

IBM TotalStorage
SAN Volume Controller



CIM Agent Developer's Reference

Version 1.2.0

IBM TotalStorage
SAN Volume Controller



CIM Agent Developer's Reference

Version 1.2.0

Note

Before using this information and the product it supports, read the information in "Notices" on page 345.

Fourth Edition (October 2004)

© Copyright International Business Machines Corporation 2003, 2004. All rights reserved.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Figures	ix
Tables	xi
About this book	xvii
What's in this book?	xvii
Who should use this book?	xvii
Emphasis	xvii
Related publications.	xvii
How to order IBM publications	xix
Related Web sites	xx
How to send your comments	xx
Summary of changes.	xx
Summary of changes for GC26-7545-01 SAN Volume Controller CIM Agent's Reference Guide Release 1.2.0	xx
Chapter 1. Introduction	1
Storage Management Initiative Specification	1
Common Information Model	2
Common Information Model-related concepts	2
CIM agent	3
SAN Volume Controller	4
Common Information Model Agent for the SAN Volume Controller	7
Functional views of the Common Information Model Agent	8
Profile Overview	9
Physical Package	9
Server Profile	10
Extent mapping subprofile	11
ExtraCapacitySet subprofile	12
Access point subprofile	13
Cluster subprofile	14
Vendor-specific Storage configuration operations	15
LUN masking	16
LUN creation subprofile.	17
Copy services	18
Vendor specific service mode subprofile.	19
Vendor-specific cluster operations	20
Security service	21
Pool Manipulation	22
Chapter 2. Performing storage configuration	25
Storage configuration	25
Performing basic storage configuration	25
Adding a candidate node to a cluster.	26
Creating a new storage pool	26
Modifying a storage pool	27
Creating a new storage volume	27
Chapter 3. Performing Copy Services	29
Copy Services	29
Creating a new FlashCopy relationship between storage volumes	29
Creating a FlashCopy relationship for a synchronized set	30
Creating a synchronous copy relationship between volumes in the same cluster	31

Creating a synchronous copy relationship between volumes in different clusters	32
Flash Copy state diagram	33
Sync Copy state diagram	34
Chapter 4. Performing LUN masking	37
LUN masking	37
Performing LUN masking	37
Chapter 5. CIM Agent object classes	39
Core object classes	39
IBMTSSVC_BackendController	39
IBMTSSVC_BackendVolume	46
IBMTSSVC_CandidateCluster	58
IBMTSSVC_CandidateNode	59
IBMTSSVC_CandidateStorageHardwareID	65
IBMTSSVC_CandidateVolume	67
IBMTSSVC_Chassis	68
IBMTSSVC_Cluster	76
IBMTSSVC_Controller	85
IBMTSSVC_ControllerConfigurationService	94
IBMTSSVC_ControllerMaskingCapabilities	97
IBMTSSVC_Dumps	99
IBMTSSVC_FCPort	100
IBMTSSVC_Features	112
IBMTSSVC_FlashCopySynchronizedSet	113
IBMTSSVC_HardwareIDCollection	114
IBMTSSVC_IOGroup	116
IBMTSSVC_IOGroupSet	122
IBMTSSVC_Job	123
IBMTSSVC_MessageLog	128
IBMTSSVC_Node	136
IBMTSSVC_NodeVPD	141
IBMTSSVC_PrimordialStoragePool	142
IBMTSSVC_Privilege	144
IBMTSSVC_Product	146
IBMTSSVC_Provider	147
IBMTSSVC_RegisteredProfile	151
IBMTSSVC_RegisteredSubProfile	154
IBMTSSVC_RemoteCluster	157
IBMTSSVC_RemoteServiceAccessPoint	159
IBMTSSVC_RemoteVolume	165
IBMTSSVC_StorageCapabilities	166
IBMTSSVC_StorageConfigurationCapabilities	169
IBMTSSVC_StorageHardwareID	173
IBMTSSVC_StoragePool	174
IBMTSSVC_StorageSetting	178
IBMTSSVC_StorageVolume	181
IBMTSSVC_SyncCopySynchronizedSet	195
Service object classes	197
IBMTSSVC_ClusteringService	197
IBMTSSVC_PrivilegeManagementService	201
IBMTSSVC_StorageConfigurationService	205
IBMTSSVC_StorageHardwareIDManagementService	208
Security object classes	212
IBMTS_Account	213
IBMTS_AccountManagementService	216

	IBMTS_CIMXMLCommunicationMechanism	219
	IBMTS_IndicationFilter	224
	IBMTS_NameSpace	225
	IBMTS_ObjectManager	227
	IBMTS_RegisteredProfile	231
	IBMTS_System	232
	Association object classes	235
	IBMTSSVC_AllocatedFromStoragePool	235
	IBMTSSVC_AuthorizedCollection	236
	IBMTSSVC_AuthorizedStorageHardwareID	236
	IBMTSSVC_AuthorizedSubject	237
	IBMTSSVC_AuthorizedTarget	237
	IBMTSSVC_AvailableHardwareID	237
	IBMTSSVC_BackendControllerForVolume	238
	IBMTSSVC_BasedOn	238
	IBMTSSVC_ClusterController	239
	IBMTSSVC_ClusterDumps	239
	IBMTSSVC_ClusteringCandidate	240
	IBMTSSVC_ClusteringServiceForSystem	240
	IBMTSSVC_ClusterMaskingCapabilities	241
	IBMTSSVC_ClusterPort	241
	IBMTSSVC_ClusterScopeCandidateVolume	241
	IBMTSSVC_ClusterScopeChassis	242
	IBMTSSVC_ClusterScopeFCSet	242
	IBMTSSVC_ClusterScopeIOGroup	242
	IBMTSSVC_ClusterScopeNodeVPD	243
	IBMTSSVC_ClusterScopePrivilege	243
	IBMTSSVC_ClusterScopeProduct	243
	IBMTSSVC_ClusterScopeSCSet	243
	IBMTSSVC_ClusterVolume	244
	IBMTSSVC_ComponentCS	244
	IBMTSSVC_ComputerSystemPackage	244
	IBMTSSVC_ConnectedBackendController	245
	IBMTSSVC_ControllerConfigurationServiceForSystem	245
	IBMTSSVC_ControllerConfServiceMaskingCapabilities	246
	IBMTSSVC_CopyCandidate	246
	IBMTSSVC_ElementConformsToProfile	246
	IBMTSSVC_FlashCopyStorageSynchronized	247
	IBMTSSVC_FlashCopySynchronizedMember	249
	IBMTSSVC_HardwareIDOnSystem	249
	IBMTSSVC_HostedAccessPoint	250
	IBMTSSVC_HostedJob	250
	IBMTSSVC_HostedPrimordialPool	250
	IBMTSSVC_HostedStoragePool	251
	IBMTSSVC_HwIDCollectionOnSystem	251
	IBMTSSVC_IndicationFiltersConformsToProfile	251
	IBMTSSVC_IndicationFiltersConformsToSubProfile	252
	IBMTSSVC_IOGroupIdentity	252
	IBMTSSVC_IOGroupPort	252
	IBMTSSVC_ManagesCollection	253
	IBMTSSVC_ManagesController	253
	IBMTSSVC_ManagesHardwareID	253
	IBMTSSVC_ManagesPrivilege	254
	IBMTSSVC_MemberOfCollection	254
	IBMTSSVC_MemberOfIOGroup	254
	IBMTSSVC_NodeDumps	255

	IBMTSSVC_PartnershipCandidate	256
	IBMTSSVC_PoolCapabilities	256
	IBMTSSVC_PrimalPoolCapabilities	256
	IBMTSSVC_PrimalPoolComponent	256
	IBMTSSVC_PrimalPoolForController	257
	IBMTSSVC_PrivilegeServiceForSystem	257
	IBMTSSVC_ProductPhysicalComponent	257
	IBMTSSVC_ProtocolControllerForPort	258
	IBMTSSVC_ProtocolControllerForUnit	259
	IBMTSSVC_ProviderInObjectManager	260
	IBMTSSVC_RemotePartnership	260
	IBMTSSVC_RemoteSystemVolume	261
	IBMTSSVC_RequiresProfile	261
	IBMTSSVC_SAPAvailableForElement	261
	IBMTSSVC_StorageConfigurationServiceCapabilities	262
	IBMTSSVC_StorageConfigurationServiceForSystem	262
	IBMTSSVC_StorageHardwareIDManagementServiceForSystem	262
	IBMTSSVC_StoragePoolComponent	263
	IBMTSSVC_SyncCopyStorageSynchronized	263
	IBMTSSVC_SyncCopySynchronizedMember	266
	IBMTSSVC_SystemBackendVolume	267
	IBMTSSVC_SystemCandidateVolume	267
	IBMTSSVC_SystemController	267
	IBMTSSVC_SystemFCPort	268
	IBMTSSVC_SystemFeatures	268
	IBMTSSVC_SystemVolume	268
	IBMTSSVC_SystemVPD	269
	IBMTSSVC_UseOfMessageLog	269
	IBMTSSVC_VolumeSettingData	270
	IBMTSSVC_AccountManagementServiceForSystem	271
	IBMTS_AccountOnCIMOM	271
	IBMTS_AccountOnSystem	272
	IBMTS_CommMechanismForManager	272
	IBMTS_ElementConformsToProfile	273
	IBMTS_HostedAccessPoint	273
	IBMTS_HostedService	274
	IBMTS_IndicationFiltersConformsToProfile	274
	IBMTS_ManagesAccount	274
	IBMTS_NamespaceInManager	275

	Chapter 6. CIM Agent methods	277
	Intrinsic methods.	277
	Associators()	277
	AssociatorNames()	278
	CreateInstance()	279
	DeleteInstance()	280
	EnumerateClasses()	280
	EnumerateClassNames().	281
	EnumerateInstances()	281
	EnumerateInstanceNames().	282
	ExecQuery()	283
	GetClass()	283
	GetInstance()	284
	GetProperty()	284
	ModifyInstance()	285
	References()	285

	ReferenceNames()	286
	SetProperty()	287
	Extrinsic methods	287
	Add2062Cluster()	290
	Add2145Cluster()	290
	AddHardwareIDsToCollection()	291
	AddNode()	292
	AssignAccess()	293
	AttachDevice()	294
	AttachReplica()	295
	BackupConfiguration()	296
	CancelIteration()	296
	Clean()	297
	ClearLog()	298
	Create2062Cluster()	298
	CreateHardwareIDCollection()	299
	CreateOrModifyStoragePool()	300
	CreateOrModifyElementFromStoragePool()	302
	CreateProtocolControllerWithPorts()	305
	CreateRemoteClusterPartnership()	305
	CreateReplica()	306
	CreateSetting()	307
	CreateStorageHardwareID()	308
	CreateSynchronizedSet()	308
	DeleteConfigurationBackup()	309
	DeleteHardwareIDCollection()	310
	DeleteProtocolController()	310
	DeleteRecord()	311
	DeleteRemoteClusterPartnership()	312
	DeleteStorageHardwareID()	312
	DeleteSynchronizedSet()	313
	DeleteStoragePool()	314
	DetachDevice()	315
	Dump()	315
	Enter()	316
	EvictNode()	316
	Exit()	317
	FixRecord()	317
	GetAllRecords()	318
	GetDump()	318
	GetFreeExtents()	319
	GetRecord()	320
	GetResetPasswordChangeFeatureStatus()	320
	GetSupportedSizeRange()	321
	GetSupportedSizes()	321
	IncludeBackendVolume()	322
	ListConfigurationBackups()	322
	MigrateVolume()	323
	ModifyErrorSettings()	323
	ModifyIPAddress()	324
	ModifyResetPasswordChangeFeature()	325
	ModifySynchronization()	325
	ModifySynchronizedSet()	327
	PositionAtRecord()	329
	PositionToFirstRecord()	330
	PositionToFirstRecordRoot()	331

	PositionToFirstRecordType()	331
	Reload2062Node()	332
	RemoveAccess()	332
	RemoveCluster()	333
	RequestDiscovery()	334
	Reset2062Node()	334
	RestoreConfiguration()	335
	ReturnToStoragePool()	336
	SetLocale()	336
	SetIOGroup()	337
	SetPasswords()	337
	SetQuorum()	338
	SetTimeZone()	338
	StartStatisticsCollection()	339
	StopStatisticsCollection()	339
	Shutdown()	340
	UnfixRecord()	340
	Upgrade()	341
	WriteRecord()	341
	Accessibility	343
	Notices	345
	Trademarks.	346
	Glossary	347
	Index	349

Figures

1.	A typical CIM Agent at work	4
2.	A SAN Volume Controller node	5
3.	Example of a SAN Volume Controller in a fabric	6
4.	High-level overview of the CIM Agent for the SAN Volume Controller.	9
5.	High-level overview of the physical package of the CIM Agent for the SAN Volume Controller.	10
6.	High-level overview of the server profile of the CIM Agent for the SAN Volume Controller.	11
7.	High-level overview of the extent mapping subprofile of the CIM Agent for the SAN Volume Controller.	12
8.	High-level overview of the ExtraCapacitySet subprofile of the CIM Agent for the SAN Volume Controller.	13
9.	High-level overview of the access point subprofile of the CIM Agent for the SAN Volume Controller.	14
10.	Class diagram of Clustering instance	15
11.	Class diagram of StorageConfiguration instance	16
12.	Class diagram for LUN masking instances	17
13.	High-level overview of the LUN creation subprofile of the CIM Agent for the SAN Volume Controller.	18
14.	Class diagram of copy services instances.	19
15.	High-level overview of the vendor-specific service mode subprofile of the CIM Agent for the SAN Volume Controller.	20
16.	High-level overview of the vendor-specific cluster operations of the CIM Agent for the SAN Volume Controller.	21
17.	Class diagram of security instances	22
18.	High-level overview of pool manipulation of the CIM Agent for the SAN Volume Controller.. . . .	23
19.	Flash Copy state diagram of the CIM Agent for the SAN Volume Controller.	34
20.	High-level overview of the Sync Copy state diagram of the CIM Agent for the SAN Volume Controller.	35

Tables

1. Publications in the SAN Volume Controller library	xviii
2. Other IBM publications	xix
3. Web sites	xx
4. IBMTSSVC_BackendController properties	39
5. IBMTSSVC_BackendVolume properties	47
6. IBMTSSVC_CandidateCluster properties	58
7. IBMTSSVC_CandidateNode properties.	59
8. IBMTSSVC_CandidateStorageHardwareID properties	66
9. IBMTSSVC_CandidateVolume properties	67
10. IBMTSSVC_Chassis properties	69
11. IBMTSSVC_Cluster properties	76
12. IBMTSSVC_Controller properties	86
13. IBMTSSVC_ControllerConfigurationService properties	94
14. IBMTSSVC_ControllerMaskingCapabilities properties	97
15. IBMTSSVC_Dumps properties	99
16. IBMTSSVC_FCPort properties	101
17. IBMTSSVC_Features properties	112
18. IBMTSSVC_FlashCopySynchronizedSet properties	113
19. IBMTSSVC_HardwareIdCollection properties	115
20. IBMTSSVC_IOGroup properties	116
21. IBMTSSVC_IOGroupSet properties	122
22. IBMTSSVC_Job properties.	124
23. IBMTSSVC_MessageLog properties	129
24. IBMTSSVC_Node properties	136
25. IBMTSSVC_NodeVPD properties	142
26. IBMTSSVC_PrimalStoragePool properties.	142
27. IBMTSSVC_Privilege properties	145
28. IBMTSSVC_Product properties	146
29. IBMTSSVC_Provider properties	147
30. IBMTSSVC_RegisteredProfile properties	152
31. IBMTSSVC_RegisteredSubProfile properties	155
32. IBMTSSVC_RemoteCluster properties	158
33. IBMTSSVC_RemoteServiceAccessPoint properties.	159
34. IBMTSSVC_RemoteVolume properties	165
35. IBMTSSVC_StorageCapabilities properties	167
36. IBMTSSVC_StorageConfigurationCapabilities properties	169
37. IBMTSSVC_StorageHardwareID properties.	174
38. IBMTSSVC_StoragePool properties	174
39. IBMTSSVC_StorageSetting properties	178
40. IBMTSSVC_StorageVolume properties	181
41. IBMTSSVC_SyncCopySynchronizedSet properties	195
42. IBMTSSVC_ClusteringService properties	198
43. IBMTSSVC_PrivilegeManagementService properties	202
44. IBMTSSVC_StorageConfigurationService properties	205
45. IBMTSSVC_StorageHardwareID ManagementService properties.	209
46. IBMTS_Account properties.	213
47. IBMTS_AccountManagementService properties	216
48. IBMTS_CIMXMLCommunicationMechanism properties	219
49. IBMTS_IndicationFilter properties	225
50. IBMTS_NameSpace properties	225
51. IBMTS_ObjectManager properties	227
52. IBMTS_RegisteredProfile properties	231
53. IBMTS_System properties	232

54. IBMTSSVC_AllocatedFromStoragePool references	236
55. IBMTSSVC_AllocatedFromStoragePool properties	236
56. IBMTSSVC_AuthorizedCollection references	236
57. IBMTSSVC_AuthorizedStorageHardwareID references	237
58. IBMTSSVC_AuthorizedSubject references	237
59. IBMTSSVC_AuthorizationTarget references	237
60. IBMTSSVC_AvailableHardwareID references	238
61. IBMTSSVC_BackendSCSILUN references	238
62. IBMTSSVC_BasedOn references	238
63. IBMTSSVC_BasedOn properties	238
64. IBMTSSVC_ClusterController references	239
65. IBMTSSVC_ClusterDumps references	239
66. IBMTSSVC_ClusterDumps properties	240
67. IBMTSSVC_ClusteringCandidate references	240
68. IBMTSSVC_ClusteringServiceForSystem references	240
69. IBMTSSVC_ClusterMaskingCapabilities references	241
70. IBMTSSVC_ClusterPort references	241
71. IBMTSSVC_ClusterScopeCandidateVolume references	242
72. IBMTSSVC_ClusterScopeChassis references	242
73. IBMTSSVC_ClusterScopeFCSet references	242
74. IBMTSSVC_ClusterScopeIOGroup references	242
75. IBMTSSVC_ClusterScopeNodeVPD references	243
76. IBMTSSVC_ClusterScopePrivilege references	243
77. IBMTSSVC_ClusterScopeProduct references	243
78. IBMTSSVC_ClusterScopeSCSet references	244
79. IBMTSSVC_ClusterVolume references	244
80. IBMTSSVC_ComponentCS references	244
81. IBMTSSVC_ComputerSystemPackage references	245
82. IBMTSSVC_ComputerSystemPackage properties	245
83. IBMTSSVC_ConnectedBackendController references	245
84. IBMTSSVC_ControllerConfigurationServiceForSystem references	245
85. IBMTSSVC_ControllerConfService MaskingCapabilities references	246
86. IBMTSSVC_CopyCandidate references	246
87. IBMTSSVC_ComponentCS references	246
88. IBMTSSVC_FlashCopyStorageSynchronized references	247
89. IBMTSSVC_FlashCopyStorageSynchronized properties	247
90. IBMTSSVC_FlashCopySynchronizedMember references	249
91. IBMTSSVC_HardwareIDOnSystem references	250
92. IBMTSSVC_HostedAccessPoint references	250
93. IBMTSSVC_HostedJob references	250
94. IBMTSSVC_HostedPrimordialPool references	250
95. IBMTSSVC_HostedStoragePool references	251
96. IBMTSSVC_HwIDCollectionOnSystem references	251
97. IBMTSSVC_IndicationFilters ConformsToProfile references	252
98. IBMTSSVC_IndicationFiltersConformsToSubProfile references	252
99. IBMTSSVC_IOGroupIdentity references	252
100. IBMTSSVC_IOGroupPort references	253
101. IBMTSSVC_ManagesCollection references	253
102. IBMTSSVC_ManagesController references	253
103. IBMTSSVC_ManagesHardwareID references	254
104. IBMTSSVC_ManagesPrivilege references	254
105. IBMTSSVC_MemberOfCollection references	254
106. IBMTSSVC_MemberOfIOGroup references	255
107. IBMTSSVC_NodeDumps references	255
108. IBMTSSVC_NodeDumps	255

109. IBMTSSVC_PartnershipCandidate references	256
110. IBMTSSVC_PoolCapabilities references	256
111. IBMTSSVC_PrimordialPoolCapabilities references	256
112. IBMTSSVC_PrimordialPoolComponent references	257
113. IBMTSSVC_PrimordialPoolForController references	257
114. IBMTSSVC_PrivilegeServiceForSystem references	257
115. IBMTSSVC_ProductPhysicalComponent references	258
116. IBMTSSVC_ProtocolControllerForPort references	258
117. IBMTSSVC_ProtocolControllerForPort	258
118. IBMTSSVC_ProtocolControllerForUnit references	259
119. IBMTSSVC_ProtocolControllerForUnit	260
120. IBMTSSVC_ProviderInObjectManager references	260
121. IBMTSSVC_RemotePartnership references	261
122. IBMTSSVC_RemoteSystemVolume references	261
123. IBMTSSVC_RequiresProfile references	261
124. IBMTSSVC_SAPAvailableForElement references	262
125. IBMTSSVC_StorageConfigurationServiceCapabilities references	262
126. IBMTSSVC_StorageConfigurationServiceForSystem references	262
127. IBMTSSVC_StorageHardwareIDManagementServiceForSystem references	263
128. IBMTSSVC_StoragePoolComponent references	263
129. IBMTSSVC_SyncCopyStorageSynchronized references	263
130. IBMTSSVC_SyncCopyStorageSynchronized properties	264
131. IBMTSSVC_SyncCopySynchronizedMember references	267
132. IBMTSSVC_SystemBackendVolume references	267
133. IBMTSSVC_SystemCandidateVolume references	267
134. IBMTSSVC_SystemController references	268
135. IBMTSSVC_SystemFCPort references	268
136. IBMTSSVC_SystemFeatures references	268
137. IBMTSSVC_SystemVolume references	268
138. IBMTSSVC_SystemVPD references	269
139. IBMTSSVC_SystemVPD properties	269
140. IBMTSSVC_UseOfMessageLog references	270
141. IBMTSSVC_UseOfMessageLog properties	270
142. IBMTSSVC_VolumeSettingData references	270
143. IBMTSSVC_VolumeSettingData properties	271
144. IBMTSSVC_AccountManagementServiceForSystem references	271
145. IBMTS_AccountOnCIMOM references	272
146. IBMTS_AccountOnCIMOM properties	272
147. IBMTS_AccountOnSystem	272
148. IBMTS_AccountOnSystem properties	272
149. IBMTS_CommMechanismForManager	273
150. IBMTS_ElementConformsToProfile	273
151. IBMTS_HostedAccessPoint	273
152. IBMTS_HostedService	274
153. IBMTS_IndicationFiltersConformsToProfile	274
154. IBMTS_ManagesAccount references	275
155. IBMTS_NamespaceInManager	275
156. Supported intrinsic methods	277
157. Associators() parameters	278
158. AssociatorNames() parameters	279
159. CreateInstance() parameters	279
160. DeleteInstance() parameters	280
161. EnumerateClasses() parameters	280
162. EnumerateClassNames() parameters	281
163. EnumerateInstances() parameters	281
164. EnumerateInstanceNames() parameters	282

165. ExecQuery() parameters	283
166. GetClass() parameters	283
167. GetInstance() parameters	284
168. GetProperty() parameters	284
169. ModifyInstance() parameters	285
170. References() parameters	285
171. ReferenceNames() parameters	286
172. SetProperty() parameters	287
173. Supported extrinsic methods	287
174. Add2062Cluster() parameters.	290
175. Add2145Cluster() parameters.	291
176. AddHardwareIDsToCollection() parameters	291
177. AddNode() parameters	292
178. AssignAccess() parameters	293
179. AttachDevice() parameters	294
180. AttachReplica() parameters	295
181. BackupConfiguration() parameters	296
182. Cancellteration() parameters	297
183. Clean() parameters	297
184. Create2062Cluster() parameters.	298
185. CreateHardwareIDCollection() parameters	299
186. CreateOrModifyStoragePool() parameters	300
187. CreateOrModifyElementFromStoragePool() parameters	303
188. CreateProtocolControllerWithPorts() parameters	305
189. CreateRemoteClusterPartnership() parameters	306
190. CreateReplica() parameters	306
191. CreateSetting() parameters	307
192. CreateStorageHardwareID() parameters	308
193. CreateSynchronizedSet() parameters	309
194. DeleteConfigurationBackup() parameters	309
195. DeleteHardwareIDCollection() parameters	310
196. DeleteProtocolController() parameters.	311
197. DeleteRecord() parameters.	311
198. DeleteRemoteClusterPartnership() parameters	312
199. DeleteStorageHardwareID() parameters	312
200. DeleteSynchronizedSet()	313
201. DeleteStoragePool()	314
202. DetachDevice() parameters	315
203. Dump() parameters	315
204. Enter() parameters.	316
205. EvictNode() parameters	317
206. Exit() parameters	317
207. FixRecord() parameters	318
208. GetAllRecords() parameters	318
209. GetDump() parameters	319
210. GetFreeExtents() parameters	319
211. GetRecord() parameters.	320
212. GetResetPasswordChangeFeatureStatus() properties	320
213. GetSupportedSizeRange() parameters	321
214. IncludeBackendVolume() parameters	322
215. ListConfigurationBackups() parameters	323
216. MigrateVolume() parameters	323
217. ModifyErrorSettings() parameters	324
218. Modifyipaddress() parameters	324
219. ModifyResetPasswordChangeFeature() parameters	325
220. ModifySynchronization() parameters	326

221. ModifySynchronizedSet() parameters	328
222. PositionAtRecord() parameters	330
223. PositionToFirstRecord() parameters	330
224. PositionToFirstRecordRoot() parameters	331
225. PositionToFirstRecordType() parameters	331
226. Reload2062Node() parameters	332
227. RemoveAccess() parameters	333
228. RemoveCluster() parameters	333
229. RequestDiscovery() parameters	334
230. Reset2062Node() parameters	334
231. RestoreConfiguration() parameters	335
232. ReturnToStoragePool() parameters	336
233. SetLocale() parameters	337
234. SetIOGroup() parameters	337
235. SetPasswords() parameters	338
236. SetQuorum() parameters	338
237. SetTimeZone() parameters	339
238. StartStatisticsCollection() parameters	339
239. Shutdown() parameters	340
240. UnfixRecord() parameters	340
241. Upgrade() parameters	341
242. WriteRecord() parameters	341

About this book

Updates in this version:

- Added new LUN masking information
- Added SMI-S compliancy classes
- Added placeholders for some new classes

What's in this book?

Who should use this book?

This reference book is for common information model (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.

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.

Related publications

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:

Table 1 on page xviii 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.ibm.com/storage/support/2145/>

Table 1. Publications in the SAN Volume Controller library

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

Other IBM publications:

Table 2 on page xix lists and describes other IBM publications that contain additional information related to the SAN Volume Controller.

Table 2. Other IBM publications

Title	Description	Order number
<i>IBM TotalStorage Enterprise Storage Server, IBM TotalStorage SAN Volume Controller, IBM TotalStorage SAN Volume Controller for Cisco MDS 9000, Subsystem Device Driver: User's Guide</i>	This guide describes the IBM 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 Subsystem Device Driver: User's Guide</i> .	SC26-7608

Related topics:

- “How to order IBM publications”
- “How to send your comments” on page xx

How to order IBM publications

The IBM publications center:

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

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:

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

Related topics:

- “Related publications” on page xvii

Related Web sites

Table 3. Web sites

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

How to send your comments

Your feedback is important to help us provide the highest quality information. If you have any comments about this book or any other documentation, you can submit them in one of the following ways:

- e-mail

Submit your comments electronically to the following e-mail address:

starpubs@us.ibm.com

Be sure to include the name and order number of the book and, if applicable, the specific location of the text you are commenting on, such as a page number or table number.

- Mail

Fill out the Readers' Comments form (RCF) at the back of this book. Return it by mail or give it to an IBM representative. 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.

Related topics:

- "Related publications" on page xvii

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.

Related topics:

- "Summary of changes for GC26-7545-01 SAN Volume Controller CIM Agent's Reference Guide Release 1.2.0"

Summary of changes for GC26-7545-01 SAN Volume Controller CIM Agent's Reference Guide Release 1.2.0

New information:

This edition includes the following new information:

Core object classes:

- IBMTSSVC_CandidateStorageHardwareID
- IBMTSSVC_ClusteringService
- IBMTSSVC_ControllerMaskingCapabilities
- IBMTSSVC_Dumps
- IBMTSSVC_HardwareIDCollection
- IBMTSSVC_IOGroup
- IBMTSSVC_IOGroupSet
- IBMTSSVC_MessageLog
- IBMTSSVC_PrimordialStoragePool
- IBMTSSVC_Privilege
- IBMTSSVC_Provider
- IBMTSSVC_RegisteredProfile
- IBMTSSVC_RegisteredSubProfile
- IBMTSSVC_RemoteServiceAccessPoint
- IBMTSSVC_StorageCapabilities
- IBMTSSVC_StorageConfigurationCapabilities
- IBMTSSVC_StorageHardwareID
- IBMTSSVC_StorageSetting

Service object classes

- IBMTSSVC_ControllerConfigurationService
- IBMTSSVC_PrivilegeManagementService
- IBMTSSVC_StorageConfigurationService
- IBMTSSVC_StorageHardwareIDManagementService

Association object classes:

- IBMTSSVC_AuthorizedCollection
- IBMTSSVC_AuthorizedStorageHardwareID
- IBMTSSVC_AvailableHardwareID
- IBMTSSVC_BackendControllerForVolume
- IBMTSSVC_ClusterController
- IBMTSSVC_ClusterDumps
- IBMTSSVC_ClusterMaskingCapabilities
- IBMTSSVC_ClusterPort
- IBMTSSVC_ClusterScopeIOGroup
- IBMTSSVC_ClusterScopePrivilege
- IBMTSSVC_ClusterVolume
- IBMTSSVC_ComponentCS
- IBMTSSVC_ControllerConfigurationServiceForSystem
- IBMTSSVC_ControllerConfServiceMaskingCapabilities
- IBMTSSVC_ElementConformsToProfile
- IBMTSSVC_HardwareIDOnSystem
- IBMTSSVC_HostedAccessPoint
- IBMTSSVC_HostedPrimordialPool
- IBMTSSVC_HwIDCollectionOnSystem

- IBMTSSVC_IndicationFiltersConformsToProfile
- IBMTSSVC_IndicationFiltersConformsToSubProfile
- IBMTSSVC_IOGroupIdentity
- IBMTSSVC_IOGroupPort
- IBMTSSVC_ManagesCollection
- IBMTSSVC_ManagesController
- IBMTSSVC_ManagesHardwareID
- IBMTSSVC_ManagesPrivilege
- IBMTSSVC_MemberOfCollection
- IBMTSSVC_MemberOfIOGroup
- IBMTSSVC_NodeDumps
- IBMTSSVC_PartnershipCandidate
- IBMTSSVC_PoolCapabilities
- IBMTSSVC_PrimordialPoolCapabilities
- IBMTSSVC_PrimordialPoolComponent
- IBMTSSVC_PrimordialPoolForController
- IBMTSSVC_PrivilegeServiceForSystem
- IBMTSSVC_ProtocolControllerForPort
- IBMTSSVC_ProtocolControllerForUnit
- IBMTSSVC_ProviderInObjectManager
- IBMTSSVC_RemotePartnership
- IBMTSSVC_RequiresProfile
- IBMTSSVC_SAPAvailableForElement
- IBMTSSVC_StorageConfigurationServiceCapabilities
- IBMTSSVC_StorageHardwareIDManagementServiceForSystem
- IBMTSSVC_SystemCandidateVolume
- IBMTSSVC_UseOfMessageLog
- IBMTSSVC_VolumeSettingData
- IBMTS_CommMechanismForManager
- IBMTS_ElementConformsToProfile
- IBMTS_HostedAccessPoint
- IBMTS_HostedService
- IBMTS_IndicationFiltersConformsToProfile
- IBMTS_NamespaceInManager

Security object classes:

- IBMTS_CIMXMLCommunicationMechanism
- IBMTS_IndicationFilter
- IBMTS_NameSpace
- IBMTS_RegisteredProfile
- IBMTS_System

Extrinsic Methods

- Cancelliteration()
- Add2062Cluster()
- Add2145Cluster()

- AddHardwareIDsToCollection()
- BackupConfiguration()
- Clean()
- Create2062Cluster()
- CreateHardwareIDCollection()
- CreateSetting()
- CreateStorageHardwareID()
- DeleteConfigurationBackup()
- DeleteHardwareIDCollection()
- DeleteRecord()
- DeleteStorageHardwareID()
- Dump()
- Enter()
- Exit()
- GetDump()
- ListConfigurationBackups()
- ModifyIPAddress()
- Reload2062Node()
- RemoveCluster()
- Reset2062Node()
- RestoreConfiguration()
- Upgrade()
- WriteRecord()

Changed information:

All core object classes and association object classes name prefixes were changed from IBMTS2145 to IBMTSSVC.

Deleted information:

The following information was deleted from the guide since the previous edition:

Core object classes:

- IBMTS2145_AccessControllInformation
- IBMTS2145_CandidateHardwareAccount
- IBMTS2145_HardwareAccount
- IBMTS2145_Host
- IBMTS2145_RedundancyGroup
- IBMTS2145_StorageSettingPool
- IBMTS2145_StorageSettingVolume
- IBMTS2145_TimeZone

Association object classes:

- IBMTS2145_AccountManagementService
- IBMTS2145_AccountOnSystem
- IBMTS2145_AllocatedFromStoragePool

- IBMTS2145_AuthorizationServiceForSystem
- IBMTS2145_AuthorizedUse
- IBMTS2145_AvailableAccount
- IBMTS2145_AvailableTimeZone
- IBMTS2145_BackendSCSILUN
- IBMTS2145_ClusterScopeACI
- IBMTS2145_ClusterScopeCandidateCluster
- IBMTS2145_ClusterScopeController
- IBMTS2145_ClusterScopeFCPort
- IBMTS2145_ClusterScopeHost
- IBMTS2145_ClusterScopeProduct
- IBMTS2145_ClusterScopeRedgroup
- IBMTS2145_ClusterScopeRemoteCluster
- IBMTS2145_ClusterScopeVolume
- IBMTS2145_ControllerFCPort
- IBMTS2145_ControllerView
- IBMTS2145_CurrentTimeZone
- IBMTS2145_FilteringServiceForSystem
- IBMTS2145_HostedAccount
- IBMTS2145_HostedACI
- IBMTS2145_ManagesAccount
- IBMTS2145_ParticipatingCS
- IBMTS2145_RedundancyComponent
- IBMTS2145_SCSILUN

Service object classes

- IBMTS2145_AccountManagementService
- IBMTS2145_AuthorizationService
- IBMTS2145_FilteringService

Extrinsic methods

- AddNodeToRedundancyGroup()
- CreateAccount()
- CreateFlashCopySynchronization()
- CreateHardwareAccount()
- CreateSyncCopySynchronization()
- CreateSyncCopySynchronizedSet()
- CreateView()
- DeleteAccount()
- DeleteHardwareAccount()
- DeleteView()
- DumpConfiguration()
- ForcedDeleteFlashCopySynchronization()
- ForcedDeleteFlashCopySynchronizedSet()
- ForcedDeleteHardwareAccount()
- ForcedDeleteStoragePool()

- | • ForcedDeleteSyncSynchronizedSet()
- | • ForcedReturnToStoragePool()
- | • GrantGlobalAccess()
- | • GrantSystemAccess()
- | • ModifySyncCopySynchronization()
- | • ModifySyncCopySynchronizedSet()
- | • RemoveDevice()
- | • SetPassword()
- | • SetRedundancyGroup()

| **Related topics:**

- | • “Summary of changes” on page xx

Chapter 1. Introduction

This chapter introduces the Common Information Model (CIM) Agent for 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). It 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.

Related topics:

- “Common Information Model” on page 2
- “Common Information Model-related concepts” on page 2
- “CIM agent” on page 3

- “Common Information Model Agent for the SAN Volume Controller” on page 7

Common Information Model

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

Related topics:

- “Storage Management Initiative Specification” on page 1
- “Common Information Model-related concepts”
- “CIM agent” on page 3
- “Common Information Model Agent for the SAN Volume Controller” on page 7

Common Information Model-related concepts

The Common Information Model (CIM) specifications use the following concepts and terminology to describe the various 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.

Related topics:

- “Storage Management Initiative Specification” on page 1
- “Common Information Model” on page 2
- “CIM agent”
- “Common Information Model Agent for the SAN Volume Controller” on page 7
- “Functional views of the Common Information Model Agent” on page 8

CIM agent

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 and supplies its location, IP address, port number, and the type of service it provides. With this information, the client application starts to directly communicate with the CIMOM.

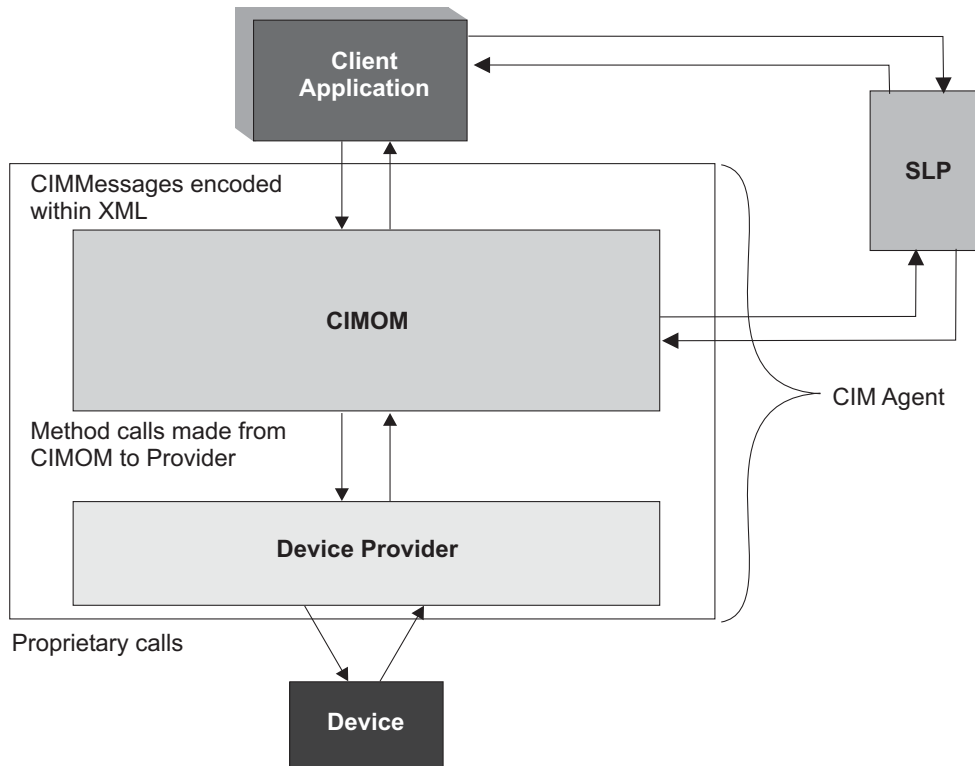


Figure 1. A typical CIM Agent at work

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.

Related topics:

- “Common Information Model” on page 2
- “Common Information Model-related concepts” on page 2
- “Common Information Model Agent for the SAN Volume Controller” on page 7

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.

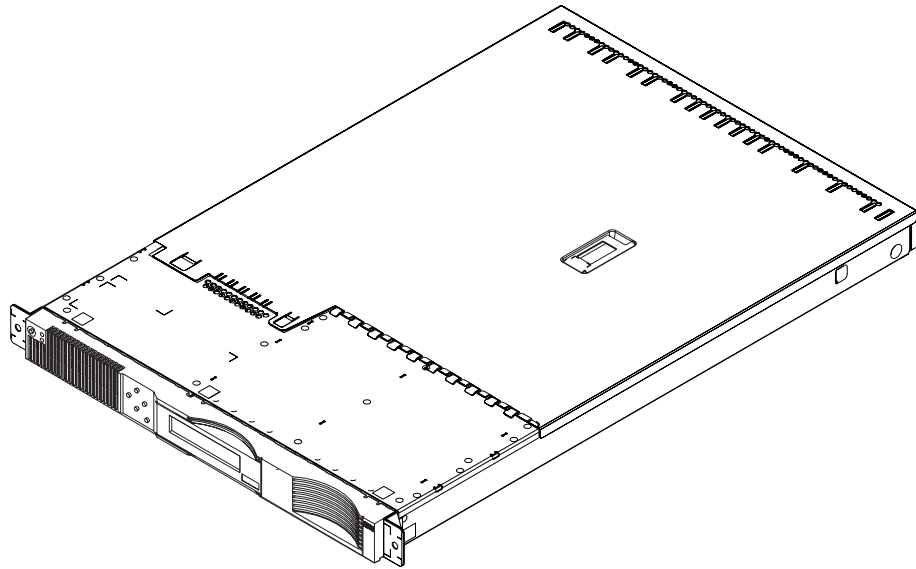


Figure 2. A SAN Volume Controller node

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:

A *node* is a single storage engine. The storage engines are always installed in pairs with one or two 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 handled 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 eliminate any single point of failure, each of the two nodes in the I/O group are protected by different uninterruptible power supplies.

The SAN Volume Controller I/O groups see the storage presented to the SAN by the backend controllers as a number of disks known as *managed disks*. The application services do not see 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 only be in 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.

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. As shown in Figure 3 on page 6, several host systems can be connected to a SAN fabric. A cluster of SAN Volume Controllers is connected to the same fabric and presents virtual disks to the host systems. You configure these virtual disks using the disks located on the RAID controllers.

Note: You can have more than one host zone. Generally you create one host zone per operating system type because some operating systems will not tolerate other operating systems in the same zone.

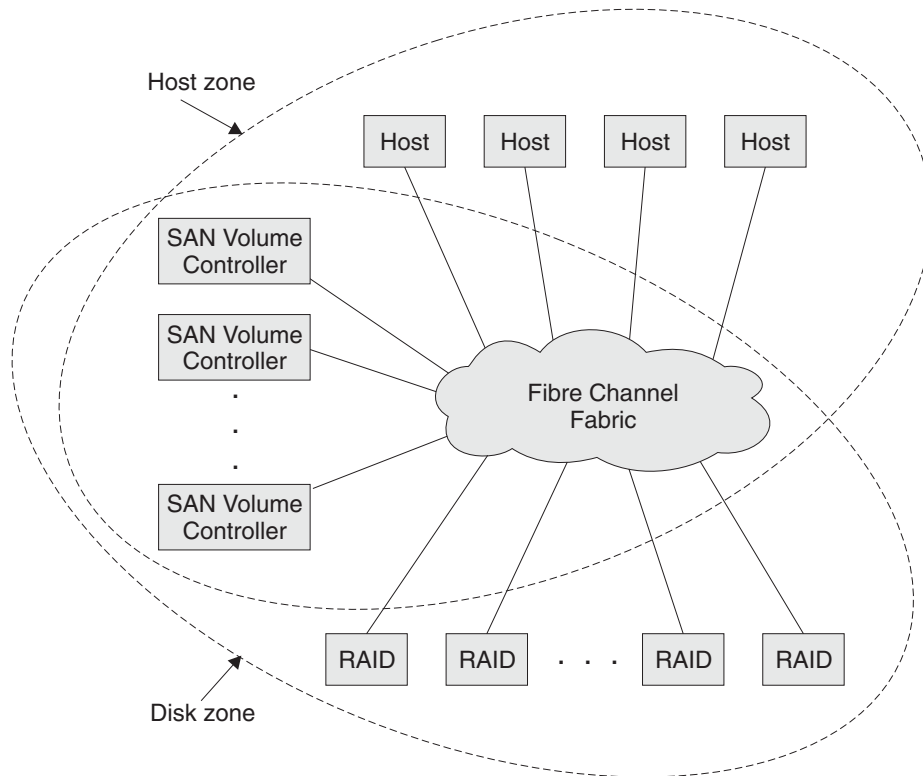


Figure 3. Example of a SAN Volume Controller in a fabric

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.

Enclosure 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 ready from other nodes in the cluster.

SAN Volume Controller operating environment:

- Minimum of one pair of SAN Volume Controller nodes
- 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.ibm.com/storage/support/2145/> and click

Supported software levels.**Multipathing software:**

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

Note: The multipath drivers, SDD and RDAC, can coexist on a host for certain operating systems.

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

<http://www.ibm.com/storage/support/2145>

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.

Related topics:

- “Common Information Model” on page 2
- “Common Information Model Agent for the SAN Volume Controller”

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.

Related topics:

- “Storage Management Initiative Specification” on page 1
- “Common Information Model” on page 2
- “Common Information Model-related concepts” on page 2
- “CIM agent” on page 3

Functional views of the Common Information Model Agent

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

Figure 4 provides a high-level overview of the CIM Agent for the SAN Volume Controller. It shows the SMI-S profiles and subprofiles supported.

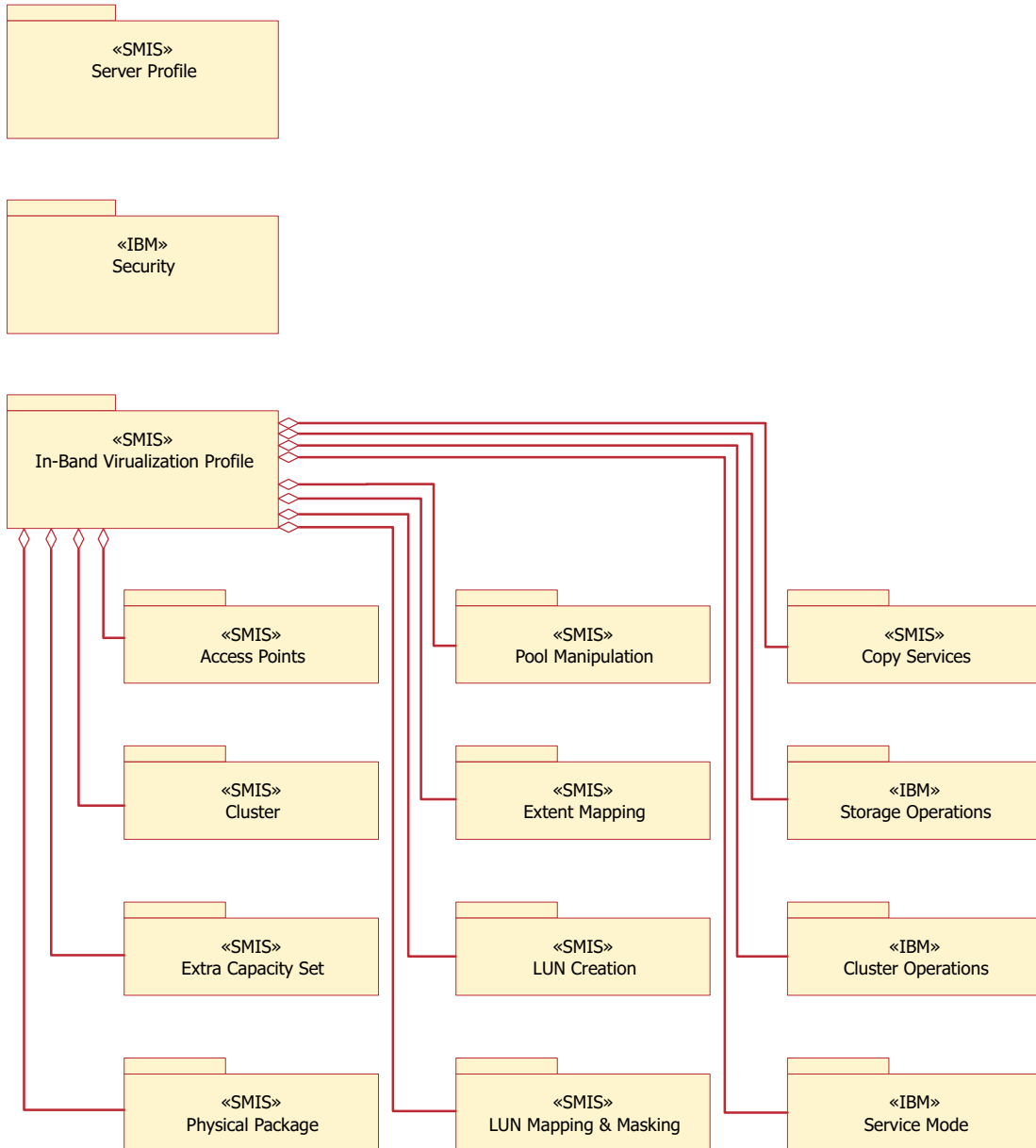


Figure 4. High-level overview of the CIM Agent for the SAN Volume Controller.

Physical Package

Figure 5 on page 10 provides a high-level overview of the physical package of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

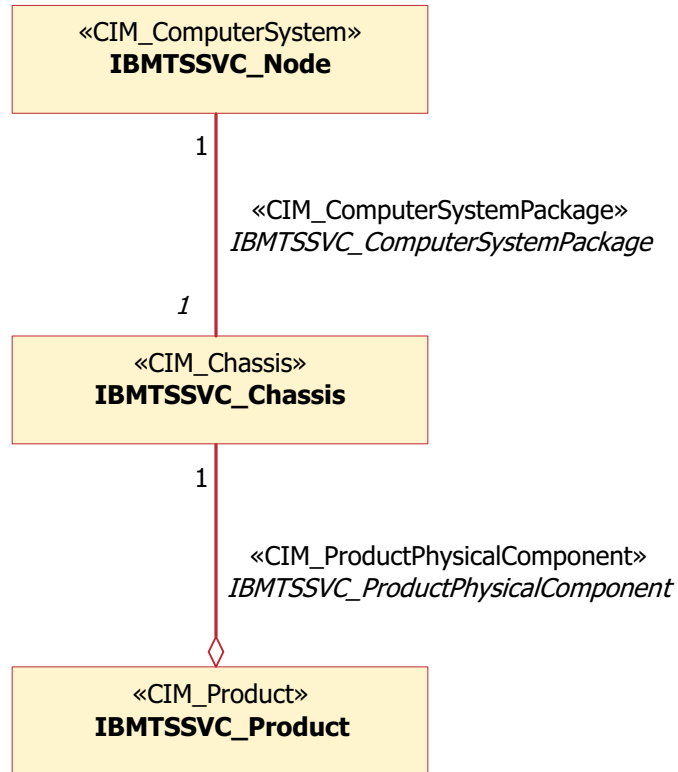


Figure 5. High-level overview of the physical package of the CIM Agent for the SAN Volume Controller.

Server Profile

Figure 6 on page 11 provides a high-level overview of the server profile of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

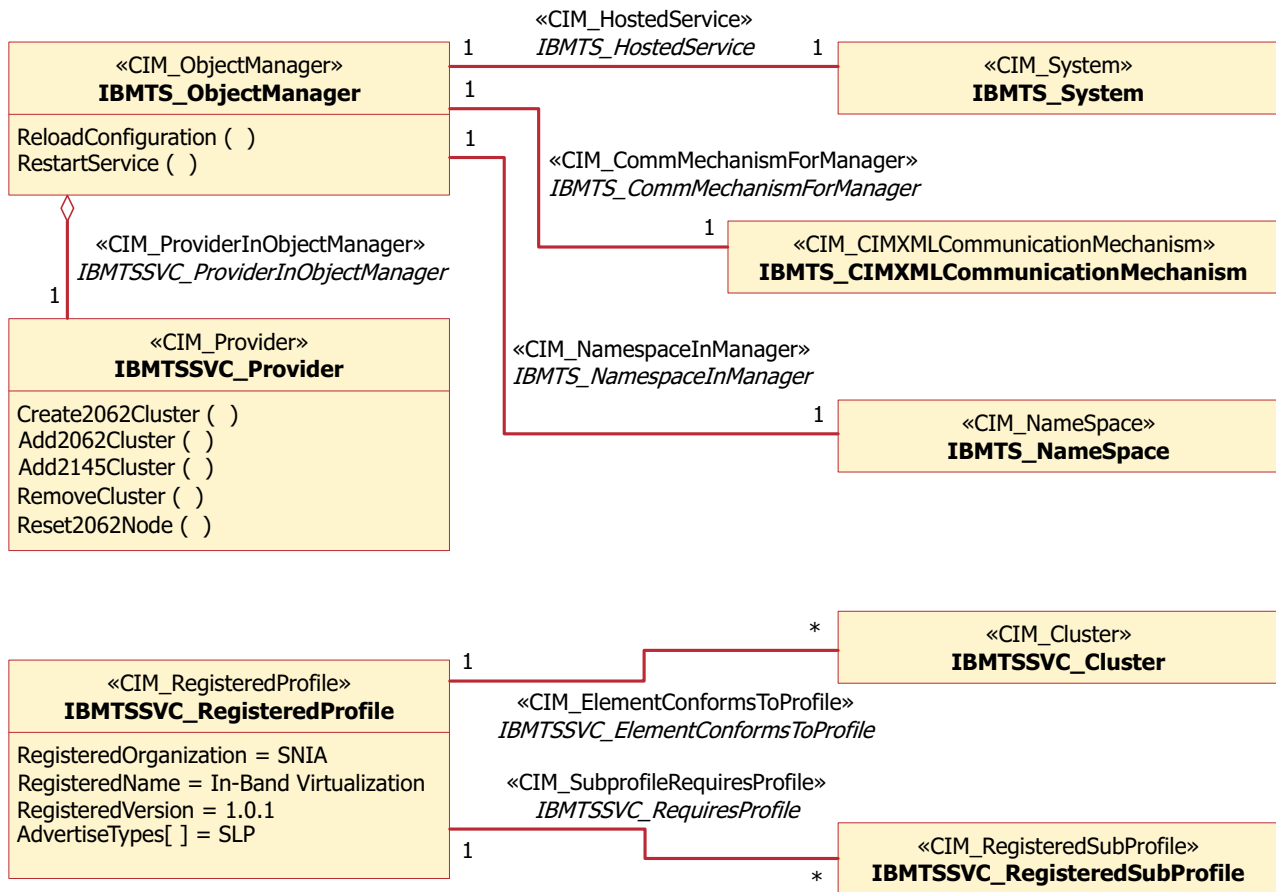


Figure 6. High-level overview of the server profile of the CIM Agent for the SAN Volume Controller.

Extent mapping subprofile

Figure 7 on page 12 provides a high-level overview of the extent mapping subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

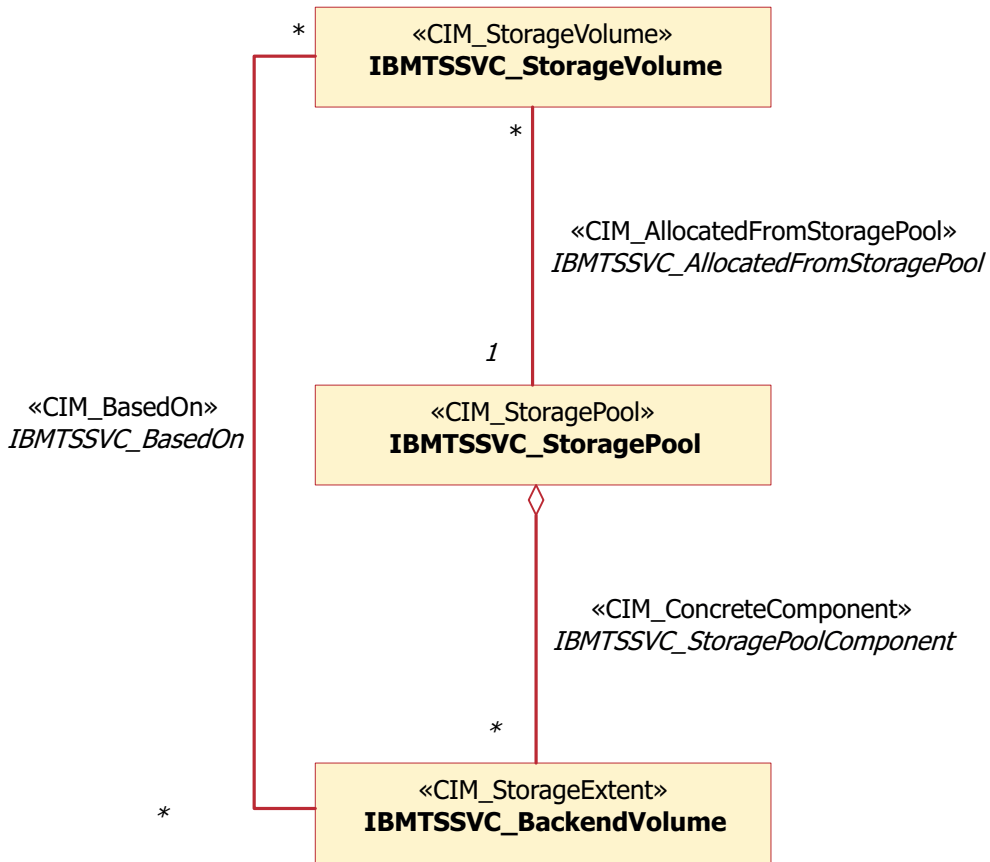


Figure 7. High-level overview of the extent mapping subprofile of the CIM Agent for the SAN Volume Controller.

ExtraCapacitySet subprofile

Figure 8 on page 13 provides a high-level overview of the ExtraCapacitySet subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

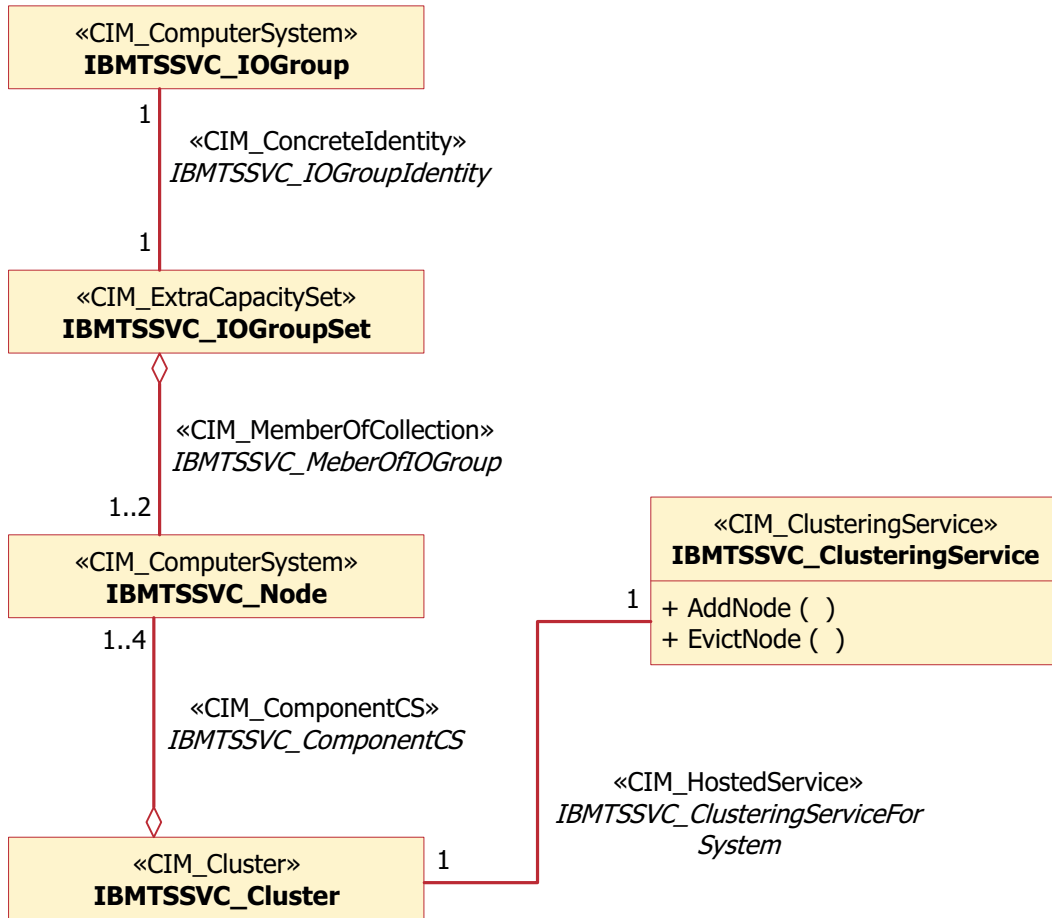


Figure 8. High-level overview of the ExtraCapacitySet subprofile of the CIM Agent for the SAN Volume Controller.

Access point subprofile

Figure 9 on page 14 provides a high-level overview of the access point subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

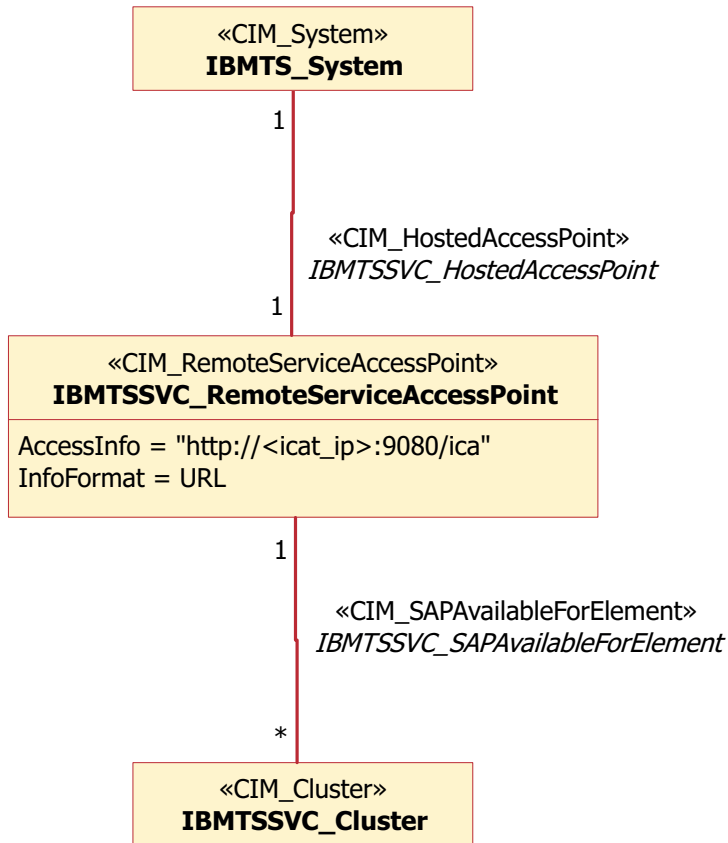


Figure 9. High-level overview of the access point subprofile of the CIM Agent for the SAN Volume Controller.

Cluster subprofile

Figure 10 on page 15 shows the classes and associations that are important for providing the functionality of clustering service.

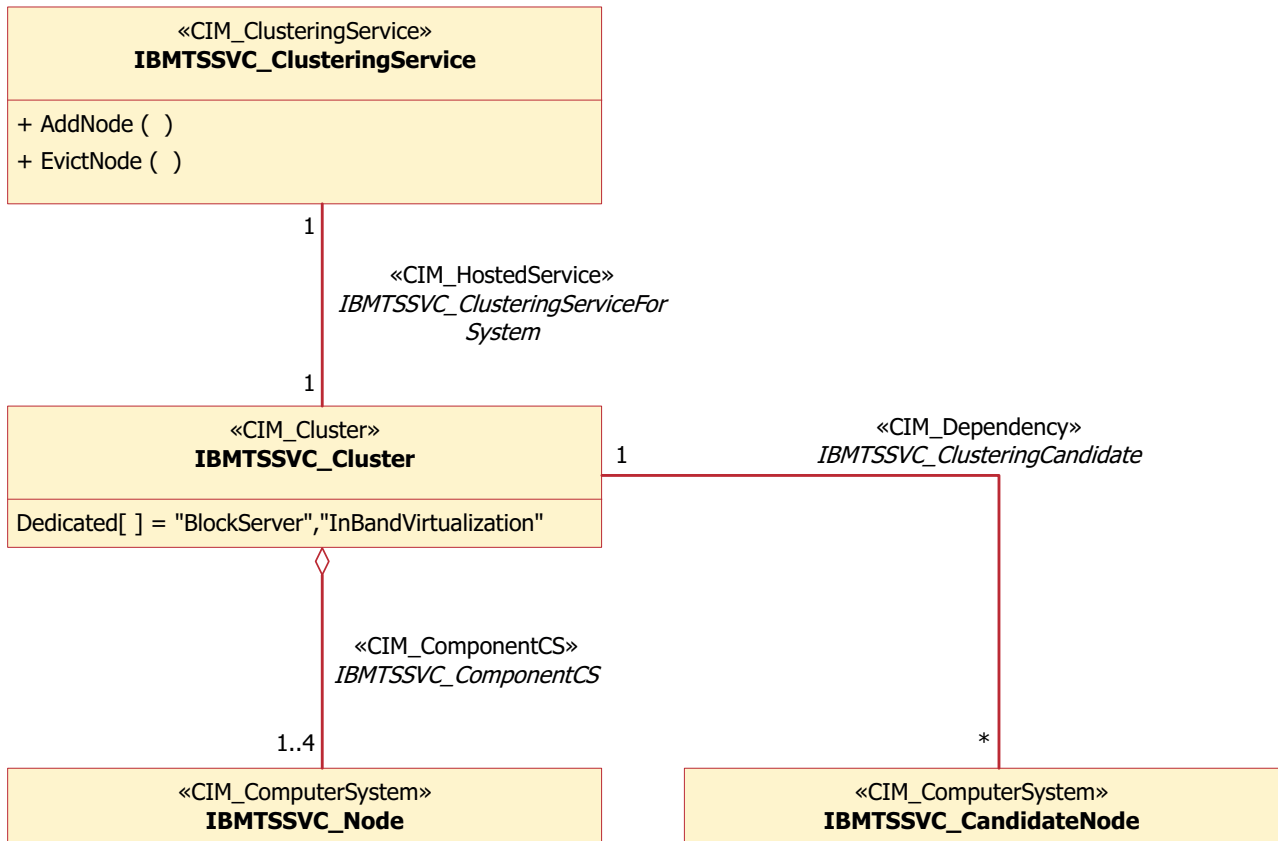


Figure 10. Class diagram of Clustering instance

Vendor-specific Storage configuration operations

Figure 11 on page 16 shows the object classes that are important to implement basic storage configuration.

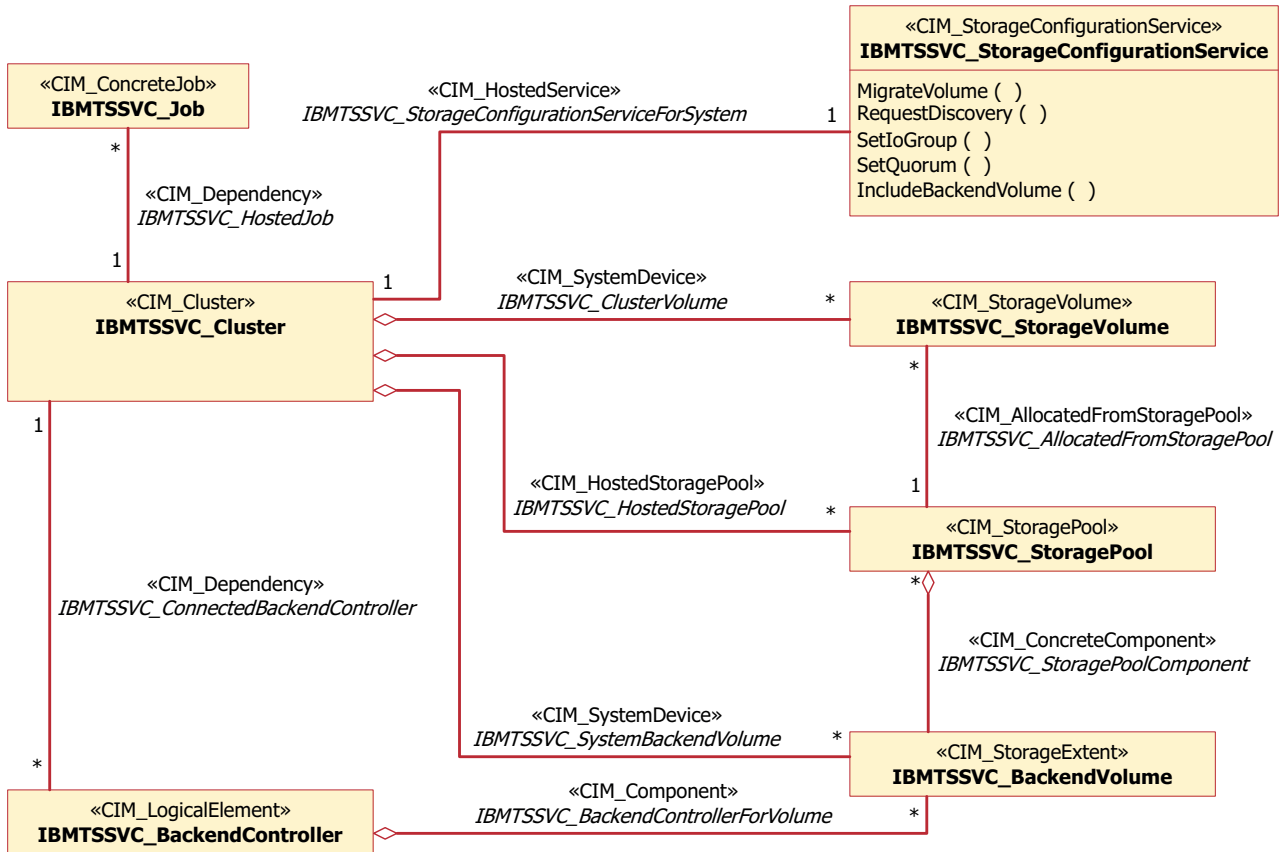


Figure 11. Class diagram of StorageConfiguration instance

LUN masking

Figure 12 on page 17 shows the object classes that are important to execute 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.

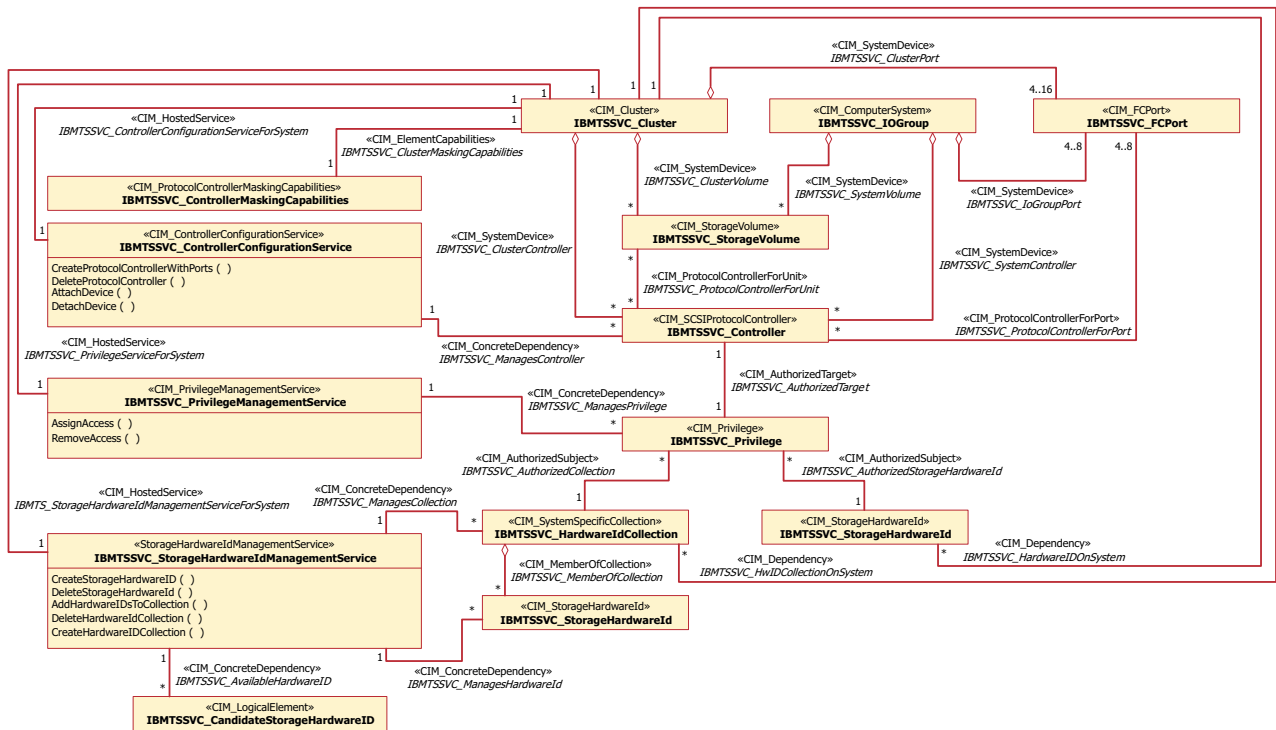


Figure 12. Class diagram for LUN masking instances

Related topics:

- “LUN masking” on page 37
- “Vendor-specific Storage configuration operations” on page 15
- “Copy services” on page 18
- “Security service” on page 21

LUN creation subprofile

Figure 13 on page 18 provides a high-level overview of the LUN creation subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

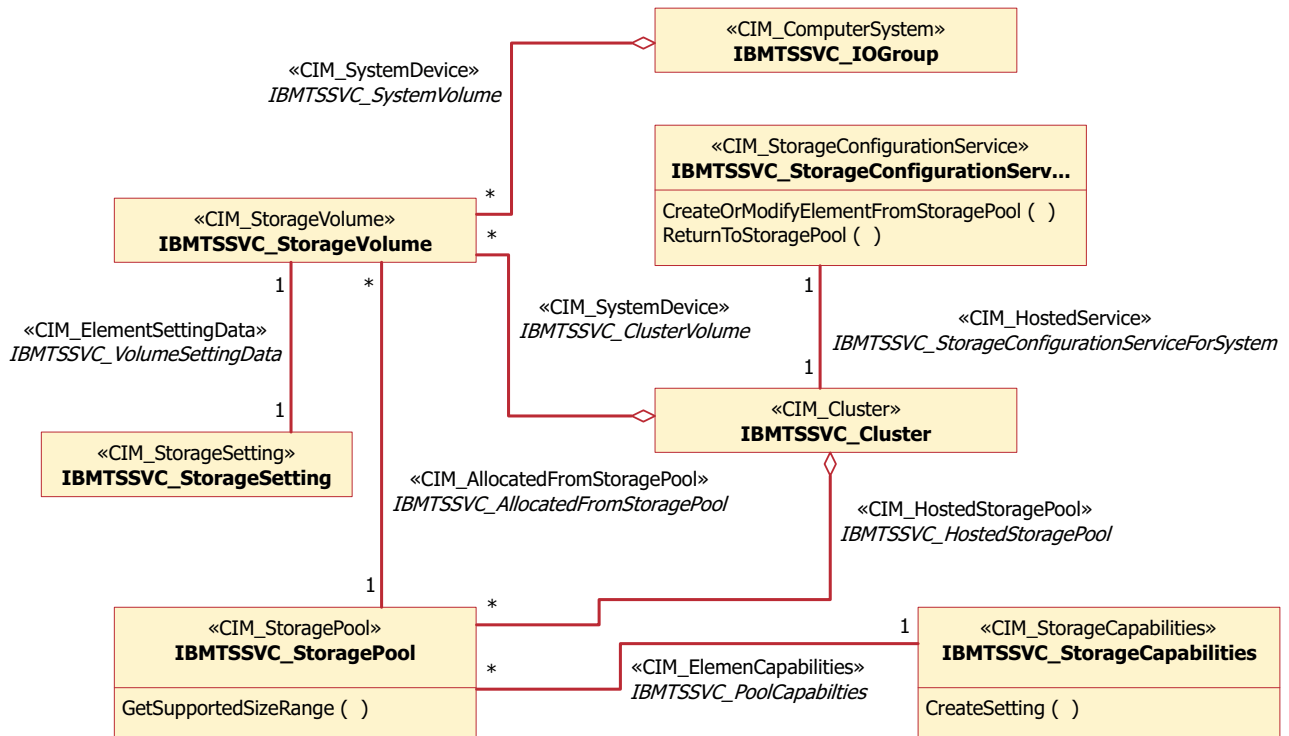


Figure 13. High-level overview of the LUN creation subprofile of the CIM Agent for the SAN Volume Controller.

Copy services

The IBMTSSVC_StorageConfigurationService class provides the methods to create copy relationships.

Figure 14 on page 19 shows the object classes that are important to provide FlashCopy[®] Remote 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.

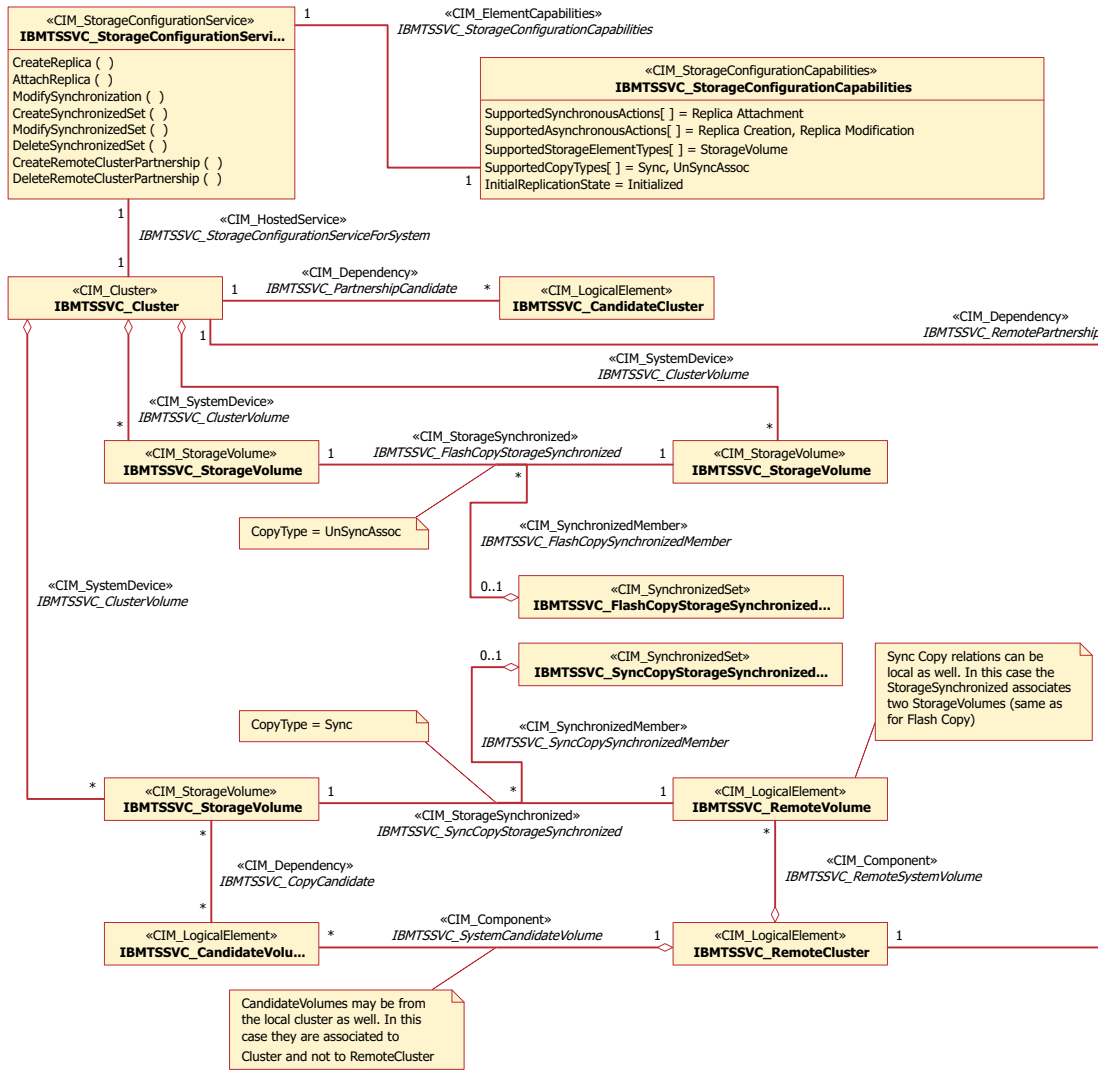


Figure 14. Class diagram of copy services instances

Related topics:

- “Cluster subprofile” on page 14
- “Vendor-specific Storage configuration operations” on page 15
- “Security service” on page 21

Vendor specific service mode subprofile

The service mode subprofile is supported for Blade SAN Volume Controllers (model 2062) only. Figure 15 on page 20 provides a high-level overview of the vendor-specific service mode subprofile of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

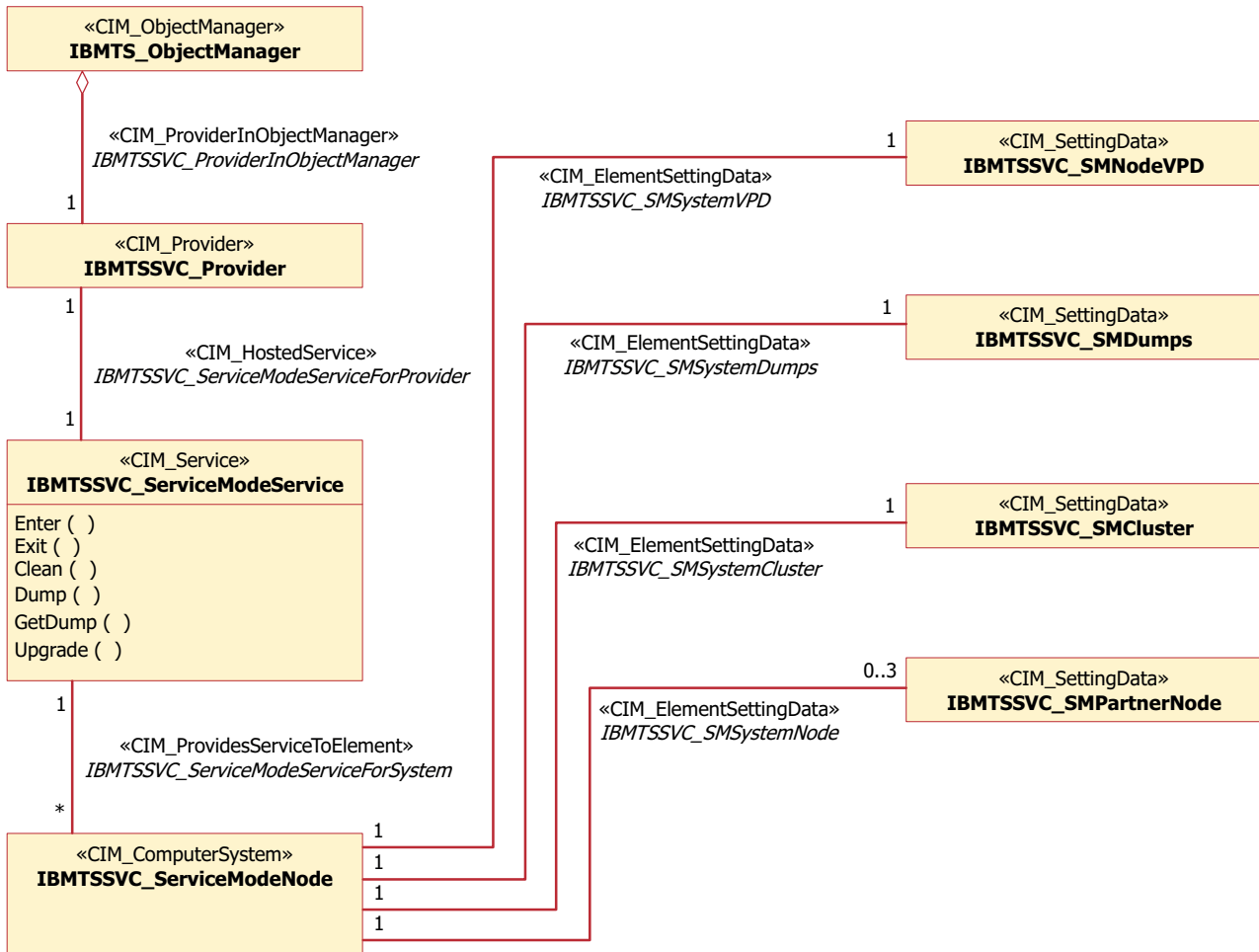


Figure 15. High-level overview of the vendor-specific service mode subprofile of the CIM Agent for the SAN Volume Controller.

Vendor-specific cluster operations

Figure 16 on page 21 provides a high-level overview of the vendor-specific cluster operations of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the basic classes (building blocks) for the model.

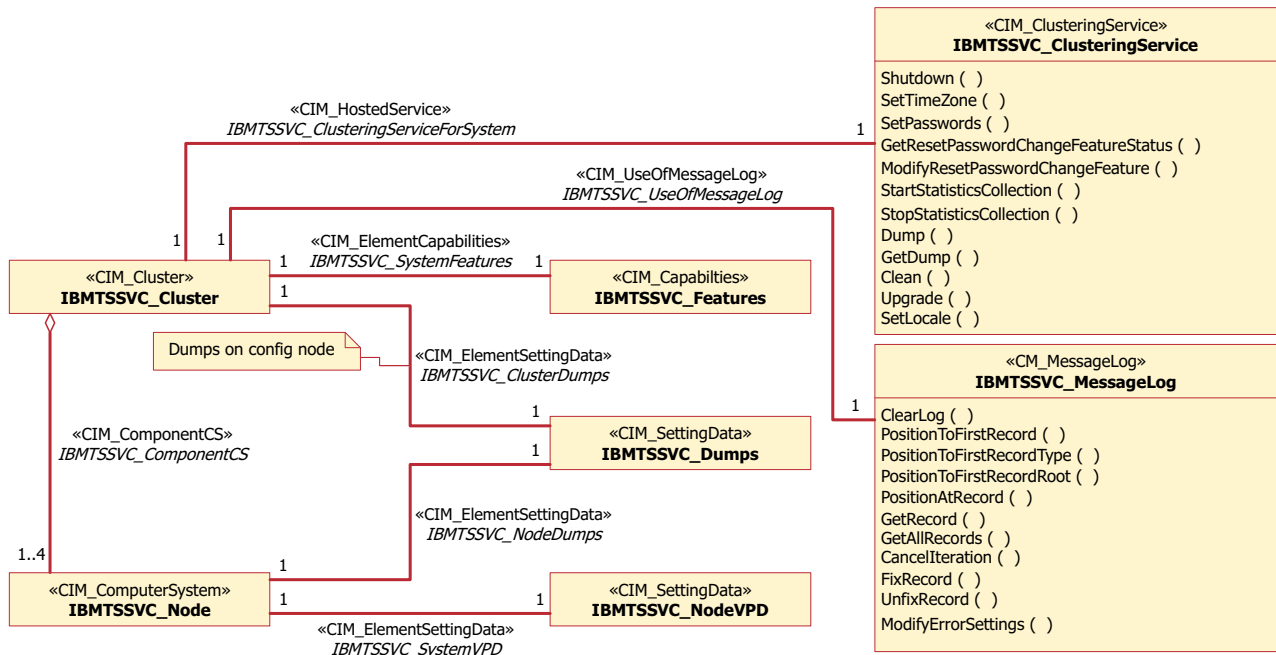


Figure 16. High-level overview of the vendor-specific cluster operations of the CIM Agent for the SAN Volume Controller.

Security service

Figure 17 on page 22 shows the object classes that are important to manage user accounts and their access rights on the Common Information Model Object Manager (CIMOM) and the clusters. In the Common Information Model (CIM) Agent for the SAN Volume Controller, the `IBMTS_AccountManagementService` class provides the methods to create, delete, and modify `IBMTS_Account` instances, each of which represents a user. You can also use the `IBMTSSVC_AccountManagementService` and the `IBMTSSVC_AuthorizationService` classes.

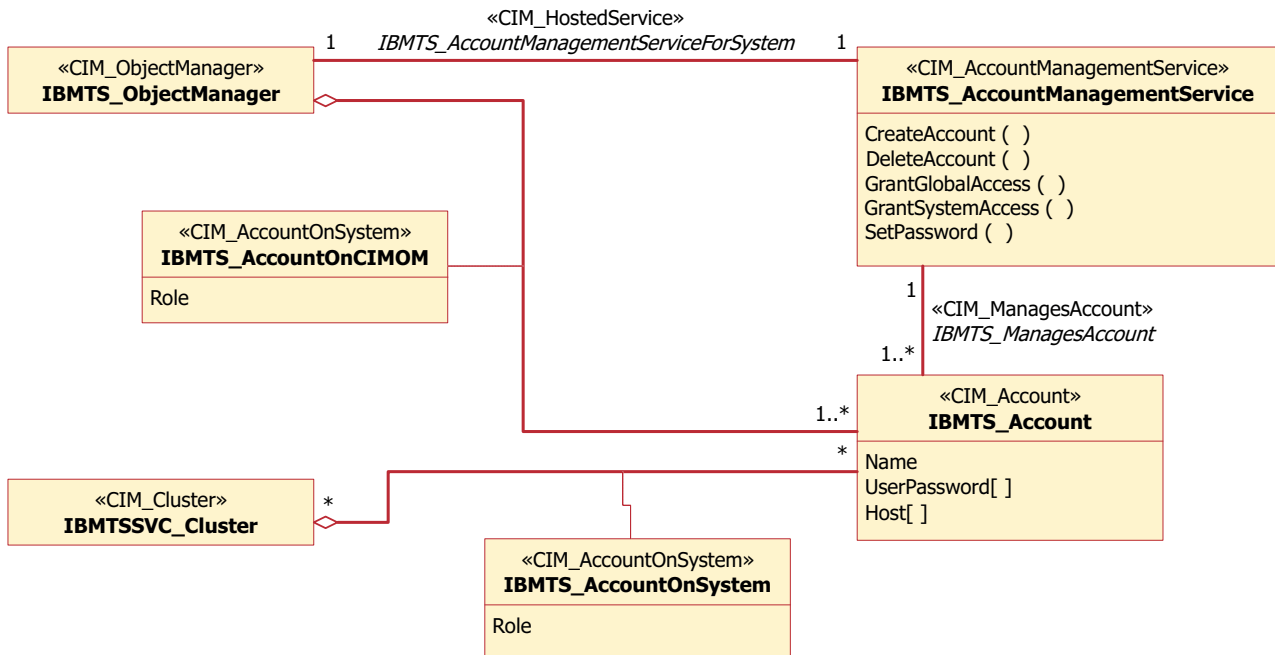


Figure 17. Class diagram of security instances

Related topics:

- “Cluster subprofile” on page 14
- “Vendor-specific Storage configuration operations” on page 15
- “Copy services” on page 18

Pool Manipulation

Figure 18 on page 23 provides a high-level overview of pool manipulation of the Common Information Model (CIM) Agent for the SAN Volume Controller.

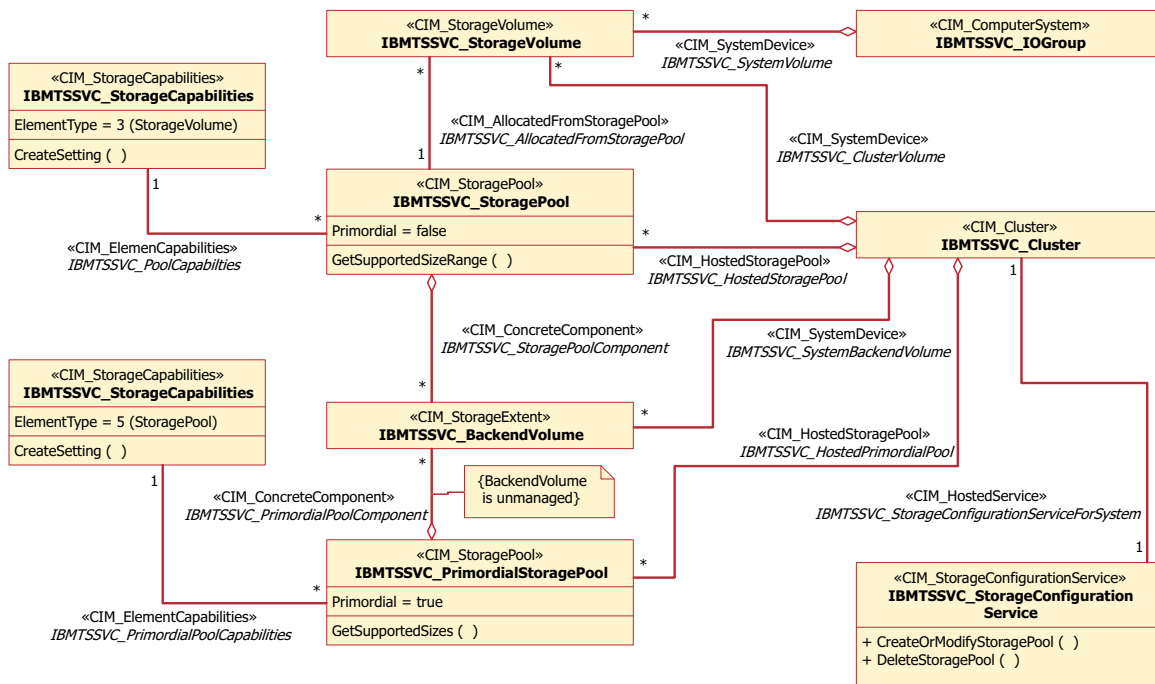


Figure 18. High-level overview of pool manipulation of the CIM Agent for the SAN Volume Controller.

Chapter 2. Performing storage configuration

This chapter describes how you can use the Common Information Model (CIM) Agent object class instances to complete the following basic storage configuration tasks:

- 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.

Related topics:

- “Performing basic storage configuration”
- “Adding a candidate node to a cluster” on page 26
- “Creating a new storage pool” on page 26
- “Modifying a storage pool” on page 27
- “Creating a new storage volume” on page 27

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`.

Prerequisites:

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.

Related topics:

- “Storage configuration” on page 25
- “Adding a candidate node to a cluster”
- “Creating a new storage pool”
- “Modifying a storage pool” on page 27
- “Creating a new storage volume” on page 27

Adding a candidate node to a cluster

Steps:

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`.

Related topics:

- “Storage configuration” on page 25
- “Performing basic storage configuration” on page 25
- “Creating a new storage pool”
- “Modifying a storage pool” on page 27
- “Creating a new storage volume” on page 27

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.

Steps:

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 `IBMTSSVC_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`.

Related topics:

- “Storage configuration” on page 25

- “Performing basic storage configuration” on page 25
- “Adding a candidate node to a cluster” on page 26
- “Modifying a storage pool”
- “Creating a new storage volume”

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.

Steps:

Perform the following steps to modify an `IBMTSSVC_StoragePool` instance:

1. Select the `IBMTSSVC_StoragePool` instance that you want to modify from an `IBMTSSVC_Cluster`.
2. Identify the `IBMTSSVC_StorageSettingPool` instance that contains the parameter settings of the `IBMTSSVC_StoragePool` instance.
3. Invoke the `IBMTSSVC_StoragePool.SetProperty()` method to change the name of the selected `IBMTSSVC_StoragePool` instance.

If necessary, you can further modify the `IBMTSSVC_StoragePool` by adding or removing an `IBMTSSVC_BackendVolume` instance to the pool:

4. 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.

Related topics:

- “Storage configuration” on page 25
- “Performing basic storage configuration” on page 25
- “Adding a candidate node to a cluster” on page 26
- “Creating a new storage pool” on page 26
- “Creating a new storage volume”

Creating a new storage volume

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`.

Steps:

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:
 - Set `ElementType` to 2.
 - Set `Size` to the desired volume size in megabytes.
 - Obtain the reference (`CIMObjectPath`) of the `IBMTSSVC_StoragePool` instance from which you will allocate an `IBMTSSVC_StorageVolume`.
 - Set `InPool` to the reference (obtained in the previous step) of the pool from which the volume will be allocated.

Related topics:

- “Storage configuration” on page 25
- “Performing basic storage configuration” on page 25
- “Adding a candidate node to a cluster” on page 26
- “Creating a new storage pool” on page 26
- “Modifying a storage pool” on page 27

Chapter 3. Performing Copy Services

This chapter describes how you can use the Common Information Model (CIM) Agent object class instances to establish new Copy Services relationships. Specifically, 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 30
3. “Creating a synchronous copy relationship between volumes in the same cluster” on page 31
4. “Creating a synchronous copy relationship between volumes in different clusters” on page 32

Copy Services

The SAN Volume Controller provides two types of copy services: FlashCopy and synchronous Remote Copy. These 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.

Related topics:

- “Creating a new FlashCopy relationship between storage volumes”
- “Creating a FlashCopy relationship for a synchronized set” on page 30
- “Creating a synchronous copy relationship between volumes in the same cluster” on page 31
- “Creating a synchronous copy relationship between volumes in different clusters” on page 32

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.

Steps:

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:
 - Set `SourceElement` to the reference (`CIMObjectPath`) of the source `IBMTSSVC_StorageVolume`.
 - Set `TargetElement` to the reference (`CIMObjectPath`) of the target `IBMTSSVC_CandidateVolume`.
 - Optionally set `ElementName` to the name of the synchronization.
 - Optionally set `BackgroundCopyRate` to the desired priority of the background copy rate in percent (0-100%).
 - 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.
 - Set `CopyType` to 4.

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

Related topics:

- “Copy Services” on page 29
- “Creating a FlashCopy relationship for a synchronized set”
- “Creating a synchronous copy relationship between volumes in the same cluster” on page 31
- “Creating a synchronous copy relationship between volumes in different clusters” on page 32

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`.

Steps:

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:

- Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume.
- Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_CandidateVolume.
- Optionally set ElementName to the name of the synchronization.
- Optionally set BackgroundCopyRate to the desired priority of the background copy rate in percent (0-100%).
- 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:
 - Set CopyType to 4 (flash).
 - 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.

Related topics:

- “Copy Services” on page 29
- “Creating a new FlashCopy relationship between storage volumes” on page 29
- “Creating a synchronous copy relationship between volumes in the same cluster”
- “Creating a synchronous copy relationship between volumes in different clusters” on page 32

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.

Steps:

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:

- Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume instance.
- Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_StorageVolume or IBMTSSVC_CandidateVolume instance.
- Optionally set ElementName to the name of the synchronization.
- 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.

Related topics:

- “Copy Services” on page 29
- “Creating a new FlashCopy relationship between storage volumes” on page 29
- “Creating a FlashCopy relationship for a synchronized set” on page 30
- “Creating a synchronous copy relationship between volumes in different clusters”

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.

Steps:

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:
 - Set RemoteCluster to the reference (CIMObjectPath) of the IBMTSSVC_CandidateCluster.
 - 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:

- Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume instance.
- Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_StorageVolume or IBMTSSVC_CandidateVolume instance.
- Optionally set ElementName to the name of the synchronization.
- 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.

Related topics:

- “Copy Services” on page 29
- “Creating a new FlashCopy relationship between storage volumes” on page 29
- “Creating a FlashCopy relationship for a synchronized set” on page 30
- “Creating a synchronous copy relationship between volumes in the same cluster” on page 31

Flash Copy state diagram

Figure 19 on page 34 provides a high-level overview of the Flash Copy state diagram of the Common Information Model (CIM) Agent for the SAN Volume Controller. It shows the supported states and transitions for Flash Copy relations.

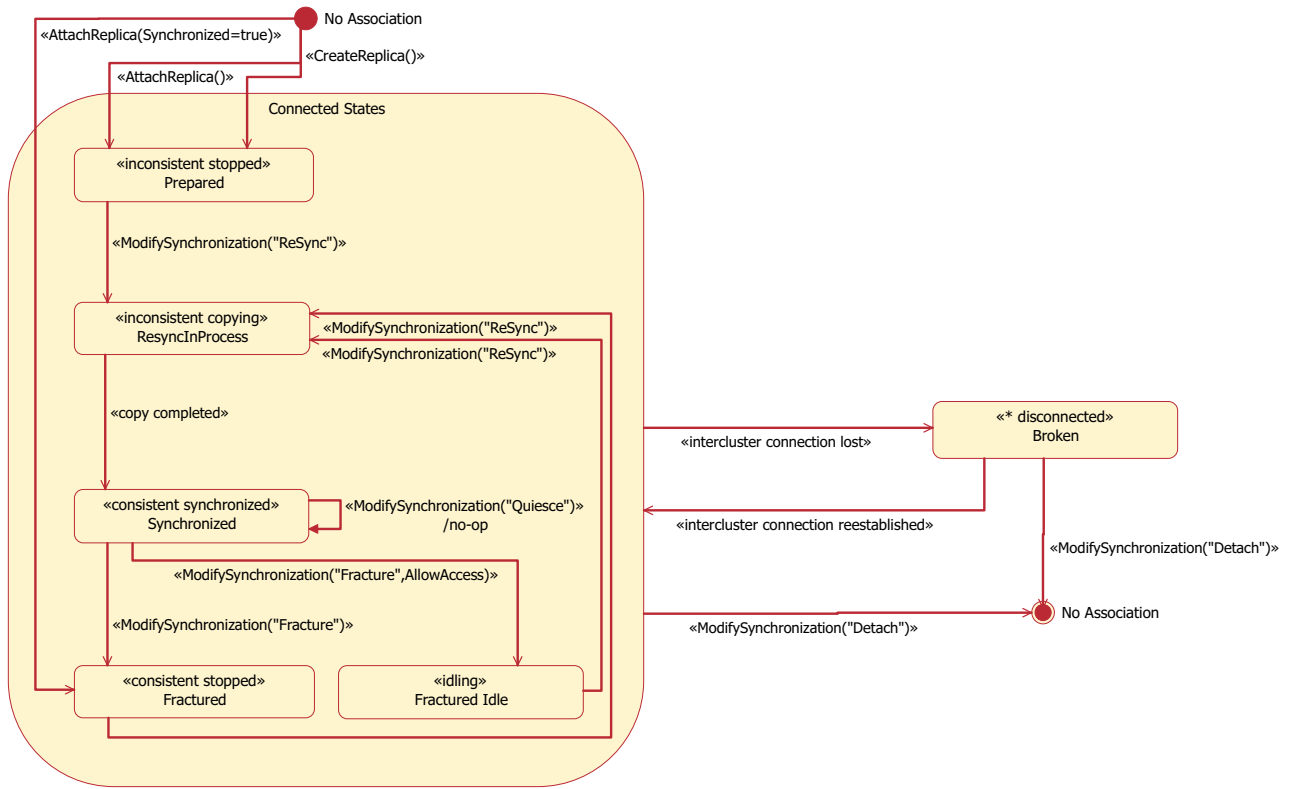


Figure 20. High-level overview of the Sync Copy state diagram of the CIM Agent for the SAN Volume Controller.

Chapter 4. Performing LUN masking

This chapter describes how you can use the Common Information Model (CIM) Agent object class instances to perform LUN masking.

LUN masking

The SAN Volume Controller provides logical unit number (LUN) masking capability. The LUN masking capability allows you to associate or dissociate a storage volume with a fibre-based host initiator through the worldwide port numbers (WWPNs).

Related topics:

- “Performing LUN masking”

Performing LUN masking

To perform logical unit number (LUN) masking you first need a volume to map, 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`.

Steps:

Before performing LUN masking, you need instances of the following services (the cluster is the referenced object):

- `IBMTSSVC_ControllerConfigurationService` (association `IBMTSSVC_ControllerConfigurationServiceForSystem`)
- `IBMTSSVC_StorageHardwareIdManagementService` (association `IBMTSSVC_StorageHardwareIdManagementServiceForSystem`)

Both are available within a cluster scope (`IBMTSSVC_Cluster`).

Perform the following steps to execute LUN masking:

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

I
I
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 `IBMTSSVC_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 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 `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`. For Details see HLD Version 1.6 chapter 6.11.1. 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 topics:

- “LUN masking” on page 37
- “`IBMTSSVC_StorageHardwareIdManagementService`” on page 208

Chapter 5. CIM Agent object classes

This chapter describes the classes that make up the object model of the Common Information Model (CIM) Agent for the SAN Volume Controller and their properties. The 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

This section describes the core classes and their properties of the Common Information Model (CIM) Agent for the SAN Volume Controller.

Related topics:

- “Service object classes” on page 197
- “Security object classes” on page 212
- “Association object classes” on page 235

IBMTSSVC_BackendController

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 4:

Table 4. IBMTSSVC_BackendController properties

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

Table 4. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
Additional Availability	UInt16[]	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_ManagedSystemElement. OperationalStatus CIM_EnabledLogicalElement. 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 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

Table 4. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description																																												
Availability	Uint16	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_ManagedSystemElement. OperationalStatus CIM_EnabledLogicalElement. EnabledStatus), ModelCorrespondence (CIM_LogicalDevice. AdditionalAvailability), Expensive(TRUE)	The primary availability and status of the Device. <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
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)	Indicates 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		Provides a textual description of the object																																												
Element Name	String		Unsupported property																																												

Table 4. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating 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 N/A</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>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 N/A</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>
ErrorCleared	Boolean	Deprecated (CIM_ManagedSystemElement)	Unsupported Property
ErrorDescription	String	Deprecated (CIM_DeviceErrorData.ErrorDescription)	Unsupported Property

Table 4. 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. Note: 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_DeviceErrorData.LastErrorCode)	Unsupported Property																																								
MaxQuiesceTime	UInt64	Deprecated(No value), Units(MilliSeconds)	Unsupported Property																																								
Name	String	MaxLen(1024), Write(TRUE), WriteRole(Administrator)	Defines 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
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 4. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions)	OtherIdentifyingInfo captures additional data, beyond DeviceID information, that could be used to identify a LogicalDevice. One example would be to hold the OperatingSystem's user-friendly name for the Device in this property.
PowerManagementCapabilities	Uint16[]	Deprecated(CIM_PowerManagementCapabilities. PowerCapabilities)	An enumerated array describing the power management capabilities of the Device. The use of this property has been deprecated. Instead, the PowerCapabilites property in an associated PowerManagementCapabilities class should 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

Table 4. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
ProductIdHigh	String		The higher part of the controller's product id.
ProductIdLow	String		The lower part of the controller's product id.
ProductRevision	String	Expensive(TRUE)	The controller's product revision
ProductSerialNumber	String		The controller's product serial number
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement)	<p>An integer enumeration indicator. This property is provided to compare Requested and current Enabledstatus. Note that SAN Volume Controller does not evaluate this attribute and, therefore, 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)	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").

Table 4. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description
StatusInfo	Uint16	Deprecated (CIM_EnabledLogicalElement.EnabledState)	Indicates 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. 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
VendorID	String		Indicates the ID of the controller's vendor
VolumeLinkCount	Uint32	Expensive(TRUE)	Specifies the number of links to the BackendVolumes
VolumeMaxLinkCount	Uint32	Expensive(TRUE)	Specifies the maximum number of links to the BackendVolumes
WWNN	String	Expensive(TRUE)	Indicates the worldwide network name (WWNN) of the controller
Wwpn	String[]	ModelCorrespondence (IBMTSSVC_BackendController.WwpnPathCount), Expensive(TRUE)	Indicates the WWPN of the controller
WwpnMaxPathCount	Uint64[]	ModelCorrespondence (IBMTSSVC_BackendController.Wwpn), Expensive(TRUE)	Specifies the maximum path count to the corresponding WWPN
WwpnPathCount	Uint64[]	ModelCorrespondence (IBMTSSVC_BackendController.Wwpn), Expensive(TRUE)	Specifies 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 5:

Table 5. IBMTSSVC_BackendVolume properties

Property	Type	Qualifier	Description
Access	Uint16		Specifies the access levels, as defined below: Code Semantics 0 Unknown 1 Readable 2 Writeable 3 Read/Write Supported 4 Write Once

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description																																												
Additional Availability	UInt16[]	ModelCorrespondence (CIM_LogicalDevice.Availability)	<p>Specifies 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> <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
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 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
Availability	Uint16	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_ManagedSystemElement. OperationalStatus CIM_EnabledLogicalElement. EnabledState) ModelCorrespondence (CIM_LogicalDevice. AdditionalAvailability)	Specifies 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)	Specifies the size (bytes) of the blocks that form this StorageExtent. If variable block size, then the maximum block size in bytes should be specified. If the block size is unknown or if a block concept is not valid, enter a 1.
Capacity	Uint64	Units(Bytes)	Specifies the total capacity of the BackendVolume
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	Identifies the object with a short (one-line string) textual description

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description												
CreationClassName	String	MaxLen(256)	Indicates 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.												
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		Defines the type of data organization techniques: <table border="0"> <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)	Specifies 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)	Indicates the current value for the Delta reservation												
Description	String		Provides a textual description of the object												

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
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
EnabledDefault	Uint16	Write(TRUE)	An enumerated value indicating 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_EnabledLogicalElement, OtherEnabledState)	Integer enumeration indicating whether the element is currently shutting down or is 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..65535 Vendor Reserved

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description																																				
ErrorCleared	Boolean	Deprecated(CIM_ManagedSystemElement.OperationalStatus)	Unsupported Property																																				
ErrorDescription	String	Deprecated(CIM_DeviceErrorData.ErrorDescription)	Unsupported Property																																				
ErrorMethodology	String		Unsupported Property																																				
ExtentStatus	Uint16[]		<p>Records status information in addition to what is captured in the Availability and StatusInfo properties, inherited from ManagedSystemElement.</p> <table border="0"> <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>None/Not Applicable</td></tr> <tr><td>3</td><td>Broken</td></tr> <tr><td>4</td><td>Data Lost</td></tr> <tr><td>5</td><td>Dynamic Reconfig</td></tr> <tr><td>6</td><td>Exposed</td></tr> <tr><td>7</td><td>Fractionally Exposed</td></tr> <tr><td>8</td><td>Partially Exposed</td></tr> <tr><td>9</td><td>Protection Disabled</td></tr> <tr><td>10</td><td>Readying</td></tr> <tr><td>11</td><td>Rebuild</td></tr> <tr><td>12</td><td>Recalculate</td></tr> <tr><td>13</td><td>Spare in Use</td></tr> <tr><td>14</td><td>Verify In Progress</td></tr> <tr><td>15..32767</td><td>DMTF Reserved</td></tr> <tr><td>32768..65535</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Other	1	Unknown	2	None/Not Applicable	3	Broken	4	Data Lost	5	Dynamic Reconfig	6	Exposed	7	Fractionally Exposed	8	Partially Exposed	9	Protection Disabled	10	Readying	11	Rebuild	12	Recalculate	13	Spare in Use	14	Verify In Progress	15..32767	DMTF Reserved	32768..65535	Vendor Reserved
Code	Semantics																																						
0	Other																																						
1	Unknown																																						
2	None/Not Applicable																																						
3	Broken																																						
4	Data Lost																																						
5	Dynamic Reconfig																																						
6	Exposed																																						
7	Fractionally Exposed																																						
8	Partially Exposed																																						
9	Protection Disabled																																						
10	Readying																																						
11	Rebuild																																						
12	Recalculate																																						
13	Spare in Use																																						
14	Verify In Progress																																						
15..32767	DMTF Reserved																																						
32768..65535	Vendor Reserved																																						
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	<p>An array of free-form strings providing explanations and details behind the entries in the OtherIdentifyingInfo array. Note: each entry of this array is related to the entry in OtherIdentifyingInfo which is located in the same index.</p>																																				

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description																				
InstallDate	Date-time		Unsupported Property																				
IsBasedOnUnderlyingRedundancy	Boolean		If set to true, indicates that the underlying StorageExtent participates in a StorageRedundancy Group																				
LastErrorCode	Uint32	Deprecated(CIM_Device.ErrorData.LastErrorCode)	Unsupported Property																				
MaxPathCount	Uint32	Counter(TRUE), Expensive(TRUE)	Specifies the maximum fibre-channel path count to the BackendVolume																				
MaxQuiesceTime	Uint64	Deprecated(No value), Units(MilliSeconds)	Unsupported Property																				
Mode	Uint32	ValueMap, Values	Specifies the mode of the BackendVolume: <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unmanaged</td> </tr> <tr> <td>1</td> <td>Router restricted</td> </tr> <tr> <td>2</td> <td>Managed</td> </tr> <tr> <td>3</td> <td>Image</td> </tr> <tr> <td>4</td> <td>for future use</td> </tr> <tr> <td>5</td> <td>for future use</td> </tr> <tr> <td>6</td> <td>Router config</td> </tr> <tr> <td>7</td> <td>Remote copy</td> </tr> <tr> <td>8</td> <td>for future use</td> </tr> </tbody> </table>	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
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)	Defines the unique label by which the object is known																				
NativeStatus	Uint16		The back-end volume's native operational status. <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Offline</td> </tr> <tr> <td>1</td> <td>Online</td> </tr> <tr> <td>2</td> <td>Degraded</td> </tr> <tr> <td>3</td> <td>Excluded</td> </tr> </tbody> </table>	Code	Semantics	0	Offline	1	Online	2	Degraded	3	Excluded										
Code	Semantics																						
0	Offline																						
1	Online																						
2	Degraded																						
3	Excluded																						
NoSinglePointOfFailure	Boolean	ModelCorrespondence (CIM_StorageSetting.NoSinglePointOfFailure)	Indicates whether the no-single-point-of-failure feature exists																				

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description																																								
NumberOfBlocks	UInt64	Expensive(TRUE)	Specifies 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.																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The status of the volume.</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
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)	Describes the element's enabled or disabled state when EnabledStatus is set to 1; must be null when EnabledStatus is set to a value other than 1																																								

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions), Expensive(TRUE)	OtherIdentifyingInfo captures additional data, beyond DeviceID information, that could be used to identify a LogicalDevice. One example would be to hold the OperatingSystem's user-friendly name for the Device in this property.
PackageRedundancy	Uint16	ModelCorrespondence (CIM_StorageSetting. PackageRedundancyGoal CIM_StorageSetting. PackageRedundancyMax CIM_StorageSetting. PackageRedundancyMin)	The number of disk spindles that can fail without data loss
PathCount	Uint32	Counter(TRUE), Expensive(TRUE)	Specifies the current counts of fibre-channel paths to the BackendVolume
PoolID	String		Defines the identifier of the associated storage pool
PoolName	String		Defines the name of the associated storage pool

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	<p>An enumerated array describing the power management capabilities of the device. The use of this property has been deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class should 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)	<p>Indicates that the Device can be power-managed. The use of this property has been deprecated. Instead, the existence of an associated PowerManagement Capabilities class (associated using the ElementCapabilities relationship) indicates that power management is supported.</p>
PowerOnHours	Uint64	Deprecated (CIM_PoweredStatistical Data.PowerOnHours), Units(Hours), Counter(TRUE),	Unsupported Property
Primordial	Boolean		<p>If true, "Primordial" indicates that the containing system does not have the ability to create or delete this operational element.</p>

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description																						
Purpose	String		A free form string describing the media and/or its use.																						
QuorumIndex	Uint8	Expensive(TRUE)	Specifies 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>Integer enumeration indicator. This property is provided to compare Requested and current Enabledstatus. Note that SAN Volume Controller does not evaluate this attribute and therefore no action is taken when it is changed.</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..32767</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..32767	DMTF Reserved	32768..65535	Vendor Reserved
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																								
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 represent randomly accessed Extents.																						
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.																						

Table 5. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	A string describing 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 6:

Table 6. IBMTSSVC_CandidateCluster properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description
Description	String		Provides a textual description of the object
ElementName	String		Specifies the name of the cluster
InstallDate	Date-time		Unsupported Property
IsConfigured	Boolean		Partnership configuration state

Table 6. 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)	Indicates 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)	A string describing the status - used when the OperationalStatus property is set to 1 ("Other")

IBMTSSVC_CandidateNode

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 7:

Table 7. IBMTSSVC_CandidateNode properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	The Caption property is a short textual description (one-line string) of the object.
CreationClassName	String	MaxLen(256)	CreationClassName 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.

Table 7. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>Enumeration indicating whether the ComputerSystem is a special-purpose System (ie, dedicated to a particular use), versus being general purpose.</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</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> </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	14	Management	15	Block Server	16	File Server	17	Mobile User Device	18	Repeater	19	Bridge/Extender	20	Gateway
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																																														
Description	String		The Description property provides a textual description of the object.																																												
ElementName	String		A user-friendly name for the object.																																												

Table 7. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating 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>EnabledState is an integer enumeration indicating whether 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 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>

Table 7. *IBMTSSVC_CandidateNode* properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form Strings providing explanations and details behind the entries in the OtherIdentifyingInfo array. Note: 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)	The NameFormat property identifies how the ComputerSystem Name is generated, using a heuristic. The heuristic is outlined, in detail, in the CIM V2 System Model specification.

Table 7. 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
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																																										
OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. Dedicated)	A string describing how or why the system is dedicated when the Dedicated array includes the value 2, "Other".																																								
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.																																								

Table 7. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. IdentifyingDescriptions)	OtherIdentifyingInfo captures additional data, beyond System Name information, that could be used to identify a ComputerSystem. One example would be to hold the Fibre Channel World-Wide Name (WWN) of a node. Note that 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 would become the System key, its data placed in the Name property.
PowerManagementCapabilities	Uint16[]	Deprecated (CIM_PowerManagementCapabilities.PowerCapabilities)	An enumerated array describing the power management capabilities of the ComputerSystem. The use of this property has been deprecated. Instead, the PowerCapabilites property in an associated PowerManagementCapabilities class should 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 7. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	RequestedState is an integer enumeration indicating whether the element should 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_ManagedSystemElement. OperationalStatus)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	A String describing the status - used when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Date time		Unsupported property.

IBMTSSVC_CandidateStorageHardwareID

Properties:

The IBMTSSVC_CandidateStorageHardwareID extends the CIM_LogicalElement class and has the properties shown in Table 8.

Table 8. 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	Date time		A datetime value indicating 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)	Indicates 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
Status	String	Deprecated (CIM_ManagedSystemElement.OperationalStatus), MaxLen(10)	A string indicating the current status of the object.

Table 8. *IBMTSSVC_CandidateStorageHardwareID* properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Strings describing 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 cluster the candidate to which hwid belongs.

IBMTSSVC_CandidateVolume

Properties:

The *IBMTSSVC_CandidateVolume* class represents a potential volume for a synchronous copy relationship. The *IBMTSSVC_CandidateVolume* class extends the *CIM_LogicalElement* class and has the properties shown in Table 9:

Table 9. *IBMTSSVC_CandidateVolume* properties

Name	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	Date- time		Unsupported property.
Name	String	MaxLen(1024)	Defines the label by which the object is known.

Table 9. IBMTSSVC_CandidateVolume properties (continued)

Name	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	Indicates 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)	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").
SystemName	String		The IP address of the scoping cluster.

IBMTSSVC_Chassis

Properties:

The IBMTSSVC_Chassis class represents the physical frame that contains other elements and provides definable functionality for a product. The IBMTSSVC_Chassis class extends the CIM_Chassis class and has the properties shown in Table 10 on page 69:

Table 10. IBMTSSVC_Chassis properties

Name	Type	Qualifier	Description
AudibleAlarm	Boolean		Indicates whether 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)	The Caption property is a short textual description (one-line String) of the object.

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description																																																												
ChassisPackage Type	Uint16	Experimental(TRUE), ModelCorrespondence (CIM_Chassis.ChassisTypeDescription)	<p>ChassisPackage Type indicates 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</td></tr> <tr><td></td><td>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
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																																																														
ChassisType Description	String	Experimental(TRUE), ModelCorrespondence (CIM_Chassis.ChassisPackageType)	A string providing more information on the ChassisPackage Type.																																																												

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description																																																				
ChassisTypes	Uint16[]	Deprecated (CIM_Chassis.Chassis PackageType CIM_Chassis.Multiple SystemSupport), ArrayType(Indexed), ModelCorrespondence (CIM_Chassis.Type Descriptions)	An enumerated, integer-valued array indicating the type of Chassis. <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>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>Rack Mount Chassis</td></tr> <tr><td>24</td><td>Sealed-Case PC</td></tr> <tr><td>25</td><td>Multi-system Chassis</td></tr> </tbody> </table>	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
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)	Indicates the name of the class or subclass used in the creation of an instance. When used with the other key properties of this class, allows all instances of this class and its subclasses to be uniquely identified.																																																				
CurrentRequired OrProduced	Uint16	Units(Amps at 120 Volts)	Unsupported property.																																																				

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description
Depth	Real32	Units(Inches)	The depth of the PhysicalPackage in inches.
Description	String		Provides 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 one while the containing Package has power applied to it (ie, is 'on').
InstallDate	Date-time		Unsupported property.
IsLocked	Boolean		Unsupported property.
LockPresent	Boolean		Indicates whether 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.

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description
MultipleSystemSupport	Uint16	Experimental(TRUE)	MultipleSystemSupport indicates whether or not this chassis supports multiple systems, for example, server blades. Code Semantics 0 Unknown 1 True 2 False
Name	String	MaxLen(1024)	Defines the label by which the object is known. When subclassed, the Name property can be overridden to be a Key property.
NumberOfPowerCords	Uint16		Integer indicating the number of power cords which must be connected to the Chassis, for all the components to operate.
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	Indicates 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

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description
OtherIdentifyingInfo[]	String	Write(TRUE)	OtherIdentifyingInfo 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)	RackMountable indicates whether or not the chassis is Rack Mountable Code Semantics 0 Unknown 1 True 2 False
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		Is used to describe 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.

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description
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.
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)	A string describing 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.

Table 10. IBMTSSVC_Chassis properties (continued)

Name	Type	Qualifier	Description
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)	A string indicating 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

Properties:

The IBMTSSVC_Cluster class represents a single SAN Volume Controller cluster, with up to four node pairs. The IBMTSSVC_Cluster class extends the IBMTSSVC_AbstractCluster class and has the properties shown in Table 11:

Table 11. 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 currently available space in the cluster. This is approximate. BackendStorage Capacity-Allocated Capacity.
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)	The Caption property is a short textual description (one-line string) of the object.

Table 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
ClusterState	Uint16		Indicates 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)	Indicates 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 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
Dedicated	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions),	Enumeration indicating whether the ComputerSystem is a special-purpose System (dedicated to a particular use), versus being general purpose. SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage,""Block Server") 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
Description	String		Provides 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 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																
EnabledDefault	Uint16	Write(TRUE),	<p>An enumerated value indicating an administrator's default/startup configuration for an element's EnabledStatus. 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>DMTF Reserved</td> </tr> <tr> <td>32768..65535</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
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 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																												
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	<p>An integer enumeration indicator. In various situations, an element that is being tested is neither enabled or 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> <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>	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																														
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																														
FcPortSpeed	Uint64	Units(GigaBit per second), Expensive(TRUE)	The transmission speed of the attached Fibre-Channel.																												
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherIdentifyingInfo)	An array of free-form strings providing explanations and details behind the entries in the OtherIdentifying Info array. Note that 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.																												

Table 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																																								
Interconnect	String		Unsupported Property.																																								
InterconnectAddress	String		Unsupported Property.																																								
Locale	String	Expensive(TRUE)	The current locale setting of the cluster.																																								
MaxNumberOfNodes	UInt32		Indicates 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."																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>The cluster's operational status.</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 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
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 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
OtherDedicated Descriptions	String[]	ModelCorrespondence (CIM_ComputerSystem.Dedicated), ArrayType(Indexed)	A string describing how or why the system is dedicated when the Dedicated array includes the value 2, "Other."
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.
OtherIdentifying Info	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 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																		
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	<p>An enumerated array describing the power management capabilities of the ComputerSystem. The use of this property has been deprecated. Instead, the Power Capabilites property in an associated PowerManagement Capabilities class should be used.</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>Not Supported</td> </tr> <tr> <td>2</td> <td>Disabled</td> </tr> <tr> <td>3</td> <td>Enabled</td> </tr> <tr> <td>4</td> <td>Power Saving Modes Entered Automatically</td> </tr> <tr> <td>5</td> <td>Power State Settable</td> </tr> <tr> <td>6</td> <td>Power Cycling Supported</td> </tr> <tr> <td>7</td> <td>Timed Power On Supported</td> </tr> </tbody> </table>	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
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																		

Table 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	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 that cluster.
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 Imple- mented
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)	Indicates the update interval for the cluster statistics
StatisticsStatus	Boolean	Expensive(TRUE)	Is true if statistics collection is active.

Table 11. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	The status of the cluster. 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_ManagedSystemElement.OperationalStatus)	A string describing 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.																
Types	Uint16[]		The cluster types. This specifies whether 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. <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>Failover</td> </tr> <tr> <td>3</td> <td>Performance</td> </tr> <tr> <td>4</td> <td>Distributed OS</td> </tr> <tr> <td>5</td> <td>Node Grouping</td> </tr> <tr> <td>6</td> <td>SysPlex</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	Failover	3	Performance	4	Distributed OS	5	Node Grouping	6	SysPlex
Code	Semantics																		
0	Unknown																		
1	Other																		
2	Failover																		
3	Performance																		
4	Distributed OS																		
5	Node Grouping																		
6	SysPlex																		

IBMTSSVC_Controller

The IBMTSSVC_Controller class represents the logical SAN Volume Controller used for modeling the authorization path from host ports to storage volumes.

Properties:

The IBMTSSVC_Controller class extends the CIM_SCSIController class and has the properties shown in Table 12 on page 86:

Table 12. IBMTSSVC_Controller properties

Property	Type	Qualifier	Description
AccessGranted	Boolean	ModelCorrespondence (CIM_Controller. AuthorizationView)	This property provides a quick interface for finding Devices with no Authorization Subject association to an AccessControl Information instance; either directly, or via a Controller. True indicates that the Device has granted access to some consumer. False indicates that no access has been granted.
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 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description																																												
Availability	Uint16	Deprecated(CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledStatus), ModelCorrespondence (CIM_LogicalDevice.AdditionalAvailability)	<p>The primary availability and status of the Device.</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>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
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.																																												

Table 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description						
ConnectionRole	UInt16[]		<p>A protocol controller can have one or more of several roles in a connection:\n. In certain applications, a controller can have both functions (both providing and consuming the connection), hence the array).\nSpecific</p> <p>Examples: A HBA which would be a 'client,' a front end controller on a RAID array which would be a 'server' and a SCSI Extended Copy controller which would be both.</p> <p>Code Semantics</p> <table> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>2</td> <td>Server</td> </tr> <tr> <td>3</td> <td>Client</td> </tr> </table>	0	Unknown	2	Server	3	Client
0	Unknown								
2	Server								
3	Client								
Controlled	Boolean		Unsupported property.						
CreationClassName	String	MaxLen(256)	CreationClassName indicates 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		The Description property provides 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.						

Table 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description																
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating an administrator's default/startup configuration for an element's EnabledStatus. 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>DMTF Reserved</td> </tr> <tr> <td>32768..65535</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
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 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description																												
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	<p>Integer enumeration. In various situations, an element that is being tested is neither enabled or 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.</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>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> </table>	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																														
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 providing explanations and details behind the entries in the OtherIdentifyingInfo array. Note: 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.																												

Table 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
LastErrorCode	Uint32	Deprecated(CIM_Device ErrorData.LastErrorCode)	Unsupported property.
MaxQuiesce Time	Uint64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.
MaxUnits Controlled	Uint32		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: Redundancy Group_id: Host_id.
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	Indicates the current status of the element. This property always reports "Unknown." 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 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	String describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions)	OtherIdentifying Info captures additional data, beyond DeviceID information, that could be used to identify a LogicalDevice.
Power Management Capabilities	Uint16[]	Deprecated(CIM_Power ManagementCapabilities. PowerCapabilities)	The use of this property has been deprecated. PowerCapabilites property in an associated Power Management Capabilities class should 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)	Boolean indicating that the Device can be power managed.
PowerOnHours	Uint64	Deprecated(CIM_Powered StatisticalData.PowerOn Hours), Units(Hours), Counter(TRUE)	Unsupported property.

Table 12. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	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_ManagedSystemElement.OperationalStatus)	Deprecated property; set to "Unknown."
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	A string describing the status — used when the OperationalStatus property is set to 1 ("Other").
StatusInfo	Uint16	Deprecated(CIM_EnabledLogicalElement.EnabledState)	Indicates whether 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

Properties:

The IBMTSSVC_ControllerConfigurationService class extends the CIM_ControllerConfigurationService and has the properties shown in Table 13:

Table 13. IBMTSSVC_ControllerConfigurationService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64),	Unsupported property.
CreationClassName	String	MaxLen(256)	CreationClass Name 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		The Description property provides a textual description of the object.
ElementName	String		Unsupported property
EnabledDefault	Uint16	Write(TRUE)	Enumerated value indicating 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 13. IBMTSSVC_ControllerConfigurationService properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	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	Date-time		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-Recover- able Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Com- munication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode

Table 13. IBMTSSVC_ControllerConfigurationService properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	String describing 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.
PrimaryOwnerContact	String	MaxLen(256), Write(TRUE)	Unsupported property.
PrimaryOwnerName	String	MaxLen(64), Write(TRUE)	Unsupported property.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	Integer enumeration indicator. Note that 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),	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").

Table 13. *IBMTSSVC_ControllerConfigurationService* properties (continued)

Property	Type	Qualifier	Description
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

Properties:

The *IBMTSSVC_ControllerMaskingCapabilities* class extends the *CIM_ProtocolControllerMaskingCapabilities* class and has the properties shown in Table 14:

Table 14. *IBMTSSVC_ControllerMaskingCapabilities* properties

Property	Type	Qualifier	Description
AttachDeviceSupported	Boolean		Set to true if this storage system supports the <i>AttachDevice</i> method.
Caption	String	MaxLen(64)	Short textual description (one-line string) of the object.
ClientSelectableDeviceNumbers	Boolean		Set to true if this storage system allows the client to specify the <i>DeviceNumber</i> parameter when calling <i>ControllerConfigurationService.AttachDevice()</i> and <i>ControllerConfigurationService.AttachDevice()</i> . Set to false if the implementation does not allow unit numbers to vary for a Protocol Controller.
Description	String		Provides a textual description of the object.
ElementName	String	Required(TRUE)	The user-friendly name for this instance of <i>Capabilities</i> .
InstanceID	String		Opaquely and uniquely identifies an instance of this class.

Table 14. IBMTSSVC_ControllerMaskingCapabilities properties (continued)

Property	Type	Qualifier	Description
OneHardwareIDPerView	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.
OtherValidHardwareIDTypes	String[]	ArrayType(Indexed)	An array of strings describing types for valid Storage HardwareID.IDType. Used when the ValidHardwareIdTypes includes 1 ("Other").
PortsPerView	UInt16		An integer enumeration indicating the way that ports per view (ProtocolController) are managed by the underlying storage system. Code Semantics 2 One Port per View 3 Multiple Ports per View 4 All Ports share the same View
PrivilegeDeniedSupported	Boolean		Set to true if this storage system allows a client to create a Privilege instance with PrivilegeGranted set to FALSE.
ProtocolControllerRequiresAuthorizedIdentity	Boolean		If true, this property indicates that at least one Privilege/Identity pair must be specified when CreateProtocolController() is called.

Table 14. IBMTSSVC_ControllerMaskingCapabilities properties (continued)

Property	Type	Qualifier	Description
Protocol Controller Supports Collections	Boolean		If true, this property indicates that the Identity parameter of CreateProtocol Controller WithPorts() MUST 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 Contollers attached to a LogicalPort can expose the same unit numbers. If true, then this storage system requires unique unit numbers across all the Protocol Controllers connected to a LogicalPort.
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

Properties:

The IBMTSSVC_Dumps class extends the CIM_SettingData class and has the properties shown in Table 15:

Table 15. IBMTSSVC_Dumps properties

Property	Type	Qualifier	Description
Admin	String[]		An array of admin log file names.
Caption	String	MaxLen(64)	The Caption property is a short textual description (one-line string) of the object.
Configs	String[]		An array of config dump file names.
Description	String		Provides a textual description of the object.

Table 15. IBMTSSVC_Dumps properties (continued)

Property	Type	Qualifier	Description
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.
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 SHOULD be constructed in the following manner: \n(Vendor ID)(ID) \n (Vendor ID) MUST 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 iotrace log file names.

IBMTSSVC_FCPort

The IBMTSSVC_FCPort class represents a fibre-channel port of a SAN Volume Controller node. Generally, all fibre-channel ports of a SAN Volume Controller pair are connected to the same devices.

Properties:

The IBMTSSVC_FCPort class extends the CIM_FCPort class and has the properties shown in Table 16 on page 101:

Table 16. IBMTSSVC_FCPort properties

Property	Type	Qualifier	Description																		
ActiveCOS	UInt16[]	ModelCorrespondence (CIM_FCPort.SupportedCOS)	<p>An array of integers indicating the Classes of Service that are active (COS). The Active COS is indicated in ActiveCOS.</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>1</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>4</td> </tr> <tr> <td>5</td> <td>5</td> </tr> <tr> <td>6</td> <td>6</td> </tr> <tr> <td>7</td> <td>F</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	1	2	2	3	3	4	4	5	5	6	6	7	F
Code	Semantics																				
0	Unknown																				
1	1																				
2	2																				
3	3																				
4	4																				
5	5																				
6	6																				
7	F																				

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																																						
ActiveFC4Types	UInt16[]	ModelCorrespondence (CIM_FCPort.Supported FC4Types)	<p>Array of integers indicating the Fibre Channel FC-4 protocols currently running. A list of all protocols supported is indicated in the Supported FC4Types 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
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																																																								
ActiveMaximumTransmissionUnit	UInt64	Units(Bytes),	Unsupported property.																																																						

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
AdditionalAvailability	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. Will be always reported as "Unknown" by the SAN Volume Controller.
AutoSense	Boolean		Indicates whether 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. Will be always reported as "Unknown."
Caption	String	MaxLen(64)	Unsupported property.
CreationClassName	String	MaxLen(256)	CreationClass Name 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		Provides 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 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>Enumerated value indicating 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>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		Boolean indicating that the port is operating in full duplex mode.

Table 16. IBMTSSVC_FCPort 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. Note, 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_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 max speed of the Port in Bits per Second.
Name	String	MaxLen(1024)	Unsupported property.
NetworkAddresses	String[]	MaxLen(64)	Unsupported property.

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions), Expensive(TRUE)	Indicates the current status of the port. 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)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST 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 could be used to identify a LogicalDevice.
OtherLink Technology	String	ModelCorrespondence (CIM_NetworkPort. LinkTechnology)	A string value describing LinkTechnology when it is set to "Other."
OtherNetwork PortType	String	ModelCorrespondence (CIM_NetworkPort. PortType)	Describes the type of module, when PortType is set to "Other."

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																										
Permanent Address	String	MaxLen(64), Expensive(TRUE)	Defines the network address hardcoded into a port. This 'hardcoded' address may be changed through firmware upgrade or software configuration.																										
PortNumber	Uint16	Expensive(TRUE)	NetworkPorts are often numbered relative to either a logical modules or a network element.																										
PortType	Uint16	ModelCorrespondence (CIM_NetworkPort, OtherNetworkPortType)	<p>The specific mode currently enabled for the Port.</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>10</td> <td>N</td> </tr> <tr> <td>11</td> <td>NL</td> </tr> <tr> <td>12</td> <td>F/NL</td> </tr> <tr> <td>13</td> <td>Nx</td> </tr> <tr> <td>14</td> <td>E</td> </tr> <tr> <td>15</td> <td>F</td> </tr> <tr> <td>16</td> <td>FL</td> </tr> <tr> <td>17</td> <td>B</td> </tr> <tr> <td>18</td> <td>G</td> </tr> <tr> <td>16000..65535</td> <td>Vendor Reserved</td> </tr> </tbody> </table>	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
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																												

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Power Management Capabilities	UInt16[]	Deprecated (CIM_PowerManagement Capabilities.Power Capabilities)	<p>Describes the power management capabilities of the Device. The use of this property has been deprecated. Instead, the PowerCapabilites property in an associated Power Management Capabilities class should 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>
Power Management Supported	Boolean	Deprecated (CIM_PowerManagement Capabilities)	<p>Boolean indicating that the Device can be power managed. The use of this property has been deprecated. Instead, the existence of an associated Power Management Capabilities class (associated using the Element Capabilities relationship) indicates that power management is supported.</p>
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.

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	Integer enumeration indicator. Note that SAN Volume Controller does not evaluate this attribute and therefore 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
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 should contain the nominal bandwidth.
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 whether the LogicalDevice is in an enabled, disabled, or some other state. Since this property is deprecated, the value "Unknown" is always reported.

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																
SupportedCOS	UInt16[]		<p>An array of integers indicating the Fibre Channel Classes of Service (COS) that are supported. The active COS are indicated in ActiveCOS.</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>1</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>4</td> </tr> <tr> <td>5</td> <td>6</td> </tr> <tr> <td>6</td> <td>F</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	1	2	2	3	3	4	4	5	6	6	F
Code	Semantics																		
0	Unknown																		
1	1																		
2	2																		
3	3																		
4	4																		
5	6																		
6	F																		

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																																						
SupportedFC4Types	Uint16[]		<p>Array of integers indicating the Fibre Channel FC-4 protocols supported. The protocols that are active and running are indicated in the ActiveFC4Types 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
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																																																								
SupportedMaximumTransmissionUnit	Uint64	Units(Bytes)	Unsupported property.																																																						

Table 16. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's CreationClass Name.
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.
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. The IBMTSSVC_Features instance corresponds with the associated IBMTSSVC_Cluster instance.

Properties:

The IBMTSSVC_Features class extends the CIM_Capabilities class and has the properties shown in Table 17:

Table 17. IBMTSSVC_Features properties

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

Table 17. IBMTSSVC_Features properties (continued)

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

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 18:

Table 18. IBMTSSVC_FlashCopySynchronizedSet properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	Identifies the object with a short (one-line string) textual description

Table 18. IBMTSSVC_FlashCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
CopyType	Uint16	Experimental(TRUE)	<p>Describes the replication policy of the SynchronizedSet. Values are: \n Async: create and maintain an asynchronous \n copy of the source. \n Sync: create and maintain a synchronized copy \n of the source. \n UnSyncAssoc: create an unsynchronized copy and \n maintain an association to the source.</p> <p>Code Semantics 2 Async 3 Sync 4 UnSyncAssoc .. DMTF Reserved 0x8000.. Vendor Specific</p>
Description	String		Provides a textual description of the object.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator), Experimental(TRUE)	Specifies 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 must be unique within a namespace. In order to ensure this, the value of InstanceID should be constructed in the following manner: \n(Vendor ID)(ID) \n.
Status	Uint32		<p>Indicates the status of the SynchronizedSet.</p> <p>Code Semantics 2 Initialized 3 PrepareIn Progress 4 Prepared 5 ResyncIn Progress 11 Idle 12 Broken 0x1000 Empty 0x8001 Stopped</p>

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 19:

Table 19. IBMTSSVC_HardwareIdCollection properties

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

Table 19. IBMTSSVC_HardwareIdCollection properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	A string describing the status - used when the OperationalStatus property is set to "Other."

IBMTSSVC_IOGroup

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.

Properties:

The IBMTSSVC_IOGroup class extends the CIM_ComputerSystem class and has the properties shown in Table 20:

Table 20. 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)	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.

Table 20. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>Enumeration indicating whether the ComputerSystem is a special-purpose System (dedicated to a particular use) versus being general purpose. SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server").</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</td></tr> <tr><td>14</td><td>Manage- ment</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> </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	14	Manage- ment	15	Block Server	16	File Server	17	Mobile User Device	18	Repeater	19	Bridge/ Extender	20	Gateway
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	Manage- ment																																														
15	Block Server																																														
16	File Server																																														
17	Mobile User Device																																														
18	Repeater																																														
19	Bridge/ Extender																																														
20	Gateway																																														
Description	String		Provides a textual description of the object.																																												
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The group's user-friendly name.																																												

Table 20. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating 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>Integer enumeration indicating whether 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 providing explanations and details behind the entries in the OtherIdentifying Info array.</p>

Table 20. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
InstallDate	Date-time		Unsupported property.
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_ManagedSystemElement.StatusDescriptions)	No status information available on group level. Look for the individual nodes' 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 20. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.Dedicated)	A string describing how or why the system is dedicated when the Dedicated array includes the value 2 ("Other").
OtherEnabled State	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.
OtherIdentifying Info	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_PowerManagementCapabilities.PowerCapabilities)	An enumerated array describing the power management capabilities of the ComputerSystem. The use of this property has been deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class should 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 20. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>Integer enumeration indicating whether the element should be shut down, enabled, disabled, taken offline, or tested at the next opportunity. This property is provided to compare Requested and current Enabledstatus. Note that the SAN Volume Controller does not evaluate this attribute and therefore 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>
ResetCapability	Uint16		<p>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</p> <p>2 Unknown</p> <p>3 Disabled</p> <p>4 Enabled</p> <p>5 Not Implemented</p>
Roles	String[]	Write(TRUE)	Unsupported property.
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)	A string describing the status - used when the OperationalStatus property is set to "Other."

Table 20. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
TimeOfLastStateChange	Date-time		Unsupported property.

IBMTSSVC_IOGroupSet

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.

Properties:

The IBMTSSVC_IOGroupSet class extends the CIM_ExtraCapacitySet class and has the properties shown in Table 21:

Table 21. IBMTSSVC_IOGroupSet properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.
Description	String		Provides 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 whether load balancing is supported by the ExtraCapacity Set.

Table 21. IBMTSSVC_IOGroupSet properties (continued)

Property	Type	Qualifier	Description
MaxNumber Supported	Uint32		MaxNumber Supported indicates the largest number of elements that can participate in the ExtraCapacity Set. A value of 0 indicates there is no limit on the number of elements.
MinNumberNeeded	Uint32	MinValue(1)	MinNumber Needed indicates the smallest number of elements that must be operational in order to function. For example, in an N+1 redundancy relationship, the MinNumber Needed property is set equal to N.
Redundancy Status	Uint16		RedundancyStatus 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

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 extends the CIM_ConcreteJob class and has the properties shown in Table 22 on page 124:

Table 22. IBMTSSVC_Job properties

Name	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID must be unique within a namespace. To ensure this, the value of InstanceID should be constructed in the following manner: \n(Vendor ID)(ID) \n.
Caption	String	MaxLen(64)	Unsupported property.
DeleteOn Completion	Boolean	Write(TRUE)	Indicates whether or not the job should be 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		Provides a textual description of the object.
ElapsedTime	Date-time		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	UInt16	ModelCorrespondence (CIM_Job.ErrorDescription)	Unsupported property.
ErrorDescription	String	ModelCorrespondence (CIM_Job.ErrorCode)	Unsupported property.
InstallDate	Date-time		Unsupported property.
JobRunTimes	UInt32	Write(TRUE)	

Table 22. IBMTSSVC_Job properties (continued)

Name	Type	Qualifier	Description
JobState	Uint16		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 22. IBMTSSVC_Job properties (continued)

Name	Type	Qualifier	Description
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	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 Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode
OtherRecoveryAction	String	ModelCorrespondence (CIM_Job.RecoveryAction)	Describes 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 has completed at the time that this value is requested.
Priority	UInt32	Write(TRUE)	Unsupported property.

Table 22. IBMTSSVC_Job properties (continued)

Name	Type	Qualifier	Description
RecoveryAction	Uint16	ModelCorrespondence (CIM_Job.OtherRecovery Action)	Describes 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 ExactDay OfMonth 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	Date- time	Write(TRUE), ModelCorrespondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDayOfWeek CIM_Job.RunStartInterval)	

Table 22. IBMTSSVC_Job properties (continued)

Name	Type	Qualifier	Description
ScheduledStartTime	Date-time	Deprecated(CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDayOfWeek CIM_Job.RunStartInterval), Write(TRUE)	Unsupported property.
StartTime	Date-time		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 - used when the OperationalStatus property is set to 1 ("Other").
TimeOfLastStateChange	Date-time		Unsupported Property.
TimeSubmitted	Date-time		Unsupported property.
UntilTime	Date-time	Write(TRUE), ModelCorrespondence (CIM_Job.LocalOrUtcTime)	Unsupported property.

IBMTSSVC_MessageLog

Properties:

The IBMTSSVC_MessageLog class is The IBMTSSVC_MessageLog class extends the CIM_MessageLog class and has the properties shown in Table 23 on page 129:

Table 23. IBMTSSVC_MessageLog properties

Property	Type	Qualifier	Description																								
Capabilities	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_MessageLog. CapabilitiesDescriptions)	<p>An array of integers indicating 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
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																										
Capabilities Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_MessageLog. Capabilities)	<p>An array of free-form strings providing more detailed explanations for any of the Log features indicated in the Capabilities array. Note that 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>The Caption property is a short textual description (one-line String) of the object.</p>																								

Table 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description																										
CharacterSet	UInt16		<p>An enumeration describing the character set used to record data in the individual Log entries.</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>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
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																												
CreationClassName	String	MaxLen(256)	CreationClass Name 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.																										
CurrentNumber OfRecords	UInt64	Gauge(TRUE)	Current number of entries (records) in the Log.																										
Description	String		The Description property provides 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. \n.																										

Table 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating 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>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 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
InstallDate	Date-time		A Datetime value indicating when the object was installed. A lack of a value does not indicate that the object is not installed.
IsFrozen	Boolean		Boolean indicating that the Log is currently frozen and modifications are not allowed.
LastChange	UInt16		An enumeration describing 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 should be set to 0.
MaxNumber OfRecords	UInt64		Maximum number of records that can be captured in the Log. If undefined, a value of zero should be specified.
MaxRecordSize	UInt64	Units(Bytes)	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 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	Indicates 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
OtherEnabled State	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.
OtherPolicy Description	String	ModelCorrespondence (CIM_MessageLog. OverwritePolicy)	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.

Table 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description																		
OverwritePolicy	UInt16	ModelCorrespondence (CIM_MessageLog. OtherPolicyDescription CIM_MessageLog. TimeWhenOutdated CIM_MessageLog. PercentageNearFull)	An enumeration describing the behavior of the Log when it becomes full or near full. <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
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																				
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.'																		
RecordHeaderFormat	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.																		
RecordLastChanged	UInt64		When a change is made to the Log, the record number that was modified is captured.																		

Table 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
RequestedState	UInt16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	Integer enumeration indicator. This property is provided to compare Requested and current Enabledstatus. Note that the SAN Volume Controller does not evaluate this attribute and therefore 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
SizeOfHeader	UInt64	Units(Bytes)	The size of the Log header, in bytes, if one is present. If there is no Log header, then this property should be set to 0.
SizeOfRecord Header	UInt64	Units(Bytes)	The size of the header for the Log's individual entries, in bytes, if record headers are defined. If there are no record headers, then this property should be set to 0.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	A string indicating 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)	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").

Table 23. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
TimeOfLastChange	Date-time		When a change is made to the Log, the date/time of that modification is captured. This property could be used to event against any update to the MessageLog.
TimeOfLastStateChange	Date-time		Unsupported property.
TimeWhenOutdated	Date-time	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_Node

Properties:

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

Name	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The Caption property is a short textual description (one-line string) of the object.
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.

Table 24. IBMTSSVC_Node properties (continued)

Name	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>Enumeration indicating whether the ComputerSystem is a special-purpose System (dedicated to a particular use), versus being 'general purpose.' SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server").</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</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> </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	14	Management	15	Block Server	16	File Server	17	Mobile User Device	18	Repeater	19	Bridge/ Extender	20	Gateway
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																																														
Description	String		The Description property provides 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)

Name	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating 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>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>
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	<p>An array of free-form strings providing explanations and details behind the entries in the OtherIdentifyingInfo array. Note that each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.</p>

Table 24. IBMTSSVC_Node properties (continued)

Name	Type	Qualifier	Description
InstallDate	Date-time		Unsupported property.
IsConfigNode	Boolean		True, if this 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. 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_ManagedSystemElement.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)

Name	Type	Qualifier	Description
OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.Dedicated)	A string describing how or why the system is dedicated when the Dedicated array includes the value 2, ("Other").
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState is any value other than 1.
OtherIdentifying Info	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.Power Capabilities)	An enumerated array describing the power management capabilities of the ComputerSystem. The use of this property has been deprecated. Instead, the PowerCapabilites property in an associated Power Management Capabilities class should 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)

Name	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	Integer enumeration indicator. Note that SAN Volume Controller does not evaluate this attribute and therefore 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_ManagedSystem Element.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").
TimeOfLast StateChange	Date- time		Unsupported property.

IBMTSSVC_NodeVPD

Properties:

The IBMTSSVC_NodeVPD class contains the vital product data (VPD) of the corresponding SAN Volume Controller IBMTSSVC_Node instance. 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		Provides a textual description of the object
ElementName	String	Required(TRUE)	Unsupported Property.
EthernetIP	String		EthernetIP
FrontPanelID	String		FrontPanelID of the node.
InstanceID	String	Key	Opaquely identifies a unique instance of SettingData. The InstanceID must be unique within a namespace. To ensure this, the value of InstanceID should be constructed in the following manner: \n(Vendor ID)(ID) \n
NodeVPD	String[]		Specifies the VPD of the SAN Volume Controller.

IBMTSSVC_PrimordialStoragePool

A group of yet unmanaged BackendVolumes from a specific storage subsystem.

Properties:

The IBMTSSVC_PrimordialStoragePool class extends the CIM_StoragePool class and 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		Provides a textual description of the object.
ElementName	String	MaxLen(15)	The pool's user-friendly name.
InstallDate	Date-time		Unsupported Property.

Table 26. IBMTSSVC_PrimordialStoragePool properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		The label by which the object is known. Format: cluster_ip: P:object_id
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)	Unsupported, always reported as "Unknown." 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
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 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.
Remaining ManagedSpace	UInt64	Units(Bytes), ModelCorrespondence (StoragePool.Total ManagedSpace AllocatedFromStorage Pool.SpaceConsumed), Required(TRUE)	The remaining amount of raw storage (in bytes) from the TotalManaged Space of this StoragePool.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	Deprecated property - set to "Unknown." Look to OperationalStatus for status information
Status Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus),	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").
TotalManaged Space	UInt64	Units(Bytes), ModelCorrespondence (StoragePool.Remaining ManagedSpace),	The total amount of raw storage (in bytes) managed by this StoragePool.

IBMTSSVC_Privilege

Properties:

The IBMTSSVC_Privilege class extends the CIM_AuthorizedPrivilege class and has the properties shown in Table 27:

Table 27. IBMTSSVC_Privilege properties

Property	Type	Qualifier	Description
Activities	Uint16[]	ModelCorrespondence (CIM_Privilege.Activity Qualifiers), ArrayType(Indexed)	An array of string values indicating the activities that are granted or denied. These activities apply to all entities specified in the ActivityQualifiers array. Code Semantics 0 Unknown 1 Other 2 Create 3 Delete 4 Read 5 Write 6 Execute 7.. DMTF Reserved
ActivityQualifiers	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_Privilege.Activities CIM_Privilege.Qualifier Formats)	Unsupported Property
Caption	String	MaxLen(64)	Unsupported Property
Description	String		Provides a textual description of the object.
ElementName	String		Unsupported Property
InstanceID	String		Opaquely identifies a unique instance of Privilege. The InstanceID must be unique within a namespace. To ensure this, the value of InstanceID should be constructed in the following manner: \\(Vendor/Admin ID):(ID) \n (Vendor/Admin ID) MUST include a copyrighted, trademarked or otherwise unique name that is owned by the business entity, or a registered ID.

Table 27. IBMTSSVC_Privilege properties (continued)

Property	Type	Qualifier	Description																						
PrivilegeGranted	Boolean		Boolean indicating whether this Privilege grants (TRUE) or denies (FALSE) permission. The default is to grant permission.																						
QualifierFormats	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_Privilege.Activity Qualifiers)	Unsupported Property. <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Class Name</td> </tr> <tr> <td>3</td> <td><Class.> Property</td> </tr> <tr> <td>4</td> <td><Class.> Method</td> </tr> <tr> <td>5</td> <td>Object Reference</td> </tr> <tr> <td>6</td> <td>Namespace</td> </tr> <tr> <td>7</td> <td>URL</td> </tr> <tr> <td>8</td> <td>Directory/File Name</td> </tr> <tr> <td>9</td> <td>Command Line Instruction</td> </tr> <tr> <td>..15999</td> <td>DMTF Reserved</td> </tr> <tr> <td>16000..</td> <td>Vendor Reserved</td> </tr> </tbody> </table>	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
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 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.

Properties:

The IBMTSSVC_Product class extends the CIM_Product class and has the properties shown in Table 28:

Table 28. IBMTSSVC_Product properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description.
Description	String		Provides a textual description of the object
ElementName	String		Specifies the name of the Product

Table 28. IBMTSSVC_Product properties (continued)

Property	Type	Qualifier	Description
IdentifyingNumber	String	MaxLen(64)	Specifies the Product identification, such as a serial number on software, a die-number on a hardware chip, or (for noncommercial Products) a project number
Name	String	MaxLen(256), ModelCorrespondence (CIM.DMTFIPRS_Product.ProductName)	Specifies the Product name
SKUNumber	String	MaxLen(64)	Unsupported property
Vendor	String	MaxLen(256), ModelCorrespondence (CIM.DMTFIPRS_Product.Vendor)	Specifies 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)	Specifies the version of the PhysicalElement.
WarrantyDuration	UInt32	Units(Days), ModelCorrespondence (CIM_Product.WarrantyStartDate)	Unsupported property
WarrantyStartDate	Date-time	ModelCorrespondence (CIM_Product.WarrantyDuration)	Unsupported property

IBMTSSVC_Provider

Properties:

The IBMTSSVC_Provider class extends the CIM_Provider class and has the properties shown in Table 29:

Table 29. IBMTSSVC_Provider properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64), ReadRole(None)	Short textual description (one-line string) of the object.

Table 29. IBMTSSVC_Provider properties (continued)

Property	Type	Qualifier	Description
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	ReadRole(None)	Textual description of the object.
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. \n.
EnabledDefault	uint16	Write(TRUE)	An enumerated value indicating 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 29. IBMTSSVC_Provider properties (continued)

Property	Type	Qualifier	Description
EnabledState	UInt16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	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	Date- time		Unsupported property
Name	String	MaxLen(256)	A human-readable name that uniquely identifies the provider within a system.

Table 29. IBMTSSVC_Provider 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)	A string describing 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 29. IBMTSSVC_Provider properties (continued)

Property	Type	Qualifier	Description
RequestedState	uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	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.Enabled Default)	Indicates if this service is started manually or automatically.
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)	A string describing the status - used when the OperationalStatus property is set to 1 ("Other").
SystemCreation ClassName	String	Propagated (CIM_System.Creation ClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLast StateChange	Date- time		Unsupported property

IBMTSSVC_RegisteredProfile

Properties:

The IBMTSSVC_RegisteredProfile 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.

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 DMTF or other standards organizations. Note that 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 providing additional information related to the AdvertiseType. A description MUST 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, via what mechanisms. 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		Provides 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 30. IBMTSSVC_RegisteredProfile properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		Opaquely and uniquely identifies an instance of this class. In order to ensure this, the value of InstanceID SHOULD be constructed using the following 'preferred' algorithm: \n <OrgID>:<LocalID> \nWhere <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> MUST 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 providing 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
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																																										
Registered Version	String	Required(TRUE)	<p>The version of this profile. The String representing the version MUST be in the form: \n M + "." + N + "." + U \nWhere: \nM - The major version (in numeric form) describing the profile's creation or last modification. \nN.</p>																																								

IBMTSSVC_RegisteredSubProfile

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 extends the CIM_RegisteredSubProfile class and has the properties shown in Table 31 on page 155:

Table 31. IBMTSSVC_RegisteredSubProfile properties

Property	Type	Qualifier	Description
AdvertiseType Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_RegisteredProfile. AdvertiseTypes)	A free-form string providing additional information related to the AdvertiseType. A description MUST 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, via what mechanisms. 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		Provides 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		Opaquely and uniquely identifies an instance of this class. In order to ensure this, the value of InstanceID should be constructed using the following 'preferred' algorithm: \n <OrgID>:<LocalID> \nWhere <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> MUST 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 providing 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
RegisteredOrganization	Uint16	Required(TRUE), ModelCorrespondence (CIM_RegisteredProfile. OtherRegisteredOrganization)	The organization that defines this profile. 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
RegisteredVersion	String	Required(TRUE)	The version of this profile. The string representing the version MUST be in the form: \n M + "." + N + "." + U \nWhere: \nM - The major version (in numeric form) describing the profile's creation or last modification.

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 on page 158:

Table 32. IBMTSSVC_RemoteCluster properties

Property	Type	Qualifier	Description																																												
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description																																												
Description	String		Provides a textual description of the object																																												
ElementName	String		Specifies the name of the cluster																																												
InstallDate	Date-time		A datetime value indicating 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)	Labels the new object																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>Indicates 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
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.																																												

Table 32. IBMTSSVC_RemoteCluster properties (continued)

Property	Type	Qualifier	Description
PartnershipStatus	String		The status of the remote cluster partnership. May be either "Fully_Configured," "Partly_Configured," or "Offline."
ServiceIP	String		The service IP address of the remote cluster.
Status	String	Deprecated (CIM_ManagedSystemElement.OperationalStatus), MaxLen(10)	A string indicating 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_ManagedSystemElement.OperationalStatus)	Strings describing the various OperationalStatus array values.
SystemName	String	MaxLen(256)	The label by which the object is known.

IBMTSSVC_RemoteServiceAccessPoint

Properties:

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

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description
CreationClass Name	String	MaxLen(256)	CreationClass Name 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		Provides 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.
EnabledDefault	UInt16	Write(TRUE)	<p>An enumerated value indicating 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 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description																												
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	<p>EnabledState is an integer enumeration that indicates the enabled/disabled states of an 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>	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																														
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																														

Table 33. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

Property	Type	Qualifier	Description																																																						
InfoFormat	UInt16	ModelCorrespondence (CIM_RemoteService AccessPoint.Other InfoFormatDescription)	<p>An enumerated integer describing 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
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																																																								
InstallDate	Date-time		A datetime value indicating 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)	The Name property 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_ManagedSystem Element.StatusDescriptions)	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> <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																																														
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																																														
OtherEnabled State	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property must be set to NULL when EnabledState is any value other than 1.																																												
OtherInfoFormat Description	String	ModelCorrespondence (CIM_RemoteService AccessPoint.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>Integer enumeration indicating 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 that when EnabledState is set to 5 (“Not Applicable”), then 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
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																												
Status	String	Deprecated (CIM_ManagedSystem Element.OperationalStatus), MaxLen(10)	A string indicating 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)	Strings describing 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.																										

Table 33. *IBMTSSVC_RemoteServiceAccessPoint* properties (continued)

Property	Type	Qualifier	Description
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping System's Name.
TimeOfLastStateChange	Date-time		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 MUST 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

Properties:

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

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		Provides a textual description of the object
ElementName	String		A user-friendly name for the object
InstallDate	Date-time		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)	Indicates 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)	A string indicating the current status of the object; reported as <i>Unknown</i>
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Is used when the OperationalStatus property is set to 1 ("Other").
SystemName	String		The IP of the scoping cluster.

IBMTSSVC_StorageCapabilities

Properties:

IBMTSSVC_StorageCapabilities class is a subclass of Capabilities that defines the Capabilities of a StorageService or StoragePool. 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 167:

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)	Describes the default number of complete copies of data that can be maintained.
DataRedundancy Max	Uint16	MinValue(1), ModelCorrespondence (CIM_StorageCapabilities. DataRedundancyMin CIM_StorageCapabilities. DataRedundancyDefault)	Describes the maximum number of complete copies of data that can be maintained.
DataRedundancy Min	Uint16	MinValue(1), ModelCorrespondence (CIM_StorageCapabilities. DataRedundancyMax CIM_StorageCapabilities. DataRedundancyDefault)	Describes 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)	Delta reservation is a number between 1 (1%) and a 100 (100%) that specifies how much space should 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 should be reserved in a replica for caching changes.
Description	String		Provides 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>Enumeration indicating the type of element to which this Storage Capabilities applies.</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>Reserved</td> </tr> <tr> <td>2</td> <td>Any Type</td> </tr> <tr> <td>3</td> <td>Storage Volume</td> </tr> <tr> <td>4</td> <td>Storage Extent</td> </tr> <tr> <td>5</td> <td>StoragePool</td> </tr> <tr> <td>6</td> <td>Storage Configuration Service</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Reserved	2	Any Type	3	Storage Volume	4	Storage Extent	5	StoragePool	6	Storage Configuration Service
Code	Semantics																		
0	Unknown																		
1	Reserved																		
2	Any Type																		
3	Storage Volume																		
4	Storage Extent																		
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 should be constructed using the following algorithm: \n <OrgID>:<LocalID > \nWhere <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> MUST 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 whether or not the associated element supports no single point of failure. Values are: FALSE = does not support no single point of failure, and TRUE = supports no single point of failure.</p>																

Table 35. IBMTSSVC_StorageCapabilities properties (continued)

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

IBMTSSVC_StorageConfigurationCapabilities

Properties:

IBMTSSVC_StorageConfigurationCapabilities class is a subclass of Capabilities that defines the Capabilities of a StorageConfigurationService. 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		Provides 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 a index property for a search of query. (Note: Name does not have to be unique within a namespace.)

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description
InitialReplicationState	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 SHOULD be constructed using the following algorithm: \n <OrgID>: <LocalID> \nWhere <OrgID> and <LocalID> are separated by a colon ':', and where <OrgID> must 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>Enumeration indicating what operations will be executed 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> <table border="0"> <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
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																						
SupportedCopy Types	Uint16[]	ModelCorrespondence (CIM_StorageConfiguration Service.CreateReplica.CopyType)	<p>Describes the replication capabilities supported by the associated Storage Configuration Services.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Async</td> </tr> <tr> <td>3</td> <td>Sync</td> </tr> <tr> <td>4</td> <td>UnSyncAssoc</td> </tr> <tr> <td>5</td> <td>UnSyncUn Assoc</td> </tr> <tr> <td>..</td> <td>DMTF Reserved</td> </tr> <tr> <td>0x8000..0xFFFF</td> <td>Vendor Specific</td> </tr> </tbody> </table>	Code	Semantics	2	Async	3	Sync	4	UnSyncAssoc	5	UnSyncUn Assoc	..	DMTF Reserved	0x8000..0xFFFF	Vendor Specific						
Code	Semantics																						
2	Async																						
3	Sync																						
4	UnSyncAssoc																						
5	UnSyncUn Assoc																						
..	DMTF Reserved																						
0x8000..0xFFFF	Vendor Specific																						

Table 36. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description
SupportedStorageElementFeatures	uint16[]	ModelCorrespondence (CIM_StorageConfigurationService.CreateOrModifyElementFromStoragePool.ElementType CIM_StorageConfigurationService.CreateOrModifyElementFromStoragePool.InPools)	Enumeration indicating features supported by the Storage Element methods. Code Semantics 2 StorageExtent Creation 3 Storage Volume Creation 4 StorageExtent Modification 5 Storage Volume Modification 6 Single InPool 7 Multiple InPools .. DMTF Reserved 0x8000..0xFFFF Vendor Specific
SupportedStorageElementTypes	Uint16[]	ModelCorrespondence (CIM_StorageConfigurationService.CreateOrModifyElementFromStoragePool.ElementType)	Enumeration indicating the type of storage elements that are supported by the associated Storage Configuration Service. Code Semantics 2 Storage Volume 3 StorageExtent .. DMTF Reserved 0x8000..0xFFFF Vendor Specific
SupportedStoragePoolFeatures	Uint16[]	ModelCorrespondence (CIM_StorageConfigurationService.CreateOrModifyStoragePool.InPools CIM_StorageConfigurationService.CreateOrModifyStoragePool.InElements)	Enumeration indicating 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>Enumeration indicating what operations will be executed without the creation of a job. If an operation is included in both this and Supported Asynchronous Actions, then the underlying instrumentation is indicating that it may or may not create a job.</p> <table border="0"> <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
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																						

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 on page 174:

Table 37. IBMTSSVC_StorageHardwareID properties

Property	Type	Qualifier	Description
InstanceID	String	Expensive(TRUE)	Opaquely identifies a unique instance of Identity. The InstanceID must be unique within a namespace. In order to ensure this, the value of InstanceID should be constructed in the format: (Vendor/Admin ID):(ID) \n
Caption	String		A short textual description (one-line string) of the object
CurrentlyAuthenticated	Boolean		Indicates whether 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_StorageHardware ID.IDType), Expensive(TRUE)	A string describing 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

Table 38. IBMTSSVC_StoragePool properties (continued)

Property	Type	Qualifier	Description								
Description	String		A textual description of the object								
ElementName	String		Name of the cluster								
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	Date-time		Unsupported property								
Name	String	MaxLen(1024)	The globally unique ID of the pool, in the format is (Vendor)(id). For the SAN Volume Controller, the ID is IBMTSSVC(id).								
NativeStatus	Uint16		The native operational state of the pool <table border="0"> <tr> <td>Code</td> <td>Semantics</td> </tr> <tr> <td>1</td> <td>Offline</td> </tr> <tr> <td>1</td> <td>Online</td> </tr> <tr> <td>2</td> <td>Degraded</td> </tr> </table>	Code	Semantics	1	Offline	1	Online	2	Degraded
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 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
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																																										
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.OperationaIStatus)	A string describing 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). 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 should maintain. The setting is associated to a StorageVolume using ElementSetting.

Properties:

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, RAID 5 where one copy is maintained and RAID 1 where two or more copies are maintained. Possible values are 1 to n. The bounds for redundancy are defined using the properties DataRedundancy Max and DataRedundancy Min.
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, RAID 5 where one copy is maintained and RAID 1 where 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, RAID 5 where one copy is maintained and RAID 1 where two or more copies are maintained. Possible values are 1 to n.

Table 39. IBMTSSVC_StorageSetting properties (continued)

Property	Type	Qualifier	Description
DeltaReservationGoal	UInt8	Units(Percentage), MinValue(1), MaxValue(100), ModelCorrespondence (CIM_StorageSetting.DeltaReservationMinCIM_StorageSetting.DeltaReservationMax), Write(TRUE)	The amount of space that should 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 DeltaReservationMax and DeltaReservationMin.
DeltaReservationMax	UInt8	Units(Percentage), MinValue(1), MaxValue(100), ModelCorrespondence (CIM_StorageSetting.DeltaReservationMinCIM_StorageSetting.DeltaReservationGoal), Write(TRUE)	The maximum amount of space that should be reserved in a replica for caching changes, specified by a number between 1 (1%) and 100 (100%). For a complete copy, use 100.
DeltaReservationMin	UInt8	Units(Percentage), MinValue(1), MaxValue(100), ModelCorrespondence (CIM_StorageSetting.DeltaReservationMaxCIM_StorageSetting.DeltaReservationGoal), Write(TRUE)	The minimum amount of space that should 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 should be constructed using the following algorithm: <OrgID>:<LocalID>. <OrgID> must 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 should not be re-used 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, in the storage domain package redundancy describes the number of disk spindles that can fail without data loss including, at most, one spare. For example, a RAID 5 with a spare disk could have a PackageRedundancy of 2.

Table 39. IBMTSSVC_StorageSetting properties (continued)

Property	Type	Qualifier	Description
PackageRedundancyMax	Uint16	Write(TRUE), ModelCorrespondence (CIM_StorageSetting. PackageRedundancyMin CIM_StorageSetting. PackageRedundancyGoal)	PackageRedundancyMax describes the maximum number of redundant packages to use. Possible values are 0 to n.
PackageRedundancyMin	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 via a Controller. 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
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 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)	<p>The primary availability and status of the Device</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>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
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)	Size in bytes of the blocks that form this StorageExtent. If variable block size, then the maximum block size in bytes should 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.																																												

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short textual description (one-line string) of the object
ConsumableBlocks	UInt64		The maximum number of blocks, of size BlockSize, that are available for consumption when layering StorageExtents using the BasedOn association. This property only has meaning when this StorageExtent is an Antecedent reference in a BasedOn relationship. For example, a StorageExtent could 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 would be 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. True indicates that the Device is connected to one or more Ports (via Controllers). False indicates that the Device exists but is not connected to a port.

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
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.
DataOrganization	Uint16		Type of data organization used 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 that are maintained
DeltaReservation	Uint8	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageSetting.DeltaReservationGoal CIM_StorageSetting.DeltaReservationMax CIM_StorageSetting.DeltaReservationMin)	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 unique for instances of the StorageVolume class only.
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</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>The operational state of the 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 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p> <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 EnabledLogicalElement, then Not Applicable (5) is used.</p>
ErrorCleared	Boolean	Deprecated(CIM_ManagedSystemElement.OperationalStatus)	Unsupported property

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
ErrorDescription	String	Deprecated(CIM_Device ErrorData.ErrorDescription)	Unsupported property
ErrorMethodology	String		Unsupported property
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 (for example, "Protection Disabled", value=9) 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 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
IsBasedOn Underlying Redundancy	Boolean		True indicates that the underlying StorageExtent(s) participate in a StorageRedundancy Group
IsFormatted	Boolean	Expensive(TRUE)	True indicates that the volume has been formatted by 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																						
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)																						

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 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> <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>VPD83Type3n (Page 83, Type 3 NAA. NameFormat should be NAA.)</td> </tr> <tr> <td>3</td> <td>VPD83Type2 (VPD Page 83, Type 2 EUI64. NameFormat EUI.)</td> </tr> <tr> <td>4</td> <td>VPD83Type1 (VPD Page 83, Type 1 T10 Vendor Identification. NameFormat T10.)</td> </tr> <tr> <td>5</td> <td>VPD80 (VPD page 80, Serial number. NameFormat should be Other.)</td> </tr> <tr> <td>6</td> <td>NodeWWN (FC NodeWWN. NameFormat should be NAA or EUI.)</td> </tr> <tr> <td>7</td> <td>SNVM (Serial Number/ Vendor/ Model. NameFormat should be SNVM.)</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	VPD83Type3n (Page 83, Type 3 NAA. NameFormat should be NAA.)	3	VPD83Type2 (VPD Page 83, Type 2 EUI64. NameFormat EUI.)	4	VPD83Type1 (VPD Page 83, Type 1 T10 Vendor Identification. NameFormat T10.)	5	VPD80 (VPD page 80, Serial number. NameFormat should be Other.)	6	NodeWWN (FC NodeWWN. NameFormat should be NAA or EUI.)	7	SNVM (Serial Number/ Vendor/ Model. NameFormat should be SNVM.)
Code	Semantics																				
0	Unknown																				
1	Other																				
2	VPD83Type3n (Page 83, Type 3 NAA. NameFormat should be NAA.)																				
3	VPD83Type2 (VPD Page 83, Type 2 EUI64. NameFormat EUI.)																				
4	VPD83Type1 (VPD Page 83, Type 1 T10 Vendor Identification. NameFormat T10.)																				
5	VPD80 (VPD page 80, Serial number. NameFormat should be Other.)																				
6	NodeWWN (FC NodeWWN. NameFormat should be NAA or EUI.)																				
7	SNVM (Serial Number/ Vendor/ Model. NameFormat should be SNVM.)																				

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 whether or not a single point of failure exists
NumberOfBlocks	Uint64		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

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
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.
OtherIdentifyingInfo	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 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)
OtherNameNamespace	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 describing the power management capabilities of the Device. This property has been deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class should be used.</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>Not Supported</td> </tr> <tr> <td>2</td> <td>Disabled</td> </tr> <tr> <td>3</td> <td>Enabled</td> </tr> <tr> <td>4</td> <td>Power Saving Modes Entered Automatically</td> </tr> <tr> <td>5</td> <td>Power State Settable</td> </tr> <tr> <td>6</td> <td>Power Cycling Supported</td> </tr> <tr> <td>7</td> <td>Timed Power On Supported</td> </tr> </tbody> </table>	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
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																				
PowerManagement Supported	Boolean	Deprecated(CIM_Power ManagementCapabilities)	<p>Boolean indicating that the Device can be power managed. This property has been deprecated. Instead, the existence of an associated PowerManagement Capabilities class (associated using the ElementCapabilities relationship) indicates that power management is supported.</p>																		
PowerOnHours	Uint64	Deprecated(CIM_Powered StatisticalData.PowerOn Hours), Units(Hours), Counter(TRUE)	Unsupported property																		
PreferredNode	String	Expensive(TRUE)	The ID of the preferred node.																		
Primordial	Boolean		Indicates whether the containing System does not have the ability to create or delete this operational element																		

Table 40. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
Purpose	String		The description of the media and its use
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	<p>Indicates the state change for the element that should 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</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>
SCID	String		The sync copy ID of the volume
SCName	String		The sync copy name of the volume
SequentialAccess	Boolean		Indicates whether the 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_ManagedSystemElement.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_EnabledLogicalElement.EnabledState)	Deprecated property. See CIM_EnabledLogicalElement.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 the volume

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 41:

Table 41. IBMTSSVC_SyncCopySynchronizedSet properties

Property	Type	Qualifier	Description
AuxiliaryID	String		The ID of the auxiliary cluster
AuxiliaryName	String		The name of the auxiliary cluster
Availability	Uint32	Expensive(TRUE)	The availability of the set Code Semantics 0 Online 1 Primary Offline 2 Secondary Offline 3 IO Channel Offline

Table 41. IBMTSSVC_SyncCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
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	A 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
InstanceID	String		InstanceID 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 should be constructed in the following format: \n(Vendor ID)(ID) \n
MasterID	String		The ID of the master cluster

Table 41. IBMTSSVC_SyncCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
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 whether the synchronization relationship is maintained

Service object classes

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

Related topics:

- “Core object classes” on page 39
- “Security object classes” on page 212
- “Association object classes” on page 235

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 42:

Table 42. IBMTSSVC_ClusteringService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property
CreationClassName	String	MaxLen(256)	Indicates 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		Provides a textual description of the object.
ElementName	String		Unsupported property
EnabledDefault	Uint16	Write(TRUE)	An enumerated value indicating 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 42. IBMTSSVC_ClusteringService properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	Integer enumeration indicating 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	Date- time		Unsupported property
Name	String	MaxLen(256)	The label by which the object is known.

Table 42. IBMTSSVC_ClusteringService 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_EnabledLogica Element.EnabledState)	A string describing the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property MUST be set to NULL when EnabledState 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 42. IBMTSSVC_ClusteringService properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	RequestedStatus is an integer enumeration indicating whether the element should 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_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."
SystemCreation ClassName	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.
TimeOfLastState Change	Date time		Unsupported property

IBMTSSVC_PrivilegeManagementService

Properties:

The IBMTSSVC_PrivilegeManagementService class extends the CIM_PrivilegeManagementService class and has the properties shown in Table 43:

Table 43. IBMTSSVC_PrivilegeManagementService 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		Provides a textual description of the object.
ElementName	String		Unsupported property
EnabledDefault	Uint16	Write(TRUE)	An enumerated value indicating 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 43. IBMTSSVC_PrivilegeManagementService properties (continued)

Property	Type	Qualifier	Description
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	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	Date- time		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-Recover- able Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Com- munication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode

Table 43. IBMTSSVC_PrivilegeManagementService properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	A string describing 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.
PrimaryOwnerContact	String	MaxLen(256), Write(TRUE)	Unsupported property
PrimaryOwnerName	String	MaxLen(64), Write(TRUE)	Unsupported property
RequestedState	UInt16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	Integer enumeration indicator. This property is provided to compare Requested and current Enabled statuses. Note that 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)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.

Table 43. IBMTSSVC_PrivilegeManagementService properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	A string describing 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_StorageConfigurationService

Properties:

The IBMTSSVC_StorageConfigurationService class provides extrinsic methods for basic storage configuration tasks.

The IBMTSSVC_StorageConfigurationService class extends the CIM_StorageConfigurationService class and has the properties shown in Table 44:

Table 44. IBMTSSVC_StorageConfigurationService 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		Provides a textual description of the object.
ElementName	String		Unsupported property

Table 44. IBMTSSVC_StorageConfigurationService properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value indicating 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>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 44. IBMTSSVC_StorageConfigurationService 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)	A string describing 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_StorageConfigurationService properties (continued)

Property	Type	Qualifier	Description
RequestedState	UInt16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	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.Enabled Default)	Indicates if this service is started manually or automatic.
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)	A string describing the status. Is used when the OperationalStatus property is set to 1 ("Other").
SystemCreation ClassName	String	Propagated (CIM_System.Creation ClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLast StateChange	Date- time		Unsupported property

IBMTSSVC_StorageHardwareIDManagementService

Properties:

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

The IBMTSSVC_StorageHardwareIDManagementService class extends the CIM_StorageHardwareIDManagementService class and has the properties shown in Table 45 on page 209:

Table 45. IBMTSSVC_StorageHardwareID ManagementService properties

Property	Type	Qualifier	Description
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.
Name	String	MaxLen(256)	The name of the object
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
Caption	String	MaxLen(64)	Unsupported property
Description	String		A textual description of the object
ElementName	String		Unsupported property
EnabledDefault	Uint16	Write(TRUE)	An enumerated value indicating 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 45. IBMTSSVC_StorageHardwareID ManagementService properties (continued)

Property	Type	Qualifier	Description																												
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.OtherEnabledState)	<p>The operational state 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>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																														
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	Date-time		Unsupported property																												

Table 45. IBMTSSVC_StorageHardwareID ManagementService 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_EnabledLogica IElement.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 45. IBMTSSVC_StorageHardwareID ManagementService properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	Indicates the state change for the element that should 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). 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 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_Managed SystemElement.Operational Status)	This property is deprecated and 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)
TimeOfLast StateChange	Date- time		Unsupported property

Security object classes

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

Related topics:

- "Core object classes" on page 39
- "Service object classes" on page 197
- "Association object classes" on page 235

IBMTS_Account

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.

Properties:

The IBMTS_Account class extends the CIM_Account class and has the properties shown in Table 46:

Table 46. IBMTS_Account properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description
CreationClass Name	String	MaxLen(256), ReadRole(None)	Indicates 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		Provides 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 may have multiple values that, therefore, cannot be placed in the inherited Description property
ElementName	String		Defines 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

Table 46. IBMTS_Account properties (continued)

Property	Type	Qualifier	Description
Host	String[]		Specifies the name(s) of the system(s) to which the account applies. The host name may be a fully-qualified DNS name or it may be an unqualified host name
InstallDate	Date-time		Specifies the date when the object was installed. Lack of this value does not mean that the object was not installed
LocalityName	String[]		Specifies the name of the selected locality, such as the name of a city, county or other geographic region
Name	String	MaxLen(1024) ReadRole(None)	Specifies the name of the object instance. The value of this property may be set to be the same as that of the UserID property or, in the case of an LDAP-derived instance
ObjectClass	String[]		In the case of an LDAP-derived instance, this property value(s) may be set to the objectClass attribute values

Table 46. IBMTS_Account properties (continued)

Property	Type	Qualifier	Description																																								
Operational Status	Uint16[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	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 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
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																																										
Organization Name	String[]	Required(TRUE)	Specifies the name of the organization related to the account																																								
OU	String[]		Specifies the name of an organizational unit related to the account																																								
Status Descriptions	String[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	Describes the status of the element when OperationalStatus is set to 1																																								
SeeAlso	String[]		Specifies the distinguished Name of other Directory objects that might resemble the real-world objects																																								
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	Indicates the current status of the object																																								
SystemCreation ClassName	String	Propagated (CIM_System.Creations ClassName), MaxLen(256), ReadRole(None)	Specifies the cluster configuration node (CCN) of the System																																								
SystemName	String	Propagated (CIM_System.Name), MaxLen(256), ReadRole(None)	Specifies the name of the System																																								
UserCertificate	String[]	Octetstring(TRUE)	Specifies a public key certificate for the user																																								

Table 46. IBMTS_Account properties (continued)

Property	Type	Qualifier	Description
UserID	String	MaxLen(256)	Defines the identifier for a user to 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 47:

Table 47. IBMTS_AccountManagementService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64), ReadRole(None)	Identifies the object with a short (one-line string) textual description
CreationClassName	String	MaxLen(256), ReadRole(None)	Indicates the name of the class or subclass used to create an instance
SystemCreationClass	String	Propogated (CIM_System.Creation) MaxLen(256), ReadRole(None)	Indicates the system's creation class name
SystemName	String	Propogated (CIM_System.Name) MaxLen(256), ReadRole(None)	Indicates the system's name
Description	String	ReadRole(None)	Provides a textual description of the object
ElementName	String	ReadRole(None)	Specifies the name of the instance

Table 47. IBMTS_AccountManagementService properties (continued)

Property	Type	Qualifier	Description																												
EnabledDefault	Uint16	Write(TRUE)	<p>Indicates the administrator's default or startup configuration for an element's Enabled Status. By default, the element is Enabled (value = 2)</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>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>DMTF Reserved</td> </tr> <tr> <td>32768...</td> <td>Vendor Reserved</td> </tr> </table>	Code	Semantics	2	Enabled	3	Disabled	5	Not Applicable	6	Enabled but Offline	7	No Default	8...32767	DMTF Reserved	32768...	Vendor Reserved												
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)	<p>Indicates whether the element is currently shutting down or in an enabled or disabled state</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>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...</td> <td>Vendor Reserved</td> </tr> </table>	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
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																														
InstallDate	Date-time		Indicates the date on which the CIM client created the object in the CIMOM's repository																												
Name	String	MaxLen(256), ReadRole(None)	Defines the unique label, in the context of the hosting system, by which the AccessControl Information is known																												

Table 47. IBMTS_AccountManagementService properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	Indicates the operational status of the cluster <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> </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
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)	Describes the element's enabled or disabled state when EnabledStatus is set to 1; must be null when EnabledStatus is set to a value other than 1																																								
StatusDescriptions	String[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	Describes the status of the cluster when OperationalStatus is set to 1																																								
PrimaryOwnerContact	String	Experimental(TRUE), MaxLen(256), Write(TRUE)	Specifies how the primary owner of the account can be contacted, such as phone number or e-mail																																								
PrimaryOwnerName	String	Experimental(TRUE), MaxLen(64), Write(TRUE)	Specifies the name of the primary owner																																								

Table 47. IBMTS_AccountManagementService properties (continued)

Property	Type	Qualifier	Description																						
RequestedStatus	Uint16	Write(TRUE), ModelCorrespondence (CIM_EnabledLog)	Sets the state (shut down, enabled, taken offline, or tested) of the element at the next operation <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...32767</td> <td>DMTF Reserved</td> </tr> <tr> <td>32768...</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...32767	DMTF Reserved	32768...	Vendor Reserved
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 whether the Service is automatically started by a system, operating system, or specific user request																						
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	Indicates the current status of the Service instance																						
TimeOfLastStateChange	Date-time	Experimental(TRUE)	Indicates the time the last change of state occurred																						

IBMTS_CIMXMLCommunicationMechanism

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

Properties:

The IBMTS_CIMXMLCommunicationMechanism properties are shown in Table 48:

Table 48. IBMTS_CIMXMLCommunicationMechanism properties

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

Table 48. IBMTS_CIMXMLCommunicationMechanism properties (continued)

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

Table 48. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>Indicates 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 whether 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)	Provides a description of the supported operations of the ObjectManager

Table 48. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description
FunctionalProfile Supply	Uint16[]	Required(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ObjectManager)	Enumerated array describing 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		Indicates the date on which the CIM client created the object in the CIMOM's repository
MultipleOperation Supply	Boolean	Required(TRUE)	Indicates whether the ObjectManager supports multiple operation requests (TRUE) or only simple requests (FALSE)
Name	String	MaxLen(256)	Defines the unique label, in the context of the hosting system, by which the AccessControl Information is known

Table 48. IBMTS_CIMXMLCommunicationMechanism properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>Indicates the operational status of the cluster</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 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
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																																														
OtherCommunicationMechanism	String	ModelCorrespondence (CIM_ObjectManager)	Provides a description of the supported protocols when 1 = Other, is specified in the Communication Mechanism.																																												
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLog)	Describes the element's enabled or disabled state when EnabledStatus is set to 1; must be null when EnabledStatus is set to a value other than 1																																												

Table 48. 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)	Indicates the current status of the Service instance
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	Describes the various OperationalStatus array values
SystemCreationClass	String	Propogated (CIM_System.Creation) MaxLen(256)	Indicates the system's creation class name
SystemName	String	Propogated (CIM_System.Name) MaxLen(256)	Indicates the system's name
TimeOfLastStateChange	Date-time		Indicates the time the last change of state occurred
Version	String	Required(TRUE)	Describes the CIM-XML protocol version supported by the ObjectManager

IBMTS_IndicationFilter

Properties:

The IBMTS_IndicationFilter extends the CIM_IndicationFilter class and has the properties shown in Table 49 on page 225:

Table 49. IBMTS_IndicationFilter properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description
CreationClassName	String	MaxLen(256)	Indicates the name of the class or subclass used to create an instance
SystemCreationClass	String	MaxLen(256)	Indicates the system's creation class name
SystemName	String	MaxLen(256)	Indicates the system's name
Description	String		Provides a textual description of the object
ElementName	String		Specifies 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)	Defines the unique label, in the context of the hosting system, by which the AccessControl Information is known

IBMTS_NameSpace

Properties:

The IBMTS_NameSpace extends the CIM_NameSpace class and has the properties shown in Table 50:

Table 50. IBMTS_NameSpace properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description

Table 50. IBMTS_NameSpace properties (continued)

Property	Type	Qualifier	Description																																
ClassInfo	Uint16	Deprecated (CIM_Namespace), Required(TRUE), Write(TRUE), ModelCorrespondence (CIM_Namespace)	Identifies the organization of the namespace <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>CIM 1.0</td></tr> <tr><td>3</td><td>CIM 2.0</td></tr> <tr><td>4</td><td>CIM 2.1</td></tr> <tr><td>5</td><td>CIM 2.2</td></tr> <tr><td>6</td><td>CIM 2.3</td></tr> <tr><td>7</td><td>CIM 2.4</td></tr> <tr><td>8</td><td>CIM 2.5</td></tr> <tr><td>9</td><td>CIM 2.6</td></tr> <tr><td>10</td><td>CIM 2.7</td></tr> <tr><td>11</td><td>CIM 2.8</td></tr> <tr><td>200</td><td>DMI Recast</td></tr> <tr><td>201</td><td>SNMP Recast</td></tr> <tr><td>202</td><td>CMIP Recast</td></tr> </tbody> </table>	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
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)	Indicates the schema of the namespace <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>CIM 1.0</td></tr> <tr><td>200</td><td>DMI Recast</td></tr> <tr><td>201</td><td>SNMP Recast</td></tr> <tr><td>202</td><td>CMIP Recast</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	CIM 1.0	200	DMI Recast	201	SNMP Recast	202	CMIP Recast																		
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)	Identifies the objects in the namespace																																
CreationClassName	String	MaxLen(256)	Indicates the name of the class or subclass used to create an instance																																
Description	String		Provides 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		Specifies the name of the instance																																
Name	String	MaxLen(256)	Defines the unique label, in the context of the hosting system, by which the AccessControl Information is known																																

Table 50. IBMTS_NameSpace properties (continued)

Property	Type	Qualifier	Description
ObjectManagerCreation	String	Propogated (CIM_ObjectManager), MaxLen(256)	Identifies the ObjectManager's CreationClassName
ObjectManagerName	String	Propogated (CIM_ObjectManager), MaxLen(256)	Identifies the ObjectManager's name
SystemCreationClass	String	Propogated (CIM_ObjectManager), MaxLen(256)	Indicates the system's creation class name
SystemName	String	Propogated (CIM_ObjectManager), MaxLen(256)	Identifies 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 51:

Table 51. IBMTS_ObjectManager properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description
Description	String		Provides a textual description of the object
ElementName	String	ReadRole(None)	Specifies the name of the instance
EnabledDefault	Uint16	Write(TRUE)	Indicates 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 51. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description																												
EnabledState	UInt16	ModelCorrespondence (CIM_EnabledLog)	Indicates whether the element is currently shutting down or in an enabled or disabled state <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>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...</td> <td>Vendor Reserved</td> </tr> </table>	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
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																														
GatherStatisticalData	Boolean	Write(TRUE)	Indicates whether the CIM_CIMOM StatisticalData object has gathered statistical data and whether the date is accessible																												
InstallDate	Date time		Indicates 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 51. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>Indicates the operational status of the cluster</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 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
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																																														
OtherEnabledStatus	String	ModelCorrespondence (CIM_EnabledLog)	Describes the element's enabled or disabled state when EnabledStatus is set to 1; must be null when EnabledStatus is set to a value other than 1																																												
PrimaryOwner Contact	String	Write(TRUE), MaxLen(256)	Specifies how the primary owner of the account can be contacted, such as phone number or e-mail																																												
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Specifies the name of the primary owner																																												

Table 51. 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 that the Service is started or stopped for the account
StartMode	String	MaxLen(10), Deprecated (CIM_Service.Enabled)	Indicates whether the Service is automatically started by a system, operating system, or specific user request
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	Indicates the current status of the Service instance
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	Describes the status of the cluster when OperationalStatus is set to 1
SystemCreationClassName	String	MaxLen(256)	Indicates the class creation name of the scoping system
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	Specifies the name of the scoping system
SystemCreationClass	String	Propagated (CIM_System.Class), MaxLen(256)	Indicates the class creation of the scoping system
TimeOfLastStateChange	Date-time		Indicated the date and time when the element's EnableState last changed

Table 51. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description
Version	String	Experimental(TRUE)	Indicates the VRMF level of the Common Information Model (CIM) Agent

IBMTS_RegisteredProfile

Properties:

The IBMTS_RegisteredProfile extends the CIM_RegisteredProfile class and has the properties shown in Table 52:

Table 52. 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)	Identifies the object with a short (one-line string) textual description
Description	String		Provides a textual description of the object
ElementName	String		Specifies the name of the instance
InstanceID	String		Identifies an instance of this class
OtherRegistered Organization	String	ModelCorrespondence (CIM_ObjectManager), MaxLen(256)	Provides a description of the organization when 1 = Other is specified for the Registered Organization
RegisteredName	String	Required(TRUE), MaxLen(256)	Provides the name of this RegisteredProfile

Table 52. IBMTS_RegisteredProfile properties (continued)

Property	Type	Qualifier	Description																																								
Registered Organization	UInt16	Required(TRUE), ModelCorrespondence (CIM_Namespace)	Identifies the organization of the namespace <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
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																																										
RegisteredVersion	String	Required(TRUE)	Indicates the version of this profile																																								

IBMTS_System

Properties:

The IBMTS_System extends the CIM_System class and has the properties shown in Table 53:

Table 53. IBMTS_System properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Identifies the object with a short (one-line string) textual description
CreationClassName	String	MaxLen(256)	Identifies the name of the class used in creation of an instance
Name	String	MaxLen(256)	Serves as key of a System instance
Description	String		Provides a textual description of the object

Table 53. IBMTS_System properties (continued)

Property	Type	Qualifier	Description																												
ElementName	String	ReadRole(None)	Specifies the name of the instance																												
EnabledDefault	Uint16	Write(TRUE)	<p>Indicates the administrator's default or startup configuration for an element's Enabled Status. 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>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...</td> <td>Vendor Reserved</td> </tr> </tbody> </table>	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
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																														
OtherEnabledState	Uint16	ModelCorrespondence (CIM_EnabledLog)	Indicates whether the element is currently shutting down or in an enabled or disabled state																												
InstallDate	Date-time		Indicates the date on which the CIM client created the object in the CIMOM's repository																												
NameFormat	String	MaxLen(64)	Provides the scope for numerous components																												

Table 53. IBMTS_System properties (continued)

Property	Type	Qualifier	Description																																												
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>Indicates the operational status of the cluster</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 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
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																																														
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE)	Specifies how the primary owner of the account can be contacted, such as phone number or e-mail																																												
PrimaryOwner Name	String	MaxLen(64), Write(TRUE)	Specifies the name of the primary owner																																												

Table 53. 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 <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...</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...	Vendor Reserved
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)	Indicates the current status of the object																										
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	Describes the various OperationalStatus array values																										
TimeOfLastStateChange	Date-time		Indicates the time the last change of state occurred																										

Association object classes

This section describes the association classes and their properties of the Common Information Model (CIM) Agent for the SAN Volume Controller.

Related topics:

- “Core object classes” on page 39
- “Service object classes” on page 197
- “Security object classes” on page 212

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 54:

Table 54. 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 55:

Table 55. 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 56:

Table 56. IBMTSSVC_AuthorizedCollection references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege
Privileged Element	IBMTSSVC_HardwareIdCollection		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 57 on page 237:

Table 57. IBMTSSVC_authorizedStorageHardwareID references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege
Privileged Element	IBMTSSVC_StorageHardwareID		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 58:

Table 58. IBMTSSVC_AuthorizedSubject references

Name	Reference	Qualifier	Description
Privilege	IBMTSSVC_Privilege		The Privilege
Privileged 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 59:

Table 59. IBMTSSVC_AuthorizationTarget 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 60 on page 238:

Table 60. 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 61:

Table 61. 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 62:

Table 62. 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 63:

Table 63. IBMTSSVC_BasedOn properties

Property	Type	Qualifier	Description
EndingAddress	Uint64		Unsupported property

Table 63. IBMTSSVC_BasedOn properties (continued)

Property	Type	Qualifier	Description
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 64:

Table 64. 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

References:

The IBMTSSVC_ClusterDumps class extends the CIM_ElementSettingData class and has the references shown in Table 65:

Table 65. 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 66 on page 240:

Table 66. 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 67:

Table 67. 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 68:

Table 68. IBMTSSVC_ClusteringServiceForSystem references

Reference	Target	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The Cluster

Table 68. IBMTSSVC_ClusteringServiceForSystem references (continued)

Reference	Target	Qualifier	Description
Dependent	IBMTSSVC_ClusteringService	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 69:

Table 69. 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

References:

The IBMTSSVC_ClusterPort defines the cluster scope of the fibre-channel port. The IBMTSSVC_ClusterPort class extends the CIM_SystemDevice class and has the references shown in Table 70:

Table 70. 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 71 on page 242:

Table 71. IBMTSSVC_ClusterScopeCandidateVolume references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Candidate Volume		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 72:

Table 72. 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 73:

Table 73. IBMTSSVC_ClusterScopeFCSet references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_FlashCopy SynchronizedSet		The FlashCopySynchronized Set 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 74:

Table 74. 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 75:

Table 75. 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 76:

Table 76. 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 77:

Table 77. 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 78 on page 244:

Table 78. IBMTSSVC_ClusterScopeSCSet references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_SyncCopy SynchronizedSet		The SyncCopySynchronized Set 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 79:

Table 79. IBMTSSVC_ClusterVolume references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_Storage Volume		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 80:

Table 80. IBMTSSVC_ComponentCS references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate	The Cluster
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 81 on page 245:

Table 81. IBMTSSVC_ComputerSystemPackage references

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

Properties:

The IBMTSSVC_ComputerSystemPackage class has the properties shown in Table 82:

Table 82. 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 83:

Table 83. 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 84:

Table 84. IBMTSSVC_ControllerConfigurationServiceForSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster	Min, Max	The system that the service should be used for
Dependent	IBMTSSVC_Controller ConfigurationService	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 85:

Table 85. IBMTSSVC_ControllerConfService MaskingCapabilities references

Name	Reference	Qualifier	Description
ManagedElement	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 86:

Table 86. IBMTSSVC_CopyCandidate references

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

IBMTSSVC_ElementConformsToProfile

References:

The IBMTSSVC_ElementConformsToProfile class extends the CIM_ElementConformsToProfile class and has the references shown in Table 87:

Table 87. IBMTSSVC_ComponentCS references

Name	Reference	Qualifier	Description
Conformant Standard	IBMTSSVC_RegisteredProfile		The RegisteredProfile to which the Managed Element conforms

Table 87. IBMTSSVC_ComponentCS references (continued)

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Cluster		The Managed Element that conforms to the Registered Profile

IBMTSSVC_FlashCopyStorageSynchronized

References:

The IBMTSSVC_FlashCopyStorageSynchronized class aggregates a source IBMTSSVC_StorageVolume instance and a target IBMTSSVC_StorageVolume for a FlashCopy relationship. 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 88:

Table 88. 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 89:

Table 89. IBMTSSVC_FlashCopyStorageSynchronized properties

Property	Type	Qualifier	Description
CopyRate	Uint16	Write(TRUE), WriteRole (Administrator)	Specifies the copy rate (%) for the SAN Volume Controller

Table 89. IBMTSSVC_FlashCopyStorageSynchronized properties (continued)

Property	Type	Qualifier	Description
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
ReplicaType	UInt16		<p>The type of replication relationship. The SAN Volume Controller replicas are FullCopy (0).</p> <p>Code Semantics</p> <p>0 FullCopy</p> <p>1 BeforeDelta</p> <p>2 AfterDelta</p> <p>3 Log</p> <p>4 NotSpecified</p> <p>.. DMTF reserved</p> <p>0x8000.. Vendor specific</p>
SyncedElementName	String		The name of the Synced Element
SynchronizedSet	String		The name of the SynchronizedSet with which the StorageSynchronized is associated

Table 89. IBMTSSVC_FlashCopyStorageSynchronized properties (continued)

Property	Type	Qualifier	Description																
SynchronizedSetID	String		The identifier of the SynchronizedSet with which the StorageSynchronized is associated																
SyncMaintained	Boolean		Indicates whether synchronization is maintained																
SyncState	Uint16		The state of the synchronization <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Initialized</td> </tr> <tr> <td>3</td> <td>Prepare InProgress</td> </tr> <tr> <td>4</td> <td>Prepared</td> </tr> <tr> <td>5</td> <td>Resync InProgress</td> </tr> <tr> <td>11</td> <td>Idle</td> </tr> <tr> <td>12</td> <td>Broken</td> </tr> <tr> <td>0x8000</td> <td>Stopped</td> </tr> </tbody> </table>	Code	Semantics	2	Initialized	3	Prepare InProgress	4	Prepared	5	Resync InProgress	11	Idle	12	Broken	0x8000	Stopped
Code	Semantics																		
2	Initialized																		
3	Prepare InProgress																		
4	Prepared																		
5	Resync InProgress																		
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 90:

Table 90. 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 91:

Table 91. IBMTSSVC_HardwareIDOnSystem references

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

IBMTSSVC_HostedAccessPoint

References:

The IBMTSSVC_HostedAccessPoint class extends the CIM_HostedAccessPoint class and has the references shown in Table 92:

Table 92. 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_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 93:

Table 93. IBMTSSVC_HostedJob references

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

IBMTSSVC_HostedPrimordialPool

References:

The IBMTSSVC_HostedPrimordialPool associates a cluster with its primordial storage pools.

The IBMTSSVC_HostedPrimordialPool class extends the CIM_HostedStoragePool class and has the references shown in Table 94:

Table 94. IBMTSSVC_HostedPrimordialPool references

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

Table 94. IBMTSSVC_HostedPrimordialPool references (continued)

Name	Reference	Qualifier	Description
PartComponent	IBMTSSVC_PrimitiveStoragePool		The Primitive 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 95:

Table 95. IBMTSSVC_HostedStoragePool references

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

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 96:

Table 96. IBMTSSVC_HwIDCollectionOnSystem references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster
Dependent	IBMTSSVC_HardwareIdCollection		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 97 on page 252:

Table 97. *IBMTSSVC_IndicationFilters*
ConformsToProfile 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 98:

Table 98. *IBMTSSVC_IndicationFiltersConformsToSubProfile* references

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

IBMTSSVC_IOGroupIdentity

References:

The IBMTSSVC_IOGroupIdentity class extends the CIM_ConcretelIdentity class and has the references shown in Table 99:

Table 99. *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

References:

The IBMTSSVC_IOGroupPort associates an I/O group with its Fibre Channel ports. The IBMTSSVC_IOGroupPort class extends the CIM_SystemDevice class and has the references shown in Table 100 on page 253:

Table 100. IBMTSSVC_IOGroupPort references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Aggregate, Max, Min	The parent system in the Association
PartComponent	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 101:

Table 101. IBMTSSVC_ManagesCollection references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Storage HardwareIDManagement Service		The StorageHardwareID ManagementService
Dependent	IBMTSSVC_Hardware IdCollection		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 102:

Table 102. IBMTSSVC_ManagesController references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Controller ConfigurationService		The ControllerConfiguration Service
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 103 on page 254:

Table 103. 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 104:

Table 104. IBMTSSVC_ManagesPrivilege references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_PrivilegeManagementService		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 105:

Table 105. IBMTSSVC_MemberOfCollection references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_HardwareIdCollection	Aggregate	The Host
Member	IBMTSSVC_StorageHardwareID		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 106 on page 255:

Table 106. IBMTSSVC_MemberOfIOGroup references

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

IBMTSSVC_NodeDumps

References:

The IBMTSSVC_NodeDumps class shows the dumps found on a specific node. The IBMTSSVC_NodeDumps class extends the CIM_ElementSettingData class and has the references shown in Table 107:

Table 107. 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 108:

Table 108. 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 109:

Table 109. IBMTSSVC_PartnershipCandidate references

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

IBMTSSVC_PoolCapabilities

References:

The IBMTSSVC_PoolCapabilities class associates a storage pool with a storage capabilities instance. The IBMTSSVC_PoolCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 110:

Table 110. IBMTSSVC_PoolCapabilities references

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

IBMTSSVC_PrimordialPoolCapabilities

References:

The IBMTSSVC_PrimordialPoolCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 111:

Table 111. IBMTSSVC_PrimordialPoolCapabilities references

Name	Reference	Qualifier	Description
ManagedElement	IBMTSSVC_Primordial StoragePool	Min, Max	The managed element
Capabilities	IBMTSSVC_Storage Capabilities		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 112:

Table 112. IBMTSSVC_PrimordialPoolComponent references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Primordial StoragePool	Aggregate	The Primordial StoragePool
PartComponent	IBMTSSVC_Backend Volume		The BackendVolume

IBMTSSVC_PrimordialPoolForController

The IBMTSSVC_PrimordialPoolForController class associates a BackendController with the corresponding PrimordialPool.

References:

The IBMTSSVC_PrimordialPoolForController class extends the CIM_Dependency class and has the references shown in Table 113:

Table 113. IBMTSSVC_PrimordialPoolForController references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Backend Controller		The BackendController
Dependent	IBMTSSVC_Primordial 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 114:

Table 114. 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 115:

Table 115. IBMTSSVC_ProductPhysicalComponent references

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

IBMTSSVC_ProtocolControllerForPort

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

References:

The IBMTSSVC_ProtocolControllerForPort class extends the CIM_ProtocolControllerForPort class and has the references shown in Table 116:

Table 116. 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 117:

Table 117. 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.

Table 117. IBMTSSVC_ProtocolControllerForPort (continued)

Name	Type	Qualifier	Description
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
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 118:

Table 118. 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 119 on page 260:

Table 119. 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.
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

References:

The IBMTSSVC_ProviderInObjectManager class associates the CIM Object Manager with its providers. The IBMTSSVC_ProviderInObjectManager class extends the CIM_Component class and has the references shown in Table 120:

Table 120. IBMTSSVC_ProviderInObjectManager references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Object Manager	Aggregate	
PartComponent	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 121:

Table 121. 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 122:

Table 122. IBMTSSVC_RemoteSystemVolume references

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

IBMTSSVC_RequiresProfile

References:

The IBMTSSVC_RequiresProfile class extends the CIM_SubProfileRequiresProfile class and has the references shown in Table 123:

Table 123. 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

References:

The IBMTSSVC_SAPAvailableForElement class associates a service access point with the device for which it offers a management interface. The IBMTSSVC_SAPAvailableForElement class extends the CIM_SAPAvailableForElement class and has the references shown in Table 124 on page 262

page 262:

Table 124. 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 125:

Table 125. 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 126:

Table 126. 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 127:

Table 127. 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 128:

Table 128. IBMTSSVC_StoragePoolComponent references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_StoragePool	Aggregate	The storage pool
PartComponent	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 129:

Table 129. 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 130:

Table 130. 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 unsynchronized 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 130. 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																				
3	Log																				
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 130. 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 ReSyncln Progress 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 131:

Table 131. IBMTSSVC_SyncCopySynchronizedMember references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_SyncCopySynchronizedSet	Aggregate	The SyncCopy SynchronizedSet
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 132:

Table 132. IBMTSSVC_SystemBackendVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Min, Max, Aggregate	The Cluster
PartComponent	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 133:

Table 133. IBMTSSVC_SystemCandidateVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_RemoteCluster	Aggregate, Max, Min	The aggregating cluster
PartComponent	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 134:

Table 134. IBMTSSVC_SystemController references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Min, Max, Aggregate	The I/O group
PartComponent	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 135:

Table 135. IBMTSSVC_SystemFCPort references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Node	Min, Max, Aggregate	The node
PartComponent	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 136:

Table 136. 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 137:

Table 137. IBMTSSVC_SystemVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Min, Max, Aggregate	The assigned RedundancyGroup

Table 137. IBMTSSVC_SystemVolume references (continued)

Name	Reference	Qualifier	Description
PartComponent	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 138:

Table 138. 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 139:

Table 139. 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 140:

Table 140. 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 141:

Table 141. IBMTSSVC_UseOfMessageLog properties

Property	Type	Qualifier	Description
RecordedData	String		The description of the use of the Log by the ManagedSystem Element

IBMTSSVC_VolumeSettingData

References:

The IBMTSSVC_VolumeSettingData class extends the CIM_ElementSettingData class and has the references shown in Table 142:

Table 142. 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 143 on page 271:

Table 143. 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 144:

Table 144. IBMTSSVC_AccountManagementServiceForSystem references

Reference	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 145:

Table 145. IBMTS_AccountOnCIMOM references

Name	Reference	Qualifier	Description
Group Component	IBMTS_ObjectManager	Aggregate, ReadRole, Min, Max	Represents the aggregation of the CIMOM for the Account
PartComponent	IBMTS_Account	ReadRole, Weak	Represents the Account

Properties:

The IBMTS_AccountOnCIMOM class has the properties shown in Table 146:

Table 146. 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 147:

Table 147. 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
PartComponent	IBMTS_Account	ReadRole, Weak	Represents the subordinate Account

Properties:

The IBMTS_AccountOnSystem class has the properties shown in Table 148:

Table 148. 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 149:

Table 149. IBMTS_CommMechanismForManager

Reference	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_ElementConformsToProfile

The IBMTS_ElementConformsToProfile connects the ObjectManager and the Server profile.

References:

The IBMTS_ElementConformsToProfile class has the references shown in Table 150:

Table 150. IBMTS_ElementConformsToProfile

Reference	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_HostedAccessPoint

The IBMTS_HostedAccessPoint connects the CIM_System and the CIMXMLMechanism profile.

References:

The IBMTS_HostedAccessPoint class has the references shown in Table 151:

Table 151. IBMTS_HostedAccessPoint

Reference	Target	Qualifier	Description
Antecedent	IBMTS_System	Min, Max	Represents the hosting system

Table 151. *IBMTS_HostedAccessPoint* (continued)

Reference	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. 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.

References:

The `IBMTS_HostedService` class has the references shown in Table 152:

Table 152. *IBMTS_HostedService*

Reference	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_IndicationFiltersConformsToProfile

References:

The `IBMTS_IndicationFiltersConformsToProfile` connects the `IndicationFilter` and the `Server` profile.

The `IBMTS_IndicationFiltersConformsToProfile` class has the references shown in Table 153:

Table 153. *IBMTS_IndicationFiltersConformsToProfile*

Reference	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 154:

Table 154. IBMTS_ManagesAccount references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_Account ManagementService	ReadRole	The AccountManagement Service
Dependent	IBMTS_Account	ReadRole	The HardwareAccount

IBMTS_NamespaceInManager

References:

The IBMTS_NamespaceInManager class has the references shown in Table 155:

Table 155. IBMTS_NamespaceInManager

Reference	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 6. 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

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 156:

Table 156. 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()

Related topics:

- “Extrinsic methods” on page 287

Associators()

You can use the `Associators()` method to enumerate the classes or instances that are associated with a CIM object.

Parameters:

Table 157 on page 278 shows the parameters you can specify for the `Associators()` method:

Table 157. *Associators()* parameters

Parameter	Type	Description
ObjectName	COP*	Defines 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. That is, 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 158 on page 279 shows the parameters you can specify for the *AssociatorNames()* method:

Table 158. *AssociatorNames()* parameters

Parameter	Type	Description
ObjectName	COP	Defines 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.

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. The new instance must be based on a class that is already defined in the namespace.

Parameters:

Table 159 shows the parameters you can specify for *CreateInstance()* method:

Table 159. *CreateInstance()* parameters

Parameter	Type	Description
Instance	String	Defines 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 160 shows the parameters you can specify for the DeleteInstance() method:

Table 160. DeleteInstance() parameters

Parameter	Type	Description
InstanceName	String	Defines 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 161 shows the parameters you can specify for the EnumerateClasses() method:

Table 161. EnumerateClasses() parameters

Parameter	Type	Description
ClassName	String	Defines 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	If set to TRUE, returns all qualifiers for the class, its properties, methods, or method parameters; if set to FALSE, returns no qualifiers
IncludeClassOrigin	Boolean	If set to 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 162 shows the parameters you can specify for the EnumerateClassNames() method:

Table 162. EnumerateClassNames() parameters

Parameter	Type	Description
ClassName	String	Defines 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 163 shows the parameters you can specify for the EnumerateInstances() method:

Table 163. EnumerateInstances() parameters

Parameter	Type	Description
ClassName	String	Defines the name of the class for which instances are to be returned.

Table 163. EnumerateInstances() parameters (continued)

Parameter	Type	Description
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 164 shows the parameters you can specify the following parameters of the EnumerateInstanceNames() method:

Table 164. EnumerateInstanceNames() parameters

Parameter	Type	Description
ClassName	String	Defines 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 execute a query against the target namespace.

Parameters:

Table 165 shows the parameters you can specify for the ExecQuery() method:

Table 165. ExecQuery() parameters

Parameter	Type	Description
QueryLanguage	String	Defines the query language in which the query parameter is expressed.
Query	String	Defines the query to be executed.

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 166 shows the parameters you can specify for the GetClass() method:

Table 166. GetClass() parameters

Parameter	Type	Description
ClassName	String	Defines the name of the class to retrieve
LocalOnly	Boolean	If set to TRUE, returns all properties, methods, and qualifiers overridden within the definition of the class
IncludeQualifiers	Boolean	If set to TRUE, returns all qualifiers for the class, its properties, methods, or method parameters; if set to FALSE, returns no qualifiers
IncludeClassOrigin	Boolean	If set to 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 167 shows the parameters you can specify for the GetInstance() method:

Table 167. GetInstance() parameters

Parameter	Type	Description
InstanceName	String	Defines the name of the instance to retrieve
LocalOnly	Boolean	If set to TRUE, returns all properties, methods, and qualifiers overridden within the definition of the class
IncludeQualifiers	Boolean	If set to TRUE, returns all qualifiers for the class, its properties, methods, or method parameters; if set to FALSE, returns no qualifiers
IncludeClassOrigin	Boolean	If set to 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 168 shows the parameters you can specify for the GetProperty() method:

Table 168. GetProperty() parameters

Parameter	Type	Description
InstanceName	String	Defines 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 169 shows the parameters you can specify for the ModifyInstance() method:

Table 169. ModifyInstance() parameters

Parameter	Type	Description
InstanceName	String	Defines 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 170 shows the parameters you can specify for the References() method:

Table 170. References() parameters

Parameter	Type	Description
ObjectName	String	Defines 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.

Table 170. References() parameters (continued)

Parameter	Type	Description
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.
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 171 shows the parameters you can specify for the ReferenceNames() method:

Table 171. ReferenceNames() parameters

Parameter	Type	Description
ObjectName	String	Defines 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 172 shows the parameters you can specify for the SetProperty() method:

Table 172. SetProperty() parameters

Parameter	Type	Description
InstanceName	String	Defines 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 173:

Table 173. Supported extrinsic methods

Class	Method name
IBMTSSVC_BackendVolume	GetFreeExtents()
IBMTSSVC_Chassis	IsCompatible()

Table 173. 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 173. 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()
	ModifySynchronization()
	ModifySynchronizedSet()
	ReturnToStoragePool()
	RequestDiscovery()
	SetIOGroup()
	SetQuorum()
	StartService()
StopService()	
IBMTSSVC_StorageHardwareID ManagementService	AddHardwareIDsToCollection()
	CreateHardwareIDCollection()
	CreateStorageHardwareID()
	DeleteHardwareIDCollection()
	DeleteStorageHardwareID()

Table 173. Supported extrinsic methods (continued)

Class	Method name
IBMTSSVC_StoragePool	GetSupportedSizes()
	GetSupportedSizeRange()

Related topics:

- “Intrinsic methods” on page 277

Add2062Cluster()

Parameters:

This command can be used to configure the ICAT to work with an existing 2062 cluster. The Add2062Cluster() method belongs to the IBMTSSVC_Provider class. Table 174 shows the parameters you can specify for the Add2062Cluster() method:

Table 174. 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()

Parameters:

This command can be used to configure the ICAT to work with an existing 2145 cluster. The Add2145Cluster() method belongs to the IBMTSSVC_Provider class. Table 175 shows the parameters you can specify for the Add2145Cluster() method:

Table 175. 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()

The AddHardwareIDsToCollection() method adds a StorageHardwareID to a HardwareIDCollection. 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.

Parameters:

Table 176 shows the parameters you can specify for the AddHardwareIDsToCollection() method:

Table 176. AddHardwareIDsToCollection() parameters

Parameter	Type	Description
HardwareIDs	String[]	An array that contains the string representations of COPs of 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_SystemSpecific Collection REF	The IBMTSSVC_HardwareIDCollection 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. 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.

Parameters:

Table 177 shows the parameters you can specify for the AddNode() method:

Table 177. AddNode() parameters

Parameter	Type	Description
CS	COP	Defines the IBMTSSVC_CandidateNode instance to be added that 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 code will be known by the cluster.

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. The AssignAccess() method belongs to the IBMTSSVC_AuthorizationService class.

Parameters:

Table 178 shows the parameters you can specify for the AssignAccess() method:

Table 178. AssignAccess() parameters

Parameter	Type	Description
Activities	Uint16[]	MUST be NULL unless the Privilege is NULL on input. This parameter specifies the activities to be granted or denied. Code Semantics 1 Other 2 Create 3 Delete 4 Detect 5 Read 6 Write 7 Execute .. DMTF Reserved 16000..65535 Vendor Reserved
ActivityQualifiers	String[]	MUST be NULL unless Privilege is NULL on input. Defines the activity qualifiers for the Activities to be granted or denied.
PrivilegeGranted	Boolean	MUST 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.
QualifierFormats	Uint16[]	MUST be NULL unless Privilege is NULL on input. Defines the qualifier formats for the corresponding ActivityQualifiers. 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 10..15999 DMTF Reserved 16000..65535 Vendor Reserved
Subject	CIM_ManagedElement REF	Defines the IBMTSSVC_HardwareAccount instance that is in the same IBMTSSVC_Cluster as the IBMTSSVC_AuthorizationService instance

Table 178. AssignAccess() parameters (continued)

Parameter	Type	Description
Target	CIM_ManagedElement REF	On input, this reference MUST be either NULL or refer to an instance of AuthorizedPrivilege that is used as a template.

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. 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.

Parameters:

Table 179 shows the parameters you can specify for the AttachDevice() method:

Table 179. AttachDevice() parameters

Parameter	Type	Description
Device	COP	Defines the volume instance to be attached. 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.

Table 179. AttachDevice() parameters (continued)

Parameter	Type	Description
[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.

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()

Parameters:

AttachReplica() creates a copy relationship between two volumes. Table 180 shows the parameters you can specify for the AttachReplica() method:

Table 180. AttachReplica() parameters

Parameter	Type	Description
[BackgroundCopyRate]	Uint16	Specifies the priority of the background copy rate "0–100". Scale is not in percent "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 "remote." For a CopyType=3 (Sync) a remote copy is created, for CopyType=4 (UnSynchAssoc) a flash copy 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()

The BackupConfiguration() command is used to execute the configuration backup script. The script stores the current cluster configuration associated with the current instance of ClusteringService, in an XML file. The file is named svc.config.backup.xml and is stored in the directory backup/<clustname> in the CIMOM home directory. If a current cluster back 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.

Parameters:

Table 181 shows the parameters you can specify for the BackupConfiguration() method:

Table 181. 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.

CancelIteration()

The CancelIteration() method requests that an iteration of the Log, identified by the IterationIdentifier input parameter, be stopped. CancelIteration() is a method that belongs to the IBMTSSVC_MessageLog class.

Table 182 shows the parameters you can specify for the Cancellteration() method:

Table 182. Cancellteration() parameters

Parameter	Type	Description
IterationIdentifier	String	The current iterator.

Return values:

The Cancellteration() 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.

Clean()

The Clean() method is used to clean the dump directories on the node. The Clean() method belongs to the IBMTSSVC_ServiceModeService class.

Parameters:

Table 183 shows the parameters you can specify for the Clean() method:

Table 183. 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 in all subdirectories including), dumps/configs, dumps/elogs, dumps/feature, dumps/iostats, dumps/iotrace and home/admin. In addition to the directory, a file filter can be specified.
SMNode	IBMTSSVC_Node	Specifies 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()

The ClearLog() method deletes all entries in the error log. 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.

Return values:

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()

Parameters:

This command can be used to create a Cluster. 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 184 shows the parameters you can specify for the Create2062Cluster() method:

Table 184. 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()

The CreateHardwareIDCollection method creates an instance of IBMTSSVC_HardwareIDCollection, which is represented on the device by a host object. 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.

Parameters:

Table 185 shows the parameters you can specify for the CreateHardwareIDCollection() method:

Table 185. CreateHardwareIDCollection() parameters

Parameter	Type	Description
ElementName	String	The name of the collection.
HardwareIDs	String[]	An array that contains the string representations of COPs of 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 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. The CreateOrModifyStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 186 shows the parameters you can specify for the CreateOrModifyStoragePool() method:

Table 186. 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 SVC. For example, if you select a block size of 256 MB, all StorageVolumes will occupy space in multiples of 256 MB. Thus, a 300 MB StorageVolume 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 only 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 186. 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, which translate to managed disks (MDisks) in SVC terminology. These are the volumes that will be added to the pool 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 from which to take additional BackendVolumes. 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 186. 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. The CreateOrModifyElementFromStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 187 shows the parameters you can specify for the `CreateOrModifyElementFromStoragePool()` method:

Table 187. `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 StorageConfiguration Service 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 187. 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. SVC 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" and the next largest multiple of 512 bytes in size.	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. SVC 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" and the next largest multiple of 512 bytes in size.
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()

The CreateProtocolControllerWithPorts() method creates an IBMTSSVC_Controller. The controller can be used to attach Volumes using AttachDevice(). 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.

Parameters:

Table 188 shows the parameters you can specify for the CreateProtocolControllerWithPorts() method:

Table 188. 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 IBMTSSVC_HardwareIdCollection or IBMTSSVC_StorageHardwareID to which the Volumes attached to the ProtocolController shall be exported.
Ports	String[]	The list of ports that will be associated with the controller. All ports must belong to the same IOGroup. The created controller will contain all FCPorts of an IOGroup even if a subset is submitted here.
Protocol	Uint16	Is required to be 2.
ProtocolController	CIM_ProtocolController REF	The created IBMTSSVC_Controller is returned here.
Privilege	CIM_Privilege REF	If not null, required to be the default static Privileges 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) where submitted.

CreateRemoteClusterPartnership()

You can use the CreateRemoteClusterPartnership() method to establish a one-way partnership between an IBMTSSVC_Cluster instance and an IBMTSSVC_CandidateCluster instance. The method must be executed 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.

Parameters:

Table 189 shows the parameters you can specify for the CreateRemoteClusterPartnership() method:

Table 189. CreateRemoteClusterPartnership() parameters

Parameter	Type	Description
RemoteCluster	IBMTSSVC_CandidateCluster REF	The cluster that a relationship will be established to. 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. The CreateReplica() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 190 shows the parameters you can specify for the CreateReplica() method:

Table 190. CreateReplica() parameters

Parameter	Type	Description
CopyType	Uint16	The type of copy relationship. Possible values are 3 (remote copy) or 4 (FlashCopy). Remote copies can be established on the same cluster only.
[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.
SourceElement	CIM_LogicalElement REF	The source StorageVolume for the replica.

Table 190. CreateReplica() parameters (continued)

Parameter	Type	Description
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()

The CreateSetting() method is used to create and populate a StorageSetting instance from a StorageCapability instance. This removes the need to populate default settings and other settings in the context of each StorageCapabilities (which could be numerous).

CreateSetting() is a method that belongs to the IBMTSSVC_StorageCapabilities class.

Table 191 shows the parameters you can specify for the CreateSetting() method:

Table 191. 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()

The CreateStorageHardwareID() method creates an instance of IBMTSSVC_StorageHardwareID. On the device level, the instance is represented by a single-port host object with the name prefix "cimhwid".

Parameters:

Table 192 shows the parameters you can specify for the CreateStorageHardwareID() method:

Table 192. 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 COP of 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 synchronous copy relationships. 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.

Parameters:

Table 193 shows the parameters you can specify for the `CreateSynchronizedSet()` method:

Table 193. CreateSynchronizedSet() parameters

Parameter	Type	Description
CopyType	Uint16	The type of copy relationship (3 for remote copy; 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 (remote copy). The default is the local cluster. This setting must be null if the CopyType is 4 (FlashCopy).
[Set]	CIM_Synch-ronized Set REF	The IBMTSSVC_FlashCopySynchronizedSet or IBMTSSVC_SyncCopySynchronizedSet 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.

DeleteConfigurationBackup()

The `DeleteConfigurationBackup()` command is used to delete the backups in the Backup directory.

Parameters:

Table 194 shows the parameters you can specify for the `DeleteConfigurationBackup()` method:

Table 194. 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()

The DeleteHardwareIDCollection() method deletes an SVC host. The DeleteHardwareIDCollection() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Parameters:

Table 195 shows the parameters you can specify for the DeleteHardwareIDCollection() method:

Table 195. DeleteHardwareIDCollection() parameters

Parameter	Type	Description
Collection	CIM_System SpecificCollection REF	The COP 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 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()

The DeleteProtocolController() method deletes a controller from the Common Information Model Object Manager (CIMOM) repository or from SAN Volume Controller, respectively. The DeleteProtocolController() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Parameters:

Table 196 shows the parameters you can specify for the DeleteProtocolController() method:

Table 196. 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.
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 The DeleteRecord() method belongs to the IBMTSSVC_MessageLog class.

Table 197 shows the parameters you can specify for the DeleteRecord() method:

Table 197. 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. You must execute the method on both clusters to delete a fully functional synchronous copy partnership. The DeleteRemoteClusterPartnership() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 198 shows the parameters you can specify for the DeleteRemoteClusterPartnership() method:

Table 198. DeleteRemoteClusterPartnership() parameters

Parameter	Type	Description
RemoteCluster	IBMTSSVC_RemoteCluster 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()

The DeleteStorageHardwareID() method deletes a StorageHardwareID. It removes the associations and aggregations, including CIM_ConcreteDependency and CIM_AuthorizedSubject. The DeleteStorageHardwareID() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Parameters:

Table 199 shows the parameters you can specify for the DeleteStorageHardwareID() method:

Table 199. DeleteStorageHardwareID() parameters

Parameter	Type	Description
HardwareID	CIM_StorageHardwareID REF	The IBMTSSVC_StorageHardwareID to delete.

Table 199. DeleteStorageHardwareID() parameters (continued)

Parameter	Type	Description
Force	Boolean	Optionally specifies that the deletion will be forced (if set to true). 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. The DeleteSynchronizedSet() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 200 shows the parameters you can specify for the DeleteSynchronizedSet() method:

Table 200. 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 will be deleted. Therefore, the StorageSynchronized survive as stand-alone copy mappings.
Set	CIM_SynchronizedSet REF	The SynchronizedSet to be deleted. The InstanceID corresponds to the SVC 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 executed, 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. The DeleteStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 201 shows the parameters you can specify for the DeleteStoragePool() method:

Table 201. 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_ConcreteJob REF	Set to null.
Pool	CIM_StoragePool 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()

The DetachDevice() method detaches a volume from the controller. The DetachDevice() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Parameters:

Table 202 shows the parameters you can specify for the DetachDevice() method:

Table 202. DetachDevice() parameters

Parameter	Type	Description
Device	CIM_LogicalDevice REF	The volume to be detached. There must be an IBMTSSVC_SCSILUN 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.

Dump()

The Dump() method is used to dump the contents of error log, the config log, or the feature log, to a text file. The Dump() method belongs to the IBMTSSVC_ServiceModeService class.

Parameters:

Table 203 shows the parameters you can specify for the Dump() method:

Table 203. Dump() parameters

Parameter	Type	Description
Type	UInt16	Decides which dump type will be generated.
FileNamePrefix	String	The dump is directed to a file with a system defined name, if this is not supplied. If supplied, a filename is created from the prefix and a timestamp. It takes the form of <FileNamePrefix>_NN_YYMMDD_HHMMSS. NN is the current configuration log id. In case of feature logs, this parameter must be null.
GeneratedFile	String	The generated file name.

Table 203. Dump() parameters (continued)

Parameter	Type	Description
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.

Enter()

The Enter() method puts a node in service mode. After this happens, the ServiceModeService methods can be executed against the returned service mode node and the objects prefixed with IBMTSSVC_SM objects can be retrieved for this node. If the config node is in service mode, no other commands for this cluster will be available. The Enter() method belongs to the IBMTSSVC_ServiceModeService class.

Parameters:

Table 204 shows the parameters you can specify for the Enter() method:

Table 204. Enter() parameters

Parameter	Type	Description
Node	IBMTSSVC_Node REF	Specifies 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. The EvictNode() method belongs to the IBMTSSVC_ClusteringService class.

Parameters:

Table 205 shows the parameters you can specify for the EvictNode() method:

Table 205. EvictNode() parameters

Parameter	Type	Description
CS	COP	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()

The Exit() method will exit the service mode for a specific node and restart it in normal operating mode. The Exit() method belongs to the IBMTSSVC_ServiceModeService class.

Parameters:

Table 206 shows the parameters you can specify for the Exit() method:

Table 206. Exit() parameters

Parameter	Type	Description
SMNode	IBMTSSVC_Service ModeNode REF	Specifies the node that will be restarted in normal 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()

The FixRecord() method fixes one entry in the log (marks the entry as fixed). The FixRecord() method belongs to the IBMTSSVC_MessageLog class.

Table 207 on page 318 shows the parameters you can specify for the FixRecord() method:

Table 207. 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()

The GetAllRecords() method retrieves the list of logs from the cluster.

Table 208 shows the parameters you can specify for the GetAllRecords() method:

Table 208. 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()

The GetDump() method is used to retrieve a log file. The feature log will be automatically decoded. The GetDump() method belongs to the IBMTSSVC_ServiceModeService class.

Parameters:

Table 209 on page 319 shows the parameters you can specify for the GetDump() method:

Table 209. 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	Specified node from for retrieving the dump. 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()

GetFreeExtents() returns the number of free extents on a BackendVolume. 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.

Parameters:

Table 210 shows the parameters you can specify for the GetFreeExtents() method:

Table 210. 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()

The GetRecord() method retrieves the list of logs from the cluster, returns the log entry specified by the IterationIdentifier, and increments the IterationIdentifier by one position if PositionToNext set to TRUE. The GetRecord() method belongs to the IBMTSSVC_MessageLog class.

Table 211 shows the parameters you can specify for the GetRecord() method:

Table 211. GetRecord() parameters

Parameter	Type	Description
[IterationIdentifier]	String	The pointer to the record to be retrieved. 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.
PositionToNext	Boolean	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. The GetResetPasswordChangeFeatureStatus() method belongs to the IBMTSSVC_ClusteringService class.

Parameters:

Table 212 shows the parameters you can specify for the GetResetPasswordChangeFeatureStatus() method:

Table 212. 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. The GetSupportedSizeRange() method belongs to the IBMTSSVC_StoragePool class.

Parameters:

Table 213 shows the parameters you can specify for the GetSupportedSizeRange() method:

Table 213. 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]	COP	Specifies the size requirements.
Minimum VolumeSize	Uint64	Specifies the minimum size (MB) to query
Maximum VolumeSize	Uint64	Specifies the maximum size (MB) to query
VolumeSizeDivisor	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. The GetSupportedSizes() method is derived from the IBMTSSVC_StoragePool class.

Parameters:

You can specify the following parameters of the GetSupportedSizes() method:

Name	Type	Description
ElementType	Uint16	The type of element for which supported sizes are reported. Code Semantics 2 Storage Pool 3 Storage Volume

Name	Type	Description
Goal	CIM_StorageSetting REF	Specifies 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)

IncludeBackendVolume()

You can use the IncludeBackendVolume() method to reinstate an IBMTSSVC_BackendVolume instance that was ejected by an IBMTSSVC_Cluster. The IncludeBackendVolume() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 214 shows the parameters you can specify for the IncludeBackendVolume() method:

Table 214. IncludeBackendVolume() parameters

Parameter	Type	Description
Volume	IBMTSSVC_BackendVolume 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()

The ListConfigurationBackups() command lists the backups in the Backup directory. Only the directory names are reported.

Parameters:

Table 215 on page 323 shows the parameters you can specify for the ListConfigurationBackups() method:

Table 215. ListConfigurationBackups() parameters

Parameter	Type	Description
Backup	String	Each array element contains the name of one backup available in the backu/directory.

Return values:

The ListConfigurationBackups() method returns one of the following error codes:

- 0: The backup was successful.

MigrateVolume()

You can use the MigrateVolume() method to migrate an IBMTSSVC_StorageVolume instance to another IBMTSSVC_StoragePool instance. The MigrateVolume() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 216 shows the parameters you can specify for the MigrateVolume() method:

Table 216. MigrateVolume() parameters

Parameter	Type	Description
Job	CIM_Concrete Job REF	The object that can be used to monitor the migration progress.
NumberOfThreads	Uint8	The number of copy threads used for the migration. Can be 1 to 4.
TargetPool	IBMTSSVC_Storage Pool 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_Storage Volume 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.

ModifyErrorSettings()

The ModifyErrorSettings() method allows you to specify what happens when an error or event is logged to the error log.

Parameters:

Table 217 on page 324 shows the parameters you can specify for the ModifyErrorSettings() method:

Table 217. 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.
[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 executed successfully but one or more parameters were ignored.)
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

ModifyIPAddress()

The ModifyIPAddress() command is used to modify the IP address in the cluster, change the entry in the provider-config.xml and reload the configuration.

Parameters:

Table 218 shows the parameters you can specify for the Modifyipaddress() method:

Table 218. 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. The `ModifyResetPasswordChangeFeature()` method belongs to the `IBMTSSVC_ClusteringService` class.

Parameters:

Table 219 shows the parameters you can specify for the `ModifyResetPasswordChangeFeature()` method:

Table 219. 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. The `ModifySynchronization()` method belongs to the `IBMTSSVC_StorageConfigurationService` class.

Parameters:

Table 220 on page 326 shows the parameters you can specify for the `ModifySynchronization()` method:

Table 220. ModifySynchronization() parameters

Parameter	Type	Description
Operation	Uint16	<p>These commands can be executed only 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. Re-establish 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 point-in-time 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	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.
[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 that is used to monitor and terminate the copy process.

Table 220. *ModifySynchronization()* parameters (continued)

Parameter	Type	Description
Synchronization	CIM_Storage Synchronized REF	The copy relationship to be modified: IBMTSSVC_FlashCopyStorageSynchronized or IBMTSSVC_SyncCopyStorageSynchronized.

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. The *ModifySynchronizedSet()* method belongs to the *IBMTSSVC_StorageConfigurationService* class.

Parameters:

Table 221 on page 328 shows the parameters you can specify for the *ModifySynchronizedSet()* method:

Table 221. 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 221. *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	Defines 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()

The *PositionAtRecord()* method sets the SequenceNumber and the RelPos token of the returned IterationIdentifier, depending on the parameters that were passed in. The *PositionAtRecord()* method belongs to the IBMTSSVC_MessageLog class.

Parameters:

Table 222 shows the parameters you can specify for the PositionAtRecord() method:

Table 222. PositionAtRecord() parameters

Parameter	Type	Description
IterationIdentifier	String	The new IterationIdentifier. The SequenceNumber and the RelPos token were modified according to the parameters that were passed in.
[IterationIdentifier]	String	The current IterationIdentifier (created by a previous position or method) or null.
MoveAbsolute	Boolean	Set to TRUE if the IterationIdentifier should be positioned absolutely. In this case the SequenceNumber is set to the value passed in RecordNumber.
RecordNumber	UInt64	If MoveAbsolute == FALSE: A (signed) offset to the current position in the log. If MoveAbsolute == TRUE: The absolute desired position in the log if which is the sequence number of the entry. It is not allowed to specify a negative value in RecordNumber. The IterationIdentifier's SequenceNumber is set to this value. If the RelPos token was set in the IterationIdentifier that was passed in it is removed from the IterationIdentifier.

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()

The PositionToFirstRecord() method creates an IterationIdentifier that points to the first entry in the log. The IterationIdentifier is used in subsequent "GetRecord" or "Position..." calls. The PositionToFirstRecord() method belongs to the IBMTSSVC_MessageLog class.

Parameters:

Table 223 shows the parameters you can specify for the PositionToFirstRecord() method:

Table 223. PositionToFirstRecord() parameters

Parameter	Type	Description
IterationIdentifier	String	The IterationIdentifier which points to the first record.

Return values:

The PositionToFirstRecord() method returns the following error code:

- 0: The IterationIdentifier was successfully created.

PositionToFirstRecordRoot()

The PositionToFirstRecordRoot() method creates an IterationIdentifier whose SequenceNumber is not set and whose RootCause token is set to the value that is passed in. The IterationIdentifier is used in subsequent GetRecord or PositionAtRecord calls. The PositionToFirstRecordRoot() method belongs to the IBMTSSVC_MessageLog class.

Parameters:

Table 224 shows the parameters you can specify for the PositionToFirstRecordRoot() method:

Table 224. PositionToFirstRecordRoot() parameters

Parameter	Type	Description
IterationIdentifier	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()

The PositionToFirstRecordType() method creates an IterationIdentifier whose SequenceNumber token is not set and whose other parameters are set according to the parameters that were passed in. The IterationIdentifier is used in subsequent GetRecord or PositionAtRecord calls.

Parameters:

Table 225 shows the parameters you can specify for the PositionToFirstRecordType() method:

Table 225. 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.
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()

The Reload2062Node() method enables a 2062 node which was shutdown. The Reload2062Node() method belongs to the IBMTSSVC_Provider class.

Table 226 shows the parameters you can specify for the Reload2062Node() method:

Table 226. Reload2062Node() parameters

Parameter	Type	Description
Node	UInt8	The node on the 2062 blade which shall be reset
Password	String	The password required to log on to the switch
Slot	UInt8	The slot of the 2062 blade where a node shall 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_AccessControlInformation instance and its associations. The RemoveAccess() method belongs to the IBMTSSVC_AuthorizationService class.

Parameters:

Table 227 on page 333 shows the parameters you can specify for the RemoveAccess() method:

Table 227. RemoveAccess() parameters

Parameter	Type	Description
Subject	CIM_ManagedElement REF	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()

The RemoveCluster() method can be used to remove a SAN Volume Controller cluster from the ICAT configuration. The RemoveCluster() method belongs to the IBMTSSVC_Provider class.

Table 228 shows the parameters you can specify for the RemoveCluster() method:

Table 228. 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 re-scan of the fibre-channel SAN to discover any new LUNs. The RequestDiscovery() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 229 shows the parameters you can specify for the ModifySynchronization() method:

Table 229. RequestDiscovery() parameters

Parameter	Type	Description
DiscoveredElementCount	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()

The Reset2062Node() method removes the cached data about a cluster from an 2062 node. The Reset2062Node() method belongs to the IBMTSSVC_Provider class.

Table 230 shows the parameters you can specify for the Reset2062Node() method:

Table 230. Reset2062Node() parameters

Parameter	Type	Description
Node	UInt8	The node on the 2062 blade which shall be reset
Password	String	The password required to log on to the switch
Slot	UInt8	The slot of the 2062 blade where a node shall 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 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()

The RestoreConfiguration() command is used to execute the configuration restore script. The script restores the current cluster configuration associated with the current instance of ClusteringService, from the corresponding cluster configuration backup.

Parameters:

Table 231 shows the parameters you can specify for the RestoreConfiguration() method:

Table 231. 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.
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. The ReturnToStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 232 shows the parameters you can use for the ReturnToStoragePool() method:

Table 232. 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_ Logical Element REF	The element to be returned to the pool. Must be a StorageVolume that belongs to the same cluster as the StorageConfigurationService.

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.

SetLocale()

You can use the SetLocale() method to define the locale of the specified cluster. The SetLocale() method belongs to the IBMTSSVC_Cluster class.

Parameters:

Table 233 on page 337 shows the parameters you can specify for the SetLocale() method:

Table 233. 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.

SetIOGroup()

The SetIOGroup() method assigns a StorageVolume to another IO group. The SetIOGroup() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Parameters:

Table 234 shows the parameters you can specify for the SetIOGroup() method:

Table 234. 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.

SetPasswords()

You can use the SetPasswords() method to set the passwords for the administrators and service personnel to access an IBMTSSVC_Cluster. The SetPasswords() method belongs to the IBMTSSVC_ClusteringService class.

Parameters:

Table 235 shows the parameters you can specify for the SetPasswords() method:

Table 235. 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. The SetQuorum() method belongs to the IBMTSSVC_StorageConfigurationService class.

Parameters:

Table 236 shows the parameters you can specify for the SetQuorum() method:

Table 236. 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. The SetTimeZone() method belongs to the IBMTSSVC_ClusteringService class.

Parameters:

Table 237 shows the parameters you can specify for the SetTimeZone() method:

Table 237. 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 about an IBMTSSVC_Cluster instance. The StartStatisticsCollection() method belongs to the IBMTSSVC_ClusteringService class.

Parameters:

Table 238 shows the parameters you can specify for the StartStatisticsCollection() method:

Table 238. 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. The StopStatisticsCollection() method belongs to the IBMTSSVC_ClusteringService class.

Return values:

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. The Shutdown() method belongs to the IBMTSSVC_ClusteringService class.

Parameters:

Table 239 shows the parameters you can specify for the Shutdown() method:

Table 239. 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()

The UnfixRecord() method unfixes one entry in the log (marks the entry as not fixed). The UnfixRecord() method belongs to the IBMTSSVC_MessageLog class.

Parameters:

Table 240 shows the parameters you can specify for the UnfixRecord() method:

Table 240. 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()

The Upgrade() method upgrades the software of one SAN Volume Controller node in service mode. The Upgrade() method belongs to the IBMTSSVC_ServiceModeService class.

Parameters:

Table 241 shows the parameters you can specify for the Upgrade() method:

Table 241. 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 which shall 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.

Table 242 shows the parameters you can specify for the WriteRecord() method:

Table 242. WriteRecord() parameters

Parameter	Type	Description
IterationIdentifier	String	
PositionToNext	Boolean	Boolean value indicating that 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.

Accessibility

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.ibm.com/storage/support/2145/>

Related topics:

- “Related publications” on page xvii

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.*

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATIONS "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Trademarks

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

- FlashCopy
- IBM
- TotalStorage

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

Glossary

This glossary includes terms for the IBM TotalStorage SAN Volume Controller.

This glossary includes selected terms and definitions from A Dictionary of Storage Networking Terminology (<http://www.snia.org/education/dictionary>), copyrighted 2001 by the Storage Networking Industry Association, 2570 West El Camino Real, Suite 304, Mountain View, California 94040-1313. Definitions derived from this book have the symbol (S) after the definition.

The following cross-references are used in this glossary:

- See** Refers the reader to one of two kinds of related information:
- A term that is the expanded form of an abbreviation or acronym. This expanded form of the term contains the full definition.
 - A synonym or more preferred term.

See also
Refers the reader to one or more related terms.

Contrast with
Refers the reader to a term that has an opposite or substantively different meaning.

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.

Index

A

- accessibility 343
 - keyboard 343
 - shortcut keys 343
- adding
 - candidate node 26
 - nodes 26
- association object classes 235
 - AccountManagementServiceForSystem 271
 - AccountOnCIMOM 271
 - AccountOnSystem 272
 - AllocatedFromStoragePool 235
 - AuthorizationTarget 237
 - AuthorizedCollection 236
 - AuthorizedStorageHardwareID 236
 - AuthorizedSubject 237
 - AvailableHardwareID 237
 - BackendControllerForVolume 238
 - BasedOn 238
 - ClusterController 239
 - ClusterDumps 239
 - ClusteringCandidate 240
 - ClusteringServiceForSystem 240
 - ClusterMaskingCapabilities 241
 - ClusterPort 241
 - ClusterScopeCandidateVolume 241
 - ClusterScopeChassis 242
 - ClusterScopeFCSet 242
 - ClusterScopeIOGroup 242
 - ClusterScopeNodeVPD 243
 - ClusterScopePrivilege 243
 - ClusterScopeProduct 243
 - ClusterScopeSCSet 243
 - ComponentCS 244
 - ComputerSystemPackage 244
 - ConnectedBackendController 245
 - ControllerConfigurationServiceForSystem 245
 - ControllerConfServiceMaskingCapabilities 246
 - CopyCandidate 246
 - ElementConformsToProfile 246
 - FlashCopyStorageSynchronized 247
 - FlashCopySynchronizedMember 249
 - HardwareIDOnSystem 249
 - HostedAccessPoint 250
 - HostedJob 250
 - HostedPrimordialPool 250
 - HostedStoragePool 251
 - HwIDCollectionOnSystem 251
 - IndicationFiltersConformsToProfile 251
 - IndicationFiltersConformsToSubProfile 252
 - IOGroupIdentity 252
 - IOGroupPort 252
 - ManagesAccount 274
 - ManagesCollection 253
 - ManagesController 253
 - ManagesHardwareId 253
 - ManagesPrivilege 254

- association object classes (*continued*)
 - MemberOfCollection 254
 - MemberOfIOGroup 254
 - NodeDumps 255
 - PartnershipCandidate 256
 - PoolCapabilities 256
 - PrimordialPoolCapabilities 256
 - PrimordialPoolComponent 256
 - PrimordialPoolForController 257
 - PrivilegeServiceForSystem 257
 - ProductPhysicalComponent 257
 - ProtocolControllerForPort 258
 - ProtocolControllerForUnit 259
 - ProviderInObjectManager 260
 - RemotePartnership 260
 - RemoteSystemVolume 261
 - RequiresProfile 261
 - SAPAvailableForElement 261
 - StorageConfigurationServiceCap 262
 - StorageConfigurationServiceForSystem 262
 - StorageHardwareIDManagementServiceForSystem 262
 - StoragePoolComponent 263
 - SyncCopyStorageSynchronized 263
 - SyncCopySynchronizedMember 266
 - SystemBackendVolume 267
 - SystemCandidateVolume 267
 - SystemController 267
 - SystemFeatures 268
 - SystemVolume 268
 - SystemVPD 269
 - UseOfMessageLog 269
 - VolumeSettingData 270

C

- candidate node
 - adding 26
- CIM (Common Information Model) 2
 - agent 2, 3
 - related topics 2
- CIM agent
 - CIMOM 3
 - device 3
 - device provider 3
 - for the SAN Volume Controller 7
 - functional views
 - clustering service 14
 - copy services 18
 - LUN masking 16
 - security service 21
 - functional views of 8
 - access point subprofile 13
 - cluster subprofile 14
 - copy services 18
 - extent mapping subprofile 11
 - ExtraCapacitySet subprofile 12
 - Flash Copy state diagram 33

- CIM agent (*continued*)
 - functional views of (*continued*)
 - LUN creation subprofile 17
 - LUN masking 16
 - physical package 9
 - pool manipulation 22
 - profile overview 9
 - security services 21
 - server profile 10
 - Sync Copy state diagram 34
 - vendor specific service mode subprofile 19
 - vendor-specific cluster operations 20
 - vendor-specific storage configuration operations 15
 - methods 277
 - object classes 39
 - association 235
 - core 39
 - security 212
 - clustering
 - service 14
- Common Information Model (CIM) 2
 - agent 2, 3
 - related topics 2
- configuration
 - adding a candidate node to a cluster 26
 - creating a new storage pool 26
 - creating a new storage volume 27
 - modifying a storage pool 27
 - performing basic storage configuration 25
 - storage 25
 - storage configuration 25
- configuring
 - storage 25
- conventions
 - emphasis in text xvii
- copy services 29
 - overview 18
- core object classes
 - BackendController 39
 - BackendVolume 46
 - CandidateCluster 58
 - CandidateNode 59
 - CandidateStorageHardwareID 65
 - CandidateVolume 67
 - Chassis 68
 - Cluster 76
 - Controller 85
 - ControllerConfigurationService 94
 - ControllerMaskingCapabilities 97
 - Dumps 99
 - FCPort 100
 - Features 112
 - FlashCopySynchronizedSet 113
 - HardwareIDCollection 114
 - IOGroup 116
 - IOGroupSet 122
 - Job 123
 - MessageLog 128
 - Node 136
 - NodeVPD 141

- core object classes (*continued*)
 - overview 39
 - PrimordialStoragePool 142
 - Privilege 144
 - PrivilegeManagementService 201
 - Product 146
 - Provider 147
 - RegisteredProfile 151
 - RegisteredSubProfile 154
 - RemoteCluster 157
 - RemoteServiceAccessPoint 159
 - RemoteVolume 165
 - StorageCapabilities 166
 - StorageConfigurationCapabilities 169
 - StorageConfigurationService 205
 - StorageHardwareIDManagementService 208
 - StoragePool 174
 - StorageSetting 178
 - StorageVolume 181
 - SyncCopySynchronizedSet 195
- creating
 - FlashCopy
 - relationship 29
 - storage
 - pools 26
 - volumes 27
 - synchronous copies
 - relationship 29
 - synchronous copy relationships
 - between volumes in different clusters 32
 - between volumes in the same cluster 31

D

- disability 343

E

- emphasis in text xvii
- extrinsic methods
 - Add2062Cluster() 290
 - Add2145Cluster() 290
 - AddHardwareIDsToCollection() 291
 - AddNode() 292
 - AssignAccess() 293
 - AttachDevice() 294
 - AttachReplica 295
 - BackupConfiguration() 296
 - CancelIteration() 296
 - Clean() 297
 - ClearLog() 298
 - Create2062Cluster() 298
 - CreateHardwareIDCollection() 299
 - CreateOrModifyElementFromStoragePool() 302
 - CreateOrModifyStoragePool() 300
 - CreateProtocolControllerWithPorts() 305
 - CreateRemoteClusterPartnership() 305
 - CreateReplica() 306
 - CreateSetting() 307
 - CreateStorageHardwareID() 308
 - CreateSynchronizedSet() 308

extrinsic methods (*continued*)

- DeleteConfigurationBackup() 309
- DeleteHardwareIDCollection() 310
- DeleteProtocolController() 310
- DeleteRecord() 311
- DeleteRemoteClusterPartnership() 312
- DeleteStorageHardwareID() 312
- DeleteStoragePool() 314
- DeleteSynchronizedSet() 313
- DetachDevice() 315
- Dump() 315
- Enter() 316
- EvictNode() 316
- Exit() 317, 341
- FixRecord() 317
- GetAllRecords() 318
- GetDump() 318
- GetFreeExtents() 319
- GetRecord() 320
- GetResetPasswordChangeFeatureStatus() 320
- GetSupportedSizeRange() 321
- IncludeBackendVolume() 322
- ListConfigurationBackups() 322
- MigrateVolume() 323
- ModifyErrorSettings() 323
- ModifyIPAddress() 324
- ModifyResetPasswordChangeFeature() 325
- ModifySynchronization() 325
- ModifySynchronizedSet() 327
- overview 287
- PositionToFirstRecord() 330
- PositionToFirstRecordRoot() 331
- PositionToFirstRecordType() 329, 331
- Reload2062Node() 332
- RemoveAccess() 332
- RemoveCluster() 333
- RequestDiscovery() 334
- Reset2062Node() 334
- RestoreConfiguration() 335
- ReturnToStoragePool() 336
- SetIOGroup() 337
- SetLocale() 336
- SetPasswords() 337
- SetQuorum() 338
- SetTimeZone() 338
- Shutdown() 340
- StartStatisticsCollection() 339
- StopStatisticsCollection() 339
- UnfixRecord() 340
- WriteRecord() 341

F

FlashCopy

- creating
- synchronized set 30

FlashCopy service 29

functional views of the CIM Agent 8

- access point subprofile 13
- cluster subprofile 14
- copy services 18

functional views of the CIM Agent (*continued*)

- extent mapping subprofile 11
- ExtraCapacitySet subprofile 12
- Flash Copy state diagram 33
- LUN creation subprofile 17
- LUN masking 16
- physical package 9
- pool manipulation 22
- profile overview 9
- security service 21
- server profile 10
- Sync Copy state diagram 34
- vendor specific service mode subprofile 19
- vendor-specific cluster operations 20
- vendor-specific storage configuration operations 15

I

IBMTS object classes

- Account 213
- AccountManagementService 216
- AccountOnSystem 272
- CIMXMLCommunicationMechanism 219
- ManagesAccount 274
- ObjectManager 227
- RegisteredProfile 231
- System 232

IBMTSSVC object classes

- AccountManagementServiceForSystem 271
- AccountOnCIMOM 271
- AllocatedFromStoragePool 235
- AuthorizedCollection 236
- AuthorizedStorageHardwareID 236
- AuthorizedSubject 237
- AuthorizedTarget 237
- AvailableHardwareID 237
- BackendController 39
- BackendControllerForVolume 238
- BackendVolume 46
- BasedOn 238
- CandidateCluster 58
- CandidateNode 59
- CandidateStorageHardwareID 65
- CandidateVolume 67
- Chassis 68
- Cluster 76
- ClusterController 239
- ClusterDumps 239
- ClusteringCandidate 240
- ClusteringService 197
- ClusteringServiceForSystem 240
- ClusterMaskingCapabilities 241
- ClusterPort 241
- ClusterScopeCandidateVolume 241
- ClusterScopeChassis 242
- ClusterScopeFCSet 242
- ClusterScopeIOGroup 242
- ClusterScopeNodeVPD 243
- ClusterScopePrivilege 243
- ClusterScopeProduct 243
- ClusterScopeSCSet 243

IBMTSSVC object classes *(continued)*

- ComponentCS 244
- ComputerSystemPackage 244
- ConnectedBackendController 245
- Controller 85
- ControllerConfigurationService 94
- ControllerConfigurationServiceForSystem 245
- ControllerConfServiceMaskingCapabilities 246
- ControllerMaskingCapabilities 97
- CopyCandidate 246
- Dumps 99
- ElementConformsToProfile 246
- FCPort 100
- Features 112
- FlashCopyStorageSynchronized 247
- FlashCopySynchronizedMember 249
- FlashCopySynchronizedSet 113
- HardwareIdCollection 114
- HardwareIDOnSystem 249
- HostedAccessPoint 250
- HostedJob 250
- HostedPrimordialPool 250
- HostedStoragePool 251
- HwIDCollectionOnSystem 251
- IndicationFiltersConformsToProfile 251
- IndicationFiltersConformsToSubProfile 252
- IOGroup 116
- IOGroupIdentity 252
- IOGroupPort 252
- IOGroupSet 122
- Job 123
- ManagesCollection 253
- ManagesController 253
- ManagesHardwareId 253
- ManagesPrivilege 254
- MemberOfCollection 254
- MemberOfIOGroup 254
- MessageLog 128
- Node 136
- NodeDumps 255
- NodeVPD 141
- PartnershipCandidate 256
- PoolCapabilities 256
- PrimordialPoolCapabilities 256
- PrimordialPoolComponent 256
- PrimordialPoolForController 257
- PrimordialStoragePool 142
- Privilege 144
- PrivilegeManagementService 201
- PrivilegeServiceForSystem 257
- Product 146
- ProductPhysicalComponent 257
- ProtocolControllerForPort 258
- ProtocolControllerForUnit 259
- Provider 147
- ProviderInObjectManager 260
- RegisteredProfile 151
- RegisteredSubProfile 154
- RemoteCluster 157
- RemotePartnership 260
- RemoteServiceAccessPoint 159

IBMTSSVC object classes *(continued)*

- RemoteSystemVolume 261
- RemoteVolume 165
- RequiresProfile 261
- SAPAvailableForElement 261
- StorageCapabilities 166
- StorageConfigurationCapabilities 169
- StorageConfigurationService 205
- StorageConfigurationServiceCap 262
- StorageConfigurationServiceForSystem 262
- StorageHardwareIDManagementServiceForSystem 262
- StorageHardwareIDManagementService 208
- StoragePool 174
- StoragePoolComponent 263
- StorageSetting 178
- StorageVolume 181
- SyncCopyStorageSynchronized 263
- SyncCopySynchronizedMember 266
- SyncCopySynchronizedSet 195
- SystemBackendVolume 267
- SystemCandidateVolume 267
- SystemController 267
- SystemFeatures 268
- SystemVolume 268
- SystemVPD 269
- UseOfMessageLog 269
- VolumeSettingData 270

information

- center xvii

intrinsic methods

- Associators() 277
- AssociatorsNames() 278
- CreateInstance() 279
- DeleteInstance() 280
- EnumerateClasses() 280
- EnumerateClassNames() 281
- EnumerateInstanceNames() 282
- EnumerateInstances() 281
- ExecQuery() 283
- GetClass() 283
- GetInstance() 284
- GetProperty() 284
- ModifyInstance() 285
- overview 277
- Reference() 285
- ReferenceNames() 286
- SetProperty() 287

K

- keyboard 343
 - shortcut keys 343

L

- logical unit numbers (LUNs)
 - masking 16
- LUN masking, performing 37
- LUNs (logical unit numbers)
 - masking 16, 37

M

- masking LUNs 37
- methods
 - CIM Agent 277
 - extrinsic 287
 - Add2062Cluster() 290
 - Add2145Cluster() 290
 - AddHardwareIDsToCollection() 291
 - AddNode() 292
 - AssignAccess() 293
 - AttachDevice() 294
 - AttachReplica 295
 - BackupConfiguration() 296
 - Cancellteration() 296
 - Clean() 297
 - ClearLog() 298
 - Create2062Cluster() 298
 - CreateHardwareIDCollection() 299
 - CreateOrModifyElementFromStoragePool() 302
 - CreateOrModifyStoragePool() 300
 - CreateProtocolControllerWithPorts() 305
 - CreateRemoteClusterPartnership() 305
 - CreateReplica() 306
 - CreateSetting() 307
 - CreateStorageHardwareID() 308
 - CreateSynchronizedSet() 308
 - DeleteConfigurationBackup() 309
 - DeleteHardwareIDCollection() 310
 - DeleteProtocolController() 310
 - DeleteRecord() 311
 - DeleteRemoteClusterPartnership() 312
 - DeleteStorageHardwareID() 312
 - DeleteStoragePool() 314
 - DeleteSynchronizedSet() 313
 - DetachDevice() 315
 - Dump() 315
 - Enter() 316
 - EvictNode() 316
 - Exit() 317, 341
 - FixRecord() 317
 - GetAllRecords() 318
 - GetDump() 318
 - GetFreeExtents() 319
 - GetRecord() 320
 - GetResetPasswordChangeFeatureStatus() 320
 - GetSupportedSizeRange() 321
 - IncludeBackendVolume() 322
 - ListConfigurationBackups() 322
 - MigrateVolume() 323
 - ModifyErrorSettings() 323
 - ModifyIPAddress() 324
 - ModifyResetPasswordChangeFeature() 325
 - ModifySynchronization() 325
 - ModifySynchronizedSet() 327
 - PositionToFirstRecord() 330
 - PositionToFirstRecordRoot() 331
 - PositionToFirstRecordType() 329, 331
 - Reload2062Node() 332
 - RemoveAccess() 332
 - RemoveCluster() 333
 - RequestDiscovery() 334

- methods (*continued*)
 - extrinsic (*continued*)
 - Reset2062Node() 334
 - RestoreConfiguration() 335
 - ReturnToStoragePool() 336
 - SetIOGroup() 337
 - SetLocale() 336
 - SetPasswords() 337
 - SetQuorum() 338
 - SetTimeZone() 338
 - Shutdown() 340
 - StartStatisticsCollection() 339
 - StopStatisticsCollection() 339
 - UnfixRecord() 340
 - WriteRecord() 341
 - intrinsic 277
 - AssociatorNames() 278
 - Associators() 277
 - CreateInstance() 279
 - DeleteInstance() 280
 - EnumerateClasses() 280
 - EnumerateClassNames() 281
 - EnumerateInstanceNames() 282
 - EnumerateInstances() 281
 - ExecQuery() 283
 - GetClass() 283
 - GetInstance() 284
 - GetProperty() 284
 - ModifyInstance() 285
 - Reference() 285
 - ReferenceNames() 286
 - SetProperty() 287
 - modifying
 - storage pools 27

N

- nodes
 - adding 26
- notices
 - legal 345

O

- object classes
 - association 235
 - core 39
 - overview 39
 - security 212
 - service 197
- ordering publications xix

P

- performing
 - LUN masking 37
- publications
 - ordering xix

R

related information xvii

S

SAN Volume Controller

overview 4

security

object classes 212

Account 213

AccountManagementService 216

CIMXMLCommunicationMechanism 219

ObjectManager 227

RegisteredProfile 231

System 232

service 21

service

object classes 197

ClusteringService 197

StorageHardwareID 173

shortcut keys 343

SMI-S (Storage Management Initiative Specification) 1

Specification, Storage Management Initiative 1

storage

configuration 25

adding a candidate node to a cluster 26

creating a new storage pool 26

creating a new storage volume 27

modifying a storage pool 27

performing basic storage configuration 25

storage configuration 25

adding a candidate node to a cluster 26

creating a new storage pool 26

creating a new storage volume 27

modifying a storage pool 27

performing basic storage configuration 25

Storage Management Initiative Specification (SMI-S) 1

storage pools

creating 26

modifying 27

support

Web sites xx

synchronous copy

creating relationships

between volumes in different clusters 32

between volumes in the same cluster 31

synchronous copy service 29

T

text emphasis xvii

trademarks 346

V

volumes

creating new storage 27

W

Web sites xx

Readers' Comments — We'd Like to Hear from You

IBM TotalStorage
SAN Volume Controller
CIM Agent Developer's Reference
Version 1.2.0

Publication No. SC26-7545-01

Overall, how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How satisfied are you that the information in this book is:

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to your tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please tell us how we can improve this book:

Thank you for your responses. May we contact you? Yes No

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

Name

Address

Company or Organization

Phone No.



Fold and Tape

Please do not staple

Fold and Tape



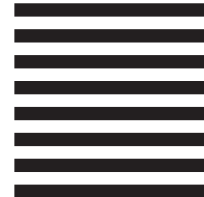
NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

International Business Machines Corporation
Information Development
Department 61C
9032 South Rita Road
Tucson, Arizona
USA 85775-4401



Fold and Tape

Please do not staple

Fold and Tape



Printed in USA

SC26-7545-01



Spine information:



IBM TotalStorage
SAN Volume Controller

CIM Agent Developer's Reference

Version 1.2.0