

IBM System Storage SAN Volume Controller



CIM Agent Developer's Reference

Version 4.1.0

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Version 4.1.0

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Contents

Figures	xi
Tables	xiii
About this guide	xix
Who should use this guide?	xix
Summary of changes	xix
Summary of changes for SC26-7904-00 SAN Volume Controller CIM Agent Developer's Reference	xix
Summary of changes for SC26-7545-04 SAN Volume Controller CIM Agent Developer's Reference	xx
Emphasis	xxi
SAN Volume Controller library and related publications	xxi
Related Web sites	xxiii
How to order IBM publications	xxiii
How to send your comments	xxiv
Chapter 1. Introduction	1
Storage Management Initiative Specification	1
CIM agent	2
CIM agent concepts	2
CIM agent components	3
SAN Volume Controller overview	5
CIM agent for the SAN Volume Controller	7
Validating the truststore certificate expiration	7
Functional diagrams of the Common Information Model Agent	8
Profile Overview	8
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	25
Creating a new storage pool	26
Modifying a storage pool	26
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	31
Flash Copy state diagram	32
Sync Copy state diagram	33
Chapter 4. Performing LUN masking	35
LUN masking	35
Performing LUN masking	35
Chapter 5. Network considerations.	37
SLP based discovery	37
RemoteServiceAccessPoint instance	37
Chapter 6. Using the problem determination tool	39
Starting the tool	39
Editing the properties file	39
Chapter 7. CIM agent object classes	41
Core object classes	41
IBMTSSVC_BackendController	41
IBMTSSVC_BackendVolume	48
IBMTSSVC_CandidateCluster	58
IBMTSSVC_CandidateNode	59
IBMTSSVC_CandidateStorageHardwareID	66
IBMTSSVC_CandidateVolume	67
IBMTSSVC_Chassis	69
IBMTSSVC_Cluster	76
IBMTSSVC_Controller	83
IBMTSSVC_ControllerConfigurationService	90
IBMTSSVC_ControllerMaskingCapabilities	93
IBMTSSVC_Dumps	96
IBMTSSVC_FabricElement	97
IBMTSSVC_FCPort	98
IBMTSSVC_Features	108
IBMTSSVC_FlashCopyJob	109
IBMTSSVC_FlashCopySynchronizedSet	113
IBMTSSVC_FormatVolumeJob	114
IBMTSSVC_HardwareIdCollection	118
IBMTSSVC_HardwareIdCollectionStorageVolumeView	120
IBMTSSVC_IOGroup	121
IBMTSSVC_IOGroupSet	127
IBMTSSVC_Job	128
IBMTSSVC_MessageLog	132
IBMTSSVC_MigrateVolumeJob	140
IBMTSSVC_Node	145
IBMTSSVC_NodeVPD	151
IBMTSSVC_PrimordialStoragePool	152
IBMTSSVC_Privilege	154
IBMTSSVC_Product	156
IBMTSSVC_Provider	157
IBMTSSVC_RegisteredProfile	160
IBMTSSVC_RegisteredSubProfile	164
IBMTSSVC_RemoteCluster	167
IBMTSSVC_RemoteServiceAccessPoint	169
IBMTSSVC_RemoteVolume	174

IBMTSSVC_StorageCapabilities	175
IBMTSSVC_StorageConfigurationCapabilities	178
IBMTSSVC_StorageHardwareID	182
IBMTSSVC_StoragePool	183
IBMTSSVC_StorageSetting	186
IBMTSSVC_StorageVolume	190
IBMTSSVC_StorageVolumeBackendVolumeView	204
IBMTSSVC_SyncCopyJob	205
IBMTSSVC_SyncCopySynchronizedSet	209
Service object classes	212
IBMTSSVC_ClusteringService	212
IBMTSSVC_PrivilegeManagementService	215
IBMTSSVC_StorageConfigurationService	218
IBMTSSVC_StorageHardwareIDManagementService	222
Security object classes	225
IBMTS_Account	226
IBMTS_AccountManagementService	228
IBMTS_Certificate	231
IBMTS_CertificateSetting	233
IBMTS_CIMXMLCommunicationMechanism	233
IBMTS_IndicationFilter	238
IBMTS_NameSpace	239
IBMTS_ObjectManager	241
IBMTS_RegisteredProfile	244
IBMTS_System	246
IBMTS_Truststore	249
IBMTS_TruststoreManagementService	250
Association object classes	261
IBMTSSVC_AllocatedFromStoragePool	261
IBMTSSVC_AuthorizedCollection	262
IBMTSSVC_AuthorizedStorageHardwareID	262
IBMTSSVC_AuthorizedSubject	262
IBMTSSVC_AuthorizedTarget	263
IBMTSSVC_AvailableHardwareID	263
IBMTSSVC_BackendControllerForVolume	263
IBMTSSVC_BasedOn	264
IBMTSSVC_ClusterController	264
IBMTSSVC_ClusterDumps	264
IBMTSSVC_ClusteringCandidate	265
IBMTSSVC_ClusteringServiceForSystem	266
IBMTSSVC_ClusterMaskingCapabilities	266
IBMTSSVC_ClusterPort	266
IBMTSSVC_ClusterScopeCandidateVolume	267
IBMTSSVC_ClusterScopeChassis	267
IBMTSSVC_ClusterScopeFCSet	267
IBMTSSVC_ClusterScopeIOGroup	267
IBMTSSVC_ClusterScopeNodeVPD	268
IBMTSSVC_ClusterScopePrivilege	268
IBMTSSVC_ClusterScopeProduct	268
IBMTSSVC_ClusterScopeSCSet	269
IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView	269
IBMTSSVC_ClusterVolume	269
IBMTSSVC_ComponentCS	270
IBMTSSVC_ComputerSystemPackage	270
IBMTSSVC_ConnectedBackendController	270
IBMTSSVC_ControllerConfigurationServiceForSystem	271

IBMTSSVC_ControllerConfServiceMaskingCapabilities	271
IBMTSSVC_CopyCandidate	272
IBMTSSVC_ElementConformsToProfile	272
IBMTSSVC_FlashCopyStorageSynchronized	272
IBMTSSVC_FlashCopySynchronizedMember	274
IBMTSSVC_HardwareIDOnSystem	275
IBMTSSVC_HostedAccessPoint	275
IBMTSSVC_HostedFlashCopyJob	275
IBMTSSVC_HostedFormatVolumeJob	276
IBMTSSVC_HostedJob	276
IBMTSSVC_HostedMigrateVolumeJob	276
IBMTSSVC_HostedPrimordialPool	277
IBMTSSVC_HostedStoragePool	277
IBMTSSVC_HostedSyncCopyJob	277
IBMTSSVC_HwIDCollectionOnSystem	278
IBMTSSVC_IndicationFiltersConformsToProfile	278
IBMTSSVC_IndicationFiltersConformsToSubProfile	278
IBMTSSVC_IOGroupIdentity	279
IBMTSSVC_IOGroupPort	279
IBMTSSVC_ManagesCollection	279
IBMTSSVC_ManagesController	280
IBMTSSVC_ManagesHardwareID	280
IBMTSSVC_ManagesPrivilege	280
IBMTSSVC_MemberOfCollection	281
IBMTSSVC_MemberOfIOGroup	281
IBMTSSVC_NodeDumps	281
IBMTSSVC_PartnershipCandidate	282
IBMTSSVC_PoolCapabilities	282
IBMTSSVC_PrimordialPoolCapabilities	283
IBMTSSVC_PrimordialPoolComponent	283
IBMTSSVC_PrimordialPoolForController	283
IBMTSSVC_PrivilegeServiceForSystem	284
IBMTSSVC_ProductPhysicalComponent	284
IBMTSSVC_ProtocolControllerForPort	284
IBMTSSVC_ProtocolControllerForUnit	286
IBMTSSVC_ProviderInObjectManager	287
IBMTSSVC_RemotePartnership	287
IBMTSSVC_RemoteSystemVolume	288
IBMTSSVC_RequiresProfile	288
IBMTSSVC_SAPAvailableForElement	288
IBMTSSVC_StorageConfigurationServiceCapabilities	289
IBMTSSVC_StorageConfigurationServiceForSystem	289
IBMTSSVC_StorageHardwareIDManagementServiceForSystem	289
IBMTSSVC_StoragePoolComponent	290
IBMTSSVC_SyncCopyStorageSynchronized	290
IBMTSSVC_SyncCopySynchronizedMember	293
IBMTSSVC_SystemBackendVolume	294
IBMTSSVC_SystemCandidateVolume	294
IBMTSSVC_SystemController	294
IBMTSSVC_SystemFCPort	295
IBMTSSVC_SystemFeatures	295
IBMTSSVC_SystemVolume	295
IBMTSSVC_SystemVPD	296
IBMTSSVC_UseOfMessageLog	297
IBMTSSVC_VolumeSettingData	297
IBMTSSVC_AccountManagementServiceForSystem	298

IBMTS_AccountOnCIMOM	299
IBMTS_AccountOnSystem	299
IBMTS_CommMechanismForManager	300
IBMTS_ContainsTruststore	300
IBMTS_ElementConformsToProfile	300
IBMTS_HasCertificate	301
IBMTS_HostedAccessPoint	301
IBMTS_HostedService	302
IBMTS_HostsTruststoreManager	302
IBMTS_IndicationFiltersConformsToProfile	302
IBMTS_ManagesAccount	303
IBMTS_ManagesTruststore	303
IBMTS_NamespaceInManager	304
Chapter 8. CIM Agent methods	305
Intrinsic methods	305
Associators()	305
AssociatorNames()	306
CreateInstance()	307
DeleteInstance()	308
EnumerateClasses()	308
EnumerateClassNames()	309
EnumerateInstances()	309
EnumerateInstanceNames()	310
ExecQuery()	311
GetClass()	311
GetInstance()	312
GetProperty()	312
ModifyInstance()	313
References()	313
ReferenceNames()	314
SetProperty()	315
Extrinsic methods	315
Add2145Cluster()	318
AddHardwareIDsToCollection()	319
AddNode()	320
AssignAccess()	321
AttachDevice()	322
AttachReplica()	323
BackupConfiguration()	324
CancelIteration()	325
CheckValidity()	325
Clean()	326
ClearLog()	327
CreateHardwareIDCollection()	327
CreateOrModifyStoragePool()	328
CreateOrModifyElementFromStoragePool()	330
CreateProtocolControllerWithPorts()	333
CreateRemoteClusterPartnership()	334
CreateReplica()	334
CreateSetting()	335
CreateStorageHardwareID()	336
CreateSynchronizedSet()	337
DeleteCertificate()	338
DeleteConfigurationBackup()	338
DeleteHardwareIDCollection()	339

DeleteProtocolController()	340
DeleteRecord()	340
DeleteRemoteClusterPartnership()	341
DeleteStorageHardwareID()	341
DeleteSynchronizedSet()	342
DeleteStoragePool()	343
DetachDevice()	344
DisableAutoGeneration()	344
Dump()	345
EnableAutoGeneration()	345
Enter()	346
EvictNode()	346
Exit()	347
FixRecord()	347
GetAllRecords()	348
GetDump()	348
GetFreeExtents()	349
GetHosts()	350
GetIOGroups()	350
GetRecord()	351
GetResetPasswordChangeFeatureStatus()	351
GetSupportedSizeRange()	352
GetSupportedSizes()	352
GenerateCIMOMCertificate()	353
IncludeBackendVolume()	354
ListConfigurationBackups()	354
MigrateVolume()	355
MigrateVolumeToImageMode()	355
ModifyErrorSettings()	356
ModifyHostIOGroupMapping()	357
ModifyIPAddress()	358
ModifyResetPasswordChangeFeature()	359
ModifySynchronization()	359
ModifySynchronizedSet()	361
PositionAtRecord()	363
PositionToFirstRecord()	364
PositionToFirstRecordRoot()	365
PositionToFirstRecordType()	365
RemoveAccess()	366
RemoveCluster()	367
RequestDiscovery()	367
RestoreConfiguration()	368
ReturnToStoragePool()	368
SetDefaultValidity()	369
SetIOGroup()	370
SetLocale()	370
SetPasswords()	371
SetQuorum()	371
SetTimeZone()	372
StartStatisticsCollection()	372
StopStatisticsCollection()	373
Shutdown()	373
UnfixRecord()	374
Upgrade()	374
WriteRecord()	375

Chapter 9. Return codes	377
Accessibility	393
Notices	395
Trademarks.	396
Glossary	397
Index	401

Figures

1. A typical CIM agent at work	4
2. SAN Volume Controller 2145-4F2 node	6
3. SAN Volume Controller 2145-8F2 and SAN Volume Controller 2145-8F4 node	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.	33
20. High-level overview of the Sync Copy state diagram of the CIM Agent for the SAN Volume Controller.	34

Tables

1.	IBMTSSVC_BackendController properties	41
2.	IBMTSSVC_BackendVolume properties	48
3.	IBMTSSVC_CandidateCluster properties	58
4.	IBMTSSVC_CandidateNode properties	59
5.	IBMTSSVC_CandidateStorageHardwareID properties	66
6.	IBMTSSVC_CandidateVolume properties	68
7.	IBMTSSVC_Chassis properties	69
8.	IBMTSSVC_Cluster properties	76
9.	IBMTSSVC_Controller properties	84
10.	IBMTSSVC_ControllerConfigurationService properties	90
11.	IBMTSSVC_ControllerMaskingCapabilities properties	94
12.	IBMTSSVC_Dumps properties	96
13.	IBMTSSVC_FabricElement properties	97
14.	IBMTSSVC_FCPort properties	98
15.	IBMTSSVC_Features properties	108
16.	IBMTSSVC_FlashCopyJob properties	109
17.	IBMTSSVC_FlashCopySynchronizedSet properties	113
18.	IBMTSSVC_FormatVolumeJob properties	115
19.	IBMTSSVC_HardwareIdCollection properties	118
20.	IBMTSSVC_HardwareIdCollectionStorageVolumeView properties	120
21.	IBMTSSVC_IOGroup properties	121
22.	IBMTSSVC_IOGroupSet properties	127
23.	IBMTSSVC_Job properties	128
24.	IBMTSSVC_MessageLog properties	133
25.	IBMTSSVC_MigrateVolumeJob properties	140
26.	IBMTSSVC_Node properties	145
27.	IBMTSSVC_NodeVPD properties	151
28.	IBMTSSVC_PrimordialStoragePool properties	152
29.	IBMTSSVC_Privilege properties	155
30.	IBMTSSVC_Product properties	156
31.	IBMTSSVC_Provider properties	157
32.	IBMTSSVC_RegisteredProfile properties	161
33.	IBMTSSVC_RegisteredSubProfile properties	164
34.	IBMTSSVC_RemoteCluster properties	167
35.	IBMTSSVC_RemoteServiceAccessPoint properties	169
36.	IBMTSSVC_RemoteVolume properties	174
37.	IBMTSSVC_StorageCapabilities properties	176
38.	IBMTSSVC_StorageConfigurationCapabilities properties	178
39.	IBMTSSVC_StorageHardwareID properties	182
40.	IBMTSSVC_StoragePool properties	184
41.	IBMTSSVC_StorageSetting properties	187
42.	IBMTSSVC_StorageVolume properties	190
43.	IBMTSSVC_StorageVolumeBackendVolumeView properties	204
44.	IBMTSSVC_SyncCopyJob properties	205
45.	IBMTSSVC_SyncCopySynchronizedSet properties	209
46.	IBMTSSVC_ClusteringService properties	212
47.	IBMTSSVC_PrivilegeManagementService properties	215
48.	IBMTSSVC_StorageConfigurationService properties	219
49.	IBMTSSVC_StorageHardwareIDManagementService properties	222
50.	IBMTS_Account properties	226
51.	IBMTS_AccountManagementService properties	228
52.	IBMTS_Certificate properties	231
53.	IBMTS_CertificateSetting Properties	233

54. IBMTS_CIMXMLCommunicationMechanism properties	233
55. IBMTS_IndicationFilter properties	238
56. IBMTS_NameSpace properties	239
57. IBMTS_ObjectManager properties	241
58. IBMTS_RegisteredProfile properties	245
59. IBMTS_System properties	246
60. IBMTS_Truststore Properties	249
61. IBMTS_TruststoreManagementService properties	251
62. IBMTSSVC_AllocatedFromStoragePool references	261
63. IBMTSSVC_AllocatedFromStoragePool properties	261
64. IBMTSSVC_AuthorizedCollection references	262
65. IBMTSSVC_AuthorizedStorageHardwareID references	262
66. IBMTSSVC_AuthorizedSubject references	262
67. IBMTSSVC_AuthorizationTarget references	263
68. IBMTSSVC_AvailableHardwareID references	263
69. IBMTSSVC_BackendSCSILUN references	263
70. IBMTSSVC_BasedOn references	264
71. IBMTSSVC_BasedOn properties	264
72. IBMTSSVC_ClusterController references	264
73. IBMTSSVC_ClusterDumps references	265
74. IBMTSSVC_ClusterDumps properties	265
75. IBMTSSVC_ClusteringCandidate references	265
76. IBMTSSVC_ClusteringServiceForSystem references	266
77. IBMTSSVC_ClusterMaskingCapabilities references	266
78. IBMTSSVC_ClusterPort references	266
79. IBMTSSVC_ClusterScopeCandidateVolume references	267
80. IBMTSSVC_ClusterScopeChassis references	267
81. IBMTSSVC_ClusterScopeFCSet references	267
82. IBMTSSVC_ClusterScopeIOGroup references	268
83. IBMTSSVC_ClusterScopeNodeVPD references	268
84. IBMTSSVC_ClusterScopePrivilege references	268
85. IBMTSSVC_ClusterScopeProduct references	269
86. IBMTSSVC_ClusterScopeSCSet references	269
87. IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView	269
88. IBMTSSVC_ClusterVolume references	269
89. IBMTSSVC_ComponentCS references	270
90. IBMTSSVC_ComputerSystemPackage references	270
91. IBMTSSVC_ComputerSystemPackage properties	270
92. IBMTSSVC_ConnectedBackendController references	271
93. IBMTSSVC_ControllerConfigurationServiceForSystem references	271
94. IBMTSSVC_ControllerConfService MaskingCapabilities references	271
95. IBMTSSVC_CopyCandidate references	272
96. IBMTSSVC_ComponentCS references	272
97. IBMTSSVC_FlashCopyStorageSynchronized references	273
98. IBMTSSVC_FlashCopyStorageSynchronized properties	273
99. IBMTSSVC_FlashCopySynchronizedMember references	275
100. IBMTSSVC_HardwareIDOnSystem references	275
101. IBMTSSVC_HostedAccessPoint references	275
102. IBMTSSVC_HostedFlashCopyJob references	276
103. IBMTSSVC_HostedFormatVolumeJob references	276
104. IBMTSSVC_HostedJob references	276
105. IBMTSSVC_HostedMigrateVolumeJob references	277
106. IBMTSSVC_HostedPrimordialPool references	277
107. IBMTSSVC_HostedStoragePool references	277
108. IBMTSSVC_HostedSyncCopyJob references	278
109. IBMTSSVC_HwIDCollectionOnSystem references	278

110. IBMTSSVC_IndicationFiltersConformsToProfile references	278
111. IBMTSSVC_IndicationFiltersConformsToSubProfile references	279
112. IBMTSSVC_IOGroupIdentity references	279
113. IBMTSSVC_IOGroupPort references	279
114. IBMTSSVC_ManagesCollection references.	280
115. IBMTSSVC_ManagesController references.	280
116. IBMTSSVC_ManagesHardwareID references	280
117. IBMTSSVC_ManagesPrivilege references	281
118. IBMTSSVC_MemberOfCollection references	281
119. IBMTSSVC_MemberOfIOGroup references.	281
120. IBMTSSVC_NodeDumps references	281
121. IBMTSSVC_NodeDumps	282
122. IBMTSSVC_PartnershipCandidate references.	282
123. IBMTSSVC_PoolCapabilities references	283
124. IBMTSSVC_PrimordialPoolCapabilities references	283
125. IBMTSSVC_PrimordialPoolComponent references	283
126. IBMTSSVC_PrimordialPoolForController references	284
127. IBMTSSVC_PrivilegeServiceForSystem references	284
128. IBMTSSVC_ProductPhysicalComponent references	284
129. IBMTSSVC_ProtocolControllerForPort references	285
130. IBMTSSVC_ProtocolControllerForPort	285
131. IBMTSSVC_ProtocolControllerForUnit references	286
132. IBMTSSVC_ProtocolControllerForUnit	286
133. IBMTSSVC_ProviderInObjectManager references	287
134. IBMTSSVC_RemotePartnership references	288
135. IBMTSSVC_RemoteSystemVolume references	288
136. IBMTSSVC_RequiresProfile references	288
137. IBMTSSVC_SAPAvailableForElement references	289
138. IBMTSSVC_StorageConfigurationServiceCapabilities references	289
139. IBMTSSVC_StorageConfigurationServiceForSystem references	289
140. IBMTSSVC_StorageHardwareIDManagementServiceForSystem references	290
141. IBMTSSVC_StoragePoolComponent references	290
142. IBMTSSVC_SyncCopyStorageSynchronized references	290
143. IBMTSSVC_SyncCopyStorageSynchronized properties	291
144. IBMTSSVC_SyncCopySynchronizedMember references	294
145. IBMTSSVC_SystemBackendVolume references	294
146. IBMTSSVC_SystemCandidateVolume references	294
147. IBMTSSVC_SystemController references	295
148. IBMTSSVC_SystemFCPort references	295
149. IBMTSSVC_SystemFeatures references.	295
150. IBMTSSVC_SystemVolume references	296
151. IBMTSSVC_SystemVPD references	296
152. IBMTSSVC_SystemVPD properties	296
153. IBMTSSVC_UseOfMessageLog references.	297
154. IBMTSSVC_UseOfMessageLog properties	297
155. IBMTSSVC_VolumeSettingData references.	297
156. IBMTSSVC_VolumeSettingData properties	298
157. IBMTSSVC_AccountManagementServiceForSystem references	298
158. IBMTS_AccountOnCIMOM references	299
159. IBMTS_AccountOnCIMOM properties.	299
160. IBMTS_AccountOnSystem	299
161. IBMTS_AccountOnSystem properties	300
162. IBMTS_CommMechanismForManager	300
163. IBMTS_ContainsTruststore references	300
164. IBMTS_ElementConformsToProfile	301
165. IBMTS_HasCertificate references	301

166. IBMTS_HostedAccessPoint	301
167. IBMTS_HostedService	302
168. IBMTS_HostsTruststoreManager references	302
169. IBMTS_IndicationFiltersConformsToProfile	303
170. IBMTS_ManagesAccount references	303
171. IBMTS_ManagesTruststore references	303
172. IBMTS_NamespaceInManager	304
173. Supported intrinsic methods	305
174. Associators() parameters	306
175. AssociatorNames() parameters	307
176. CreateInstance() parameters	307
177. DeleteInstance() parameters	308
178. EnumerateClasses() parameters.	308
179. EnumerateClassNames() parameters	309
180. EnumerateInstances() parameters	310
181. EnumerateInstanceNames() parameters	310
182. ExecQuery() parameters	311
183. GetClass() parameters	311
184. GetInstance() parameters	312
185. GetProperty() parameters	313
186. ModifyInstance() parameters	313
187. References() parameters	314
188. ReferenceNames() parameters	314
189. SetProperty() parameters	315
190. Supported extrinsic methods	316
191. Add2145Cluster() parameters.	319
192. AddHardwareIDsToCollection() parameters	319
193. AddNode() parameters	320
194. AssignAccess() parameters	321
195. AttachDevice() parameters	323
196. AttachReplica() parameters	324
197. BackupConfiguration() parameters	325
198. Cancellation() parameters	325
199. CheckValidity() parameters.	326
200. Clean() parameters	326
201. CreateHardwareIDCollection() parameters	327
202. CreateOrModifyStoragePool() parameters	328
203. CreateOrModifyElementFromStoragePool() parameters	331
204. CreateProtocolControllerWithPorts() parameters	333
205. CreateRemoteClusterPartnership() parameters	334
206. CreateReplica() parameters	334
207. CreateSetting() parameters	336
208. CreateStorageHardwareID() parameters	336
209. CreateSynchronizedSet() parameters	337
210. DeleteCertificate() parameters	338
211. DeleteConfigurationBackup() parameters	338
212. DeleteHardwareIDCollection() parameters	339
213. DeleteProtocolController() parameters	340
214. DeleteRecord() parameters	340
215. DeleteRemoteClusterPartnership() parameters	341
216. DeleteStorageHardwareID() parameters	342
217. DeleteSynchronizedSet()	343
218. DeleteStoragePool()	343
219. DetachDevice() parameters	344
220. Dump() parameters	345
221. Enter() parameters.	346

222. EvictNode() parameters	346
223. Exit() parameters	347
224. FixRecord() parameters	347
225. GetAllRecords() parameters	348
226. GetDump() parameters	349
227. GetFreeExtents() parameters	349
228. GetHosts() parameter	350
229. GetIOGroups() parameter	350
230. GetRecord() parameters.	351
231. GetResetPasswordChangeFeatureStatus() properties	352
232. GetSupportedSizeRange() parameters	352
233. GetSupported Sizes() parameters	353
234. GenerateCIMOMCertificate() parameters	353
235. IncludeBackendVolume() parameters	354
236. ListConfigurationBackups() parameters	354
237. MigrateVolume() parameters	355
238. MigrateVolumeToImageMode() parameters	356
239. ModifyErrorSettings() parameters	356
240. ModifyHostIOGroupMapping() parameters	357
241. Modifyipaddress() parameters	358
242. ModifyResetPasswordChangeFeature() parameters	359
243. ModifySynchronization() parameters	360
244. ModifySynchronizedSet() parameters	362
245. PositionAtRecord() parameters	364
246. PositionToFirstRecord() parameters	364
247. PositionToFirstRecordRoot() parameters.	365
248. PositionToFirstRecordType() parameters.	365
249. RemoveAccess() parameters	366
250. RemoveCluster() parameters	367
251. RequestDiscovery() parameters	367
252. RestoreConfiguration() parameters.	368
253. ReturnToStoragePool() parameters.	369
254. SetDefaultValidity() properties.	369
255. SetIOGroup() parameters	370
256. SetLocale() parameters	370
257. SetPasswords() parameters	371
258. SetQuorum() parameters	371
259. SetTimeZone() parameters.	372
260. StartStatisticsCollection() parameters	372
261. Shutdown() parameters	373
262. UnfixRecord() parameters	374
263. Upgrade() parameters	374
264. WriteRecord() parameters	375

About this guide

This publication introduces the Common Information Model (CIM) Agent for the IBM System Storage SAN Volume Controller.

This section describes:

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

Who should use this guide?

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

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

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

Summary of changes

This document contains terminology, maintenance, and editorial changes.

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

Summary of changes for SC26-7904-00 SAN Volume Controller CIM Agent Developer's Reference

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

New information

This topic describes the changes to this guide since the previous edition, SC26-7545-04. The following sections summarize the changes that have since been implemented from the previous version.

This version includes the following new information:

- Added the following new CIM Agent Core object classes:
 - IBMTSSVC_FabricElement
 - IBMTSSVC_StorageVolumeBackendVolumeView

- Added the following new CIM Agent Association object class:
 - IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView

Changed information

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

- Added new properties to the following CIM Agent Core object classes:
 - IBMTSSVC_BackendVolume
 - IBMTSSVC_CandidateNode
 - IBMTSSVC_Cluster
 - IBMTSSVC_Node
 - IBMTSSVC_HardwareIdCollection
 - IBMTSSVC_StorageHardwareID
 - IBMTSSVC_StorageVolume
- Added new properties to the following CIM Agent Service object class:
 - IBMTSSVC_StorageConfigurationService
- Added new parameters to the following CIM Agent Extrinsic methods:
 - CreateOrModifyElementFromStoragePool()
 - CreateReplica()
 - RequestDiscovery()
- Modified a property of the following CIM Agent core object class:
 - IBMTSSVC_NodeVPD

Summary of changes for SC26-7545-04 SAN Volume Controller CIM Agent Developer's Reference

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

New information

This topic describes the changes to this guide since the previous edition, SC26-7545-03. The following sections summarize the changes that have since been implemented from the previous version.

This version includes the following new information:

- Added the following new CIM Agent Core object class:
 - IBMTSSVC_HardwareIdCollectionStorageVolumeView
- Added the following new CIM Agent Extrinsic methods:
 - GetHosts()
 - GetIOGroups()
 - ModifyHostIOGroupMapping()
- Device-specific error codes can be found in the deviceerrors.txt file that is located in the CIMOM\MOF directory of your SAN Volume Controller Console installation directory.

Changed information

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

- Added new properties to the following CIM Agent Core object classes:

- IBMTSSVC_StorageHardwareID
- IBMTSSVC_StorageVolume
- IBMTSSVC_HardwareIDCollection
- Added new parameters to the following CIM Agent Extrinsic methods:
 - CreateHardwareIDCollection()
 - CreateReplica()
- Modified a parameter for the following CIM Agent Extrinsic method:
 - CreateOrModifyStoragePool()
- Added new return codes to the parameters of the following CIM Agent Core object class:
 - IBMTSSVC_Node
- Added new return codes to the following CIM Agent Extrinsic method:
 - CreateProtocolControllerWithPorts()

Emphasis

Different typefaces are used in this guide to show emphasis.

The following typefaces are used to show emphasis:

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

SAN Volume Controller library and related publications

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

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

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

SAN Volume Controller library

The following table lists and describes the publications that make up the SAN Volume Controller library. Unless otherwise noted, these publications are available in Adobe portable document format (PDF) from the following Web site:

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

Title	Description	Order number
<i>IBM System Storage SAN Volume Controller: CIM agent Developer's Reference</i>	This reference guide describes the objects and classes in a Common Information Model (CIM) environment.	GA32-0552
<i>IBM System Storage 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).	SC26-7903
<i>IBM System Storage SAN Volume Controller: Configuration Guide</i>	This guide provides guidelines for configuring your SAN Volume Controller.	SC26-7902
<i>IBM System Storage SAN Volume Controller: Host Attachment Guide</i>	This guide provides guidelines for attaching the SAN Volume Controller to your host system.	SC26-7905
<i>IBM System Storage SAN Volume Controller: Installation Guide</i>	This guide includes the instructions the service representative uses to install the SAN Volume Controller.	GC26-7900
<i>IBM System Storage 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.	GA32-0551
<i>IBM System Storage SAN Volume Controller: Service Guide</i>	This guide includes the instructions the service representative uses to service the SAN Volume Controller.	GC26-7901
<i>IBM System 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.	G229-9054
<i>IBM System Storage Master Console for SAN File System and SAN Volume Controller: Installation and User's Guide</i>	This guide includes the instructions on how to install and use the SAN Volume Controller Console	GC30-4090

Other IBM publications

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

Title	Description	Order number
<i>IBM System Storage Multipath Subsystem Device Driver: User's Guide</i>	This guide describes the IBM System Storage Multipath Subsystem Device Driver Version 1.5 for TotalStorage Products and how to use it with the SAN Volume Controller. This publication is referred to as the <i>IBM System Storage Multipath Subsystem Device Driver: User's Guide</i> .	SC30-4131

Related Web sites

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

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

How to order IBM publications

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

The IBM publications center

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

<http://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:

<http://www.ibm.com/shop/publications/order/>

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- Mail

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Department 61C
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U.S.A.

Chapter 1. Introduction

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

It provides overviews of the following components:

- 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) that is launched by the Storage Networking Industry Association (SNIA).

The SMI-S specifies a secure and reliable interface that allows storage management systems to identify, classify, monitor, and control physical and logical resources in a storage area network (SAN). The interface 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 that is 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 that is 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 uses 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 provides provisions for security, resource-locking management, event notification, and service discovery.

CIM agent

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

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

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

CIM agent concepts

There are several concepts that describe the Common Information Model (CIM) agent. You must familiarize yourself with these concepts to understand the object models.

The CIM agent specifications use the following concepts and terminology to describe the object models:

Association

A class with 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 a class. In object-oriented programming, an object that is 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 that the CIM agent manages, and the model path provides navigation within the implementation.

Property

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

Qualifier

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

Reference

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

Schema

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

CIM agent components

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

Components

A CIM agent involves the following components:

agent code

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

CIM object manager (CIMOM)

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

client application

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

device

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

device provider

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

Service Location Protocol (SLP)

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

CIM agent at work

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

Note: The standard secure port is 5999.

The following output provides an example of the registered string:

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

The SLP provides the following attributes:

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

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

```
service-hi-description=IBM SAN Volume Controller CIM Agent Version 3.1.0
```

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

```

service-id=IBM_CIMOM_1094736587984_1108027145

template-url-syntax=https://<CIM Agent IP>

CommunicationMechanism=cim-xml

InteropSchemaNamespace=/root/ibm

FunctionalProfilesSupported=Basic Read, Basic Write, Instance Manipulation,
Association Traversal, Query Execution, Qualifier Declaration, Indications

MultipleOperationsSupported=false

ProtocolVersion=1

AuthenticationMechanismSupported=Basic

Namespace=/root/ibm

```

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

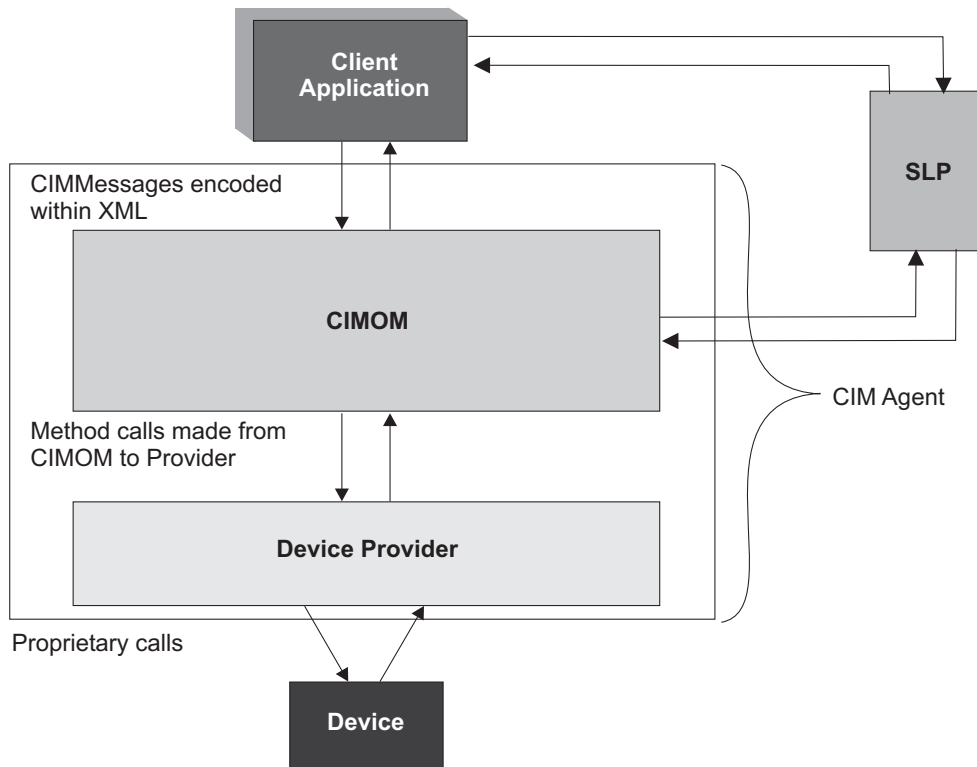


Figure 1. A typical CIM agent at work

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

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

SAN Volume Controller overview

The *SAN Volume Controller* is a SAN (storage area network) appliance that attaches open-systems storage devices to supported open-systems hosts.

The SAN Volume Controller is a rack-mounted unit that you can install in a standard Electrical Industries Association (EIA) 19-inch rack. It provides symmetric virtualization by creating a pool of managed disks (MDisks) from the attached storage subsystems. Those storage systems are then mapped to a set of virtual disks (VDisks) for use by attached host systems. System administrators can view and access a common pool of storage on the SAN. This lets the administrators use storage resources more efficiently and provides a common base for advanced functions.

A *SAN* is a high-speed fibre-channel network that connects host systems and storage devices. It allows a host system to be connected to a storage device across the network. The connections are made through units such as routers, gateways, hubs, and switches. The area of the network that contains these units is known as the *fabric* of the network.

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

- Creates a single pool of storage
- Provides logical unit virtualization
- Manages logical volumes
- Provides the following advanced functions for the SAN:
 - Large scalable cache
 - Copy Services
 - FlashCopy® (point-in-time copy)
 - Metro Mirror (synchronous copy)
 - Global Mirror (asynchronous copy)
 - Data migration
 - Space management
 - Mapping that is based on desired performance characteristics
 - Metering of service quality

Each SAN Volume Controller is a *node*. The nodes are always installed in pairs, with one-to-four pairs of nodes constituting a *cluster*. Each node in a pair is configured to back up the other. Each pair of nodes is known as an *I/O group*. There are three models of SAN Volume Controller nodes: the SAN Volume Controller 2145-4F2, the SAN Volume Controller 2145-8F2 and the SAN Volume Controller 2145-8F4. Figure 2 on page 6 and Figure 3 on page 6 provide illustrations of the three types of SAN Volume Controller nodes.

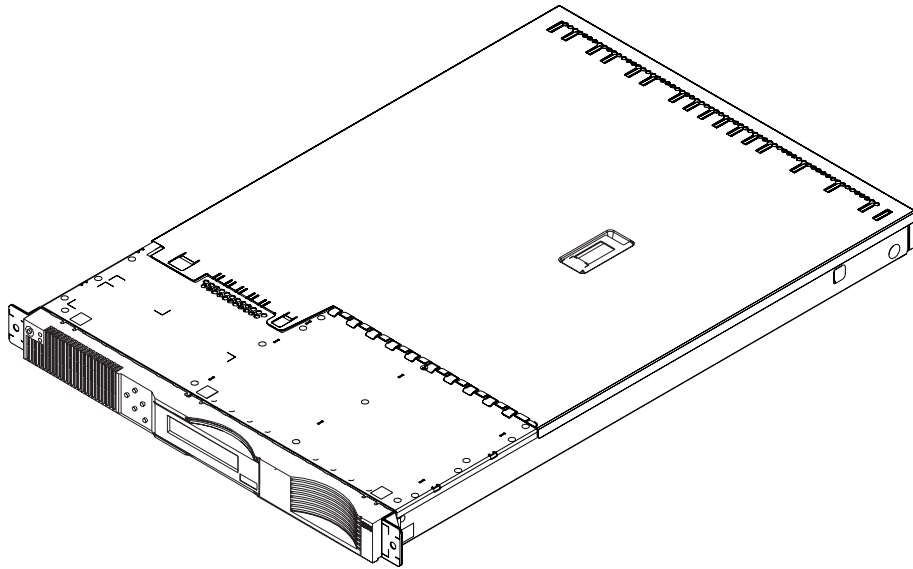
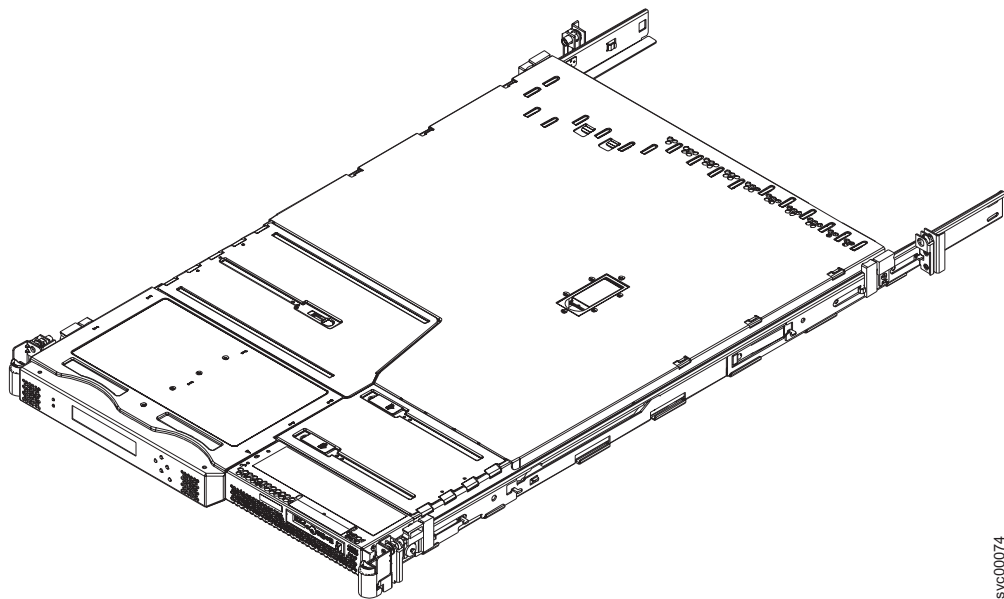


Figure 2. SAN Volume Controller 2145-4F2 node



svc00074

Figure 3. SAN Volume Controller 2145-8F2 and SAN Volume Controller 2145-8F4 node

All I/O operations that are managed by the nodes in an I/O group are cached on both nodes. Each virtual volume is defined to an I/O group. To avoid any single point of failure, the nodes of an I/O group are protected by independent uninterruptible power supplies (UPSs). There are two different UPSs. The UPSs are called the 2145 uninterruptible power supply-1U (2145 UPS-1U) or 2145 uninterruptible power supply (2145 UPS) units.

A SAN Volume Controller I/O group takes the storage that is presented to the SAN by the storage subsystems as MDisks and translates that storage into logical disks, known as VDIs, that are used by applications on the hosts. Each node must reside in only one I/O group and provide access to the VDIs in that I/O group.

The SAN Volume Controller provides continuous operations and can also optimize the data path to ensure that performance levels are maintained.

Field replaceable units (FRU) can be removed and replaced on one node while the other node of the pair continues to run. This allows the attached hosts to continue to access the attached storage while a node is repaired.

CIM agent for the SAN Volume Controller

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

The CIM agent 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 CIMOM makes requests to the provider and the provider uses the functions that are provided by the SAN Volume Controller to fulfill these requests.

Validating the truststore certificate expiration

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

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

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

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

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

Perform the following steps to regenerate a truststore certificate:

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

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

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

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

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

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

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

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

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

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

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

Functional diagrams of the Common Information Model Agent

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

The following topics provide functional diagrams of the Common Information Model (CIM) Agent object model.

Profile Overview

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

Figure 4 on page 9 shows the supported SMI-S profiles and subprofiles.

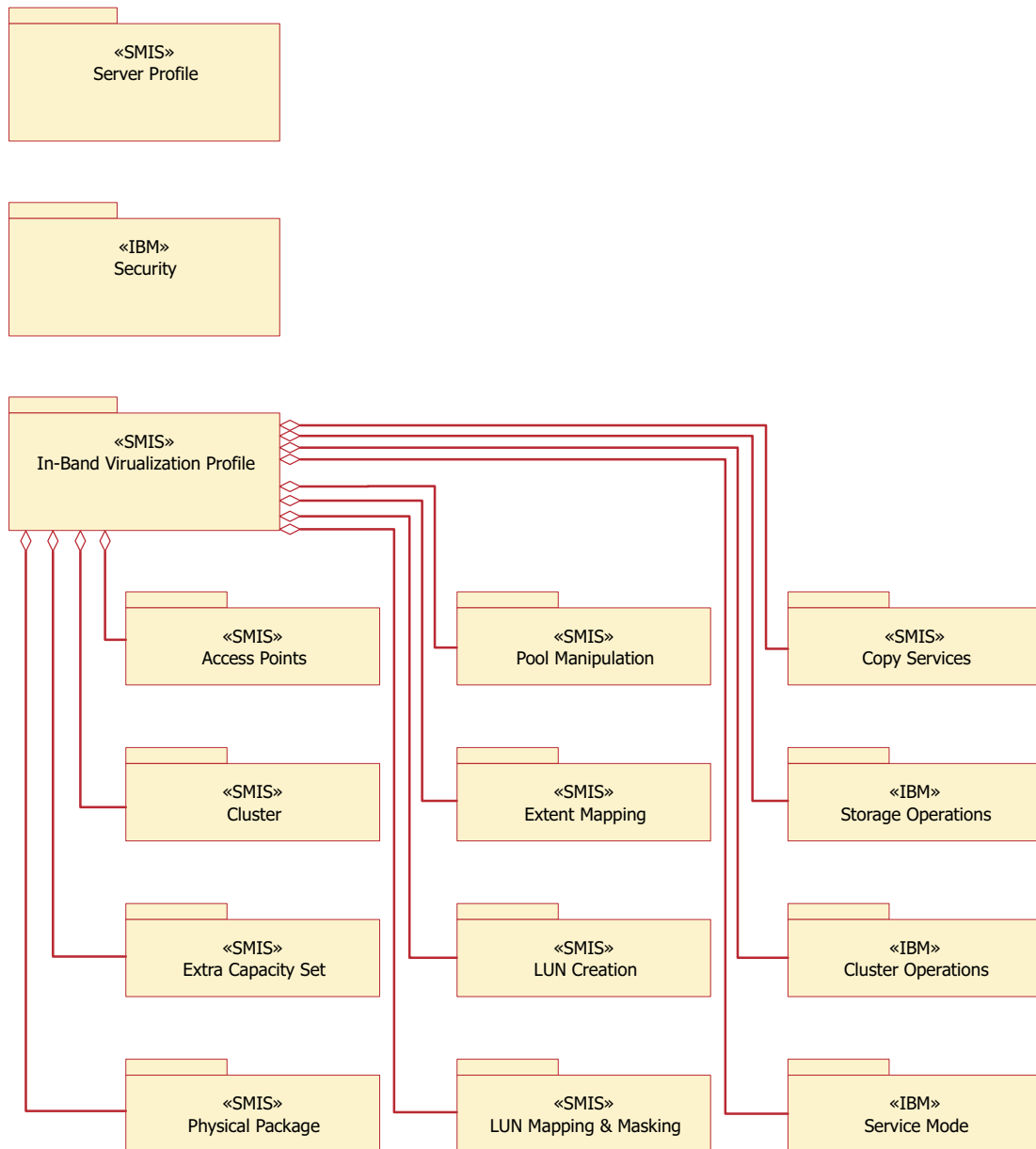


Figure 4. High-level overview of the CIM Agent for the SAN Volume Controller.

Physical Package

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

Figure 5 on page 10 shows the basic classes (building blocks) for the model.

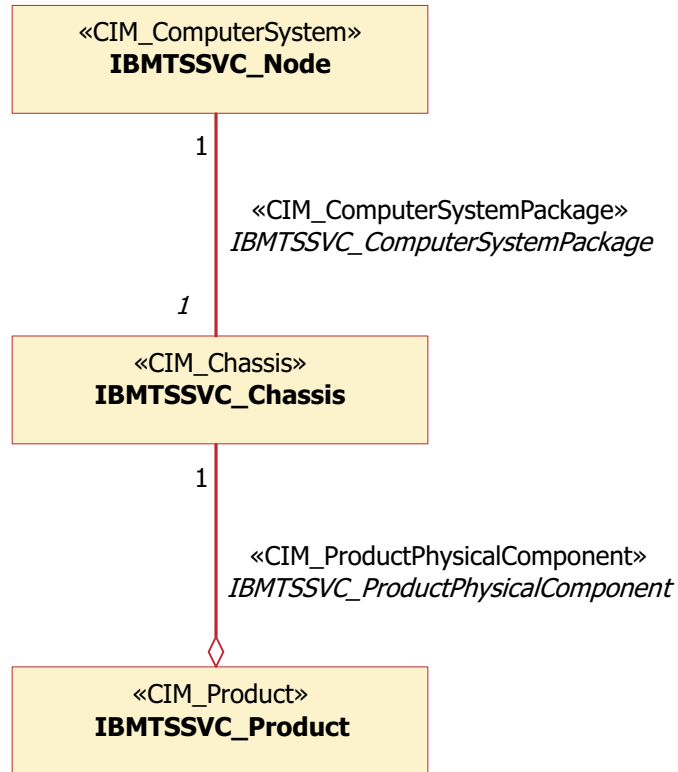


Figure 5. High-level overview of the physical package of the CIM Agent for the SAN Volume Controller.

Server Profile

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

Figure 6 on page 11 shows the basic classes (building blocks) for the model.

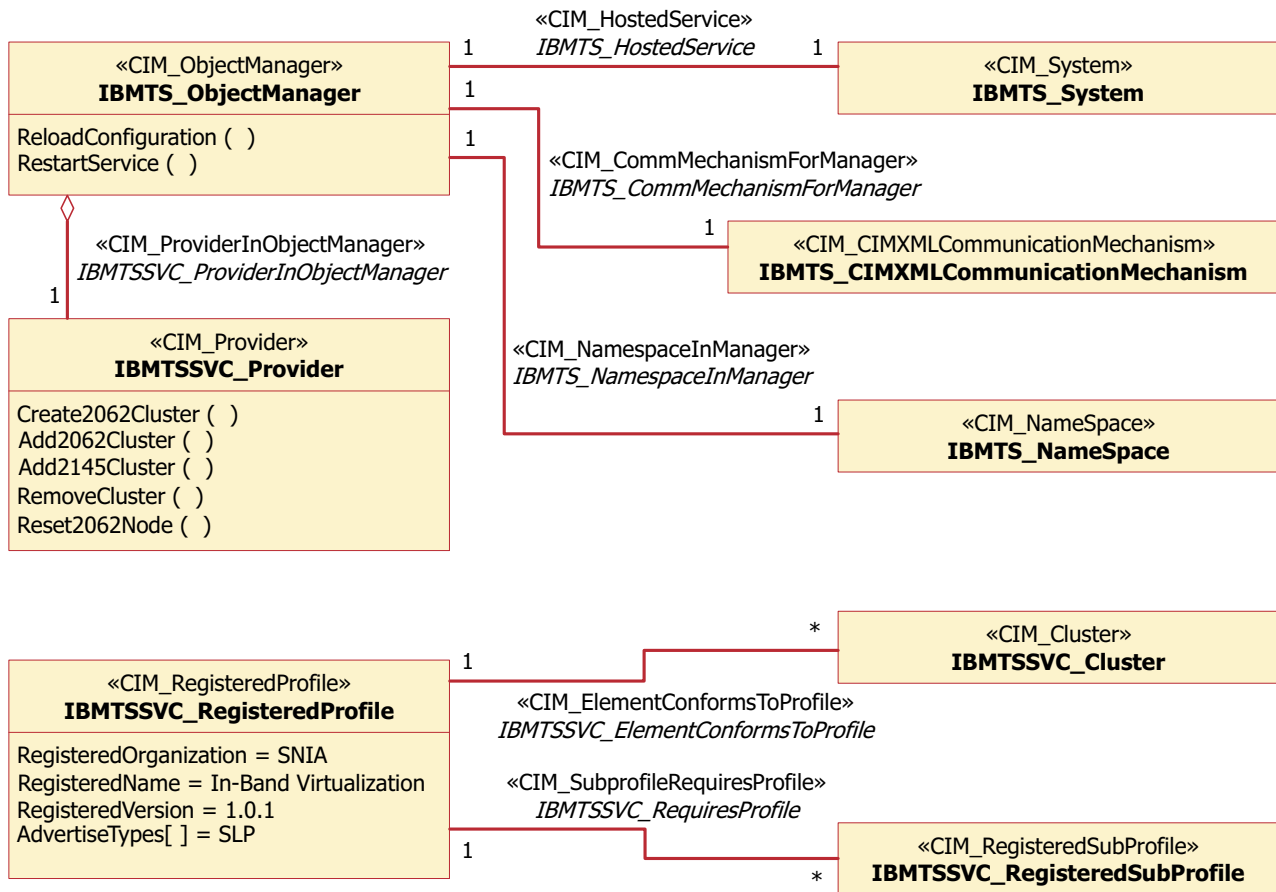


Figure 6. High-level overview of the server profile of the CIM Agent for the SAN Volume Controller.

Extent mapping subprofile

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

Figure 7 on page 12 shows the basic classes (building blocks) for the model.

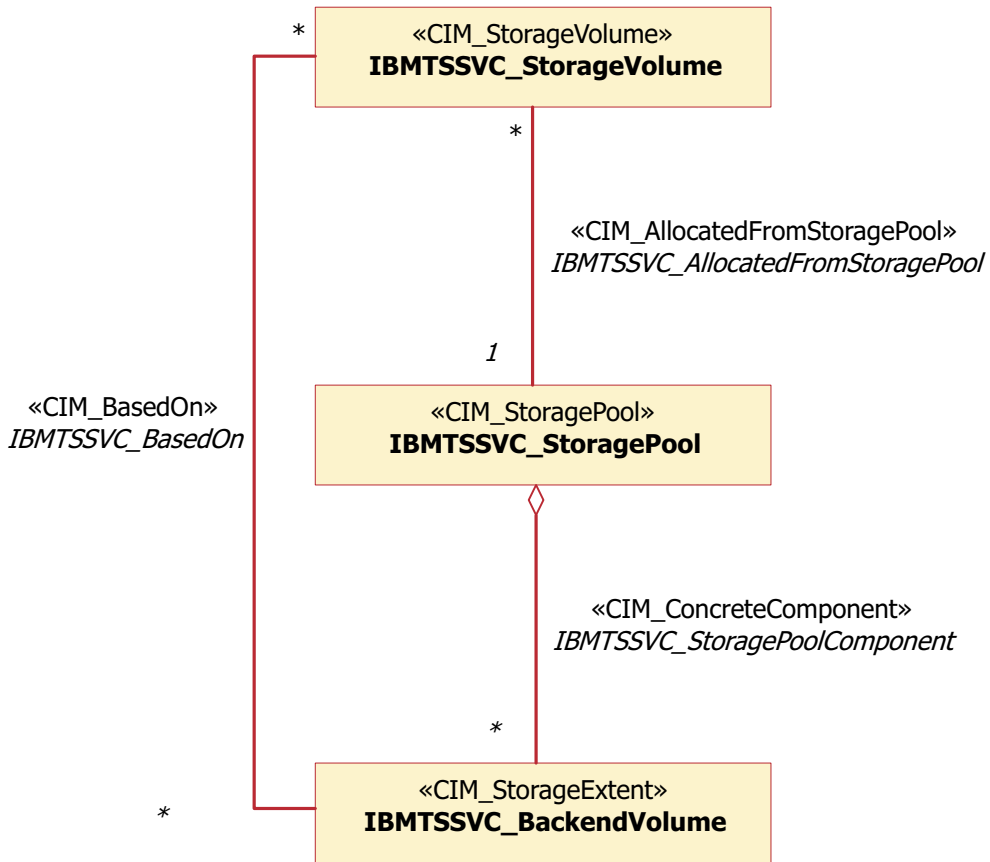


Figure 7. High-level overview of the extent mapping subprofile of the CIM Agent for the SAN Volume Controller

ExtraCapacitySet subprofile

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

Figure 8 on page 13 shows the basic classes (building blocks) for the model.

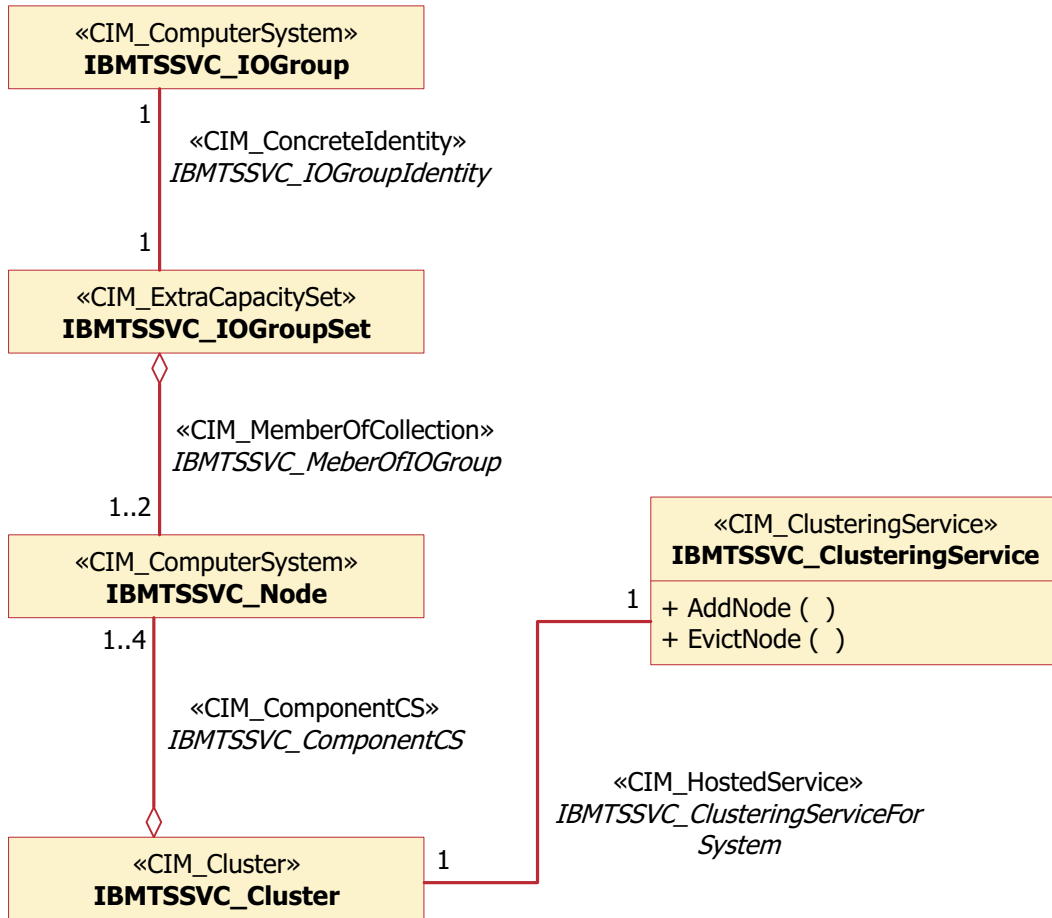


Figure 8. High-level overview of the ExtraCapacitySet subprofile of the CIM Agent for the SAN Volume Controller.

Access point subprofile

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

Figure 9 on page 14 shows the basic classes (building blocks) for the model.

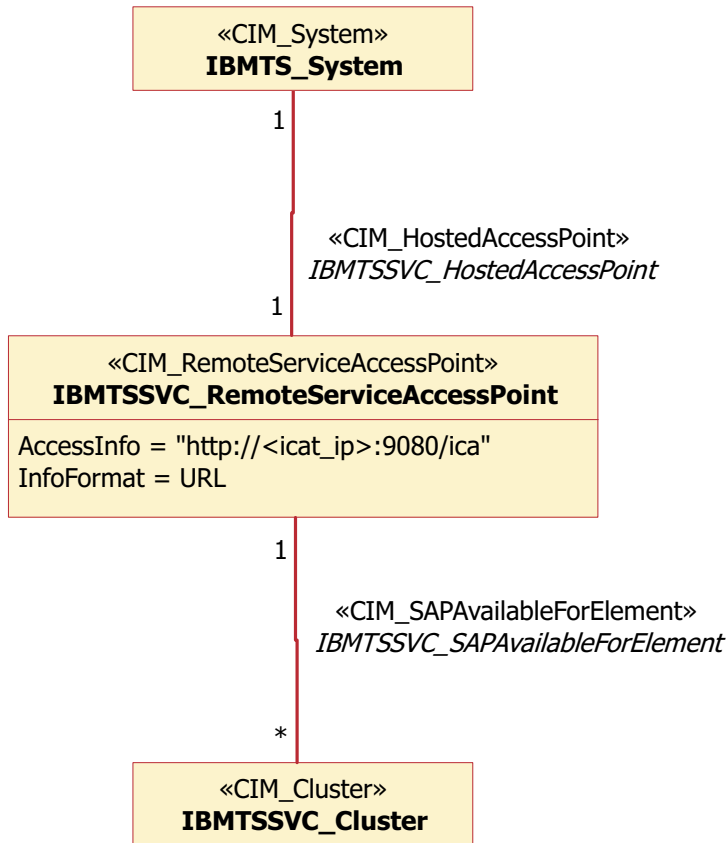


Figure 9. High-level overview of the access point subprofile of the CIM Agent for the SAN Volume Controller.

Cluster subprofile

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

Figure 10 on page 15 shows the classes and associations that provide the function of a clustering service.

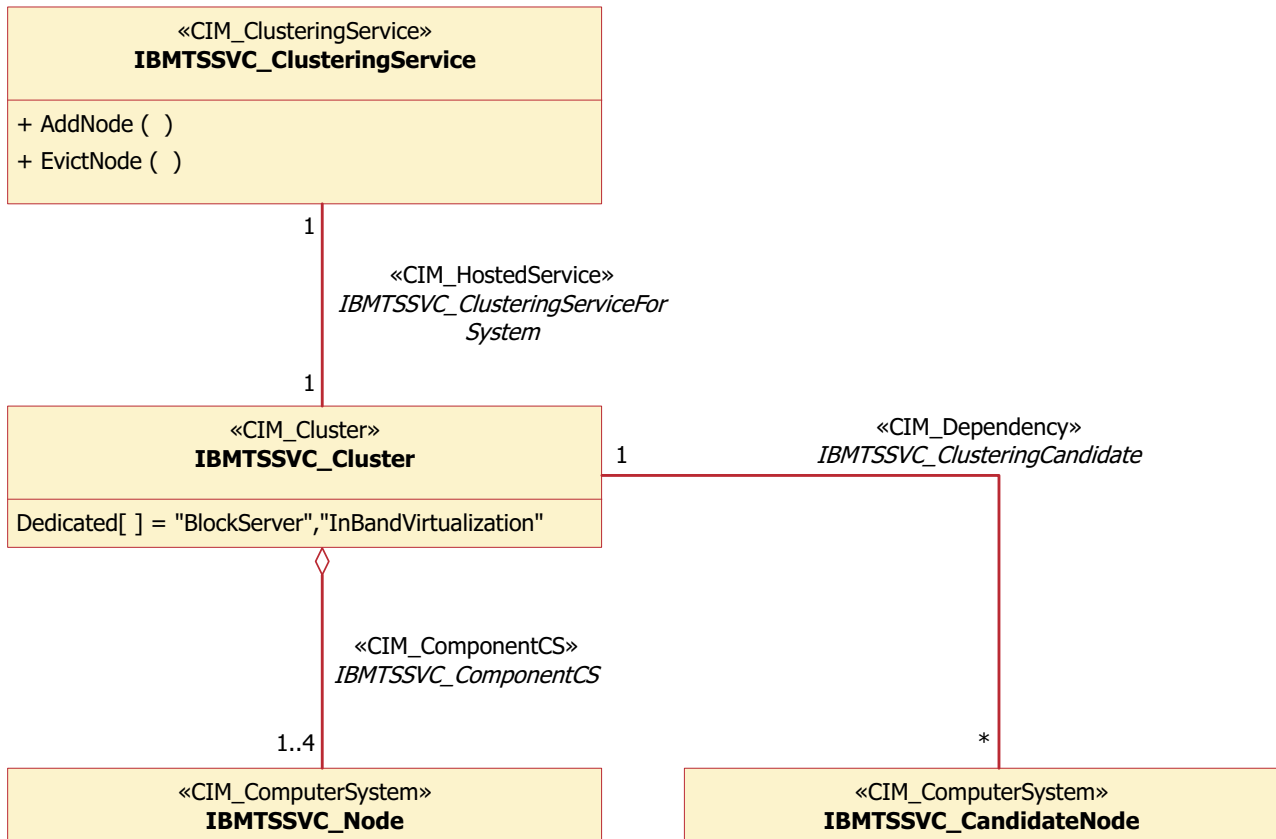


Figure 10. Class diagram of Clustering instance

Vendor-specific storage configuration operations

The StorageConfiguration instance uses several object classes.

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

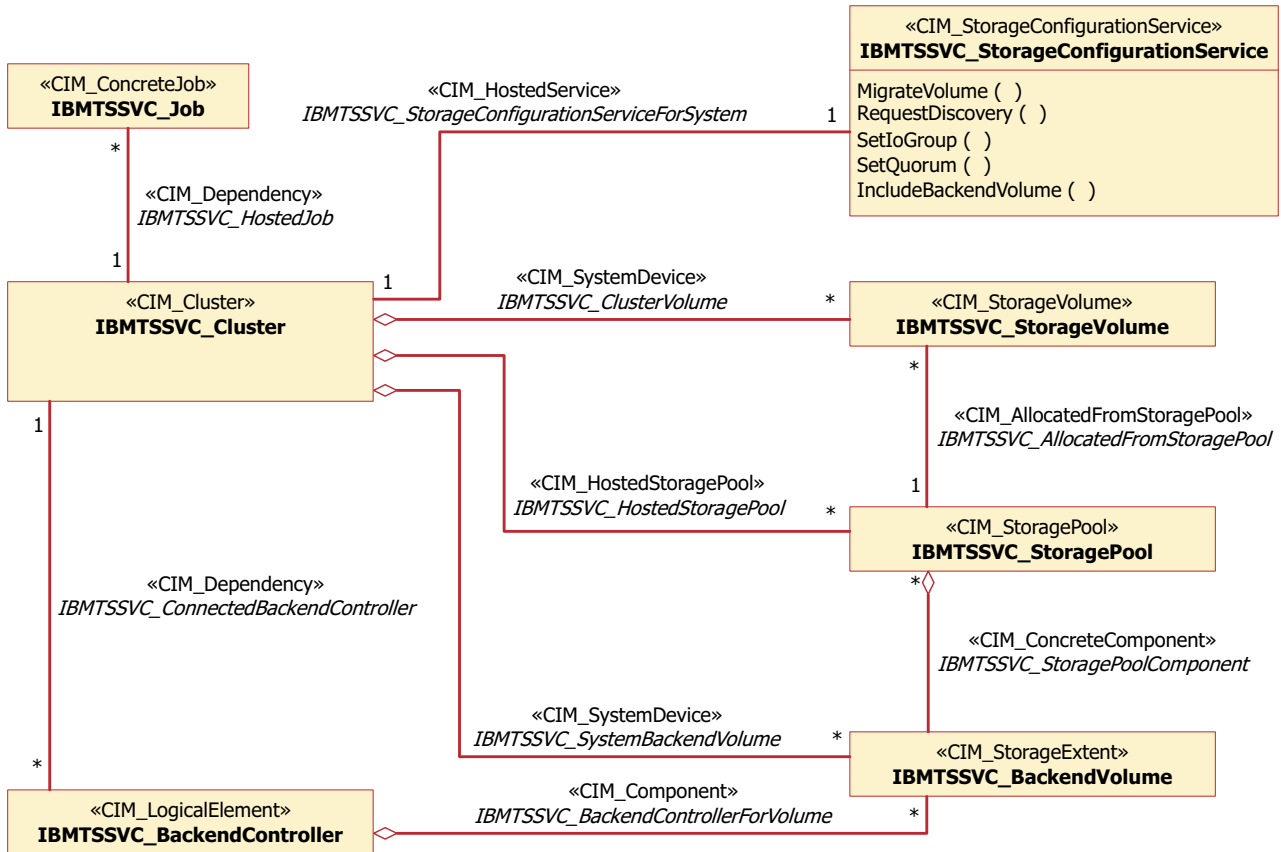


Figure 11. Class diagram of StorageConfiguration instance

LUN masking

A LUN masking instance uses several object classes.

Figure 12 on page 17 shows the object classes that run LUN masking. In the CIM Agent for the SAN Volume Controller, the following classes provide the methods to map an IBMTSSVC_StorageVolume instance to an IBMTSSVC_HardwareIdCollection instance of an IBMTSSVC_StorageHardwareID instance.

- IBMTSSVC_StorageHardwareIdManagementService
- IBMTSSVC_PrivilegeManagementService
- IBMTSSVC_ControllerConfigurationService

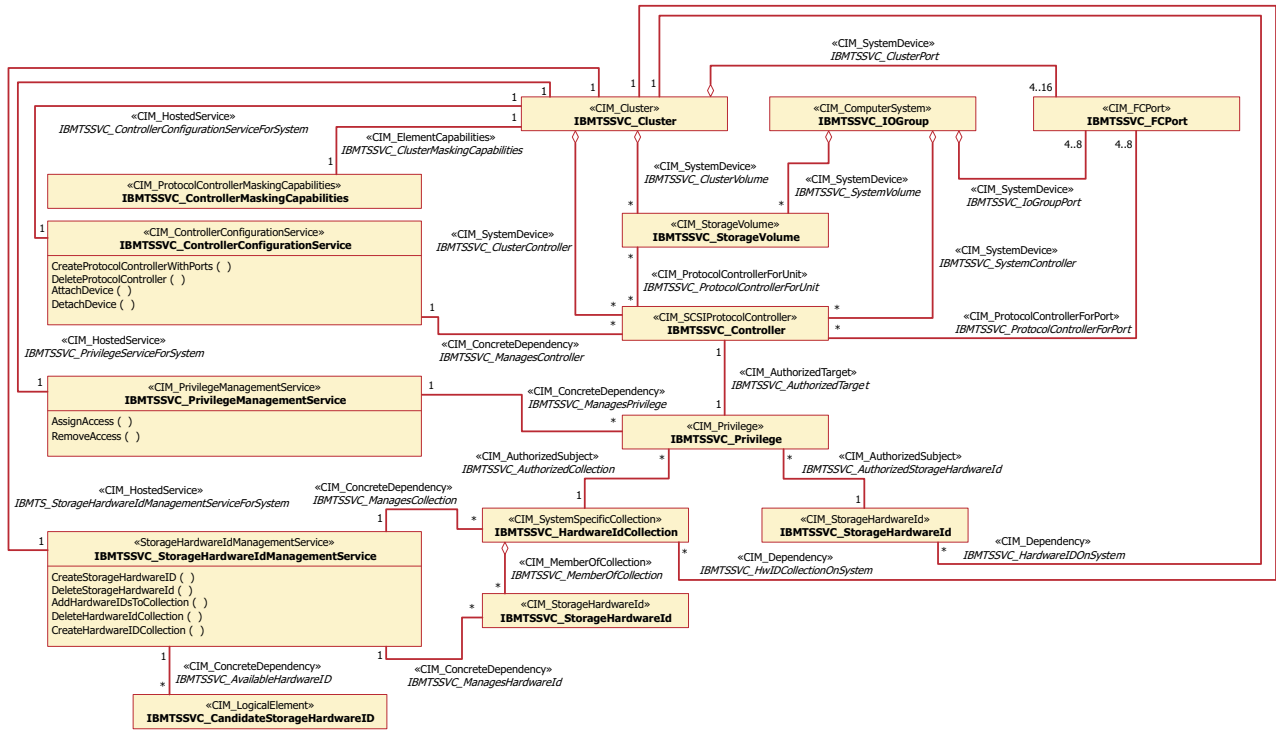


Figure 12. Class diagram for LUN masking instances

LUN creation subprofile

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

Figure 13 on page 18 shows the basic classes (building blocks) for the model.

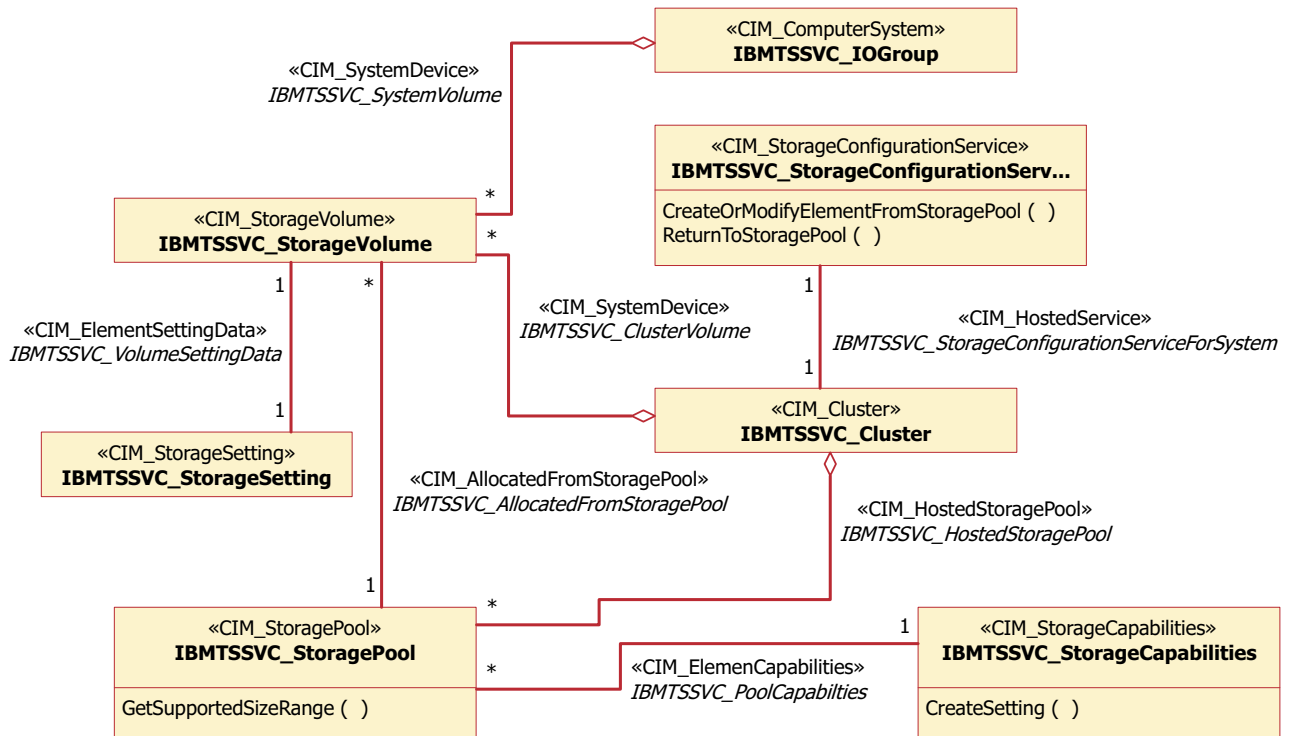


Figure 13. High-level overview of the LUN creation subprofile of the CIM Agent for the SAN Volume Controller.

Copy services

The IBMTSSVC_StorageConfigurationService class provides the methods to create copy relationships.

Figure 14 on page 19 shows the object classes that provide FlashCopy, Metro Mirror, and synchronous copy services. In the Common Information Model (CIM) Agent for the SAN Volume Controller, the IBMTSSVC_StorageConfigurationService class provides the methods to create copy relationships. An IBMTSSVC_StorageConfigurationService instance is always associated with an IBMTSSVC_Cluster instance.

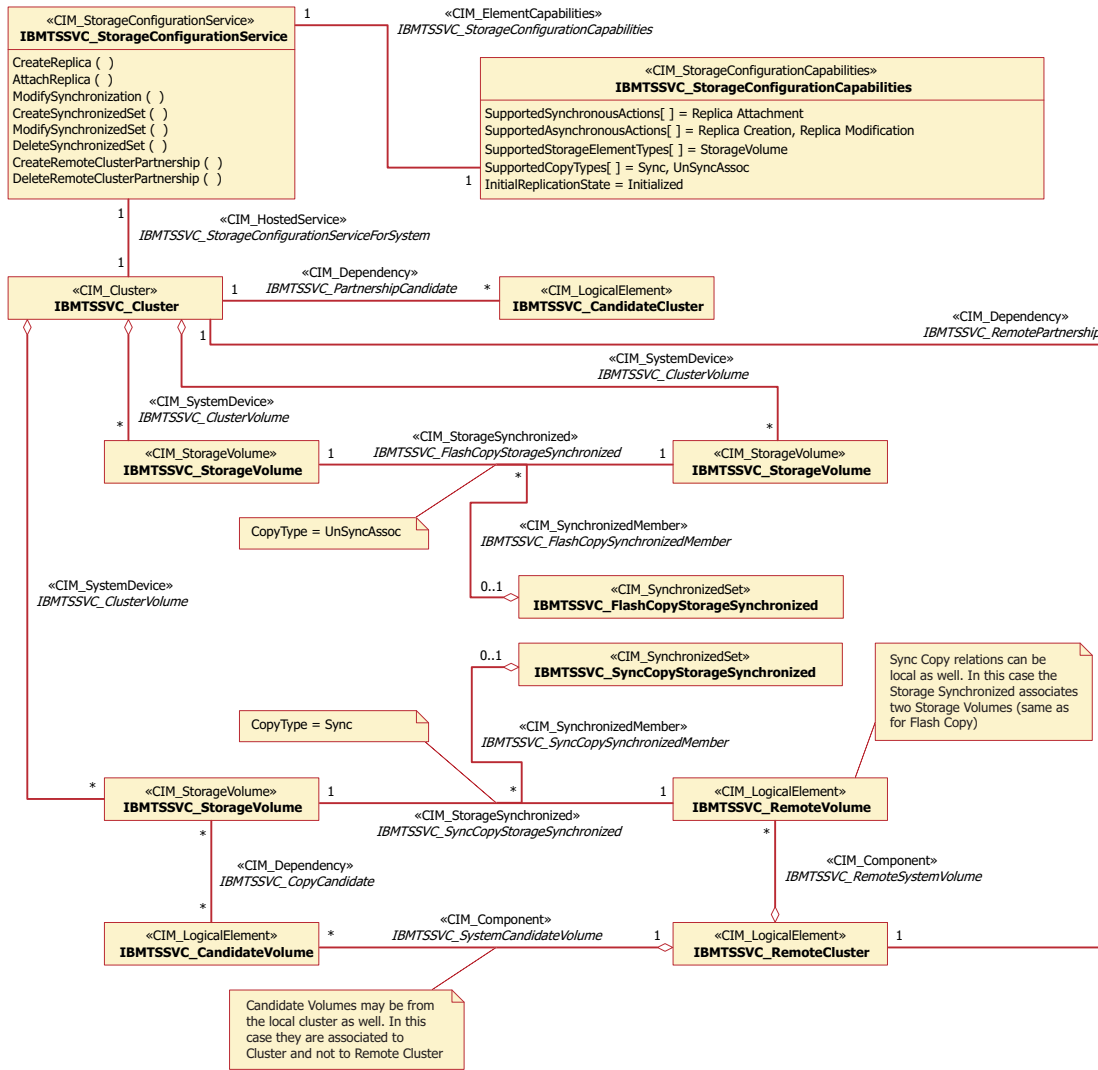


Figure 14. Class diagram of copy services instances

Vendor-specific service mode subprofile

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

The service mode subprofile is supported for Blade SAN Volume Controllers (model 2062) only. Figure 15 on page 20 shows the basic classes (building blocks) for the model.

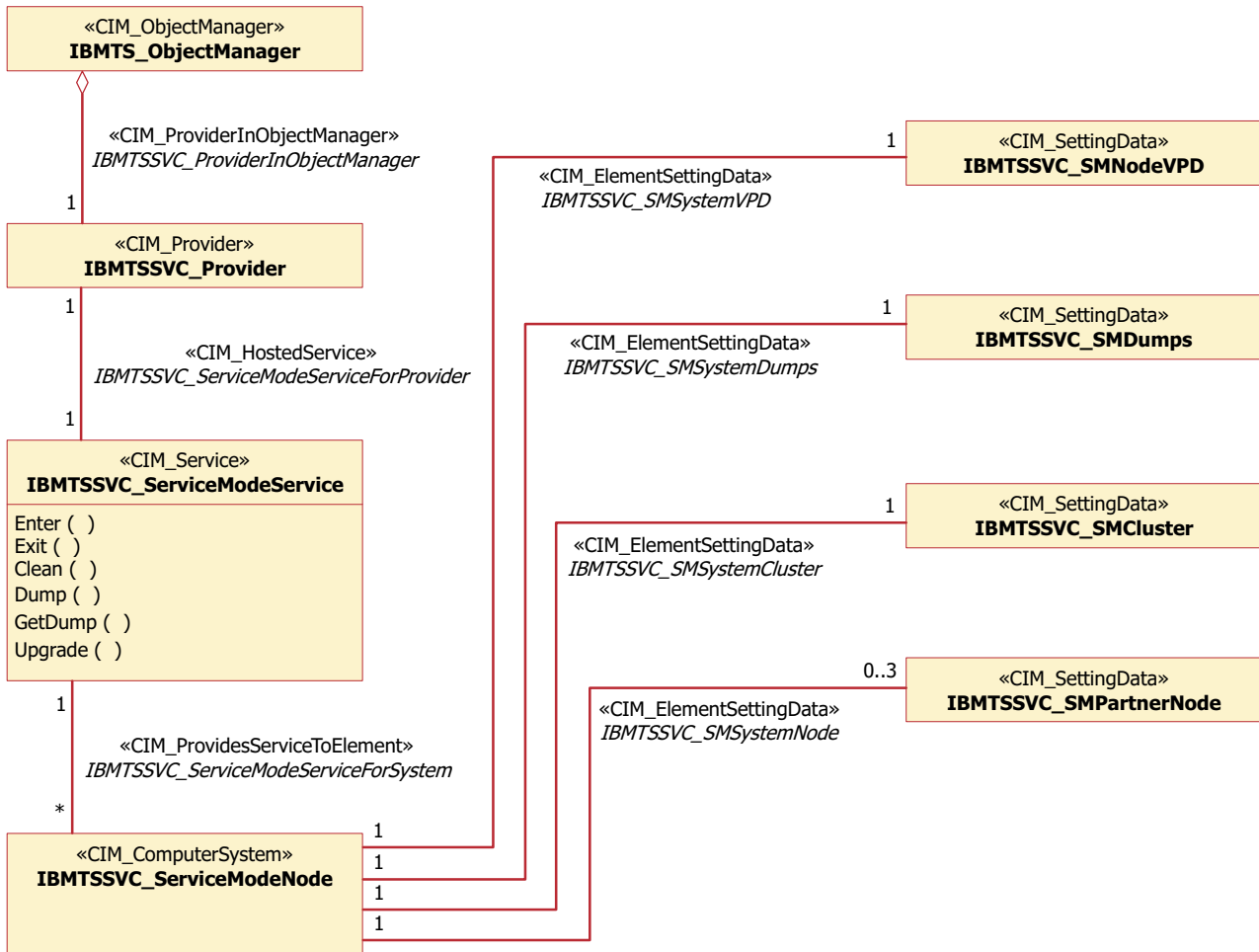


Figure 15. High-level overview of the vendor-specific service mode subprofile of the CIM Agent for the SAN Volume Controller.

Vendor-specific cluster operations

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

Figure 16 on page 21 shows the basic classes (building blocks) for the model.

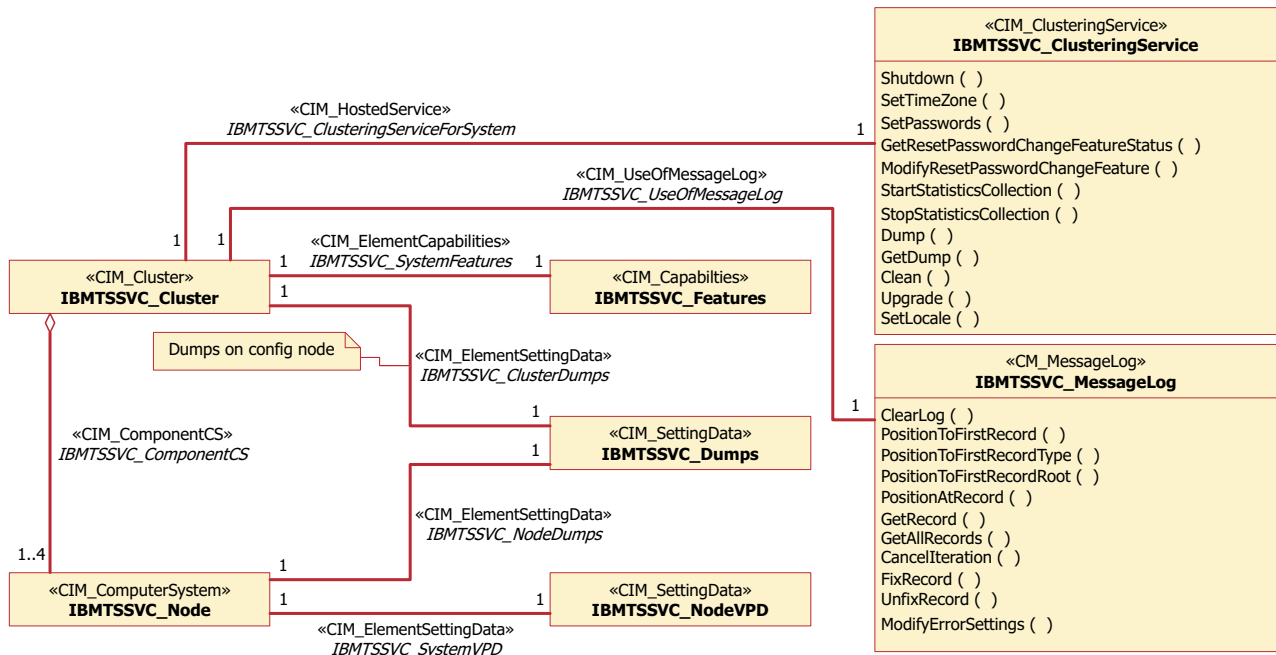


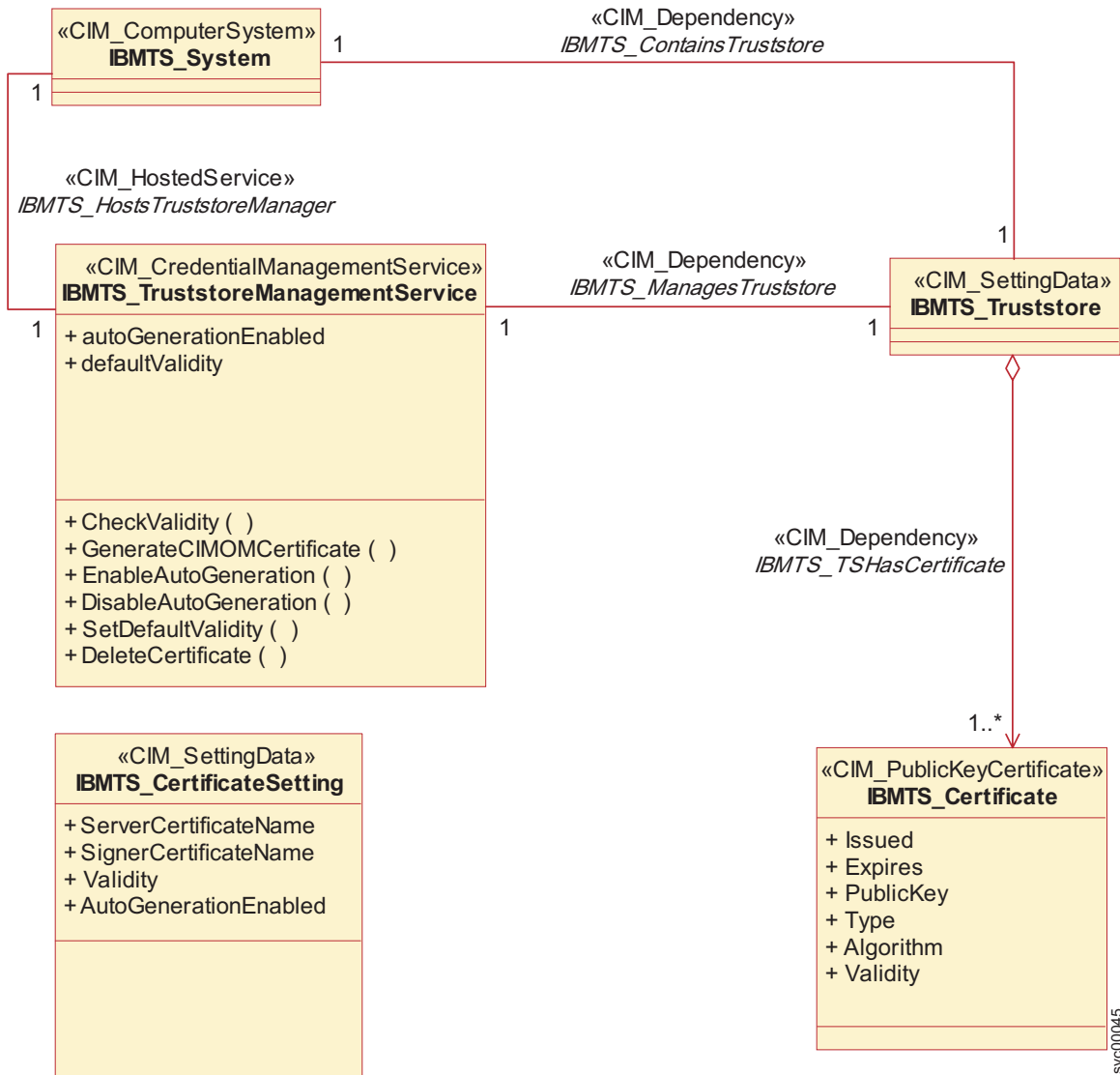
Figure 16. High-level overview of the vendor-specific cluster operations of the CIM Agent for the SAN Volume Controller.

Security service

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

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

Figure 17 on page 22 provides a diagram of these object classes.



svc00045

Figure 17. Class diagram of security instances

Pool Manipulation

You can use several object classes to manipulate storage pools.

Figure 18 on page 23 provides a high-level overview of the object classes that you can use for pool manipulation of the CIM Agent for the SAN Volume Controller.

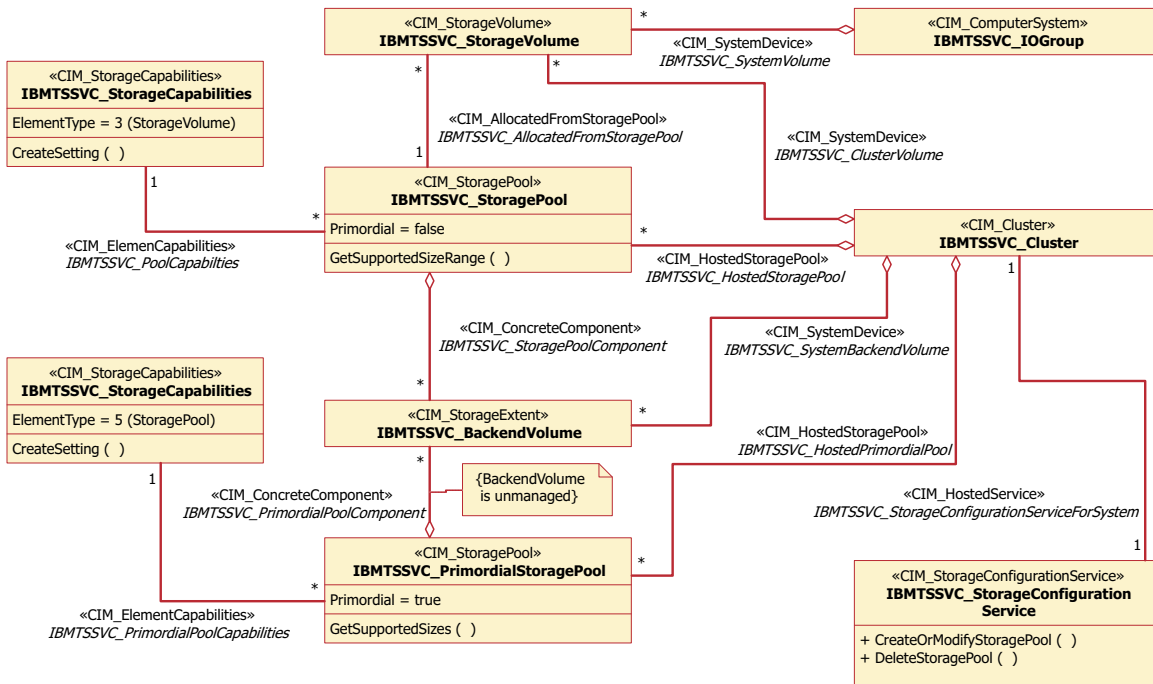


Figure 18. High-level overview of pool manipulation of the CIM Agent for the SAN Volume Controller.

Chapter 2. Performing storage configuration

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

The following basic storage configuration tasks are discussed:

- Adding a node to a cluster
- Creating or modifying a storage pool
- Creating 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: back-end, middle and front-end. The objects in the *back-end* layer contain the back-end controllers and volumes, those in the *middle* layer contain the storage pools, and those in the *front-end* layer contain the storage volumes that are exposed to the hosts.

Performing basic storage configuration

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

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

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

Perform the following tasks to complete basic storage configuration:

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

Adding a candidate node to a cluster

You can add an IBMTSSVC_CandidateNode to an existing IBMTSSVC_Cluster.

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

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

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

Creating a new storage pool

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

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

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

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

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

Modifying a storage pool

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

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.
4. If necessary, you can further modify the `IBMTSSVC_StoragePool` by adding or removing an `IBMTSSVC_BackendVolume` instance to the pool. Invoke the `IBMTSSVC_StorageSettingPool.CreateOrModifyStoragePool` method while you specify the `Extent[]` parameter with information about the `IBMTSSVC_BackendVolume` that is 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 are removed, and BackendVolumes that are not in the pool are added. Also, you can specify the property `Force` of `StorageSettingPool` to remove BackendVolumes from the pool even if there is data on these disks. This will trigger the migration process that moves data from the removed volumes to the remaining ones.

Creating a new storage volume

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

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` instance.

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

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

Chapter 3. Performing Copy Services

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

Copy Services

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

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

The FlashCopy service enables you to make an instant, point-in-time copy of a source IBMTSSVC_StorageVolume instance to a target IBMTSSVC_StorageVolume instance. 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 instance or different IBMTSSVC_Cluster instances.

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 instance.

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 instance.

3. Retrieve the IBMTSSVC_StorageConfigurationService instance that is associated with the IBMTSSVC_Cluster instance to which the selected IBMTSSVC_StorageVolume instances belong.
4. Invoke the IBMTSSVC_StorageConfigurationService.AttachReplica() method with the following parameter specifications:
 - a. Set SourceElement to the reference (CIMObjectPath) of the source IBMTSSVC_StorageVolume.
 - b. Set TargetElement to the reference (CIMObjectPath) of the target IBMTSSVC_CandidateVolume.
 - c. Optionally set ElementName to the name of the synchronization.
 - d. Optionally set BackgroundCopyRate to the desired priority of the background copy rate in percent (0 - 100%).
 - e. Optionally specify Set to add the newly created FlashCopySynchronization to the set. If you specify a null value, the newly created FlashCopySynchronization will not be a member of a synchronized set.

- f. Set CopyType to 4.

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

Creating a FlashCopy relationship for a synchronized set

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

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

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

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

5. Create an IBMTSSVC_FlashCopySynchronizedSet instance by invoking the IBMTSSVC_StorageConfigurationService.CreateSynchronizedSet() method with the following parameter specifications:
 - a. Set CopyType to 4 (flash).
 - b. Optionally set ElementName to the name of the newly created IBMTSSVC_FlashCopySynchronizedSet instance.
6. Add the IBMTSSVC_FlashCopyStorageSynchronized instance to the IBMTSSVC_FlashCopySynchronizedSet instance by invoking the IBMTSSVC_StorageConfigurationService.ModifySynchronizedSet() method with the Operation parameter set to 0 (add).

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

Creating a synchronous copy relationship between volumes in the same cluster

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

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 that is associated with the `IBMTSSVC_Cluster` instance to which the selected volumes belong.
4. Invoke the `IBMTSSVC_StorageConfigurationService.AttachReplica()` method with the following parameter specifications:
 - a. Set `SourceElement` to the reference (`CIMObjectPath`) of the source `IBMTSSVC_StorageVolume` instance.
 - b. Set `TargetElement` to the reference (`CIMObjectPath`) of the target `IBMTSSVC_StorageVolume` or `IBMTSSVC_CandidateVolume` instance.
 - c. Optionally set `ElementName` to the name of the synchronization.
 - d. Set `CopyType` to 3.

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

Creating a synchronous copy relationship between volumes in different clusters

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

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

1. Identify an `IBMTSSVC_Cluster` instance as the source cluster for the desired synchronous copy relationship.
2. Obtain the reference (`CIMObjectPath`) of the `IBMTSSVC_StorageConfigurationService` instance that is associated with the source cluster.
3. Identify the `IBMTSSVC_CandidateCluster` on which you want the synchronous copy to reside by traversing the `IBMTSSVC_ClusterScopeRemoteCluster` association.

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

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

Flash Copy state diagram

The Flash Copy state diagram of the Common Information Model (CIM) Agent for the SAN Volume Controller provides states and transitions for Flash Copy relationships.

Figure 19 on page 33 shows the supported states and transitions for Flash Copy relationships.

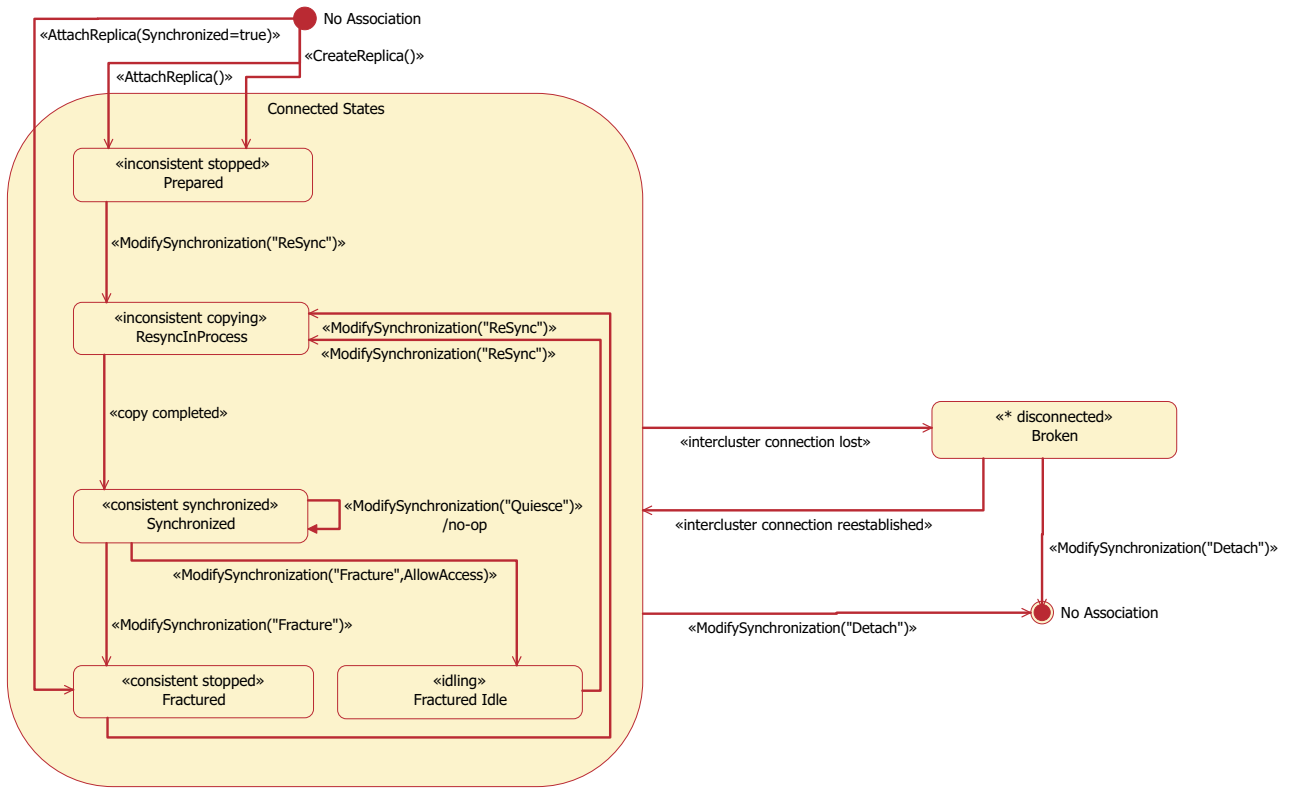


Figure 20. High-level overview of the Sync Copy state diagram of the CIM Agent for the SAN Volume Controller.

Chapter 4. Performing LUN masking

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

LUN masking

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

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

Performing LUN masking

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

You can map host ports as well as entire hosts to a storage volume.

- Host = IBMTSSVC_HardwareIdCollection
- Port = IBMTSSVC_StorageHardwareID

IBMTSSVC_HardwareIdCollection aggregates instances of IBMTSSVC_StorageHardwareID.

1. 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).
2. Select an IBMTSSVC_StorageVolume (LUN) instance and either an IBMTSSVC_HardwareIdCollection (host) instance or an IBMTSSVC_StorageHardwareID (port) instance. The association between the two instances is IBMTSSVC_MemberOfCollection.

Note: If you want to work with the host and host ports, obtain the reference of IBMTSSVC_StorageHardwareIdManagementService by traversing either IBMTSSVC_ManagesCollection or IBMTSSVC_ManagesHardwareID. The IBMTSSVC_StorageHardwareIdManagementService class has a CreateHardwareIDCollection() method that takes an array of strings and references I/O groups as an input parameter to bind the host collection to the I/O group.

3. Obtain the reference (CIMObjectPath) of both instances.
4. Traverse the IBMTSSVC_SystemVolume association from the storage volume to obtain the reference of the scoping IBMTSSVC_IOGroup.
5. 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. The IBMTSSVC_HardwareIdCollection class has the numberOfIOGroups property that indicates how many hosts are bound to a specific I/O group. It is also

possible to directly traverse the association IBMTSSVC_AuthorizedStorageHardwareID to get to the associated instance of IBMTSSVC_Privilege.

6. Check to see if a controller already exists for the host. You can check this by traversing the IBMTSSVC_AuthorizedCollection to obtain the reference of the IBMTSSVC_Privilege instance. A privilege has a 1:1 relation to the controller.
 - If starting from IBMTSSVC_StorageHardwareID, you can traverse the IBMTSSVC_AuthorizedStorageHardwareID association to obtain the reference of the IBMTSSVC_Privilege instance.
 - If a controller does not already exist for the Host, a new controller must be created using the IBMTSSVC_ControllerConfigurationService class. This class offers you a method called CreateProtocolControllerWithPorts(). In order to invoke this method, you need the fibre-channel ports and the host. An easy way to use this method is to use the reference of the IO group rather than the fibre-channel ports. The methods automatically detect the fibre-channel ports.
 - If a privilege is already associated, obtain the reference of the IBMTSSVC_Controller instance by traversing the IBMTSSVC_AuthorizedTarget association.
7. Check to make sure that the IO group of the volume (LUN) and the IO group of the controller are the same.
8. Traverse the IBMTSSVC_SystemController association to obtain the reference of the scoping IO group.
9. Select the Controller which belongs to the same IO group as the storage volume.
10. Call the method AttachDevice() on that Controller instance. Make sure to set the device parameter to the reference of the storage volume.

Chapter 5. Network considerations

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

SLP based discovery

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

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

The example below illustrates why this occurs:

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

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

Perform the following steps to set the attribute:

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

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

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

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

RemoteServiceAccessPoint instance

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

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

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

Perform the following steps to set the connection data:

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

The CIM Agent automatically updates the RSAP.

Chapter 6. Using the problem determination tool

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

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

The default settings allow you to collect the following files:

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

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

Starting the tool

You can start the Reliability, Availability and Serviceability (RAS) Problem Determination Collection Tool using the **collectLogs** batch file.

The **collectLogs** batch file allows you to zip all of the log and trace files that are generated by the ICAT and user interface. You can move the log and trace files to a default location or a location that you specify.

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

1. Go to the *CIM agent installation directory/svconconsole/cimom/support* directory.

Where *CIM agent installation directory* is the directory where the CIM agent is installed.

2. Find the batch file name **collectLogs.bat**. The **collectLogs.bat** batch file zips all of the files that are found in the CIM agent directory and its subdirectories with an extension of *.log*.

3. Issue the following command to run the batch file:

```
collectLogs.bat target directory
```

Where *target directory* is the location where you want to save the zip file.

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

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

Editing the properties file

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

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

- The default location where the zip file is created.
- The location of the CIMOM log files and the file extension types that are collected.
- The location of the user interface log files and the file extension types that are collected.
- The location of the installation log files and the file extension types that are collected.
- The location of the vital product data (VPD) text files and the file extension types that are collected.

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

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

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

Note: Do not edit the **raspd.properties** unless you want to collect additional file extension types.

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

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

Chapter 7. CIM agent object classes

Object classes are the building blocks of the Common Information Model (CIM) agent and provide functionality such as storage configuration, Copy Services, and logical unit number (LUN) masking.

Core object classes

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

IBMTSSVC_BackendController

The IBMTSSVC_BackendController class extends the CIM_SCSIController class.

Properties

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

Table 1. IBMTSSVC_BackendController properties

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

Table 1. IBMTSSVC_BackendController properties (continued)

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

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

Table 1. IBMTSSVC_BackendController properties (continued)

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

Table 1. IBMTSSVC_BackendController properties (continued)

Property	Type	Qualifier	Description																																								
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	An array of free-form strings providing explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.																																								
InstallDate	Date-time		Unsupported property.																																								
LastErrorCode	Uint32	Deprecated(CIM_DeviceError.Data.LastErrorCode)	Unsupported property.																																								
MaxQuiesceTime	Uint64	Deprecated(No value), Units(MilliSeconds)	Unsupported property.																																								
Name	String	MaxLen(1024), Write(TRUE), WriteRole(Administrator)	The unique label, in the context of the hosting system, by which the controller is known.																																								
Operational Status	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions), Expensive(TRUE)	Indicates the current status of the element. <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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17	Completed																																										
18	Power Mode																																										

Table 1. IBMTSSVC_BackendController properties (continued)

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

Table 1. IBMTSSVC_BackendController properties (continued)

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

Table 1. IBMTSSVC_BackendController properties (continued)

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

IBMTSSVC_BackendVolume

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

Properties

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

Table 2. IBMTSSVC_BackendVolume properties

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

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description																																												
ActiveWWPN	String		The volume's active worldwide port number.																																												
Additional Availability	Uint16[]	ModelCorrespondence (CIM_LogicalDevice.Availability)	<p>The availability and status of the device in addition to what is specified in the Availability property. The Availability property denotes the primary status and availability of the device. In cases where this will not be sufficient to denote the complete status of the device, the AdditionalAvailability property provides further information.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>Unknown</td></tr> <tr><td>3</td><td>Running/Full Power</td></tr> <tr><td>4</td><td>Warning</td></tr> <tr><td>5</td><td>In Test</td></tr> <tr><td>6</td><td>Not Applicable</td></tr> <tr><td>7</td><td>Power Off</td></tr> <tr><td>8</td><td>Off Line</td></tr> <tr><td>9</td><td>Off Duty</td></tr> <tr><td>10</td><td>Degraded</td></tr> <tr><td>11</td><td>Not Installed</td></tr> <tr><td>12</td><td>Install Error</td></tr> <tr><td>13</td><td>Power Save - Unknown</td></tr> <tr><td>14</td><td>Power Save - Low Power Mode</td></tr> <tr><td>15</td><td>Power Save - Standby</td></tr> <tr><td>16</td><td>Power Cycle</td></tr> <tr><td>17</td><td>Power Save - Warning</td></tr> <tr><td>18</td><td>Paused</td></tr> <tr><td>19</td><td>Not Ready</td></tr> <tr><td>20</td><td>Not Configured</td></tr> <tr><td>21</td><td>Quiesced</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	Unknown	3	Running/Full Power	4	Warning	5	In Test	6	Not Applicable	7	Power Off	8	Off Line	9	Off Duty	10	Degraded	11	Not Installed	12	Install Error	13	Power Save - Unknown	14	Power Save - Low Power Mode	15	Power Save - Standby	16	Power Cycle	17	Power Save - Warning	18	Paused	19	Not Ready	20	Not Configured	21	Quiesced
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Table 2. IBMTSSVC_BackendVolume properties (continued)

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

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description												
ConsumableBlocks	Uint64	Expensive(TRUE)	The maximum number of blocks, of size BlockSize, that are available for consumption when layering StorageExtents using the BasedOn association.												
ControllerName	String		The name of the volume's backend controller.												
DataOrganization	Uint16		The type of data organization techniques: <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Other</td> </tr> <tr> <td>1</td> <td>Unknown</td> </tr> <tr> <td>2</td> <td>Fixed Block</td> </tr> <tr> <td>3</td> <td>Variable Block</td> </tr> <tr> <td>4</td> <td>Count Key Data</td> </tr> </tbody> </table>	Code	Semantics	0	Other	1	Unknown	2	Fixed Block	3	Variable Block	4	Count Key Data
Code	Semantics														
0	Other														
1	Unknown														
2	Fixed Block														
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4	Count Key Data														
DataRedundancy	Uint16	ModelCorrespondence (CIM_StorageSetting. DataRedundancyGoal CIM_StorageSetting. DataRedundancyMax CIM_StorageSetting. DataRedundancyMin)	The number of complete copies of data maintained.												
DeltaReservation	Uint8	MinValue(0), MaxValue(100), Units(Percentage), ModelCorrespondence (CIM_StorageSetting. DeltaReservationGoal CIM_StorageSetting. DeltaReservationMax CIM_StorageSetting. DeltaReservationMin)	The current value for the Delta reservation.												
Description	String		A textual description of the object.												
DeviceID	String	MaxLen(64)	The ID of the BackendVolume. A numerical value which is unique inside the BackendVolume class only.												
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The BackendVolume's user-friendly name												

Table 2. IBMTSSVC_BackendVolume properties (continued)

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

Table 2. IBMTSSVC_BackendVolume properties (continued)

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

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
LastErrorCode	UInt32	Deprecated(CIM_Device ErrorData.LastErrorCode)	This property is not supported.
MaxPathCount	UInt32	Counter(TRUE), Expensive(TRUE)	The maximum fibre-channel path count to the BackendVolume.
MaxQuiesceTime	UInt64	Deprecated(No value), Units(MilliSeconds)	This property is not supported.
Mode	UInt32	ValueMap, Values	The mode of the BackendVolume: Code Semantics 0 Unmanaged 1 Router restricted 2 Managed 3 Image 4 for future use 5 for future use 6 Router config 7 Remote copy 8 for future use
Name	String	MaxLen(1024)	The unique label by which the object is known.
NativeStatus	UInt16		The back-end volume's native operational status. Code Semantics 0 Offline 1 Online 2 Degraded 3 Excluded
NoSinglePointOfFailure	Boolean	ModelCorrespondence (CIM_StorageSetting. NoSinglePointOfFailure)	Indicates if the no-single-point-of-failure feature exists.
NumberOfBlocks	UInt64	Expensive(TRUE)	The total number of logically contiguous blocks that form the extent. The total size of the extent can be calculated by multiplying BlockSize by NumberOfBlocks. If the BlockSize is 1, this property is the total size of the extent.

Table 2. IBMTSSVC_BackendVolume properties (continued)

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

Table 2. IBMTSSVC_BackendVolume properties (continued)

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

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Table 2. IBMTSSVC_BackendVolume properties (continued)

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

Table 2. IBMTSSVC_BackendVolume properties (continued)

Property	Type	Qualifier	Description
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
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		This property is not supported.
TotalPowerOnHours	Uint64	Deprecated (CIM_PoweredStatisticalData.TotalPowerOnHours), Units(Hours), Counter(TRUE)	This property is not supported.

IBMTSSVC_CandidateCluster

The IBMTSSVC_CandidateCluster class extends the CIM_LogicalElement class.

Properties

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

Table 3. IBMTSSVC_CandidateCluster properties

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

Table 3. IBMTSSVC_CandidateCluster properties (continued)

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

IBMTSSVC_CandidateNode

The IBMTSSVC_CandidateNode class extends the CIM_ComputerSystem class.

Properties

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

Table 4. IBMTSSVC_CandidateNode properties

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

Table 4. IBMTSSVC_CandidateNode properties (continued)

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

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 No Default</p> <p>8..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration that indicates if the element is currently shutting down (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 4. *IBMTSSVC_CandidateNode* properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.
InstallDate	Date-time		This property is not supported.
HardwareType	String	MaxLen(256)	The hardware type for this node.
Name	String	MaxLen(256)	The label by which the object is known. Format: cluster_ip:node_id.
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated, using a heuristic. The heuristic is outlined, in detail, in the CIM V2 System Model specification.

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>Indicates the current status(es) of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. Dedicated)	Describes how or why the system is dedicated when the Dedicated array includes the value 2, "Other".																																								
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	Describes the element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																								

Table 4. IBMTSSVC_CandidateNode properties (continued)

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

Table 4. IBMTSSVC_CandidateNode properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration that indicates if the element must be shut down (value = 4), enabled (2), disabled (3), taken offline (6) or tested (7) at the next opportunity.</p> <p>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</p>
ResetCapability	Uint16		<p>If enabled, the ComputerSystem can be reset through hardware (e.g. the power and reset buttons). If disabled, hardware reset is not allowed.</p> <p>Code Semantics 1 Other 2 Unknown 3 Disabled 4 Enabled 5 Not Implemented</p>
Roles	String[]	Write(TRUE)	This property is not supported.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem Element.OperationalStatus)	This property is deprecated in lieu of OperationalStatus.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").
TimeOfLastState Change	Date- time		This property is not supported.
UPSSerialNumber	String	MaxLen(256)	The serial number of the uninterruptible power supply for this node.

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Table 4. *IBMTSSVC_CandidateNode* properties (continued)

Property	Type	Qualifier	Description
UPSUniqueID	String	MaxLen(256)	The unique identifier of the uninterruptible power supply for this node.

IBMTSSVC_CandidateStorageHardwareID

The *IBMTSSVC_CandidateStorageHardwareID* extends the *CIM_LogicalElement* class.

Properties

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

Table 5. *IBMTSSVC_CandidateStorageHardwareID* properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.
InstallDate	Datetime		Indicates when the object was installed. A lack of a value does not indicate that the object is not installed.
Name	String	MaxLen(1024)	The label by which the object is known. When subclassed, the Name property can be overridden to be a key property.

Table 5. IBMTSSVC_CandidateStorageHardwareID properties (continued)

Property	Type	Qualifier	Description
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The current status of the element. Code Semantics 0 Unknown 1 Other 2 OK 3 Degraded 4 Stressed 5 Predictive Failure 6 Error 7 Non-Recoverable Error 8 Starting 9 Stopping 10 Stopped 11 In Service 12 No Contact 13 Lost Communication 14 Aborted 15 Dormant 16 Supporting Entity in Error 17 Completed 18 Power Mode .. DMTF Reserved 0x8000.. Vendor Reserved
Status	String	Deprecated (CIM_ManagedSystem Element.OperationalStatus), MaxLen(10)	The current status of the object.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	The various OperationalStatus array values.
StorageID	String	ModelCorrespondence (CIM_StorageHardware ID.IDType)	The unique ID of the candidate port.
SystemName	String		The IP address of the candidate HWID's cluster.

IBMTSSVC_CandidateVolume

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

Properties

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

Table 6. IBMTSSVC_CandidateVolume properties

Property	Type	Qualifier	Description																																								
AuxClusterID	String		The ID of this volume's cluster.																																								
Caption	String	MaxLen(64)	A short textual description (one-line string) of the object.																																								
Description	String		A textual description of the object.																																								
ElementName	String		A user-friendly name for the object.																																								
InstallDate	Datetime		Unsupported property.																																								
Name	String	MaxLen(1024)	The label by which the object is known.																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The current status of the element. Various health and operational statuses are defined.</p> <table border="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
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SourceVolumeID	String		The ID of the potential master StorageVolume.																																								
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	This property is deprecated in lieu of OperationalStatus.																																								

Table 6. IBMTSSVC_CandidateVolume properties (continued)

Property	Type	Qualifier	Description
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
SystemName	String		The IP address of the scoping cluster.

IBMTSSVC_Chassis

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

Properties

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

Table 7. IBMTSSVC_Chassis properties

Property	Type	Qualifier	Description
AudibleAlarm	Boolean		Indicates if the Frame is equipped with an audible alarm.
BreachDescription	String	ModelCorrespondence (CIM_PhysicalFrame. SecurityBreach)	Unsupported property.
CableManagementStrategy	String		Unsupported property.
CanBeFRUed	Boolean		Unsupported property.
Caption	String	MaxLen(64)	A short textual description (one-line String) of the object.

Table 7. IBMTSSVC_Chassis properties (continued)

Property	Type	Qualifier	Description																																																												
ChassisPackage Type	Uint16	Experimental(TRUE), ModelCorrespondence (CIM_Chassis.ChassisTypeDescription)	<p>The physical form factor for the type of Chassis.</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>SMBIOS</td></tr> <tr><td></td><td>Reserved</td></tr> <tr><td>3</td><td>Desktop</td></tr> <tr><td>4</td><td>Low Profile Desktop</td></tr> <tr><td>5</td><td>Pizza Box</td></tr> <tr><td>6</td><td>Mini Tower</td></tr> <tr><td>7</td><td>Tower</td></tr> <tr><td>8</td><td>Portable</td></tr> <tr><td>9</td><td>LapTop</td></tr> <tr><td>10</td><td>Notebook</td></tr> <tr><td>11</td><td>Hand Held</td></tr> <tr><td>12</td><td>Docking Station</td></tr> <tr><td>13</td><td>All in One</td></tr> <tr><td>14</td><td>Sub Notebook</td></tr> <tr><td>15</td><td>Space-Saving</td></tr> <tr><td>16</td><td>Lunch Box</td></tr> <tr><td>17</td><td>Main System Chassis</td></tr> <tr><td>18</td><td>Expansion Chassis</td></tr> <tr><td>19</td><td>SubChassis</td></tr> <tr><td>20</td><td>Bus Expansion Chassis</td></tr> <tr><td>21</td><td>Peripheral Chassis</td></tr> <tr><td>22</td><td>Storage Chassis</td></tr> <tr><td>23</td><td>SMBIOS Reseved</td></tr> <tr><td>24</td><td>Sealed-Case PC</td></tr> <tr><td>25</td><td>SMBIOS Reserved</td></tr> <tr><td>..</td><td>DMTF Reserved</td></tr> <tr><td>0x8000..0xFFFF</td><td>Vendor Reserved</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	SMBIOS		Reserved	3	Desktop	4	Low Profile Desktop	5	Pizza Box	6	Mini Tower	7	Tower	8	Portable	9	LapTop	10	Notebook	11	Hand Held	12	Docking Station	13	All in One	14	Sub Notebook	15	Space-Saving	16	Lunch Box	17	Main System Chassis	18	Expansion Chassis	19	SubChassis	20	Bus Expansion Chassis	21	Peripheral Chassis	22	Storage Chassis	23	SMBIOS Reseved	24	Sealed-Case PC	25	SMBIOS Reserved	..	DMTF Reserved	0x8000..0xFFFF	Vendor Reserved
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ChassisType Description	String	Experimental(TRUE), ModelCorrespondence (CIM_Chassis.ChassisPackageType)	Provides more information on the ChassisPackageType.																																																												

Table 7. IBMTSSVC_Chassis properties (continued)

Property	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 that indicates the type of Chassis. Code Semantics 1 Other 2 Unknown 3 Desktop 4 Low Profile Desktop 5 Pizza Box 6 Mini Tower 7 Tower 8 Portable 9 LapTop 10 Notebook 11 Hand Held 12 Docking Station 13 All in One 14 Sub-Notebook 15 Space-Saving 16 Lunch Box 17 Main System Chassis 18 Expansion Chassis 19 SubChassis 20 Bus Expansion Chassis 21 Peripheral Chassis 22 Storage Chassis 23 Rack Mount Chassis 24 Sealed-Case PC 25 Multi-system Chassis
CreationClassName	String	MaxLen(256)	The name of the class or subclass used in the creation of an instance. When used with the other key properties of this class, this allows all instances of this class and its subclasses to be uniquely identified.
CurrentRequired OrProduced	Uint16	Units(Amps at 120 Volts)	Unsupported property.
Depth	Real32	Units(Inches)	The depth of the PhysicalPackage in inches.
Description	String		A textual description of the object.

Table 7. IBMTSSVC_Chassis properties (continued)

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

Table 7. IBMTSSVC_Chassis properties (continued)

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

Table 7. IBMTSSVC_Chassis properties (continued)

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

Table 7. IBMTSSVC_Chassis properties (continued)

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

IBMTSSVC_Cluster

The IBMTSSVC_Cluster class represents a single SAN Volume Controller cluster.

Properties

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

Table 8. IBMTSSVC_Cluster properties

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

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the computer system is a special-purpose system (dedicated to a particular use), or a general purpose system. The SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server")</p> <p>Code Semantics</p> <p>0 Not Dedicated</p> <p>1 Unknown</p> <p>2 Other</p> <p>3 Storage</p> <p>4 Router</p> <p>5 Switch</p> <p>6 Layer 3 Switch</p> <p>7 Central Office Switch</p> <p>8 Hub</p> <p>9 Access Server</p> <p>10 Firewall</p> <p>11 Print</p> <p>12 I/O</p> <p>13 Web Caching</p> <p>14 Management</p> <p>15 Block Server</p> <p>16 File Server</p> <p>17 Mobile User Device</p> <p>18 Repeater</p> <p>19 Bridge/Extender</p> <p>20 Gateway</p>
Description	String		A textual description of the object.
DiscoveryStatus	Sint8		<p>The discovery status of the cluster. The following values are possible:</p> <p>Code Semantics</p> <p>-2 Not Supported</p> <p>-1 Unknown</p> <p>0 No Discovery In Progress</p> <p>1 Discovery In Progress</p>
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator), ReadRole(None)	The user-friendly name for the cluster.
EmailSetting	String	Expensive(TRUE)	The email setting.

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Table 8. IBMTSSVC_Cluster properties (continued)

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

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																				
FeatureIndex	Uint16		<p>The following values are possible:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Global Mirror</td> </tr> <tr> <td>2</td> <td>Cacheless VDisks</td> </tr> <tr> <td>3</td> <td>VDisk Unit Device ID</td> </tr> <tr> <td>4</td> <td>Host IOGroup Mapping</td> </tr> <tr> <td>5</td> <td>CIM User Auditing</td> </tr> <tr> <td>6</td> <td>LUN Discovery Status</td> </tr> <tr> <td>7</td> <td>Node Port Speed</td> </tr> <tr> <td>8</td> <td>Host Port Masking</td> </tr> <tr> <td>9</td> <td>Set Port Speed</td> </tr> </tbody> </table>	Code	Semantics	1	Global Mirror	2	Cacheless VDisks	3	VDisk Unit Device ID	4	Host IOGroup Mapping	5	CIM User Auditing	6	LUN Discovery Status	7	Node Port Speed	8	Host Port Masking	9	Set Port Speed
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GetFeatureSupportStatus	Uint32		<p>Indicates if a feature is supported by the firmware level that is running on the cluster. The following values are possible:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Supported</td> </tr> <tr> <td>1</td> <td>Unknown Feature</td> </tr> <tr> <td>2</td> <td>Unsupported</td> </tr> </tbody> </table>	Code	Semantics	0	Supported	1	Unknown Feature	2	Unsupported												
Code	Semantics																						
0	Supported																						
1	Unknown Feature																						
2	Unsupported																						
HardwareType	String		The hardware type for this node.																				
IdentifyingDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifying Info array. Each entry of this array is related to the entry in OtherIdentifying Info that is located at the same index.																				
InstallDate	Date-time		This property is not supported.																				
Interconnect	String		This property is not supported.																				
InterconnectAddress	String		This property is not supported.																				
Locale	String	Expensive(TRUE)	The current locale setting of the cluster.																				

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																																								
MaxNumberOfNodes	UInt32		The maximum number of nodes that may participate in the cluster. If unlimited, enter 0.																																								
Name	String	MaxLen(256), ReadRole(None)	The label by which the object is known. Format: cluster_ip:object_id																																								
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated. SAN Volume Controller returns the cluster's ID as Name, therefore this attribute is set to "Other."																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The cluster's operational status.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherDedicatedDescriptions	String[]	ModelCorrespondence (CIM_ComputerSystem.Dedicated), ArrayType(Indexed)	Describes how or why the system is dedicated when the Dedicated array includes the value 2, "Other."																																								
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to null when EnabledState is any value other than 1.																																								

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																		
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 storage pools in the cluster.																		
PowerManagement Capabilities	UInt16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	<p>An enumerated array that describes the power management capabilities of the computer system. The use of this property is deprecated. Instead, the Power Capabilities property in an associated PowerManagement Capabilities class must 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
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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),	This property is not supported.																		

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	An integer enumeration value. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
RequiredMemory	Uint32	Units(MegaBytes), Expensive(TRUE)	The amount of required memory for a cluster.
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)	This property is not supported.
SNMPCommunity	String	Expensive(TRUE)	The SNMP community.
SNMPServerIP	String	Expensive(TRUE)	The SNMP server IP address.
SNMPSetting	String	Expensive(TRUE)	The SNMP setting of the cluster.
StatisticsFrequency	Uint32	Units(Seconds), Expensive(TRUE)	The update interval for the cluster statistics.
StatisticsStatus	Boolean	Expensive(TRUE)	Indicates if statistics collection is active. When set to true, statistics collection is active.

Table 8. IBMTSSVC_Cluster properties (continued)

Property	Type	Qualifier	Description																
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	The status of the cluster. The status can be either "OK," "Key Refused," "Invalid Fingerprint," "Cluster Interface Not Available," "CLI Error rc," "Connection Lost," or "No Contact."																
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status - used when the OperationalStatus property is set to 1 ("Other").																
TimeOfLastStateChange	Date-time		This property is not supported.																
TimeZone	String	Expensive(TRUE)	The timezone setting of the cluster.																
Types	Uint16[]		<p>The cluster types. This specifies if the cluster is for failover (value=2), performance (3). The values which can be specified are not mutually exclusive. Thus, Types is an array.</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>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																		
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IBMTSSVC_Controller

The IBMTSSVC_Controller class extends the CIM_SCSIController class.

Properties

The IBMTSSVC_Controller class represents the logical SAN Volume Controller used for modeling the authorization path from host ports to storage volumes. The IBMTSSVC_Controller class has the properties shown in Table 9 on page 84.

Table 9. IBMTSSVC_Controller properties

Property	Type	Qualifier	Description																																												
AccessGranted	Boolean	ModelCorrespondence (CIM_Controller.AuthorizationView)	A quick interface for finding devices with no Authorization Subject association to an AccessControl Information instance; either directly, or through a controller. True indicates that the device has granted access to some consumer. False indicates that no access has been granted.																																												
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. <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
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Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description																																												
Availability	Uint16	Deprecated(CIM_Associated PowerManagementService. PowerState CIM_ManagedSystem Element.OperationalStatus CIM_EnabledLogical Element.EnabledStatus), ModelCorrespondence (CIM_LogicalDevice. AdditionalAvailability)	<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
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Caption	String	MaxLen(64)	Unsupported property.																																												
ConnectionRole	Uint16[]		<p>The role of the protocol controller in a connection. A protocol controller can have one or more of several roles in a connection. In certain applications, a controller can have both functions (providing and consuming the connection). For example, a HBA can be a 'client,' a front end controller on a RAID array can be a 'server,' and a SCSI Extended Copy controller can be both.</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>2</td><td>Server</td></tr> <tr><td>3</td><td>Client</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	2	Server	3	Client																																				
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2	Server																																														
3	Client																																														
Controlled	Boolean		Unsupported property.																																												

Table 9. IBMTSSVC_Controller properties (continued)

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

Table 9. IBMTSSVC_Controller properties (continued)

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

Table 9. IBMTSSVC_Controller properties (continued)

Property	Type	Qualifier	Description																																								
MaxUnits Controlled	Uint32		The maximum number of units that can be controlled by or accessed through this protocol controller.																																								
Name	String	MaxLen(1024)	The label by which the object is known. Format: RedundancyGroup_id: Host_id.																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>The current status of the element. This property always reports "Unknown."</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
Code	Semantics																																										
0	Unknown																																										
1	Other																																										
2	OK																																										
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4	Stressed																																										
5	Predictive Failure																																										
6	Error																																										
7	Non-Recoverable Error																																										
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9	Stopping																																										
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15	Dormant																																										
16	Supporting Entity in Error																																										
17	Completed																																										
18	Power Mode																																										
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																								
OtherIdentifying Info	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice. IdentifyingDescriptions)	Captures additional data, beyond DeviceID information, that can be used to identify a LogicalDevice.																																								

Table 9. IBMTSSVC_Controller properties (continued)

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

Table 9. IBMTSSVC_Controller properties (continued)

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

IBMTSSVC_ControllerConfigurationService

The IBMTSSVC_ControllerConfigurationService class extends the CIM_ControllerConfigurationService.

Properties

The IBMTSSVC_ControllerConfigurationService class has the properties shown in Table 10.

Table 10. IBMTSSVC_ControllerConfigurationService properties

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

Table 10. IBMTSSVC_ControllerConfigurationService properties (continued)

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

Table 10. IBMTSSVC_ControllerConfigurationService properties (continued)

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

Table 10. IBMTSSVC_ControllerConfigurationService properties (continued)

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

IBMTSSVC_ControllerMaskingCapabilities

The IBMTSSVC_ControllerMaskingCapabilities class extends the CIM_ProtocolControllerMaskingCapabilities class.

Properties

The IBMTSSVC_ControllerMaskingCapabilities class has the properties shown in Table 11.

Table 11. IBMTSSVC_ControllerMaskingCapabilities properties

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

Table 11. IBMTSSVC_ControllerMaskingCapabilities properties (continued)

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

Table 11. IBMTSSVC_ControllerMaskingCapabilities properties (continued)

Property	Type	Qualifier	Description										
ValidHardwareIdTypes	Uint16[]	ArrayType(Indexed)	<p>A list of the valid values for StorageHardwareID.IDType.</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>Port WWN</td> </tr> <tr> <td>3</td> <td>Node WWN</td> </tr> <tr> <td>4</td> <td>Host Name</td> </tr> </tbody> </table>	Code	Semantics	1	Other	2	Port WWN	3	Node WWN	4	Host Name
Code	Semantics												
1	Other												
2	Port WWN												
3	Node WWN												
4	Host Name												

IBMTSSVC_Dumps

The IBMTSSVC_Dumps class extends the CIM_SettingData class.

Properties

The IBMTSSVC_Dumps class has the properties shown in Table 12.

Table 12. IBMTSSVC_Dumps properties

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

Table 12. IBMTSSVC_Dumps properties (continued)

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

IBMTSSVC_FabricElement

The IBMTSSVC_FabricElement class represents an element that is present on the fibre-channel fabric.

Properties

The IBMTSSVC_FabricElement class has the properties shown in Table 13.

Table 13. IBMTSSVC_FabricElement properties

Property	Type	Qualifier	Description
ClusterName	String	Key, MaxLen(256)	The cluster name for the element.
ID	String	Key, MaxLen(256)	The ID of the element.
LocalNPortID	String	Key, MaxLen(256)	The local nPort ID of the element.
LocalPort	String	Key, MaxLen(256)	The local port of the element.
LocalWWPN	String	Key, MaxLen(256)	The local worldwide port number of the element.
Name	String	Key, MaxLen(256)	The name of the element.
NodeName	String	Key, MaxLen(256)	The node name for the element.

Table 13. IBMTSSVC_FabricElement properties (continued)

Property	Type	Qualifier	Description
RemoteNPortID	String	Key, MaxLen(256)	The remote nPort ID of the element.
RemoteWWPN	String	Key, MaxLen(256)	The remote worldwide port number of the element.
State	String	Key, MaxLen(256)	The state of the element.
SystemName	String	Key, MaxLen(256)	The unique handle for the element.
Type	String	Key, MaxLen(256)	The type of element.

IBMTSSVC_FCPort

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

Properties

Generally, all fibre-channel ports of a SAN Volume Controller pair are connected to the same devices. The IBMTSSVC_FCPort class extends the CIM_FCPort class and has the properties shown in Table 14.

Table 14. IBMTSSVC_FCPort properties

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

Table 14. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																																						
ActiveFC4Types	Uint16[]	ModelCorrespondence (CIM_FCPort.Supported FC4Types)	<p>An array of integers that indicates the Fibre Channel FC-4 protocols currently running. A list of all protocols supported is indicated in the Supported FC4Types property.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>4</td> <td>ISO/IEC 8802 - 2 LLC</td> </tr> <tr> <td>5</td> <td>IP over FC</td> </tr> <tr> <td>8</td> <td>SCSI - FCP</td> </tr> <tr> <td>9</td> <td>SCSI - GPP</td> </tr> <tr> <td>17</td> <td>IPI - 3 Master</td> </tr> <tr> <td>18</td> <td>IPI - 3 Slave</td> </tr> <tr> <td>19</td> <td>IPI - 3 Peer</td> </tr> <tr> <td>21</td> <td>CP IPI - 3 Master</td> </tr> <tr> <td>22</td> <td>CP IPI - 3 Slave</td> </tr> <tr> <td>23</td> <td>CP IPI - 3 Peer</td> </tr> <tr> <td>25</td> <td>SBCCS Channel</td> </tr> <tr> <td>26</td> <td>SBCCS Control Unit</td> </tr> <tr> <td>27</td> <td>FC-SB-2 Channel</td> </tr> <tr> <td>28</td> <td>FC-SB-2 Control Unit</td> </tr> <tr> <td>32</td> <td>Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)</td> </tr> <tr> <td>34</td> <td>FC-SW</td> </tr> <tr> <td>36</td> <td>FC - SNMP</td> </tr> <tr> <td>64</td> <td>HIPPI - FP</td> </tr> <tr> <td>80</td> <td>BBL Control</td> </tr> <tr> <td>81</td> <td>BBL FDDI Encapsulated LAN PDU</td> </tr> <tr> <td>82</td> <td>BBL 802.3 Encapsulated LAN PDU</td> </tr> <tr> <td>88</td> <td>FC - VI</td> </tr> <tr> <td>96</td> <td>FC - AV</td> </tr> <tr> <td>255</td> <td>Vendor Unique</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	4	ISO/IEC 8802 - 2 LLC	5	IP over FC	8	SCSI - FCP	9	SCSI - GPP	17	IPI - 3 Master	18	IPI - 3 Slave	19	IPI - 3 Peer	21	CP IPI - 3 Master	22	CP IPI - 3 Slave	23	CP IPI - 3 Peer	25	SBCCS Channel	26	SBCCS Control Unit	27	FC-SB-2 Channel	28	FC-SB-2 Control Unit	32	Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)	34	FC-SW	36	FC - SNMP	64	HIPPI - FP	80	BBL Control	81	BBL FDDI Encapsulated LAN PDU	82	BBL 802.3 Encapsulated LAN PDU	88	FC - VI	96	FC - AV	255	Vendor Unique
Code	Semantics																																																								
0	Unknown																																																								
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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																																																								
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88	FC - VI																																																								
96	FC - AV																																																								
255	Vendor Unique																																																								
ActiveMaximumTransmissionUnit	Uint64	Units(Bytes),	This property is not supported.																																																						

Table 14. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Additional Availability	Uint16[]	Deprecated (CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState), ModelCorrespondence (CIM_LogicalDevice.Availability)	Additional availability and status of the device, beyond that specified in the Availability property. The SAN Volume Controller always reports this property as "Unknown."
AutoSense	Boolean		Indicates if the NetworkPort is capable of automatically determining the speed or other communications characteristics of the attached network media.
Availability	Uint16	Deprecated (CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState) ModelCorrespondence (CIM_LogicalDevice.AdditionalAvailability)	The primary availability and status of the device. The SAN Volume Controller always reports this property as "Unknown."
Caption	String	MaxLen(64)	This property is not supported.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
DeviceID	String	MaxLen(64), Expensive(TRUE)	An address or other identifying information to uniquely name the LogicalDevice.
ElementName	String		This property is not supported.

Table 14. IBMTSSVC_FCPort properties (continued)

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

Table 14. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifying Info array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.
InstallDate	Datetime		This property is not supported.
LastErrorCode	UInt32	Deprecated (CIM_DeviceErrorData.LastErrorCode)	This property is not supported.
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)	This property is not supported.
MaxSpeed	UInt64	Units(Bits per Second)	The maximum speed of the port in bits per second.
Name	String	MaxLen(1024)	This property is not supported.
NetworkAddresses	String[]	MaxLen(64)	This property is not supported.

Table 14. IBMTSSVC_FCPort properties (continued)

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

Table 14. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																										
PortNumber	Uint16	Expensive(TRUE)	NetworkPorts are often numbered relative to either a logical module or a network element.																										
PortType	Uint16	ModelCorrespondence (CIM_NetworkPort. OtherNetworkPortType)	<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
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16000..65535	Vendor Reserved																												
Power Management Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.Power Capabilities)	<p>The power management capabilities of the device. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated Power Management Capabilities class must be used.</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								
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Table 14. IBMTSSVC_FCPort properties (continued)

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

Table 14. IBMTSSVC_FCPort properties (continued)

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

Table 14. IBMTSSVC_FCPort properties (continued)

Property	Type	Qualifier	Description																																																						
SupportedFC4Types	Uint16[]		<p>An array of integers that indicates the Fibre Channel FC-4 protocols that are supported. The protocols that are active and running are indicated in the ActiveFC4 Types property.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>Other</td> </tr> <tr> <td>4</td> <td>ISO/IEC 8802 - 2 LLC</td> </tr> <tr> <td>5</td> <td>IP over FC</td> </tr> <tr> <td>8</td> <td>SCSI - FCP</td> </tr> <tr> <td>9</td> <td>SCSI - GPP</td> </tr> <tr> <td>17</td> <td>IPI - 3 Master</td> </tr> <tr> <td>18</td> <td>IPI - 3 Slave</td> </tr> <tr> <td>19</td> <td>IPI - 3 Peer</td> </tr> <tr> <td>21</td> <td>CP IPI - 3 Master</td> </tr> <tr> <td>22</td> <td>CP IPI - 3 Slave</td> </tr> <tr> <td>23</td> <td>CP IPI - 3 Peer</td> </tr> <tr> <td>25</td> <td>SBCCS Channel</td> </tr> <tr> <td>26</td> <td>SBCCS Control Unit</td> </tr> <tr> <td>27</td> <td>FC-SB-2 Channel</td> </tr> <tr> <td>28</td> <td>FC-SB-2 Control Unit</td> </tr> <tr> <td>32</td> <td>Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)</td> </tr> <tr> <td>34</td> <td>FC-SW</td> </tr> <tr> <td>36</td> <td>FC - SNMP</td> </tr> <tr> <td>64</td> <td>HIPPI - FP</td> </tr> <tr> <td>80</td> <td>BBL Control</td> </tr> <tr> <td>81</td> <td>BBL FDDI Encapsulated LAN PDU</td> </tr> <tr> <td>82</td> <td>BBL 802.3 Encapsulated LAN PDU</td> </tr> <tr> <td>88</td> <td>FC - VI</td> </tr> <tr> <td>96</td> <td>FC - AV</td> </tr> <tr> <td>255</td> <td>Vendor Unique</td> </tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	4	ISO/IEC 8802 - 2 LLC	5	IP over FC	8	SCSI - FCP	9	SCSI - GPP	17	IPI - 3 Master	18	IPI - 3 Slave	19	IPI - 3 Peer	21	CP IPI - 3 Master	22	CP IPI - 3 Slave	23	CP IPI - 3 Peer	25	SBCCS Channel	26	SBCCS Control Unit	27	FC-SB-2 Channel	28	FC-SB-2 Control Unit	32	Fibre Channel Services (FC-GS, FC-GS-2, FC-GS-3)	34	FC-SW	36	FC - SNMP	64	HIPPI - FP	80	BBL Control	81	BBL FDDI Encapsulated LAN PDU	82	BBL 802.3 Encapsulated LAN PDU	88	FC - VI	96	FC - AV	255	Vendor Unique
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255	Vendor Unique																																																								
SupportedMaximumTransmissionUnit	Uint64	Units(Bytes)	This property is not supported.																																																						
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's CreationClass Name.																																																						

Table 14. IBMTSSVC_FCPort properties (continued)

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

IBMTSSVC_Features

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

Properties

The IBMTSSVC_Features instance corresponds with the associated IBMTSSVC_Cluster instance. The IBMTSSVC_Features class extends the CIM_Capabilities class and has the properties shown in Table 15.

Table 15. IBMTSSVC_Features properties

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

Table 15. IBMTSSVC_Features properties (continued)

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

IBMTSSVC_FlashCopyJob

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

Properties

A job instance is used to monitor asynchronous Flash Copy operations on the device. The IBMTSSVC_FlashCopyJob class has the properties shown in Table 16.

Table 16. IBMTSSVC_FlashCopyJob properties

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

Table 16. IBMTSSVC_FlashCopyJob properties (continued)

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

Table 16. IBMTSSVC_FlashCopyJob properties (continued)

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

Table 16. IBMTSSVC_FlashCopyJob properties (continued)

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

Table 16. IBMTSSVC_FlashCopyJob properties (continued)

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

IBMTSSVC_FlashCopySynchronizedSet

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

Properties

The IBMTSSVC_FlashCopySynchronizedSet class extends the CIM_SynchronizedSet class and has the properties shown in Table 17.

Table 17. IBMTSSVC_FlashCopySynchronizedSet properties

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

Table 17. IBMTSSVC_FlashCopySynchronizedSet properties (continued)

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

IBMTSSVC_FormatVolumeJob

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

Properties

A job instance is used to monitor asynchronous format volume operations on the device. The IBMTSSVC_FormatVolumeJob class has the properties shown in Table 18.

Table 18. IBMTSSVC_FormatVolumeJob properties

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

Table 18. IBMTSSVC_FormatVolumeJob properties (continued)

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

Table 18. IBMTSSVC_FormatVolumeJob properties (continued)

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

Table 18. IBMTSSVC_FormatVolumeJob properties (continued)

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

IBMTSSVC_HardwareIdCollection

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

Properties

The IBMTSSVC_HardwareIdCollection class extends the CIM_SystemSpecificCollection class and has the properties shown in Table 19.

Table 19. IBMTSSVC_HardwareIdCollection properties

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

Table 19. IBMTSSVC_HardwareIdCollection properties (continued)

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

Table 19. IBMTSSVC_HardwareIdCollection properties (continued)

Property	Type	Qualifier	Description
PortLoginMask	String	Expensive(TRUE), Write(TRUE), WriteRole(Administrator)	The 4-character port login mask for the host. Valid mask values range from 0000 (no ports enabled) to 1111 (all ports enabled). For example, a mask of 0011 enables port 1 and port 2. The default value is 1111 (all ports enabled).
PortWWN	String[]	Expensive(TRUE)	The fibre-channel ports that are registered for this host.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to "Other."

IBMTSSVC_HardwareIdCollectionStorageVolumeView

The IBMTSSVC_HardwareIdCollectionStorageVolumeView class represents a host-to-VDisk mapping.

Properties

The IBMTSSVC_HardwareIdCollectionStorageVolumeView class has the properties shown in Table 20.

Table 20. IBMTSSVC_HardwareIdCollectionStorageVolumeView properties

Property	Type	Qualifier	Description
SystemName	String	Key, MaxLen(256)	The system scoping identifier.
CollectionOID	String	Key, MaxLen(256)	The HardwareIdCollection (host) object ID.
CollectionName	String	Key, MaxLen(256)	The HardwareIdCollection (host) object name.
CollectionScsilID	String	Key, MaxLen(256)	The HardwareIdCollection (host) object SCSI ID.
VolumeOID	String	Key, MaxLen(256)	The StorageVolume (VDisk) object ID.
VolumeName	String	Key, MaxLen(256)	The StorageVolume (VDisk) object name.
VolumeWWPN	String	Key, MaxLen(256)	The StorageVolume (VDisk) worldwide port name (WWPN).
VolumeUniqueID	String	Key, MaxLen(256)	The StorageVolume (VDisk) unique identifier.

IBMTSSVC_IOGroup

The IBMTSSVC_IOGroup class extends the CIM_ComputerSystem class.

Properties

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

The IBMTSSVC_IOGroup class extends the CIM_ComputerSystem class and has the properties shown in Table 21.

Table 21. IBMTSSVC_IOGroup properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short textual description (one-line string) of the object.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass that is 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 21. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the computer system is a special-purpose system (dedicated to a particular use) or a general purpose system. The SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server").</p> <table border="0"> <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
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20	Gateway																																														
Description	String		A textual description of the object.																																												
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The group's user-friendly name.																																												

Table 21. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default and 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</p> <p> DMTF Reserved</p> <p>32768..65535</p> <p> Vendor Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration that indicates if the element is currently shutting down 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</p> <p> DMTF Reserved</p> <p>32768..65535</p> <p> Vendor Reserved</p>
NumberOfHosts	Uint32		The number of hosts that are associated with this I/O group.
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array.

Table 21. IBMTSSVC_IOGroup properties (continued)

Property	Type	Qualifier	Description																																								
InstallDate	Datetime		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 name of the computer system 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 disks that are offered by the group.																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	<p>No status information is available at the group level. Look for the individual nodes' status.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.Dedicated)	Describes how or why the system is dedicated when the Dedicated array includes the value 2 ("Other").																																								

Table 21. IBMTSSVC_IOGroup properties (continued)

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

Table 21. IBMTSSVC_IOGroup properties (continued)

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

Table 21. IBMTSSVC_IOGroup properties (continued)

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

IBMTSSVC_IOGroupSet

The IBMTSSVC_IOGroup class extends the CIM_ExtraCapacitySet class.

Properties

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

The IBMTSSVC_IOGroupSet class extends the CIM_ExtraCapacitySet class and has the properties shown in Table 22.

Table 22. IBMTSSVC_IOGroupSet properties

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

Table 22. IBMTSSVC_IOGroupSet properties (continued)

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

IBMTSSVC_Job

The IBMTSSVC_Job class extends the CIM_ConcreteJob class.

Properties

The IBMTSSVC_Job class is used to monitor the asynchronous commands for format, migration, or copy operations on the device. The IBMTSSVC_Job class has the properties shown in Table 23.

Table 23. IBMTSSVC_Job properties

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

Table 23. IBMTSSVC_Job properties (continued)

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

Table 23. IBMTSSVC_Job properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	UInt16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.StatusDescriptions)	<p>The current status of the element. Various health and operational statuses are defined. Many of the enumeration's values are self-explanatory.</p> <table border="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
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17	Completed																																										
18	Power Mode																																										
OtherRecoveryAction	String	ModelCorrespondence (CIM_Job.RecoveryAction)	The recovery action when the instance's RecoveryAction property is set to "Other."																																								
Owner	String	ModelCorrespondence (CIM_OwningJobElement)	Unsupported property.																																								
PercentComplete	UInt16	MaxValue(101), MinValue(0), Units(Percent)	The percentage of the job that is complete at the time of the request.																																								
Priority	UInt32	Write(TRUE)	Unsupported property.																																								

Table 23. IBMTSSVC_Job properties (continued)

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

Table 23. IBMTSSVC_Job properties (continued)

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

IBMTSSVC_MessageLog

The IBMTSSVC_MessageLog class extends the CIM_MessageLog class.

Properties

The IBMTSSVC_MessageLog class is The IBMTSSVC_MessageLog class extends the CIM_MessageLog class and has the properties shown in Table 24 on page 133

Table 24. IBMTSSVC_MessageLog properties

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

Table 24. IBMTSSVC_MessageLog properties (continued)

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

Table 24. IBMTSSVC_MessageLog properties (continued)

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

Table 24. IBMTSSVC_MessageLog properties (continued)

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

Table 24. IBMTSSVC_MessageLog properties (continued)

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

Property	Type	Qualifier	Description																		
OverwritePolicy	Uint16	ModelCorrespondence (CIM_MessageLog.OtherPolicyDescription CIM_MessageLog.TimeWhen Outdated CIM_MessageLog.PercentageNearFull)	<p>An enumeration that describes the behavior of the log when it becomes full or near full.</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>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> </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.'																		
RecordHeader Format	String		If the SizeOfRecordHeader property is non-zero, this property describes the structure and format of the record headers. It is a free-form string. If the SizeOfRecordHeader property is 0, then the information in this property is undefined.																		
RecordLast Changed	Uint64		When a change is made to the log, the record number that was modified is captured.																		

Table 24. IBMTSSVC_MessageLog properties (continued)

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

Table 24. IBMTSSVC_MessageLog properties (continued)

Property	Type	Qualifier	Description
TimeOfLastChange	Datetime		When a change is made to the log, the date/time of that modification is captured. This property can be used to event against any update to the MessageLog.
TimeOfLastState Change	Datetime		This property is not supported.
TimeWhenOutdated	Datetime	ModelCorrespondence (CIM_MessageLog. OverwritePolicy)	If the OverwritePolicy is based on 'outdated' records (values 4 or 5), this property defines when a log entry is considered to be outdated, either by time interval or at a specific date and time.

IBMTSSVC_MigrateVolumeJob

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

Properties

A job instance is used to monitor asynchronous volume migration operations on the device. The IBMTSSVC_MigrateVolumeJob class has the properties shown in Table 25.

Table 25. IBMTSSVC_MigrateVolumeJob properties

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

Table 25. IBMTSSVC_MigrateVolumeJob properties (continued)

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

Table 25. IBMTSSVC_MigrateVolumeJob properties (continued)

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

Table 25. IBMTSSVC_MigrateVolumeJob properties (continued)

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

Table 25. IBMTSSVC_MigrateVolumeJob properties (continued)

Property	Type	Qualifier	Description																										
RunMonth	UInt8	Write(TRUE), Model Correspondence (CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)	<table border="0"> <tr> <td>Code</td> <td>Semantics</td> </tr> <tr> <td>0</td> <td>January</td> </tr> <tr> <td>1</td> <td>February</td> </tr> <tr> <td>2</td> <td>March</td> </tr> <tr> <td>3</td> <td>April</td> </tr> <tr> <td>4</td> <td>May</td> </tr> <tr> <td>5</td> <td>June</td> </tr> <tr> <td>6</td> <td>July</td> </tr> <tr> <td>7</td> <td>August</td> </tr> <tr> <td>8</td> <td>September</td> </tr> <tr> <td>9</td> <td>October</td> </tr> <tr> <td>10</td> <td>November</td> </tr> <tr> <td>11</td> <td>December</td> </tr> </table>	Code	Semantics	0	January	1	February	2	March	3	April	4	May	5	June	6	July	7	August	8	September	9	October	10	November	11	December
Code	Semantics																												
0	January																												
1	February																												
2	March																												
3	April																												
4	May																												
5	June																												
6	July																												
7	August																												
8	September																												
9	October																												
10	November																												
11	December																												
RunStartInterval	Datetime	Write(TRUE), Model Correspondence (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval)																											
ScheduledStartTime	Datetime	Deprecated (CIM_Job.RunMonth CIM_Job.RunDay CIM_Job.RunDay OfWeek CIM_Job.RunStart Interval), Write(TRUE),	Unsupported property.																										
SourceMDisk	String		The ID of the source BackendVolume.																										
SourceMDiskgrp	String		The ID of the source StoragePool.																										
SourceVDisk	String		The ID of the source StorageVolume.																										
StartTime	Datetime		Unsupported property.																										
Status	String	MaxLen(10), Deprecated(CIM_ ManagedSystem Element)	This property is deprecated in lieu of OperationalStatus.																										
StatusDescriptions	String[]	ArrayType(Indexed), Model Correspondence (CIM_Managed SystemElement)	Describes the status. Use this property when the OperationalStatus property is set to 1 ("Other").																										
TargetMDisk	String		The ID of the target BackendVolume.																										
TargetMDiskgrp	String		The ID of the target Storagepool.																										
TargetVDisk	String		The ID of the target StorageVolume.																										

Table 25. IBMTSSVC_MigrateVolumeJob properties (continued)

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

IBMTSSVC_Node

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

Properties

A cluster can contain up to eight nodes or four node pairs. The IBMTSSVC_Node class extends the CIM_ComputerSystem class and has the properties shown in Table 26.

Table 26. IBMTSSVC_Node properties

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

Table 26. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description																																												
Dedicated	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. OtherDedicatedDescriptions)	<p>An enumeration that indicates if the ComputerSystem is a special-purpose system (dedicated to a particular use) or a general purpose system. The SAN Volume Controller is a dedicated storage device and will return {3,15} ("Storage," "Block Server"). The following values are possible:</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		A textual description of the object.																																												
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The node's user-friendly name																																												

Table 26. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's EnabledStatus. By default, the element is "Enabled" (value=2).</p> <p>Code Semantics</p> <p>2 Enabled</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</p> <p>Reserved</p> <p>32768..65535</p> <p>Vendor</p> <p>Reserved</p>
EnabledState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.OtherEnabledState)	<p>An integer enumeration indicator.</p> <p>Code Semantics</p> <p>0 Unknown</p> <p>1 Other</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shutting Down</p> <p>5 Not Applicable</p> <p>6 Enabled but Offline</p> <p>7 In Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10 Starting</p> <p>11..32767</p> <p>DMTF</p> <p>Reserved</p> <p>32768..65535</p> <p>Vendor</p> <p>Reserved</p>
HardwareType	String	MaxLen(256)	The hardware type for this node.

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Table 26. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description														
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem.OtherIdentifyingInfo)	An array of free-form strings that provide explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.														
InstallDate	Datetime		This property is not supported.														
IsConfigNode	Boolean		Indicates if this node is the config node of its cluster. When true, the node is the config node of its cluster.														
Name	String	MaxLen(256)	The label by which the object is known. Format: cluster_ip:object_id														
NameFormat	String	MaxLen(64)	Identifies how the ComputerSystem Name is generated. The SAN Volume Controller returns the node's id as Name, therefore this attribute is set to "Other."														
NativeStatus	Uint16		The native operational status for the node. The following values are possible: <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>Pending</td> </tr> <tr> <td>3</td> <td>Adding</td> </tr> <tr> <td>4</td> <td>Deleting</td> </tr> <tr> <td>5</td> <td>Flushing</td> </tr> </tbody> </table>	Code	Semantics	0	Offline	1	Online	2	Pending	3	Adding	4	Deleting	5	Flushing
Code	Semantics																
0	Offline																
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Table 26. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description																																										
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem Element.StatusDescriptions)	The operational status of the node. The following values are possible: <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>19</td><td>Flushing</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	19	Flushing
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17	Completed																																												
18	Power Mode																																												
19	Flushing																																												
OtherDedicated Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. Dedicated)	Describes how or why the system is dedicated when the Dedicated array includes the value 2, ("Other").																																										
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	The element's enabled/disabled state when the EnabledState property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledState is any value other than 1.																																										
OtherIdentifyingInfo	String[]	MaxLen(256), ArrayType(Indexed), ModelCorrespondence (CIM_ComputerSystem. IdentifyingDescriptions), Expensive(TRUE)	The node's "Redundancy Group ID," "RedundancyGroup Name," "Partner Node Name," "Partner Node ID" and "WWWN."																																										
PortSpeeds	String[]		The speed of each node port.																																										

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Table 26. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
PowerManagement Capabilities	Uint16[]	Deprecated (CIM_PowerManagement Capabilities.PowerCapabilities)	<p>An enumerated array that describes the power management capabilities of the ComputerSystem. The use of this property is deprecated. Instead, the PowerCapabilites property in an associated PowerManagement Capabilities class must be used.</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>
PrimaryOwner Contact	String	MaxLen(256), Write(TRUE),	This property is not supported.
PrimaryOwner Name	String	MaxLen(64), Write(TRUE),	This property is not supported.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogical Element.EnabledState)	<p>An integer enumeration indicator. The SAN Volume Controller does not evaluate this attribute so no action is taken when it is changed.</p> <p>Code Semantics</p> <p>2 Enabled</p> <p>3 Disabled</p> <p>4 Shut Down</p> <p>5 No Change</p> <p>6 Offline</p> <p>7 Test</p> <p>8 Deferred</p> <p>9 Quiesce</p> <p>10..32767 DMTF Reserved</p> <p>32768..65535 Vendor Reserved</p>

Table 26. IBMTSSVC_Node properties (continued)

Property	Type	Qualifier	Description
ResetCapability	Uint16		If enabled (value = 4), the ComputerSystem can be reset through hardware (the power and reset buttons). If disabled (value = 3), hardware reset is not allowed. Code Semantics 1 Other 2 Unknown 3 Disabled 4 Enabled 5 Not Implemented
Roles	String[]	Write(TRUE)	This property is not supported.
Status	String	MaxLen(10), Deprecated(CIM_ManagedSystemElement. OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement. OperationalStatus)	Describes the status. Use when the OperationalStatus property is set to 1 ("Other").
TimeOfLastStateChange	Datetime		This property is not supported.
UPSSerialNumber	String	MaxLen(256)	The serial number of the uninterruptible power supply for this node.
UPSUniqueID	String	MaxLen(256)	The unique identifier of the uninterruptible power supply for this node.

IBMTSSVC_NodeVPD

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

Properties

The IBMTSSVC_NodeVPD class extends the CIM_SettingData class and has the properties shown in Table 27.

Table 27. IBMTSSVC_NodeVPD properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	This property is not supported.
Description	String		A textual description of the object.

Table 27. IBMTSSVC_NodeVPD properties (continued)

Property	Type	Qualifier	Description
ElementName	String	Required(TRUE)	This property is not supported.
EthernetIP	String		The ethernet IP of the node.
FrontPanelID	String		The front panel ID of the node.
InstanceID	String	Key	Opaquely identifies a unique instance of SettingData. The InstanceID property <i>must</i> be unique within a namespace. To ensure this, the value of the InstanceID property must be constructed in the following manner: (Vendor ID)(ID).
NodeVPD	String[]		The MAC address of the node.

IBMTSSVC_PrimordialStoragePool

The IBMTSSVC_PrimordialStoragePool class extends the CIM_StoragePool class.

Properties

The IBMTSSVC_PrimordialStoragePool class has the properties shown in Table 28.

Table 28. IBMTSSVC_PrimordialStoragePool properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(15)	A short textual description (one-line string) of the object.
Description	String		A textual description of the object.
ElementName	String	MaxLen(15)	The pool's user-friendly name.
InstallDate	Datetime		Unsupported property.
InstanceID	String		The label by which the object is known. Format: cluster_ip:P:object_id
Name	String	MaxLen(1024)	The pool's globally unique id. The ID format is (Vendor)(id), in case of SAN Volume Controller IBMTSSVC(id).

Table 28. IBMTSSVC_PrimordialStoragePool properties (continued)

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

Table 28. IBMTSSVC_PrimordialStoragePool properties (continued)

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

IBMTSSVC_Privilege

IBMTSSVC_Privilege class extends the CIM_AuthorizedPrivilege class.

Properties

The IBMTSSVC_Privilege class has the properties shown in Table 29.

Table 29. IBMTSSVC_Privilege properties

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

Table 29. IBMTSSVC_Privilege properties (continued)

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

IBMTSSVC_Product

The IBMTSSVC_Product class extends the CIM_Product class.

Properties

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

The IBMTSSVC_Product class has the properties shown in Table 30.

Table 30. IBMTSSVC_Product properties

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

Table 30. IBMTSSVC_Product properties (continued)

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

IBMTSSVC_Provider

The IBMTSSVC_Provider class extends the CIM_Provider class.

Properties

The IBMTSSVC_Provider class has the properties shown in Table 31.

Table 31. IBMTSSVC_Provider properties

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

Table 31. IBMTSSVC_Provider properties (continued)

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

Table 31. IBMTSSVC_Provider properties (continued)

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

Table 31. IBMTSSVC_Provider properties (continued)

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

IBMTSSVC_RegisteredProfile

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

Properties

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

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

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

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

The IBMTSSVC_RegisteredProfile class extends the CIM_RegisteredProfile class and has the properties shown in Table 32.

Table 32. IBMTSSVC_RegisteredProfile properties

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

Table 32. IBMTSSVC_RegisteredProfile properties (continued)

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

Table 32. IBMTSSVC_RegisteredProfile properties (continued)

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

IBMTSSVC_RegisteredSubProfile

The IBMTSSVC_RegisteredProfile class extends the CIM_RegisteredSubProfile class.

Properties

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

The IBMTSSVC_RegisteredProfile class has the properties shown in Table 33.

Table 33. IBMTSSVC_RegisteredSubProfile properties

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

Table 33. IBMTSSVC_RegisteredSubProfile properties (continued)

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

Table 33. IBMTSSVC_RegisteredSubProfile properties (continued)

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

IBMTSSVC_RemoteCluster

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

Properties

The IBMTSSVC_RemoteCluster class extends the IBMTSSVC_AbstractCluster class and has the properties shown in Table 34:

Table 34. IBMTSSVC_RemoteCluster properties

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

Table 34. IBMTSSVC_RemoteCluster properties (continued)

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

Table 34. IBMTSSVC_RemoteCluster properties (continued)

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

IBMTSSVC_RemoteServiceAccessPoint

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

Properties

The IBMTSSVC_RemoteServiceAccessPoint class extends the CIM_RemoteServiceAccessPoint class and has the properties shown in Table 35.

Table 35. IBMTSSVC_RemoteServiceAccessPoint properties

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

Table 35. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

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

Table 35. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

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

Table 35. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

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

Table 35. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

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

Table 35. IBMTSSVC_RemoteServiceAccessPoint properties (continued)

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

IBMTSSVC_RemoteVolume

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

Properties

The IBMTSSVC_RemoteVolume class extends the CIM_LogicalElement class and has the properties shown in Table 36.

Table 36. IBMTSSVC_RemoteVolume properties

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

Table 36. IBMTSSVC_RemoteVolume properties (continued)

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

IBMTSSVC_StorageCapabilities

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

Properties

For example, an instance of StorageCapabilities could be associated with either a StorageConfigurationService or StoragePool by using ElementCapabilities. The IBMTSSVC_StorageCapabilities class extends the CIM_StorageCapabilities class and has the properties shown in Table 37 on page 176.

Table 37. IBMTSSVC_StorageCapabilities properties

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

Table 37. IBMTSSVC_StorageCapabilities properties (continued)

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

Table 37. IBMTSSVC_StorageCapabilities properties (continued)

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

IBMTSSVC_StorageConfigurationCapabilities

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

Properties

An instance of StorageConfigurationCapabilities is associated with a StorageConfigurationService using ElementCapabilities. The IBMTSSVC_StorageConfigurationCapabilities class extends the CIM_StorageConfigurationCapabilities class and has the properties shown in Table 38.

Table 38. IBMTSSVC_StorageConfigurationCapabilities properties

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

Table 38. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

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

Table 38. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

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

Table 38. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

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

Table 38. IBMTSSVC_StorageConfigurationCapabilities properties (continued)

Property	Type	Qualifier	Description																				
Supported Synchronous Actions	Uint16[]	ModelCorrespondence (CIM_StorageConfiguration Capabilities.Supported AsynchronousActions)	<p>An enumeration that indicates what operations are run without the creation of a job. If an operation is included in both this and Supported Asynchronous Actions, then the underlying implementation is indicating that it may or may not create a job.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Storage Pool Creation</td> </tr> <tr> <td>3</td> <td>Storage Pool Deletion</td> </tr> <tr> <td>4</td> <td>Storage Pool Modification</td> </tr> <tr> <td>5</td> <td>Storage Element Creation</td> </tr> <tr> <td>6</td> <td>Storage Element Return</td> </tr> <tr> <td>7</td> <td>Storage Element Modification</td> </tr> <tr> <td>8</td> <td>Replica Creation</td> </tr> <tr> <td>9</td> <td>Replica Modification</td> </tr> <tr> <td>10</td> <td>Replica Attachment</td> </tr> </tbody> </table>	Code	Semantics	2	Storage Pool Creation	3	Storage Pool Deletion	4	Storage Pool Modification	5	Storage Element Creation	6	Storage Element Return	7	Storage Element Modification	8	Replica Creation	9	Replica Modification	10	Replica Attachment
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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 39.

Table 39. IBMTSSVC_StorageHardwareID properties

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

Table 39. IBMTSSVC_StorageHardwareID properties (continued)

Property	Type	Qualifier	Description
Caption	String		A short textual description (one-line string) of the object.
ClientType	Uint16	Expensive(TRUE), Write(TRUE), WriteRole(Administrator)	The type of client. Code Semantics 0 Generic 1 HPUX
CurrentlyAuthenticated	Boolean		Indicates if the port is currently logged in to the fibre-channel network.
Description	String		A textual description of the object.
ElementName	String	Expensive(TRUE)	A user-friendly name for the object.
IDType	Uint16	Required(TRUE), ModelCorrespondence (CIM_StorageHardware ID.StorageID)	The type of ID property. Code Semantics 1 Other 2 PortWWN 3 NodeWWN 4 Hostname
OtherIDType	String	Required(TRUE), MaxLen(256), ModelCorrespondence (CIM_StorageHardwareID. IDType), Expensive(TRUE)	The ID type if IDType is set to "Other."
PortLoginMask	String	Expensive(TRUE), Write(TRUE), WriteRole(Administrator)	The 4-character port login mask for the host. Valid mask values range from 0000 (no ports enabled) to 1111 (all ports enabled). For example, a mask of 0011 enables port 1 and port 2. The default value is 1111 (all ports enabled).

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 40 on page 184.

Table 40. IBMTSSVC_StoragePool properties

Property	Type	Qualifier	Description
InstanceID	String		Labels the object instance in the format cluster_id:object_id.
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short (one-line string) textual description of the object.
Description	String		A textual description of the object.
ElementName	String		The name of the cluster.
ExtentSize	UInt16	Units(megabytes)	The extent size of the pool. Volumes allocated from this pool have a space occupation that is a multiple of the extent size.
InstallDate	Datetime		This property is not supported.
Name	String	MaxLen(1024)	The globally unique ID of the pool, in the format (Vendor)(id). For the SAN Volume Controller, the ID is IBMTSSVC(id).
NativeStatus	UInt16		The native operational state of the pool. Code Semantics 1 Offline 1 Online 2 Degraded
NumberOfBackend Volumes	UInt16	Counter(TRUE)	The number of BackendVolumes that make up the pool.
NumberOfStorage Volumes	UInt16	Counter(TRUE)	The number of StorageVolumes that are allocated from the pool.

Table 40. IBMTSSVC_StoragePool properties (continued)

Property	Type	Qualifier	Description																																								
OperationalStatus	Uint16[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.Status Descriptions)	<p>The pool's operational status. Values are 2 (OK) for online, 10 (Stopped) for offline, 1 (Other) for empty, or 1 (Other) for invalid.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unknown</td></tr> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>OK</td></tr> <tr><td>3</td><td>Degraded</td></tr> <tr><td>4</td><td>Stressed</td></tr> <tr><td>5</td><td>Predictive Failure</td></tr> <tr><td>6</td><td>Error</td></tr> <tr><td>7</td><td>Non-Recoverable Error</td></tr> <tr><td>8</td><td>Starting</td></tr> <tr><td>9</td><td>Stopping</td></tr> <tr><td>10</td><td>Stopped</td></tr> <tr><td>11</td><td>In Service</td></tr> <tr><td>12</td><td>No Contact</td></tr> <tr><td>13</td><td>Lost Communication</td></tr> <tr><td>14</td><td>Aborted</td></tr> <tr><td>15</td><td>Dormant</td></tr> <tr><td>16</td><td>Supporting Entity in Error</td></tr> <tr><td>17</td><td>Completed</td></tr> <tr><td>18</td><td>Power Mode</td></tr> </tbody> </table>	Code	Semantics	0	Unknown	1	Other	2	OK	3	Degraded	4	Stressed	5	Predictive Failure	6	Error	7	Non-Recoverable Error	8	Starting	9	Stopping	10	Stopped	11	In Service	12	No Contact	13	Lost Communication	14	Aborted	15	Dormant	16	Supporting Entity in Error	17	Completed	18	Power Mode
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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 40. IBMTSSVC_StoragePool properties (continued)

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

IBMTSSVC_StorageSetting

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

Properties

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

The `IBMTSSVC_StorageSetting` class extends the `CIM_StorageSetting` class and has the properties shown in Table 41.

Table 41. *IBMTSSVC_StorageSetting* properties

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

Table 41. IBMTSSVC_StorageSetting properties (continued)

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

Table 41. IBMTSSVC_StorageSetting properties (continued)

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

Table 41. IBMTSSVC_StorageSetting properties (continued)

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

IBMTSSVC_StorageVolume

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

Properties

The IBMTSSVC_StorageVolume class extends the CIM_StorageVolume class and has the properties shown in Table 42.

Table 42. IBMTSSVC_StorageVolume properties

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description																																												
Additional Availability	Uint16[]	Deprecated(CIM_AssociatedPowerManagementService.PowerState CIM_ManagedSystemElement.OperationalStatus CIM_EnabledLogicalElement.EnabledState), ModelCorrespondence (CIM_LogicalDevice.Availability)	<p>Additional availability and status of the device, beyond that specified in the Availability property. The Availability property denotes the primary status and availability of the device. In some cases, it is not sufficient to denote the complete status of the device. In those cases, the AdditionalAvailability property can be used to provide further information.</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr><td>1</td><td>Other</td></tr> <tr><td>2</td><td>Unknown</td></tr> <tr><td>3</td><td>Running/Full Power</td></tr> <tr><td>4</td><td>Warning</td></tr> <tr><td>5</td><td>In Test</td></tr> <tr><td>6</td><td>Not Applicable</td></tr> <tr><td>7</td><td>Power Off</td></tr> <tr><td>8</td><td>Off Line</td></tr> <tr><td>9</td><td>Off Duty</td></tr> <tr><td>10</td><td>Degraded</td></tr> <tr><td>11</td><td>Not Installed</td></tr> <tr><td>12</td><td>Install Error</td></tr> <tr><td>13</td><td>Power Save - Unknown</td></tr> <tr><td>14</td><td>Power Save - Low Power Mode</td></tr> <tr><td>15</td><td>Power Save - Standby</td></tr> <tr><td>16</td><td>Power Cycle</td></tr> <tr><td>17</td><td>Power Save - Warning</td></tr> <tr><td>18</td><td>Paused</td></tr> <tr><td>19</td><td>Not Ready</td></tr> <tr><td>20</td><td>Not Configured</td></tr> <tr><td>21</td><td>Quiesced</td></tr> </tbody> </table>	Code	Semantics	1	Other	2	Unknown	3	Running/Full Power	4	Warning	5	In Test	6	Not Applicable	7	Power Off	8	Off Line	9	Off Duty	10	Degraded	11	Not Installed	12	Install Error	13	Power Save - Unknown	14	Power Save - Low Power Mode	15	Power Save - Standby	16	Power Cycle	17	Power Save - Warning	18	Paused	19	Not Ready	20	Not Configured	21	Quiesced
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Table 42. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description																																												
Availability	Uint16	Deprecated(CIM_AssociatedPowerManagementService.PowerStateCIM_ManagedSystemElement.OperationalStatusCIM_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
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BackendVolumeID	String	Expensive(TRUE)	The ID of the underlying BackendVolume. Only valid if Type=Image.																																												
BackendVolume Name	String	Expensive(TRUE)	The name of the underlying BackendVolume. Only valid if Type=Image.																																												
BlockSize	Uint64	Units(Bytes)	The size in bytes of the blocks that form this StorageExtent. If a variable block size, then the maximum block size in bytes must be specified. If the block size is unknown or if a block concept is not valid (for example, for AggregateExtents, Memory, or LogicalDisks), enter a 1.																																												
Caption	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	A short textual description (one-line string) of the object.																																												

Table 42. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
CacheMode	Uint16		<p>Code Semantics 0 None 1 ReadWrite</p>
CacheState	Uint16	Expensive(TRUE)	<p>The volume's cache state.</p> <p>Code Semantics 0 Empty 1 Not empty 2 Corrupt</p>
ConsumableBlocks	Uint64		<p>The maximum number of blocks, of size BlockSize, that are available for consumption when layering StorageExtents using the BasedOn association. This property is used when this StorageExtent is an Antecedent reference in a BasedOn relationship. For example, a StorageExtent can be composed of 120 blocks. However, the extent itself may use 20 blocks for redundancy data. If another StorageExtent is BasedOn this extent, only 100 blocks are available to it. This information ("100 blocks are available for consumption") is indicated in the ConsumableBlocks property.</p>
Controlled	Boolean		<p>A quick interface for finding devices with no ControlledBy associations to controllers. A value of true indicates that the device is connected to one or more ports by use of controllers. False indicates that the device exists but is not connected to a port.</p>

Table 42. 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		The type of data organization that is used. Code Semantics 0 Other 1 Unknown 2 Fixed Block 3 Variable Block 4 Count Key Data
DataRedundancy	Uint16	ModelCorrespondence (CIM_StorageSetting.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 only unique for instances of the StorageVolume class.
ElementName	String	MaxLen(15), Write(TRUE), WriteRole(Administrator)	The user-friendly name of the volume.

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description
Identifying Descriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_LogicalDevice.OtherIdentifyingInfo)	An array of free-form Strings that provides explanations and details behind the entries in the OtherIdentifyingInfo array. Each entry of this array is related to the entry in OtherIdentifyingInfo that is located at the same index.
InstallDate	Date-time		This property is not supported.
IsBasedOn Underlying Redundancy	Boolean		A value of true indicates that the underlying StorageExtent(s) participate in a StorageRedundancy Group.
IsFormatted	Boolean	Expensive(TRUE)	A value of true indicates that the volume has been formatted by the SAN Volume Controller.
LastErrorCode	Uint32	Deprecated(CIM_Device ErrorData.LastErrorCode)	This property is not supported.
MaxQuiesceTime	Uint64	Deprecated(No value), Units(MilliSeconds)	This property is not supported.
Name	String	ModelCorrespondence (CIM_StorageVolume.NameFormat), MaxLen(1024)	A unique identifier for the volume.

Table 42. 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)
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8	NodeWWN (Node WWN, for single LUN or controller)																						

Table 42. IBMTSSVC_StorageVolume properties (continued)

Property	Type	Qualifier	Description																		
NameNamespace	Uint16	ModelCorrespondence (CIM_StorageVolume.Name CIM_StorageVolume. OtherNameNamespace)	<p>The preferred source for volume names is SCSI vital product data (VPD) Page 83 responses. Page 83 returns a list of identifiers for various device elements. The metadata for each identifier includes an Association field, identifiers with association of 0 apply to volumes. Page 83 supports several namespaces specified in the Type field in the identifier metadata.</p> <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>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.)
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7	SNVM (Serial Number/ Vendor/ Model. NameFormat should be SNVM.)																				

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

Table 42. IBMTSSVC_StorageVolume properties (continued)

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

IBMTSSVC_StorageVolumeBackendVolumeView

The IBMTSSVC_StorageVolumeBackendVolumeView class represents a mapping between a virtual disk (the storage volume) and a managed disk (the backend volume).

Properties

The IBMTSSVC_StorageVolumeBackendVolumeView class extends the CIM_LogicalElement class and has the properties shown in Table 43.

Table 43. IBMTSSVC_StorageVolumeBackendVolumeView properties

Property	Type	Qualifier	Description
BackendVolumeID	Uint16	Key	The ID of the backend volume (managed disk).
Count	Uint16		The number of storage extents that the storage volume (virtual disk) has on the backend volume (managed disk).

Table 43. IBMTSSVC_StorageVolumeBackendVolumeView properties (continued)

Property	Type	Qualifier	Description
StorageVolumeID	Uint16	Key	The ID of the storage volume (virtual disk).
SystemName	String	Key, MaxLen(256)	The system scoping identifier in the format cluster_ip.

IBMTSSVC_SyncCopyJob

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

Properties

A job instance is used to monitor asynchronous Global Mirror operations on the device. The IBMTSSVC_SyncCopyJob class has the properties shown in Table 44.

Table 44. IBMTSSVC_SyncCopyJob properties

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of ConcreteJob. The InstanceID must be unique within a namespace. In order to ensure that the name is unique, the value of InstanceID <i>must</i> be constructed in the following manner: (Vendor ID)(ID).
Caption	String	MaxLen(64),	Unsupported property.
DeleteOnCompletion	Boolean	Write(TRUE),	Indicates if the job is automatically deleted after completion. If this property is set to false and the job completes, the extrinsic method DeleteInstance <i>must</i> be used to delete the job.
Description	String		A textual description of the object.
Elapsed Time	Datetime		Unsupported property.
ElementName	String		Unsupported property.
ErrorCode	Uint16	Model Correspondence (CIM_Job.Error Description)	Unsupported property.
ErrorDescription	String	Model Correspondence (CIM_Job.ErrorCode),	Unsupported property.
InstallDate	Datetime		Unsupported property.
JobRunTimes	Uint32	Write(TRUE),	

Table 44. IBMTSSVC_SyncCopyJob properties (continued)

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

Table 44. IBMTSSVC_SyncCopyJob properties (continued)

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

Table 44. IBMTSSVC_SyncCopyJob properties (continued)

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

Table 44. IBMTSSVC_SyncCopyJob properties (continued)

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

IBMTSSVC_SyncCopySynchronizedSet

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

Properties

The IBMTSSVC_SyncCopySynchronizedSet class extends the CIM_SynchronizedSet class and has the properties shown in Table 45.

Table 45. IBMTSSVC_SyncCopySynchronizedSet properties

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

Table 45. IBMTSSVC_SyncCopySynchronizedSet properties (continued)

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

Table 45. IBMTSSVC_SyncCopySynchronizedSet properties (continued)

Property	Type	Qualifier	Description
InstanceID	String		Opaquely identifies a unique instance of collection that is scoped (contained) by a system. The InstanceID must be unique within a namespace. In order to ensure uniqueness, the value of InstanceID must be constructed in the following format: (Vendor ID)(ID).
MasterID	String		The ID of the master cluster.
NativeState	Uint16	ValueMap, Values	The native state of the set. Code Semantics 0 Idling 1 Idling disconnected 2 Consistent synchronized 3 Consistent disconnected 4 Consistent stopped 5 Inconsistent copying 6 Inconsistent disconnected 7 Inconsistent disconnected 8 Empty
Primary	Uint32		Shows which side is currently the primary in the relationship. The primary volumes are the ones accessible for I/O by the clients.
Status	Uint32		The status of the SynchronizedSet. Code Semantics 4 Prepared 5 ReSyncln Progress 6 Synchronized 12 Broken 13 Fractured 0x1000 Empty 0x8101 Fractured Idle
SyncMaintained	Boolean	Expensive(TRUE)	Indicates if the synchronization relationship is maintained.

Service object classes

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

IBMTSSVC_ClusteringService

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

Properties

The IBMTSSVC_ClusteringService class extends the CIM_ClusteringService class and has the properties shown in Table 46.

Table 46. IBMTSSVC_ClusteringService properties

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

Table 46. IBMTSSVC_ClusteringService properties (continued)

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

Table 46. IBMTSSVC_ClusteringService properties (continued)

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

Table 46. *IBMTSSVC_ClusteringService* properties (continued)

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

IBMTSSVC_PrivilegeManagementService

IBMTSSVC_PrivilegeManagementService class extends the CIM_PrivilegeManagementService class.

Properties

The IBMTSSVC_PrivilegeManagementService class has the properties shown in Table 47.

Table 47. *IBMTSSVC_PrivilegeManagementService* properties

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

Table 47. IBMTSSVC_PrivilegeManagementService properties (continued)

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

Table 47. IBMTSSVC_PrivilegeManagementService properties (continued)

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

Table 47. IBMTSSVC_PrivilegeManagementService properties (continued)

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

IBMTSSVC_StorageConfigurationService

IBMTSSVC_StorageConfigurationService class provides extrinsic methods for basic storage configuration tasks.

Properties

The IBMTSSVC_StorageConfigurationService class extends the CIM_StorageConfigurationService class and has the properties shown in Table 48.

Table 48. IBMTSSVC_StorageConfigurationService properties

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

Table 48. IBMTSSVC_StorageConfigurationService properties (continued)

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

Table 48. IBMTSSVC_StorageConfigurationService properties (continued)

Property	Type	Qualifier	Description
OtherEnabledState	String	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The element's enabled/disabled state when the EnabledStatus property is set to 1 ("Other"). This property <i>must</i> be set to NULL when EnabledStatus is any value other than 1.
PrimaryOwnerContact	String	MaxLen(256), Write(TRUE)	This property is not supported.
PrimaryOwnerName	String	MaxLen(64), Write(TRUE)	This property is not supported.
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	An integer enumeration indicator. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10..32767 DMTF Reserved 32768..65535 Vendor Reserved
Started	Boolean		Indicates if this service is started.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.EnabledDefault)	Indicates if this service is started manually or automatic.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystemElement.OperationalStatus)	Deprecated property - set to "Unknown." Look at OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	Describes the status. Used when the OperationalStatus property is set to 1 ("Other").
SystemCreationClassName	String	Propagated (CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The scoping system's name.
TimeOfLastStateChange	Datetime		This property is not supported.

Table 48. IBMTSSVC_StorageConfigurationService properties (continued)

Property	Type	Qualifier	Description
UnitDeviceID	Uint16		The unit device ID that is defined by OpenVMS for the volume.

IBMTSSVC_StorageHardwareIDManagementService

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

Properties

The IBMTSSVC_StorageHardwareIDManagementService class extends the CIM_StorageHardwareIDManagementService class and has the properties shown in Table 49.

Table 49. IBMTSSVC_StorageHardwareIDManagementService properties

Property	Type	Qualifier	Description
Caption	String	MaxLen(64)	Unsupported property.
CreationClassName	String	MaxLen(256)	The name of the class or the subclass used in the creation of an instance. When used with the other key properties of this class, this property allows all instances of this class and its subclasses to be uniquely identified.
Description	String		A textual description of the object.
ElementName	String		Unsupported property.
EnabledDefault	Uint16	Write(TRUE)	An enumerated value that indicates 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 49. IBMTSSVC_StorageHardwareIDManagementService properties (continued)

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

Table 49. IBMTSSVC_StorageHardwareIDManagementService properties (continued)

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

Table 49. IBMTSSVC_StorageHardwareIDManagementService properties (continued)

Property	Type	Qualifier	Description
RequestedState	Uint16	ModelCorrespondence (CIM_EnabledLogicalElement.EnabledState)	The state change for the element that must be made at the next opportunity. When EnabledStatus is set to 5 (No Change), then this property has no effect. By default, the RequestedStatus is 5 (No Change). 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_ManagedSystemElement.OperationalStatus)	This property is deprecated and set to "Unknown." See OperationalStatus for status information.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystemElement.OperationalStatus)	The description of the status that is used when the OperationalStatus property is set to 1 (Other).
SystemCreationClassName	String	Propagated(CIM_System.CreationClassName), MaxLen(256)	The scoping system's creation class name.
SystemName	String	Propagated(CIM_System.Name), MaxLen(256)	The name of the scoping system.
TimeOfLastStateChange	Datetime		Unsupported property.

Security object classes

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

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

IBMTS_Account

The IBMTS_Account class extends the CIM_Account class.

Properties

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

The IBMTS_Account class has the properties shown in Table 50.

Table 50. IBMTS_Account properties

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

Table 50. IBMTS_Account properties (continued)

Property	Type	Qualifier	Description																																								
InstallDate	Date-time		The date when the object was installed. Lack of this value does not mean that the object is not installed.																																								
LocalityName	String[]		The name of the selected locality, such as the name of a city, county or other geographic region.																																								
Name	String	MaxLen(1024) ReadRole(None)	The name of the object instance. The value of this property can be set to be the same as that of the UserID property or, in the case of an LDAP-derived instance, the Name property value can be set to the DistinguishedName of the LDAP-accessed object instance.																																								
ObjectClass	String[]		In the case of an LDAP-derived instance, this property value(s) can be set to the objectClass attribute values.																																								
Operational Status	UInt16[]	Experimental(TRUE), ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	<p>The current status of the element.</p> <table border="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
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14	Aborted																																										
15	Dormant																																										
16	Supporting Entity Error																																										
17	Complete																																										
18	Power Mode																																										

Table 50. IBMTS_Account properties (continued)

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

IBMTS_AccountManagementService

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

Properties

The IBMTS_AccountManagementService class extends the CIM_AccountManagementService class and has the properties shown in Table 51.

Table 51. IBMTS_AccountManagementService properties

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

Table 51. IBMTS_AccountManagementService properties (continued)

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

Table 51. IBMTS_AccountManagementService properties (continued)

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

Table 51. IBMTS_AccountManagementService properties (continued)

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

IBMTS_Certificate

The SecurityProvider generates one instance of this class.

Properties

IBMTS_Certificate class has the properties shown in Table 52.

Table 52. IBMTS_Certificate properties

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

Table 52. IBMTS_Certificate properties (continued)

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

IBMTS_CertificateSetting

This class sets data to create new certificates.

Properties

IBMTS_CertificateSetting class has the properties shown in Table 53.

Table 53. IBMTS_CertificateSetting Properties

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

IBMTS_CIMXMLCommunicationMechanism

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

Properties

The IBMTS_CIMXMLCommunicationMechanism properties are shown in Table 54

Table 54. IBMTS_CIMXMLCommunicationMechanism properties

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

Table 54. IBMTS_CIMXMLCommunicationMechanism properties (continued)

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

Table 54. IBMTS_CIMXMLCommunicationMechanism properties (continued)

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

Table 54. IBMTS_CIMXMLCommunicationMechanism properties (continued)

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

Table 54. IBMTS_CIMXMLCommunicationMechanism properties (continued)

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

Table 54. IBMTS_CIMXMLCommunicationMechanism properties (continued)

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

IBMTS_IndicationFilter

The IBMTS_IndicationFilter extends the CIM_IndicationFilter class.

Properties

The IBMTS_IndicationFilter has the properties shown in Table 55.

Table 55. IBMTS_IndicationFilter properties

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

Table 55. IBMTS_IndicationFilter properties (continued)

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

IBMTS_NameSpace

The IBMTS_NameSpace extends the CIM_NameSpace class.

Properties

The IBMTS_NameSpace has the properties shown in Table 56.

Table 56. IBMTS_NameSpace properties

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

Table 56. IBMTS_NameSpace properties (continued)

Property	Type	Qualifier	Description
ClassInfo	Uint16	Deprecated (CIM_Namespace), Required(TRUE), Write(TRUE), ModelCorrespondence (CIM_Namespace)	The organization of the namespace. Code Semantics 0 Unknown 1 Other 2 CIM 1.0 3 CIM 2.0 4 CIM 2.1 5 CIM 2.2 6 CIM 2.3 7 CIM 2.4 8 CIM 2.5 9 CIM 2.6 10 CIM 2.7 11 CIM 2.8 200 DMI Recast 201 SNMP Recast 202 CMIP Recast
ClassType	Uint16	Write(TRUE), ModelCorrespondence (CIM_Namespace)	The schema of the namespace. Code Semantics 0 Unknown 1 Other 2 CIM 1.0 200 DMI Recast 201 SNMP Recast 202 CMIP Recast
ClassTypeVersion	String	Write(TRUE), ModelCorrespondence (CIM_Namespace)	The objects in the namespace.
CreationClassName	String	MaxLen(256)	The name of the class or subclass used to create an instance.
Description	String		A textual description of the object.
DescriptionOf ClassInfo	String	Deprecated (CIM_Namespace), Write(TRUE), ModelCorrespondence (CIM_Namespace)	Provides detailed information about the object.
DescriptionOf ClassType	String	Write(TRUE), ModelCorrespondence (CIM_Namespace)	Provides detailed information about the object.
ElementName	String		The name of the instance.
Name	String	MaxLen(256)	The unique label, in the context of the hosting system, by which the AccessControl Information is known.
ObjectManager Creation	String	Propogated (CIM_ObjectManager), MaxLen(256)	The ObjectManager's CreationClassName.

Table 56. IBMTS_NameSpace properties (continued)

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

IBMTS_ObjectManager

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

Properties

The IBMTS_ObjectManager class extends the CIM_ObjectManager class and has the properties shown in Table 57.

Table 57. IBMTS_ObjectManager properties

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

Table 57. IBMTS_ObjectManager properties (continued)

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

Table 57. IBMTS_ObjectManager properties (continued)

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

Table 57. IBMTS_ObjectManager properties (continued)

Property	Type	Qualifier	Description
RequestedState	UInt16	ModelCorrespondence (CIM_EnabledLog)	Sets the state (shut down, enabled, taken offline, or tested) of the element at the next operation. Code Semantics 2 Enabled 3 Disabled 4 Shut Down 5 No Change 6 Offline 7 Test 8 Deferred 9 Quiesce 10 Reboot 11 Reset .. DMTF Reserved 32768... Vendor Reserved
Started	Boolean		Indicates if the Service is started or stopped for the account.
StartMode	String	MaxLen(10), Deprecated (CIM_Service.Enabled)	Indicates if the Service is automatically started by a system, operating system, or specific user request.
Status	String	MaxLen(10), Deprecated (CIM_ManagedSystem)	The current status of the Service instance.
StatusDescriptions	String[]	ArrayType(Indexed), ModelCorrespondence (CIM_ManagedSystem)	The status of the cluster when OperationalStatus is set to 1.
SystemCreationClassName	String	MaxLen(256)	The class creation name of the scoping system.
SystemName	String	Propagated (CIM_System.Name), MaxLen(256)	The name of the scoping system.
SystemCreationClass	String	Propagated (CIM_System.Class), MaxLen(256)	The class creation of the scoping system.
TimeOfLastStateChange	Date-time		The date and time when the element's EnableState last changed.
Version	String	Experimental(TRUE)	The VRMF level of the Common Information Model (CIM) Agent.

IBMTS_RegisteredProfile

The IBMTS_RegisteredProfile extends the CIM_RegisteredProfile class.

Properties

The IBMTS_RegisteredProfile has the properties shown in Table 58.

Table 58. IBMTS_RegisteredProfile properties

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

Table 58. IBMTS_RegisteredProfile properties (continued)

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

IBMTS_System

The IBMTS_System extends the CIM_System class.

Properties

The IBMTS_System has the properties shown in Table 59.

Table 59. IBMTS_System properties

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

Table 59. IBMTS_System properties (continued)

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

Table 59. IBMTS_System properties (continued)

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

Table 59. IBMTS_System properties (continued)

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

IBMTS_Truststore

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

Properties

The IBMTS_Truststore class has the properties shown in Table 60.

Table 60. IBMTS_Truststore Properties

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

Table 60. IBMTS_Truststore Properties (continued)

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

IBMTS_TruststoreManagementService

The SecurityProvider generates one instance of this class.

Properties

IBMTS_TruststoreManagementService class has the properties shown in Table 61 on page 251.

Table 61. IBMTS_TruststoreManagementService properties

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

Property	Type	Qualifier	Description																
EnabledDefault	Uint16	Write(TRUE)	<p>An enumerated value that indicates an administrator's default/startup configuration for an element's Enabled State. By default the element is "Enabled" (value=2).</p> <table border="0"> <thead> <tr> <th>Code</th> <th>Semantics</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Enabled</td> </tr> <tr> <td>3</td> <td>Disabled</td> </tr> <tr> <td>5</td> <td>Not Applicable</td> </tr> <tr> <td>6</td> <td>Enabled but Offline</td> </tr> <tr> <td>7</td> <td>No Default</td> </tr> <tr> <td>8..32767</td> <td>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
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Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Table 61. IBMTS_TruststoreManagementService properties (continued)

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

Association object classes

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

IBMTSSVC_AllocatedFromStoragePool

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

References

The IBMTSSVC_AllocatedFromStoragePool class extends the CIM_AllocatedFromStoragePool class and has the references shown in Table 62.

Table 62. 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 63.

Table 63. 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 64.

Table 64. IBMTSSVC_authorizedCollection references

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

IBMTSSVC_authorizedStorageHardwareID

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

References

The IBMTSSVC_authorizedStorageHardwareID class extends the CIM_AuthorizedSubject class and has the references shown in Table 65.

Table 65. IBMTSSVC_authorizedStorageHardwareID references

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

IBMTSSVC_authorizedSubject

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

References

The IBMTSSVC_authorizedSubject class extends the CIM_AuthorizedSubject class and has the references shown in Table 66.

Table 66. IBMTSSVC_authorizedSubject references

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

IBMTSSVC_authorizedTarget

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

References

The IBMTSSVC_authorizedTarget class extends the CIM_authorizedTarget class and has the references shown in Table 67.

Table 67. IBMTSSVC_authorizedTarget references

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

IBMTSSVC_AvailableHardwareID

The IBMTSSVC_AvailableHardwareID class associates the AccountManagementService to CandidateStorageHardwareIDs.

References

The IBMTSSVC_AvailableHardwareID class extends the CIM_ConcreteDependency class and has the references shown in Table 68.

Table 68. 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 69.

Table 69. 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 70.

Table 70. IBMTSSVC_BasedOn references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Backend Volume		The BackendVolume containing data from the Dependent
Dependent	IBMTSSVC_Storage Volume		The StorageVolume

Properties

The IBMTSSVC_BasedOn class has the properties shown in Table 71.

Table 71. IBMTSSVC_BasedOn properties

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

IBMTSSVC_ClusterController

The IBMTSSVC_ClusterController class defines the Cluster scope of the Controller.

References

The IBMTSSVC_ClusterController class extends the CIM_SystemDevice class and has the references shown in Table 72.

Table 72. IBMTSSVC_ClusterController references

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

IBMTSSVC_ClusterDumps

The IBMTSSVC_ClusterDumps class extends the CIM_ElementSettingData class.

References

The IBMTSSVC_ClusterDumps class has the references shown in Table 73.

Table 73. 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 74.

Table 74. 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 75.

Table 75. 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 76.

Table 76. IBMTSSVC_ClusteringServiceForSystem references

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

IBMTSSVC_ClusterMaskingCapabilities

The IBMTSSVC_ClusterMaskingCapabilities class associates an IBMTSSVC_Cluster instance with its DeviceMaskingCapabilities.

References

The IBMTSSVC_ClusterMaskingCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 77.

Table 77. IBMTSSVC_ClusterMaskingCapabilities references

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

IBMTSSVC_ClusterPort

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

References

The IBMTSSVC_ClusterPort class extends the CIM_SystemDevice class and has the references shown in Table 78.

Table 78. 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 79.

Table 79. IBMTSSVC_ClusterScopeCandidateVolume references

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

IBMTSSVC_ClusterScopeChassis

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

References

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

Table 80. 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 81.

Table 81. IBMTSSVC_ClusterScopeFCSet references

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

IBMTSSVC_ClusterScopeIOGroup

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

References

The IBMTSSVC_ClusterScopeIOGroup class extends the CIM_Dependency class and has the references shown in Table 82.

Table 82. 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 83.

Table 83. 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 84.

Table 84. 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 85 on page 269.

Table 85. 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 86.

Table 86. IBMTSSVC_ClusterScopeSCSet references

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

IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView

The IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView class defines the cluster scope of the IBMTSSVC_StorageVolumeBackendVolumeView instance.

References

The IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView class extends the CIM_Dependency class and has the references shown in Table 87.

Table 87. IBMTSSVC_ClusterScopeStorageVolumeBackendVolumeView

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The cluster
Dependent	IBMTSSVC_StorageVolumeBackendVolumeView		The 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 88.

Table 88. IBMTSSVC_ClusterVolume references

Name	Reference	Qualifier	Description
Antecedent	IBMTSSVC_Cluster		The Cluster

Table 88. IBMTSSVC_ClusterVolume references (continued)

Name	Reference	Qualifier	Description
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 89.

Table 89. 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 90.

Table 90. 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 91.

Table 91. 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 92.

Table 92. 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 93.

Table 93. 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 94.

Table 94. IBMTSSVC_ControllerConfService MaskingCapabilities references

Name	Reference	Qualifier	Description
Managed Element	IBMTSSVC_Controller ConfigurationService	Min, Max	The IBMTSSVC_ControllerMasking Capabilities for this service
Capabilities	IBMTSSVC_Controller MaskingCapabilities		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 95.

Table 95. 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

The IBMTSSVC_ElementConformsToProfile extends the CIM_ElementConformsToProfile class.

References

The IBMTSSVC_ElementConformsToProfile class has the references shown in Table 96.

Table 96. IBMTSSVC_ComponentCS references

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

IBMTSSVC_FlashCopyStorageSynchronized

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

References

The source and target volumes can reside on different IBMTSSVC_RedundancyGroup instances, but must be managed by the same IBMTSSVC_Cluster instance. The IBMTSSVC_FlashCopyStorageSynchronized class extends the CIM_StorageSynchronized class and has the references shown in Table 97 on page 273.

Table 97. 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 98.

Table 98. IBMTSSVC_FlashCopyStorageSynchronized properties

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

Table 98. IBMTSSVC_FlashCopyStorageSynchronized properties (continued)

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

IBMTSSVC_FlashCopySynchronizedMember

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

References

The IBMTSSVC_FlashCopySynchronizedMember class extends the CIM_SynchronizedMember class and has the references shown in Table 99.

Table 99. 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 100.

Table 100. IBMTSSVC_HardwareIDOnSystem references

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

IBMTSSVC_HostedAccessPoint

The IBMTSSVC_HostedAccessPoint extends the CIM_HostedAccessPoint class.

References

The IBMTSSVC_HostedAccessPoint class has the references shown in Table 101.

Table 101. IBMTSSVC_HostedAccessPoint references

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

IBMTSSVC_HostedFlashCopyJob

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

References

The IBMTSSVC_HostedFlashCopyJob class extends the CIM_Dependency class and has the references shown in Table 102.

Table 102. IBMTSSVC_HostedFlashCopyJob references

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

IBMTSSVC_HostedFormatVolumeJob

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

References

IBMTSSVC_HostedFormatVolumeJob class extends the CIM_Dependency class and has the references shown in Table 103.

Table 103. IBMTSSVC_HostedFormatVolumeJob references

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

IBMTSSVC_HostedJob

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

References

The IBMTSSVC_HostedJob class extends the CIM_Dependency class and has the references shown in Table 104.

Table 104. IBMTSSVC_HostedJob references

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

IBMTSSVC_HostedMigrateVolumeJob

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

References

IBMTSSVC_HostedMigrateVolumeJob class extends the CIM_Dependency class and has the references shown in Table 105 on page 277.

Table 105. IBMTSSVC_HostedMigrateVolumeJob references

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

IBMTSSVC_HostedPrimordialPool

The IBMTSSVC_HostedPrimordialPool associates a cluster with its primordial storage pools.

References

The IBMTSSVC_HostedPrimordialPool class extends the CIM_HostedStoragePool class and has the references shown in Table 106.

Table 106. IBMTSSVC_HostedPrimordialPool references

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

IBMTSSVC_HostedStoragePool

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

References

The IBMTSSVC_HostedStoragePool class extends the CIM_HostedStoragePool class and has the references shown in Table 107.

Table 107. IBMTSSVC_HostedStoragePool references

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

IBMTSSVC_HostedSyncCopyJob

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

References

The IBMTSSVC_HostedSyncCopyJob class extends the CIM_Dependency class and has the references shown in Table 108 on page 278.

Table 108. IBMTSSVC_HostedSyncCopyJob references

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

IBMTSSVC_HwIDCollectionOnSystem

The IBMTSSVC_HwIDCollectionOnSystem associates a cluster with its hardware ID.

References

The IBMTSSVC_HwIDCollectionOnSystem class extends the CIM_Dependency class and has the references shown in Table 109.

Table 109. IBMTSSVC_HwIDCollectionOnSystem references

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

IBMTSSVC_IndicationFiltersConformsToProfile

The IBMTSSVC_IndicationFiltersConformsToProfile class associates IndicationFilters and the InBand profile.

References

The IBMTSSVC_IndicationFiltersConformsToProfile class extends the CIM_ElementConformsToProfile class and has the references shown in Table 110.

Table 110. IBMTSSVC_IndicationFiltersConformsToProfile references

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

IBMTSSVC_IndicationFiltersConformsToSubProfile

The IBMTSSVC_IndicationFiltersConformsToSubProfile class associates IndicationFilters and the InBand subprofile.

References

The IBMTSSVC_IndicationFiltersConformsToSubProfile class extends the CIM_ElementConformsToProfile class and has the references shown in Table 111 on page 279.

Table 111. IBMTSSVC_IndicationFiltersConformsToSubProfile references

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

IBMTSSVC_IOGroupIdentity

The IBMTSSVC_IOGroupIdentity class extends the CIM_ConcreteIdentity class.

References

The IBMTSSVC_IOGroupIdentity class has the references shown in Table 112.

Table 112. IBMTSSVC_IOGroupIdentity references

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

IBMTSSVC_IOGroupPort

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

References

The IBMTSSVC_IOGroupPort class extends the CIM_SystemDevice class and has the references shown in Table 113.

Table 113. IBMTSSVC_IOGroupPort references

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

IBMTSSVC_ManagesCollection

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

References

The IBMTSSVC_ManagesCollection class extends the CIM_ConcreteDependency class and has the references shown in Table 114 on page 280.

Table 114. IBMTSSVC_ManagesCollection references

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

IBMTSSVC_ManagesController

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

References

The IBMTSSVC_ManagesController class extends the CIM_ConcreteDependency class and has the references shown in Table 115.

Table 115. IBMTSSVC_ManagesController references

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

IBMTSSVC_ManagesHardwareID

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

References

The IBMTSSVC_ManagesHardwareID class extends the CIM_ConcreteDependency class and has the references shown in Table 116.

Table 116. 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 117 on page 281.

Table 117. 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 118.

Table 118. 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 119.

Table 119. IBMTSSVC_MemberOfIOGroup references

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

IBMTSSVC_NodeDumps

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

References

The IBMTSSVC_NodeDumps class extends the CIM_ElementSettingData class and has the references shown in Table 120.

Table 120. 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 121.

Table 121. 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 122.

Table 122. IBMTSSVC_PartnershipCandidate references

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

IBMTSSVC_PoolCapabilities

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

References

The IBMTSSVC_PoolCapabilities class extends the CIM_ElementCapabilities class and has the references shown in Table 123.

Table 123. IBMTSSVC_PoolCapabilities references

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

IBMTSSVC_PrimordialPoolCapabilities

The IBMTSSVC_PrimordialPoolCapabilities class extends the CIM_ElementCapabilities class.

References

The IBMTSSVC_PrimordialPoolCapabilities class has the references shown in Table 124.

Table 124. IBMTSSVC_PrimordialPoolCapabilities references

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

IBMTSSVC_PrimordialPoolComponent

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

References

The IBMTSSVC_PrimordialPoolComponent class extends the CIM_ConcreteComponent class and has the references shown in Table 125.

Table 125. IBMTSSVC_PrimordialPoolComponent references

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

IBMTSSVC_PrimordialPoolForController

The IBMTSSVC_PrimordialPoolForController class associates a BackendController with the corresponding PrimordialPool.

References

The IBMTSSVC_PrimordialPoolForController class extends the CIM_Dependency class and has the references shown in Table 126.

Table 126. 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 127.

Table 127. 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 128.

Table 128. IBMTSSVC_ProductPhysicalComponent references

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

IBMTSSVC_ProtocolControllerForPort

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

References

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

The IBMTSSVC_ProtocolControllerForPort class extends the CIM_ProtocolControllerForPort class and has the references shown in Table 129.

Table 129. 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 130.

Table 130. IBMTSSVC_ProtocolControllerForPort

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

Table 130. IBMTSSVC_ProtocolControllerForPort (continued)

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

IBMTSSVC_ProtocolControllerForUnit

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

References

The IBMTSSVC_ProtocolControllerForUnit class extends the CIM_ProtocolControllerForUnit class and has the references shown in Table 131.

Table 131. 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 132.

Table 132. IBMTSSVC_ProtocolControllerForUnit

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

Table 132. IBMTSSVC_ProtocolControllerForUnit (continued)

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

IBMTSSVC_ProviderInObjectManager

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

References

The IBMTSSVC_ProviderInObjectManager class extends the CIM_Component class and has the references shown in Table 133.

Table 133. IBMTSSVC_ProviderInObjectManager references

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

IBMTSSVC_RemotePartnership

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

References

The IBMTSSVC_RemotePartnership class extends the CIM_Dependency class and has the references shown in Table 134 on page 288.

Table 134. 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 135.

Table 135. IBMTSSVC_RemoteSystemVolume references

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

IBMTSSVC_RequiresProfile

The IBMTSSVC_RequiresProfile class extends the CIM_SubProfileRequiresProfile class.

References

The IBMTSSVC_RequiresProfile class has the references shown in Table 136.

Table 136. IBMTSSVC_RequiresProfile references

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

IBMTSSVC_SAPAvailableForElement

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

References

The IBMTSSVC_SAPAvailableForElement class extends the CIM_SAPAvailableForElement class and has the references shown in Table 137 on page 289.

Table 137. 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 138.

Table 138. 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 139.

Table 139. IBMTSSVC_StorageConfigurationServiceForSystem references

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

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 140.

Table 140. 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 141.

Table 141. IBMTSSVC_StoragePoolComponent references

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

IBMTSSVC_SyncCopyStorageSynchronized

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

References

The IBMTSSVC_SyncCopyStorageSynchronized class extends the CIM_StorageSynchronized class and has the references shown in Table 142.

Table 142. 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 143.

Table 143. IBMTSSVC_SyncCopyStorageSynchronized properties

Property	Type	Qualifier	Description
BackgroundCopy Priority	Uint16	Write(TRUE), WriteRole(Administrator)	The background copy priority, in the range 1 to 100. The default is 50.
Connected	Boolean		The status of the connection between the StorageVolumes
CopyType	Uint16		The Replication Policy. Code Semantics 2 Async. Create and maintain an asynchronous copy of the source. 3 Sync. Create and maintain a synchronized copy of the source. 4 UnSyncAssoc. Create an un-synchronized copy and maintain an association to the source. .. DMTF Reserved 0x8000.. Vendor Specific
ElementName	String	Write(TRUE), WriteRole(Administrator)	The user-friendly name of this association
FreezeTime	String		The time when the copy relationship was removed
Name	String		The name of the association

Table 143. 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 143. IBMTSSVC_SyncCopyStorageSynchronized properties (continued)

Property	Type	Qualifier	Description
SyncedElement ClusterID	String		The ID of the SyncedElement's cluster
SyncedElement ClusterName	String		The name of the SyncedElement's cluster
SyncedElementID	String		The ID of the SyncedElement
SyncedElementName	String		The name of the SyncedElement
SynchronizedSet	String		The name of the SynchronizedSet with which the StorageSynchronized is associated
SynchronizedSetID	String		The ID of the SynchronizedSet with which the StorageSynchronized is associated
SyncMaintained	Boolean		Indicates whether synchronization is maintained
SyncState	UInt16		The state of the synchronization Code Semantics 4 Prepared 5 ReSync InProgress 6 Synchronized 12 Broken 13 Fractured 0x8101 Fractured Idle
SystemElement ClusterID	String		The ID of the SystemElement's cluster
SystemElement ClusterName	String		The name of the SystemElement's cluster
SystemElementID	String		The ID of the SystemElement
SystemElementName	String		The name of the SystemElement
WhenSynced	Date-time		Unsupported property

IBMTSSVC_SyncCopySynchronizedMember

The IBMTSSVC_SyncCopySynchronizedMember class associates an IBMTSSVC_FlashCopySynchronizedSet instance with its member IBMTSSVC_SyncCopySynchronized instances.

References

The IBMTSSVC_SyncCopySynchronizedMember class extends the CIM_SynchronizedMember class and has the references shown in Table 144.

Table 144. IBMTSSVC_SyncCopySynchronizedMember references

Name	Reference	Qualifier	Description
Collection	IBMTSSVC_SyncCopySynchronizedSet	Aggregate	The SyncCopySynchronizedSet
Member	IBMTSSVC_SyncCopyStorageSynchronized		The aggregated member of the set

IBMTSSVC_SystemBackendVolume

The IBMTSSVC_SystemBackendVolume class connects an IBMTSSVC_Cluster instance with the IBMTSSVC_BackendVolume instances that are visible in the fibre-channel SAN.

References

The IBMTSSVC_SystemBackendVolume class extends the CIM_SystemDevice class and has the references shown in Table 145.

Table 145. IBMTSSVC_SystemBackendVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Min, Max, Aggregate	The Cluster
Part Component	IBMTSSVC_BackendVolume	Weak	The BackendVolume

IBMTSSVC_SystemCandidateVolume

The IBMTSSVC_SystemCandidateVolume class associates a Cluster or RemoteCluster and its Candidate Volumes.

References

The IBMTSSVC_SystemCandidateVolume class extends the CIM_SystemDevice class and has the references shown in Table 146.

Table 146. IBMTSSVC_SystemCandidateVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_RemoteCluster	Aggregate, Max, Min	The aggregating cluster
Part Component	IBMTSSVC_CandidateVolume	Weak	The Candidate Volume

IBMTSSVC_SystemController

The IBMTSSVC_SystemController class associates an I/O group with the corresponding Controller instances.

References

The IBMTSSVC_SystemController class extends the CIM_SystemDevice class and has the references shown in Table 147.

Table 147. IBMTSSVC_SystemController references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Min, Max, Aggregate	The I/O group
Part Component	IBMTSSVC_Controller	Weak	The Controller

IBMTSSVC_SystemFCPort

The IBMTSSVC_SystemFCPort class associates a node to its fibre-channel ports.

References

The IBMTSSVC_SystemFCPort class extends the CIM_SystemDevice class and has the references shown in Table 148.

Table 148. IBMTSSVC_SystemFCPort references

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

IBMTSSVC_SystemFeatures

The IBMTSSVC_SystemFeatures class associates the Cluster with its features.

References

The IBMTSSVC_SystemFeatures class extends the CIM_ElementCapabilities class and has the references shown in Table 149.

Table 149. 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 150 on page 296.

Table 150. IBMTSSVC_SystemVolume references

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_IOGroup	Min, Max, Aggregate	The assigned RedundancyGroup
Part Component	IBMTSSVC_Storage Volume	Weak	The StorageVolume

IBMTSSVC_SystemVPD

The IBMTSSVC_SystemVPD class associates the Node with its vital product data (VPD).

References

The IBMTSSVC_SystemVPD class extends the CIM_ElementSettingData class and has the references shown in Table 151.

Table 151. 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 152.

Table 152. 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 153.

Table 153. 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 154.

Table 154. IBMTSSVC_UseOfMessageLog properties

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

IBMTSSVC_VolumeSettingData

The IBMTSSVC_VolumeSettingData class extends the CIM_ElementSettingData class.

References

The IBMTSSVC_VolumeSettingData class has the references shown in Table 155.

Table 155. 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 156.

Table 156. 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 157.

Table 157. IBMTSSVC_AccountManagementServiceForSystem references

Name	Target	Qualifier	Description
Antecedent	IBMTSSVC_Account ManagementService	ReadRole, Min, Max	Represents the SecurityService that provides services for the system
Dependent	IBMTSSVC_Object Manager	ReadRole, Weak	Represents the system that is dependent on the security service

IBMTS_AccountOnCIMOM

The IBMTS_AccountOnCIMOM class connects an IBMTS_Account instance with the IBMTS_ObjectManager instance.

References

The IBMTS_AccountOnCIMOM class extends the CIM_AccountOnSystem class and has the references shown in Table 158.

Table 158. IBMTS_AccountOnCIMOM references

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

Properties

The IBMTS_AccountOnCIMOM class has the properties shown in Table 159.

Table 159. 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 160.

Table 160. IBMTS_AccountOnSystem

Name	Reference	Qualifier	Description
Group Component	IBMTSSVC_Cluster	Aggregate, ReadRole, Min, Max	Represents the aggregating system to which access is granted for the Account
Part Component	IBMTS_Account	ReadRole, Weak	Represents the subordinate Account

Properties

The IBMTS_AccountOnSystem class has the properties shown in Table 161 on page 300.

Table 161. 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 162.

Table 162. IBMTS_CommMechanismForManager

Name	Target	Qualifier	Description
Antecedent	IBMTS_ObjectManager	Min, Max	Represents the specific ObjectManager whose communication mechanism is described
Dependent	IBMTS_CIMXML Communication	Min	Represents the encoding, protocol, or set of operations that may be used to communicate with the referenced ObjectManager

IBMTS_ContainsTruststore

The IBMTS_ContainsTruststore class associates the IBMTS_Truststore with the scoping IBMTS_System.

References

The IBMTS_ContainsTruststore class extends the CIM_Dependency class and has the references shown in Table 163

Table 163. IBMTS_ContainsTruststore references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_System		The scoping instance of IBMTS_System.
Dependent	IBMTS_Truststore		The truststore file of the system represented by IBMTS_Truststore.

IBMTS_ElementConformsToProfile

The IBMTS_ElementConformsToProfile connects the ObjectManager and the Server profile.

References

The IBMTS_ElementConformsToProfile class has the references shown in Table 164.

Table 164. IBMTS_ElementConformsToProfile

Name	Target	Qualifier	Description
Conformant Standard	IBMTS_RegisteredProfile		Represents the RegisteredProfile to which the ManagedElement conforms
ManagedElement	IBMTS_ObjectManager		Represents the ManagedElement that conforms to the RegisteredProfile

IBMTS_HasCertificate

The IBMTS_HasCertificate class associates the IBMTS_Truststore to instances of the IBMTS_Certificates.

References

The IBMTS_HasCertificate class extends the CIM_Dependency class and has the references shown in Table 165.

Table 165. IBMTS_HasCertificate references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_Truststore		The instance of IBMTS_Truststore that represents the truststore file.
Dependent	IBMTS_Certificate		The certificate that is contained in the truststore file. The IBMTS_Truststore class represents the truststore file.

IBMTS_HostedAccessPoint

The IBMTS_HostedAccessPoint connects the CIM_System and the CIMXMLMechanism profile.

References

The IBMTS_HostedAccessPoint class has the references shown in Table 166.

Table 166. IBMTS_HostedAccessPoint

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

Table 166. *IBMTS_HostedAccessPoint* (continued)

Name	Target	Qualifier	Description
Dependent	IBMTS_CIMXML Communication	Weak	Represents the SAP(s) that are hosted on this system

IBMTS_HostedService

The *IBMTS_HostedService* is an association between a Service and the System on which the functionality resides. A System may host many Services. Services are weak with respect to their hosting System. A Service is hosted on the System where the LogicalDevices or SoftwareFeatures that implement the Service are located.

References

The model does not represent Services hosted across multiple systems. This is modeled as an *ApplicationSystem* that acts as an aggregation point for Services, that are each located on a single host.

The *IBMTS_HostedService* class has the references shown in Table 167.

Table 167. *IBMTS_HostedService*

Name	Target	Qualifier	Description
Antecedent	IBMTS_System	Min, Max	Represents the hosting system
Dependent	IBMTS_Object Manager	Weak	Represents the service hosted on this system

IBMTS_HostsTruststoreManager

The *IBMTS_HostsTruststoreManager* class associates the *IBMTS_TruststoreManagementService* to the scoping *IBMTS_System*.

References

The *IBMTS_HostsTruststoreManager* class extends the *CIM_HostedService* and has the references shown in Table 168.

Table 168. *IBMTS_HostsTruststoreManager* references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_System		The scoping instance of <i>IBMTS_System</i> .
Dependent	IBMTS_Truststore ManagementService		The <i>IBMTS_Truststore ManagementService</i> of the system.

IBMTS_IndicationFiltersConformsToProfile

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

References

The IBMTS_IndicationFiltersConformsToProfile class has the references shown in Table 169.

Table 169. IBMTS_IndicationFiltersConformsToProfile

Name	Target	Qualifier	Description
Conformant Standard	IBMTS_RegisteredProfile		Represents the RegisteredProfile to which the ManagedElement conforms
ManagedElement	IBMTS_IndicationFilter		Represents the IndicationFilter that conforms to the RegisteredProfile

IBMTS_ManagesAccount

The IBMTS_ManagesAccount class connects an IBMTS_AccountManagementService instance with an IBMTS_Account instance.

References

The IBMTS_ManagesAccount class extends the CIM_ManagesAccount class and has the references shown in Table 170.

Table 170. IBMTS_ManagesAccount references

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

IBMTS_ManagesTruststore

The IBMTS_ManagesTruststore class associates the IBMTS_TruststoreManagementService with the managed instance of the IBMTS_Truststore.

References

Only one truststore file can be represented by an instance of IBMTS_Truststore. If the truststore file is removed, the association is not available.

The IBMTS_ManagesTruststore class extends the CIM_Dependency class and has the references shown in Table 171.

Table 171. IBMTS_ManagesTruststore references

Name	Reference	Qualifier	Description
Antecedent	IBMTS_Truststore ManagementService		The instance of IBMTS_Truststore ManagementService that manages the IBMTS_Truststore

Table 171. *IBMTS_ManagesTruststore* references (continued)

Name	Reference	Qualifier	Description
Dependent	IBMTS_Truststore		The IBMTS_Truststore that is managed

IBMTS_NamespaceInManager

The IBMTS_NamespaceInManager.

References

The IBMTS_NamespaceInManager class has the references shown in Table 172.

Table 172. *IBMTS_NamespaceInManager*

Name	Target	Qualifier	Description
Antecedent	IBMTS_Object Manager	Min, Max	Represents the ObjectManager containing a Namespace
Dependent	IBMTS_Name Space	Weak	Represents the Namespace in an ObjectManager

Chapter 8. CIM Agent methods

This chapter describes the intrinsic and extrinsic methods that the CIM Agent classes provide.

These methods are required for implementing the functionality of the CIM Agent.

Intrinsic methods

Intrinsic methods are provided for modeling a typical Common Information Model (CIM) operation.

Originating from the CIM and Web-Based Enterprise Management (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 173.

Table 173. Supported intrinsic methods

Functional group	Method name
Association traversal	Associators()
	AssociatorNames()
	References()
	ReferenceNames()
Basic read	EnumerateClasses()
	EnumerateClassNames()
	EnumerateInstance()
	EnumerateInstanceNames()
	GetClass()
	GetInstance()
	GetProperty()
Basic write	SetProperty()
Instance manipulation	DeleteInstance()
	CreateInstance()
	ModifyInstance()
Query execution	ExecQuery()

Associators()

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

Parameters

Table 174 on page 306 shows the parameters you can specify for the `Associators()` method.

Table 174. *Associators()* parameters

Parameter	Type	Description
ObjectName	COP*	The class name or instance name that is the source of the association.
AssocClass	String	If not NULL, indicates that all objects must be associated to the source object through an instance of this class or one of its subclasses.
ResultClass	String	If not NULL, indicates that all returned objects must be instances of this class or one of its subclasses or be this class.
Role	String	If not NULL, indicates that each return object must be associated to the source object through an association in which the source object plays the specified role. The name of the property in the association class that refers to the source object must match the value of this parameter.
ResultRole	String	If not NULL, indicates that each returned object must be associated to the source object through an association in which the returned object plays the specified role. The name of the property in the association class that refers to the returned object must match the value of this parameter.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.
* CIMObjectPath		

Return values

The `Associators()` method enumerates the specified classes or instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

AssociatorNames()

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

Parameters

Table 175 on page 307 shows the parameters you can specify for the `AssociatorNames()` method.

Table 175. *AssociatorNames()* parameters

Parameter	Type	Description
ObjectName	COP*	The class name or instances name that is the source of the association.
AssocClass	String	If not NULL, indicates that all object paths returned identify an object that is associated to the source object through an instance of this class or one of its subclasses.
ResultClass	String	If not NULL, indicates that all returned object paths must identify instances of this class or one of its subclasses, or must be this class.
Role	String	If not NULL, the name of the property in the association class that refers to the source object must match the value of this parameter.
ResultRole	String	If not NULL, the name of the property in the association class that refers to the returned object must match the value of this parameter.
* CIMObjectPath		

Return values

The *AssociatorNames()* method enumerates the names of the classes or instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_FAILED

CreateInstance()

You can use the *CreateInstance()* method to create a new instance of an object in the target namespace.

Parameters

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

Table 176 shows the parameters you can specify for *CreateInstance()* method.

Table 176. *CreateInstance()* parameters

Parameter	Type	Description
Instance	String	The name of the instance to create.

Return values

The *CreateInstance()* method creates the specified class or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE

- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

DeleteInstance()

You can use the DeleteInstance() method to remove a single instance of an object from the target namespace.

Parameters

Table 177 shows the parameters you can specify for the DeleteInstance() method.

Table 177. DeleteInstance() parameters

Parameter	Type	Description
InstanceName	String	The name of the instance to delete.

Return values

The DeleteInstance() method deletes the specified instance or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

EnumerateClasses()

You can use the EnumerateClasses() method to enlist all subclasses of a single object class or all classes of the same object type in the target namespace.

Parameters

Table 178 shows the parameters you can specify for the EnumerateClasses() method.

Table 178. EnumerateClasses() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which subclasses are to be returned. If this parameter is NULL, all base classes within the target namespace are returned.
DeepInheritance	Boolean	True returns all subclasses of the specified class. False returns only immediate child subclasses.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers, that are overridden within the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. False returns no qualifiers.

Table 178. EnumerateClasses() parameters (continued)

Parameter	Type	Description
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The EnumerateClasses() method enumerates the specified one or more classes or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

EnumerateClassNames()

You can use the EnumerateClassNames() method to enlist the names of all subclasses of a single object class or the names of all classes of the same object type in the target namespace.

Parameters

Table 179 shows the parameters you can specify for the EnumerateClassNames() method.

Table 179. EnumerateClassNames() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which subclasses are to be returned. If this parameter is NULL, all base classes within the target namespace are returned.
DeepInheritance	Boolean	True returns all subclasses of the specified class. False returns only immediate child subclasses.

Return values

The EnumerateClassNames() method enumerates the specified name of one or more classes or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

EnumerateInstances()

You can use the EnumerateInstances() method to enlist all instances of the same object class in the target namespace.

Parameters

Table 180 shows the parameters you can specify for the `EnumerateInstances()` method:

Table 180. EnumerateInstances() parameters

Parameter	Type	Description
ClassName	String	The name of the class for which instances are to be returned.
DeepInheritance	Boolean	True returns all instances and all properties of the instance, including those added by creating subclasses. False returns only properties defined for the specified class.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers that are overridden within the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for each instance, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class within the instance.

Return values

The `EnumerateInstances()` method enumerates the specified instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

EnumerateInstanceNames()

You can use the `EnumerateInstanceNames()` method to enlist all the names of the instances of the same object class in the target namespace.

Parameters

Table 181 shows the parameters you can specify for the `EnumerateInstanceNames()` method.

Table 181. EnumerateInstanceNames() parameters

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

Return values

The `EnumerateInstanceNames()` method enumerates the specified names of the instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED

- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

ExecQuery()

You can use the ExecQuery() method to run a query against the target namespace.

Parameters

Table 182 shows the parameters you can specify for the ExecQuery() method.

Table 182. ExecQuery() parameters

Parameter	Type	Description
QueryLanguage	String	The query language in which the query parameter is expressed.
Query	String	The query you want to run.

Return values

The ExecQuery() method retrieves one or more classes or instances or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_FAILED

GetClass()

You can use the GetClass() method to retrieve a single object class from the target namespace.

Parameters

Table 183 shows the parameters you can specify for the GetClass() method.

Table 183. GetClass() parameters

Parameter	Type	Description
ClassName	String	The name of the class to retrieve.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers overridden within the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. FALSE returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The GetClass() method returns the specified class or one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_FAILED

GetInstance()

You can use the GetInstance() method to retrieve a single instance of an object from the target namespace.

Parameters

Table 184 shows the parameters you can specify for the GetInstance() method.

Table 184. GetInstance() parameters

Parameter	Type	Description
InstanceName	String	The name of the instance to retrieve.
LocalOnly	Boolean	True returns all properties, methods, and qualifiers overridden during the definition of the class.
IncludeQualifiers	Boolean	True returns all qualifiers for the class, its properties, methods, or method parameters. False returns no qualifiers.
IncludeClassOrigin	Boolean	True returns the CLASSORIGIN attribute of the class.

Return values

The GetInstance() method returns the specified class or one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_FAILED

GetProperty()

You can use the GetProperty() method to retrieve the whole instance and return one specific property from this instance.

Parameters

Table 185 on page 313 shows the parameters you can specify for the GetProperty() method.

Table 185. *GetProperty()* parameters

Parameter	Type	Description
InstanceName	String	The name of the instance.
Property	String	The name of the property whose value is to be returned from the instance.

Return values

The `GetProperty()` method returns the specified property of the target instance or one of the following error codes:

- `CIM_ERR_ACCESS_DENIED`
- `CIM_ERR_INVALID_NAMESPACE`
- `CIM_ERR_INVALID_PARAMETER`
- `CIM_ERR_INVALID_CLASS`
- `CIM_ERR_NOT_FOUND`
- `CIM_ERR_NO_SUCH_PROPERTY`
- `CIM_ERR_FAILED`

ModifyInstance()

You can use the `ModifyInstance()` method to modify an existing instance of an object in the target namespace.

Parameters

Table 186 shows the parameters you can specify for the `ModifyInstance()` method.

Table 186. *ModifyInstance()* parameters

Parameter	Type	Description
InstanceName	String	The name of the instance to modify.

Return values

The `ModifyInstance()` method modifies the specified instance or returns one of the following error codes:

- `CIM_ERR_ACCESS_DENIED`
- `CIM_ERR_INVALID_NAMESPACE`
- `CIM_ERR_INVALID_PARAMETER`
- `CIM_ERR_INVALID_CLASS`
- `CIM_ERR_NOT_FOUND`
- `CIM_ERR_FAILED`

References()

You can use the `References()` method to enumerate the association objects that refer to a particular target class or instance.

Parameters

Table 187 shows the parameters you can specify for the References() method.

Table 187. References() parameters

Parameter	Type	Description
ObjectName	String	The class name or instance name whose referring objects are to be returned.
ResultClass	String	If not NULL, indicates that all returned objects must be instances of this class or one of its subclasses or must be this class.
Role	String	If not NULL, must be a valid property name. Each returned object must refer to the target object through a property whose name matches the value of this parameter.
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 188 shows the parameters you can specify for the ReferenceNames() method.

Table 188. ReferenceNames() parameters

Parameter	Type	Description
ObjectName	String	The class name or instance name whose referring objects are to be returned.
ResultClass	String	If not NULL, indicates that all returned object paths must be object paths of instances of this class or one of its subclasses, or must be this class.
Role	String	If not NULL, must be a valid property name. Each returned object must refer to the target object through a property whose name matches the value of this parameter.

Return values

The ReferenceNames() method enumerates the association objects or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_NO_SUCH_PROPERTY
- CIM_ERR_FAILED

SetProperty()

You can use the SetProperty() method to define a single property value of an instance in the target namespace.

Parameters

Table 189 shows the parameters you can specify for the SetProperty() method.

Table 189. SetProperty() parameters

Parameter	Type	Description
InstanceName	String	The name of the instance.
PropertyName	String	The name of the property whose value is to be defined.

Return values

The SetProperty() method defines the property name of the target instance or returns one of the following error codes:

- CIM_ERR_ACCESS_DENIED
- CIM_ERR_INVALID_NAMESPACE
- CIM_ERR_INVALID_PARAMETER
- CIM_ERR_INVALID_CLASS
- CIM_ERR_NOT_FOUND
- CIM_ERR_NO_SUCH_PROPERTY
- CIM_ERR_TYPE_MISMATCH
- CIM_ERR_FAILED

Extrinsic methods

Extrinsic methods are specific to Common Information Model (CIM) object classes and are defined by the object model provider according to a specific Storage Management Initiative Specification (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 that are listed in Table 190.

Table 190. Supported extrinsic methods

Class	Method name
IBMTSSVC_BackendVolume	GetFreeExtents()
IBMTSSVC_Chassis	IsCompatible()
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_HardwareIdCollection	GetIOGroups()
IBMTSSVC_IOGroups	GetHosts()
IBMTSSVC_Job	KillJob()

Table 190. Supported extrinsic methods (continued)

Class	Method name
IBMTSSVC_MessageLog	CancelIteration()
	ClearLog()
	DeleteRecord()
	FixRecord()
	GetAllRecords()
	GetRecord()
	ModifyErrorSettings()
	PositionAtRecord()
	PositionToFirstRecord()
	PositionToFirstRecordRoot()
	PositionToFirstRecordType()
	UnfixRecord()
	WriteRecord()
IBMTSSVC_PrimordialStoragePool	GetSupportedSizes()
	GetSupportedSizeRange()
IBMTSSVC_PrivilegeManagementService	AssignAccess()
	RemoveAccess()
IBMTSSVC_Provider	Add2062Cluster()
	Add2145Cluster()
	Create2062Cluster()
	Reload2062Node()
	RemoveCluster()
	Reset2062Node()
IBMTSSVC_ServiceModeService	Clean()
	Dump()
	Enter()
	Exit()
	GetDump()
	Upgrade()
IBMTSSVC_StorageCapabilities	CreateSetting()

Table 190. Supported extrinsic methods (continued)

Class	Method name
IBMTSSVC_StorageConfigurationService	AttachReplica()
	CreateOrModifyStoragePool()
	CreateOrModifyElementFromStoragePool()
	CreateRemoteClusterPartnership()
	CreateReplica()
	CreateSynchronizedSet()
	DeleteRemoteClusterPartnership()
	DeleteStoragePool()
	DeleteSynchronizedSet()
	IncludeBackendVolume()
	MigrateVolume()
	MigrateVolumeToImageMode()
	ModifySynchronization()
	ModifySynchronizedSet()
	ReturnToStoragePool()
	RequestDiscovery()
	SetIOGroup()
	SetQuorum()
	StartService()
StopService()	
IBMTSSVC_StorageHardwareID ManagementService	AddHardwareIDsToCollection()
	CreateHardwareIDCollection()
	CreateStorageHardwareID()
	DeleteHardwareIDCollection()
	DeleteStorageHardwareID()
	ModifyHostIOGroupMapping()
IBMTSSVC_StoragePool	GetSupportedSizes()
	GetSupportedSizeRange()
IBMTS_TrustStorageManagementService	GenerateCIMOMCertificate()
	DeleteCertificate()
	EnableAutoGeneration()
	DisableAutoGeneration()
	SetDefaultValidity()
	CheckValidity()

Add2145Cluster()

You can use the Add2145Cluster() command to configure the ICAT to work with an existing 2145 cluster.

Parameters

The Add2145Cluster() method belongs to the IBMTSSVC_Provider class. Table 191 shows the parameters you can specify for the Add2145Cluster() method.

Table 191. Add2145Cluster() parameters

Parameter	Type	Description
Cluster	IBMTSSVC_Cluster REF	A reference to the cluster that was added.
ClusterIP	String	The IP of the cluster to be added.

Return values

The Add2145Cluster() method returns one of the following error codes:

- 0: The cluster was added successfully.
- 2: The attempt failed.
- 5: The number or type of parameters that have been passed is invalid.
- ...: DMTF Reserved.
- 0x8000: Connection to cluster refused.
- ...: Vendor Reserved.
- 0x8005: Syntax error in cluster IP.

AddHardwareIDsToCollection()

You can use the AddHardwareIDsToCollection() method to add a StorageHardwareID to a HardwareIDCollection.

Parameters

When a StorageHardwareID is added to a collection, the corresponding host object is deleted on the device and the WWPN is added to the host representing the collection. The AddHardwareIDsToCollection() method belongs to the IBMTSSVC_StorageHardwareIDManagementService class.

Table 192 shows the parameters you can specify for the AddHardwareIDsToCollection() method.

Table 192. AddHardwareIDsToCollection() parameters

Parameter	Type	Description
HardwareIDs	String[]	An array that contains the string representations of the CIMOM Object Paths for StorageHardwareIDs that must be immediately added to the collection. Alternatively, IDs can contain the WWPN. In this case, the creation of StorageHardwareIDs is circumvented.
Collection	CIM_SystemSpecific Collection REF	The IBMTSSVC_HardwareID Collection to add the IDs to.

Return values

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

- 0: The collection was successfully created.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: One of the parameters is invalid.
- 0x1000: The `StorageHardwareID` could not be found or is already member of another collection.
- 0x1001: Implementation does not support device collections.
- 0x1002: Input devices cannot be used in this collection.
- 0x8100: One or more parameters is out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

AddNode()

You can use the `AddNode()` method to add an `IBMTSSVC_CandidateNode` instance to an `IBMTSSVC_Cluster` instance.

Parameters

The `AddNode()` method belongs to the `IBMTSSVC_ClusteringService` class.

When invoked, the `AddNode()` method automatically chooses the `IBMTSSVC_RedundancyGroup` for the candidate node. If the `IBMTSSVC_RedundancyGroup` instances have only one existing node, the method selects the one whose identifier contains the smallest number. If no such `IBMTSSVC_RedundancyGroup` exists, the method selects an empty `IBMTSSVC_RedundancyGroup` whose identifier contains the smallest number.

Table 193 shows the parameters you can specify for the `AddNode()` method.

Table 193. *AddNode()* parameters

Parameter	Type	Description
CS	COP*	Defines the <code>IBMTSSVC_CandidateNode</code> instance to be added. The <code>IBMTSSVC_CandidateNode</code> instance is in the same cluster as the <code>IBMTSSVC_ClusteringService</code> instance.
Set	String	The IO group to add the node to. This must be of type <code>IBMTSSVC_IOGroupSet</code> , belong to the same Cluster as the Service hosting this method and contain zero or one nodes.
Name	String	The name by which the new node will be known by the cluster.
* CIMObjectPath		

Return values

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

- 0: The node was successfully added.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted ComputerSystem was not a IBMTSSVC_CandidateNode
- 0x8001: All redundancy groups already have two nodes assigned.
- 0x8002; The submitted ExtraCapacitySet was not a IBMTSSVC_IGroupSet.
- 0x8003; The submitted IOGroupSet already has two assigned nodes.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

AssignAccess()

You can use the AssignAccess() method to create a temporary IBMTSSVC_AccessControlInformation instance that contains the IBMTSSVC_AuthorizationSubject, IBMTSSVC_AuthorizationTarget, IBMTSSVC_HostedACI, and IBMTSSVC_AuthorizedUse associations in the CIMOM repository.

Parameters

The AssignAccess() method belongs to the IBMTSSVC_AuthorizationService class.

Table 194 shows the parameters you can specify for the AssignAccess() method.

Table 194. AssignAccess() parameters

Parameter	Type	Description
Activities	Uint16[]	<p><i>Must</i> be NULL unless the Privilege is NULL on input. This parameter specifies the activities to be granted or denied.</p> <p>Code Semantics</p> <p>1 Other</p> <p>2 Create</p> <p>3 Delete</p> <p>4 Detect</p> <p>5 Read</p> <p>6 Write</p> <p>7 Execute</p> <p>.. DMTF Reserved</p> <p>16000..65535 Vendor Reserved</p>
ActivityQualifiers	String[]	<p><i>Must</i> be NULL unless Privilege is NULL on input. Defines the activity qualifiers for the Activities to be granted or denied.</p>
PrivilegeGranted	Boolean	<p><i>Must</i> be NULL unless Privilege is NULL on input. Indicates whether the rights defined by the parameters in this call should be granted or denied to the named subject/target pair.</p>

Table 194. AssignAccess() parameters (continued)

Parameter	Type	Description
QualifierFormats	UInt16[]	<p>Must be NULL unless Privilege is NULL on input. Defines the qualifier formats for the corresponding ActivityQualifiers.</p> <p>Code Semantics</p> <p>2 Class Name</p> <p>3 <Class.>Property</p> <p>4 <Class.>Method</p> <p>5 Object Reference</p> <p>6 Namespace</p> <p>7 URL</p> <p>8 Directory/File Name</p> <p>9 Command Line Instruction</p> <p>10..15999 DMTF Reserved</p> <p>16000..65535 Vendor Reserved</p>
Subject	CIM_ManagedElement REF	Defines the IBMTSSVC_HardwareAccount instance that is in the same IBMTSSVC_Cluster as the IBMTSSVC_AuthorizationService instance.
Target	CIM_ManagedElement REF	On input, this reference <i>must</i> 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.

Parameters

The AttachDevice() method belongs to the IBMTSSVC_Controller class.

The provider must verify that unit numbers are unique for each initiator. When the ProtocolController is already part of an AuthorizedTarget association, the provider should update the access configuration in the underlying hardware when AttachDevice is called.

Table 195 shows the parameters you can specify for the AttachDevice() method.

Table 195. AttachDevice() parameters

Parameter	Type	Description
Device	COP*	Defines the volume instance to be attached. This device must belong to the same RedundancyGroup as the controller and be of type IBMTSSVC_StorageVolume.
[DeviceNumber]		The logical unit number (LUN) at which the volume will be exposed to all hosts connected to this controller.
[Force]	Boolean	When false (the default), attempting to attach a volume that is already attached to another controller will fail.
ProtocolController		The controller to which you attach the volume must belong to the same cluster as this service.
* CIMObjectPath		

Return values

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

- 0: The volume was successfully attached.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The device is not a volume of the controller's RedundancyGroup.
- 0x1001: The specified device number is already occupied.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

AttachReplica()

You can use AttachReplica() to create a copy relationship between two volumes.

Parameters

Table 196 on page 324 shows the parameters you can specify for the AttachReplica() method.

Table 196. AttachReplica() parameters

Parameter	Type	Description
[BackgroundCopyRate]	UInt16	Specifies the priority of the background copy rate "0–100". Scale is not in percent, instead it is "non-linear."
CopyType	String	Determines the type of the copy relationship. In CIM this is Sync, Async or UnSynchAssoc. In SAN Volume Controller terminology, this translates to "flash" or "metro." For a CopyType=3 (Sync) a Metro Mirror copy is created, for CopyType=4 (UnSynchAssoc) a FlashCopy is created.
[ElementName]	String	The name of the IBMTSSVC_StorageSynchronized association.
[Set]	String	Defines the IBMTSSVC_SynchronizedSet.
SourceElement		The source volume. Required to be an IBMTSSVC_StorageVolume.
[Synchronized]	Boolean	Valid for CopyType "Sync" only. If true, the SAN Volume Controller assumes that both source and target already contain identical data and no initial synchronization has to be performed.
TargetElement		The target volume. Can be an IBMTSSVC_StorageVolume or an IBMTSSVC_CandidateVolume.

Return values

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

- 0: The copy relationship was established successfully.
- 4: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: CopyType is neither 2 nor 3.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

BackupConfiguration()

You can use the BackupConfiguration() command to run the configuration backup script. The script stores the current cluster configuration associated with the current instance of ClusteringService in an XML file.

Parameters

The file name is svc.config.backup.xml. The svc.config.backup.xml file is stored in the directory backup/<clustername> that is located in the CIMOM home directory. If a current cluster backup file already exists, the file will be renamed with a .bak extension on the original backup file name. Any current .bak files of the same name will be overwritten. This file is designed for file restoration if an error or corruption occurs during the backup process. If the .bak files are used for restore, they must be renamed manually.

Table 197 on page 325 shows the parameters you can specify for the BackupConfiguration() method.

Table 197. 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()

You can use the CancelIteration() method to request that an iteration of the Log, identified by the IterationIdentifier input parameter, be stopped. CancelIteration() belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 198 shows the parameters you can specify for the CancelIteration() method.

Table 198. CancelIteration() parameters

Parameter	Type	Description
IterationIdentifier	String	The current iterator.

Return values

The CancelIteration() method returns one of the following error codes.

- 0: The method completed successfully.
- 2: Unknown.
- 3: Timeout.
- 4: Failed.
- 5. The number or type of parameters that have been passed is incorrect.

CheckValidity()

You can use this method to check the validity of an IBMTS_Certificate.

Parameters

You must have administrator privileges to run this method.

Table 199 shows the parameters you can specify for the CheckValidity() method.

Table 199. CheckValidity() parameters

Parameter	Type	Description
Certificate	IBMTS_Certificate REF	The reference to the instance of IBMTS_Certificate you want to check.
IsValid	Boolean	A boolean that indicates if the checked certificate is valid.
Validity	UInt32	The number of remaining valid days.

Return values

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

- 0: The information about the certificate was successfully obtained.
- 2: Failed to obtain information on certificate.
- 5: One of the parameters is invalid.

Clean()

You can use the Clean() method to clean the dump directories on the node.

Parameters

The Clean() method belongs to the IBMTSSVC_ServiceModeService class. Table 200 shows the parameters you can specify for the Clean() method.

Table 200. Clean() parameters

Parameter	Type	Description
Filter	String	The filter's syntax. If a directory is specified with no file filter, all relevant dump/log files in this directory are cleaned. The allowable directory arguments are: dumps (which cleans all files, including all subdirectories), dumps/configs, dumps/elogs, dumps/feature, dumps/iostats, dumps/iotrace and home/admin. You can also specify a file filter.
SMNode	IBMTSSVC_Node	The node that the dump file is deleted from. A dump file on the config node will be deleted, if nothing is specified.

Return values

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

- 0: The Clean() method was successful.
- 2: An unexpected error occurred and the command failed.
- 5: The wrong number or type of parameter has been passed.
- 0x8100: One of the parameters was out of the cluster scope.

- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ClearLog()

You can use the ClearLog() method to delete all of the entries in the error log.

Return values

If the request is not supported, check the Capabilities array that a value of 6 ("Clear Log Supported") is specified. In a subclass, the set of possible return codes could be described using a ValueMap qualifier on the method. The ClearLog() method belongs to the IBMTSSVC_MessageLog class.

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

- 0: All entries in the error log were deleted.
- 2: An unexpected error occurred.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

CreateHardwareIDCollection()

You can use the CreateHardwareIDCollection method to create an instance of IBMTSSVC_HardwareIDCollection. The IBMTSSVC_HardwareIDCollection is represented by a host object on the device.

Parameters

The HardwareIDCollection aggregates StorageHardwareIDs. If a StorageHardwareID is added to a collection, the corresponding host object is deleted on the device and the worldwide port name (WWPN) is added to the host that represents the collection. The CreateHardwareIDCollection() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Table 201 shows the parameters that you can specify for the CreateHardwareIDCollection() method.

Table 201. CreateHardwareIDCollection() parameters

Parameter	Type	Description
ElementName	String	The name of the collection.
HardwareIDs	String[]	An array that contains the string representations of the CIMOM Object Paths for StorageHardwareIDs to be added immediately to the collection. Alternatively, IDs can contain the WWPN. In this case, the creation of StorageHardwareIDs is circumvented.
IOGroups	String[]	An array that contains the names or IDs of the I/O groups that will be associated with the new collection. If you do not specify this parameter, the new collection is associated with all of the I/O groups in the cluster.
Collection	CIM_System SpecificCollection REF	The IBMTSSVC_HardwareIDCollection is the collection to add the IDs to.

Return values

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

- 0: The collection was successfully created.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: One of the parameters is invalid.
- 0x1000: The `StorageHardwareID` could not be found or is already member of another collection.
- 0x1001: Implementation does not support hardware ID collections.
- 0x1002: Input hardware IDs cannot be used in same collection.
- 0x8100: One or more parameters is out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

CreateOrModifyStoragePool()

You can use the `CreateOrModifyStoragePool()` method to create or modify an `IBMTSSVC_StoragePool`.

Parameters

The `CreateOrModifyStoragePool()` method belongs to the `IBMTSSVC_StorageConfigurationService` class. You can use the `CreateOrModifyStoragePool()` method to create an `IBMTSSVC_StoragePool` if the `Pool` parameter is set to null, or you can modify an existing `IBMTSSVC_StoragePool` if the `Pool` parameter is not null.

Table 202 shows the parameters you can specify for the `CreateOrModifyStoragePool()` method.

Table 202. `CreateOrModifyStoragePool()` parameters

Parameter	Type	Pool creation description	Pool modification description
Blocksize	Uint16	The block size (also known as extent size) for the new pool. Supported values are 16, 32, 64, 128, 256, or 512 MB. The default value is 16 MB. The block size defines the granularity by which the capacity is managed by the SAN Volume Controller. For example, if you select a block size of 256 MB, all storage volumes will occupy space in multiples of 256 MB. Thus, a 300 MB storage volume will allocate 512 MB of pool capacity.	Must be null. The block size can only be set when the pool is first created.
ElementName	String	The <code>ElementName</code> of the pool to be created. If null, the system will assign a name.	The new name for the pool.

Table 202. CreateOrModifyStoragePool() parameters (continued)

Parameter	Type	Pool creation description	Pool modification description
[Extent]	String	Points to the StorageExtent.	Points to the StorageBackend Volume.
Force	Boolean	Not used.	If set to True, the deletion of managed disks (MDisks) is forced. Force is ignored if disks are added.
Goal	CIM_StorageSetting REF	Contains the desired name and extent size for the new pool. If Goal is different from the static instance in the persistence layer, the method will fail.	The desired name and extent size for the new pool. If Goal is different from the static instance in the persistence layer, the method will fail.
InExtents	String[]	The BackendVolumes from which to build the Pool. Mutually exclusive with InPools. If InExtents is given, Size will be ignored.	StorageBackend Volumes are the names used by the SAN Volume Controller for managed disks (MDisks). StorageBackend Volumes can be added or removed from the pool. They must belong to the same cluster as the pool and must not be aggregated by any other pool. If Size is less than the actual size of the pool, BackendVolumes passed in here will be removed.
InPools	String[]	The PrimordialPool from which to take the BackendVolumes. Mutually exclusive with InExtents.	The PrimordialPool that you take additional BackendVolumes from. Mutally 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.

Table 202. CreateOrModifyStoragePool() parameters (continued)

Parameter	Type	Pool creation description	Pool modification description
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.
[Size]		The desired size of the new Pool. When InPools is given, it will take as many BackendVolumes as necessary from the PrimordialPool in order to achieve the requested size. If InExtents is given, this parameter will be ignored. The size of the new storage pool is given by the sum of the sizes of the aggregated extents.	The desired new size of the pool. When InPools is given, it will take BackendVolumes from the PrimordialPool in order to achieve the requested size. If InExtents is given, this parameter will be ignored. See InExtents for more information. The size of the new storage pool is given by the sum of the sizes of the aggregated extents. You cannot shrink a pool using this method and passing InPools.
Size	Uint64	The real allocated size of the Pool in bytes.	The real allocated size of the Pool in bytes.

Return values

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

- 0: The pool was successfully created.
- 2: An unknown error occurred.
- 4: An unexpected error occurred.
- 3: The action timed out.
- 5: At least one of the parameters was invalid.
- 6: In use.
- 4096: Method parameters checked. Job started.
- 4097: Size not supported.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateOrModifyElementFromStoragePool()

You can use the CreateOrModifyElementFromStoragePool() method to create an IBMTSSVC_StorageVolume instance if TheElement parameter is null, or you can modify an IBMTSSVC_StorageVolume instance if TheElement parameter is not null.

Parameters

The `CreateOrModifyElementFromStoragePool()` method belongs to the `IBMTSSVC_StorageConfigurationService` class.

Table 203 shows the parameters you can specify for the `CreateOrModifyElementFromStoragePool()` method.

Table 203. `CreateOrModifyElementFromStoragePool()` parameters

Parameter	Type	Description	
		Volume creation	Volume modification
Backend Volumes	String[]	An array that contains the backend volumes that will store the data from the volume. This parameter is mandatory if the virtualization type is "sequential" or "image". For all virtualization types except "image," all backend volumes must belong to the storage pool in the <code>InPool</code> . If the virtualization type is "image," the backend volume must belong to a <code>PrimordialStoragePool</code> .	In the case of volume expansion, a list of backend volumes on which the additional capacity will be allocated can be submitted. In all other cases, this parameter must be null.
Element Name	String	The <code>ElementName</code> of the volume to be created. If null, the system will assign a name.	The new name for the volume.
ElementType	Uint16	<code>ElementType=2</code> , <code>IBMTSSVC_StorageVolume</code> .	<code>ElementType=2</code> , <code>IBMTSSVC_StorageVolume</code> .
Format	Boolean	Specifies if the volume is formatted on creation. The default is false.	Specifies if the additional volume capacity is formatted on expansion. The default is false.
Goal	CIM_Managed Element REF	Contains special settings for the new volume. Must be a valid <code>StorageSetting</code> for volumes if submitted.	Must be a valid <code>StorageSetting</code> for volumes, if submitted.
InPool	CIM_Storage Pool REF	The <code>IBMTSSVC_StoragePool</code> from which the volume is to be allocated. The pool and the <code>StorageConfigurationService</code> must belong to the same cluster. Must be set if <code>TheElement</code> is null.	Set to null.
IOGroup	IBMTSSVC_ IOGroup REF	The I/O group that the storage volume will be assigned to. If null, the method will choose the I/O group with the fewest number of virtual disks (VDisks) assigned.	Must be null.

Table 203. CreateOrModifyElementFromStoragePool() parameters (continued)

Parameter	Type	Description	
		Volume creation	Volume modification
Job	CIM_Concrete Job REF	Set to null.	Set to null.
Preferred Node	IBMTSSVC_ Node REF	The preferred node for volume access. If I/O group is null, this parameter must also be null. Otherwise, it must belong to the I/O group that is specified.	
Size	UInt64	The size of the volume in bytes. This parameter directly corresponds to the size CLI parameter. The SAN Volume Controller supports only sizes that are multiples of 512 bytes. If the size doesn't fulfill this criteria, the method fails with "size not supported."	The size of the volume in bytes. The CLI amount parameter is calculated as follows: amount = size - current size. If the amount is positive, the volume will be expanded. If the amount is negative, it will be reduced. The SAN Volume Controller supports only sizes that are multiples of 512 bytes. If the size does not fulfill this criteria, the method fails with "size not supported."
TheElement	CIM_Logical Element REF	Specifies the IBMTSSVC_StorageVolume instance to be created. If null, a new storage volume will be allocated from InPool. If not null the passed storage volume will be expanded or reduced, depending on the Size parameter.	Specifies the IBMTSSVC_StorageVolume instance to be modified (reduced or expanded).
UnitDeviceID	UInt16	Sets the unit device identifier for the new VDisk.	-
Virtualization Type	UInt8	Sets the type of Volume created. The following values are possible: "striped" (0), "sequential" (1) or "image" (2). The default is "striped."	Must be null.

Return values

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

- 0: The volume was successfully created.
- 4: An unexpected error occurred.
- 5: At least one of the parameters was invalid.
- 0x1001: The requested size is not a multiple of 512. The nearest supported size greater than the requested size is returned in Size.
- 0x8100: One of the parameters was out of the cluster scope.

- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateProtocolControllerWithPorts()

You can use the CreateProtocolControllerWithPorts() method to create an IBMTSSVC_Controller.

Parameters

You can use the controller to attach Volumes using the AttachDevice() method. The controller is created in the Common Information Model Object Manager (CIMOM) repository. A controller is bound to an IOGroup and can therefore contain only FCPorts of this IOGroup. The CreateProtocolControllerWithPorts() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Table 204 shows the parameters you can specify for the CreateProtocolControllerWithPorts() method.

Table 204. 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 are 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.
- 0x8002: This SPC already exists, the return parameter ProtocolController contains a reference to the existing SPC.
- 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.

Parameters

The method must be run on both the source cluster and the candidate cluster to establish a fully functional synchronous copy partnership. The `CreateRemoteClusterPartnership()` method belongs to the `IBMTSSVC_StorageConfigurationService` class.

Table 205 shows the parameters you can specify for the `CreateRemoteClusterPartnership()` method.

Table 205. *CreateRemoteClusterPartnership()* parameters

Parameter	Type	Description
RemoteCluster	IBMTSSVC_CandidateCluster REF	The cluster for which a relationship is created. Cluster membership checks are required.
[Bandwidth]	Uint16	The bandwidth for the copy operation in megabytes (MB).

Return values

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

- 0: The cluster partnership was successfully established.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The wrong number or type of parameters were passed.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateReplica()

You can use the `CreateReplica()` method to create a replica of the source volume for a copy relationship.

Parameters

The `CreateReplica()` method belongs to the `IBMTSSVC_StorageConfigurationService` class. Table 206 shows the parameters you can specify for the `CreateReplica()` method.

Table 206. *CreateReplica()* parameters

Parameter	Type	Description
CopyType	Uint16	The type of copy relationship. Possible values are 3 (Metro Mirror) or 4 (FlashCopy). Metro Mirror copies can only be established on the same cluster.

Table 206. CreateReplica() parameters (continued)

Parameter	Type	Description
CacheMode	Uint16	If this value is 0 (None), there is no caching. If this value is 1 (Read/Write), there is caching of both reads and writes. The default value is 1 (Read/Write). Code Semantics 0 None 1 Read/Write
[ElementName]	String	The name of the replica to be created. If null, 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 storage volume for the replica.
TargetElement	CIM_LogicalElement REF	The target storage volume for the replica.
TargetSettingGoal	CIM_StorageSetting REF	The StorageSetting object to be matched by the replica. Passed to the CreateOrModifyElement FromStoragePool method.
TargetPool	String	The IBMTSSVC_StoragePool that will be used for the target volume.
UnitDeviceID	Uint16	Sets the unit device identifier for the new replica.

Return values

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

- 0: The cluster partnership was successfully established.
- 4: An unexpected error occurred.
- 5: The number or type of parameters that were passed is incorrect.
- 0x8000: A CopyType other than 3 or 4 was used.
- 0x8100: One or more of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

CreateSetting()

You can use the CreateSetting() method to create and populate a StorageSetting instance from a StorageCapability instance.

Parameters

This removes the need to populate default settings and other settings in the context of each StorageCapabilities (which could be numerous).

The CreateSetting() method belongs to the IBMTSSVC_StorageCapabilities class. Table 207 on page 336 shows the parameters you can specify for the CreateSetting() method.

Table 207. CreateSetting() parameters

Parameter	Type	Description
NewSetting	CIM_StorageSetting REF	Reference to the created StorageSetting instance.
SettingType	Uint16	The value of this parameter is without meaning to the SAN Volume Controller. For both Default and Goal, the same StorageSetting is returned.

Return values

The CreateSetting() method returns one of the following error codes.

- 0: The method completed successfully.
- 2: Unspecified error.
- 3: Timeout.
- 4: The method failed.
- 5. The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.
- 32768..65535: Vendor specific.

CreateStorageHardwareID()

You can use the CreateStorageHardwareID() method to create an instance of IBMTSSVC_StorageHardwareID.

Parameters

On the device level, the instance is represented by a single-port host object with the name prefix "cimhwid".

Table 208 shows the parameters you can specify for the CreateStorageHardwareID() method.

Table 208. CreateStorageHardwareID() parameters

Parameter	Type	Description
ElementName	String	The name of the new HardwareID instance. Must be identical to ID.
StorageID	String	The value used by the SecurityService to represent identity. In this case, a PortWWN.
IDType	Uint16	The type of the ID property. In this case, 2 (PortWWN).
OtherIDType	String	The type of the storage ID when the IDType is "Other."
Setting	CIM_StorageClient SettingData REF	Required to be null.
HardwareID	CIM_StorageHardwareID REF	The CIMOM Object Path for the created StorageHardwareID.

Return values

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

- 0: The volume was successfully detached.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The WWPN is already assigned to an existing StorageHardwareID.
- 0x1001: The IDType is not 2.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

CreateSynchronizedSet()

You can use the CreateSynchronizedSet() method to create an IBMTSSVC_SynchronizedSet instance for aggregating IBMTSSVC_StorageSynchronized associations for FlashCopy or Metro Mirror relationships.

Parameters

Some devices may not support SynchronizedSets. In order to find out if SynchronizedSets are supported, call GetSupportedSetTypes. The CreateSynchronizedSet() method belongs to the IBMTSSVC_StorageConfigurationService class.

Table 209 shows the parameters you can specify for the CreateSynchronizedSet() method.

Table 209. CreateSynchronizedSet() parameters

Parameter	Type	Description
CopyType	Uint16	The type of copy relationship (3 for Metro Mirror ; 4 for FlashCopy).
[ElementName]	String	The name of the copy relationship.
[RemoteCluster]	IBMTSSVC_Remote Cluster REF	The remote cluster for the ConsistencySet. Only StorageSynchronized with volumes on this remote cluster can be added to this set. This setting is valid only for CopyType 3 (Metro Mirror). The default is the local cluster. This setting must be null if the CopyType is 4 (FlashCopy).
[Set]	CIM_Synchronized Set REF	The IBMTSSVC_FlashCopySynchronized Set or IBMTSSVC_SyncCopySynchronized Set instance that is created.

Return values

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

- 0: The SynchronizedSet was created successfully.

- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that were passed is incorrect.
- 6: A copy type other than 3 or 4 was used.
- 8: SynchronizedSets are not supported.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents SAN Volume Controller return codes and messages.

DeleteCertificate()

You can use this method to delete a server certificate.

Parameters

After the server certificate is deleted, it is not possible to establish a secure connection using server authentication. You must either restart the CIM Agent on port 5988 and invoke the generateCIMOMCertificate() or manually call the batch file mkcertificate.bat.

You must have administrator privileges to run this method.

Table 210 shows the parameters you can specify for the DeleteCertificate() method.

Table 210. DeleteCertificate() parameters

Parameter	Type	Description
Certificate	IBMTS_Certificate REF	The reference to the instance of IBMTS_Certificate that you want to delete.

Return values

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

- 0: The certificate was successfully deleted.
- 2: Failed to generate new certificate due to provider internal reasons.
- 4: Failed to generate new certificate due to truststore problems.
- 5: One of the parameters is invalid.

DeleteConfigurationBackup()

You can use the DeleteConfigurationBackup() command to delete the backups in the Backup directory.

Parameters

Table 211 shows the parameters you can specify for the DeleteConfigurationBackup() method.

Table 211. DeleteConfigurationBackup() parameters

Parameter	Type	Description
Backup	String	The name of the backup to delete.

Return values

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

- 0: The restore was successful.
- 2: An unexpected error occurred.
- 5: The given backup could not be found.
- 0x8000: The backup directory deletion failed. This could be caused by a sharing violation.

DeleteHardwareIDCollection()

You can use the DeleteHardwareIDCollection() method to delete a SAN Volume Controller host.

Parameters

The DeleteHardwareIDCollection() method belongs to the IBMTSSVC_ControllerConfigurationService class.

Table 212 shows the parameters you can specify for the DeleteHardwareIDCollection() method.

Table 212. DeleteHardwareIDCollection() parameters

Parameter	Type	Description
Collection	CIM_System SpecificCollection REF	The CIMOM Object Path of the IBMTSSVC_Host to be deleted.
Force	Boolean	Optionally specifies that the deletion will be forced (if set to true). Otherwise the deletion would fail if a privilege is still associated with the collection. If specified, the host will be deleted even if it is a member of a LUN mapping.

Return values

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

- 0: The volume was successfully detached.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The device has no ProtocolControllerForUnit association to this controller.
- 0x8000: Collection is associated with a privilege, and the Force parameter was not specified.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

DeleteProtocolController()

You can use the DeleteProtocolController() method to delete a controller from the Common Information Model Object Manager (CIMOM) repository or from the SAN Volume Controller, respectively.

Parameters

The DeleteProtocolController() method belongs to the IBMTSSVC_ControllerConfigurationService class. Table 213 shows the parameters you can specify for the DeleteProtocolController() method.

Table 213. 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 belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 214 shows the parameters you can specify for the DeleteRecord() method.

Table 214. 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	

Table 214. DeleteRecord() parameters (continued)

Parameter	Type	Description
RecordData	UInt8[]	

Return values

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

- 0: The method completed successfully.
- 2: Unknown.
- 3: Timeout.
- 4: Failed.
- 5. The number or type of parameters that have been passed is incorrect.

DeleteRemoteClusterPartnership()

You can use the DeleteRemoteClusterPartnership() method to remove a partnership between two IBMTSSVC_Cluster instances.

Parameters

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

Table 215 shows the parameters you can specify for the DeleteRemoteClusterPartnership() method.

Table 215. DeleteRemoteClusterPartnership() parameters

Parameter	Type	Description
RemoteCluster	IBMTSSVC_Remote Cluster REF	The name of the candidate remote cluster. Cluster membership checks are required.

Return values

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

- 0: The cluster partnership was successfully deleted.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed
- 5: The wrong number or type of parameters was passed.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

DeleteStorageHardwareID()

You can use the DeleteStorageHardwareID() method to delete a StorageHardwareID.

Parameters

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

Table 216 shows the parameters you can specify for the DeleteStorageHardwareID() method.

Table 216. DeleteStorageHardwareID() parameters

Parameter	Type	Description
HardwareID	CIM_StorageHardwareID REF	The IBMTSSVC_StorageHardwareID to delete.
Force	Boolean	TRUE, the deletion will be forced. The StorageHardwareID will be deleted even if it is associated with a Privilege. If specified, the ID will be deleted even if any active LUN masking is assigned to it.

Return values

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

- 0: The volume was successfully detached.
- 2: An unexpected error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x1000: The StorageHardwareID could not be found.
- 0x8000: The HardwareAccount is still bound to AuthorizationSubject.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

DeleteSynchronizedSet()

You can use the DeleteSynchronizedSet() method to delete a SynchronizedSet if it does not contain any StorageSynchronized associations.

Parameters

The DeleteSynchronizedSet() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 217 on page 343 shows the parameters you can specify for the DeleteSynchronizedSet() method.

Table 217. DeleteSynchronizedSet()

Parameter	Type	Description
Force	Boolean	If set to False, the delete will fail if any StorageSynchronized are member of the set. The default is false. When Force is set to True, all contained StorageSynchronized will be moved out of the Set before it is deleted. Therefore, the StorageSynchronized survive as stand-alone copy mappings.
Set	CIM_SynchronizedSet REF	The SynchronizedSet to be deleted. The InstanceID corresponds to the SAN Volume Controller consistency_grp ID.

Return values

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

- 0: The SynchronizedSet was successfully deleted.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 6: There are still StorageSynchronized associations in the set when it should be empty. Any StorageSynchronized associations must be removed before deletion of the set can be completed, or the Force flag must be set.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

DeleteStoragePool()

You can use the DeleteStoragePool() method to delete an IBMTSSVC_StoragePool instance if it does not contain any IBMTSSVC_StorageVolume instances.

Parameters

The DeleteStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 218 shows the parameters you can specify for the DeleteStoragePool() method.

Table 218. DeleteStoragePool()

Parameter	Type	Description
[Force]	Boolean	When set to True, the pool will be deleted despite constraints (for example, no StorageVolume or BackendVolume contained). The default is False.
Job	CIM_Concrete Job REF	Set to null.
Pool	CIM_Storage Pool REF	The IBMTSSVC_StoragePool to be deleted. Contains the mdisk_grp_ID in Name. The pool and the StorageConfigurationService must belong to the same cluster.

Return values

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

- 0: The pool was successfully deleted.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed
- 6: The method is in use.
- 5: The number or type of parameters that have been passed is incorrect.
- 4096: Method parameters checked. Job started.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

DetachDevice()

You can use the DetachDevice() method to detach a volume from the controller.

Parameters

The DetachDevice() method belongs to the IBMTSSVC_ControllerConfigurationService class. Table 219 shows the parameters you can specify for the DetachDevice() method.

Table 219. 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.

DisableAutoGeneration()

You can use this method to disable the certificate automatic generation feature.

You must have administrator privileges to run this method.

Return values

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

- 0: The certificate was successfully deleted.
- 2: Failed due to provider internal reasons.

Dump()

You can use the Dump() method to dump the contents of error log, the config log, or the feature log to a text file.

Parameters

The Dump() method belongs to the IBMTSSVC_ServiceModeService class. Table 220 shows the parameters you can specify for the Dump() method.

Table 220. Dump() parameters

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

Return values

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

- 0: The text file dump was successful.
- 2: An unexpected error occurred and the command failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: A type greater than 2 was passed.
- 0x8001: A file prefix was passed at the same time as the feature log type.
- 0x9000: to 0x9FFF: SAN Volume Controller return codes and messages.

EnableAutoGeneration()

You can use this method to enable the certificate automatic generation feature. With this method enabled, a new certificate is automatically generated when the old certificate expires.

You must have administrator privileges to run this method.

Return values

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

- 0: The certificate was successfully deleted.
- 2: Failed due to provider internal reasons.

Enter()

You can use the Enter() method to put a node into service mode.

Parameters

After this happens, the ServiceModeService methods is run against the returned service mode node and the objects prefixed with IBMTSSVC_SM objects are retrieved for this node. If the config node is in service mode, no other commands for this cluster are available.

The Enter() method belongs to the IBMTSSVC_ServiceModeService class. Table 221 shows the parameters you can specify for the Enter() method.

Table 221. Enter() parameters

Parameter	Type	Description
Node	IBMTSSVC_Node REF	The node that shall be put in service mode.
SMNode	IBMTSSVC_ServiceModeNode REF	The reference to the node that is now in service mode.

Return values

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

- 0: The Enter() method was successful.
- 5: The wrong number or type of parameter has been passed.
- ...: DMTF reserved.
- 0x8100: Cluster scope violation.

EvictNode()

You can use the EvictNode() method to remove an IBMTSSVC_Node instance from an IBMTSSVC_Cluster instance.

Parameters

The EvictNode() method belongs to the IBMTSSVC_ClusteringService class. Table 222 shows the parameters you can specify for the EvictNode() method.

Table 222. EvictNode() parameters

Parameter	Type	Description
CS	CIMOM Object Path	Defines the IBMTSSVC_Node instance to be added that is in the same cluster as the IBMTSSVC_ClusteringService instance.

Return values

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

- 0: The node was successfully added.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted computer system was not an IBMTSSVC_CandidateNode.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

Exit()

You can use the Exit() method to exit the service mode for a specific node and restart it in normal operating mode.

Parameters

The Exit() method belongs to the IBMTSSVC_ServiceModeService class. Table 223 shows the parameters you can specify for the Exit() method.

Table 223. Exit() parameters

Parameter	Type	Description
SMNode	IBMTSSVC_ServiceModeNode REF	The node that will be restarted in normal operating mode.

Return values

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

- 0: The Exit() method was successful.
- 5: The wrong number or type of parameter has been passed.
- ...: DMTF reserved.
- 0x8100: Cluster scope violation.
- 0x9000 to 0x9FFF: Device error codes.

FixRecord()

You can use the FixRecord() method to fix one entry in the log. After you run the FixRecord() method, the entry is marked as fixed.

Parameters

The FixRecord() method belongs to the IBMTSSVC_MessageLog class. Table 224 shows the parameters you can specify for the FixRecord() method.

Table 224. FixRecord() parameters

Parameter	Type	Description
RecordNumber	UInt64	Passed to the CLI command in the -d parameter.

Return values

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

- 0: The method completed successfully.
- 2: An unexpected error occurred.
- 5: One of the mandatory parameters is missing.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

GetAllRecords()

You can use the GetAllRecords() method to retrieve the list of logs from the cluster. The GetAllRecords() method belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 225 shows the parameters you can specify for the GetAllRecords() method.

Table 225. GetAllRecords() parameters

Parameter	Type	Description
ErrorOnly	Boolean	If set to true or null, only error records are returned. If false, all log entries are returned.
Records	String[]	The file as a string array.

Return values

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

- 0: The method completed successfully.
- 2: An unexpected error occurred.
- 0x8000: Records not found.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

GetDump()

You can use the GetDump() method to retrieve a log file. The feature log is automatically decoded.

Parameters

The GetDump() method belongs to the IBMTSSVC_ServiceModeService class. Table 226 on page 349 shows the parameters you can specify for the GetDump() method.

Table 226. *GetDump()* parameters

Parameter	Type	Description
FilePath	String	The fully specified file name. File names can be viewed in the IBMTSSVC_Dump instance. Allowed paths are: dumps/configs, dumps/elogs, dumps/feature, dumps/iostats, dumps/iotrace and home/admin.
SMNode	IBMTSSVC_Node REF	The node for which you want the dump retrieval. The config node dump will be returned if nothing is specified.
File	String[]	The file as a string array.

Return values

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

- 0: The *GetDump()* method was successful.
- 5: The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.
- 0x8000: The connection to the cluster has been lost, or failed to connect to a node.
- x8001: A given file path was not found for CISCO..
- 0x8100: One or more parameters where out of the cluster scope.
- 0x9000..0x9FFF: Device error codes.

GetFreeExtents()

You can use the *GetFreeExtents()* method to return the number of free extents on a BackendVolume.

Parameters

These extents are the blocks which the SAN Volume Controller uses for capacity management. They do not correspond to the CIM_StorageExtent class.

The *GetFreeExtents()* method belongs to the IBMTSSVC_BackendVolume class. Table 227 shows the parameters you can specify for the *GetFreeExtents()* method.

Table 227. *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.

GetHosts()

You can use the GetHosts() method to display a list of the hosts that are associated with an I/O group. The host names are returned as a vector of strings.

Parameters

The GetHosts() method belongs to the IBMTSSVC_IOGroups class. Table 228 shows the parameter that you can specify for the GetHosts() method.

Table 228. GetHosts() parameter

Parameter	Type	Description
HostNames	String[]	The names that are returned for the associated hosts.

Return Values

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

- 0: Success
- 1: Not Supported
- 2: Failed
- 5: Wrong Parameter Set
- 6 to 0x8FFF: Vendor Reserved
- 0x9000 to 0x9FFF: Device Error Codes

GetIOGroups()

You can use the GetIOGroups() method to display a list of I/O groups that are associated with a host. The I/O group names are returned as a vector of strings.

Parameters

The GetIOGroups() method belongs to the IBMTSSVC_HardwareIdCollection class. Table 229 shows the parameter that you can specify for the GetIOGroups() method.

Table 229. GetIOGroups() parameter

Parameter	Type	Description
IOGroupNames	String[]	The names that are returned for the associated I/O groups.

Return Values

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

- 0: Success
- 1: Not Supported
- 2: Failed
- 5: Wrong Parameter Set
- 6 to 0x8FFF: Vendor Reserved
- 0x9000 to 0x9FFF: Device Error Codes

GetRecord()

You can use the `GetRecord()` method to retrieve the list of logs from the cluster, returns the log entry specified by the `IterationIdentifier`, and increment the `IterationIdentifier` by one position if `PositionToNext` is set to `TRUE`.

Parameters

The `GetRecord()` method belongs to the `IBMTSSVC_MessageLog` class. Table 230 shows the parameters you can specify for the `GetRecord()` method.

Table 230. `GetRecord()` parameters

Parameter	Type	Description
[<code>IterationIdentifier</code>]	String	The pointer to the record you want to retrieve. The tokens are evaluated and the corresponding command is called.
<code>IterationIdentifier</code>	String	The new <code>IterationIdentifier</code> . The <code>SequenceNumber</code> was modified according to the parameters that were passed in. If <code>PositionToNext</code> was true and there is no next entry, null will be returned here.
<code>PositionToNext</code>	String	If this value is true, the <code>IterationIdentifier</code> is advanced by one position. Otherwise the old <code>IterationIdentifier</code> will be returned.
<code>RecordData</code>	UInt8[]	The entry in byte representation (UTF-8). Use <code>String.getBytes(UTF-8)</code> .
<code>RecordNumber</code>	UInt64	This value equals the <code>SequenceNumber</code> token of the <code>IterationIdentifier</code> that is returned.

Return values

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

- 0: The method completed successfully.
- 2: An unexpected error occurred.

GetResetPasswordChangeFeatureStatus()

You can use the `GetResetPasswordChangeFeatureStatus()` method to retrieve the current status of the rest password change feature.

Parameters

The `GetResetPasswordChangeFeatureStatus()` method belongs to the `IBMTSSVC_ClusteringService` class. Table 231 on page 352 shows the parameters you can specify for the `GetResetPasswordChangeFeatureStatus()` method.

Table 231. *GetResetPasswordChangeFeatureStatus()* properties

Parameter	Type	Description
Enable	Boolean	If set to True, indicates that the password reset feature is enabled; if set to False, indicates that the feature is disabled.

Return values

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

- 0: The feature status has been successfully retrieved.
- 2: An unexpected error occurred.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

GetSupportedSizeRange()

You can use the `GetSupportedSizeRange()` method to query the volume sizes that are supported.

Parameters

The `GetSupportedSizeRange()` method belongs to the `IBMTSSVC_StoragePool` class. Table 232 shows the parameters you can specify for the `GetSupportedSizeRange()` method.

Table 232. *GetSupportedSizeRange()* parameters

Parameter	Type	Description
ElementType	Uint16	The type of element for which supported size ranges are reported. Code Semantics 2 Storage Pool 3 Storage Volume
[Goal]	CIMOM Object Path	The size requirements.
Minimum VolumeSize	Uint64	The minimum size (MB) to query.
Maximum VolumeSize	Uint64	The maximum size (MB) to query.
VolumeSize Divisor	Uint64	A volume/pool size must be a multiple of this value.

Return values

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

- 0: Parameters are valid.
- 2: Use `GetSupportedSizes` instead.
- 5: The number or type of parameters that have been passed is incorrect.

GetSupportedSizes()

You can use the `GetSupportedSizes()` method to query the supported volume sizes.

Parameters

The GetSupportedSizes() method is derived from the IBMTSSVC_StoragePool class. Table 233 shows the parameters of the GetSupportedSizes() method.

Table 233. GetSupported Sizes() parameters

Parameter	Type	Description
ElementType	UInt16	The type of element for which supported sizes are reported. Code Semantics 2 Storage Pool 3 Storage Volume
Goal	CIM_StorageSetting REF	The size requirements.
Sizes	uint64[]	List of support sizes for a Volume/Pool creation or modification (MB).

Return values

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

- 1: Method not supported.
- 2: Use the GetSupportedSizeRange method instead.

GenerateCIMOMCertificate()

You can use this method to generate a new server certificate.

Parameters

The data contained in the referenced instance of the IBMTS_CertificateSetting are the base for the creation. The existing certificate contained in the truststore is deleted and a newly created one is added.

You must have administrator privileges to run this method.

Table 234 shows the parameters you can specify for the GenerateCIMOMCertificate() method.

Table 234. GenerateCIMOMCertificate() parameters

Parameter	Type	Description
CertificateSetting	IBMTS_CertificateSetting REF	The reference to the instance that contains the setting data for the creation of a new certificate.
Force	Boolean	The force flag that specifies if an existing valid truststore must be replaced. If the existing certificate is still valid, the Force parameter must be set to true.
Certificate	IBMTS_Certificate REF	The reference to the newly created instance of IBMTS_Certificate.

Return values

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

- 0: The certificate was successfully deleted.
- 2: Failed to generate new certificate due to provider internal reasons.
- 4: Failed to generate new certificate due to truststore problems.
- 5: One of the parameters is invalid.
- 6: Failed to generate new certificate. Existing one is still valid and in use.

IncludeBackendVolume()

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

Parameters

The IncludeBackendVolume() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 235 shows the parameters you can specify for the IncludeBackendVolume() method.

Table 235. 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()

You can use the ListConfigurationBackups() command to list the backups in the Backup directory. Only the directory names are reported.

Parameters

Table 236 shows the parameters you can specify for the ListConfigurationBackups() method.

Table 236. ListConfigurationBackups() parameters

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

Return values

The ListConfigurationBackups() method returns the following error code:

- 0: The backup was successful.

MigrateVolume()

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

Parameters

The MigrateVolume() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 237 shows the parameters you can specify for the MigrateVolume() method.

Table 237. MigrateVolume() parameters

Parameter	Type	Description
Job	CIM_ConcreteJob REF	The object that can be used to monitor the migration progress.
NumberOfThreads	UInt8	The number of copy threads used for the migration. The number can be one to four.
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.

MigrateVolumeToImageMode()

You can use the MigrateVolumeToImageMode() method to migrate the content of a StorageVolume to a new StorageVolume in image mode.

Parameters

Use this method when data no longer needs to be managed by the SAN Volume Controller. This method can also be used to migrate data between two image mode disks.

Table 238 on page 356 shows the parameters you can specify for the MigrateVolumeToImageMode() method.

Table 238. *MigrateVolumeToImageMode()* parameters

Parameter	Type	Description
NumberOfThreads	UInt8	The number of copy threads used for the migration. This can be a number from one to four.
Job	CIM_Concrete Job REF	The job object. This can be used to monitor the progress of the migration.
TargetPool	IBMTSSVC_Storage Pool REF	The pool that the target volume will become a member of.
TargetVolume	IBMTSSVC_Backend Pool REF	The backend volume that the data will be migrated to. It must be in unmanaged state and large enough to contain the data of the source volume.
Volume	IBMTSSVC_Storage Volume REF	The volume to be migrated. All data for this volume will be copied to the new location.

Return values

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

- 0: The migration job was started.
- 2: Unexpected error occurred.
- 5: The wrong number or type of parameters have been passed.
- 0x8100: One of the parameters belongs to a different cluster than the service.
- 0x9000: SVC CLI return codes

ModifyErrorSettings()

You can use the `ModifyErrorSettings()` method to specify what happens when an error or event is logged in the error log. The `ModifyErrorSettings()` method belongs to the `IBMTSSVC_MessageLog` class.

Parameters

Table 239 shows the parameters you can specify for the `ModifyErrorSettings()` method.

Table 239. *ModifyErrorSettings()* parameters

Parameter	Type	Description
[EmailAddress]	String	The email address of which to send email notification.

Table 239. *ModifyErrorSettings()* parameters (continued)

Parameter	Type	Description
[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 ran successfully but one or more parameters were ignored.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

ModifyHostIOGroupMapping()

You can use the *ModifyHostIOGroupMapping()* method to modify the current I/O groups that are mapped to a specified host.

Parameters

The *ModifyHostIOGroupMapping()* method belongs to the *IBMTSSVC_StorageHardwareIDManagementService* class. Table 240 shows the parameters that you can specify for the *ModifyHostIOGroupMapping()* method.

Table 240. *ModifyHostIOGroupMapping()* parameters

Parameter	Type	Description
Host	CIM_SystemSpecificCollection REF	The host that you want to modify.
IOGroups	String[]	The list of I/O groups that you want to modify. You can use either the names or IDs of the I/O group.

Table 240. *ModifyHostIOGroupMapping()* parameters (continued)

Parameter	Type	Description
Operation	Uint32	The operation that you want perform on the host and I/O group. Note: The I/OGroups parameter is ignored if you specify the value 3 (RemoveAllMappings) for the operation. Code Semantics 1 AddingMapping 2 RemoveMapping 3 RemoveAllMappings
Force	Boolean	Specifies that the changes will be forced if this parameter is set to true. This parameter is optional. A deletion of a mapping can fail if it results in the loss of a VDisk-to-host mapping and you do not set the force parameter to true.

Return Values

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

- 0: Success
- 1: Not Supported
- 2: Failed
- 3: Timeout
- 4: Failed
- 5: Invalid Parameter
- 6 to 0x80FF: DMTF Reserved
- 0x8100: Cluster Scope Violation
- 0x8100 to 0x8FFF: Vendor Reserved
- 0x9000 to 0x9FFF: Device Error Codes

ModifyIPAddress()

You can use the `ModifyIPAddress()` command to modify the IP address in the cluster, change the entry in the `provider-config.xml` and reload the configuration.

Parameters

Table 241 shows the parameters you can specify for the `Modifyipaddress()` method.

Table 241. *Modifyipaddress()* parameters

Parameter	Type	Description
ClusterIP	String	Specifies and validates the new cluster IP address.

Return values

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

- 0: The `Modifyipaddress` command was successful.
- 2: An unexpected error occurred and the command failed.

- 5: One of the mandatory parameters is missing or invalid.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ModifyResetPasswordChangeFeature()

You can use the `ModifyResetPasswordChangeFeature()` method to enable or disable the password reset feature.

Parameters

The `ModifyResetPasswordChangeFeature()` method belongs to the `IBMTSSVC_ClusteringService` class. Table 242 shows the parameters you can specify for the `ModifyResetPasswordChangeFeature()` method.

Table 242. `ModifyResetPasswordChangeFeature()` parameters

Parameter	Type	Description
Enable	Boolean	If set to True, enables the password reset feature; if set to False, disables the feature

Return values

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

- 0: The passwords were changed.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ModifySynchronization()

You can use the `ModifySynchronization()` method to modify a FlashCopy or synchronous copy relationship between two `IBMTSSVC_StorageVolume` instances based on the specified type of operation.

Parameters

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

Table 243 on page 360 shows the parameters you can specify for the `ModifySynchronization()` method.

Table 243. *ModifySynchronization()* parameters

Parameter	Type	Description
Operation	UInt16	<p>These commands can only be run if the copy mapping does not belong to a consistency group (check SynchronizedSetID in StorageSynchronized).</p> <p>Code Semantics</p> <p>2 Detach. Delete the copy mapping.</p> <p>3 Fracture. Suspend the synchronization between two storage objects. The association and changes are remembered to allow a fast resynchronization. This can be used during a backup cycle to allow one of the objects to be copied while the other remains in production.</p> <p>4 Resync Replica. Reestablish the synchronization of a replica. If CopyJob is Sync or Async, this will negate the action of a previous fracture operation.</p> <p>5 Restore from Replica. Renew the contents of the original storage object from a replica.</p> <p>6 Prepare. Prepare the participating volumes for a Flash Copy.</p> <p>7 Unprepare.</p> <p>8 Quiesce.</p> <p>9 Unquiesce.</p> <p>10 Reset To Sync.</p> <p>11 Reset To Async.</p> <p>0x8000 Switch. Switch primary relationship.</p> <p>0x8001 Stop.</p>
[AllowAccess]	Boolean	<p>If set to True, the target will be accessible for I/O after fracture of a synchronized copy. The default is False. The parameter is ignored for all operations except synchronized copy fracture.</p>
[Clean]	Boolean	<p>If set to True, the target is assumed to be clean (initialized with zeros), thus no initialize will be done before resynchronization of a synchronized copy. The default is False. Ignored for all other operations except resynchronization of a synchronized copy.</p>

Table 243. *ModifySynchronization()* parameters (continued)

Parameter	Type	Description
[Direction]	Boolean	If set to True, the master (SyncedSystemElement) will become the source of the synchronized copy relationship. If set to False, the auxiliary (SyncedElement) will become the source of the synchronized copy relationship. By default, the direction will be autonomically chosen (reverse on switch and keep on resync). Valid for switch and resync operation of sync copy only. Ignored in all other cases.
[Force]	Boolean	If set to True, the operation will be forced. The default is False. Applies only on resync and detach of FlashCopy mappings and resync of sync copy mappings. Ignored in all other cases.
Job	CIM_ConcreteJob REF	The object that is used to monitor and terminate the copy process.
Synchronization	CIM_Storage Synchronized REF	The copy relationship to be modified: IBMTSSVC_FlashCopyStorage Synchronized or IBMTSSVC_SyncCopyStorage Synchronized.

Return values

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

- 0: The FlashCopy mapping was successfully established.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed
- 5: The number or type of parameters that have been passed is incorrect.
- 6: The method is in use.
- 0x1000: The CLI copy command ran and a job object was returned.
- 0x8001: The operation that was submitted is not allowed in the current state of the StorageSynchronized. For example, a prepare operation on a StorageSynchronized is in synchronized state.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

ModifySynchronizedSet()

You can use the `ModifySynchronizedSet()` method to modify a `SynchronizedSet` based on the specified operation type.

Parameters

The `ModifySynchronizedSet()` method belongs to the `IBMTSSVC_StorageConfigurationService` class. Table 244 on page 362 shows the parameters you can specify for the `ModifySynchronizedSet()` method.

Table 244. 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 244. *ModifySynchronizedSet()* parameters (continued)

Parameter	Type	Description
[Direction]	Boolean	If set to True, the master (SyncedSystemElement) will become the source of the sync copy relationship. If set to False, the auxiliary (SyncedElement) will become the source of the sync copy relationship. By default, the direction will be autonomically chosen (reverse on switch and keep on resync). Valid for switch and resync operation of sync copy only. Ignored in all other cases.
[Force]	Boolean	If set to True, the operation will be forced. The default is False. Applies only on resync and detach of FlashCopy mappings and resync of sync copy mappings. Ignored in all other cases.
Job	CIM_ConcreteJob REF	The object used to monitor and terminate the copy process.
[Synchronization]	CIM_Storage Synchronized REF	The copy mapping to be added to or removed from the set. Ignore for all other operations.
SynchronizedSet	CIM_Synchronized Set REF	The SynchronizedSet to be modified.

Return values

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

- 0: The `SyncCopySynchronizedSet` was successfully created.
- 2: An unknown error occurred.
- 3: The action timed out.
- 4: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 6: The operation is not supported.
- 7: `StorageSynchronized` not in the set.
- 8: `StorageSynchronized` already in a set.
- 9: A `StorageSynchronized` should be added to the set that is not compatible to the set. For example, a `FlashCopy` synchronized to a sync sopy set.
- 0x1000: Method parameters checked. Job started.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x8001: An operation should be performed which is not allowed on the current `SyncState` of the set.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

PositionAtRecord()

You can use the `PositionAtRecord()` method to set the `SequenceNumber` and the `RelPos` token of the returned `IterationIdentifier`.

Parameters

The `PositionAtRecord()` method belongs to the `IBMTSSVC_MessageLog` class. Table 245 shows the parameters you can specify for the `PositionAtRecord()` method.

Table 245. *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 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()

You can use the `PositionToFirstRecord()` method to create an IterationIdentifier that points to the first entry in the log.

Parameters

The IterationIdentifier is used in subsequent `GetRecord` or `Position` calls.

The `PositionToFirstRecord()` method belongs to the `IBMTSSVC_MessageLog` class. Table 246 shows the parameters you can specify for the `PositionToFirstRecord()` method.

Table 246. *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()

You can use the PositionToFirstRecordRoot() method to create an IterationIdentifier whose SequenceNumber is not set and whose RootCause token is set to the value that is passed in.

Parameters

The IterationIdentifier is used in subsequent GetRecord or PositionAtRecord calls.

The PositionToFirstRecordRoot() method belongs to the IBMTSSVC_MessageLog class. Table 247 shows the parameters you can specify for the PositionToFirstRecordRoot() method.

Table 247. PositionToFirstRecordRoot() parameters

Parameter	Type	Description
Iteration Identifier	String	The IterationIdentifier that contains the root sequence number that was passed in the "RootCause" token.
RootSequence Number	UInt64	The object root cause id.

Return values

The PositionToFirstRecordRoot() method returns the following error code:

- 0: The IterationIdentifier was successfully created.
- 5: One of the mandatory parameters is missing.

PositionToFirstRecordType()

You can use the PositionToFirstRecordType() method to create an IterationIdentifier whose SequenceNumber token is not set and whose other parameters are set according to the parameters that were passed in.

Parameters

The IterationIdentifier is used in subsequent GetRecord or PositionAtRecord calls.

The PositionToFirstRecordType() method belongs to the IBMTSSVC_MessageLog class. Table 248 shows the parameters you can specify for the PositionToFirstRecordType() method.

Table 248. PositionToFirstRecordType() parameters

Parameter	Type	Description
ConfigOnly	Boolean	Is required to be false or not specified.
IterationIdentifier		The IterationIdentifier that was generated.
ObjectID	UInt64	The SAN Volume Controller object id. This parameter will be set to the LSObjID token of the IterationIdentifier.

Table 248. *PositionToFirstRecordType()* parameters (continued)

Parameter	Type	Description
ObjectType	String	The SAN Volume Controller object type. This parameter will be set to the LSObjType token of the IterationIdentifier.
UnfixedOnly	Boolean	Display only unfixed errors.

Return values

The *PositionToFirstRecordType()* method returns the following error code:

- 0: The *IterationIdentifier* was successfully created.

RemoveAccess()

You can use the *RemoveAccess()* method to delete a temporary *IBMTSSVC_AccessControlInformation* instance and its associations.

Parameters

The *RemoveAccess()* method belongs to the *IBMTSSVC_AuthorizationService* class. Table 249 shows the parameters you can specify for the *RemoveAccess()* method.

Table 249. *RemoveAccess()* parameters

Parameter	Type	Description
Subject	CIM_ManagedElement REF	A reference to a <i>ManagedElement</i> instance (associated through <i>AuthorizedSubject</i>) for which privileges are to be revoked.
Privilege	CIM_AuthorizedPrivilege REF	A reference to the <i>AuthorizedPrivilege</i> that is to be revoked.
Target	CIM_ManagedElement REF	A reference to a <i>ManagedElement</i> (associated through <i>AuthorizedTarget</i>) which will no longer be protected through <i>AuthorizedPrivilege</i> .

Return values

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

- 0: All instances were successfully deleted.
- 2: An unexpected error occurred.
- 3: Timeout.
- 4: Failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 6..15999: DMTF Reserved.
- 16000: Unsupported Privilege.
- 16001: Unsupported Target.
- 16002: Authorization Error.
- 16003: Null parameter not supported.
- 16004..32767: Method Reserved.

- 32768..65535: Vendor Specific.

RemoveCluster()

You can use the RemoveCluster() method to remove a SAN Volume Controller cluster from the ICAT configuration.

Parameters

The RemoveCluster() method belongs to the IBMTSSVC_Provider class. Table 250 shows the parameters you can specify for the RemoveCluster() method.

Table 250. RemoveCluster() parameters

Parameter	Type	Description
ClusterIP	String	The IP of the cluster to be removed.

Return values

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

- 0: The method completed successfully.
- 5. The number or type of parameters that have been passed is incorrect.
- ...: DMTF reserved.

RequestDiscovery()

You can use the RequestDiscovery() method to initiate a rescan of the fibre-channel SAN to discover any new LUNs.

Parameters

The RequestDiscovery() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 251 shows the parameters you can specify for the RequestDiscovery() method.

Table 251. RequestDiscovery() parameters

Parameter	Type	Description
DiscoveredElement Count	Uint32	The number of discovered LUNs (BackendVolumes).
DiscoveredElement Instances	String[]	String representations of the instances of the discovered LUNs (BackendVolumes).
DiscoveredElements	String[]	String representations of the COPs of the discovered LUNs (BackendVolumes).
WaitForResults	Boolean	Waits for the discovery to complete.
WaitTimeout	Uint32	Allows a timeout to wait for the discovery to complete.

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.

RestoreConfiguration()

You can use the RestoreConfiguration() command to run the configuration restore script.

Parameters

The script restores the current cluster configuration associated with the current instance of ClusteringService, from the corresponding cluster configuration backup.

Table 252 shows the parameters you can specify for the RestoreConfiguration() method.

Table 252. 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.

Parameters

The ReturnToStoragePool() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 253 on page 369 shows the parameters you can use for the ReturnToStoragePool() method.

Table 253. ReturnToStoragePool() parameters

Parameter	Type	Description
[Force]	Boolean	If set to True the, the volume will be deleted, ignoring the usual constraints (for example, if no LUN mapping exists for the volume). The default is False.
Job	CIM_ConcreteJob REF	Set to null.
TheElement	CIM_LogicalElement REF	The element to be returned to the pool. Must be a 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.

SetDefaultValidity()

You can use this method to set the default validity to the number of days the certificate has been used.

Parameters

You must have administrator privileges to run this method.

Table 254 shows the parameters you can specify for the SetDefaultValidity() method.

Table 254. SetDefaultValidity() properties

Parameter	Type	Description
DefaultValidity	Uint32	The default validity in days.

Return values

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

- 0: The validity was successfully set.
- 2: Failed to set validity.
- 5: One of the parameters is invalid.

SetIOGroup()

You can use the SetIOGroup() method to assign a StorageVolume to another I/O group.

Parameters

The SetIOGroup() method belongs to the IBMTSSVC_ControllerConfigurationService class. Table 255 shows the parameters you can specify for the SetIOGroup() method:

Table 255. SetIOGroup() parameters

Parameter	Type	Description
Force	Boolean	Set to True in order to move a Volume to or from the recovery I/O group.
Group	IBMTSSVC_IOGroup REF	The IOGroup to which to assign the StorageVolume.
Volume	IBMTSSVC_StorageVolume REF	The StorageVolume to move.

Return values

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

- 0: The volume was successfully moved.
- 2: The action failed.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The I/O group must have the nodes aggregated.
- 0x8100: One or more parameters were out of cluster scope.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes.

SetLocale()

You can use the SetLocale() method to define the locale of the specified cluster.

Parameters

The SetLocale() method belongs to the IBMTSSVC_Cluster class. Table 256 shows the parameters you can specify for the SetLocale() method.

Table 256. SetLocale() parameters

Parameter	Type	Description
Locale	Uint16	Sets the locale value of the named cluster. Valid values are US English, Simplified Chinese, Traditional Chinese, Japanese, Korean, French, German, Italian, Spanish, and Portuguese.

Return values

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

- 0: The locale was set.
- 2: An unexpected error occurred.

- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000 : The submitted locale was invalid (greater than 9).
- 0x9000 to 0x9FFF: SAN Volume Controller CLI return codes.

SetPasswords()

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

Parameters

The SetPasswords() method belongs to the IBMTSSVC_ClusteringService class. Table 257 shows the parameters you can specify for the SetPasswords() method.

Table 257. SetPasswords() parameters

Parameter	Type	Description
[AdminPW]	String	Changes the administrator's password to the cluster.
[ServicePW]	String	Changes the service personnel's password to the cluster.

Return values

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

- 0: The passwords were changed.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

SetQuorum()

You can use the SetQuorum() method to identify an IBMTSSVC_BackendVolume as a quorum volume.

Parameters

The SetQuorum() method belongs to the IBMTSSVC_StorageConfigurationService class. Table 258 shows the parameters you can specify for the SetQuorum() method.

Table 258. SetQuorum() parameters

Parameter	Type	Description
Volume	IBMTSSVC_BackendVolume REF	Defines the IBMTSSVC_BackendVolume as a quorum disk. Must belong to the same Cluster as the StorageConfigurationService.
QuorumID	UInt8	Specifies the ID of the quorum volume, 0, 1, or 2.

Return values

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

- 0: The quorum volume was established.

- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The quorum ID is a number greater than 2.
- 0x8100: The volume belongs to a different cluster than the StorageConfigurationService.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

SetTimeZone()

You can use the SetTimeZone() method to specify the time zone of an IBMTSSVC_Cluster instance.

Parameters

The SetTimeZone() method belongs to the IBMTSSVC_ClusteringService class. Table 259 shows the parameters you can specify for the SetTimeZone() method.

Table 259. SetTimeZone() parameters

Parameter	Type	Description
Zone	COP	Defines the name of the TimeZone to set through an IBMTSSVC_AvailableTimeZone association to the IBMTSSVC_ClusteringService instance.

Return values

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

- 0: The time zone for the cluster was successfully set.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted time zone is not associated to the clustering service.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

StartStatisticsCollection()

You can use the StartStatisticsCollection() method to initiate the statistics collection for an IBMTSSVC_Cluster instance.

Parameters

The StartStatisticsCollection() method belongs to the IBMTSSVC_ClusteringService class. Table 260 shows the parameters you can specify for the StartStatisticsCollection() method.

Table 260. StartStatisticsCollection() parameters

Parameter	Type	Description
Interval	UInt32	Sets the time interval in minutes for gathering the statistics of the cluster.

Return values

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

- 0: The collection was started.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

StopStatisticsCollection()

You can use the StopStatisticsCollection() method to terminate the statistics collection about an IBMTSSVC_Cluster instance.

Return values

The StopStatisticsCollection() method belongs to the IBMTSSVC_ClusteringService class.

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

- 0: The collection was stopped.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

Shutdown()

You can use the Shutdown() method to shut down an IBMTSSVC_Node instance or an IBMTSSVC_Cluster instance.

Parameters

The Shutdown() method belongs to the IBMTSSVC_ClusteringService class. Table 261 shows the parameters you can specify for the Shutdown() method.

Table 261. Shutdown() parameters

Parameter	Type	Description
System	COP	Specifies the IBMTSSVC_Cluster or IBMTSSVC_Node to be shut down.
[Force]	Boolean	If set to True, shuts down the remaining online node of an IBMTSSVC_RedundancyGroup.

Return values

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

- 0: The shutdown for the node or cluster was successfully initiated.
- 2: An unexpected error occurred.
- 5: The number or type of parameters that have been passed is incorrect.
- 0x8000: The submitted computer system was not of type IBMTSSVC_Node or IBMTSSVC_Cluster.
- 0x8100: One of the parameters was out of the cluster scope.
- 0x9000 to 0x9FFF: SAN Volume Controller return codes and messages.

UnfixRecord()

You can use the `UnfixRecord()` method to undue a fix for one entry in the log. The entry is changed from fixed to not fixed.

Parameters

The `UnfixRecord()` method belongs to the `IBMTSSVC_MessageLog` class. Table 262 shows the parameters you can specify for the `UnfixRecord()` method.

Table 262. *UnfixRecord()* parameters

Parameter	Type	Description
RecordNumber	UInt64	Is passed to the CLI command in the -u parameter.

Return values

The `UnfixRecord()` method returns the following error codes:

- 0: The method successfully unfixes the entry.
- 2: A command failed.
- 5: One of the mandatory parameters is missing.
- 0x9000 to 0x9FFF: This range represents various SAN Volume Controller return codes and messages.

Upgrade()

You can use the `Upgrade()` method to upgrade the software of one SAN Volume Controller node in service mode.

Parameters

The `Upgrade()` method belongs to the `IBMTSSVC_ServiceModeService` class. Table 263 shows the parameters you can specify for the `Upgrade()` method.

Table 263. *Upgrade()* parameters

Parameter	Type	Description
FilePath	String	The location where the new software is stored.
SMNode	IBMTSSVC_ServiceModeNode REF	Specifies the node that is in service mode that will be upgraded.

Return values

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

- 0: The `Upgrade()` method was successful.
- 2: The `Upgrade()` method failed.
- 5: The wrong number or type of parameter has been passed.
- ...: DMTF reserved.
- 0x9000 to 0x9FFF: Device error codes.

WriteRecord()

The WriteRecord() method is an unsupported method that belongs to the IBMTSSVC_MessageLog class.

Parameters

Table 264 shows the parameters you can specify for the WriteRecord() method.

Table 264. WriteRecord() parameters

Parameter	Type	Description
IterationIdentifier	String	
PositionToNext	Boolean	Boolean value that indicates the IterationIdentifier should be advanced to the next record after writing the Log entry.
RecordData	UInt8[]	
RecordNumber	UInt64	

Return values

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

- 0: The method completed successfully.
- 2: Unknown.
- 3: Timeout.
- 4: Failed.
- 5. The number or type of parameters that have been passed is incorrect.

Chapter 9. Return codes

The Common Information Model (CIM) return codes provide information on the status of ICAT operations.

Common information model

The following table is a condensed list of possible CIM return codes.

CIM return code	Description	Method	Explanation
0x0000	Success	GetFreeExtends() ListConfiguration Backups()	The parameters are fine. The method completed successfully.
		AddNode()	The node was successfully added.
		CheckValidity()	The information about the certificate was successfully obtained.
		DeleteAccount()	The account was successfully deleted.
		GenerateCIMOM Certificate() EnableAuto Generation() DisableAuto Generation()	The certificate was successfully deleted.
		CreateCode()	The new account was successfully created.
		SetDefault Validity()	The validity was successfully set.
		GrantGlobal Access() GrantSystem Access()	The role was successfully changed.
		CreateGatewayID() AddHardwareIDs ToCollection()	The collection was successfully created.
		DeleteStorage HardwareID()	The StorageHardwareID was successfully deleted.
CreateStorage HardwareID()	The StorageHardwareID was successfully created.		

CIM return code	Description	Method	Explanation
0x0000	Success (continued)	AttachDevice()	The volume was successfully attached.
		DeleteProtocolController()	The controller was successfully deleted.
		CreateProtocolControllerWithPorts()	A clone was successfully created.
		DeleteRemoteClusterPartnership()	The cluster partnership was successfully deleted.
		CreateRemoteClusterPartnership()	The cluster partnership was successfully established.
		DeleteHardwareIDCollection()	The collection was successfully created.
		DeleteCertificate()	The certificate was successfully deleted.
		DeleteSynchronizedSet()	The SynchronizedSet was successfully deleted.
		ModifySynchronisation()	The method was successfully run.
EvictNode()	The node was successfully evicted.		

CIM return code	Description	Method	Explanation
0x0000	Success (continued)	RestartService()	The CIMOM reboots.
		Shutdown()	The shutdown for the node/cluster was successfully initiated.
		SetLocale()	The locale was set.
		SetTimezone()	The time zone for the cluster was successfully set.
		SetPasswords() ModifyReset Password ChangeFeature()	The passwords were changed.
		GetResetPassword ChangeFeature Status()	The feature status was successfully retrieved.
		StartStatistics Collection()	The statistics collection was started.
		DetachDevice()	The volume was successfully detached.
		StopStatistics Collection()	The statistics collection was stopped.
		Backup Configuration()	A backup was successfully created.
		Reload Configuration()	The configuration was reloaded.
		Restore Configuration() Delete Configuration Backup()	A restore was successfully made.
		AttachReplica()	The copy relationship was successfully established.
		CreateSynchronized Set()	The SynchronizedSet was successfully created.
SetPassword()	The password was successfully changed.		

CIM return code	Description	Method	Explanation
0x0000	Job completed with no error	CreateOrModifyStoragePool()	The pool was successfully created.
		CreateOrModifyElementFromStoragePool()	The volume was successfully created. The pool was successfully modified.
		DeleteStoragePool()	The pool was successfully deleted.
		ReturnToStoragePool()	The volume was successfully deleted.
		RequestDiscovery()	BackendVolume discovery was successful.
		SetIOGroup()	The change was successful.
		SetQuorum()	The method was successful.
		IncludeBackendVolume()	The volume was successfully included.
		ModifySynchronizedSet()	The CLI command was successfully run.
0x0000	Job started successfully	MigrateVolume() MigrateVolumeToImageMode()	The migration job was started.
0x0001	Not supported	SetLocales()	The cluster does not support locales.
		SetPasswords()	The cluster does not support password change (CISCO).
		ModifyResetPasswordChangeFeature() GetResetPasswordChangeFeatureStatus()	The cluster does not support the reset password change feature.
		Upgrade()	The method was called on a 2145 Cluster Configuration Service.

CIM return code	Description	Method	Explanation
0x0002	Failed	Dump() Clean() Enter() Exit() Clean() GetDump() ClearLog() GetRecord() GetAllRecords() FixRecord() UnfixRecord() ModifyError Settings() Create2062 Cluster()	An unexpected error occurred. A CLI command failed.
		GetDump()	Failure during command processing. The file was not found.
		Reload Configuration()	Failed to reload the configuration.
		CreateCode()	Failed to create the account.
		GrantGlobal Access() GrantSystem Access()	Failed to change the role.
		SetPassword()	Failed to change the password.
		DeleteAccount()	Failed to delete the account.
0x0002	Unknown error	GenerateCIMOM Certificate() DeleteCertificate()	Failed to generate new certificate due to provider internal reasons.
		EnableAuto Generation() DisableAuto Generation()	Failed due to provider internal reasons.
		SetDefault Validity()	Failed to set validity.
		CheckValidity()	Failed to obtain information on certificate.
0x0004	Failed	GenerateCIMOM Certificate() DeleteCertificate()	Unexpected error occurred. Failed to generate new certificate due to truststore problems.

CIM return code	Description	Method	Explanation
0x0005	Wrong Parameter Set	Delete Configuration Backup()	The wrong number or type of parameters were passed. The given backup could not be found.
		Modify Synchronisation()	The wrong number or type of parameters were passed or other parameter checking failed.
		CreateCode() GrantGlobal Access() SetPassword() GrantSystem Access() DeleteAccount() DeleteCertificate() SetDefault Validity() CheckValidity()	One of the parameters is invalid.
0x0005	Invalid Parameter	Dump(), GetDump() PositionToFirst RecordRoot() GetRecord() FixRecord() UnfixRecord()	One of the mandatory parameters is missing.
		ModifyIP Address() Create2062 Cluster() Add2062Cluster() Add2145Cluster() Reset2062Node() Reload2062Node()	One of the mandatory parameters is missing or invalid.
		CreateOrModify StoragePool() CreateOrModify ElementFrom StoragePool() Delete StoragePool() ReturnTo StoragePool()	At least one of the parameters is invalid.
		CreateGatewayID() GenerateCIMOM Certificate()	One of the parameters was invalid.
		PositionAtRecord()	One of the mandatory parameters is missing or having a negative number of records is not allowed.

CIM return code	Description	Method	Explanation
0x0006	CopyType not supported	ModifySynchronized Set()	The type of copy passed in was different from 3 or 4.
0x0006	Operation not supported	ModifySynchronized Set()	The operation code submitted is not valid for the copy type of the synchronized set.
0x0006	SynchronizedSet is not empty	DeleteSynchronized Set()	There are still StorageSynchronized associations in the set. All StorageSynchronized associations must be removed before deletion of the set can be run or the Force flag must be set.
0x0006	User ID already exists	CreateCode()	The user ID that you submitted is used in an already existing account.
0x0006	In use	GenerateCIMOM Certificate()	Failed to generate new certificate. Existing certificate is still valid and in use.
0x0007	StorageSynchronized not in the Set		The synchronized storage does not exist in the set.
0x0008	StorageSynchronized already in the Set		The synchronized storage already exists in the set and cannot be added.
0x0009	StorageSynchronized incompatible with Set		The synchronized storage is not compatible with the Set. For example, a Flash Copy is synchronized to a Sync Copy set.
0x1000	Parameters checked – Job started		The CLI copy command was run and a job object was returned.
0x1000	LogicalDevices associated to other ProtocolControllers not deleted	DeleteProtocol Controller()	At least one of the attached storage volumes is attached to another controller so it cannot be deleted.
0x1000	Invalid LogicalDevice instance	AttachDevice()	The device is not a volume of the RedundancyGroup of the controller.

CIM return code	Description	Method	Explanation
0x1000	LogicalDevice not associated to Controller	DetachDevice()	The device has no Protocol ControllerFor Unit association to this controller.
0x1000	ID already created	CreateStorage HardwareID()	The WWPN is already assigned to an existing storage hardware ID.
0x1000	Specified instance not found	DeleteStorage HardwareID()	The storage hardware ID could not be found.
0x1000	Invalid HardwareID instance	CreateGateway ID() AddHardwareIDs ToCollection()	The storage hardware ID could not be found or is already a member of another collection.
0x1001	Size not supported	CreateOrModify ElementFrom StoragePool()	The requested size is not supported by the primordial pools. The size parameter contains the nearest supported size larger than the requested one. The size requested was not a multiple of 512. The nearest supported size that can be requested is returned in size.
0x1001	Device Number Conflict	AttachDevice()	The specified device number is already occupied.
0x1001	Hardware implementation does not support specified IDType	CreateStorage HardwareID()	The type of ID is different from 2.
0x8000	Invalid ComputerSystem	AddNode()	The submitted ComputerSystem was not a IBMTSSVC_CandidateNode.
		EvictNode()	The submitted ComputerSystem was not a IBMTSSVC_Node.
		Shutdown()	The submitted ComputerSystem was not a IBMTSSVC_Node of IBMTSSVC_Cluster.
0x8000	Invalid Locale	SetLocale()	The submitted Locale was greater than 9.
0x8000	Invalid Type	Dump()	A type greater than 2 was passed in.

CIM return code	Description	Method	Explanation
0x8000	Connection refused	GetDump()	We lost connection to the cluster or failed to connect to a node (CISCO only).
0x8000	Backup not found	Restore Configuration()	The specified backup was not found.
0x8000	Delete failed	Delete Configuration Backup()	The deletion of the backup directory failed. The failure might have been caused by a sharing violation.
0x8000	IOGroup must have Nodes aggregated	SetIOGroup()	The IO group does not have any nodes.
0x8000	Invalid ID	SetQuorum()	The quorum ID is a number greater than 2.
0x8000	Invalid Volume	IncludeBackend Volume()	The volume is not expelled.
0x8000	CopyType not supported	AttachReplica()	The type of copy passed in was different from 2 or 3.
		CreateReplica()	The type of copy passed in was different from 3 or 4.
0x8000	Ports are from multiple IOGroups	CreateProtocol ControllerWith Ports()	All ports are required to belong to the same IO group.
0x8000	HardwareID still bound to AuthorizationSubject. Force required	DeleteStorage HardwareID()	The hardware ID has access granted to a storage volume and Force was not specified.
0x8000	Host is member of a LUN mapping	DeleteHardware IDCollection()	To delete this host either use this host to run the RemoveAccess method for each privilege and controller this host is associated to or set "Force" equal to "True."
0x8000	Record(s) not found	GetRecord() GetAllRecords()	No records were found.
0x8000	Cannot connect to cluster	Create2062 Cluster() Add2062 Cluster()	Unable to connect to the cluster.
0x8000	Connection to cluster refused	Add2145Cluster()	The connection to the cluster was refused.

CIM return code	Description	Method	Explanation
0x8000	Connection to switch refused	Reset2062Node() Reload2062Node()	The connection to the switch was refused.
0x8000	Cluster IP not found	RemoveCluster()	The IP for the cluster cannot be found.
0x8001	Maximum number of Nodes for Cluster exceeded	AddNode()	All IO groups already have two nodes assigned to them.
0x8001	Invalid Prefix	Dump()	A file prefix and feature log type were passed in at the same time.
0x8001	File not found	GetDump()	The given file path was not found (CISCO).
0x8001	Backup script failed	Backup Configuration()	The backup script returned with an error.
0x8001	Restore script failed	Restore Configuration()	The backup script returned with an error.
0x8001	Operation not allowed for current state	Modify Configuration()	The operation submitted is not allowed in the current state of the synchronized storage. For example, you cannot have a "prepare" operation on a synchronized storage in "synchronized" state.
0x8001	Operation not allowed for current SyncState	Modify Synchronized Set()	The operation is not allowed with the current SyncState of the set.
0x8001	Unsupported protocol	CreateProtocol ControllerWith Ports()	Protocol != 2.
0x8001	Syntax error in ClusterName	Create2062 Cluster() Add2062Cluster() Reset2062Node() Reload2062Node()	The cluster name is not valid because of a syntax error.
0x8002	Invalid ExtraCapacitySet	AddNode()	The submitted ExtraCapacitySet was not a IBMTSSVC_ IOGroupSet.
0x8002	Secure copy failed	Backup Configuration()	The download of the backup file using secure copy failed.

CIM return code	Description	Method	Explanation
0x8002	Secure copy failed	Upload Configuration()	The upload of the backup file using secure copy failed.
		CreateStorage HardwareID()	The name of the element and setting are required to be null.
0x8002	Syntax error in Node or Node is invalid	Create2062 Cluster() Add2062Cluster() Reset2062Node() Reload2062 Node()	The node contains a syntax error, or the specified node is invalid.
0x8003	Maximum number of Nodes for IOGroup exceeded	AddNode()	The submitted IO group set already has two nodes assigned to it.
0x8003	Creation of backup dir failed	Backup Configuration()	The backup directory cannot be created.
0x8003	Clear command failed	Upload Configuration()	The cluster /tmp/ directory cannot be cleared.
0x8003	Invalid username or password (only ResetNode)	Add2062Cluster() Reset2062Node() Reload2062Node()	The user name or password are invalid.
0x8004	Delete/rename of old backup files failed	N/A	The backup directory cannot be renamed or deleted.
0x8004	Wrong SwitchIP / can't connect to switch	Create2062 Cluster() Add2062Cluster()	The IP for the switch is not correct, so a connection to the switch cannot be made.
0x8004	SwitchIP is not configured	Reset2062Node() Reload2062Node()	The IP for the switch is not configured.
0x8005	Syntax error in ClusterIP	N/A	The IP for the cluster contains a syntax error.
0x8006	Invalid Slot	N/A	The slot is not valid.
0x8007	Cannot upload public key to switch	N/A	The public key cannot be uploaded to the switch.
0x8100	Cluster Scope Violation	N/A	One or more parameters were out of the cluster scope.
0x8200	N/A	N/A	The method was run successfully but one or more parameters were ignored.

Common information model and command line interface

The following table is a condensed list of CIM return codes and their corresponding SAN Volume Controller Command-Line Interface (CLI) error codes.

CIM return code	SAN Volume Controller CLI error code	Description
0x9001	CMMVC5700E	The parameter list is not valid.
0x9002	CMMVC5701E	No object ID was specified.
0x9003	CMMVC5702E	%1 is below the minimum level.
0x9004	CMMVC5703E	%1 is above the maximum level.
0x9005	CMMVC5704E	%1 is not divisible by the permitted step level.
0x9006	CMMVC5705E	A required parameter is missing.
0x9007	CMMVC5706E	%1 is not a valid argument for the -x parameter.
0x9008	CMMVC5707E	Required parameters are missing.
0x9009	CMMVC5708E	The %1 parameter is missing its associated arguments.
0x900A	CMMVC5709E	%1 is not a supported parameter.
0x900B	CMMVC5710E	No self-describing structure for identifier parameter [%1].
0x900C	CMMVC5711E	%1 is not valid data.
0x900D	CMMVC5712E	Required data is missing.
0x900E	CMMVC5713E	Some parameters cannot be used together.
0x900F	CMMVC5714E	There are no items in the parameter list.
0x9010	CMMVC5715E	There is no parameter list.
0x9011	CMMVC5716E	Nonnumeric data was entered for a numeric field (%1). Enter a numeric value.
0x9012	CMMVC5717E	No match was found for the specified unit.
0x9013	CMMVC5718E	An unexpected return code was received.
0x9014	CMMVC5719E	A value of %2 requires the parameter %1 to be specified.
0x9015	CMMVC5720E	%1 is not a valid argument for the -o parameter.
0x9016	CMMVC5721E	%1 is not a valid time-stamp format. The valid format is MMDDHHmmYY.
0x9017	CMMVC5722E	%1 is not a valid month.
0x9018	CMMVC5723E	%1 is not a valid day.
0x9019	CMMVC5724E	%1 is not a valid hour.
0x901A	CMMVC5725E	%1 is not a valid minute.
0x901B	CMMVC5726E	%1 are not valid seconds.
0x901C	CMMVC5727E	%1 is not a valid filter.

CIM return code	SAN Volume Controller CLI error code	Description
0x901D	CMMVC5728E	%1 must be in the format minute:hour:day:month:weekday.
0x901E	CMMVC5729E	One or more components in the list are not valid.
0x901F	CMMVC5730E	%1 is only valid when %2 has a value of %3.
0x9020	CMMVC5731E	%1 can only be entered when %2 has been entered.
0x9021	CMMVC5732E	The shared memory interface (SMI) is not available.
0x9022	CMMVC5733E	Enter at least one parameter.
0x9023	CMMVC5734E	A combination of values was entered that is not valid.
0x9024	CMMVC5735E	The name entered is not valid.
0x9025	CMMVC5736E	-c is not a valid unit.
0x9026	CMMVC5737E	The parameter %1 has been entered multiple times. Enter the parameter once.
0x9027	CMMVC5738E	The argument %1 contains too many letters.
0x9028	CMMVC5739E	The argument %1 does not contain enough letters.
0x9029	CMMVC5740E	The filter flag %1 is not valid.
0x902A	CMMVC5741E	The filter value %1 is not valid.
0x903A	CMMVC5987E	%1 is not a valid command line option.
0x903B	CMMVC6007E	The two passwords that were entered do not match.
0x903C	CMMVC6009E	Unable to malloc a block of memory to copy the returned data.
0x9101	CMMVC5742E	AE_ParamOutOfRange. A parameter specified is out of range.
0x9102	CMMVC5743E	AE_ParamNotInStep. A parameter specified does not comply with the step value.
0x9103	CMMVC5744E	AE_TooManyCandidates. Too many objects were specified in the request.
0x9104	CMMVC5745E	AE_TooFewCandidates. Too few objects were specified in the request.
0x9105	CMMVC5746E	AE_InvalidObjectType. The requested operation cannot be applied to the object specified.
0x9106	CMMVC5747E	AE_InvalidRequestId. The action requested is invalid. This is an internal error.
0x9107	CMMVC5748E	AE_NotSupportedYet. The action requested is invalid. This is an internal error.

CIM return code	SAN Volume Controller CLI error code	Description
0x9108	CMMVC5749E	AE_DumpFileExists. The specified dump file name already exists.
0x9109	CMMVC5750E	AE_DumpFileCreateError. Cannot create the dump file. The file system is probably full.
0x910A	CMMVC5751E	AE_DumpFileWriteError. Cannot write to the dump file.
0x910B	CMMVC5752E	AE_ObjectNotEmpty. The request failed. The object contains child objects. You must first delete the child objects.
0x910C	CMMVC5753E	AE_InvalidObject. The specified object does not exist or is not a suitable candidate.
0x910D	CMMVC5754E	AE_InvalidObjectName. The specified object does not exist, or the name that is supplied does not meet the naming rules.
0x910E	CMMVC5755E	AE_SizeMismatch. Cannot create because the sizes of the specified objects do not match.
0x910F	CMMVC5756E	AE_ObjectMapped. Cannot perform the request as the object is already mapped.
0x9110	CMMVC5757E	AE_NoSDSdefaults.SDS The defaults are not found. This is an internal error.
0x9111	CMMVC5758E	AE_NameExists. The object name already exists.
0x9112	CMMVC5759E	AE_MemoryAllocationFailed. Memory cannot be allocated. This is an internal error.
0x9113	CMMVC5760E	AE_AddNodeCallFailed. Failed to add the node to the cluster member list.
0x9114	CMMVC5761E	AE_DeleteNodeCallFailed. Failed to delete the node from the cluster member list.
0x9115	CMMVC5762E	AE_ClusterTimerExpired. The request did not complete before the timeout period has expired.
0x9116	CMMVC5763E	AE_NodeUnpendFailed. The node failed to go online.
0x9117	CMMVC5764E	AE_InvalidModeChange. The requested mode change is invalid. This is an internal error.
0x9118	CMMVC5765E	AE_NoMatchingCandidate. The selected object is no longer a candidate. A change occurred during the request.
0x9119	CMMVC5766E	AE_NoAssociations.
0x911A	CMMVC5767E	AE_InvalidParams. One or more of the parameters specified are invalid.
0x911B	CMMVC5768E	AE_UnfixedErrorsExist. Not used.

CIM return code	SAN Volume Controller CLI error code	Description
0x911C	CMMVC5769E	AE_NotAllNodesOnline. The requested operation requires all nodes to be online. One or more nodes are not online.
0x911D	CMMVC5770E	AE_InvalidSSHKeyFile. The supplied ssh key file is invalid.
0x911E	CMMVC5771E	AE_ForceRequired. The requested operation did not complete. This usually occurs when a child object exists. To force the operation, specify the force flag.
0x911F	CMMVC5772E	AE_SoftwareUpgradeInProgress. The operation requested cannot be performed because a software upgrade is in progress.
0x9120	CMMVC5773E	AE_InvalidMode. The object selected is in the wrong mode to perform the requested operation.
0x9121	CMMVC5774E	AE_InvalidSSHUserId. The supplied user ID is not valid.
0x9122	CMMVC5775E	AE_InvalidDirectory. The specified directory attribute is not valid.
0x9123	CMMVC5776E	AE_DirectoryListingFailed. The directory listing cannot be retrieved.
0x9124	CMMVC5777E	AE_IncorrectPowerDomain. The node cannot be added to the IO Group because the other node in the IO Group is in the same power domain.
0x9125	CMMVC5778E	AE_ClusterAlreadyCreated. Cannot create another cluster because a cluster already exists.
0x9126	CMMVC5779E	AE_TooManyClustersExistAlready.
0x9127	CMMVC5780E	AE_ClusterIDCannotBeDeleted.
0x9128	CMMVC5781E	AE_InvalidClusterID. The cluster ID specified is invalid.
0x9129	CMMVC5782E	AE_ObjectOffline. The specified object is offline.
0x912A	CMMVC5783E	AE_InformationNotAvailable
0x912B	CMMVC5784E	AE_ClusterNameNotUniqueUseId. The specified cluster name is not unique. You must specify the cluster using the cluster ID.
0x912C	CMMVC5785E	AE_IllegalCharacterInFilename. The specified filename contains an illegal character.

Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Features

These are the major accessibility features in the SAN Volume Controller master console:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen. The following screen readers have been tested: JAWS v4.5 and IBM Home Page Reader v3.0.
- You can operate all features using the keyboard instead of the mouse.

Navigating by keyboard

You can use keys or key combinations to perform operations and initiate many menu actions that can also be done through mouse actions. You can navigate the SAN Volume Controller Console and help system from the keyboard by using the following key combinations:

- To traverse to the next link, button, or topic, press Tab inside a frame (page).
- To expand or collapse a tree node, press → or ←, respectively.
- To move to the next topic node, press V or Tab.
- To move to the previous topic node, press ^ or Shift+Tab.
- To scroll all the way up or down, press Home or End, respectively.
- To go back, press Alt+←.
- To go forward, press Alt+→.
- To go to the next frame, press Ctrl+Tab.
- To move to the previous frame, press Shift+Ctrl+Tab.
- To print the current page or active frame, press Ctrl+P.
- To select, press Enter.

Accessing the publications

You can view the publications for the SAN Volume Controller in Adobe Portable Document Format (PDF) using the Adobe Acrobat Reader. The PDFs are provided at the following Web site:

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

Related reference

“SAN Volume Controller library and related publications” on page xxi

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

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Glossary

Glossary of terms used in the CIM Agent Developer's Reference Guide.

A

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.

association

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

C

CIM See *Common Information Model*.

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.

CIMOM

See *CIM object manager*.

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.

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.

D

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.

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.

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

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).

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.

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.

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
 keyboard 393
 shortcut keys 393

adding
 candidate node 25
 nodes 25

association object classes 261
 AccountManagementServiceForSystem 298
 AccountOnCIMOM 299
 AccountOnSystem 299
 AllocatedFromStoragePool 261
 AuthorizationTarget 263
 AuthorizedCollection 262
 AuthorizedStorageHardwareID 262
 AuthorizedSubject 262
 AvailableHardwareID 263
 BackendControllerForVolume 263
 BasedOn 264
 ClusterController 264
 ClusterDumps 265
 ClusteringCandidate 265
 ClusteringServiceForSystem 266
 ClusterMaskingCapabilities 266
 ClusterPort 266
 ClusterScopeCandidateVolume 267
 ClusterScopeChassis 267
 ClusterScopeFCSet 267
 ClusterScopeIOGroup 268
 ClusterScopeNodeVPD 268
 ClusterScopePrivilege 268
 ClusterScopeProduct 268
 ClusterScopeSCSet 269
 ClusterScopeStorage VolumeBackend
 VolumeView 269
 ComponentCS 270
 ComputerSystemPackage 270
 ConnectedBackendController 271
 ContainsTruststore 300
 ControllerConfigurationServiceForSystem 271
 ControllerConfServiceMaskingCapabilities 271
 CopyCandidate 272
 ElementConformsToProfile 272
 FlashCopyStorageSynchronized 272
 FlashCopySynchronizedMember 275
 HardwareIDOnSystem 275
 HasCertificate 301
 HostedAccessPoint 275
 HostedFlashCopyJob 276
 HostedFormatVolumeJob 276
 HostedJob 276
 HostedMigrateVolumeJob 276
 HostedPrimordialPool 277
 HostedStoragePool 277
 HostedSyncCopyJob 277
 HostsTruststoreManager 302
 HwIDCollectionOnSystem 278

association object classes (*continued*)
 IBMTS_CommMechanismForManager 300
 IBMTS_ElementConformsToProfile 301
 IBMTS_NamespaceInManager 304
 IBMTSSVC_ClusterVolume 269
 IBMTSSVC_SystemFCPort 295
 IndicationFiltersConformsToProfile 278
 IndicationFiltersConformsToSubProfile 278
 IOGroupIdentity 279
 IOGroupPort 279
 ManagesAccount 303
 ManagesCollection 279
 ManagesController 280
 ManagesHardwareId 280
 ManagesPrivilege 280
 ManagesTruststore 303
 MemberOfCollection 281
 MemberOfIOGroup 281
 NodeDumps 281
 PartnershipCandidate 282
 PoolCapabilities 283
 PrimordialPoolCapabilities 283
 PrimordialPoolComponent 283
 PrimordialPoolForController 284
 PrivilegeServiceForSystem 284
 ProductPhysicalComponent 284
 ProtocolControllerForPort 285
 ProtocolControllerForUnit 286
 ProviderInObjectManager 287
 RemotePartnership 287
 RemoteSystemVolume 288
 RequiresProfile 288
 SAPAvailableForElement 288
 StorageConfigurationServiceCap 289
 StorageConfigurationServiceForSystem 289
 StorageHardwareIDManagement
 ServiceForSystem 290
 StoragePoolComponent 290
 SyncCopyStorageSynchronized 290
 SyncCopySynchronizedMember 294
 SystemBackendVolume 294
 SystemCandidateVolume 294
 SystemController 295
 SystemFeatures 295
 SystemVolume 295
 SystemVPD 296
 UseOfMessageLog 297
 VolumeSettingData 297

C

candidate node
 adding 25

certificate
 truststore 7

CIM (Common Information Model)
 agent 3
 CIM agent 7

- CIM agent *(continued)*
 - CIMOM 3
 - device 3
 - device provider 3
 - functional diagrams of 8
 - functional views
 - clustering service 14
 - copy services 18
 - LUN masking 16
 - security service 21
 - functional views of
 - access point subprofile 13
 - cluster subprofile 14
 - copy services 18
 - extent mapping subprofile 11
 - ExtraCapacitySet subprofile 12
 - Flash Copy state diagram 32
 - LUN creation subprofile 17
 - LUN masking 16
 - physical package 9
 - pool manipulation 22
 - profile overview 8
 - security services 21
 - server profile 10
 - Sync Copy state diagram 33
 - vendor specific service mode subprofile 19
 - vendor-specific cluster operations 20
 - vendor-specific storage configuration operations 15
 - IP discovery 37
 - IP registration 37
 - methods 305
 - object classes 41
 - association 261
 - core 41
 - security 226
 - SLP based discovery 37
- CIM return code 377
- CIMOM
 - manual SLP registration 37
- clustering
 - service 14
- collecting log files 39
- Common Information Model (CIM) 2
 - agent 3
- configuration
 - adding a candidate node to a cluster 25
 - creating a new storage pool 26
 - creating a new storage volume 27
 - modifying a storage pool 26
 - performing basic storage configuration 25
 - storage 25
 - storage configuration 25
- configuring
 - storage 25
- conventions xxi
- copy services 29
 - overview 18
- core object classes
 - BackendController 41
 - BackendVolume 48
- core object classes *(continued)*
 - CandidateCluster 58
 - CandidateNode 59
 - CandidateStorageHardwareID 66
 - CandidateVolume 68
 - Chassis 69
 - Cluster 76
 - Controller 83
 - ControllerConfigurationService 90
 - ControllerMaskingCapabilities 94
 - Dumps 96
 - FCPort 98
 - Features 108
 - FlashCopyJob 109
 - FlashCopySynchronizedSet 113
 - FormatVolumeJob 115
 - HardwareIdCollection 118
 - HardwareIdCollectionStorageVolumeView 120
 - IOGroup 121
 - IOGroupSet 127
 - Job 128
 - MessageLog 132
 - MigrateVolumeJob 140
 - Node 145
 - NodeVPD 151
 - overview 41
 - PrimordialStoragePool 152
 - Privilege 155
 - PrivilegeManagementService 215
 - Product 156
 - Provider 157
 - RegisteredProfile 160
 - RegisteredSubProfile 164
 - RemoteCluster 167
 - RemoteServiceAccessPoint 169
 - RemoteVolume 174
 - StorageCapabilities 175
 - StorageConfigurationCapabilities 178
 - StorageConfigurationService 219
 - StorageHardwareIDManagementService 222
 - StoragePool 183
 - StorageSetting 187
 - StorageVolume 190
 - StorageVolumeBackendVolumeView 204
 - SyncCopyJob 205
 - SyncCopySynchrononizedSet 209
- creating
 - FlashCopy
 - relationship 29
 - storage
 - pools 26
 - volumes 27
 - synchronous copies
 - relationship 29
 - synchronous copy relationships
 - between volumes in different clusters 31
 - between volumes in the same cluster 31

E

- editing
 - raspd.properties 39
- emphasis in text xxi
- error codes 377
- expiration 7
- expired
 - certificate 7
- extrinsic methods
 - Add2145Cluster() 319
 - AddHardwareIDsToCollection() 319
 - AddNode() 320
 - AssignAccess() 321
 - AttachDevice() 323
 - AttachReplica 323
 - BackupConfiguration() 324
 - CancelIteration() 325
 - CheckValidity() 325
 - Clean() 326
 - ClearLog() 327
 - CreateHardwareIDCollection() 327
 - CreateOrModifyElementFromStoragePool() 331
 - CreateOrModifyStoragePool() 328
 - CreateProtocolControllerWithPorts() 333
 - CreateRemoteClusterPartnership() 334
 - CreateReplica() 334
 - CreateSetting() 335
 - CreateStorageHardwareID() 336
 - CreateSynchronizedSet() 337
 - DeleteCertificate() 338
 - DeleteConfigurationBackup() 338
 - DeleteHardwareIDCollection() 339
 - DeleteProtocolController() 340
 - DeleteRecord() 340
 - DeleteRemoteClusterPartnership() 341
 - DeleteStorageHardwareID() 342
 - DeleteStoragePool() 343
 - DeleteSynchronizedSet() 342
 - DetachDevice() 344
 - DisableAutoGeneration() 344
 - Dump() 345
 - EnableAutoGeneration() 345
 - Enter() 346
 - EvictNode() 346
 - Exit() 347, 374
 - FixRecord() 347
 - GenerateCIMOMCertificate() 353
 - GetAllRecords() 348
 - GetDump() 348
 - GetFreeExtents() 349
 - GetHosts() 350
 - GetIOGroups() 350
 - GetRecord() 351
 - GetResetPasswordChangeFeatureStatus() 351
 - GetSupportedSizeRange() 352
 - IncludeBackendVolume() 354
 - ListConfigurationBackups() 354
 - MigrateVolume() 355
 - MigrateVolumeToImageMode() 355
 - ModifyErrorSettings() 356
 - ModifyHostIOGroupMapping() 357

- extrinsic methods (*continued*)
 - ModifyIPAddress() 358
 - ModifyResetPasswordChangeFeature() 359
 - ModifySynchronization() 359
 - ModifySynchronizedSet() 361
 - overview 316
 - PositionToFirstRecord() 364
 - PositionToFirstRecordRoot() 365
 - PositionToFirstRecordType() 364, 365
 - RemoveAccess() 366
 - RemoveCluster() 367
 - RequestDiscovery() 367
 - RestoreConfiguration() 368
 - ReturnToStoragePool() 368
 - SetDefaultValidity() 369
 - SetIOGroup() 370
 - SetLocale() 370
 - SetPasswords() 371
 - SetQuorum() 371
 - SetTimeZone() 372
 - Shutdown() 373
 - StartStatisticsCollection() 372
 - StopStatisticsCollection() 373
 - UnfixRecord() 374
 - WriteRecord() 375

F

- FlashCopy
 - creating
 - synchronized set 30
- FlashCopy service 29
- functional diagrams of the CIM Agent 8
- functional views of the CIM Agent
 - access point subprofile 13
 - cluster subprofile 14
 - copy services 18
 - extent mapping subprofile 11
 - ExtraCapacitySet subprofile 12
 - Flash Copy state diagram 32
 - LUN creation subprofile 17
 - LUN masking 16
 - physical package 9
 - pool manipulation 22
 - profile overview 8
 - security service 21
 - server profile 10
 - Sync Copy state diagram 33
 - vendor specific service mode subprofile 19
 - vendor-specific cluster operations 20
 - vendor-specific storage configuration operations 15

G

- generating new truststore certificate 7

I

- IBMTS object classes
 - Account 226
 - AccountManagementService 228

IBMTS object classes *(continued)*

AccountOnSystem 299
 CIMXMLCommunicationMechanism 233
 IBMTS_Certificate 231
 IBMTS_CertificateSetting 233
 IBMTS_CommMechanismForManager 300
 IBMTS_ElementConformsToProfile 301
 IBMTS_IndicationFilter 238
 IBMTS_NameSpace 239
 IBMTS_NamespaceInManager 304
 ManagesAccount 303
 ObjectManager 241
 RegisteredProfile 245
 System 246
 Truststore 249
 TruststoreManagementService 250

IBMTSSVC object classes

AccountManagementServiceForSystem 298
 AccountOnCIMOM 299
 AllocatedFromStoragePool 261
 AuthorizedCollection 262
 AuthorizedStorageHardwareID 262
 AuthorizedSubject 262
 AuthorizedTarget 263
 AvailableHardwareID 263
 BackendController 41
 BackendControllerForVolume 263
 BackendVolume 48
 BasedOn 264
 CandidateCluster 58
 CandidateNode 59
 CandidateStorageHardwareID 66
 CandidateVolume 68
 Chassis 69
 Cluster 76
 ClusterController 264
 ClusterDumps 265
 ClusteringCandidate 265
 ClusteringService 212
 ClusteringServiceForSystem 266
 ClusterMaskingCapabilities 266
 ClusterPort 266
 ClusterScopeCandidateVolume 267
 ClusterScopeChassis 267
 ClusterScopeFCSet 267
 ClusterScopeIOGroup 268
 ClusterScopeNodeVPD 268
 ClusterScopePrivilege 268
 ClusterScopeProduct 268
 ClusterScopeSCSet 269
 ClusterScopeStorage VolumeBackend
 VolumeView 269
 ComponentCS 270
 ComputerSystemPackage 270
 ConnectedBackendController 271
 ContainsTruststore 300
 Controller 83
 ControllerConfigurationService 90
 ControllerConfigurationServiceForSystem 271
 ControllerConfServiceMaskingCapabilities 271
 ControllerMaskingCapabilities 94

IBMTSSVC object classes *(continued)*

CopyCandidate 272
 Dumps 96
 ElementConformsToProfile 272
 FCPort 98
 Features 108
 FlashCopyJob 109
 FlashCopyStorageSynchronized 272
 FlashCopySynchronizedMember 275
 FlashCopySynchronizedSet 113
 FormatVolumeJob 115
 HardwareIdCollection 118
 HardwareIdCollectionStorageVolumeView 120
 HardwareIDOnSystem 275
 HasCertificate 301
 HostedAccessPoint 275
 HostedFlashCopyJob 276
 HostedFormatVolumeJob 276
 HostedJob 276
 HostedMigrateVolumeJob 276
 HostedPrimordialPool 277
 HostedStoragePool 277
 HostedSyncCopyJob 277
 HostsTruststoreManager 302
 HwIDCollectionOnSystem 278
 IBMTSSVC_ClusterVolume 269
 IBMTSSVC_SystemFCPort 295
 IndicationFiltersConformsToProfile 278
 IndicationFiltersConformsToSubProfile 278
 IOGroup 121
 IOGroupIdentity 279
 IOGroupPort 279
 IOGroupSet 127
 Job 128
 ManagesCollection 279
 ManagesController 280
 ManagesHardwareId 280
 ManagesPrivilege 280
 ManagesTruststore 303
 MemberOfCollection 281
 MemberOfIOGroup 281
 MessageLog 132
 MigrateVolumeJob 140
 Node 145
 NodeDumps 281
 NodeVPD 151
 PartnershipCandidate 282
 PoolCapabilities 283
 PrimordialPoolCapabilities 283
 PrimordialPoolComponent 283
 PrimordialPoolForController 284
 PrimordialStoragePool 152
 Privilege 155
 PrivilegeManagementService 215
 PrivilegeServiceForSystem 284
 Product 156
 ProductPhysicalComponent 284
 ProtocolControllerForPort 285
 ProtocolControllerForUnit 286
 Provider 157
 ProviderInObjectManager 287

IBMTSSVC object classes *(continued)*

- RegisteredProfile 160
- RegisteredSubProfile 164
- RemoteCluster 167
- RemotePartnership 287
- RemoteServiceAccessPoint 169
- RemoteSystemVolume 288
- RemoteVolume 174
- RequiresProfile 288
- SAPAvailableForElement 288
- StorageCapabilities 175
- StorageConfigurationCapabilities 178
- StorageConfigurationService 219
- StorageConfigurationServiceCap 289
- StorageConfigurationServiceForSystem 289
- StorageHardwareIDManagement
 - ServiceForSystem 290
- StorageHardwareIDManagementService 222
- StoragePool 183
- StoragePoolComponent 290
- StorageSetting 187
- StorageVolume 190
- StorageVolumeBackendVolumeView 204
- SyncCopyJob 205
- SyncCopyStorageSynchronized 290
- SyncCopySynchronizedMember 294
- SyncCopySynchronizedSet 209
- SystemBackendVolume 294
- SystemCandidateVolume 294
- SystemController 295
- SystemFeatures 295
- SystemVolume 295
- SystemVPD 296
- UseOfMessageLog 297
- VolumeSettingData 297

information center *xxi*

intrinsic methods

- Associators() 305
- AssociatorsNames() 306
- CreateInstance() 307
- DeleteInstance() 308
- EnumerateClasses() 308
- EnumerateClassNames() 309
- EnumerateInstanceNames() 310
- EnumerateInstances() 310
- ExecQuery() 311
- GetClass() 311
- GetInstance() 312
- GetProperty() 312
- ModifyInstance() 313
- overview 305
- Reference() 314
- ReferenceNames() 314
- SetProperty() 315

K

- keyboard 393
- keyboard shortcuts 393

L

- log files
 - collecting 39
 - zipping 39
- logical unit numbers (LUNs)
 - masking 16
- LUN masking
 - performing 35
- LUNs (logical unit numbers)
 - masking 16, 35

M

- Management Application
 - launching Web User Interface 37
- masking LUNs 35
- master console
 - error 7
- methods
 - CIM Agent 305
 - extrinsic 316
 - Add2145Cluster() 319
 - AddHardwareIDsToCollection() 319
 - AddNode() 320
 - AssignAccess() 321
 - AttachDevice() 323
 - AttachReplica 323
 - BackupConfiguration() 324
 - CancelIteration() 325
 - CheckValidity() 325
 - Clean() 326
 - ClearLog() 327
 - CreateHardwareIDCollection() 327
 - CreateOrModifyElementFromStoragePool() 331
 - CreateOrModifyStoragePool() 328
 - CreateProtocolControllerWithPorts() 333
 - CreateRemoteClusterPartnership() 334
 - CreateReplica() 334
 - CreateSetting() 335
 - CreateStorageHardwareID() 336
 - CreateSynchronizedSet() 337
 - DeleteCertificate() 338
 - DeleteConfigurationBackup() 338
 - DeleteHardwareIDCollection() 339
 - DeleteProtocolController() 340
 - DeleteRecord() 340
 - DeleteRemoteClusterPartnership() 341
 - DeleteStorageHardwareID() 342
 - DeleteStoragePool() 343
 - DeleteSynchronizedSet() 342
 - DetachDevice() 344
 - DisableAutoGeneration() 344
 - Dump() 345
 - EnableAutoGeneration() 345
 - Enter() 346
 - EvictNode() 346
 - Exit() 347, 374
 - FixRecord() 347
 - GenerateCIMOMCertificate() 353
 - GetAllRecords() 348

methods (*continued*)

- extrinsic (*continued*)
 - GetDump() 348
 - GetFreeExtents() 349
 - GetHosts() 350
 - GetIOGroups() 350
 - GetRecord() 351
 - GetResetPasswordChangeFeatureStatus() 351
 - GetSupportedSizeRange() 352
 - IncludeBackendVolume() 354
 - ListConfigurationBackups() 354
 - MigrateVolume() 355
 - MigrateVolumeToImageMode() 355
 - ModifyErrorSettings() 356
 - ModifyHostIOGroupMapping() 357
 - ModifyIPAddress() 358
 - ModifyResetPasswordChangeFeature() 359
 - ModifySynchronization() 359
 - ModifySynchronizedSet() 361
 - PositionToFirstRecord() 364
 - PositionToFirstRecordRoot() 365
 - PositionToFirstRecordType() 364, 365
 - RemoveAccess() 366
 - RemoveCluster() 367
 - RequestDiscovery() 367
 - RestoreConfiguration() 368
 - ReturnToStoragePool() 368
 - SetDefaultValidity() 369
 - SetIOGroup() 370
 - SetLocale() 370
 - SetPasswords() 371
 - SetQuorum() 371
 - SetTimeZone() 372
 - Shutdown() 373
 - StartStatisticsCollection() 372
 - StopStatisticsCollection() 373
 - UnfixRecord() 374
 - WriteRecord() 375
- intrinsic 305
 - AssociatorNames() 306
 - Associators() 305
 - CreateInstance() 307
 - DeleteInstance() 308
 - EnumerateClasses() 308
 - EnumerateClassNames() 309
 - EnumerateInstanceNames() 310
 - EnumerateInstances() 310
 - ExecQuery() 311
 - GetClass() 311
 - GetInstance() 312
 - GetProperty() 312
 - ModifyInstance() 313
 - Reference() 314
 - ReferenceNames() 314
 - SetProperty() 315
- mkcertificate.bat 7
- modifying
 - storage pools 26
- Multiple network cards 37

N

- nodes
 - adding 25
- notices
 - legal 395

O

- object classes
 - association 261
 - core 41
 - overview 41
 - security 226
 - service 212
- ordering publications xxiii

P

- performing
 - LUN masking 35
- publications
 - ordering xxiii

R

- related information xxi
- RemoteServiceAccessPoint
 - manually set connection data 37
- return codes 377

S

- SAN Volume Controller
 - overview 5
- security
 - object classes 226
 - Account 226
 - AccountManagementService 228
 - CIMXMLCommunicationMechanism 233
 - IBMTS_Certificate 231
 - IBMTS_CertificateSetting 233
 - IBMTS_IndicationFilter 238
 - IBMTS_NameSpace 239
 - ObjectManager 241
 - RegisteredProfile 245
 - System 246
 - Truststore 249
 - TruststoreManagementService 250
 - service 21
- service
 - object classes 212
 - ClusteringService 212
 - StorageHardwareID 182
- shortcut keys 393
- SMI-S (Storage Management Initiative Specification) 1
- Specification, Storage Management Initiative 1
- storage
 - configuration 25
 - adding a candidate node to a cluster 25
 - creating a new storage pool 26

- storage (*continued*)
 - configuration (*continued*)
 - creating a new storage volume 27
 - modifying a storage pool 26
 - performing basic storage configuration 25
 - storage configuration 25
 - adding a candidate node to a cluster 25
 - creating a new storage pool 26
 - creating a new storage volume 27
 - modifying a storage pool 26
 - performing basic storage configuration 25
- Storage Management Initiative Specification (SMI-S) 1
- storage pools
 - creating 26
 - modifying 26
- support
 - Web sites xxiii
- synchronous copy
 - creating relationships
 - between volumes in different clusters 31
 - between volumes in the same cluster 31
- synchronous copy service 29

T

- text emphasis xxi
- trademarks 396
- truststore
 - certificate 7
- truststore certificate 7

V

- volumes
 - creating new storage 27

W

- Web sites xxiii

Z

- zip
 - log files 39

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