_Candidate Cluster		The remote Cluster

IBMTSSVC_PoolCapabilities

The IBMTSSVC_PoolCapabilities class associates a storage pool with a storage capabilities instance.

References

The IBMTSSVC_PoolCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 119.

Table 119. IBMTSSVC_PoolCapabilities references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_StoragePool	Min, Max	The managed element
Capabilities	IBMTSSVC_StorageCapabilities		The Capabilities object associated with the element

IBMTSSVC_PrimordialPoolCapabilities

The IBMTSSVC_PrimordialPoolCapabilities class extends the CIM_ElementCapabilities class.

References

The IBMTSSVC_PrimordialPoolCapabilities class has the references shown in Table 120.

Table 120. IBMTSSVC_PrimordialPoolCapabilities references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_PrimordialStoragePool	Min, Max	The managed element
Capabilities	IBMTSSVC_StorageCapabilities		The Capabilities object associated with the element

IBMTSSVC_PrimordialPoolComponent

The IBMTSSVC_PrimordialPoolComponent class associates a PrimordialPool with the BackendVolumes from which it is assembled.

References

The IBMTSSVC_PrimordialPoolComponent class extends the CIM_ConcreteComponent class and has the references shown in Table 121.

Table 121. IBMTSSVC_PrimordialPoolComponent references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_PrimordialStoragePool	Aggregate	The PrimordialStoragePool
Part Component	IBMTSSVC_BackendVolume		The BackendVolume

IBMTSSVC_PrimordialPoolForController

The IBMTSSVC_PrimordialPoolForController class associates a BackendController with the corresponding PrimordialPool.

References

The IBMTSSVC_PrimalPoolForController class extends the CIM_Dependency class and has the references shown in Table 122.

Table 122. IBMTSSVC_PrimalPoolForController references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Backend Controller		The BackendController
Dependent	IBMTSSVC_PrimalPool StoragePool		The primordial storage pool

IBMTSSVC_PrivilegeServiceForSystem

The IBMTSSVC_PrivilegeServiceForSystem class associates a Cluster with its PrivilegeManagementService.

References

The IBMTSSVC_PrivilegeServiceForSystem class extends the CIM_HostedService class and has the references shown in Table 123.

Table 123. IBMTSSVC_PrivilegeServiceForSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The system for which the service should be used
Dependent	IBMTSSVC_Privilege ManagementService	Weak	The Privilege Management Service that provides services for the system

IBMTSSVC_ProductPhysicalComponent

The IBMTSSVC_ProductPhysicalComponent class associates an IBMTSSVC_Product instance with the corresponding IBMTSSVC_Chassis instance.

References

The IBMTSSVC_ProductPhysicalComponent class extends the CIM_ProductPhysicalComponent class and has the references shown in Table 124.

Table 124. IBMTSSVC_ProductPhysicalComponent references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Product	Max, Aggregate	The Product
Part Component	IBMTSSVC_Chassis		The Chassis

IBMTSSVC_ProtocolControllerForPort

The IBMTSSVC_ProtocolControllerForPort class associates a Controller with the fibre-channel ports through which it can be accessed.

References

A Controller instance has a corresponding RedundancyGroup. The RedundancyGroup associates one or two nodes, and a node associates fibre-channel ports. ControllerFCPort provides a shortcut for traversing from a Controller to the fibre-channel ports.

The IBMTSSVC_ProtocolControllerForPort class extends the CIM_ProtocolControllerForPort class and has the references shown in Table 125.

Table 125. IBMTSSVC_ProtocolControllerForPort references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Controller	Experimental	The protocol controller
Dependent	IBMTSSVC_FCPort	Experimental	The port

Properties

The IBMTSSVC_ProtocolControllerForPort class has the properties shown in Table 126.

Table 126. IBMTSSVC_ProtocolControllerForPort

Name	Type	Qualifier	Description
AccessPriority	Uint16	Experimental(TRUE)	The priority given to accesses of the device through this controller. The highest priority path will have the lowest value for this parameter. No priorities, constant value of 0.
AccessState	Uint16	Experimental(TRUE)	Indicates whether the Controller is actively commanding or accessing the Device. This information is necessary when a LogicalDevice can be commanded by or accessed through multiple Controllers. Code Semantics 0 Unknown 1 Active 2 Inactive

Table 126. IBMTSSVC_ProtocolControllerForPort (continued)

Name	Type	Qualifier	Description
DeviceNumber	String	Experimental(TRUE)	Address of the associated Device in the context of the antecedent Controller. Because the port has no specialid in the controller's context, this is a constant value of 0.

IBMTSSVC_ProtocolControllerForUnit

The IBMTSSVC_ProtocolControllerForUnit class associates a StorageVolume with Controller instances through which it is exposed to clients.

References

The IBMTSSVC_ProtocolControllerForUnit class extends the CIM_ProtocolControllerForUnit class and has the references shown in Table 127.

Table 127. IBMTSSVC_ProtocolControllerForUnit references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Controller	Experimental	The protocol controller
Dependent	IBMTSSVC_Storage Volume	Experimental	The volume

Properties

The IBMTSSVC_ProtocolControllerForUnit class has the properties shown in Table 128.

Table 128. IBMTSSVC_ProtocolControllerForUnit

Property	Type	Qualifier	Description
AccessPriority	Uint16	Experimental(TRUE)	The priority given to accesses of the device through this controller. The highest priority path will have the lowest value for this parameter. No priorities, constant value of 0.

Table 128. IBMTSSVC_ProtocolControllerForUnit (continued)

Property	Type	Qualifier	Description
AccessState	Uint16	Experimental(TRUE)	Indicates whether the Controller is actively commanding or accessing the Device. This information is necessary when a Logical Device can be commanded by or accessed through multiple Controllers. Code Semantics 0 Unknown 1 Active 2 Inactive
DeviceNumber	String	Experimental(TRUE)	Address of the associated Device in the context of the antecedent Controller. This is the LUN number.
UniqueID	String		The unique ID of the volume shown on SCSI inquiry.

IBMTSSVC_ProviderInObjectManager

The IBMTSSVC_ProviderInObjectManager class associates the CIM Object Manager with its providers.

References

The IBMTSSVC_ProviderInObjectManager class extends the CIM_Component class and has the references shown in Table 129.

Table 129. IBMTSSVC_ProviderInObjectManager references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Object Manager	Aggregate	
Part Component	IBMTSSVC_Provider		

IBMTSSVC_RemotePartnership

The IBMTSSVC_RemotePartnership class associates the Cluster with the selected remote clusters.

References

The IBMTSSVC_RemotePartnership class extends the CIM_Dependency class and has the references shown in Table 130 on page 285.

Table 130. IBMTSSVC_RemotePartnership references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The local Cluster
Dependent	IBMTSSVC_Remote Cluster		The remote Cluster

IBMTSSVC_RemoteSystemVolume

The IBMTSSVC_RemoteSystemVolume class associates the IBMTS_RemoteCluster instance with potential IBMTSSVC_CandidateVolumes.

References

The IBMTSSVC_RemoteSystemVolume class extends the CIM_Component class and has the references shown in Table 131.

Table 131. IBMTSSVC_RemoteSystemVolume references

Name	Target	Qualifier	Description
Group Component	IBMTSSVC_Remote Cluster	Aggregate	The Remote Cluster
PartComponent	IBMTSSVC_Remote Volume		The potential sync copy auxiliary volume.

IBMTSSVC_RequiresProfile

The IBMTSSVC_RequiresProfile class extends the CIM_SubProfileRequiresProfile class.

References

The IBMTSSVC_RequiresProfile class has the references shown in Table 132.

Table 132. IBMTSSVC_RequiresProfile references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Registered Profile	Min	The Registered Profile that is referenced or required by the subprofile.
Dependent	IBMTSSVC_Registered SubProfile		A Registered SubProfile that requires a scoping profile for context.

IBMTSSVC_SAPAvailableForElement

The IBMTSSVC_SAPAvailableForElement class associates a service access point with the device for which it offers a management interface.

References

The IBMTSSVC_SAPAvailableForElement class extends the CIM_SAPAvailableForElement class and has the references shown in Table 133 on page 286.

Table 133. IBMTSSVC_SAPAvailableForElement references

Name	Reference	Qualifier	Description
AvailableSAP	IBMTSSVC_RemoteServiceAccessPoint	Min	The Service Access Point that is available.
ManagedElement	IBMTSSVC_Cluster		The ManagedElement for which the Service Access Point is available.

IBMTSSVC_StorageConfigurationServiceCapabilities

The IBMTSSVC_StorageConfigurationServiceCapabilities class associates an instance of IBMTSSVC_StorageConfigurationService with its DeviceMaskingCapabilities.

References

The IBMTSSVC_StorageConfigurationServiceCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 134.

Table 134. IBMTSSVC_StorageConfigurationServiceCapabilities references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_StorageConfigurationService	Min, Max	The IBMTSSVC_StorageConfigurationService for this cluster
SettingData	IBMTSSVC_StorageConfigurationCapabilities		The Capabilities object associated with the element

IBMTSSVC_StorageConfigurationServiceForSystem

The IBMTSSVC_StorageConfigurationServiceForSystem class associates an IBMTSSVC_Cluster instance with its corresponding IBMTSSVC_StorageConfigurationService instance.

References

The IBMTSSVC_StorageConfigurationServiceForSystem class extends the CIM_HostedService class and has the references shown in Table 135.

Table 135. IBMTSSVC_StorageConfigurationServiceForSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The Cluster
Dependent	IBMTSSVC_StorageConfigurationService	Weak	The StorageConfigurationService

IBMTSSVC_StorageHardwareIDManagementServiceForSystem

The IBMTSSVC_StorageHardwareIDManagementServiceForSystem class associates a Cluster with its StorageHardwareIDManagementService.

References

The IBMTSSVC_StorageHardwareIDManagementServiceForSystem class extends the CIM_HostedService class and has the references shown in Table 136.

Table 136. IBMTSSVC_StorageHardwareIDManagementServiceForSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The system for which the service should be used.
Dependent	IBMTSSVC_StorageHardwareIDManagementService	Weak	The StorageHardwareIDManagementService that provides services for the system.

IBMTSSVC_StoragePoolComponent

The IBMTSSVC_StoragePoolComponent class associates the IBMTSSVC_StoragePool instances to the IBMTSSVC_BackendVolume instances from which the StoragePool is assembled.

References

The IBMTSSVC_StoragePoolComponent class extends the CIM_ConcreteComponent class and has the references shown in Table 137.

Table 137. IBMTSSVC_StoragePoolComponent references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_StoragePool	Aggregate	The storage pool
Part Component	IBMTSSVC_BackendVolume		The back-end volume

IBMTSSVC_SyncCopyStorageSynchronized

The IBMTSSVC_SyncCopyStorageSynchronized class associates an IBMTSSVC_StorageVolume instance with an IBMTSSVC_CandidateVolume or another IBMTSSVC_StorageVolume instance for a synchronous copy relationship.

References

The IBMTSSVC_SyncCopyStorageSynchronized class extends the CIM_StorageSynchronized class and has the references shown in Table 138.

Table 138. IBMTSSVC_SyncCopyStorageSynchronized references

Name	Reference	Qualifier	Description
SystemElement	CIM_LogicalElement	MappingStrings	The StorageVolume that is the master in the relationship
SyncedElement	CIM_LogicalElement	MappingStrings	The StorageVolume that is the auxiliary in the relationship

Properties

The IBMTSSVC_SyncCopyStorageSynchronized class has the properties shown in Table 139.

Table 139. IBMTSSVC_SyncCopyStorageSynchronized properties

Property	Type	Qualifier	Description
BackgroundCopy Priority	Uint16	Write(TRUE), WriteRole(Administrator)	The background copy priority, in the range 1 to 100. The default is 50.
Connected	Boolean		The status of the connection between the StorageVolumes
CopyType	Uint16		The Replication Policy. Code Semantics 2 Async. Create and maintain an asynchronous copy of the source. 3 Sync. Create and maintain a synchronized copy of the source. 4 UnSyncAssoc. Create an un-synchronized copy and maintain an association to the source. .. DMTF Reserved 0x8000.. Vendor Specific
ElementName	String	Write(TRUE), WriteRole(Administrator)	The user-friendly name of this association
FreezeTime	String		The time when the copy relationship was removed
Name	String		The name of the association

Table 139. IBMTSSVC_SyncCopyStorageSynchronized properties (continued)

Property	Type	Qualifier	Description																		
NativeState	Uint16		<p>The native state of the copy relationship</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Idling</td> </tr> <tr> <td>1</td> <td>Idling disconnected</td> </tr> <tr> <td>2</td> <td>Consistent synchronized</td> </tr> <tr> <td>3</td> <td>Consistent disconnected</td> </tr> <tr> <td>4</td> <td>Consistent stopped</td> </tr> <tr> <td>5</td> <td>Inconsistent copying</td> </tr> <tr> <td>6</td> <td>Inconsistent disconnected</td> </tr> <tr> <td>7</td> <td>Inconsistent stopped</td> </tr> </tbody> </table>	Code	Semantics	0	Idling	1	Idling disconnected	2	Consistent synchronized	3	Consistent disconnected	4	Consistent stopped	5	Inconsistent copying	6	Inconsistent disconnected	7	Inconsistent stopped
Code	Semantics																				
0	Idling																				
1	Idling disconnected																				
2	Consistent synchronized																				
3	Consistent disconnected																				
4	Consistent stopped																				
5	Inconsistent copying																				
6	Inconsistent disconnected																				
7	Inconsistent stopped																				
Primary	Uint32		<p>Indicates which of the StorageVolumes is currently the primary in the copy relationship. The primary volume is the one accessible for I/O by the clients.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Master</td> </tr> <tr> <td>1</td> <td>Auxiliary</td> </tr> </tbody> </table>	Code	Semantics	0	Master	1	Auxiliary												
Code	Semantics																				
0	Master																				
1	Auxiliary																				
Progress	Uint32	Units (Percent)	The progress of the copy process, if one is ongoing																		
ReplicaType	Uint16		<p>The type of the replica. SAN Volume Controller replicas are always FullCopy (0).</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FullCopy</td> </tr> <tr> <td>1</td> <td>BeforeDelta</td> </tr> <tr> <td>2</td> <td>AfterDelta</td> </tr> <tr> <td>3</td> <td>Log</td> </tr> <tr> <td>4</td> <td>NotSpecified</td> </tr> <tr> <td>..</td> <td>DMTF Reserved</td> </tr> <tr> <td>0x8000..</td> <td>Vendor Specific</td> </tr> </tbody> </table>	Code	Semantics	0	FullCopy	1	BeforeDelta	2	AfterDelta	3	Log	4	NotSpecified	..	DMTF Reserved	0x8000..	Vendor Specific		
Code	Semantics																				
0	FullCopy																				
1	BeforeDelta																				
2	AfterDelta																				
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4	NotSpecified																				
..	DMTF Reserved																				
0x8000..	Vendor Specific																				
Status			<p>The status of the relationship.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Online</td> </tr> <tr> <td>1</td> <td>Primary Offline</td> </tr> <tr> <td>2</td> <td>Secondary Offline</td> </tr> </tbody> </table>	Code	Semantics	0	Online	1	Primary Offline	2	Secondary Offline										
Code	Semantics																				
0	Online																				
1	Primary Offline																				
2	Secondary Offline																				

Table 139. IBMTSSVC_SyncCopyStorageSynchronized properties (continued)

Property	Type	Qualifier	Description
SyncedElement ClusterID	String		The ID of the SyncedElement's cluster
SyncedElement ClusterName	String		The name of the SyncedElement's cluster
SyncedElementID	String		The ID of the SyncedElement
SyncedElementName	String		The name of the SyncedElement
SynchronizedSet	String		The name of the SynchronizedSet with which the StorageSynchronized is associated
SynchronizedSetID	String		The ID of the SynchronizedSet with which the StorageSynchronized is associated
SyncMaintained	Boolean		Indicates whether synchronization is maintained
SyncState	UInt16		The state of the synchronization Code Semantics 4 Prepared 5 ReSync InProgress 6 Synchronized 12 Broken 13 Fractured 0x8101 Fractured Idle
SystemElement ClusterID	String		The ID of the SystemElement's cluster
SystemElement ClusterName	String		The name of the SystemElement's cluster
SystemElementID	String		The ID of the SystemElement
SystemElementName	String		The name of the SystemElement
WhenSynced	Date-time		Unsupported property

IBMTSSVC_SyncCopySynchronizedMember

The IBMTSSVC_SyncCopySynchronizedMember class associates an IBMTSSVC_FlashCopySynchronizedSet instance with its member IBMTSSVC_SyncCopySynchronized instances.

References

The IBMTSSVC_SyncCopySynchronizedMember class extends the CIM_SynchronizedMember class and has the references shown in Table 140.

Table 140. IBMTSSVC_SyncCopySynchronizedMember references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_SyncCopySynchronizedSet	Aggregate	The SyncCopySynchronizedSet
Member	IBMTSSVC_SyncCopyStorageSynchronized		The aggregated member of the set

IBMTSSVC_SystemBackendVolume

The IBMTSSVC_SystemBackendVolume class connects an IBMTSSVC_Cluster instance with the IBMTSSVC_BackendVolume instances that are visible in the fibre-channel SAN.

References

The IBMTSSVC_SystemBackendVolume class extends the CIM_SystemDevice class and has the references shown in Table 141.

Table 141. IBMTSSVC_SystemBackendVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Min, Max, Aggregate	The Cluster
Part Component	IBMTSSVC_BackendVolume	Weak	The BackendVolume

IBMTSSVC_SystemCandidateVolume

The IBMTSSVC_SystemCandidateVolume class associates a Cluster or RemoteCluster and its Candidate Volumes.

References

The IBMTSSVC_SystemCandidateVolume class extends the CIM_SystemDevice class and has the references shown in Table 142.

Table 142. IBMTSSVC_SystemCandidateVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_RemoteCluster	Aggregate, Max, Min	The aggregating cluster
Part Component	IBMTSSVC_CandidateVolume	Weak	The Candidate Volume

IBMTSSVC_SystemController

The IBMTSSVC_SystemController class associates an I/O group with the corresponding Controller instances.

References

The IBMTSSVC_SystemController class extends the CIM_SystemDevice class and has the references shown in Table 143.

Table 143. IBMTSSVC_SystemController references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Min, Max, Aggregate	The I/O group
Part Component	IBMTSSVC_Controller	Weak	The Controller

IBMTSSVC_SystemFCPort

The IBMTSSVC_SystemFCPort class associates a node to its fibre-channel ports.

References

The IBMTSSVC_SystemFCPort class extends the CIM_SystemDevice class and has the references shown in Table 144.

Table 144. IBMTSSVC_SystemFCPort references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Node	Min, Max, Aggregate	The node
Part Component	IBMTSSVC_FCPort	Weak	The fibre-channel port

IBMTSSVC_SystemFeatures

The IBMTSSVC_SystemFeatures class associates the Cluster with its features.

References

The IBMTSSVC_SystemFeatures class extends the CIM_ElementCapabilities class and has the references shown in Table 145.

Table 145. IBMTSSVC_SystemFeatures references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Cluster	Min, Max	The Cluster
Capabilities	IBMTSSVC_Features	Weak	The Features

IBMTSSVC_SystemVolume

The IBMTSSVC_SystemVolume class associates a StorageVolume with the RedundancyGroup to which it is assigned.

References

The IBMTSSVC_SystemVolume class extends the CIM_SystemDevice class and has the references shown in Table 146 on page 293.

Table 146. IBMTSSVC_SystemVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Min, Max, Aggregate	The assigned RedundancyGroup
Part Component	IBMTSSVC_Storage Volume	Weak	The StorageVolume

IBMTSSVC_SystemVPD

The IBMTSSVC_SystemVPD class associates the Node with its vital product data (VPD).

References

The IBMTSSVC_SystemVPD class extends the CIM_ElementSettingData class and has the references shown in Table 147.

Table 147. IBMTSSVC_SystemVPD references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Node	Key	The Node
SettingData	IBMTSSVC_NodeVPD	Key	The VPD

Properties

The IBMTSSVC_SystemVPD class has the properties shown in Table 148.

Table 148. IBMTSSVC_SystemVPD properties

Property	Type	Qualifier	Description
IsCurrent	Uint16		An enumerated integer that indicates that the referenced setting is currently being used in the operation of the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Current 2 Is Not Current
IsDefault	Uint16		An enumerated integer that indicates that the referenced setting is a default setting for the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Default 2 Is Not Default

IBMTSSVC_UseOfMessageLog

ManagedSystemElements may record their event, error, or informational data in MessageLogs. The use of a log to hold ManagedSystemElement data is described by this association. The type of data captured by the log can be specified using the RecordedData string property.

References

The IBMTSSVC_UseOfMessageLog class extends the CIM_UseOfMessageLog class and has the references shown in Table 149.

Table 149. IBMTSSVC_UseOfMessageLog references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_MessageLog		The MessageLog
Dependent	IBMTSSVC_Cluster		The ManagedSystem Element for which data is recorded in the MessageLog

Properties

The IBMTSSVC_UseOfMessageLog class has the properties shown in Table 150.

Table 150. IBMTSSVC_UseOfMessageLog properties

Property	Type	Qualifier	Description
RecordedData	String		The description of the use of the Log by the ManagedSystem Element

IBMTSSVC_VolumeSettingData

The IBMTSSVC_VolumeSettingData class extends the CIM_ElementSettingData class.

References

The IBMTSSVC_VolumeSettingData class has the references shown in Table 151.

Table 151. IBMTSSVC_VolumeSettingData references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Storage Volume		The managed element
SettingData	IBMTSSVC_Storage Setting		The SettingData object that is associated with the element

Properties

The IBMTSSVC_VolumeSettingData class has the properties shown in Table 152.

Table 152. IBMTSSVC_VolumeSettingData properties

Property	Type	Qualifier	Description
IsCurrent	Uint16		An enumerated integer that indicates that the referenced setting is currently being used in the operation of the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Current 2 Is Not Current
IsDefault	Uint16		An enumerated integer that indicates that the referenced setting is a default setting for the element or that the setting is unknown. Code Semantics 0 Unknown 1 Is Default 2 Is Not Default

IBMTSSVC_AccountManagementServiceForSystem

The IBMTSSVC_AccountManagementServiceForSystem class connects an IBMTSSVC_Cluster instance with an IBMTSSVC_AccountManagementService.

References

The IBMTSSVC_AccountManagementServiceForSystem class extends the CIM_ManagesAccountOnSystem class and has the references shown in Table 153.

Table 153. IBMTSSVC_AccountManagementServiceForSystem references

Name	Target	Qualifier	Description
Antecedent	IBMTSSVC_Account ManagementService	ReadRole, Min, Max	Represents the SecurityService that provides services for the system
Dependent	IBMTSSVC_Object Manager	ReadRole, Weak	Represents the system that is dependent on the security service

IBMTS_AccountOnCIMOM

The IBMTS_AccountOnCIMOM class connects an IBMTS_Account instance with the IBMTS_ObjectManager instance.

References

The IBMTS_AccountOnCIMOM class extends the CIM_AccountOnSystem class and has the references shown in Table 154.

Table 154. IBMTS_AccountOnCIMOM references

Name	Reference	Qualifier	Description
Group Component	IBMTS_ObjectManager	Aggregate, ReadRole, Min, Max	Represents the aggregation of the CIMOM for the Account
Part Component	IBMTS_Account	ReadRole, Weak	Represents the Account

Properties

The IBMTS_AccountOnCIMOM class has the properties shown in Table 155.

Table 155. IBMTS_AccountOnCIMOM properties

Property	Type	Qualifier	Description
Role	String	ReadRole(Administrator)	Specifies the role of the Account on the CIMOM

IBMTS_AccountOnSystem

The IBMTS_AccountOnSystem class connects an IBMTS_Account instance with an IBMTSSVC_Host instance.

References

The IBMTS_AccountOnSystem class extends the CIM_AccountOnSystem class and has the references shown in Table 156.

Table 156. IBMTS_AccountOnSystem

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate, ReadRole, Min, Max	Represents the aggregating system to which access is granted for the Account
Part Component	IBMTS_Account	ReadRole, Weak	Represents the subordinate Account

Properties

The IBMTS_AccountOnSystem class has the properties shown in Table 157 on page 297.

Table 157. IBMTS_AccountOnSystem properties

Property	Type	Qualifier	Description
Role	String	ReadRole(Administrator)	Specifies the role of the Account on the System

IBMTS_CommMechanismForManager

The IBMTS_CommMechanismForManager is an association between an ObjectManager and an ObjectManagerCommunicationMechanism class.

References

The IBMTS_CommMechanismForManager class has the references shown in Table 158.

Table 158. IBMTS_CommMechanismForManager

Name	Target	Qualifier	Description
Antecedent	IBMTS_ObjectManager	Min, Max	Represents the specific ObjectManager whose communication mechanism is described
Dependent	IBMTS_CIMXML Communication	Min	Represents the encoding, protocol, or set of operations that may be used to communicate with the referenced ObjectManager

IBMTS_ContainsTruststore

The IBMTS_ContainsTruststore class associates the IBMTS_Truststore with the scoping IBMTS_System.

References

The IBMTS_ContainsTruststore class extends the CIM_Dependency class and has the references shown in Table 159

Table 159. IBMTS_ContainsTruststore references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_System		The scoping instance of IBMTS_System.
Dependent	IBMTS_Truststore		The truststore file of the system represented by IBMTS_Truststore.

IBMTS_ElementConformsToProfile

The IBMTS_ElementConformsToProfile connects the ObjectManager and the Server profile.

References

The IBMTS_ElementConformsToProfile class has the references shown in Table 160.

Table 160. IBMTS_ElementConformsToProfile

Name	Target	Qualifier	Description
Conformant Standard	IBMTS_RegisteredProfile		Represents the RegisteredProfile to which the ManagedElement conforms
ManagedElement	IBMTS_ObjectManager		Represents the ManagedElement that conforms to the RegisteredProfile

IBMTS_HasCertificate

The IBMTS_HasCertificate class associates the IBMTS_Truststore to instances of the IBMTS_Certificates.

References

The IBMTS_HasCertificate class extends the CIM_Dependency class and has the references shown in Table 161.

Table 161. IBMTS_HasCertificate references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_Truststore		The instance of IBMTS_Truststore that represents the truststore file.
Dependent	IBMTS_Certificate		The certificate that is contained in the truststore file. The IBMTS_Truststore class represents the truststore file.

IBMTS_HostedAccessPoint

The IBMTS_HostedAccessPoint connects the CIM_System and the CIMXMLMechanism profile.

References

The IBMTS_HostedAccessPoint class has the references shown in Table 162.

Table 162. IBMTS_HostedAccessPoint

Name	Target	Qualifier	Description
Antecedent	IBMTS_System	Min, Max	Represents the hosting system

Table 162. *IBMTS_HostedAccessPoint* (continued)

Name	Target	Qualifier	Description
Dependent	IBMTS_CIMXML Communication	Weak	Represents the SAP(s) that are hosted on this system

IBMTS_HostedService

The `IBMTS_HostedService` is an association between a Service and the System on which the functionality resides. A System may host many Services. Services are weak with respect to their hosting System. A Service is hosted on the System where the LogicalDevices or SoftwareFeatures that implement the Service are located.

References

The model does not represent Services hosted across multiple systems. This is modeled as an `ApplicationSystem` that acts as an aggregation point for Services, that are each located on a single host.

The `IBMTS_HostedService` class has the references shown in Table 163.

Table 163. *IBMTS_HostedService*

Name	Target	Qualifier	Description
Antecedent	IBMTS_System	Min, Max	Represents the hosting system
Dependent	IBMTS_Object Manager	Weak	Represents the service hosted on this system

IBMTS_HostsTruststoreManager

The `IBMTS_HostsTruststoreManager` class associates the `IBMTS_TruststoreManagementService` to the scoping `IBMTS_System`.

References

The `IBMTS_HostsTruststoreManager` class extends the `CIM_HostedService` and has the references shown in Table 164.

Table 164. *IBMTS_HostsTruststoreManager* references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_System		The scoping instance of <code>IBMTS_System</code> .
Dependent	IBMTS_Truststore ManagementService		The <code>IBMTS_TruststoreManagementService</code> of the system.

IBMTS_IndicationFiltersConformsToProfile

The `IBMTS_IndicationFiltersConformsToProfile` connects the `IndicationFilter` and the Server profile.

References

The IBMTS_IndicationFiltersConformsToProfile class has the references shown in Table 165.

Table 165. IBMTS_IndicationFiltersConformsToProfile

Name	Target	Qualifier	Description
Conformant Standard	IBMTS_RegisteredProfile		Represents the RegisteredProfile to which the ManagedElement conforms
ManagedElement	IBMTS_IndicationFilter		Represents the IndicationFilter that conforms to the RegisteredProfile

IBMTS_ManagesAccount

The IBMTS_ManagesAccount class connects an IBMTS_AccountManagementService instance with an IBMTS_Account instance.

References

The IBMTS_ManagesAccount class extends the CIM_ManagesAccount class and has the references shown in Table 166.

Table 166. IBMTS_ManagesAccount references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_Account ManagementService	ReadRole	The AccountManagement Service
Dependent	IBMTS_Account	ReadRole	The HardwareAccount

IBMTS_ManagesTruststore

The IBMTS_ManagesTruststore class associates the IBMTS_TruststoreManagementService with the managed instance of the IBMTS_Truststore.

References

Only one truststore file can be represented by an instance of IBMTS_Truststore. If the truststore file is removed, the association is not available.

The IBMTS_ManagesTruststore class extends the CIM_Dependency class and has the references shown in Table 167.

Table 167. IBMTS_ManagesTruststore references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_Truststore ManagementService		The instance of IBMTS_Truststore ManagementService that manages the IBMTS_Truststore

Table 167. *IBMTS_ManagesTruststore* references (continued)

Name	Reference	Qualifier	Description
Dependent	IBMTS_Truststore		The IBMTS_Truststore that is managed

IBMTS_NamespaceInManager

The IBMTS_NamespaceInManager.

References

The IBMTS_NamespaceInManager class has the references shown in Table 168.

Table 168. *IBMTS_NamespaceInManager*

Name	Target	Qualifier	Description
Antecedent	IBMTS_Object Manager	Min, Max	Represents the ObjectManager containing a Namespace
Dependent	IBMTS_Name Space	Weak	Represents the Namespace in an ObjectManager

Chapter 8. CIM Agent methods

This chapter describes the intrinsic and extrinsic methods that the CIM Agent classes provide.

These methods are required for implementing the functionality of the CIM Agent.

Intrinsic methods

Intrinsic methods are provided for modeling a typical CIM operation.

Originating from the CIM and WBEM standards, intrinsic methods are provided for modeling a typical CIM operation. Intrinsic methods provide the basic means that enable you to work with an object model.

The CIM Agent for the SAN Volume Controller supports the intrinsic methods shown in Table 169.

Table 169. Supported intrinsic methods

Functional group	Method name
Association traversal	Associators()
	AssociatorNames()
	References()
	ReferenceNames()
Basic read	EnumerateClasses()
	EnumerateClassNames()
	EnumerateInstance()
	EnumerateInstanceNames()
	GetClass()
	GetInstance()
	GetProperty()
Basic write	SetProperty()
Instance manipulation	DeleteInstance()
	CreateInstance()
	ModifyInstance()
Query execution	ExecQuery()

Associators()

You can use the `Associators()` method to enumerate the classes or instances that are associated with a CIM object.

Parameters

Table 170 on page 304 shows the parameters you can specify for the `Associators()` method.

Table 170. *Associators()* parameters

Parameter	Type	Description
ObjectName	COP*	The class name or instance name that is the source of the association.
AssocClass	String	If not NULL, indicates that all objects must be associated to the source object through an instance of this class or one of its subclasses.
ResultClass	String	If not NULL, indicates that all returned objects must be instances of this class or one of its subclasses or be this class.
Role	String	If not NULL, indicates that each return object must be associated to the source object through an association in which the source object plays the specified role. The name of the property in the association class that refers to the source object must match the value of this parameter.
ResultRole	String	If not NULL, indicates that each returned object must be associated to the source object through an association in which the returned object plays the specified role. The name of the property in the association class that refers to the returned object must match the value of this parameter.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.
* CIMObjectPath		

Return values

The `Associators()` method enumerates the specified classes or instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

AssociatorNames()

You can use the `AssociatorNames()` method to enumerate the names of the classes or instances that are associated with a CIM object.

Parameters

Table 171 on page 305 shows the parameters you can specify for the `AssociatorNames()` method.

Table 171. *AssociatorNames()* parameters

Parameter	Type	Description
ObjectName	COP*	The class name or instances name that is the source of the association.
AssocClass	String	If not NULL, indicates that all object paths returned identify an object that is associated to the source object through an instance of this class or one of its subclasses.
ResultClass	String	If not NULL, indicates that all returned object paths must identify instances of this class or one of its subclasses, or must be this class.
Role	String	If not NULL, the name of the property in the association class that refers to the source object must match the value of this parameter.
ResultRole	String	If not NULL, the name of the property in the association class that refers to the returned object must match the value of this parameter.
* CIMObjectPath		

Return values

The *AssociatorNames()* method enumerates the names of the classes or instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_FAILED

CreateInstance()

You can use the *CreateInstance()* method to create a new instance of an object in the target namespace.

Parameters

The new instance must be based on a class that is already defined in the namespace.

Table 172 shows the parameters you can specify for *CreateInstance()* method.

Table 172. *CreateInstance()* parameters

Parameter	Type	Description
Instance	String	The name of the instance to create.

Return values

The *CreateInstance()* method creates the specified class or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER

- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

DeleteInstance()

You can use the DeleteInstance() method to remove a single instance of an object from the target namespace.

Parameters

Table 173 shows the parameters you can specify for the DeleteInstance() method.

Table 173. DeleteInstance() parameters

Parameter	Type	Description
InstanceName	String	The name of the instance to delete.

Return values

The DeleteInstance() method deletes the specified instance or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

EnumerateClasses()

You can use the EnumerateClasses() method to enlist all subclasses of a single object class or all classes of the same object type in the target namespace.

Parameters

Table 174 shows the parameters you can specify for the EnumerateClasses() method.

Table 174. EnumerateClasses() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which subclasses are to be returned. If this parameter is NULL, all base classes within the target namespace are returned.
DeepInheritance	Boolean	True returns all subclasses of the specified class. False returns only immediate child subclasses.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers, that are overridden within the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The EnumerateClasses() method enumerates the specified one or more classes or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

EnumerateClassNames()

You can use the EnumerateClassNames() method to enlist the names of all subclasses of a single object class or the names of all classes of the same object type in the target namespace.

Parameters

Table 175 shows the parameters you can specify for the EnumerateClassNames() method.

Table 175. EnumerateClassNames() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which subclasses are to be returned. If this parameter is NULL, all base classes within the target namespace are returned.
DeepInheritance	Boolean	True returns all subclasses of the specified class. False returns only immediate child subclasses.

Return values

The EnumerateClassNames() method enumerates the specified name of one or more classes or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

EnumerateInstances()

You can use the EnumerateInstances() method to enlist all instances of the same object class in the target namespace.

Parameters

Table 176 on page 308 shows the parameters you can specify for the EnumerateInstances() method:

Table 176. EnumerateInstances() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which instances are to be returned.
DeepInheritance	Boolean	True returns all instances and all properties of the instance, including those added by creating subclasses. False returns only properties defined for the specified class.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers that are overridden within the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for each instance, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class within the instance.

Return values

The EnumerateInstances() method enumerates the specified instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

EnumerateInstanceNames()

You can use the EnumerateInstanceNames() method to enlist all the names of the instances of the same object class in the target namespace.

Parameters

Table 177 shows the parameters you can specify for the EnumerateInstanceNames() method.

Table 177. EnumerateInstanceNames() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which instances are to be returned.

Return values

The EnumerateInstanceNames() method enumerates the specified names of the instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

ExecQuery()

You can use the ExecQuery() method to run a query against the target namespace.

Parameters

Table 178 shows the parameters you can specify for the ExecQuery() method.

Table 178. ExecQuery() parameters

Parameter	Type	Description
QueryLanguage	String	The query language in which the query parameter is expressed.
Query	String	The query you want to run.

Return values

The ExecQuery() method retrieves one or more classes or instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

GetClass()

You can use the GetClass() method to retrieve a single object class from the target namespace.

Parameters

Table 179 shows the parameters you can specify for the GetClass() method.

Table 179. GetClass() parameters

Parameter	Type	Description
ClassName	String	The name of the class to retrieve.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers overridden within the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. FALSE returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The GetClass() method returns the specified class or one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_FAILED

GetInstance()

You can use the `GetInstance()` method to retrieve a single instance of an object from the target namespace.

Parameters

Table 180 shows the parameters you can specify for the `GetInstance()` method.

Table 180. *GetInstance()* parameters

Parameter	Type	Description
InstanceName	String	The name of the instance to retrieve.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers overridden during the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The `GetInstance()` method returns the specified class or one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

GetProperty()

You can use the `GetProperty()` method to retrieve the whole instance and return one specific property from this instance.

Parameters

Table 181 shows the parameters you can specify for the `GetProperty()` method.

Table 181. *GetProperty()* parameters

Parameter	Type	Description
InstanceName	String	The name of the instance.
Property	String	The name of the property whose value is to be returned from the instance.

Return values

The `GetProperty()` method returns the specified property of the target instance or one of the following error codes:

- CIM_ERR_ACCESS_DENIED

- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_NO_SUCH_PROPERTY
- CIM_ERR_FAILED

ModifyInstance()

You can use the ModifyInstance() method to modify an existing instance of an object in the target namespace.

Parameters

Table 182 shows the parameters you can specify for the ModifyInstance() method.

Table 182. ModifyInstance() parameters

Parameter	Type	Description
InstanceName	String	The name of the instance to modify.

Return values

The ModifyInstance() method modifies the specified instance or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

References()

You can use the References() method to enumerate the association objects that refer to a particular target class or instance.

Parameters

Table 183 shows the parameters you can specify for the References() method.

Table 183. References() parameters

Parameter	Type	Description
ObjectName	String	The class name or instance name whose referring objects are to be returned.
ResultClass	String	If not NULL, indicates that all returned objects must be instances of this class or one of its subclasses or must be this class.
Role	String	If not NULL, must be a valid property name. Each returned object must refer to the target object through a property whose name matches the value of this parameter.

Table 183. References() parameters (continued)

Parameter	Type	Description
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. FALSE returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The References() method enumerates the association objects or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

ReferenceNames()

You can use the ReferenceNames() method to enumerate the association objects that refer to a particular target class or instance.

Parameters

Table 184 shows the parameters you can specify for the ReferenceNames() method.

Table 184. ReferenceNames() parameters

Parameter	Type	Description
ObjectName	String	The class name or instance name whose referring objects are to be returned.
ResultClass	String	If not NULL, indicates that all returned object paths must be object paths of instances of this class or one of its subclasses, or must be this class.
Role	String	If not NULL, must be a valid property name. Each returned object must refer to the target object through a property whose name matches the value of this parameter.

Return values

The ReferenceNames() method enumerates the association objects or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_NO_SUCH_PROPERTY

- CIM_ERR_FAILED

SetProperty()

You can use the SetProperty() method to define a single property value of an instance in the target namespace.

Parameters

Table 185 shows the parameters you can specify for the SetProperty() method.

Table 185. SetProperty() parameters

Parameter	Type	Description
InstanceName	String	The name of the instance.
PropertyName	String	The name of the property whose value is to be defined.

Return values

The SetProperty() method defines the property name of the target instance or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_NO_SUCH_PROPERTY
- CIM_ERR_TYPE_MISMATCH
- CIM_ERR_FAILED

Extrinsic methods

Extrinsic methods are specific to CIM object classes and are defined by the object model provider according to a specific SMI-S schema. The extrinsic methods add functionality to the CIM object classes.

The CIM Agent for the SAN Volume Controller supports the extrinsic methods listed in Table 186.

Table 186. Supported extrinsic methods

Class	Method name
IBMTSSVC_BackendVolume	GetFreeExtents()
IBMTSSVC_Chassis	IsCompatible()

Table 186. Supported extrinsic methods (continued)

Class	Method name
IBMTSSVC_ClusteringService	AddNode()
	BackupConfiguration()
	Clean()
	DeleteConfigurationBackups()
	Dump()
	EvictNode()
	GetDump()
	GetResetPasswordChangeFeatureStatus()
	ListConfigurationBackups()
	ModifyIPAddress()
	ModifyResetPasswordChangeFeature()
	RestoreConfiguration()
	SetLocale()
	SetTimeZone()
	SetPasswords()
	Shutdown()
	StartService()
	StartStatisticsCollection()
StopService()	
StopStatisticsCollection()	
IBMTSSVC_ControllerConfigurationService	AttachDevice()
	CreateProtocolControllerWithPorts()
	DeleteProtocolController()
	DetachDevice()
IBMTSSVC_Job	KillJob()
IBMTSSVC_MessageLog	CancelIteration()
	ClearLog()
	DeleteRecord()
	FixRecord()
	GetAllRecords()
	GetRecord()
	ModifyErrorSettings()
	PositionAtRecord()
	PositionToFirstRecord()
	PositionToFirstRecordRoot()
	PositionToFirstRecordType()
	UnfixRecord()
	WriteRecord()
IBMTSSVC_PrimordialStoragePool	GetSupportedSizes()
	GetSupportedSizeRange()

Table 186. Supported extrinsic methods (continued)

Class	Method name
IBMTSSVC_PrivilegeManagementService	AssignAccess()
	RemoveAccess()
IBMTSSVC_Provider	Add2062Cluster()
	Add2145Cluster()
	Create2062Cluster()
	Reload2062Node()
	RemoveCluster()
	Reset2062Node()
IBMTSSVC_ServiceModeService	Clean()
	Dump()
	Enter()
	Exit()
	GetDump()
	Upgrade()
IBMTSSVC_StorageCapabilities	CreateSetting()
IBMTSSVC_StorageConfigurationService	AttachReplica()
	CreateOrModifyStoragePool()
	CreateOrModifyElementFromStoragePool()
	CreateRemoteClusterPartnership()
	CreateReplica()
	CreateSynchronizedSet()
	DeleteRemoteClusterPartnership()
	DeleteStoragePool()
	DeleteSynchronizedSet()
	IncludeBackendVolume()
	MigrateVolume()
	MigrateVolumeToImageMode()
	ModifySynchronization()
	ModifySynchronizedSet()
	ReturnToStoragePool()
	RequestDiscovery()
	SetIOGroup()
	SetQuorum()
StartService()	
StopService()	
IBMTSSVC_StorageHardwareID ManagementService	AddHardwareIDsToCollection()
	CreateHardwareIDCollection()
	CreateStorageHardwareID()
	DeleteHardwareIDCollection()
	DeleteStorageHardwareID()

Table 186. Supported extrinsic methods (continued)

Class	Method name
IBMTSSVC_StoragePool	GetSupportedSizes()
	GetSupportedSizeRange()
IBMTS_TrustStorageManagementService	GenerateCIMOMCertificate()
	DeleteCertificate()
	EnableAutoGeneration()
	DisableAutoGeneration()
	SetDefaultValidity()
	CheckValidity()

Add2062Cluster()

You can use the Add2062Cluster() command to configure the ICAT to work with an existing 2062 cluster.

Parameters

The Add2062Cluster() method belongs to the IBMTSSVC_Provider class. Table 187 shows the parameters you can specify for the Add2062Cluster() method.

Table 187. Add2062Cluster() parameters

Parameter	Type	Description
Cluster	IBMTSSVC_Cluster REF	A reference to the cluster that was added.
ClusterIP	String	The IP of the cluster to be added.
ClusterName	String	The name of the cluster to be added.
Password	String	The password required to log on to the switch.
SwitchIDs	String[]	This parameter identifies all switches that the cluster spans. It must be specified, even if the cluster contains nodes from one switch only.
User	String	The user name required to log on to the switch.

Return values

The Add2062Cluster() method returns one of the following error codes:

- 0: The cluster was added successfully.
- 2: The attempt failed.
- 5: The number or type of parameters that have been passed is invalid.
- ...: DMTF Reserved.
- 0x8000: Connection to cluster refused.
- 0x8001: Syntax error in cluster name.
- 0x8002: Invalid node.
- 0x8003: Invalid user name or password.
- 0x8004: Syntax error in switch IP.

- 0x8005: Syntax error in cluster IP.
- 0x8006: Invalid slot.

Add2145Cluster()

You can use the Add2145Cluster() command to configure the ICAT to work with an existing 2145 cluster.

Parameters

The Add2145Cluster() method belongs to the IBMTSSVC_Provider class. Table 188 shows the parameters you can specify for the Add2145Cluster() method.

Table 188. Add2145Cluster() parameters

Parameter	Type	Description
Cluster	IBMTSSVC_Cluster REF	A reference to the cluster that was added.
ClusterIP	String	The IP of the cluster to be added.

Return values

The Add2145Cluster() method returns one of the following error codes:

- 0: The cluster was added successfully.
- 2: The attempt failed.
- 5: The number or type of parameters that have been passed is invalid.
- ..: DMTF Reserved.
- 0x8000: Connection to cluster refused.
- ..: Vendor Reserved.
- 0x8005: Syntax error in cluster IP.

AddHardwareIDsToCollection()

You can use the AddHardwareIDsToCollection() method to add a StorageHardwareID to a HardwareIDCollection.

Parameters

When a StorageHardwareID is added to a collection, the corresponding host object is deleted on the device and the WWPN is added to the host representing the collection. The AddHardwareIDsToCollection() method belongs to the IBMTSSVC_StorageHardwareIDManagementService class.

Table 189 on page 318 shows the parameters you can specify for the AddHardwareIDsToCollection() method.

Table 189. AddHardwareIDsToCollection() parameters

Parameter	Type	Description
HardwareIDs	String[]	An array that contains the string representations of the CIMOM Object Paths for StorageHardwareIDs that must be immediately added to the collection. Alternatively, IDs can contain the WWPN. In this case, the creation of StorageHardwareIDs is circumvented.
Collection	CIM_SystemSpecific Collection REF	The IBMTSSVC_HardwareId Collection to add the IDs to.

Return values

The AddHardwareIDsToCollection() method returns one of the following error codes:

- 0: The collection was successfully created.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: One of the parameters is invalid.
- 0x1000: The StorageHardwareID could not be found or is already member of another collection.
- 0x1001: Implementation does not support device collections.
- 0x1002: Input devices cannot be used in this collection.
- 0x8100: One or more parameters is out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

AddNode()

You can use the AddNode() method to add an IBMTSSVC_CandidateNode instance to an IBMTSSVC_Cluster instance.

Parameters

The AddNode() method belongs to the IBMTSSVC_ClusteringService class.

When invoked, the AddNode() method automatically chooses the IBMTSSVC_RedundancyGroup for the candidate node. If the IBMTSSVC_RedundancyGroup instances have only one existing node, the method selects the one whose identifier contains the smallest number. If no such IBMTSSVC_RedundancyGroup exists, the method selects an empty IBMTSSVC_RedundancyGroup whose identifier contains the smallest number.

Table 190 on page 319 shows the parameters you can specify for the AddNode() method.

Table 190. AddNode() parameters

Parameter	Type	Description
CS	COP*	Defines the IBMTSSVC_CandidateNode instance to be added. The IBMTSSVC_CandidateNode instance is in the same cluster as the IBMTSSVC_CLusteringService instance.
Set	String	The IO group to add the node to. This must be of type IBMTSSVC_IOGroupSet, belong to the same Cluster as the Service hosting this method and contain zero or one nodes.
Name	String	The name by which the new node will be known by the cluster.
* CIMObjectPath		

Return values

The AddNode() method returns one of the following error codes:

- 0: The node was successfully added.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted ComputerSystem was not a IBMTSSVC_CandidateNode
- 0x8001: All redundancy groups already have two nodes assigned.
- 0x8002; The submitted ExtraCapacitySet was not a IBMTSSVC_IGroupSet.
- 0x8003; The submitted IOGroupSet already has two assigned nodes.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

AssignAccess()

You can use the AssignAccess() method to create a temporary IBMTSSVC_AccessControlInformation instance that contains the IBMTSSVC_AuthorizationSubject, IBMTSSVC_AuthorizationTarget, IBMTSSVC_HostedACI, and IBMTSSVC_AuthorizedUse associations in the CIMOM repository.

Parameters

The AssignAccess() method belongs to the IBMTSSVC_AuthorizationService class.

Table 191 on page 320 shows the parameters you can specify for the AssignAccess() method.

Table 191. AssignAccess() parameters

Parameter	Type	Description
Activities	Uint16[]	<p><i>Must</i> be NULL unless the Privilege is NULL on input. This parameter specifies the activities to be granted or denied.</p> <p>Code Semantics</p> <p>1 Other 2 Create 3 Delete 4 Detect 5 Read 6 Write 7 Execute .. DMTF Reserved 16000..65535 Vendor Reserved</p>
ActivityQualifiers	String[]	<p><i>Must</i> be NULL unless Privilege is NULL on input. Defines the activity qualifiers for the Activities to be granted or denied.</p>
PrivilegeGranted	Boolean	<p><i>Must</i> be NULL unless Privilege is NULL on input. Indicates whether the rights defined by the parameters in this call should be granted or denied to the named subject/target pair.</p>
QualifierFormats	Uint16[]	<p><i>Must</i> be NULL unless Privilege is NULL on input. Defines the qualifier formats for the corresponding ActivityQualifiers.</p> <p>Code Semantics</p> <p>2 Class Name 3 <Class.>Property 4 <Class.>Method 5 Object Reference 6 Namespace 7 URL 8 Directory/File Name 9 Command Line Instruction 10..15999 DMTF Reserved 16000..65535 Vendor Reserved</p>
Subject	CIM_ManagedElement REF	<p>Defines the IBMTSSVC_HardwareAccount instance that is in the same IBMTSSVC_Cluster as the IBMTSSVC_AuthorizationService instance.</p>
Target	CIM_ManagedElement REF	<p>On input, this reference <i>must</i> be either NULL or refer to an instance of AuthorizedPrivilege that is used as a template.</p>

Return values

The AssignAccess() method returns one of the following error codes:

- 0: All instances were successfully created.
- 2: An unexpected error occurred.

- 3: Timeout
- 4: Failedx
- 5: The number or type of parameters that have been passed is incorrect.
- 6..15999: DMTF Reserved
- 16000: Unsupported Subject
- 16001: Unsupported Privilege
- 16002: Unsupported Target
- 16003: Authorization Error
- 16004: NULL not supported
- 16005..31999: Method Reserved
- 32000..65535: Vendor Specific

AttachDevice()

You can use the AttachDevice() method to attach an IBMTSSVC_StorageVolume instance to an IBMTSSVC_Controller instance that is associated with an IBMTSSVC_AccessControllInformation instance and has the AuthorizationView parameter set to true.

Parameters

The AttachDevice() method belongs to the IBMTSSVC_Controller class.

The provider must verify that unit numbers are unique for each initiator. When the ProtocolController is already part of an AuthorizedTarget association, the provider should update the access configuration in the underlying hardware when AttachDevice is called.

Table 192 shows the parameters you can specify for the AttachDevice() method.

Table 192. AttachDevice() parameters

Parameter	Type	Description
Device	COP*	Defines the volume instance to be attached. This device must belong to the same RedundancyGroup as the controller and be of type IBMTSSVC_StorageVolume.
[DeviceNumber]		The logical unit number (LUN) at which the volume will be exposed to all hosts connected to this controller.
[Force]	Boolean	When false (the default), attempting to attach a volume that is already attached to another controller will fail.
ProtocolController		The controller to which you attach the volume must belong to the same cluster as this service.
* CIMObjectPath		

Return values

The AttachDevice() method returns one of the following error codes:

- 0: The volume was successfully attached.
- 2: An unexpected error occurred.

- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The device is not a volume of the controller's RedundancyGroup.
- 0x1001: The specified device number is already occupied.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

AttachReplica()

You can use AttachReplica() to create a copy relationship between two volumes.

Parameters

Table 193 shows the parameters you can specify for the AttachReplica() method.

Table 193. AttachReplica() parameters

Parameter	Type	Description
[BackgroundCopyRate]	Uint16	Specifies the priority of the background copy rate "0–100". Scale is not in percent, instead it is "non-linear."
CopyType	String	Determines the type of the copy relationship. In CIM this is Sync, Async or UnSynchAssoc. In SAN Volume Controller terminology, this translates to "flash" or "metro." For a CopyType=3 (Sync) a Metro Mirror copy is created, for CopyType=4 (UnSynchAssoc) a FlashCopy is created.
[ElementName]	String	The name of the IBMTSSVC_StorageSynchronized association.
[Set]	String	Defines the IBMTSSVC_SynchronizedSet.
SourceElement		The source volume. Required to be an IBMTSSVC_StorageVolume.
[Synchronized]	Boolean	Valid for CopyType "Sync" only. If true, the SAN Volume Controller assumes that both source and target already contain identical data and no initial synchronization has to be performed.
TargetElement		The target volume. Can be an IBMTSSVC_StorageVolume or an IBMTSSVC_CandidateVolume.

Return values

The AttachReplica() method returns one of the following error codes:

- 0: The copy relationship was established successfully.
- 4: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: CopyType is neither 2 nor 3.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

BackupConfiguration()

You can use the BackupConfiguration() command to run the configuration backup script. The script stores the current cluster configuration associated with the current instance of ClusteringService in an XML file.

Parameters

The file name is svc.config.backup.xml. The svc.config.backup.xml file is stored in the directory backup/<clustername> that is located in the CIMOM home directory. If a current cluster backup file already exists, the file will be renamed with a .bak extension on the original backup file name. Any current .bak files of the same name will be overwritten. This file is designed for file restoration if an error or corruption occurs during the backup process. If the .bak files are used for restore, they must be renamed manually.

Table 194 shows the parameters you can specify for the BackupConfiguration() method.

Table 194. BackupConfiguration() parameters

Parameter	Type	Description
Force	Boolean	True/False statement. If true, command continuation is forced. False is the default.
FilePath	String	The backup file path.
Messages	String[]	The errors/warnings received from the backup script.

Return values

The BackupConfiguration() method returns one of the following error codes:

- 0: The backup was successful.
- 2: An unexpected error occurred and the command failed.
- 5: The number or type of passed parameters is incorrect.
- 0x8001: The backup script returned an error.
- 0x8002: The backup file download via scp, failed.
- 0x8003: The backup directory could not be created.
- 0x8004: The old backup file could not be renamed or deleted.

Cancelliteration()

You can use the Cancelliteration() method to request that an iteration of the Log, identified by the IterationIdentifier input parameter, be stopped. Cancelliteration() belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 195 shows the parameters you can specify for the Cancelliteration() method.

Table 195. Cancelliteration() parameters

Parameter	Type	Description
IterationIdentifier	String	The current iterator.

Return values

The Cancellation() method returns one of the following error codes.

- 0: The method completed successfully.
- 2: Unknown.
- 3: Timeout.
- 4: Failed.
- 5. The number or type of parameters that have been passed is incorrect.

CheckValidity()

You can use this method to check the validity of an IBMTS_Certificate.

Parameters

You must have administrator privileges to run this method.

Table 196 shows the parameters you can specify for the CheckValidity() method.

Table 196. CheckValidity() parameters

Parameter	Type	Description
Certificate	IBMTS_Certificate REF	The reference to the instance of IBMTS_Certificate you want to check.
IsValid	Boolean	A boolean that indicates if the checked certificate is valid.
Validity	Uint32	The number of remaining valid days.

Return values

The CheckValidity() method returns one of the following error codes:

- 0: The information about the certificate was successfully obtained.
- 2: Failed to obtain information on certificate.
- 5: One of the parameters is invalid.

Clean()

You can use the Clean() method to clean the dump directories on the node.

Parameters

The Clean() method belongs to the IBMTSSVC_ServiceModeService class. Table 197 on page 325 shows the parameters you can specify for the Clean() method.

Table 197. Clean() parameters

Parameter	Type	Description
Filter	String	The filter's syntax. If a directory is specified with no file filter, all relevant dump/log files in this directory are cleaned. The allowable directory arguments are: dumps (which cleans all files, including all subdirectories), dumps/configs, dumps/elogs, dumps/feature, dumps/iostats, dumps/iotrace and home/admin. You can also specify a file filter.
SMNode	IBMTSSVC_Node	The node that the dump file is deleted from. A dump file on the config node will be deleted, if nothing is specified.

Return values

The Clean() method returns one of the following error codes:

- 0: The Clean() method was successful.
- 2: An unexpected error occurred and the command failed.
- 5: The wrong number or type of parameter has been passed.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ClearLog()

You can use the ClearLog() method to delete all of the entries in the error log.

Return values

If the request is not supported, check the Capabilities array that a value of 6 ("Clear Log Supported") is specified. In a subclass, the set of possible return codes could be described using a ValueMap qualifier on the method. The ClearLog() method belongs to the IBMTSSVC_MessageLog class.

The ClearLog() method returns one of the following error codes:

- 0: All entries in the error log were deleted.
- 2: An unexpected error occurred.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

Create2062Cluster()

You can use the Create2062Cluster() command to create a Cluster.

Parameters

After the cluster has been successfully created, the configuration of the ICAT will be updated with the new cluster information. The Create2062Cluster() method belongs to the IBMTSSVC_Provider class. Table 198 on page 326 shows the parameters you can specify for the Create2062Cluster() method.

Table 198. Create2062Cluster() parameters

Parameter	Type	Description
ClusterIP	String	The desired IP of the cluster to be created.
ClusterName	String	The desired name of the cluster to be created.
Node	UInt8	The node on the 2062 blade where the cluster will be created.
Password	String	The password required to log on to the switch.
Slot	UInt8	The slot of the 2062 blade where the cluster will be created.
SwitchIDs	String[]	This parameter identifies all switches that the cluster spans. It must be specified, even if the cluster contains nodes from one switch only.
SwitchIP	String	The IP of the switch where the 2062 blades will reside.
User	String	The user name required to log on to the switch.

Return values

The Create2062Cluster() method returns one of the following error codes:

- 0: The cluster was established successfully.
- 2: The attempt failed.
- 5: The number or type of parameters that have been passed is invalid.
- ...: DMTF Reserved.
- 0x8000: Connection to cluster refused.
- 0x8001: Syntax error in cluster name.
- 0x8002: Invalid node.
- 0x8003: Invalid user name or password.
- 0x8004: Syntax error in switch IP.
- 0x8005: Syntax error in cluster IP.
- 0x8006: invalid slot.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateHardwareIDCollection()

You can use the CreateHardwareIDCollection method to create an instance of IBMTSSVC_HardwareIdCollection. The IBMTSSVC_HardwareIdCollection is represented by a host object on the device.

Parameters

The HardwareIdCollection aggregates StorageHardwareIDs. If a StorageHardwareID is added to a collection, then the corresponding host object is deleted on the device and the WWPN is added to the host that represents the

collection. The CreateHardwareIDCollection() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Table 199 shows the parameters you can specify for the CreateHardwareIDCollection() method.

Table 199. CreateHardwareIDCollection() parameters

Parameter	Type	Description
ElementName	String	The name of the collection.
HardwareIDs	String[]	An array that contains the string representations of the CIMOM Object Paths for StorageHardwareIDs to be added immediately to the collection. Alternatively, IDs can contain the WWPN. In this case, the creation of StorageHardwareIDs is circumvented.
Collection	CIM_System SpecificCollection REF	The IBMTSSVC_HardwareId Collection to add the IDs to.

Return values

The CreateHardwareIDCollection() method returns one of the following error codes:

- 0: The collection was successfully created.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: One of the parameters is invalid.
- 0x1000: The StorageHardwareID could not be found or is already member of another collection.
- 0x1001: Implementation does not support hardware ID collections.
- 0x1002: Input hardware IDs cannot be used in same collection.
- 0x8100: One or more parameters is out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

CreateOrModifyStoragePool()

You can use the CreateOrModifyStoragePool() method to create or modify an IBMTSSVC_StoragePool.

Parameters

The CreateOrModifyStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class. You can use the CreateOrModifyStoragePool() method to create an IBMTSSVC_StoragePool if the Pool parameter is set to null, or you can modify an existing IBMTSSVC_StoragePool if the Pool parameter is not null.

Table 200 on page 328 shows the parameters you can specify for the CreateOrModifyStoragePool() method.

Table 200. CreateOrModifyStoragePool() parameters

Parameter	Type	Pool creation description	Pool modification description
BlockSize	Uint16	The block size (also known as extent size) for the new pool. Supported values are 16, 32, 64, 128, 256, or 512 MB. The default value is 16 MB. The block size defines the granularity by which the capacity is managed by the SAN Volume Controller. For example, if you select a block size of 256 MB, all storage volumes will occupy space in multiples of 256 MB. Thus, a 300 MB storage volume will allocate 512 MB of pool capacity.	Must be null. The block size can be set at creation time only.
ElementName	String	The ElementName of the pool to be created. If null, the system will assign a name.	The new name for the pool.
[Extent]	String	Points to the StorageExtent.	Points to the StorageBackend Volume.
Force	Boolean	Not used.	If set to True, deletion of managed disks (MDisks) is forced. Force is ignored if disks are added.
Goal	CIM_StorageSetting REF	Contains the desired name and extent size for the new pool. If Goal is different from the static instance in the persistence layer, the method will fail.	The desired name and extent size for the new pool. If Goal is different from the static instance in the persistence layer, the method will fail.

Table 200. CreateOrModifyStoragePool() parameters (continued)

Parameter	Type	Pool creation description	Pool modification description
InExtents	String[]	The BackendVolumes from which to build the Pool. Mutually exclusive with InPools. If InExtents is given, Size will be ignored.	StorageBackend Volumes are the names used by the SAN Volume Controller for managed disks (MDisks). StorageBackend Volumes can be added or removed from the pool. They must belong to the same cluster as the pool and must not be aggregated by any other pool. If Size is less than the actual size of the pool, BackendVolumes passed in here will be removed.
InPools	String[]	The PrimordialPool from which to take the BackendVolumes. Mutually exclusive with InExtents.	The PrimordialPool that you take additional BackendVolumes from. Mutually exclusive with InExtents.
Job	CIM_ConcreteJob REF	Set to Null.	Set to Null.
[Pool]	String	Set to Null.	Specifies the StoragePool that is in the same cluster as the Storage ConfigurationService instance.
Pool	CIM_StoragePool REF	The name of the new pool.	The parameter is left unchanged by the method and therefore contains the passed value from invocation.

Table 200. CreateOrModifyStoragePool() parameters (continued)

Parameter	Type	Pool creation description	Pool modification description
[Size]		The desired size of the new Pool. When InPools is given, it will take as many BackendVolumes as necessary from the PrimordialPool in order to achieve the requested size. If InExtents is given, this parameter will be ignored. The size of the new storage pool is given by the sum of the sizes of the aggregated extents.	The desired new size of the pool. When InPools is given, it will take BackendVolumes from the PrimordialPool in order to achieve the requested size. If InExtents is given, this parameter will be ignored. See InExtents for more information. The size of the new storage pool is given by the sum of the sizes of the aggregated extents. You cannot shrink a pool using this method and passing InPools.
Size	UInt64	The real allocated size of the Pool in bytes.	The real allocated size of the Pool in bytes.

Return values

The CreateOrModifyStoragePool() method returns one of the following error codes:

- 0: The pool was successfully created.
- 2: An unknown error occurred.
- 4: An unexpected error occurred.
- 3: The action timed out.
- 5: At least one of the parameters was invalid.
- 6: In use.
- 4096: Method parameters checked. Job started.
- 4097: Size not supported.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateOrModifyElementFromStoragePool()

You can use the CreateOrModifyElementFromStoragePool() method to create an IBMTSSVC_StorageVolume instance if TheElement parameter is null, or you can modify an IBMTSSVC_StorageVolume instance if TheElement parameter is not null.

Parameters

The CreateOrModifyElementFromStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class.

Table 201 shows the parameters you can specify for the `CreateOrModifyElementFromStoragePool()` method.

Table 201. `CreateOrModifyElementFromStoragePool()` parameters

Parameter	Type	Description	
		Volume creation	Volume modification
Backend Volumes	String[]	An array that contains the BackendVolumes that will store the data from the volume. This parameter is mandatory if the virtualization type is "sequential" or "image". For all VirtualizationTypes except "image," all BackendVolumes must belong to the StoragePool in InPool. If the virtualization type is "image," then the BackendVolume must belong to a PrimordialStoragePool.	In the case of Volume expansion, a list of BackendVolumes on which the additional capacity will be allocated can be submitted. In all other cases, this parameter must be null.
Element Name	String	The ElementName of the volume to be created. If null, the system will assign a name.	The new name for the Volume.
ElementType	Uint16	ElementType=2, IBMTSSVC_StorageVolume.	ElementType=2, IBMTSSVC_StorageVolume.
Format	Boolean	Specifies whether or not the volume will be formatted on creation. Default is false.	Whether or not the additional volume capacity will be formatted on expansion. Default is false.
Goal	CIM_Managed Element REF	Contains special settings for the new volume. Must be a valid StorageSetting for Volumes if submitted.	Must be a valid StorageSetting for Volumes, if submitted.
InPool	CIM_Storage Pool REF	The IBMTSSVC_StoragePool from which the volume is to be allocated. The pool and the StorageConfigurationService must belong to the same cluster. Must be set if TheElement is null.	Set to null.
IOGroup	IBMTSSVC_ IOGroup REF	The IOGroup that the StorageVolume will be assigned to. If null, the method will choose the IOGroup with the fewest number of virtual disks (VDisks) assigned.	Must be null.
Job	CIM_Concrete Job REF	Set to null.	Set to null.

Table 201. CreateOrModifyElementFromStoragePool() parameters (continued)

Parameter	Type	Description	
		Volume creation	Volume modification
Preferred Node	IBMTSSVC_Node REF	The preferred Node for Volume access. If IOGroup is null, this parameter must also be null. Otherwise, it must belong to the IOGroup specified.	
Size	UInt64	The size of the volume in bytes. This parameter directly corresponds to the size CLI parameter. The SAN Volume Controller supports only sizes that are multiples of 512 bytes. If the size doesn't fulfill this criteria, then the method fails with "size not supported."	The size of the volume in bytes. The CLI amount parameter is calculated as follows: amount = size - current size. If amount is positive, then the volume will be expanded. If the amount is negative, it will be reduced. The SAN Volume Controller supports only sizes that are multiples of 512 bytes. If the size doesn't fulfill this criteria, then the method fails with "size not supported."
TheElement	CIM_Logical Element REF	Specifies the IBMTSSVC_StorageVolume instance to be created. If null, a new StorageVolume will be allocated from InPool. If not null the passed StorageVolume will be expanded or reduced, depending on the Size parameter.	Specifies the IBMTSSVC_StorageVolume instance to be modified (reduced or expanded).
Virtualization Type	UInt8	Sets the type of Volume created. May be "striped" (0), "sequential" (1) or "image" (2). Default is "striped."	Must be null.

Return values

The CreateOrModifyElementFromStoragePool() method returns one of the following error codes:

- 0: The volume was successfully created.
- 4: An unexpected error occurred.
- 5: At least one of the parameters was invalid.
- 0x1001: The requested size is not a multiple of 512. The nearest supported size greater than the requested size is returned in Size.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateProtocolControllerWithPorts()

You can use the `CreateProtocolControllerWithPorts()` method to create an `IBMTSSVC_Controller`.

Parameters

You can use the controller to attach Volumes using the `AttachDevice()` method. The controller is created in the Common Information Model Object Manager (CIMOM) repository. A controller is bound to an `IOGroup` and can therefore contain only `FCPorts` of this `IOGroup`. The `CreateProtocolControllerWithPorts()` method belongs to the `IBMTSSVC_ControllerConfigurationService` class.

Table 202 shows the parameters you can specify for the `CreateProtocolControllerWithPorts()` method.

Table 202. `CreateProtocolControllerWithPorts()` parameters

Parameter	Type	Description
ElementName	String	The name is automatically assigned and cannot be chosen individually. Therefore, this parameter is required to be null.
Identity	CIM_ManagedElement REF	The <code>IBMTSSVC_HardwareIdCollection</code> or <code>IBMTSSVC_StorageHardwareId</code> to which the volumes attached to the <code>ProtocolController</code> are exported.
Ports	String[]	The list of ports that will be associated with the controller. All ports must belong to the same <code>IOGroup</code> . The created controller will contain all <code>FCPorts</code> of an <code>IOGroup</code> even if a subset is submitted here.
Protocol	Uint16	Is required to be 2.
ProtocolController	CIM_ProtocolController REF	The created <code>IBMTSSVC_Controller</code> is returned here.
Privilege	CIM_Privilege REF	If not null, required to be the default static <code>Privileges</code> instance from the persistence layer.

Return values

The `CreateProtocolControllerWithPorts()` method returns one of the following error codes:

- 0: A clone was successfully created.
- 2: An unexpected error occurred.
- 5: The wrong number or type of parameters were passed.
- 0x8000: All ports are required to belong to the same `IOGroup`.
- 0x8100: `COPs` of a `Cluster` (which is different to this service's cluster) were submitted.

CreateRemoteClusterPartnership()

You can use the `CreateRemoteClusterPartnership()` method to establish a one-way partnership between an `IBMTSSVC_Cluster` instance and an `IBMTSSVC_CandidateCluster` instance.

Parameters

The method must be run on both the source cluster and the candidate cluster to establish a fully functional synchronous copy partnership. The `CreateRemoteClusterPartnership()` method belongs to the `IBMTSSVC_StorageConfigurationService` class.

Table 203 shows the parameters you can specify for the `CreateRemoteClusterPartnership()` method.

Table 203. *CreateRemoteClusterPartnership()* parameters

Parameter	Type	Description
RemoteCluster	IBMTSSVC_CandidateCluster REF	The cluster for which a relationship is created. Cluster membership checks are required.
[Bandwidth]	Uint16	The bandwidth for the copy operation in megabytes (MB).

Return values

The `CreateRemoteClusterPartnership()` method returns one of the following error codes:

- 0: The cluster partnership was successfully established.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The wrong number or type of parameters were passed.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateReplica()

You can use the `CreateReplica()` method to create a replica of the source volume for a copy relationship.

Parameters

The `CreateReplica()` method belongs to the `IBMTSSVC_StorageConfigurationService` class. Table 204 shows the parameters you can specify for the `CreateReplica()` method.

Table 204. *CreateReplica()* parameters

Parameter	Type	Description
CopyType	Uint16	The type of copy relationship. Possible values are 3 (Metro Mirror) or 4 (FlashCopy). Metro Mirror copies can only be established on the same cluster.
[ElementName]	String	The name of the replica to be created. If null, then the system will assign a name.
Job	CIM_ConcreteJob REF	The object used to monitor and terminate the copy process.

Table 204. CreateReplica() parameters (continued)

Parameter	Type	Description
SourceElement	CIM_LogicalElement REF	The source StorageVolume for the replica.
TargetElement	CIM_LogicalElement REF	The target StorageVolume for the replica.
TargetSettingGoal	CIM_StorageSetting REF	The StorageSetting object to be matched by the replica. Passed to CreateOrModifyElement FromStoragePool.
TargetPool	String	The IBMTSSVC_StoragePool that will be used for the target volume.

Return values

The CreateReplica() method returns one of the following error codes:

- 0: The cluster partnership was successfully established.
- 4: An unexpected error occurred.
- 5: The number or type of parameters that were passed is incorrect.
- 0x8000: A CopyType other than 3 or 4 was used.
- 0x8100: One or more of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateSetting()

You can use the CreateSetting() method to create and populate a StorageSetting instance from a StorageCapability instance.

Parameters

This removes the need to populate default settings and other settings in the context of each StorageCapabilities (which could be numerous).

The CreateSetting() method belongs to the IBMTSSVC_StorageCapabilities class. Table 205 shows the parameters you can specify for the CreateSetting() method.

Table 205. CreateSetting() parameters

Parameter	Type	Description
NewSetting	CIM_StorageSetting REF	Reference to the created StorageSetting instance.
SettingType	Uint16	The value of this parameter is without meaning to the SAN Volume Controller. For both Default and Goal, the same StorageSetting is returned.

Return values

The CreateSetting() method returns one of the following error codes.

- 0: The method completed successfully.

- 2: Unspecified error.
- 3: Timeout.
- 4: The method failed.
- 5: The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.
- 32768..65535: Vendor specific.

CreateStorageHardwareID()

You can use the CreateStorageHardwareID() method to create an instance of IBMTSSVC_StorageHardwareID.

Parameters

On the device level, the instance is represented by a single-port host object with the name prefix "cimhwid".

Table 206 shows the parameters you can specify for the CreateStorageHardwareID() method.

Table 206. CreateStorageHardwareID() parameters

Parameter	Type	Description
ElementName	String	The name of the new HardwareID instance. Must be identical to ID.
StorageID	String	The value used by the SecurityService to represent identity. In this case, a PortWWN.
IDType	Uint16	The type of the ID property. In this case, 2 (PortWWN).
OtherIDType	String	The type of the storage ID when the IDType is "Other."
Setting	CIM_StorageClient SettingData REF	Required to be null.
HardwareID	CIM_StorageHardwareID REF	The CIMOM Object Path for the created StorageHardwareID.

Return values

The CreateStorageHardwareID() method returns one of the following error codes:

- 0: The volume was successfully detached.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The WWPN is already assigned to an existing StorageHardwareID.
- 0x1001: The IDType is not 2.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

CreateSynchronizedSet()

You can use the CreateSynchronizedSet() method to create an IBMTSSVC_SynchronizedSet instance for aggregating IBMTSSVC_StorageSynchronized associations for FlashCopy or Metro Mirror relationships.

Parameters

Some devices may not support SynchronizedSets. In order to find out if SynchronizedSets are supported, call GetSupportedSetTypes. The CreateSynchronizedSet() method belongs to the IBMTSSVC_StorageConfigurationService class.

Table 207 shows the parameters you can specify for the CreateSynchronizedSet() method.

Table 207. CreateSynchronizedSet() parameters

Parameter	Type	Description
CopyType	Uint16	The type of copy relationship (3 for Metro Mirror ; 4 for FlashCopy).
[ElementName]	String	The name of the copy relationship.
[RemoteCluster]	IBMTSSVC_ Remote Cluster REF	The remote cluster for the ConsistencySet. Only StorageSynchronized with volumes on this remote cluster can be added to this set. This setting is valid only for CopyType 3 (Metro Mirror). The default is the local cluster. This setting must be null if the CopyType is 4 (FlashCopy).
[Set]	CIM_Synchronized Set REF	The IBMTSSVC_FlashCopySynchronized Set or IBMTSSVC_SyncCopySynchronized Set instance that is created.

Return values

The CreateSynchronizedSet() method returns one of the following error codes:

- 0: The SynchronizedSet was created successfully.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that were passed is incorrect.
- 6: A copy type other than 3 or 4 was used.
- 8: SynchronizedSets are not supported.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents SAN Volume Controller return codes and messages.

DeleteCertificate()

You can use this method to delete a server certificate.

Parameters

After the server certificate is deleted, it is not possible to establish a secure connection using server authentication. You must either restart the CIM Agent on port 5988 and invoke the generateCIMOMCertificate() or manually call the batch file mkcertificate.bat.

You must have administrator privileges to run this method.

Table 208 shows the parameters you can specify for the DeleteCertificate() method.

Table 208. DeleteCertificate() parameters

Parameter	Type	Description
Certificate	IBMTS_Certificate REF	The reference to the instance of IBMTS_Certificate that you want to delete.

Return values

The DeleteCertificate() method returns one of the following error codes:

- 0: The certificate was successfully deleted.
- 2: Failed to generate new certificate due to provider internal reasons.
- 4: Failed to generate new certificate due to truststore problems.
- 5: One of the parameters is invalid.

DeleteConfigurationBackup()

You can use the DeleteConfigurationBackup() command to delete the backups in the Backup directory.

Parameters

Table 209 shows the parameters you can specify for the DeleteConfigurationBackup() method.

Table 209. DeleteConfigurationBackup() parameters

Parameter	Type	Description
Backup	String	The name of the backup to delete.

Return values

The DeleteConfigurationBackup() method returns one of the following error codes:

- 0: The restore was successful.
- 2: An unexpected error occurred.
- 5: The given backup could not be found.
- 0x8000: The backup directory deletion failed. This could be caused by a sharing violation.

DeleteHardwareIDCollection()

You can use the DeleteHardwareIDCollection() method to delete a SAN Volume Controller host.

Parameters

The DeleteHardwareIDCollection() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Table 210 shows the parameters you can specify for the DeleteHardwareIDCollection() method.

Table 210. DeleteHardwareIDCollection() parameters

Parameter	Type	Description
Collection	CIM_System SpecificCollection REF	The CIMOM Object Path of the IBMTSSVC_Host to be deleted.
Force	Boolean	Optionally specifies that the deletion will be forced (if set to true). Otherwise the deletion would fail if a privilege is still associated with the collection. If specified, the host will be deleted even if it is a member of a LUN mapping.

Return values

The DeleteHardwareIDCollection() method returns one of the following error codes:

- 0: The volume was successfully detached.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The device has no ProtocolControllerForUnit association to this controller.
- 0x8000: Collection is associated with a privilege, and the Force parameter was not specified.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

DeleteProtocolController()

You can use the DeleteProtocolController() method to delete a controller from the Common Information Model Object Manager (CIMOM) repository or from the SAN Volume Controller, respectively.

Parameters

The DeleteProtocolController() method belongs to the IBMTSSVC_ControllerConfigurationService class. Table 211 shows the parameters you can specify for the DeleteProtocolController() method.

Table 211. DeleteProtocolController() parameters

Parameter	Type	Description
DeleteLogicalUnits	Boolean	If true, all StorageVolumes which are exclusively attached to the submitted controller are deleted as well. The default is false.

Table 211. DeleteProtocolController() parameters (continued)

Parameter	Type	Description
ProtocolController	CIM_ProtocolController REF	The controller to be deleted.

Return values

The DeleteProtocolController() method returns one of the following error codes:

- 0: The controller was successfully deleted.
- 2: An unexpected error occurred.
- 5: The wrong number or type of parameters were passed.
- 0x1000: At least one of the attached StorageVolumes is attached to another controller and has therefore not been deleted.
- 0x8100: The passed controller and the service owning the method belong to different clusters.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

DeleteRecord()

The DeleteRecord() method belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 212 shows the parameters you can specify for the DeleteRecord() method.

Table 212. DeleteRecord() parameters

Parameter	Type	Description
IterationIdentifier	String	
PositionToNext	Boolean	When set to true, requests the IterationIdentifier to be advanced to the next record, after the current entry is deleted. If set to false, IterationIdentifier is set to the previous record.
RecordNumber	UInt64	
RecordData	UInt8[]	

Return values

The DeleteRecord() method returns one of the following error codes:

- 0: The method completed successfully.
- 2: Unknown.
- 3: Timeout.
- 4: Failed.
- 5: The number or type of parameters that have been passed is incorrect.

DeleteRemoteClusterPartnership()

You can use the DeleteRemoteClusterPartnership() method to remove a partnership between two IBMTSSVC_Cluster instances.

Parameters

You must run this method on both clusters to delete a fully functional synchronous copy partnership. The DeleteRemoteClusterPartnership() method belongs to the IBMTSSVC_StorageConfigurationService class.

Table 213 shows the parameters you can specify for the DeleteRemoteClusterPartnership() method.

Table 213. DeleteRemoteClusterPartnership() parameters

Parameter	Type	Description
RemoteCluster	IBMTSSVC_Remote Cluster REF	The name of the candidate remote cluster. Cluster membership checks are required.

Return values

The DeleteRemoteClusterPartnership() method returns one of the following error codes:

- 0: The cluster partnership was successfully deleted.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed
- 5: The wrong number or type of parameters was passed.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

DeleteStorageHardwareID()

You can use the DeleteStorageHardwareID() method to delete a StorageHardwareID.

Parameters

The DeleteStorageHardwareID() method removes the associations and aggregations, including CIM_ConcreteDependency and CIM_AuthorizedSubject. The DeleteStorageHardwareID() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Table 214 shows the parameters you can specify for the DeleteStorageHardwareID() method.

Table 214. DeleteStorageHardwareID() parameters

Parameter	Type	Description
HardwareID	CIM_StorageHardwareID REF	The IBMTSSVC_StorageHardwareID to delete.

Table 214. DeleteStorageHardwareID() parameters (continued)

Parameter	Type	Description
Force	Boolean	TRUE, the deletion will be forced. The StorageHardwareID will be deleted even if it is associated with a Privilege. If specified, the ID will be deleted even if any active LUN masking is assigned to it.

Return values

The DeleteStorageHardwareID() method returns one of the following error codes:

- 0: The volume was successfully detached.
- 2: An unexpected error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The StorageHardwareID could not be found.
- 0x8000: The HardwareAccount is still bound to AuthorizationSubject.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

DeleteSynchronizedSet()

You can use the DeleteSynchronizedSet() method to delete a SynchronizedSet if it does not contain any StorageSynchronized associations.

Parameters

The DeleteSynchronizedSet() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 215 shows the parameters you can specify for the DeleteSynchronizedSet() method.

Table 215. DeleteSynchronizedSet()

Parameter	Type	Description
Force	Boolean	If set to False, the delete will fail if any StorageSynchronized are member of the set. The default is false. When Force is set to True, all contained StorageSynchronized will be moved out of the Set before it is deleted. Therefore, the StorageSynchronized survive as stand-alone copy mappings.
Set	CIM_SynchronizedSet REF	The SynchronizedSet to be deleted. The InstanceID corresponds to the SAN Volume Controller consistency_grp ID.

Return values

The DeleteSynchronizedSet() method returns one of the following error codes:

- 0: The SynchronizedSet was successfully deleted.
- 2: An unknown error occurred.

- 3: The action timed out.
- 4: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 6: There are still StorageSynchronized associations in the set when it should be empty. Any StorageSynchronized associations must be removed before deletion of the set can be completed, or the Force flag must be set.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

DeleteStoragePool()

You can use the DeleteStoragePool() method to delete an IBMTSSVC_StoragePool instance if it does not contain any IBMTSSVC_StorageVolume instances.

Parameters

The DeleteStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 216 shows the parameters you can specify for the DeleteStoragePool() method.

Table 216. DeleteStoragePool()

Parameter	Type	Description
[Force]	Boolean	When set to True, the pool will be deleted despite constraints (for example, no StorageVolume or BackendVolume contained). The default is False.
Job	CIM_Concrete Job REF	Set to null.
Pool	CIM_Storage Pool REF	The IBMTSSVC_StoragePool to be deleted. Contains the mdisk_grp_ID in Name. The pool and the StorageConfigurationService must belong to the same cluster.

Return values

The DeleteStoragePool() method returns one of the following error codes:

- 0: The pool was successfully deleted.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed
- 6: The method is in use.
- 5: The number or type of parameters that have been passed is incorrect.
- 4096: Method parameters checked. Job started.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

DetachDevice()

You can use the DetachDevice() method to detach a volume from the controller.

Parameters

The `DetachDevice()` method belongs to the `IBMTSSVC_ControllerConfigurationService` class. Table 217 shows the parameters you can specify for the `DetachDevice()` method.

Table 217. `DetachDevice()` parameters

Parameter	Type	Description
Device	CIM_LogicalDevice REF	The volume to be detached. There must be an <code>IBMTSSVC_SCSILUN</code> association between this volume and the controller.
ProtocolController	CIM_ProtocolController REF	The controller from which to detach the volume.

Return values

The `DetachDevice()` method returns one of the following error codes:

- 0: The volume was successfully detached.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The device has no `ProtocolControllerForUnit` association to this controller.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

| `DisableAutoGeneration()`

| You can use this method to disable the certificate automatic generation feature.

| You must have administrator privileges to run this method.

| Return values

| The `EnableAutoGeneration()` method returns one of the following error codes:

- |
- 0: The certificate was successfully deleted.
 - 2: Failed due to provider internal reasons.
- |

| `Dump()`

You can use the `Dump()` method to dump the contents of error log, the config log, or the feature log to a text file.

Parameters

The `Dump()` method belongs to the `IBMTSSVC_ServiceModeService` class. Table 218 shows the parameters you can specify for the `Dump()` method.

Table 218. `Dump()` parameters

Parameter	Type	Description
Type	UInt16	Decides which dump type will be generated.

Table 218. Dump() parameters (continued)

Parameter	Type	Description
FileNamePrefix	String	When this parameter is not set, the dump is directed to a file with a system defined name. If supplied, a filename is created from the prefix and timestamp. It takes the form of <FileNamePrefix>_NN_YYMMDD_HHMMSS. NN is the current configuration log id. In the case of feature logs, this parameter must be null.
GeneratedFile	String	The generated file name.
SMNode	IBMTSSVC_ServiceMode Node REF	The node that is in service mode where dump files will be created.

Return values

The Dump() method returns one of the following error codes:

- 0: The text file dump was successful.
- 2: An unexpected error occurred and the command failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: A type greater than 2 was passed.
- 0x8001: A file prefix was passed at the same time as the feature log type.
- 0x9000: to 0x9FFF: San Volume Controller return codes and messages.

EnableAutoGeneration()

You can use this method to enable the certificate automatic generation feature. With this method enabled, a new certificate is automatically generated when the old certificate expires.

You must have administrator privileges to run this method.

Return values

The EnableAutoGeneration() method returns one of the following error codes:

- 0: The certificate was successfully deleted.
- 2: Failed due to provider internal reasons.

Enter()

You can use the Enter() method to put a node into service mode.

Parameters

After this happens, the ServiceModeService methods is run against the returned service mode node and the objects prefixed with IBMTSSVC_SM objects are retrieved for this node. If the config node is in service mode, no other commands for this cluster are available.

The Enter() method belongs to the IBMTSSVC_ServiceModeService class. Table 219 on page 346 shows the parameters you can specify for the Enter() method.

Table 219. Enter() parameters

Parameter	Type	Description
Node	IBMTSSVC_Node REF	The node that shall be put in service mode.
SMNode	IBMTSSVC_Service ModeNode REF	The reference to the node that is now in service mode.

Return values

The Enter() method returns one of the following error codes:

- 0: The Enter() method was successful.
- 5: The wrong number or type of parameter has been passed.
- ..: DMTF reserved.
- 0x8100: Cluster scope violation.

EvictNode()

You can use the EvictNode() method to remove an IBMTSSVC_Node instance from an IBMTSSVC_Cluster instance.

Parameters

The EvictNode() method belongs to the IBMTSSVC_ClusteringService class. Table 220 shows the parameters you can specify for the EvictNode() method.

Table 220. EvictNode() parameters

Parameter	Type	Description
CS	CIMOM Object Path	Defines the IBMTSSVC_Node instance to be added that is in the same cluster as the IBMTSSVC_ClusteringService instance.

Return values

The EvictNode() method returns one of the following error codes:

- 0: The node was successfully added.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted computer system was not an IBMTSSVC_CandidateNode.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

Exit()

You can use the Exit() method to exit the service mode for a specific node and restart it in normal operating mode.

Parameters

The Exit() method belongs to the IBMTSSVC_ServiceModeService class. Table 221 on page 347 shows the parameters you can specify for the Exit() method.

Table 221. Exit() parameters

Parameter	Type	Description
SMNode	IBMTSSVC_Service ModeNode REF	The node that will be restarted in normal operating mode.

Return values

The Exit() method returns one of the following error codes:

- 0: The Exit() method was successful.
- 5: The wrong number or type of parameter has been passed.
- ...: DMTF reserved.
- 0x8100: Cluster scope violation.
- 0x9000 to 0x9FFF: Device error codes.

FixRecord()

You can use the FixRecord() method to fix one entry in the log. After you run the FixRecord() method, the entry is marked as fixed.

Parameters

The FixRecord() method belongs to the IBMTSSVC_MessageLog class. Table 222 shows the parameters you can specify for the FixRecord() method.

Table 222. FixRecord() parameters

Parameter	Type	Description
RecordNumber	Uint64	Passed to the CLI command in the -d parameter.

Return values

The FixRecord() method returns one of the following error codes:

- 0: The method completed successfully.
- 2: An unexpected error occurred.
- 5: One of the mandatory parameters is missing.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

GetAllRecords()

You can use the GetAllRecords() method to retrieve the list of logs from the cluster. The GetAllRecords() method belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 223 on page 348 shows the parameters you can specify for the GetAllRecords() method.

Table 223. GetAllRecords() parameters

Parameter	Type	Description
ErrorOnly	Boolean	If set to true or null, only error records are returned. If false, all log entries are returned.
Records	String[]	The file as a string array.

Return values

The GetAllRecords() method returns one of the following error codes:

- 0: The method completed successfully.
- 2: An unexpected error occurred.
- 0x8000: Records not found.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

GetDump()

You can use the GetDump() method to retrieve a log file. The feature log is automatically decoded.

Parameters

The GetDump() method belongs to the IBMTSSVC_ServiceModeService class. Table 224 shows the parameters you can specify for the GetDump() method.

Table 224. GetDump() parameters

Parameter	Type	Description
FilePath	String	The fully specified file name. File names can be viewed in the IBMTSSVC_Dump instance. Allowed paths are: dumps/configs, dumps/elogs, dumps/feature, dumps/iostats, dumps/iotrace and home/admin.
SMNode	IBMTSSVC_Node REF	The node for which you want the dump retrieval. The config node dump will be returned if nothing is specified.
File	String[]	The file as a string array.

Return values

The GetDump() method returns one of the following error codes:

- 0: The GetDump() method was successful.
- 5: The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.
- 0x8000: The connection to the cluster has been lost, or failed to connect to a node.
- x8001: A given file path was not found for CISCO..
- 0x8100: One or more parameters where out of the cluster scope.
- 0x9000..0x9FFF: Device error codes.

GetFreeExtents()

You can use the GetFreeExtents() method to return the number of free extents on a BackendVolume.

Parameters

These extents are the blocks which the SAN Volume Controller uses for capacity management. They do not correspond to the CIM_StorageExtent class.

The GetFreeExtents() method belongs to the IBMTSSVC_BackendVolume class. Table 225 shows the parameters you can specify for the GetFreeExtents() method.

Table 225. GetFreeExtents() parameters

Parameter	Type	Description
FreeExtents		The number of free extents on this BackendVolume.

Return values

The GetFreeExtents() method returns one of the following error codes:

- 0: Method successfully completed.
- 2: An unexpected error occurred.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

GetRecord()

You can use the GetRecord() method to retrieve the list of logs from the cluster, returns the log entry specified by the IterationIdentifier, and increment the IterationIdentifier by one position if PositionToNext is set to TRUE.

Parameters

The GetRecord() method belongs to the IBMTSSVC_MessageLog class. Table 226 shows the parameters you can specify for the GetRecord() method.

Table 226. GetRecord() parameters

Parameter	Type	Description
[IterationIdentifier]	String	The pointer to the record you want to retrieve. The tokens are evaluated and the corresponding command is called.
IterationIdentifier	String	The new IterationIdentifier. The SequenceNumber was modified according to the parameters that were passed in. If PositionToNext was true and there is no next entry, null will be returned here.

Table 226. *GetRecord()* parameters (continued)

Parameter	Type	Description
PositionToNext	String	If this value is true, the IterationIdentifier is advanced by one position. Otherwise the old IterationIdentifier will be returned.
RecordData	UInt8[]	The entry in byte representation (UTF-8). Use String.getBytes(UTF-8).
RecordNumber	UInt64	This value equals the SequenceNumber token of the IterationIdentifier that is returned.

Return values

The *GetRecord()* method returns one of the following error codes:

- 0: The method completed successfully.
- 2: An unexpected error occurred.

GetResetPasswordChangeFeatureStatus()

You can use the *GetResetPasswordChangeFeatureStatus()* method to retrieve the current status of the rest password change feature.

Parameters

The *GetResetPasswordChangeFeatureStatus()* method belongs to the *IBMTSSVC_ClusteringService* class. Table 227 shows the parameters you can specify for the *GetResetPasswordChangeFeatureStatus()* method.

Table 227. *GetResetPasswordChangeFeatureStatus()* properties

Parameter	Type	Description
Enable	Boolean	If set to True, indicates that the password reset feature is enabled; if set to False, indicates that the feature is disabled.

Return values

The *GetResetPasswordChangeFeatureStatus()* method returns one of the following error codes:

- 0: The feature status has been successfully retrieved.
- 2: An unexpected error occurred.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

GetSupportedSizeRange()

You can use the *GetSupportedSizeRange()* method to query the volume sizes that are supported.

Parameters

The GetSupportedSizeRange() method belongs to the IBMTSSVC_StoragePool class. Table 228 shows the parameters you can specify for the GetSupportedSizeRange() method.

Table 228. GetSupportedSizeRange() parameters

Parameter	Type	Description
ElementType	Uint16	The type of element for which supported size ranges are reported. Code Semantics 2 Storage Pool 3 Storage Volume
[Goal]	CIMOM Object Path	The size requirements.
Minimum VolumeSize	Uint64	The minimum size (MB) to query.
Maximum VolumeSize	Uint64	The maximum size (MB) to query.
VolumeSize Divisor	Uint64	A volume/pool size must be a multiple of this value.

Return values

The GetSupportedSizeRange() method returns one of the following error codes:

- 0: Parameters are valid.
- 2: Use GetSupportedSizes instead.
- 5: The number or type of parameters that have been passed is incorrect.

GetSupportedSizes()

You can use the GetSupportedSizes() method to query the supported volume sizes.

Parameters

The GetSupportedSizes() method is derived from the IBMTSSVC_StoragePool class. Table 229 shows the parameters of the GetSupportedSizes() method.

Table 229. GetSupported Sizes() parameters

Parameter	Type	Description
ElementType	Uint16	The type of element for which supported sizes are reported. Code Semantics 2 Storage Pool 3 Storage Volume
Goal	CIM_StorageSetting REF	The size requirements.
Sizes	uint64[]	List of support sizes for a Volume/Pool creation or modification (MB).

Return values

The GetSupportedSizes() method returns one of the following error codes:

- 1: Method not supported.

- 2: Use the GetSupportedSizeRange method instead.

GenerateCIMOMCertificate()

You can use this method to generate a new server certificate.

Parameters

The data contained in the referenced instance of the IBMTS_CertificateSetting are the base for the creation. The existing certificate contained in the truststore is deleted and a newly created one is added.

You must have administrator privileges to run this method.

Table 230 shows the parameters you can specify for the GenerateCIMOMCertificate() method.

Table 230. GenerateCIMOMCertificate() parameters

Parameter	Type	Description
CertificateSetting	IBMTS_CertificateSetting REF	The reference to the instance that contains the setting data for the creation of a new certificate.
Force	Boolean	The force flag that specifies if an existing valid truststore must be replaced. If the existing certificate is still valid, the Force parameter must be set to true.
Certificate	IBMTS_Certificate REF	The reference to the newly created instance of IBMTS_Certificate.

Return values

The GenerateCIMOMCertificate() method returns one of the following error codes:

- 0: The certificate was successfully deleted.
- 2: Failed to generate new certificate due to provider internal reasons.
- 4: Failed to generate new certificate due to truststore problems.
- 5: One of the parameters is invalid.
- 6: Failed to generate new certificate. Existing one is still valid and in use.

IncludeBackendVolume()

You can use the IncludeBackendVolume() method to reinstate an IBMTSSVC_BackendVolume instance that was ejected by an IBMTSSVC_Cluster.

Parameters

The IncludeBackendVolume() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 231 on page 353 shows the parameters you can specify for the IncludeBackendVolume() method.

Table 231. IncludeBackendVolume() parameters

Parameter	Type	Description
Volume	IBMTSSVC_Backend Volume REF	The IBMTSSVC_BackendVolume instance to be reinstated. Must belong to the same cluster as the StorageConfigurationService.

Return values

The IncludeBackendVolume() method returns one of the following error codes:

- 0: The volume was successfully included.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The volume had not been ejected.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ListConfigurationBackups()

You can use the ListConfigurationBackups() command to list the backups in the Backup directory. Only the directory names are reported.

Parameters

Table 232 shows the parameters you can specify for the ListConfigurationBackups() method.

Table 232. ListConfigurationBackups() parameters

Parameter	Type	Description
Backup	String	Each array element contains the name of one backup available in the backup directory.

Return values

The ListConfigurationBackups() method returns the following error code:

- 0: The backup was successful.

MigrateVolume()

You can use the MigrateVolume() method to migrate an IBMTSSVC_StorageVolume instance to another IBMTSSVC_StoragePool instance.

Parameters

The MigrateVolume() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 233 shows the parameters you can specify for the MigrateVolume() method.

Table 233. MigrateVolume() parameters

Parameter	Type	Description
Job	CIM_ConcreteJob REF	The object that can be used to monitor the migration progress.

Table 233. *MigrateVolume()* parameters (continued)

Parameter	Type	Description
NumberOfThreads	UInt8	The number of copy threads used for the migration. The number can be one to four.
TargetPool	IBMTSSVC_StoragePool REF	The IBMTSSVC_StoragePool instance to which the IBMTSSVC_StorageVolume instance will be migrated. Must be different from the pool the volume is currently a member of.
Volume	IBMTSSVC_StorageVolume REF	The IBMTSSVC_StorageVolume to be migrated. The complete data of this volume will be copied to the new location.

Return values

The `MigrateVolume()` method returns one of the following error codes:

- 0: The volume was successfully migrated.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

MigrateVolumeToImageMode()

You can use the `MigrateVolumeToImageMode()` method to migrate the content of a `StorageVolume` to a new `StorageVolume` in image mode.

Parameters

Use this method when data no longer needs to be managed by the SAN Volume Controller. This method can also be used to migrate data between two image mode disks.

Table 234 shows the parameters you can specify for the `MigrateVolumeToImageMode()` method.

Table 234. *MigrateVolumeToImageMode()* parameters

Parameter	Type	Description
NumberOfThreads	UInt8	The number of copy threads used for the migration. This can be a number from one to four.
Job	CIM_ConcreteJob REF	The job object. This can be used to monitor the progress of the migration.
TargetPool	IBMTSSVC_StoragePool REF	The pool that the target volume will become a member of.

Table 234. *MigrateVolumeToImageMode()* parameters (continued)

Parameter	Type	Description
TargetVolume	IBMTSSVC_Backend Pool REF	The backend volume that the data will be migrated to. It must be in unmanaged state and large enough to contain the data of the source volume.
Volume	IBMTSSVC_Storage Volume REF	The volume to be migrated. All data for this volume will be copied to the new location.

Return values

The *MigrateVolumeToImageMode()* method returns one of the following error codes:

- 0: The migration job was started.
- 2: Unexpected error occurred.
- 5: The wrong number or type of parameters have been passed.
- 0x8100: One of the parameters belongs to a different cluster than the service.
- 0x9000: SVC CLI return codes

ModifyErrorSettings()

You can use the *ModifyErrorSettings()* method to specify what happens when an error or event is logged in the error log. The *ModifyErrorSettings()* method belongs to the *IBMTSSVC_MessageLog* class.

Parameters

Table 235 shows the parameters you can specify for the *ModifyErrorSettings()* method.

Table 235. *ModifyErrorSettings()* parameters

Parameter	Type	Description
[EmailAddress]	String	The email address of which to send email notification.
[EmailAlert]	String	The email setting (when to raise an email notification). <ul style="list-style-type: none"> • all = raise email for all errors logged • hardware_only = raise email for errors but not object state changes • none = do not raise email for any errors (default cluster setting)
[SNMP Community]	String	The SNMP community string.
[SNMP ManagerIP]	String	The IP address of the host system running the SNMP manager software.

Table 235. *ModifyErrorSettings()* parameters (continued)

Parameter	Type	Description
[SNMPTrap]	String	The SNMP trap setting (when to raise a trap). Allowed values: <ul style="list-style-type: none"> • all = raise SNMP for all errors logged • no_state = raise SNMP for errors but not object state changes • none = do not raise SNMP for any errors (default cluster setting)

Return values

The `ModifyErrorSettings()` method returns the following error codes:

- 0: The method successfully specified action.
- 2: A command failed.
- 0x8200: The method ran successfully but one or more parameters were ignored.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

ModifyIPAddress()

You can use the `ModifyIPAddress()` command to modify the IP address in the cluster, change the entry in the `provider-config.xml` and reload the configuration.

Parameters

Table 236 shows the parameters you can specify for the `Modifyipaddress()` method.

Table 236. *Modifyipaddress()* parameters

Parameter	Type	Description
ClusterIP	String	Specifies and validates the new cluster IP address.

Return values

The `Modifyipaddress()` method returns one of the following error codes:

- 0: The `Modifyipaddress` command was successful.
- 2: An unexpected error occurred and the command failed.
- 5: One of the mandatory parameters is missing or invalid.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ModifyResetPasswordChangeFeature()

You can use the `ModifyResetPasswordChangeFeature()` method to enable or disable the password reset feature.

Parameters

The `ModifyResetPasswordChangeFeature()` method belongs to the `IBMTSSVC_ClusteringService` class. Table 237 on page 357 shows the parameters you can specify for the `ModifyResetPasswordChangeFeature()` method.

Table 237. *ModifyResetPasswordChangeFeature()* parameters

Parameter	Type	Description
Enable	Boolean	If set to True, enables the password reset feature; if set to False, disables the feature

Return values

The `ModifyResetPasswordChangeFeature()` method returns one of the following error codes:

- 0: The passwords were changed.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ModifySynchronization()

You can use the `ModifySynchronization()` method to modify a FlashCopy or synchronous copy relationship between two `IBMTSSVC_StorageVolume` instances based on the specified type of operation.

Parameters

The `ModifySynchronization()` method belongs to the `IBMTSSVC_StorageConfigurationService` class.

Table 238 on page 358 shows the parameters you can specify for the `ModifySynchronization()` method.

Table 238. ModifySynchronization() parameters

Parameter	Type	Description
Operation	UInt16	<p>These commands can only be run if the copy mapping does not belong to a consistency group (check SynchronizedSetID in StorageSynchronized).</p> <p>Code Semantics</p> <p>2 Detach. Delete the copy mapping.</p> <p>3 Fracture. Suspend the synchronization between two storage objects. The association and changes are remembered to allow a fast resynchronization. This can be used during a backup cycle to allow one of the objects to be copied while the other remains in production.</p> <p>4 Resync Replica. Reestablish the synchronization of a replica. If CopyJob is Sync or Async, this will negate the action of a previous fracture operation.</p> <p>5 Restore from Replica. Renew the contents of the original storage object from a replica.</p> <p>6 Prepare. Prepare the participating volumes for a Flash Copy.</p> <p>7 Unprepare.</p> <p>8 Quiesce.</p> <p>9 Unquiesce.</p> <p>10 Reset To Sync.</p> <p>11 Reset To Async.</p> <p>0x8000 Switch. Switch primary relationship.</p> <p>0x8001 Stop.</p>
[AllowAccess]	Boolean	<p>If set to True, the target will be accessible for I/O after fracture of a synchronized copy. The default is False. The parameter is ignored for all operations except synchronized copy fracture.</p>
[Clean]	Boolean	<p>If set to True, the target is assumed to be clean (initialized with zeros), thus no initialize will be done before resynchronization of a synchronized copy. The default is False. Ignored for all other operations except resynchronization of a synchronized copy.</p>

Table 238. *ModifySynchronization()* parameters (continued)

Parameter	Type	Description
[Direction]	Boolean	If set to True, the master (SyncedSystemElement) will become the source of the synchronized copy relationship. If set to False, the auxiliary (SyncedElement) will become the source of the synchronized copy relationship. By default, the direction will be autonomically chosen (reverse on switch and keep on resync). Valid for switch and resync operation of sync copy only. Ignored in all other cases.
[Force]	Boolean	If set to True, the operation will be forced. The default is False. Applies only on resync and detach of FlashCopy mappings and resync of sync copy mappings. Ignored in all other cases.
Job	CIM_ConcreteJob REF	The object that is used to monitor and terminate the copy process.
Synchronization	CIM_Storage Synchronized REF	The copy relationship to be modified: IBMTSSVC_FlashCopyStorage Synchronized or IBMTSSVC_SyncCopyStorage Synchronized.

Return values

The *ModifySynchronization()* method returns one of the following error codes:

- 0: The FlashCopy mapping was successfully established.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed
- 5: The number or type of parameters that have been passed is incorrect.
- 6: The method is in use.
- 0x1000: The CLI copy command ran and a job object was returned.
- 0x8001: The operation that was submitted is not allowed in the current state of the StorageSynchronized. For example, a prepare operation on a StorageSynchronized is in synchronized state.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ModifySynchronizedSet()

You can use the *ModifySynchronizedSet()* method to modify a *SynchronizedSet* based on the specified operation type.

Parameters

The *ModifySynchronizedSet()* method belongs to the *IBMTSSVC_StorageConfigurationService* class. Table 239 on page 360 shows the parameters you can specify for the *ModifySynchronizedSet()* method.

Table 239. ModifySynchronizedSet() parameters

Parameter	Type	Description
Operation	UInt16	<p>Code Semantics</p> <p>0 Add. Add a synchronization to the set.</p> <p>1 Remove. Remove a synchronization from the set.</p> <p>2 Detach all. Delete all synchronizations in the set.</p> <p>3 Fracture replicas. Suspend the synchronization between two storage objects. The association and changes are remembered to allow a fast resynchronization. This can be used during a backup cycle to allow one of the objects to be copied while the other remains in production.</p> <p>4 Resync replicas. Re-establish the synchronizations of all replicas in the set. If CopyJob is Sync or Async, this will negate the action of a previous fracture operation.</p> <p>5 Restore from replica. Renew the contents of the original storage objects from the replicas.</p> <p>6 Prepare all. Prepare the participating volumes for a point-in-time copy.</p> <p>7 Unprepare all.</p> <p>8 Quiesce replicas.</p> <p>9 Unquiesce replicas.</p> <p>0x8000 Switch. Switch primary relationships.</p> <p>0x8001 Stop All. Stop copy mapping.</p>
[AllowAccess]	Boolean	If set to True, the target will be accessible for I/O after fracture of a sync copy. The default is False. The parameter is ignored for all operations except sync copy fracture.
[Clean]	Boolean	If set to True, the target is assumed to be clean (initialized with zeros), thus no initialize will be done before resync of a sync copy. The default is False. Ignored for all other operations except resync of a sync copy.

Table 239. *ModifySynchronizedSet()* parameters (continued)

Parameter	Type	Description
[Direction]	Boolean	If set to True, the master (SyncedSystemElement) will become the source of the sync copy relationship. If set to False, the auxiliary (SyncedElement) will become the source of the sync copy relationship. By default, the direction will be autonomically chosen (reverse on switch and keep on resync). Valid for switch and resync operation of sync copy only. Ignored in all other cases.
[Force]	Boolean	If set to True, the operation will be forced. The default is False. Applies only on resync and detach of FlashCopy mappings and resync of sync copy mappings. Ignored in all other cases.
Job	CIM_ConcreteJob REF	The object used to monitor and terminate the copy process.
[Synchronization]	CIM_Storage Synchronized REF	The copy mapping to be added to or removed from the set. Ignore for all other operations.
SynchronizedSet	CIM_Synchronized Set REF	The SynchronizedSet to be modified.

Return values

The `ModifySynchronizedSet()` method returns one of the following error codes:

- 0: The `SyncCopySynchronizedSet` was successfully created.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 6: The operation is not supported.
- 7: `StorageSynchronized` not in the set.
- 8: `StorageSynchronized` already in a set.
- 9: A `StorageSynchronized` should be added to the set that is not compatible to the set. For example, a `FlashCopy` synchronized to a sync sopy set.
- 0x1000: Method parameters checked. Job started.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x8001: An operation should be performed which is not allowed on the current `SyncState` of the set.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

PositionAtRecord()

You can use the `PositionAtRecord()` method to set the `SequenceNumber` and the `RelPos` token of the returned `IterationIdentifier`.

Parameters

The `PositionAtRecord()` method belongs to the `IBMTSSVC_MessageLog` class. Table 240 shows the parameters you can specify for the `PositionAtRecord()` method.

Table 240. `PositionAtRecord()` parameters

Parameter	Type	Description
<code>IterationIdentifier</code>	String	The new <code>IterationIdentifier</code> . The <code>SequenceNumber</code> and the <code>RelPos</code> token were modified according to the parameters that were passed in.
<code>[IterationIdentifier]</code>	String	The current <code>IterationIdentifier</code> (created by a previous position or method) or null.
<code>MoveAbsolute</code>	Boolean	Set to <code>TRUE</code> if the <code>IterationIdentifier</code> should be positioned absolutely. In this case the <code>SequenceNumber</code> is set to the value passed in <code>RecordNumber</code> .
<code>RecordNumber</code>	UInt64	If <code>MoveAbsolute == FALSE</code> : A (signed) offset to the current position in the log. If <code>MoveAbsolute == TRUE</code> : The absolute desired position in the log is the sequence number of the entry. It is not allowed to specify a negative value in <code>RecordNumber</code> . The <code>IterationIdentifier</code> 's <code>SequenceNumber</code> is set to this value. If the <code>RelPos</code> token was set in the <code>IterationIdentifier</code> that was passed in it is removed from the <code>IterationIdentifier</code> .

Return values

The `PositionAtRecord()` method returns the following error code:

- 0: The `IterationIdentifier` was successfully created.
- 5: One of the mandatory parameters is missing or `RecordNumber` is negative when not allowed.

PositionToFirstRecord()

You can use the `PositionToFirstRecord()` method to create an `IterationIdentifier` that points to the first entry in the log.

Parameters

The `IterationIdentifier` is used in subsequent `GetRecord` or `Position` calls.

The `PositionToFirstRecord()` method belongs to the `IBMTSSVC_MessageLog` class. Table 241 shows the parameters you can specify for the `PositionToFirstRecord()` method.

Table 241. `PositionToFirstRecord()` parameters

Parameter	Type	Description
<code>IterationIdentifier</code>	String	The <code>IterationIdentifier</code> which points to the first record.

Return values

The PositionToFirstRecord() method returns the following error code:

- 0: The IterationIdentifier was successfully created.

PositionToFirstRecordRoot()

You can use the PositionToFirstRecordRoot() method to create an IterationIdentifier whose SequenceNumber is not set and whose RootCause token is set to the value that is passed in.

Parameters

The IterationIdentifier is used in subsequent GetRecord or PositionAtRecord calls.

The PositionToFirstRecordRoot() method belongs to the IBMTSSVC_MessageLog class. Table 242 shows the parameters you can specify for the PositionToFirstRecordRoot() method.

Table 242. PositionToFirstRecordRoot() parameters

Parameter	Type	Description
Iteration Identifier	String	The IterationIdentifier that contains the root sequence number that was passed in the "RootCause" token.
RootSequence Number	UInt64	The object root cause id.

Return values

The PositionToFirstRecordRoot() method returns the following error code:

- 0: The IterationIdentifier was successfully created.
- 5: One of the mandatory parameters is missing.

PositionToFirstRecordType()

You can use the PositionToFirstRecordType() method to create an IterationIdentifier whose SequenceNumber token is not set and whose other parameters are set according to the parameters that were passed in.

Parameters

The IterationIdentifier is used in subsequent GetRecord or PositionAtRecord calls.

The PositionToFirstRecordType() method belongs to the IBMTSSVC_MessageLog class. Table 243 shows the parameters you can specify for the PositionToFirstRecordType() method.

Table 243. PositionToFirstRecordType() parameters

Parameter	Type	Description
ConfigOnly	Boolean	Is required to be false or not specified.
IterationIdentifier		The IterationIdentifier that was generated.
ObjectID	UInt64	The SAN Volume Controller object id. This parameter will be set to the LSObjID token of the IterationIdentifier.

Table 243. *PositionToFirstRecordType()* parameters (continued)

Parameter	Type	Description
ObjectType	String	The SAN Volume Controller object type. This parameter will be set to the LSObjType token of the IterationIdentifier.
UnfixedOnly	Boolean	Display only unfixed errors.

Return values

The *PositionToFirstRecordType()* method returns the following error code:

- 0: The *IterationIdentifier* was successfully created.

Reload2062Node()

You can use the *Reload2062Node()* method to enable a 2062 node that has been shut down.

Parameters

The *Reload2062Node()* method belongs to the *IBMTSSVC_Provider* class. Table 244 shows the parameters you can specify for the *Reload2062Node()* method.

Table 244. *Reload2062Node()* parameters

Parameter	Type	Description
Node	UInt8	The node on the 2062 blade that will be reset.
Password	String	The password required to log on to the switch.
Slot	UInt8	The slot of the 2062 blade where a node will be reset.
SwitchIP	String	The IP of the switch where the 2062 blade resides.
User	String	The user name required to log on to the switch.

Return values

The *Reload2062Node()* method returns one of the following error codes:

- 0: The method completed successfully.
- 2: The method failed.
- 5. The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.
- 0x8000: Connection to cluster refused.
- 0x8001: Syntax error in cluster name.
- 0x8002: Invalid node.
- 0x8003: Invalid user name or password.
- 0x8004: Syntax error in switch IP.
- 0x8005: Syntax error in cluster IP.
- 0x8006: Invalid slot.

RemoveAccess()

You can use the RemoveAccess() method to delete a temporary IBMTSSVC_AccessControllInformation instance and its associations.

Parameters

The RemoveAccess() method belongs to the IBMTSSVC_AuthorizationService class. Table 245 shows the parameters you can specify for the RemoveAccess() method.

Table 245. RemoveAccess() parameters

Parameter	Type	Description
Subject	CIM_ManagedElement REF	A reference to a ManagedElement instance (associated through AuthorizedSubject) for which privileges are to be revoked.
Privilege	CIM_AuthorizedPrivilege REF	A reference to the AuthorizedPrivilege that is to be revoked.
Target	CIM_ManagedElement REF	A reference to a ManagedElement (associated through AuthorizedTarget) which will no longer be protected through AuthorizedPrivilege.

Return values

The RemoveAccess() method returns one of the following error codes:

- 0: All instances were successfully deleted.
- 2: An unexpected error occurred.
- 3: Timeout.
- 4: Failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 6..15999: DMTF Reserved.
- 16000: Unsupported Privilege.
- 16001: Unsupported Target.
- 16002: Authorization Error.
- 16003: Null parameter not supported.
- 16004..32767: Method Reserved.
- 32768..65535: Vendor Specific.

RemoveCluster()

You can use the RemoveCluster() method to remove a SAN Volume Controller cluster from the ICAT configuration.

Parameters

The RemoveCluster() method belongs to the IBMTSSVC_Provider class. Table 246 on page 366 shows the parameters you can specify for the RemoveCluster() method.

Table 246. *RemoveCluster()* parameters

Parameter	Type	Description
ClusterIP	String	The IP of the cluster to be removed.

Return values

The `RemoveCluster()` method returns one of the following error codes:

- 0: The method completed successfully.
- 5. The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.

RequestDiscovery()

You can use the `RequestDiscovery()` method to initiate a rescan of the fibre-channel SAN to discover any new LUNs.

Parameters

The `RequestDiscovery()` method belongs to the `IBMTSSVC_StorageConfigurationService` class. Table 247 shows the parameters you can specify for the `RequestDiscovery()` method.

Table 247. *RequestDiscovery()* parameters

Parameter	Type	Description
DiscoveredElement Count	Uint32	The number of discovered LUNs (BackendVolumes).
DiscoveredElement Instances	String[]	String representations of the instances of the discovered LUNs (BackendVolumes).
DiscoveredElements	String[]	String representations of the COPs of the discovered LUNs (BackendVolumes).

Return values

The `RequestDiscovery()` method returns one of the following error codes:

- 0: Discovery successfully invoked.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

Reset2062Node()

You can use the `Reset2062Node()` method to remove the cached data for a cluster from a 2062 node.

Parameters

The `Reset2062Node()` method belongs to the `IBMTSSVC_Provider` class. Table 248 on page 367 shows the parameters you can specify for the `Reset2062Node()` method.

Table 248. *Reset2062Node()* parameters

Parameter	Type	Description
Node	Uint8	The node on the 2062 blade that is reset.
Password	String	The password required to log on to the switch.
Slot	Uint8	The slot of the 2062 blade where a node is reset.
SwitchIP	String	The IP of the switch where the 2062 blade resides.
User	String	The user name required to log on to the switch.

Return values

The `Reset2062Node()` method returns one of the following error codes:

- 0: The method completed successfully.
- 2: The method failed.
- 5: The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.
- 0x8000: Connection to cluster refused.
- 0x8001: Syntax error in cluster name.
- 0x8002: Invalid node.
- 0x8003: Invalid user name or password.
- 0x8004: Syntax error in switch IP.
- 0x8005: Syntax error in cluster IP.
- 0x8006: Invalid slot.

RestoreConfiguration()

You can use the `RestoreConfiguration()` command to run the configuration restore script.

Parameters

The script restores the current cluster configuration associated with the current instance of `ClusteringService`, from the corresponding cluster configuration backup.

Table 249 shows the parameters you can specify for the `RestoreConfiguration()` method.

Table 249. *RestoreConfiguration()* parameters

Parameter	Type	Description
Force	Boolean	True/False statement. If true, command continuation on non-severe errors/warnings is forced. False is the default.
Format	Boolean	True/False statement. If true, the vdisk is formatted during restore. False is the default.
Phase	Uint8	The phase to be performed. Any value other than 1 (prepare) or 2 (execute) will result in rc 5.

Table 249. *RestoreConfiguration()* parameters (continued)

Parameter	Type	Description
Messages	String[]	The errors/warnings received from the backup script.

Return values

The *RestoreConfiguration()* method returns one of the following error codes:

- 0: The backup was successful.
- 2: An unexpected error occurred and the command failed.
- 5: The number or type of passed parameters is incorrect.
- 0x8000: The specified backup was not found.
- 0x8001: The backup script returned with an error.
- 0x8002: The backup file upload via scp failed.
- 0x8003: The cluster's /tmp/dir is cleared of any backups before uploading the backup file. The command has failed.

ReturnToStoragePool()

You can use the *ReturnToStoragePool()* method to delete an *IBMTSSVC_StorageVolume* instance if it is not mapped to any host.

Parameters

The *ReturnToStoragePool()* method belongs to the *IBMTSSVC_StorageConfigurationService* class. Table 250 shows the parameters you can use for the *ReturnToStoragePool()* method.

Table 250. *ReturnToStoragePool()* parameters

Parameter	Type	Description
[Force]	Boolean	If set to True the, the volume will be deleted, ignoring the usual constraints (for example, if no LUN mapping exists for the volume). The default is False.
Job	CIM_ConcreteJob REF	Set to null.
TheElement	CIM_LogicalElement REF	The element to be returned to the pool. Must be a <i>StorageVolume</i> that belongs to the same cluster as the <i>StorageConfigurationService</i> .

Return values

The *ReturnToStoragePool()* method returns one of the following error codes:

- 0: The volume was successfully deleted.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: An unexpected error occurred.
- 5: At least one of the parameters was invalid.
- 6: The method is in use.

- 4096: Method parameters checked. Job started.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

SetDefaultValidity()

You can use this method to set the default validity to the number of days the certificate has been used.

Parameters

You must have administrator privileges to run this method.

Table 251 shows the parameters you can specify for the SetDefaultValidity() method.

Table 251. SetDefaultValidity() properties

Parameter	Type	Description
DefaultValidity	UInt32	The default validity in days.

Return values

The SetDefaultValidity() method returns one of the following error codes:

- 0: The validity was successfully set.
- 2: Failed to set validity.
- 5: One of the parameters is invalid.

SetIOGroup()

You can use the SetIOGroup() method to assign a StorageVolume to another I/O group.

Parameters

The SetIOGroup() method belongs to the IBMTSSVC_ControllerConfigurationService class. Table 252 shows the parameters you can specify for the SetIOGroup() method:

Table 252. SetIOGroup() parameters

Parameter	Type	Description
Force	Boolean	Set to True in order to move a Volume to or from the recovery I/O group.
Group	IBMTSSVC_IOGroup REF	The IOGroup to which to assign the StorageVolume.
Volume	IBMTSSVC_StorageVolume REF	The StorageVolume to move.

Return values

The SetIOGroup() method returns one of the following error codes:

- 0: The volume was successfully moved.
- 2: The action failed.

- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The I/O group must have the nodes aggregated.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

SetLocale()

You can use the SetLocale() method to define the locale of the specified cluster.

Parameters

The SetLocale() method belongs to the IBMTSSVC_Cluster class. Table 253 shows the parameters you can specify for the SetLocale() method.

Table 253. SetLocale() parameters

Parameter	Type	Description
Locale	Uint16	Sets the locale value of the named cluster. Valid values are US English, Simplified Chinese, Traditional Chinese, Japanese, Korean, French, German, Italian, Spanish, and Portuguese.

Return values

The SetLocale() method returns one of the following error codes:

- 0: The locale was set.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000 : The submitted locale was invalid (greater than 9).
- 0x9000 to 0x9FFF: SAN Volume Controller CLI return codes.

SetPasswords()

You can use the SetPasswords() method to set the passwords for the administrators and service personnel to access an IBMTSSVC_Cluster.

Parameters

The SetPasswords() method belongs to the IBMTSSVC_ClusteringService class. Table 254 shows the parameters you can specify for the SetPasswords() method.

Table 254. SetPasswords() parameters

Parameter	Type	Description
[AdminPW]	String	Changes the administrator's password to the cluster.
[ServicePW]	String	Changes the service personnel's password to the cluster.

Return values

The SetPasswords() method returns one of the following error codes:

- 0: The passwords were changed.
- 2: An unexpected error occurred.

- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

SetQuorum()

You can use the SetQuorum() method to identify an IBMTSSVC_BackendVolume as a quorum volume.

Parameters

The SetQuorum() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 255 shows the parameters you can specify for the SetQuorum() method.

Table 255. SetQuorum() parameters

Parameter	Type	Description
Volume	IBMTSSVC_BackendVolume REF	Defines the IBMTSSVC_BackendVolume as a quorum disk. Must belong to the same Cluster as the StorageConfigurationService.
QuorumID	Uint8	Specifies the ID of the quorum volume, 0, 1, or 2.

Return values

The SetQuorum() method returns one of the following error codes:

- 0: The quorum volume was established.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The quorum ID is a number greater than 2.
- 0x8100: The volume belongs to a different cluster than the StorageConfigurationService.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

SetTimeZone()

You can use the SetTimeZone() method to specify the time zone of an IBMTSSVC_Cluster instance.

Parameters

The SetTimeZone() method belongs to the IBMTSSVC_ClusteringService class. Table 256 shows the parameters you can specify for the SetTimeZone() method.

Table 256. SetTimeZone() parameters

Parameter	Type	Description
Zone	COP	Defines the name of the TimeZone to set through an IBMTSSVC_AvailableTimeZone association to the IBMTSSVC_ClusteringService instance.

Return values

The SetTimeZone() method returns one of the following error codes:

- 0: The time zone for the cluster was successfully set.

- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted time zone is not associated to the clustering service.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

StartStatisticsCollection()

You can use the StartStatisticsCollection() method to initiate the statistics collection for an IBMTSSVC_Cluster instance.

Parameters

The StartStatisticsCollection() method belongs to the IBMTSSVC_ClusteringService class. Table 257 shows the parameters you can specify for the StartStatisticsCollection() method.

Table 257. StartStatisticsCollection() parameters

Parameter	Type	Description
Interval	UInt32	Sets the time interval in minutes for gathering the statistics of the cluster.

Return values

The StartStatisticsCollection() method returns one of the following error codes:

- 0: The collection was started.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

StopStatisticsCollection()

You can use the StopStatisticsCollection() method to terminate the statistics collection about an IBMTSSVC_Cluster instance.

Return values

The StopStatisticsCollection() method belongs to the IBMTSSVC_ClusteringService class.

The StopStatisticsCollection() method returns one of the following error codes:

- 0: The collection was stopped.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

Shutdown()

You can use the Shutdown() method to shut down an IBMTSSVC_Node instance or an IBMTSSVC_Cluster instance.

Parameters

The Shutdown() method belongs to the IBMTSSVC_ClusteringService class. Table 258 on page 373 shows the parameters you can specify for the

Shutdown() method.

Table 258. Shutdown() parameters

Parameter	Type	Description
System	COP	Specifies the IBMTSSVC_Cluster or IBMTSSVC_Node to be shut down.
[Force]	Boolean	If set to True, shuts down the remaining online node of an IBMTSSVC_RedundancyGroup.

Return values

The Shutdown() method returns one of the following error codes:

- 0: The shutdown for the node or cluster was successfully initiated.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted computer system was not of type IBMTSSVC_Node or IBMTSSVC_Cluster.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

UnfixRecord()

You can use the UnfixRecord() method to undue a fix for one entry in the log. The entry is changed from fixed to not fixed.

Parameters

The UnfixRecord() method belongs to the IBMTSSVC_MessageLog class. Table 259 shows the parameters you can specify for the UnfixRecord() method.

Table 259. UnfixRecord() parameters

Parameter	Type	Description
RecordNumber	Uint64	Is passed to the CLI command in the -u parameter.

Return values

The UnfixRecord() method returns the following error codes:

- 0: The method successfully unfixes the entry.
- 2: A command failed.
- 5: One of the mandatory parameters is missing.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

Upgrade()

You can use the Upgrade() method to upgrade the software of one SAN Volume Controller node in service mode.

Parameters

The Upgrade() method belongs to the IBMTSSVC_ServiceModeService class. Table 260 shows the parameters you can specify for the Upgrade() method.

Table 260. Upgrade() parameters

Parameter	Type	Description
FilePath	String	The location where the new software is stored.
SMNode	IBMTSSVC_ServiceModeNode REF	Specifies the node that is in service mode that will be upgraded.

Return values

The Upgrade() method returns one of the following error codes:

- 0: The Upgrade() method was successful.
- 2: The Upgrade() method failed.
- 5: The wrong number or type of parameter has been passed.
- ...: DMTF reserved.
- 0x9000 to 0x9FFF: Device error codes.

WriteRecord()

The WriteRecord() method is an unsupported method that belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 261 shows the parameters you can specify for the WriteRecord() method.

Table 261. WriteRecord() parameters

Parameter	Type	Description
IterationIdentifier	String	
PositionToNext	Boolean	Boolean value that indicates the IterationIdentifier should be advanced to the next record after writing the Log entry.
RecordData	UInt8[]	
RecordNumber	UInt64	

Return values

The WriteRecord() method returns one of the following error codes:

- 0: The method completed successfully.
- 2: Unknown.
- 3: Timeout.
- 4: Failed.
- 5: The number or type of parameters that have been passed is incorrect.

Chapter 9. Return codes

The Common Information Model (CIM) return codes provide information on the status of ICAT operations.

Common information model

The following table is a condensed list of possible CIM return codes.

CIM return code	Description	Method	Explanation
0x0000	Success	GetFreeExtends() ListConfiguration Backups()	The parameters are fine. The method completed successfully.
		AddNode()	The node was successfully added.
		CheckValidity()	The information about the certificate was successfully obtained.
		DeleteAccount()	The account was successfully deleted.
		GenerateCIMOM Certificate() EnableAuto Generation() DisableAuto Generation()	The certificate was successfully deleted.
		CreateCode()	The new account was successfully created.
		SetDefault Validity()	The validity was successfully set.
		GrantGlobal Access() GrantSystem Access()	The role was successfully changed.
		CreateGatewayID() AddHardwareIDs ToCollection()	The collection was successfully created.
		DeleteStorage HardwareID()	The StorageHardwareID was successfully deleted.
CreateStorage HardwareID()	The StorageHardwareID was successfully created.		

CIM return code	Description	Method	Explanation
0x0000	Success (continued)	AttachDevice()	The volume was successfully attached.
		DeleteProtocolController()	The controller was successfully deleted.
		CreateProtocolControllerWithPorts()	A clone was successfully created.
		DeleteRemoteClusterPartnership()	The cluster partnership was successfully deleted.
		CreateRemoteClusterPartnership()	The cluster partnership was successfully established.
		DeleteHardwareIDCollection()	The collection was successfully created.
		DeleteCertificate()	The certificate was successfully deleted.
		DeleteSynchronizedSet()	The SynchronizedSet was successfully deleted.
		ModifySynchronisation()	The method was successfully run.
EvictNode()	The node was successfully evicted.		

CIM return code	Description	Method	Explanation
0x0000	Success (continued)	RestartService()	The CIMOM will reboot.
		Shutdown()	The shutdown for the node/cluster was successfully initiated.
		SetLocale()	The locale was set.
		SetTimezone()	The time zone for the cluster was successfully set.
		SetPasswords() ModifyReset Password ChangeFeature()	The passwords were changed.
		GetResetPassword ChangeFeature Status()	The feature status was successfully retrieved.
		StartStatistics Collection()	The statistics collection was started.
		DetachDevice()	The volume was successfully detached.
		StopStatistics Collection()	The statistics collection was stopped.
		Backup Configuration()	A backup was successfully created.
		Reload Configuration()	The configuration was reloaded.
		Restore Configuration() Delete Configuration Backup()	A restore was successfully made.
		AttachReplica()	The copy relationship was successfully established.
		CreateSynchronized Set()	The SynchronizedSet was successfully created.
SetPassword()	The password was successfully changed.		

CIM return code	Description	Method	Explanation
0x0000	Job completed with no error	CreateOrModifyStoragePool()	The pool was successfully created.
		CreateOrModifyElementFromStoragePool()	The volume was successfully created. The pool was successfully modified.
		DeleteStoragePool()	The pool was successfully deleted.
		ReturnToStoragePool()	The volume was successfully deleted.
		RequestDiscovery()	BackendVolume discovery was successful.
		SetIOGroup()	The change was successful.
		SetQuorum()	The method was successful.
		IncludeBackendVolume()	The volume was successfully included.
		ModifySynchronizedSet()	The CLI command was successfully run.
0x0000	Job started successfully	MigrateVolume() MigrateVolumeToImageMode()	The migration job was started.
0x0001	Not supported	SetLocales()	The cluster does not support locales.
		SetPasswords()	The cluster does not support password change (CISCO).
		ModifyResetPasswordChangeFeature() GetResetPasswordChangeFeatureStatus()	The cluster does not support the reset password change feature.
		Upgrade()	The method was called on a 2145's Cluster Configuration Service.

CIM return code	Description	Method	Explanation
0x0002	Failed	Dump() Clean() Enter() Exit() Clean() GetDump() ClearLog() GetRecord() GetAllRecords() FixRecord() UnfixRecord() ModifyError Settings() Create2062 Cluster()	An unexpected error occurred. A CLI command failed.
		GetDump()	Failure during command processing. The file was not found.
		Reload Configuration()	Failed to reload the configuration.
		CreateCode()	Failed to create the account.
		GrantGlobal Access() GrantSystem Access()	Failed to change the role.
		SetPassword()	Failed to change the password.
		DeleteAccount()	Failed to delete the account.
0x0002	Unknown error	GenerateCIMOM Certificate() DeleteCertificate()	Failed to generate new certificate due to provider internal reasons.
		EnableAuto Generation() DisableAuto Generation()	Failed due to provider internal reasons.
		SetDefault Validity()	Failed to set validity.
		CheckValidity()	Failed to obtain information on certificate.
0x0004	Failed	GenerateCIMOM Certificate() DeleteCertificate()	Unexpected error occurred. Failed to generate new certificate due to truststore problems.

CIM return code	Description	Method	Explanation
0x0005	Wrong Parameter Set	Delete Configuration Backup()	The wrong number or type of parameters were passed. The given backup could not be found.
		Modify Synchronisation()	The wrong number or type of parameters were passed or other parameter checking failed.
		CreateCode() GrantGlobal Access() SetPassword() GrantSystem Access() DeleteAccount() DeleteCertificate() SetDefault Validity() CheckValidity()	One of the parameters is invalid.
0x0005	Invalid Parameter	Dump(), GetDump() PositionToFirst RecordRoot() GetRecord() FixRecord() UnfixRecord()	One of the mandatory parameters is missing.
		ModifyIP Address() Create2062 Cluster() Add2062Cluster() Add2145Cluster() Reset2062Node() Reload2062Node()	One of the mandatory parameters is missing or invalid.
		CreateOrModify StoragePool() CreateOrModify ElementFrom StoragePool() Delete StoragePool() ReturnTo StoragePool()	At least one of the parameters is invalid.
		CreateGatewayID() GenerateCIMOM Certificate()	One of the parameters was invalid.
		PositionAtRecord()	One of the mandatory parameters is missing or having a negative RecordNumber is not allowed.

CIM return code	Description	Method	Explanation
0x0006	CopyType not supported	ModifySynchronized Set()	A CopyType different from 3 or 4 was passed in.
0x0006	Operation not supported	ModifySynchronized Set()	The operation code submitted is not valid for the CopyType of the SynchronizedSet.
0x0006	SynchronizedSet is not empty	DeleteSynchronized Set()	There are still StorageSynchronized associations in the set. All StorageSynchronized associations have to be removed before deletion of the set can be run or the Force flag has to be set.
0x0006	User ID already exists	CreateCode()	The user id you submitted is used in an already existing account.
0x0006	In use	GenerateCIMOM Certificate()	Failed to generate new certificate. Existing certificate is still valid and in use.
0x0007	StorageSynchronized not in the Set		The Storage Synchronized does not exist in the set.
0x0008	StorageSynchronized already in the Set		The Storage Synchronized already exists in the set and cannot be added.
0x0009	StorageSynchronized incompatible with Set		The Storage Synchronized is not compatible with the Set. E.g. a Flash Copy synchronized to a Sync Copy set.
0x1000	Parameters checked – Job started		The CLI copy command was run and a job object was returned.
0x1000	LogicalDevices associated to other ProtocolControllers not deleted	DeleteProtocol Controller()	At least one of the attached StorageVolumes is attached to another Controller so it cannot be deleted.
0x1000	Invalid LogicalDevice instance	AttachDevice()	The device is not a volume of the controller's RedundancyGroup.

CIM return code	Description	Method	Explanation
0x1000	LogicalDevice not associated to Controller	DetachDevice()	The device has no Protocol ControllerFor Unit association to this controller.
0x1000	ID already created	CreateStorage HardwareID()	The WWPN is already assigned to an existing Storage HardwareID.
0x1000	Specified instance not found	DeleteStorage HardwareID()	The Storage HardwareID could not be found.
0x1000	Invalid HardwareID instance	CreateGateway ID() AddHardwareIDs ToCollection()	The Storage HardwareID could not be found or is already a member of another collection.
0x1001	Size not supported	CreateOrModify ElementFrom StoragePool()	The requested size is not supported by the primordial pools. The size parameter contains the nearest supported size bigger than the requested one. The size requested was not a multiple of 512. The nearest supported size requested size is returned in size.
0x1001	Device Number Conflict	AttachDevice()	The specified device number is already occupied.
0x1001	Hardware implementation does not support specified IDType	CreateStorage HardwareID()	IDType is different from 2.
0x8000	Invalid ComputerSystem	AddNode()	The submitted ComputerSystem was not a IBMTSSVC_CandidateNode.
		EvictNode()	The submitted ComputerSystem was not a IBMTSSVC_Node.
		Shutdown()	The submitted ComputerSystem was not a IBMTSSVC_Node of IBMTSSVC_Cluster.
0x8000	Invalid Locale	SetLocale()	The submitted Locale was greater than 9.
0x8000	Invalid Type	Dump()	A type greater than 2 was passed in.

CIM return code	Description	Method	Explanation
0x8000	Connection refused	GetDump()	We lost connection to the cluster or failed to connect to a node (CISCO only).
0x8000	Backup not found	Restore Configuration()	The specified backup was not found.
0x8000	Delete failed	Delete Configuration Backup()	The deletion of the backup directory failed. The failure might have been caused by a sharing violation.
0x8000	IOGroup must have Nodes aggregated	SetIOGroup()	The IOGroup does not have any nodes.
0x8000	Invalid ID	SetQuorum()	The QuorumID is a number greater than 2.
0x8000	Invalid Volume	IncludeBackend Volume()	The volume is not expelled.
0x8000	CopyType not supported	AttachReplica()	A Copytype different from 2 or 3 was passed in.
		CreateReplica()	A CopyType different from 3 or 4 was passed in.
0x8000	Ports are from multiple IOGroups	CreateProtocol ControllerWith Ports()	All ports are required to belong to the same IOGroup.
0x8000	HardwareID still bound to AuthorizationSubject. Force required	DeleteStorage HardwareID()	The HardwareID has access granted to a StorageVolume and Force was not specified.
0x8000	Host is member of a LUN mapping	DeleteHardware IDCollection()	In order to delete the host either call RemoveAccess with this host, each privilege and the controller this host is associated to or set "Force" equal to "true."
0x8000	Record(s) not found	GetRecord() GetAllRecords()	
0x8000	Cannot connect to cluster	Create2062 Cluster() Add2062 Cluster()	
0x8000	Connection to cluster refused	Add2145Cluster()	
0x8000	Connection to switch refused	Reset2062Node() Reload2062Node()	

CIM return code	Description	Method	Explanation
0x8000	Cluster IP not found	RemoveCluster()	
0x8001	Maximum number of Nodes for Cluster exceeded	AddNode()	All IOGroups already have two nodes assigned to them.
0x8001	Invalid Prefix	Dump()	A file prefix and feature log type were passed in at the same time.
0x8001	File not found	GetDump()	The given file path was not found (CISCO).
0x8001	Backup script failed	Backup Configuration()	The backup script returned with an error.
0x8001	Restore script failed	Restore Configuration()	The backup script returned with an error.
0x8001	Operation not allowed for current state	Modify Configuration()	The operation submitted is not allowed in the current state of the Storage Synchronized. For example, you cannot have a "prepare" operation on a StorageSynchronized in "synchronized" state.
0x8001	Operation not allowed for current SyncState	Modify Synchronized Set()	The operation is not allowed with current SyncState of the set.
0x8001	Unsupported protocol	CreateProtocol ControllerWith Ports()	Protocol != 2.
0x8001	Syntax error in ClusterName	Create2062 Cluster() Add2062Cluster() Reset2062Node() Reload2062Node()	
0x8002	Invalid ExtraCapacitySet	AddNode()	The submitted ExtraCapacitySet was not a IBMTSSVC_ IOGroupSet.
0x8002	Secure copy failed	Backup Configuration()	The download of the backup file using secure copy failed.
0x8002	Secure copy failed	Upload Configuration()	The upload of the backup file using secure copy failed.
		CreateStorage HardwareID()	ElementName and setting are required to be null.

CIM return code	Description	Method	Explanation
0x8002	Syntax error in Node or Node is invalid	Create2062Cluster() Add2062Cluster() Reset2062Node() Reload2062Node()	
0x8003	Maximum number of Nodes for IOGroup exceeded	AddNode()	The submitted IOGroupSet already has two nodes assigned to it.
0x8003	Creation of backup dir failed	Backup Configuration()	The backup directory could not be created.
0x8003	Clear command failed	Upload Configuration()	The cluster's /tmp/ directory could not be cleared.
0x8003	Invalid username or password (only ResetNode)	Add2062Cluster() Reset2062Node() Reload2062Node()	
0x8004	Delete/rename of old backup files failed		The backup directory could not be renamed or deleted.
0x8004	Wrong SwitchIP / can't connect to switch	Create2062Cluster() Add2062Cluster()	
0x8004	SwitchIP is not configured	Reset2062Node() Reload2062Node()	
0x8005	Syntax error in ClusterIP		
0x8006	Invalid Slot		
0x8007	Cannot upload public key to switch		
0x8100	Cluster Scope Violation		One or more parameters were out of the cluster scope.
0x8200			The method was run successfully but one or more parameters were ignored.

Common information model and command line interface

The following table is a condensed list of CIM return codes and their corresponding SAN Volume Controller Command-Line Interface (CLI) error codes.

CIM return code	SAN Volume Controller CLI error code	Description
0x9001	CMMVC5700E	The parameter list is not valid.
0x9002	CMMVC5701E	No object ID was specified.
0x9003	CMMVC5702E	[%1] is below the minimum level.
0x9004	CMMVC5703E	[%1] is above the maximum level.

CIM return code	SAN Volume Controller CLI error code	Description
0x9005	CMMVC5704E	[%1] is not divisible by the permitted step level.
0x9006	CMMVC5705E	A required parameter is missing.
0x9007	CMMVC5706E	[%1] is not a valid argument for the -x parameter.
0x9008	CMMVC5707E	Required parameters are missing.
0x9009	CMMVC5708E	The %1 parameter is missing its associated arguments.
0x900A	CMMVC5709E	[%1] is not a supported parameter.
0x900B	CMMVC5710E	No self describing structure for identifier parameter [%1].
0x900C	CMMVC5711E	[%1] is not valid data.
0x900D	CMMVC5712E	Required data is missing.
0x900E	CMMVC5713E	Some parameters are mutually exclusive.
0x900F	CMMVC5714E	There are no items in the parameter list.
0x9010	CMMVC5715E	There is no parameter list.
0x9011	CMMVC5716E	Nonnumeric data was entered for a numeric field ([%1]). Enter a numeric value.
0x9012	CMMVC5717E	No match was found for the specified unit.
0x9013	CMMVC5718E	An unexpected return code was received.
0x9014	CMMVC5719E	A value of %2 requires the parameter %1 to be specified.
0x9015	CMMVC5720E	[%1] is not a valid argument for the -o parameter.
0x9016	CMMVC5721E	[%1] is not a valid time-stamp format. The valid format is MMDDHHmmYY.
0x9017	CMMVC5722E	[%1] is not a valid month.
0x9018	CMMVC5723E	[%1] is not a valid day.
0x9019	CMMVC5724E	[%1] is not a valid hour.
0x901A	CMMVC5725E	[%1] is not a valid minute.
0x901B	CMMVC5726E	[%1] are not valid seconds.
0x901C	CMMVC5727E	[%1] is not a valid filter.
0x901D	CMMVC5728E	[%1] must be in the format minute:hour:day:month:weekday.
0x901E	CMMVC5729E	One or more components in the list are not valid.
0x901F	CMMVC5730E	%1 is only valid when %2 has a value of %3.
0x9020	CMMVC5731E	%1 can only be entered when %2 has been entered.

CIM return code	SAN Volume Controller CLI error code	Description
0x9021	CMMVC5732E	The shared memory interface (SMI) is not available.
0x9022	CMMVC5733E	Enter at least one parameter.
0x9023	CMMVC5734E	A combination of values was entered that is not valid.
0x9024	CMMVC5735E	The name entered is not valid.
0x9025	CMMVC5736E	-c is not a valid unit.
0x9026	CMMVC5737E	The parameter %1 has been entered multiple times. Enter the parameter once.
0x9027	CMMVC5738E	The argument %1 contains too many letters.
0x9028	CMMVC5739E	The argument %1 does not contain enough letters.
0x9029	CMMVC5740E	The filter flag %1 is not valid.
0x902A	CMMVC5741E	The filter value %1 is not valid.
0x903A	CMMVC5987E	%1 is not a valid command line option.
0x903B	CMMVC6007E	The two passwords that were entered do not match.
0x903C	CMMVC6009E	Unable to malloc a block of memory to copy the returned data.
0x9101	CMMVC5742E	AE_ParamOutOfRange. A parameter specified is out of range.
0x9102	CMMVC5743E	AE_ParamNotInStep. A parameter specified does not comply with the step value.
0x9103	CMMVC5744E	AE_TooManyCandidates. Too many objects were specified in the request.
0x9104	CMMVC5745E	AE_TooFewCandidates. Too few objects were specified in the request.
0x9105	CMMVC5746E	AE_InvalidObjectType. The requested operation cannot be applied to the object specified.
0x9106	CMMVC5747E	AE_InvalidRequestId. The action requested is invalid - internal error.
0x9107	CMMVC5748E	AE_NotSupportedYet. The action requested is invalid - internal error.
0x9108	CMMVC5749E	AE_DumpFileExists. The dump filename specified already exists.
0x9109	CMMVC5750E	AE_DumpFileCreateError. Could not create the dump file - filesystem probably full.
0x910A	CMMVC5751E	AE_DumpFileWriteError. Could not write to the dump file.
0x910B	CMMVC5752E	AE_ObjectNotEmpty. Request failed, the object contains child objects. You must delete the child objects first.

CIM return code	SAN Volume Controller CLI error code	Description
0x910C	CMMVC5753E	AE_InvalidObject. The object specified does not exist or is not a suitable candidate.
0x910D	CMMVC5754E	AE_InvalidObjectName. The object specified does not exist, or the name supplied does not meet the naming rules.
0x910E	CMMVC5755E	AE_SizeMismatch. Cannot create because the sizes of the specified objects do not match.
0x910F	CMMVC5756E	AE_ObjectMapped. Cannot perform the request as the object is already mapped.
0x9110	CMMVC5757E	AE_NoSDSdefaults.SDS defaults not found - internal error.
0x9111	CMMVC5758E	AE_NameExists. Object name already exists.
0x9112	CMMVC5759E	AE_MemoryAllocationFailed. Cannot allocate memory - internal error.
0x9113	CMMVC5760E	AE_AddNodeCallFailed. Failed to add the node to the cluster member list.
0x9114	CMMVC5761E	AE_DeleteNodeCallFailed. Failed to delete the node from the cluster member list.
0x9115	CMMVC5762E	AE_ClusterTimerExpired. The request did not complete before the timeout period expired.
0x9116	CMMVC5763E	AE_NodeUnpendFailed. The node failed to go online.
0x9117	CMMVC5764E	AE_InvalidModeChange. The mode change requested is invalid - internal error.
0x9118	CMMVC5765E	AE_NoMatchingCandidate. The object selected is no longer a candidate - a change occurred during the request.
0x9119	CMMVC5766E	AE_NoAssociations.
0x911A	CMMVC5767E	AE_InvalidParams. One or more of the parameters specified are invalid.
0x911B	CMMVC5768E	AE_UnfixedErrorsExist. Not used.
0x911C	CMMVC5769E	AE_NotAllNodesOnline. The requested operation requires all nodes to be online – one or more nodes are not online.
0x911D	CMMVC5770E	AE_InvalidSSHKeyFile. The ssh key file supplied is invalid.
0x911E	CMMVC5771E	AE_ForceRequired. The operation requested could not complete. This usually occurs when a child object exists. To force the operation, specify the force flag.

CIM return code	SAN Volume Controller CLI error code	Description
0x911F	CMMVC5772E	AE_SoftwareUpgradeInProgress. The operation requested could not be performed because software upgrade is in progress.
0x9120	CMMVC5773E	AE_InvalidMode. The object selected is in the wrong mode to perform the requested operation.
0x9121	CMMVC5774E	AE_InvalidSSHUserId. The user ID supplied is not valid.
0x9122	CMMVC5775E	AE_InvalidDirectory. The directory attribute specified is not valid.
0x9123	CMMVC5776E	AE_DirectoryListingFailed. The directory listing could not be retrieved.
0x9124	CMMVC5777E	AE_IncorrectPowerDomain. The node could not be added to the IO Group because the other node in the IO Group is in the same power domain.
0x9125	CMMVC5778E	AE_ClusterAlreadyCreated. Cannot create another cluster because a cluster already exists.
0x9126	CMMVC5779E	AE_TooManyClustersExistAlready.
0x9127	CMMVC5780E	AE_ClusterIDCannotBeDeleted.
0x9128	CMMVC5781E	AE_InvalidClusterID. The cluster id specified is invalid.
0x9129	CMMVC5782E	AE_ObjectOffline. The object specified is offline.
0x912A	CMMVC5783E	AE_InformationNotAvailable
0x912B	CMMVC5784E	AE_ClusterNameNotUniqueUsed. The cluster name specified is not unique. You must specify the cluster using the cluster id.
0x912C	CMMVC5785E	AE_IllegalCharacterInFilename. The filename specified contains an illegal character.

Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Features

These are the major accessibility features in the SAN Volume Controller master console:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen. The following screen readers have been tested: JAWS v4.5 and IBM Home Page Reader v3.0.
- You can operate all features using the keyboard instead of the mouse.

Navigating by keyboard

You can use keys or key combinations to perform operations and initiate many menu actions that can also be done through mouse actions. You can navigate the SAN Volume Controller Console and help system from the keyboard by using the following key combinations:

- To traverse to the next link, button, or topic, press Tab inside a frame (page).
- To expand or collapse a tree node, press → or ←, respectively.
- To move to the next topic node, press V or Tab.
- To move to the previous topic node, press ^ or Shift+Tab.
- To scroll all the way up or down, press Home or End, respectively.
- To go back, press Alt+←.
- To go forward, press Alt+→.
- To go to the next frame, press Ctrl+Tab.
- To move to the previous frame, press Shift+Ctrl+Tab.
- To print the current page or active frame, press Ctrl+P.
- To select, press Enter.

Accessing the publications

You can view the publications for the SAN Volume Controller in Adobe Portable Document Format (PDF) using the Adobe Acrobat Reader. The PDFs are provided on a CD that is packaged with the product or you can access them at the following Web site:

<http://www-1.ibm.com/servers/storage/support/virtual/2145.html>

Related reference

“SAN Volume Controller library and related publications” on page xxi

A list of other publications that are related to this product are provided to you for your reference.

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Glossary

Glossary of terms used in the CIM Agent Developer's Reference Guide.

A

association

A class that contains two references that define a relationship between two referenced objects.

agent code

An open-systems standard that interprets Common Information Model (CIM) requests and responses as they transfer between the client application and the device.

C

CIM See *Common Information Model*.

CIMOM

See *CIM object manager*.

Common Information Model (CIM)

A set of standards developed by the Distributed Management Task Force (DMTF). CIM provides a conceptual framework for storage management and an open approach to the design and implementation of storage systems, applications, databases, networks, and devices.

class The definition of an object within a specific hierarchy. A class can have properties and methods and can serve as the target of an association.

client application

A storage management program that initiates Common Information Model (CIM) requests to the CIM agent for the device.

CIMOM

See *CIM object manager*.

CIM object manager (CIMOM)

The common conceptual framework for data management that receives, validates, and authenticates the CIM requests from the client application. It then directs the requests to the appropriate component or service provider.

D

device provider

A device-specific handler that serves as a plug-in for the Common Information Model (CIM); that is, the CIM object manager (CIMOM) uses the handler to interface with the device.

device

- In the CIM Agent, the storage server that processes and hosts client application requests.
- IBM definition: A piece of equipment that is used with the computer and does not generally interact directly with the system, but is controlled by a controller.
- HP definition: In its physical form, a magnetic disk that can be attached to a SCSI bus. The term is also used to indicate a physical device that has been made part of a controller configuration; that is, a physical

device that is known to the controller. Units (virtual disks) can be created from devices after the devices have been made known to the controller.

I

indication

An object representation of an event.

instance

An individual object that is a member of some class. In object-oriented programming, an object is created by instantiating a class.

M

method

A way to implement a function on a class.

N

namespace

The scope within which a Common Information Model (CIM) schema applies.

O

object In object-oriented design or programming, a concrete realization of a class that consists of data and the operations associated with that data.

object model

A representation, such as a diagram, of objects in a given system. Using symbols similar to standard flowchart symbols, an object model depicts the classes the objects belong to, their associations with each other, the attributes that make them unique, and the operations that the objects can perform and that can be performed on them.

object name

An object that consists of a namespace path and a model path. The namespace path provides access to the Common Information Model (CIM) implementation managed by the CIM Agent, and the model path provides navigation within the implementation.

P

property

In the Common Information Model (CIM), an attribute that is used to characterize instances of a class.

Q

qualifier

A value that provides additional information about a class, association, indication, method, method parameter, instance, property, or reference.

R

reference

A pointer to another instance that defines the role and scope of an object in an association.

S

SMI-S See *Storage Management Initiative Specification*.

Storage Management Initiative Specification (SMI-S)

A design specification developed by the Storage Networking Industry Association (SNIA) that specifies a secure and reliable interface that allows storage management systems to identify, classify, monitor, and control physical and logical resources in a storage area network. The interface is intended as a solution that integrates the various devices to be managed in a storage area network (SAN) and the tools used to manage them.

Service Location Protocol (SLP)

In the Internet suite of protocols, a protocol that identifies and uses network hosts without having to designate a specific network host name.

schema

A group of object classes defined for and applicable to a single namespace. Within the CIM Agent, the supported schemas are the ones that are loaded through the managed object format (MOF).

W

WBEM

See *Web-Based Enterprise Management*.

Web-Based Enterprise Management (WBEM)

A tiered, enterprise-management architecture that was developed by the Distributed Management Task Force (DMTF). This architecture provides the management design framework that consists of devices, device providers, the object manager, and the messaging protocol for the communication between client applications and the object manager.

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