

Dell PowerMax 10.3.0

REST API Changelog

Revision: 01

October 2025

Revision History

Version	Date	Description
01	October 2025	Initial release of document

Table of Contents

1	Design Overview	8
1.1	Overall	8
1.2	SLO Provisioning.....	8
1.3	Replication.....	8
1.4	VVOL	8
1.5	System.....	8
1.6	Settings.....	8
1.7	Enhanced Endpoints	8
2	Design Details	10
2.1	SLO Provisioning.....	10
2.1.1	SRP	10
2.1.1.1	GET(Object)	10
2.1.1.1.1	Sample JSON response from GET /103/sloprovisioning/symmetrix/<symmId>/srp/<srpld> (V4)	12
2.1.2	Symmetrix	13
2.1.2.1	GET(Object)	13
2.2	Replication.....	16
2.2.1	symmetrix	16
2.2.1.1	GET (Object)	16
2.2.1.1.1	Sample JSON request.....	17
2.2.1.2	metrodr	18
2.2.1.2.1	PUT.....	18
2.2.1.3	storagegroup/rdf_group	25
2.2.1.3.1	PUT.....	25

2.2.1.3.2	DELETE	37
2.2.1.4	devicegroup.....	38
2.2.1.4.1	PUT.....	38
2.3	VVOL.....	43
2.3.1	storagecontainer/storageresource/volume	43
2.3.1.1	GET (List).....	43
2.3.1.2	GET (Object)	44
2.3.1.2.1	Sample JSON response	45
2.3.2	vasaprovider.....	46
2.3.2.1	GET (List).....	46
2.3.2.1.1	Sample JSON response	47
2.4	System.....	47
2.4.1	symmetrix.....	47
2.4.1.1	GET(Object)	47
2.4.1.1.1	Sample JSON response from GET /103/system/symmetrix/<symmId>.....	49
2.5	Settings.....	49
2.5.1	Alert.....	49
2.5.1.1	alert_policy.....	49
2.5.1.1.1	GET (List)	49
2.5.1.1.2	PUT.....	72
2.5.1.2	compliance_alert_policy	74
2.5.1.2.1	GET (Object).....	74
2.5.1.2.2	PUT.....	76
2.5.1.2.3	storage_group	78
2.5.1.3	system_threshold.....	82
2.5.1.3.1	GET.....	82
2.5.1.3.2	PUT.....	87
2.5.1.4	performance_threshold	90
2.5.1.4.1	GET.....	90
2.5.1.4.2	PUT.....	93
2.5.1.5	notification	97
2.5.1.5.1	GET (Object).....	97
2.5.1.5.2	PUT.....	100

2.5.1.5.3	test	104
2.5.1.5.4	agent_details	106
2.5.1.5.5	symmetrix/alert/notification	108
2.5.2	access_control	116
2.5.2.1	hostaccess	116
2.5.2.1.1	GET (List)	116
2.5.2.1.2	POST	118
2.5.2.1.3	DELETE	120
2.5.2.2	block_security_api	121
2.5.2.2.1	PUT	121
2.5.2.3	authentication	122
2.5.2.3.1	GET (Object)	122
2.5.2.3.2	PUT	123
2.5.2.4	authorization_rule	127
2.5.2.4.1	GET (List)	127
2.5.2.4.2	POST	132
2.5.2.4.3	PUT	135
2.5.2.5	local_user	138
2.5.2.5.1	PUT	138
2.5.3	Registration	140
2.5.3.1	performance/Array/register	140
2.5.3.1.1	POST	140
2.5.3.2	scg	142
2.5.3.2.1	GET	142
2.5.3.2.2	POST	144
2.5.3.2.3	DELETE	146
2.5.3.2.4	server_cert	146
2.5.3.3	cloudiq	150
2.5.3.3.1	GET	150
2.5.3.3.2	PUT	151
2.6	Enhanced Endpoints	154
2.6.1	storage-groups	154
2.6.1.1	GET	154

2.6.1.1.1	Sample JSON Response.....	156
2.6.2	volumes	157
2.6.2.1	GET	157
2.6.2.1.1	Sample JSON Response.....	159
2.6.3	directors.....	160
2.6.3.1	GET	160
2.6.3.1.1	Sample JSON Response.....	162
2.6.4	ports	163
2.6.4.1	GET	163
2.6.4.1.1	Sample JSON Response.....	171
2.6.5	ip-routes	173
2.6.5.1	GET	173
2.6.5.1.1	Sample JSON Response.....	175
2.6.6	ip-interfaces.....	175
2.6.6.1	GET	175
2.6.6.1.1	Sample JSON Response.....	178
2.6.7	rdf-groups	179
2.6.7.1	GET	179
2.6.7.1.1	Sample JSON Response.....	189
2.6.8	port-groups	191
2.6.8.1	GET	191
2.6.8.1.1	Sample JSON Response.....	196
2.6.9	masking-views.....	197
2.6.9.1	GET	197
2.6.9.1.1	Sample JSON Response.....	211
2.6.10	hosts.....	216
2.6.10.1	GET	216
2.6.10.1.1	Sample JSON Response	224
2.6.11	initiators	227
2.6.11.1	GET	227
2.6.11.2	Sample JSON Response	236
3	Appendix	239

3.1	Basic Authentication	239
3.2	Request Types	239
3.2.1	GET (OBJECT)	239
3.2.1.1	Sample	239
3.2.1.2	Response Codes	241
3.2.2	GET (LIST)	241
3.2.2.1	Sample	241
3.2.2.2	Response Codes	242
3.2.3	POST	242
3.2.3.1	Sample	242
3.2.3.2	Response Codes	245
3.2.3.3	Response Header	245
3.2.4	PUT	246
3.2.4.1	Sample	246
3.2.4.2	Response Codes	248
3.2.4.3	Response Header:	248
3.2.5	DELETE	249
3.2.5.1	Sample	249
3.2.5.2	Response Codes:	249
3.3	Common Objects	250
3.3.1	Iterator	250
3.3.1.1	Sample Object Array:	250
3.3.1.1.1	Sample JSON Response:	251
3.3.2	Job	251
3.3.2.1	Sample JSON Response:	252
3.3.2.2	Response Codes:	253
3.3.3	Configuration Management Type	253
3.4	Automatic Cleanup of REST API jobs	254
3.5	Enhanced Endpoints	254
3.5.1	Base URL	255
3.5.1.1	https://{ipaddress}:{port}/univmax/rest/	255

3.5.2	Query Details:	255
3.5.2.1	Filtering:	255
3.5.2.2	Ordering:	255
3.5.2.3	Selecting:	255
3.5.2.4	Sample	256
3.5.2.4.1	Example query	257
3.5.3	Pagination	257
3.5.3.1	Description:	257
3.5.3.2	Request Query Params	258
3.5.3.2.1	Sample	258
3.5.3.3	Response	258
3.5.3.3.1	Sample	259
3.5.3.3.2	Sample Expired Token Error:	259
3.5.3.4	Limits:	260
3.5.3.4.1	Edge Case:	260
3.5.3.5	Sample Behavioural Use Case:	260
3.5.4	Enhanced Error Messages	261
3.5.4.1	Description:	261
3.5.4.2	Response	261
3.5.4.2.1	Sample	262

1 Design Overview

This document describes the changes in the 10.3.0 release of the public PowerMax REST (Representational State Transfer) API. This overview gives a concise description of the changes. Details for each of the changes are provided in the relevant resource sections. For common REST API behavior, see the [Appendix](#). In this document “symmetrix” and “Symmetrix” is a synonym for storage array.

1.1 Overall

- Update the error messages received when incorrectly formatted values are supplied in the request body.

1.2 SLO Provisioning

- Expose the Data Reduction Ratio On Enabled value at the SRP and System level.
- Update how DRR on Reducible and DRR on Enabled values are displayed.

1.3 Replication

- Add new properties to symmetrix GET.

1.4 VVOL

- Add VM properties to vvol GET.
- Add ipv6 property to vasa provider GET.

1.5 System

- Solutions enabler have retired some fields from SYMAPI_CONFIG_T so the corresponding fields have been removed from 103/system/symmetrix in palmetto

1.6 Settings

New resource to be introduced that will group the settings management endpoints. The existing endpoints will be moved under new resource from system and new endpoints to be introduced to manage:

- Alert Settings
- Global Performance Thresholds for zero touch management
- Users and Groups
- SCG and CloudIQ configuration settings
- Host Access Control
- Performance Registration for zero touch management

1.7 Enhanced Endpoints

- Add the following collection endpoints:
 - Directors
 - Ports
 - Ip Routes
 - Ip Interfaces

- RDF Groups
 - Port Groups
 - Masking Views
 - Hosts
 - Initiators
- Modify the following collection endpoints:
 - Volumes
 - Storage Groups
- Add pagination capabilities to enhanced endpoints (See Enhanced Endpoints in Index)
- Improve enhanced endpoints error messages to include error codes (See Enhanced Endpoints in Index)

2 Design Details

2.1 SLO Provisioning

2.1.1 SRP

2.1.1.1 GET(Object)

Resource	srp								
Request Type:	GET								
New Endpoint Description:	Not applicable								
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>On a V4, the data_reduction_ratio_on_enabled_to_one value will be available in the “data_reduction” section of the SRP GET call for both single and mixed emulation SRPs</td></tr><tr><td>In the srp_efficiency section of the output, the data_reduction_ratio_to_one value will show DRROnReducible on a V4 and show DRROnEnabled on a V3.</td></tr><tr><td>data_reduction_ratio_on_enabled_to_one will be available on a V4 only. drr_on_reducible_only_to_one will be available on a V3 only.</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	On a V4, the data_reduction_ratio_on_enabled_to_one value will be available in the “data_reduction” section of the SRP GET call for both single and mixed emulation SRPs	In the srp_efficiency section of the output, the data_reduction_ratio_to_one value will show DRROnReducible on a V4 and show DRROnEnabled on a V3.	data_reduction_ratio_on_enabled_to_one will be available on a V4 only. drr_on_reducible_only_to_one will be available on a V3 only.	Removed in this Release	Not applicable
Added in this Release									
Not applicable									
Modified in this Release									
On a V4, the data_reduction_ratio_on_enabled_to_one value will be available in the “data_reduction” section of the SRP GET call for both single and mixed emulation SRPs									
In the srp_efficiency section of the output, the data_reduction_ratio_to_one value will show DRROnReducible on a V4 and show DRROnEnabled on a V3.									
data_reduction_ratio_on_enabled_to_one will be available on a V4 only. drr_on_reducible_only_to_one will be available on a V3 only.									
Removed in this Release									
Not applicable									
URL:	...103/sloprovisioning/symmetrix/{symmetrixId}/srp/{srpld}								
User Roles:	Monitor and above								
Prerequisite:	Not applicable								
Path Parameters:	Not applicable								

Query Parameters:	Not applicable			
Request Parameters:	Not applicable			
Response Parameters:	Object	DataReductionType		
	Attribute Name	Type	Optional	Description
	data_reduction_on_enabled_ratio_to_one	String	No	DRR on Enabled value for the SRP
	Object	SRPEfficiencyType		
	Attribute Name	Type	Optional	Description
	data_reduction_on_enabled_ratio_to_one	String	No	New property. Will show DRR on Enable value for the SRP. (Available on a V4 only)
	drr_on_reducible_only_to_one	String	No	Existing Property. Will show the DRR on Reducible value for the SRP. Updates: it will be available on a V3 only
	data_reduction_ratio_to_one	String	No	Existing Property. On a V4, this will show DRR on Reducible.

				On a V3, this will show DRR on Enabled
				Updates: it will be available on a V3 only

2.1.1.1.1 Sample JSON response from GET /103/sloprovisioning/symmetrix/<symmld>/srp/<srpld> (V4)

...	
..	
.	
"data_reduction": "data_reduction_ratio_to_one": "data_reduction_ratio_on_enabled_to_one": "reducing_data_percent": "savings_tb": "effective_used": "enabled_and_reducing_tb": "enabled_and_unreducible_tb": "enabled_and_unevaluated_tb": "disabled_and_unreduced_tb": }, "physical_used": "enabled_and_reducing_tb": "enabled_and_unreducible_tb": "enabled_and_unevaluated_tb": "disabled_and_unreduced_tb": } }	{ 999.9, 989.9, 3, 0, { 0, 0, 0, 0.01 }, { 0, 0, 0, 0.01 } }
..	
..	
"srp_efficiency": "compression_state": "overall efficiency ratio to one":	{ "Enabled", 848,

```

    "data_reduction_ratio_to_one": 999.9,
    "data_reduction_ratio_on_enabled_to_one": 989.9,
    "data_reduction_enabled_percent": 3,
    "unreducible_data_tb": 0,
    "reducible_data_tb": 0,
    "deduplication_and_compression_savings_tb": 0,
    "pattern_detection_savings_tb": 0
  },
  ..
.

```

2.1.2 Symmetrix

2.1.2.1 GET(Object)

Resource	symmetrix	
Request Type:	GET	
New Endpoint Description:	Not applicable	
Modify Endpoint Description:	Added in this Release	
	Not applicable	
	Modified in this Release	
	On a V4, data_reduction_ratio_on_enabled_to_one value will be available in the "data_reduction" section Symmetrix GET call	
	In the srp_efficiency section of the output, the data_reduction_ratio_to_one value will show DRROnReducible on a V4 and show DRROnEnabled on a V3.	
	data_reduction_ratio_on_enabled_to_one will be available on a V4 only. drr_on_reducible_only_to_one will be available on a V3 only	
	Removed in this Release	

	Not applicable		
URL:	... /103/sloprovisioning/symmetrix/{symmetrixId}		
User Roles:	Monitor and above		
Prerequisite:	Not applicable		
Path Parameters:	Not applicable		
Query Parameters:	Not applicable		
Request Parameters:	Not applicable		
Response Parameters:	Object	DataReductionType	
	Attribute Name	Type	Optional
	data_reduction_on_enabled_ratio_to_one	String	No
			DRR on Enabled value for the SRP
	Object	SRPEfficiencyType	
	Attribute Name	Type	Optional
	data_reduction_on_enabled_ratio_to_one	String	No
			New property. Will show DRR on Enable value for the Array. (Available on a V4 only)
	drr_on_reducible_only_to_one	String	No
			Existing Property. Will show the DRR on Reducible value for the Array.

				Updates: it will be available on a V3 only
	data_reduction_ratio_to_one	String	No	Existing Property. On a V4, this will show DRR on Reducible. On a V3, this will show DRR on Enabled Updates: it will be available on a V3 only

Example GET response /103/sloprovisioning/symmetrix/<symmId> (V4 only)

```
{
  "symmetrixId": "000220002429",
  "device_count": 2206,
  "microcode": "6079.275.0",
  "model": "PowerMax_2500",
  "local": true,
  "default_fba_srp": "SRP_1",
  "provisioned_capacity": {
    "used_tb": 4.04,
    "total_tb": 12594.78,
    "free_tb": 12590.74,
    "provisioning_resources_percent": 0
  },
  "snapshot_capacity": {
    "used_tb": 0,
    "total_tb": 0.31,
    "free_tb": 0.31,
    "snapshot_resources_percent": 0.2
  },
  "system_efficiency": {
```

```

    "data_reduction_ratio_to_one": 999.9,
    "data_reduction_ratio_on_enabled_to_one": 989.9,
    "data_reduction_enabled_percent": 3,
    "unreducible_data_tb": 0,
    "reducible_data_tb": 0,
    "deduplication_and_compression_savings_tb": 0,
    "pattern_detection_savings_tb": 0
  },
  "physicalCapacity": {
    "used_capacity_gb": 6,
    "total_capacity_gb": 103990.1
  },
  "host_visible_device_count": 8,
  "tags": "fearghal, infra",
  "disk_group_total_capacity_gb": 123517.35
}
}
}

```

2.2 Replication

2.2.1 symmetrix

2.2.1.1 GET (Object)

Resource	symmetrix
Request Type:	GET
New Endpoint Description:	Not applicable
Modify Endpoint Description:	Added in this Release New properties in the list response object. A list of replication remote array IDs Modified in this Release Not applicable Removed in this Release Not applicable
URL:	... /103/replication/symmetrix/{symmetrixId}

User Roles:	Monitor and above			
Prerequisite:	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:	Not applicable			
Response Parameters:				
	Object	ReplicationSymmetrix		
	Attribute Name	Type	Optional	Description
	replication_remote_array	ReplicationRemoteArray	Yes	A Remote Replication Storage Array ID
	Object	ReplicationRemoteArray		
	Attribute Name	Type	Optional	Description
	symmetrixId	SymmetrixIdType	Yes	Replication Remote Array ID

2.2.1.1.1 Sample JSON request

```
{
  "symmetrixId": "000220002429",
  "storageGroupCount": 293,
  "rdfGroupCount": 49,
  "replicationCacheUsage": 0,
  "snapshot_policy_count": 15,
  "code_level": "6079.325.0",
  "replication_remote_array": [
    {
      "symmetrixId": "000220002445"
    },
    {
      "symmetrixId": "000220200269"
    },
    {
      "symmetrixId": "000297903340"
    }
  ]
}
```

2.2.1.2 metrodr

2.2.1.2.1 PUT

Resource	metrodr						
Request Type:	PUT						
New Endpoint Description:	Not applicable						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>New actions for adding and removing volumes from a metrodr environment</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	New actions for adding and removing volumes from a metrodr environment	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
New actions for adding and removing volumes from a metrodr environment							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	... /103/replication/symmetrix/{symmetrixId}/metrodr/{environmentName}						
User Roles:	StorAdmin and above						
Prerequisite:	Not applicable						
Path Parameters:	Not applicable						
Query Parameters:	Not applicable						

Request Parameters:	Object	SrdfMetroDREnvironmentUpdate		
	Attribute Name	Type	Optional	Description
	add_volumes	MetroDREnvAddVolumesParam	Yes	Parameters for adding volumes to a metroDR environment
	remove_volumes	MetroDREnvRemoveVolumesParam	Yes	Parameters for removing volumes from a metroDR environment
	Object	MetroDREnvironmentAction		
	Attribute Name	Type	Optional	Description
	value	String enum: AddVolumes, RemoveVolumes	No	Actions for adding and removing volumes
	Object	MetroDREnvAddVolumesParam		
	Attribute Name	Type	Optional	Description
	metrodr_volume_auto_criteria	MetroDrVolumeAutoCriteria	Yes	Parameters for creating volumes to add
	metrodr_volume_list_criteria	MetroDrVolumeListCriteria	Yes	Parameters for listing volumes to add
	metrodr_staging_rdfg_selection	MetroDrStagingRdfgSelection	Yes	Parameters for selecting staging rdfgs. If this is null, it indicates that the staging

			rdfigs are being auto selected.
--	--	--	---------------------------------

Object	MetroDrVolumeAutoCriteria		
Attribute Name	Type	Optional	Description
volume_count	integer	No	Number of volume to be selected
emulation	EmulationType	No	Emulation for the volumes
capacity	long	No	Capacity of the volumes
capacity_unit	CapacityUnitType	No	Unit type of the capacity

Object	MetroDrVolumeListCriteria		
Attribute Name	Type	Optional	Description
metro_r1_volume_list	List<String>	No	Metro R1 volumes
metro_r2_volume_list	List<String>	Yes	Metro R2 volumes
metro_dr_volume_list	List<String>	Yes	Metro DR volumes

Object	MetroDrStagingRdfgSelection		
Attribute Name	Type	Optional	Description
metro_r1_metro_r2_staging_rdfg_number	Integer	No	Metro rdfg number
metro_r1_dr_staging_rdfg_number	Integer	Yes	DR rdfg number

Object	MetroDREnvRemoveVolumesParam		
Attribute Name	Type	Optional	Description

	volumes_to_remove_r1	List<String>	No	Volumes to remove from the metro dr environment
	delete_removed_pairs	boolean	Yes	Delete the removed pairs from the staging rdfs
	metrodr_staging_rdfg_selection	MetroDrStagingRdfgSelection	Yes	Parameters for selecting staging rdfs
Response Parameters:	Object		MetroDREnvironment	
	Attribute Name		Type	Optional
				Description

2.2.1.2.1.1 Sample JSON request

```
{
  "action": "AddVolumes",
  "add_volumes": {
    "metrodr_volume_auto_criteria": {
      "volume_count": 3,
      "emulation": "FBA",
      "capacity": 1,
```

```

        "capacity_unit": "GB"
    },
    "metrodr_staging_rdfg_selection": {
        "metro_r1_metro_r2_staging_rdfg_number": 4,
        "metro_r1_dr_staging_rdfg_number": 6
    }
}

```

```

{
  "action": "AddVolumes",
  "add_volumes": {
    "metrodr_volume_list_criteria": {
      "metro_r1_volume_list": ["00123", "00124", "00456"],
      "metro_r2_volume_list": ["00223", "00224", "00556"],
      "metro_dr_volume_list": ["00323", "00324", "00656"]
    }
  }
}

```

```

{
  "action": "RemoveVolumes",
  "remove_volumes": {
    "volumes_to_remove_r1": ["00123", "00124", "00456"],
    "delete_removed_pairs": false,
    "metrodr_staging_rdfg_selection": {
      "metro_r1_metro_r2_staging_rdfg_number": 10,
      "metro_r1_dr_staging_rdfg_number": 20
    }
  }
}

```

2.2.1.2.1.2 Sample JSON response

```
{
  "rdfgNumber": 1710,
  "label": "DRD2975yRZ",
  "remoteRdfgNumber": 371,
  "remoteSymmetrix": "000220002297",
  "numDevices": 1,
  "totalDeviceCapacity": 1.0,
  "localPorts": [
    "OR-1C:4",
    "OR-1C:5",
    "OR-2C:4",
    "OR-2C:5"
  ],
  "remotePorts": [
    "OR-1C:4",
    "OR-1C:5",
    "OR-2C:4",
    "OR-2C:5"
  ],
  "modes": [
    "Asynchronous"
  ],
  "type": "Dynamic",
  "metro": false,
  "async": true,
  "witness": false,
  "witnessProtectedPhysical": false,
```

```
"witnessProtectedVirtual": false,
"witnessConfigured": false,
"witnessEffective": false,
"biasConfigured": false,
"biasEffective": false,
"witnessDegraded": false,
"localOnlinePorts": [
  "OR-1C:4",
  "OR-1C:5",
  "OR-2C:4",
  "OR-2C:5"
],
"remoteOnlinePorts": [
  "OR-1C:4",
  "OR-1C:5",
  "OR-2C:4",
  "OR-2C:5"
],
"vasa_group": false,
"link_limbo": 10,
"hardware_compression": false,
"software_compression": false,
"device_polarity": "RDF1",
"offline": false,
"rdfa_properties": {
  "session_uncommitted_tracks": 0,
  "r1_to_r2_lag_time": 24,
  "duration_of_last_cycle": 15,
```



```

    "average_cycle_time": 15,
    "minimum_cycle_time": 15,
    "duration_of_last_transmit_cycle": 15,
    "transmit_queue_depth": 1,
    "cycle_number": 16,
    "transmit_idle_state": "Enabled",
    "transmit_idle_time": 0,
    "consistency_protection": "Disabled",
    "dse_active": true,
    "dse_threshold": 50,
    "dse_autostart": "Enabled",
    "session_priority": 33,
    "consistency_exempt_volumes": false
  },
  "srdfa_auto_recovery_configured": true,
  "srdfa_auto_recovery_enabled": false,
  "srdfa_auto_recovery_active": false
}

```

2.2.1.3 storagegroup/rdf_group

2.2.1.3.1 PUT

Resource	rdf_group	
Request Type:	PUT	
New Endpoint Description:	Not applicable	
Modify Endpoint Description:	Added in this Release New actions to allow switching of mode from SRDF/S to Metro and vice versa for an SRDF Group. New Active Management Controls: • ActivateSRDFA	

	- DeactivateSRDFA - Invalidate - NotReady - R1Update - Ready - Refresh - RWDisableR2 - RWEnable - WriteDisable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	.../103/replication/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}/rdf_group/{rdfGroupId}			
User Roles:	StorAdmin and above			
Prerequisite:	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:				
Request Parameters:	Object	SgModeParam		
	Attribute Name	Type	Optional	Description
	metroBias	Boolean	Yes	Sets the useBias parameter in the SRDF/Metro Group
	keepR2	Boolean	Yes	Sets the keepR2 parameter in the SRDF/Synchronous Group
	Object	RdfMode		
	Attribute Name	Type	Optional	Description
	Active	String	Yes	Set the desired mode to Active
	Object	StorageGroupRdfUpdate		
	Attribute Name	Type	Optional	Description
	action	Restore	Yes	Run a restore operation on SRDF Storage Group
	action	Suspend	Yes	Run a suspend operation on SRDF Storage Group
	Object	SgSuspendParam		

	Attribute Name	Type	Optional	Description
	keepR2	Boolean	Yes	When the SRDF is set to Active, this specifies to move the Bias to the R2 System
	Object	SgActivateSRDFAParam		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	type	RdfAType	No	Activate or Deactivate SRDF/A control actions that detect cache overflow conditions and take corrective action to offload cache or slow down the host I/O rates to match the SRDF/A service rates
	Object	RdfAType		
	Attribute Name	Type	Optional	Description

	DSE	String	Yes	Specify to Set DSE
	WritePacing	String	Yes	Specify to Set WritePacing
	WritePacingExempt	String	Yes	Specify to Set WritePacingExempt
	Object	SgDeactivateSRDFAParam		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	type	RdfAType	No	Activate or Deactivate SRDF/A control actions that detect cache overflow conditions and take corrective action to offload cache or slow down the host I/O rates to match the SRDF/A service rates
	Object	SgInvalidateParam		
	Attribute Name	Type	Optional	Description

	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	noWD	Boolean	Yes	Bypasses the check to ensure the target of the operation is not writable by the host.
	r1	Boolean	Yes	Operation is targeted at the source (R1) side. Setting to false will imply it is targeting the R2 side. If not specified, it will target the R2 side.
Object		SgNotReadyParam		
Attribute Name		Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for

				the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	r1	Boolean	Yes	Operation is targeted at the source (R1) side. Setting to false will imply it is targeting the R2 side. If not specified, it will target the R2 side.
	Object	SgReadyParam		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.

	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	r1	Boolean	Yes	Operation is targeted at the source (R1) side. Setting to false will imply it is targeting the R2 side. If not specified, it will target the R2 side.
	Object	SgR1UpdateParam		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System

				exclusive locks during an SRDF operation.
	remote	Boolean	Yes	Requests a remote data copy flag. When the concurrent link is ready, data is copied to the concurrent SRDF mirror. These operations require the remote data copy option, or the concurrent link to be suspended
	Object	SgRWDisableR2Param		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	Object	SgRWEnableParam		
	Attribute Name	Type	Optional	Description

	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	r1	Boolean	Yes	Operation is targeted at the source (R1) side. Setting to false will imply it is targeting the R2 side. If not specified, it will target the R2 side.
Object		SgRefreshParam		
Attribute Name		Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.

	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	r1	Boolean	Yes	Operation is targeted at the source (R1) side. Setting to false will imply it is targeting the R2 side. If not specified, it will target the R2 side.
	Object	SgWriteDisableParam		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.

	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	r1	Boolean	Yes	Operation is targeted at the source (R1) side. Setting to false will imply it is targeting the R2 side. If not specified, it will target the R2 side.
Response Parameters:				
	Object		StorageGroupRdfg	
	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	The storage array ID
	storageGroupId	String	No	The storage group name
	rdfgNumId	String	No	The SRDF group number

2.2.1.3.1.1 Sample JSON request – SRDF/Synchronous to SRDF/Metro

```
{
  "action": "SetMode",
  "setMode": {
    "mode": "Active",
    "useBias": "true"
  }
}
```

2.2.1.3.1.2 Sample JSON response – SRDF/Synchronous to SRDF/Metro

```
{
  "symmetrixId": "000220200226",
  "storageGroupName": "RDF_Test",
}
```

```

"rdfGroupNumber": 3,
"volumeRdfTypes": [
  "R1"
],
"states": [
  "Active"
],
"modes": [
  "Active"
],
"largerRdfSides": [
  "Equal"
],
"totalTracks": 8190,
"capacity_mb": 1024,
"localR1InvalidTracksHop1": 0,
"localR2InvalidTracksHop1": 0,
"remoteR1InvalidTracksHop1": 0,
"remoteR2InvalidTracksHop1": 0,
"srcR1InvalidTracksHop2": 0,
"srcR2InvalidTracksHop2": 0,
"tgtR1InvalidTracksHop2": 0,
"tgtR2InvalidTracksHop2": 0,
"domino": [
  "Disabled"
]
}

```

2.2.1.3.1.3 Sample JSON request – SRDF/Metro to SRDF/Synchronous

```

{
  "action": "SetMode",
  "setMode": {
    "mode": "Synchronous",
    "keepR1": "true",
    "keepR2": "false",
  }
}

```

2.2.1.3.1.4 Sample JSON response – SRDF/Metro to SRDF/Synchronous

```

{
  "symmetrixId": "000220200226",
  "storageGroupName": "RDF_Test1",
  "rdfGroupNumber": 6,
  "volumeRdfTypes": [
    "R1"
  ],
  "states": [
    "Synchronous"
  ],
  "modes": [

```

```

    "Synchronous"
  ],
  "largerRdfSides": [
    "Equal"
  ],
  "totalTracks": 8190,
  "capacity_mb": 1024,
  "localR1InvalidTracksHop1": 0,
  "localR2InvalidTracksHop1": 0,
  "remoteR1InvalidTracksHop1": 0,
  "remoteR2InvalidTracksHop1": 0,
  "srcR1InvalidTracksHop2": 0,
  "srcR2InvalidTracksHop2": 0,
  "tgtR1InvalidTracksHop2": 0,
  "tgtR2InvalidTracksHop2": 0,
  "domino": [
    "Disabled"
  ]
}

```

2.2.1.3.1.5 Sample JSON Request - Restore

```

{
  "action": "Restore",
  "restore": {
    "keepR2": "true"
  }
}

```

2.2.1.3.1.6 Sample JSON Request – Suspend

```

{
  "action": "Suspend",
  "restore": {
    "keepR2": "true"
  }
}

```

2.2.1.3.2 DELETE

Resource	storagegroup
Request Type:	DELETE
New Endpoint Description:	Not applicable

Modify Endpoint Description:	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	keepR1			
URL:	/103/replication/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}/rdf_group/{rdfgNumId}			
User Roles:	Admin Storage Admin			
Prerequisite :	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:	Attribute Name	Type	Optional	Description
	deleteSgPairing	String	No	Delete SRDF pairing for a particular RDFG for the storage group
Response Parameters:				

2.2.1.4 devicegroup

2.2.1.4.1 PUT

Resource	devicegroup
Request Type:	PUT
New Endpoint Description:	Not applicable
Modify Endpoint Description:	Added in this Release
	New Active Management Controls: R1Update SetMode

	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	.../103/replication/symmetrix/{symmetrixId}/devicegroup/{deviceGroupId}			
User Roles:	StorAdmin and above			
Prerequisite:	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:	Object	DgRdfAction		
	Attribute Name	Type	Optional	Description
	SetMode	Enum	Yes	Sets the action type to SetMode
	R1Update	Enum	Yes	Sets the action type to R1Update
	Object	DeviceGroupRdfUpdate		
	Attribute Name	Type	Optional	Description
	set_Mode	DgSetModeParam	Yes	Params for running SetMode action
	r1_update	DgR1UpdateParam	Yes	Params for running R1Update action
	Object	DgSetModeParam		
	Attribute Name	Type	Optional	Description
	force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
	symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.

	star	Boolean	Yes	Targets the action at volumes in STAR mode
	hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
	bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
	all	Boolean	Yes	Targets the SRDF action at all the group's std volumes
	bcv	Boolean	Yes	Targets the SRDF action at the group's locally associated bcv volumes
	mode	RDFMode	Yes	Sets the SRDF mode for one or more SRDF pairs to synchronous, asynchronous, adaptive copy disk mode or adaptive copy write pending mode.
	skew	int	Yes	Sets the skew factor for the adaptive copy mode. Possible values range from 0 to 65,534 tracks. For devices larger than 2 GB, a value of 65,535 can be specified to target all the tracks of any given drive.
	consistent	boolean	Yes	Transitions from async to sync mode

Object	DgR1UpdateParam		
Attribute Name	Type	Optional	Description
force	Boolean	Yes	Attempts to force the operation even though one or more volumes may not be in the normal, expected state(s) for the specified operation.
symForce	Boolean	Yes	Requests the System force operation be executed when normally it is rejected. Use extreme caution when using this option.
star	Boolean	Yes	Targets the action at volumes in STAR mode
hop2	Boolean	Yes	Targets the SRDF action at the group's second-hop volumes in a cascaded SRDF relationship
bypass	Boolean	Yes	Bypasses any existing System exclusive locks during an SRDF operation.
all	Boolean	Yes	Targets the SRDF action at all the group's std volumes
bcv	Boolean	Yes	Targets the SRDF action at the group's locally associated bcv volumes
remote	Boolean	Yes	Requests a remote data copy flag. When the concurrent link is ready, data is copied to the

				concurrent SRDF mirror. These operations require the remote data copy option, or the concurrent link to be suspended
Response Parameters:				

2.2.1.4.1.1 Sample JSON request – SRDF/Synchronous to SRDF/AdaptiveCopyDisk

```
{
  "rdmgNumber" : 37,
  "action" : "SetMode",
  "set_mode" : {
    "force": false,
    "star": false,
    "hop2": true,
    "bypass": false,
    "all": false,
    "bcv": false,
    "skew" : 1,
    "consistent" : false,
    "mode" : "AdaptiveCopyDisk"
  }
}
```

2.2.1.4.1.2 Sample JSON response – SRDF/Synchronous to SRDF/AdaptiveCopyDisk

```

{
  "name": "shiv_rdf_dg2",
  "symmetrixId": "000297903340",
  "isValid": true,
  "isConcurrentRdf": false,
  "isCascadedRdf": false,
  "numStandards": [
    3
  ],
  "standardRdfs": [
    37
  ],
  "standardPairStates": [
    "Synchronized"
  ],
  "standardHop2PairStates": [],
  "numBcvs": [
    0
  ],
  "bcvRdfs": [],
  "bcvPairStates": [],
  "bcvHop2PairStates": [],
  "groupType": "RDF1"
}

```

2.3 VVOL

2.3.1 storagecontainer/storageresource/volume

2.3.1.1 GET (List)

Resource	volume
Request Type:	GET
New Endpoint Description:	Not applicable
Modify Endpoint Description:	Added in this Release Added query parameters: - virtual_machine - esxi

	vcenter			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	.../103/vvol/symmetrix/{symmetrixId}/storagecontainer/{storageContainerId}/storageResource/{storageResourceId}/volume			
User Roles:	Monitor and above			
Prerequisite:	None			
Path Parameters:	Not Applicable			
Query Parameters:	Attribute Name	Type	Optional	Description
	virtual_machine	String	Yes	Filters returned list to display Storage Resource Volumes that have specified virtual machine
	esxi	String	Yes	Filters returned list to display Storage Resource Volumes that have specified esxi
	vcenter	String	Yes	Filters returned list to display Storage Resource Volumes that have specified vcenter
Response Parameters:				

2.3.1.2 GET (Object)

Resource	volume
Request Type:	GET
New Endpoint Description:	Not applicable

Modify Endpoint Description:	Added in this Release																						
	Added VM-related properties																						
	Modified in this Release																						
	Not applicable																						
	Removed in this Release																						
	Not applicable																						
URL:	.../103/vvol/symmetrix/{symmetrixId}/storagecontainer/{storageContainerId}/storageresource/{storageResourceId}/volume/{volumeId}																						
User Roles:	Monitor and above																						
Prerequisite:	Not applicable																						
Path Parameters:	Not applicable																						
Query Parameters:	Not applicable																						
Header Parameters:	Not Applicable																						
Request Parameters:	Not applicable																						
Response Parameters:	<table> <tr> <th>Object</th><th colspan="3">vvol</th></tr> <tr> <th>Attribute Name</th><th>Type</th><th>Optional</th><th>Description</th></tr> <tr> <td>virtual_machine</td><td>String</td><td>No</td><td>The virtual machine with which the vVol is associated</td></tr> <tr> <td>exsi</td><td>String</td><td>Yes</td><td>The ESXi server with which the vVol is associated</td></tr> <tr> <td>vcenter</td><td>String</td><td>Yes</td><td>The vCenter with which the vVol is associated</td></tr> </table>			Object	vvol			Attribute Name	Type	Optional	Description	virtual_machine	String	No	The virtual machine with which the vVol is associated	exsi	String	Yes	The ESXi server with which the vVol is associated	vcenter	String	Yes	The vCenter with which the vVol is associated
Object	vvol																						
Attribute Name	Type	Optional	Description																				
virtual_machine	String	No	The virtual machine with which the vVol is associated																				
exsi	String	Yes	The ESXi server with which the vVol is associated																				
vcenter	String	Yes	The vCenter with which the vVol is associated																				

2.3.1.2.1 Sample JSON response

```
{
```

```

...
"virtual_machine" : "VM_1",
"esxi": "Esxi_1",
"vcenter": "VC_1"
...
}

```

2.3.2 vasaprovider

2.3.2.1 GET (List)

Resource	vasaprovider						
Request Type:	GET						
New Endpoint Description:	Not applicable						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Added IPv6 address property</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Added IPv6 address property	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Added IPv6 address property							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	.../103/vvol/symmetrix/{symmetrixId}/vasaprovider						
User Roles:	Monitor and above						
Prerequisite:	Not applicable						
Path Parameters:	Not applicable						
Query Parameters:	Not applicable						
Header Parameters:	Not Applicable						

Request Parameters:	Not applicable														
Response Parameters:	<table> <tr> <td>Object</td><td colspan="3">vasaProvider</td></tr> <tr> <th>Attribute Name</th><th>Type</th><th>Optional</th><th>Description</th></tr> <tr> <td>ipv6_address</td><td>String</td><td>Yes</td><td>The IPv6 address of VASA provider</td></tr> </table>			Object	vasaProvider			Attribute Name	Type	Optional	Description	ipv6_address	String	Yes	The IPv6 address of VASA provider
Object	vasaProvider														
Attribute Name	Type	Optional	Description												
ipv6_address	String	Yes	The IPv6 address of VASA provider												

2.3.2.1.1 Sample JSON response

<pre>{ "vasaProviders": [{ "ipaddress": "10.60.141.252", "ipv6_address": "2001:0db8:85a3:0000:0000:8a2e:0370:7334", "status": "ONLINE", "availabilityStatus": "Stand-by" }, { "ipaddress": "10.60.141.251", "ipv6_address": "2001:0db8:85a3:0000:0000:8a2e:0370:7335", "status": "ONLINE", "availabilityStatus": "Stand-by" }] }</pre>
--

2.4 System

2.4.1 symmetrix

2.4.1.1 GET(Object)

Resource	symmetrix
Request Type:	GET

New Endpoint Description:	Not applicable		
Modify Endpoint Description:	Added in this Release		
	A node_wwn property has been added to the output of the GET 103/system/symmetrix/<array> endpoint that shows the Storage Array Node WWN		
	Modified in this Release		
	Not applicable		
	Removed in this Release		
	Not applicable		
URL:	... /103/system/symmetrix/{symmetrixId}		
User Roles:	Monitor and above		
Prerequisite:	Not applicable		
Path Parameters:	Not applicable		
Query Parameters:	Not applicable		
Request Parameters:	Not applicable		
Response Parameters:	Object	SystemSymmetrix	
	Attribute Name	Type	Optional
	Node_wwn	String	No
			Storage Array Node WWN

2.4.1.1.1 Sample JSON response from GET /103/system/symmetrix/<symmId>...

```
{
  "symmetrixId": "000220200269",
  ....
  ..
  .
  "system_sized_property": [
    {
      "srp_name": "SRP_1",
      "sized_fba_data_reduction_ratio": "5.0:1",
      "sized_ckd_data_reduction_ratio": "1.0:1",
      "sized_fba_capacity_tb": 435,
      "sized_ckd_capacity_tb": 15,
      "sized_fba_reducible_percent": 100,
      "sized_ckd_reducible_percent": 100
    }
  ],
  "node_wwn": "50000974100437FF"
}
```

2.5 Settings

2.5.1 Alert

2.5.1.1 alert_policy

2.5.1.1.1 GET (List)

Resource	alert_policy
Request Type:	GET
New Endpoint Description:	The endpoint gets a list of all possible alert policies. A flag “applicable” indicates whether the policy is applicable to the storage array.
Modify Endpoint Description:	
	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
	Not applicable

URL:	{{protocol}}://{{server}}:{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/alert/alert_policy																																		
User Roles:	Admin, Storage Admin, Performance Monitor, Monitor, Auditor, Security Admin, Local Replication, Remote Replication, Device Management																																		
Prerequisite:	None																																		
Path Parameters:	symmetrixId – identifier for the storage array																																		
Query Parameters:	Not applicable																																		
Response Parameters:	<table> <tr> <td>Object</td><td colspan="3">SettingsAlertPolicyList</td></tr> <tr> <th>Attribute Name</th><th>Type</th><th>Optional</th><th>Description</th></tr> <tr> <td>alert_policies</td><td>List of Objects</td><td>No</td><td>List of alert policy objects</td></tr> <tr> <td>name</td><td>Nested string</td><td>No</td><td>name of the of the alert policy (see appendix table for possible values)</td></tr> <tr> <td>type</td><td>Nested string</td><td>No</td><td>alert policy category. Possible values are “array” and “file”</td></tr> <tr> <td>applicable</td><td>Nested boolean</td><td>No</td><td>whether the policy is applicable to the storage array. Possible values are “true” or “false”</td></tr> <tr> <td>enabled</td><td>Nested boolean</td><td>No</td><td>whether the policy is enabled. Possible values are “true” or “false”</td></tr> <tr> <td>email_notifications</td><td>Nested boolean</td><td>No</td><td>whether email notifications are enabled on the</td></tr> </table>			Object	SettingsAlertPolicyList			Attribute Name	Type	Optional	Description	alert_policies	List of Objects	No	List of alert policy objects	name	Nested string	No	name of the of the alert policy (see appendix table for possible values)	type	Nested string	No	alert policy category. Possible values are “ array ” and “ file ”	applicable	Nested boolean	No	whether the policy is applicable to the storage array. Possible values are “ true ” or “ false ”	enabled	Nested boolean	No	whether the policy is enabled. Possible values are “ true ” or “ false ”	email_notifications	Nested boolean	No	whether email notifications are enabled on the
Object	SettingsAlertPolicyList																																		
Attribute Name	Type	Optional	Description																																
alert_policies	List of Objects	No	List of alert policy objects																																
name	Nested string	No	name of the of the alert policy (see appendix table for possible values)																																
type	Nested string	No	alert policy category. Possible values are “ array ” and “ file ”																																
applicable	Nested boolean	No	whether the policy is applicable to the storage array. Possible values are “ true ” or “ false ”																																
enabled	Nested boolean	No	whether the policy is enabled. Possible values are “ true ” or “ false ”																																
email_notifications	Nested boolean	No	whether email notifications are enabled on the																																

				policy. Possible values are "true" and "false"
	snmp_notifications	Nested boolean	No	whether snmp notifications are enabled on the policy. Possible values are "true" and "false"
	syslog_notifications	Nested boolean	No	whether syslog notifications are enabled on the policy. Possible values are "true" and "false"

2.5.1.1.1.1 Sample json response

```
{
  "alert_policies": [
    {
      "name": "arrayComponentEvents",
      "type": "array",
      "enabled": false,
      "applicable": true,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "arrayEvents",
      "type": "array",
      "enabled": false,
      "applicable": true,
      "email_notifications": false,
```

```
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "cgTripped",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "dbChecksumTriggered",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "deferredServiceThresholdAlert",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
```

```
    "syslog_notifications": false
  },
  {
    "name": "deviceConfigChange",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "deviceStatus",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "directorStatus",
    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  }
}
```

```
},  
  
{  
  "name": "diskStatus",  
  "type": "array",  
  "enabled": false,  
  "applicable": true,  
  "email_notifications": false,  
  "snmp_notifications": false,  
  "syslog_notifications": false  
},  
  
{  
  "name": "environmentalAlert",  
  "type": "array",  
  "enabled": false,  
  "applicable": true,  
  "email_notifications": false,  
  "snmp_notifications": false,  
  "syslog_notifications": false  
},  
  
{  
  "name": "eventLostAlert",  
  "type": "array",  
  "enabled": false,  
  "applicable": true,  
  "email_notifications": false,  
  "snmp_notifications": false,  
  "syslog_notifications": false  
},  
  
}
```

```

{
  "name": "eventOverflowAlert",
  "type": "array",
  "enabled": false,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "externalDiskGroupFullyAllocated",
  "type": "array",
  "enabled": true,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fabricPerformanceImpactNotification",
  "type": "array",
  "enabled": true,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{

```

```

    "name": "fileSystemAutoExtendFailedExtentTooSmall",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "fileSystemAutoExtendFailedNoSpace",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "fileSystemAutoExtendFailedPoolSize",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "fileSystemProjectionAlert",

```



```
"type": "file",
"enabled": false,
"applicable": false,
"email_notifications": false,
"snmp_notifications": false,
"syslog_notifications": false
},
{
  "name": "fileSystemProjectionAlmostFullAlert",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fileSystemProjectionFullAlert",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fileSystemProjectionMaxFsAlert",
  "type": "file",
```

```
"enabled": false,

"applicable": false,

"email_notifications": false,

"snmp_notifications": false,

"syslog_notifications": false
},
{
  "name": "fileSystemProjectionMaxPoolAlert",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fileSystemSizeThresholdCrossed",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fileSystemUsageAvailableAlert",
  "type": "file",
  "enabled": false,
```

```

    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "fileSystemUsageAvailableMaxFsAlert",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "fileSystemUsageAvailableMaxPoolAlert",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "fileSystemUsageInodePercentAlert",
    "type": "file",
    "enabled": false,
    "applicable": false,

```

```
"email_notifications": false,

"snmp_notifications": false,

"syslog_notifications": false
},
{
  "name": "fileSystemUsagePercentAlert",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fileSystemUsagePercentMaxFsAlert",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "fileSystemUsagePercentMaxPoolAlert",
  "type": "file",
  "enabled": false,
  "applicable": false,
  "email_notifications": false,
```

```
    "snmp_notifications": false,  
    "syslog_notifications": false  
  },  
  {  
    "name": "gkTimeout",  
    "type": "array",  
    "enabled": false,  
    "applicable": true,  
    "email_notifications": false,  
    "snmp_notifications": false,  
    "syslog_notifications": false  
  },  
  {  
    "name": "gkUtilization",  
    "type": "array",  
    "enabled": false,  
    "applicable": true,  
    "email_notifications": false,  
    "snmp_notifications": false,  
    "syslog_notifications": false  
  },  
  {  
    "name": "hotspareInvoked",  
    "type": "array",  
    "enabled": false,  
    "applicable": true,  
    "email_notifications": false,  
    "snmp_notifications": false,
```

```
    "syslog_notifications": false
  },
  {
    "name": "portLinkStatus",
    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "portStatus",
    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "rvaSpareCoverage",
    "type": "array",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  }
```

```

    },
    {
      "name": "snapshotComplianceForStorageGroupDegraded",
      "type": "array",
      "enabled": true,
      "applicable": true,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "snapshotComplianceForStorageGroupImproved",
      "type": "array",
      "enabled": false,
      "applicable": true,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "snapshotPolicyAddedToStorageGroup",
      "type": "array",
      "enabled": false,
      "applicable": true,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    }
  ],

```

```

{
  "name": "snapshotPolicyCreated",
  "type": "array",
  "enabled": false,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "snapshotPolicyDeleted",
  "type": "array",
  "enabled": false,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "snapshotPolicyModified",
  "type": "array",
  "enabled": false,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{

```



```

    "name": "snapshotPolicyRemovedFromStorageGroup",
    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "spAlerts",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfAAutoRecoveryActive",
    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfAAutoRecoveryInactive",

```

```

    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfANoCycleSwitchAlert",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfASession",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfASessionDroppedTransitIdleStateTimeout",
    "type": "array",

```

```

    "enabled": false,

    "applicable": true,

    "email_notifications": false,

    "snmp_notifications": false,

    "syslog_notifications": false
  },
  {
    "name": "srdfASessionEnteringTransmitIdleState",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfASessionRecoveredFromATransmitIdleState",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srdfAlerts",
    "type": "array",
    "enabled": false,

```

```
"applicable": true,
"email_notifications": false,
"snmp_notifications": false,
"syslog_notifications": false
},
{
  "name": "srdJobFlowControlChange",
  "type": "array",
  "enabled": false,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "srdLinkStatus",
  "type": "array",
  "enabled": false,
  "applicable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
},
{
  "name": "srdMetroAutomaticallySuspended",
  "type": "array",
  "enabled": false,
  "applicable": true,
```

```

    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srpReliabilityState",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "storagePoolProjectionAlert",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "storagePoolProjectionAlmostFullAlert",
    "type": "file",
    "enabled": false,
    "applicable": false,
    "email_notifications": false,

```

```
    "snmp_notifications": false,  
    "syslog_notifications": false  
  },  
  {  
    "name": "storagePoolProjectionFullAlert",  
    "type": "file",  
    "enabled": false,  
    "applicable": false,  
    "email_notifications": false,  
    "snmp_notifications": false,  
    "syslog_notifications": false  
  },  
  {  
    "name": "storagePoolUsageAvailableAlert",  
    "type": "file",  
    "enabled": false,  
    "applicable": false,  
    "email_notifications": false,  
    "snmp_notifications": false,  
    "syslog_notifications": false  
  },  
  {  
    "name": "storagePoolUsagePercentAlert",  
    "type": "file",  
    "enabled": false,  
    "applicable": false,  
    "email_notifications": false,  
    "snmp_notifications": false,
```

```
    "syslog_notifications": false
  },
  {
    "name": "targetEnginuityWarning",
    "type": "array",
    "enabled": true,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "thinDeviceAllocation",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "thinDeviceUsage",
    "type": "array",
    "enabled": false,
    "applicable": true,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  }
}
```

```

    }
  ]
}

```

2.5.1.1.2 PUT

Resource	alert_policy						
Request Type:	PUT						
New Endpoint Description:	A new endpoint that updates flags on alerts policies. The flags that can be configured include: - enabled – indicates whether event(s) associated with the policy should be monitored on the storage array - email_notifications – indicates whether an email notification should be sent once alert is raised on the storage array - snmp_notifications – indicates whether an snmp trap should be sent once alert is raised on the storage array - syslog_notifications – indicates whether a syslog message should be sent once alert is raised on the storage array All flags do not need to be specified in order for the request to be executed successfully. A successful call will return 204 (no content) response code. In case any errors occur, those errors will be listed. Individual alert policies can be updated, and a full list does not need to be provided with each call. Missing optional fields will be ignored. Non-configurable fields that are defined in the schema are being ignored. If the alert policy identifier (policy name) doesn't match any policy an error code of “Not Found” will be returned.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}:{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/alert/alert_policy						

User Roles:	Admin, Storage Admin																																		
Prerequisite:	No prerequisites. The alert notifications can be configured on the policy even when notifications are not configured. The notifications won't be sent until the notifications are configured.																																		
Path Parameters:	symmetrixId – identifier for the storage array																																		
Query Parameters:	Not applicable																																		
Request Parameters:	<table> <tr> <td>Object</td><td>SettingsAlertPolicyList</td><td></td><td></td></tr> <tr> <th>Attribute Name</th><th>Type</th><th>Optional</th><th>Description</th></tr> <tr> <td>alert_policies</td><td>List of Objects</td><td>No</td><td>List of alert policy objects</td></tr> <tr> <td>name</td><td>Nested string</td><td>No</td><td>name of the of the alert policy (see appendix table for possible values)</td></tr> <tr> <td>type</td><td>Nested string</td><td>Yes</td><td>Property is ignored. It is listed as the GET response can be used as request body.</td></tr> <tr> <td>applicable</td><td>Nested boolean</td><td>Yes</td><td>Property is ignored. It is listed as the GET response can be used as request body.</td></tr> <tr> <td>enabled</td><td>Nested boolean</td><td>Yes</td><td>whether the policy is enabled. Possible values are “true” or “false”</td></tr> <tr> <td>email_notifications</td><td>Nested boolean</td><td>Yes</td><td>whether email notifications are enabled on the</td></tr> </table>			Object	SettingsAlertPolicyList			Attribute Name	Type	Optional	Description	alert_policies	List of Objects	No	List of alert policy objects	name	Nested string	No	name of the of the alert policy (see appendix table for possible values)	type	Nested string	Yes	Property is ignored. It is listed as the GET response can be used as request body.	applicable	Nested boolean	Yes	Property is ignored. It is listed as the GET response can be used as request body.	enabled	Nested boolean	Yes	whether the policy is enabled. Possible values are “true” or “false”	email_notifications	Nested boolean	Yes	whether email notifications are enabled on the
Object	SettingsAlertPolicyList																																		
Attribute Name	Type	Optional	Description																																
alert_policies	List of Objects	No	List of alert policy objects																																
name	Nested string	No	name of the of the alert policy (see appendix table for possible values)																																
type	Nested string	Yes	Property is ignored. It is listed as the GET response can be used as request body.																																
applicable	Nested boolean	Yes	Property is ignored. It is listed as the GET response can be used as request body.																																
enabled	Nested boolean	Yes	whether the policy is enabled. Possible values are “true” or “false”																																
email_notifications	Nested boolean	Yes	whether email notifications are enabled on the																																

				policy. Possible values are “ true ” and “ false ”	
	snmp_notifications	Nested boolean	Yes	whether snmp notifications are enabled on the policy. Possible values are “ true ” and “ false ”	
	syslog_notifications	Nested boolean	Yes	whether syslog notifications are enabled on the policy. Possible values are “ true ” and “ false ”	
Response Parameters:	204 <<No Content>>				

2.5.1.1.2.1 Sample json request

```
{
  "alert_policies": [
    {
      "name": "arrayComponentEvents",
      "enabled": true,
      "snmp_notifications": true
    }
  ]
}
```

2.5.1.2 compliance_alert_policy

2.5.1.2.1 GET (Object)

Resource	compliance_alert_policy
Request Type:	GET
New Endpoint Description:	The endpoint lists compliance alert policy settings for a storage array. The settings are applicable to the storage group names that have been associated with the policy.
Modify Endpoint	

Description:	Added in this Release		
	Not applicable		
	Modified in this Release		
	Not applicable		
	Removed in this Release		
	Not applicable		
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/symmetrix/{{symmetrixId}}/alert/compliance_alert_policy		
User Roles:	Admin, Storage Admin, Performance Monitor, Monitor, Auditor, Security Admin, Local Replication, Remote Replication, Device Management		
Prerequisite:	None		
Path Parameters:	symmetrixId – identifier for the storage array		
Query Parameters:	Not applicable		
Request Body:	Not applicable		
Response Parameters:	1.		
	Object	ComplianceAlertPolicy	
	Attribute Name	Type	Optional
	marginal	boolean	Yes
	stable	boolean	Yes
	critical	boolean	Yes

				group compliance changes state to critical
	email_notifications	boolean	Yes	indicates whether an email should be sent, if alert is generated for the storage group compliance
	snmp_notifications	boolean	Yes	indicates whether an snmp notification should be sent, if alert is generated for the storage group compliance
	syslog_notifications	boolean	Yes	indicates whether a syslog notification should be sent, if alert is generated for the storage group compliance

2.5.1.2.1.1 Sample json response

```
{
  "critical": true,
  "marginal": true,
  "stable": true,
  "email_notifications": false,
  "snmp_notifications": false,
  "syslog_notifications": false
}
```

2.5.1.2.2 PUT

Resource	compliance_alert_policy
Request Type:	PUT
New Endpoint Description:	Configures compliance alert policy settings on the storage array level. The settings will be applied to any storage group associated with the policy. These are also the default settings at the time of creation of a storage group with a “compliance policy” option selected.

Modify Endpoint Description:	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/symmetrix/{{symmetrixId}}/alert/compliance_alert_policy			
User Roles:	Admin, Storage Admin			
Prerequisite:	No prerequisites. The compliance alert policies can be configured even when the performance data is not being collected. The alert notifications can be configured on the policy even when notifications are not configured. The notifications won't be sent until the notifications are configured.			
Path Parameters:	symmetrixId – identifier for the storage array			
Query Parameters:	Not applicable			
Request Parameters:	Object	ComplianceAlertPolicy		
	Attribute Name	Type	Optional	Description
	marginal	boolean	Yes	indicates whether an alert should be generated if storage group compliance changes state to marginal
	stable	boolean	Yes	indicates whether an alert should be generated if storage group compliance changes state to stable
	critical	boolean	Yes	indicates whether an alert should be

				generated if storage group compliance changes state to critical
	email_notifications	boolean	Yes	indicates whether an email should be sent, if alert is generated for the storage group compliance
	snmp_notifications	boolean	Yes	indicates whether an snmp notification should be sent, if alert is generated for the storage group compliance
	syslog_notifications	boolean	Yes	indicates whether a syslog notification should be sent, if alert is generated for the storage group compliance

2.5.1.2.2.1 Sample json request

<pre>{ "critical": true }</pre>

2.5.1.2.2.2 Sample json response

204 <<No Content>>

2.5.1.2.3 storage_group

2.5.1.2.3.1 GET (Object)

Resource	storage_group
Request Type:	GET

New Endpoint Description:	The endpoint lists storage group allocation for service level compliance policy. An eligible storage group can be either be allocated to system-level policy via REST API ("system_policy") or can have individual policy settings configured in GUI ("custom_policy"). Eligible storage groups with no compliance policy configuration are listed under "no_policy". The storage group must: ○ Be either a child or stand-alone. Parent storage groups are not supported. ○ Be associated with a service level other than optimized. ○ Contain volumes other than gatekeepers. ○ Be in a masking view. ○ Not have a policy currently associated with it. In order for alerting to work, performance data are needed, therefore the storage array needs to be registered for performance statistics collection. Please note the policy is not linked to a storage group, but rather checks are based on matching name only. Therefore, if there are any changes to the storage group itself, the policy will need to be updated as it may no longer work.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/symmetrix/{{symmetrixId}}/alert/compliance_alert_policy/storage_group						
User Roles:	Admin, Storage Admin, Performance Monitor, Monitor, Auditor, Security Admin, Local Replication, Remote Replication, Device Management						
Prerequisite:	None						
Path Parameters:	symmetrixId – identifier for the storage array						
Query Parameters:	Not applicable						
Request Body:	Not applicable						
Response							

Parameters:	Object	ComplianceAlertPolicyStorageGroups		
	Attribute Name	Type	Optional	Description
	system_policy	string[]	No	Lists of storage group names allocated to one system-wide compliance policy configurable via REST API.
	custom_policy	string[]	No	List of storage group names with custom policy configurations. Policy settings are configured per storage group name and are maintained via Unisphere GUI.
	no_policy	String[]	No	List of storage group names that are eligible for slo compliance monitoring but have not slo compliance policy configuration.

Sample json response

```
{
  "system_policy": [],
  "custom_policy": [],
  "no_policy": [
    "temp",
    "test3",
    "445_145_ORs",
    "PPDM_Internal",
    "shiv_srdf",
    "KG_R21"
  ]
}
```


2.5.1.2.3.2 PUT

Resource	storage_group			
Request Type:	PUT			
New Endpoint Description:	Adds or removes a storage group to/from system-level compliance policy. The policy settings can be managed with settings/compliance_policy endpoint.			
Modify Endpoint Description:	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/symmetrix/{{symmetrixId}}/alert/compliance_alert_policy/storage_group			
User Roles:	Admin, Storage Admin			
Prerequisite:	No prerequisites. The compliance alert policies can be configured even when the performance data is not being collected. The alert notifications can be configured on the policy even when notifications are not configured. The notifications won't be sent until the notifications are configured.			
Path Parameters:	symmetrixId – identifier for the storage array			
Query Parameters:	Not applicable			
Request Parameters:	Object	ComplianceAlertPolicyStorageGroups		
	Attribute Name	Type	Optional	Description
	system_policy	string[]	No	Lists of storage group

				names allocated to one system-wide compliance policy configurable via REST API.
	custom_policy	string[]	Yes	Property is ignored. It is listed as the GET response can be used as the request body.
	no_policy	String[]	Yes	Property is ignored. It is listed as the GET response can be used as the request body.

Sample json request

```
{
  "system_policy": [
    "temp",
    "test3",
  ]
}
```

Sample json response

204 <<No Content>>

2.5.1.3 system_threshold

2.5.1.3.1 GET

Resource	system_threshold
-----------------	------------------

Request Type:	GET			
New Endpoint Description:	The endpoint lists system threshold policy list for a storage array. Threshold policies listed are all available policies per Unisphere instance and it is indicated with “applicable” property whether the policy is applicable to the storage array.			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
Not applicable				
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/alert/system_threshold			
User Roles:	Admin, Storage Admin, Performance Monitor, Monitor, Auditor, Security Admin, Local Replication, Remote Replication, Device Management			
Prerequisite:	None			
Path Parameters:	symmetrixId – identifier for the storage array			
Query Parameters:	Not applicable			
Request Body:	Not applicable			
Response Parameters:				
	Object	ComplianceAlertPolicyStorageGroups		
	Attribute Name	Type	Optional	Description
	System_thresholds	List of objects	No	System threshold details
	name	Nested String	No	the system threshold name

	applicable	Nested boolean	No	Whether the policy is applicable to the storage array.
	type	Nested String	No	The type of threshold
	warning_threshold	Nested Integer	No	the warning threshold value
	critical_threshold	Nested Integer	No	the critical threshold value
	fatal_threshold	Nested Integer	No	the fatal threshold value
	unit	Nested String	No	the units of the threshold values
	email_notifications	Nested boolean	No	Whether email notifications are enabled or disabled
	snmp_notifications	Nested boolean	No	Whether snmp notifications are enabled or disabled
	syslog_notifications	Nested boolean	No	Whether syslog notifications are enabled or disabled

2.5.1.3.1.1 Sample json response

```
{
  "system_thresholds": [
    {
      "name": "backendMetaDataUsage",
      "applicable": true,
      "type": "system",
      "unit": "percent",
      "warning_threshold": 60,
      "critical_threshold": 80,
      "fatal_threshold": 100,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    }
  ]
}
```

```

    },
    {
      "name": "frontendMetaDataUsage",
      "applicable": true,
      "type": "system",
      "unit": "percent",
      "warning_threshold": 60,
      "critical_threshold": 80,
      "fatal_threshold": 100,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "localReplicationUtilization",
      "applicable": true,
      "type": "system",
      "unit": "percent",
      "warning_threshold": 60,
      "critical_threshold": 80,
      "fatal_threshold": 100,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "srpCkdEffectiveCapacityResourceUsage",
      "applicable": false,
      "type": "srp",
      "unit": "percent",
      "warning_threshold": 60,
      "critical_threshold": 80,
      "fatal_threshold": 95,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "srpCkdEffectiveUsedCapacity",
      "applicable": false,
      "type": "srp",
      "unit": "percent",
      "warning_threshold": 60,
      "critical_threshold": 80,
      "fatal_threshold": 95,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    },
    {
      "name": "srpCkdOverProvisionedCapacity",

```

```

    "applicable": false,
    "type": "srp",
    "unit": "percent",
    "warning_threshold": 60,
    "critical_threshold": 80,
    "fatal_threshold": 95,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srpCkdPhysicalCapacity",
    "applicable": false,
    "type": "srp",
    "unit": "percent",
    "warning_threshold": 60,
    "critical_threshold": 80,
    "fatal_threshold": 95,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srpFbaEffectiveCapacityResourceUsage",
    "applicable": true,
    "type": "srp",
    "unit": "percent",
    "warning_threshold": 60,
    "critical_threshold": 80,
    "fatal_threshold": 95,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srpFbaEffectiveUsedCapacity",
    "applicable": true,
    "type": "srp",
    "unit": "percent",
    "warning_threshold": 60,
    "critical_threshold": 80,
    "fatal_threshold": 95,
    "email_notifications": false,
    "snmp_notifications": false,
    "syslog_notifications": false
  },
  {
    "name": "srpFbaOverProvisionedCapacity",
    "applicable": true,
    "type": "srp",
    "unit": "percent",

```

```

        "warning_threshold": 60,
        "critical_threshold": 80,
        "fatal_threshold": 95,
        "email_notifications": false,
        "snmp_notifications": false,
        "syslog_notifications": false
    },
    {
        "name": "srpFbaPhysicalCapacity",
        "applicable": true,
        "type": "srp",
        "unit": "percent",
        "warning_threshold": 60,
        "critical_threshold": 80,
        "fatal_threshold": 95,
        "email_notifications": false,
        "snmp_notifications": false,
        "syslog_notifications": false
    },
    {
        "name": "storageContainerUtilization",
        "applicable": true,
        "type": "storage_container",
        "unit": "percent",
        "warning_threshold": 60,
        "critical_threshold": 80,
        "fatal_threshold": 100,
        "email_notifications": false,
        "snmp_notifications": false,
        "syslog_notifications": false
    },
    {
        "name": "systemMetaDataUtilization",
        "applicable": true,
        "type": "system",
        "unit": "percent",
        "warning_threshold": 60,
        "critical_threshold": 80,
        "fatal_threshold": 100,
        "email_notifications": false,
        "snmp_notifications": false,
        "syslog_notifications": false
    }
]
}

```

2.5.1.3.2 PUT

Resource	system_threshold						
Request Type:	PUT						
New Endpoint Description:	A new endpoint that updates configuration on system threshold policies. Policies are being configurable on system-level. For non-system-based threshold the configuration applies to all managed system components unless custom configuration for specific component instance has been configured in GUI. The properties that can be configured include: • warning_threshold – the warning threshold value • critical_threshold – the critical threshold value • fatal_threshold - the fatal threshold value • email_notifications – indicates whether an email notification should be sent once alert is raised on the storage array • snmp_notifications – indicates whether an snmp trap should be sent once alert is raised on the storage array • syslog_notifications – indicates whether a syslog message should be sent once alert is raised on the storage array All flags do not need to be specified in order for the request to be executed successfully. A successful call will return 204 (no content) response code. In case any errors occur, those errors will be listed. Individual threshold policies can be updated, and a full list does not need to be provided with each call. Missing optional fields will be ignored. Non-configurable fields that are defined in the schema are being ignored. If the threshold policy identifier (threshold name) doesn't match any policy an error code of "Not Found" will be returned.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/alert/system_threshold						
User Roles:	Admin, Storage Admin, Performance Monitor, Monitor, Auditor, Security Admin, Local Replication, Remote Replication, Device Management						
Prerequisite:	None						

Path Parameters:	symmetrixId – identifier for the storage array																																										
Query Parameters:	Not applicable																																										
Request Body:	Not applicable																																										
Response Parameters:	<table> <tr> <td>Object</td><td>ComplianceAlertPolicyStorageGroups</td><td></td><td></td></tr> <tr> <th>Attribute Name</th><th>Type</th><th>Optional</th><th>Description</th></tr> <tr> <td>System_thresholds</td><td>List of objects</td><td>No</td><td>System threshold details</td></tr> <tr> <td>name</td><td>Nested String</td><td>No</td><td>the system threshold name</td></tr> <tr> <td>applicable</td><td>Nested boolean</td><td>Yes</td><td>Property is ignored. It is listed as the GET response can be used as the request body.</td></tr> <tr> <td>type</td><td>Nested String</td><td>Yes</td><td>Property is ignored. It is listed as the GET response can be used as the request body.</td></tr> <tr> <td>warning_threshold</td><td>Nested Integer</td><td>Yes</td><td>the warning threshold value</td></tr> <tr> <td>critical_threshold</td><td>Nested Integer</td><td>Yes</td><td>the critical threshold value</td></tr> <tr> <td>fatal_threshold</td><td>Nested Integer</td><td>Yes</td><td>the fatal threshold value</td></tr> <tr> <td>unit</td><td>Nested String</td><td>Yes</td><td>Property is ignored. It is listed as the GET response can be used as</td></tr> </table>			Object	ComplianceAlertPolicyStorageGroups			Attribute Name	Type	Optional	Description	System_thresholds	List of objects	No	System threshold details	name	Nested String	No	the system threshold name	applicable	Nested boolean	Yes	Property is ignored. It is listed as the GET response can be used as the request body.	type	Nested String	Yes	Property is ignored. It is listed as the GET response can be used as the request body.	warning_threshold	Nested Integer	Yes	the warning threshold value	critical_threshold	Nested Integer	Yes	the critical threshold value	fatal_threshold	Nested Integer	Yes	the fatal threshold value	unit	Nested String	Yes	Property is ignored. It is listed as the GET response can be used as
Object	ComplianceAlertPolicyStorageGroups																																										
Attribute Name	Type	Optional	Description																																								
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type	Nested String	Yes	Property is ignored. It is listed as the GET response can be used as the request body.																																								
warning_threshold	Nested Integer	Yes	the warning threshold value																																								
critical_threshold	Nested Integer	Yes	the critical threshold value																																								
fatal_threshold	Nested Integer	Yes	the fatal threshold value																																								
unit	Nested String	Yes	Property is ignored. It is listed as the GET response can be used as																																								

				the request body.
	email_notifications	Nested boolean	Yes	Whether email notifications are enabled or disabled
	snmp_notifications	Nested boolean	Yes	Whether snmp notifications are enabled or disabled
	syslog_notifications	Nested boolean	Yes	Whether syslog notifications are enabled or disabled

2.5.1.3.2.1 Sample json request

```
{
  "system_thresholds": [
    {
      "name": "backendMetaDataUsage",
      "applicable": true,
      "type": "system",
      "unit": "percent",
      "warning_threshold": 15,
      "critical_threshold": 80,
      "fatal_threshold": 100,
      "email_notifications": false,
      "snmp_notifications": false,
      "syslog_notifications": false
    }
  ]
}
```

2.5.1.3.2.2 Sample json response

204 <<No Content>>

2.5.1.4 performance_threshold

2.5.1.4.1 GET

Resource	performance_threshold
-----------------	-----------------------

Request Type:	GET			
New Endpoint Description:	The endpoint retrieves all global performance thresholds for all categories per instance of Unisphere.			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
Not applicable				
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/performance_threshold			
User Roles:	Admin, Manager, Performance Monitor			
Prerequisite:	None			
Path Parameters:	None			
Query Parameters:	Not applicable			
Response Parameters:				
	Object	GlobalPerformanceThresholdsList		
	Attribute Name	Type	Optional	Description
	global_Performance_Thresholds	Nested list of objects	No	List of GlobalPerformanceThreshold objects
	ignored_Global_Performance_Thresholds	Nested list of objects	Yes	List of GlobalPerformanceThreshold objects
	category	Nested String	No	The category of the thresholds

	metric	Nested String	Yes	the threshold metric
	kpi	Nested boolean	Yes	whether the threshold is a kpi
	alert_error	Nested boolean	Yes	whether the threshold has an alert error
	first_upper_threshold	Nested String	Yes	the value of the first upper threshold
	second_upper_threshold	Nested String	Yes	the value of the second upper threshold
	first_lower_threshold	Nested String	Yes	the value of the first lower threshold
	second_lower_threshold	Nested String	Yes	the value of the second lower threshold

2.5.1.4.1.1 Sample json response

```
{
  "global_performance_thresholds": [
    {
      "category": "Array",
      "metric": "VPEfficiencyRatio",
      "kpi": false,
      "alert_error": false,
      "first_upper_threshold": "",
      "second_upper_threshold": "",
      "first_lower_threshold": "",
      "second_lower_threshold": ""
    },
    {
      "category": "Array",
      "metric": "UsableCapacity",
      "kpi": false,
      "alert_error": false,
      "first_upper_threshold": "",
      "second_upper_threshold": "",
      "first_lower_threshold": "",
      "second_lower_threshold": ""
    },
    {
      "category": "Array",
      "metric": "OverallEfficiencyRatio",

```

```

    "kpi": false,
    "alert_error": false,
    "first_upper_threshold": "",
    "second_upper_threshold": "",
    "first_lower_threshold": "",
    "second_lower_threshold": ""
  },
  {
    "category": "Array",
    "metric": "HWConfigHS",
    "kpi": false,
    "alert_error": false,
    "first_upper_threshold": "",
    "second_upper_threshold": "",
    "first_lower_threshold": "",
    "second_lower_threshold": ""
  },

```

:abbreviated content

}

2.5.1.4.2 PUT

Resource	performance_threshold
Request Type:	PUT
New Endpoint Description:	A new endpoint that allows to specify all performance categories global thresholds; The request body may be the same as GET output; the global thresholds can be easily populated across Unisphere instances.
Modify Endpoint Description:	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
	Not applicable

URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/performance_threshold			
User Roles:	Admin, Manager, Performance Monitor			
Prerequisite:	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:				
	Object	GlobalPerformanceThresholdsList		
	Attribute Name	Type	Optional	Description
	global_Performance_Thresholds	Nested list of objects	No	List of GlobalPerformanceThreshold objects
	ignored_Global_Performance_Thresholds	Nested list of objects	No	List of GlobalPerformanceThreshold objects
	category	Nested String	No	The category of the thresholds
	metric	Nested String	Yes	the threshold metric
	kpi	Nested boolean	Yes	whether the threshold is a kpi
	alert_error	Nested boolean	Yes	whether the threshold has an alert error
first_upper_threshold	Nested String	Yes	the value of the first upper threshold	

	second_upper_threshold	Nested String	Yes	the value of the second upper threhsold
	first_lower_threshold	Nested String	Yes	the value of the first lower threhsold
	second_lower_threshold	Nested String	Yes	the value of the second lower threhsold
Response Parameters				
	Object	RestApiResponse		
	Attribute Name	Type	Optional	Description
	messages	List of objects	Yes	List of messages
	severity	Nested string	Yes	The severity level
	message	Nested string	Yes	The message
	dto	Nested object	Yes	GlobalPerformanceThreshold

2.5.1.4.2.1 Sample json request and response

```
{
  "global_performance_thresholds": [
    {
      "category": "Array",
      "metric": "VPEfficiencyRatio",
      "kpi": false,
      "alert_error": false,
      "first_upper_threshold": "",
      "second_upper_threshold": "",
      "first_lower_threshold": "",
      "second_lower_threshold": ""
    },
    {
      "category": "Array",
      "metric": "UsableCapacity",
      "kpi": false,
```

```
"alert_error": false,  
"first_upper_threshold": "",  
"second_upper_threshold": "",  
"first_lower_threshold": "",  
"second_lower_threshold": ""  
},
```

: abbreviated content

```
}
```

```
{  
  "messages": [  
    {  
      "severity": "Error",  
      "message": "Ensure secondUpperThreshold > firstUpperThreshold",  
      "dto": {  
        "category": "Array",  
        "metric": "PercentReads",  
        "kpi": true,  
        "alert_error": true,  
        "first_upper_threshold": "81.0",  
        "second_upper_threshold": "71.0",  
        "first_lower_threshold": "21.0",  
        "second_lower_threshold": "18.0",  
        "alert_warning": true,  
        "first_threshold_occurrences": 3,  
        "first_threshold_samples": 5,  
        "first_threshold_severity": "WARNING",  
        "second_threshold_occurrences": 3,  
        "second_threshold_samples": 5,  
        "second_threshold_severity": "CRITICAL",  
        "include_real_time_trace_on_critical": true,  
        "message": "Ensure secondUpperThreshold > firstUpperThreshold"  
      }  
    },  
    {  
      "severity": "Error",  
      "message": "Ensure firstLowerThreshold > secondLowerThreshold",  
      "dto": {  
        "category": "BeEmulation",  
        "metric": "TotalWorkTime",  
        "kpi": true,  
        "alert_error": false,  
        "first_upper_threshold": "79.0",  
        "second_upper_threshold": "89.0",  
        "first_lower_threshold": "9.0",  
        "second_lower_threshold": "14.0",
```



```

    "message": "Ensure firstLowerThreshold > secondLowerThreshold"
  },
  {
    "severity": "Error",
    "message": "Unable to map restapi metric to internal metric name. Ignoring metric PercentHitxxx",
    "dto": {
      "category": "CachePartition",
      "metric": "PercentHitxxx",
      "kpi": true,
      "alert_error": false,
      "first_upper_threshold": "",
      "second_upper_threshold": "",
      "first_lower_threshold": "70.0",
      "second_lower_threshold": "50.0",
      "message": "Unable to map restapi metric to internal metric name. Ignoring metric PercentHitxxx"
    }
  }
]
}

```

2.5.1.5 notification

2.5.1.5.1 GET (Object)

Resource	notification
Request Type:	GET
New Endpoint Description:	The endpoint retrieves alert notification configuration for Unisphere instance. This includes email, snmp and syslog notifications configuration
Modify Endpoint Description:	
	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
URL:	{{protocol}}://{{server}}:{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/notification

User Roles:	Admin, Manager		
Prerequisite:	None		
Path Parameters:	None		
Response Parameters	AlertNotificationsConfiguration		
	Object		
	Attribute Name	Type	Optional
	email	Object	No
	enabled	Nested boolean	No
	Smtp_config	Nested object	Yes
	server	Nested String	Yes
	port	Nested Integer	Yes
	sender	Nested String	Yes
	snmp	Object	No
	enabled	Nested boolean	No
	Snmp_trap_targets	Nested list of objects	Yes
	host	Nested String	Yes
	port	Nested Integer	Yes

	version	Nested String	Yes	The snmp trap target version
	security_model	Nested String	Yes	The snmp trap target security model
	syslog	Object	Yes	Syslog notification details
	enabled	Nested boolean	Yes	Whether syslog notification is enabled or disabled
	Syslog_target	Nested object	Yes	Syslog target details
	host	Nested String	Yes	The syslog target host
	port	Nested Integer	Yes	The syslog target port
	protocol	Nested String	Yes	The syslog target protocol
	text_format	Nested String	Yes	The syslog target text format

2.5.1.5.1.1 Sample json response

```
{
  "email": {
    "enabled": false
  },
  "snmp": {
    "enabled": true,
    "snmp_trap_targets": [
      {
        "host": "10.40.116.138",
        "port": 165,
        "version": 1
      }
    ]
  }
}
```

```

    {
      "host": "10.40.250.100",
      "port": 162,
      "version": 1
    },
    {
      "host": "10.40.116.136",
      "port": 163,
      "version": 3,
      "security_model": "usm"
    }
  ]
},
"syslog": {
  "enabled": true,
  "syslog_target": {
    "host": "10.228.203.166",
    "port": 524,
    "protocol": "tcp",
    "text_format": "RFC_5424"
  }
}
}

```

2.5.1.5.2 PUT

Resource	notification
Request Type:	PUT
New Endpoint Description:	Endpoint that configures the alert notification settings for Unisphere. This includes email, snmp and syslog notifications configuration.
Modify Endpoint Description:	
	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
	Not applicable

URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/notification		
User Roles:	Admin, Manager		
Prerequisite:	None		
Path Parameters:	None		
Query Parameters:	Not applicable		
Request Parameters:			
	Object	AlertNotificationsConfiguration	
	Attribute Name	Type	Optional
	email	Object	Yes
	enabled	Nested boolean	Yes
	smtp_config	Nested object	Yes
	server	Nested String	Yes
	port	Nested Integer	Yes
	sender	Nested String	Yes
	snmp	Object	Yes
	enabled	Nested boolean	Yes
	snmp_trap_targets	Nested list of objects	Yes

	host	Nested String	Yes	The snmp trap target host
	port	Nested Integer	Yes	The snmp trap target port
	version	Nested String	Yes	The snmp trap target version
	security_model	Nested String	Yes	The snmp trap target security model
	authorization	Nested object	Yes	Authorizatoin detils for snmp
	username	Nested String	Yes	The username for snmp
	password	Nested String	Yes	The password for snmp
	passphrase	Nested String	Yes	The passphrase for snmp
	tls	Nested object	Yes	the tls details for snmp
	security_name	Nested String	Yes	the security name for snmp
	certificate_authority_pem	Nested String	Yes	the certificate for snmp
	syslog	Object	Yes	Syslog notification details
	enabled	Nested boolean	Yes	Whether syslog notification is enabled or disabled
	syslog_target	Nested object	Yes	Syslog target detilas
	host	Nested String	Yes	The syslog target host

	port	Nested Integer	Yes	The syslog target port
	protocol	Nested String	Yes	The syslog target protocol
	text_format	Nested String	Yes	The syslog target text format

2.5.1.5.2.1 Sample json request

```
{
  "email": {
    "enabled": false
  },
  "snmp": {
    "enabled": true,
    "snmp_trap_targets": [
      {
        "host": "10.40.116.138",
        "port": 165,
        "version": 1
      },
      {
        "host": "10.40.250.100",
        "port": 162,
        "version": 1
      },
      {
        "host": "10.40.116.136",
        "port": 163,
        "version": 3,
        "security_model": "usm"
      }
    ]
  },
  "syslog": {
    "enabled": true,
    "syslog_target": {
      "host": "10.228.203.166",
      "port": 524,
      "protocol": "tcp",
      "text_format": "RFC_5424"
    }
  }
}
```

--

2.5.1.5.2.2 Sample json response

204 <<No Content>>

2.5.1.5.3 test

2.5.1.5.3.1 POST

Resource	test				
Request Type:	POST				
New Endpoint Description:	Endpoint that verifies the notification configuration by attempting to send a sample test notification to specified email recipient(s) and/or all snmp targets and/or syslog target				
Modify Endpoint Description:					
	Added in this Release				
	Not applicable				
	Modified in this Release				
	Not applicable				
	Removed in this Release				
	Not applicable				
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/notification/test				
User Roles:	Admin, Manager				
Prerequisite :	None				
Path Parameters:	None				
Query Parameters:	Not applicable				
	Object	AlertNotificationsTest			

	Attribute Name	Type	Optional	Description
	email	Object	Yes	Email recipients details
	snmp	boolean	Yes	Whether test snmp trap should be sent to all targets.
	syslog	boolean	Yes	Whether test syslog message should be sent to the target.
	recipients	Nested String[]	Yes	The list of email recipients the test email should be sent to
Response Parameters				
	Object	RestApiResponse		
	Attribute Name	Type	Optional	Description
	messages	List of objects	Yes	List of messages
	severity	Nested string	Yes	The severity level
	message	Nested string	Yes	The message
	dto	Nested object	Yes	
	email	Nested object	Yes	The email details
	recipients	Nested List<String>	Yes	List of email addresses of the recipients

Sample json request

```
{
  "snmp": true,
  "syslog": false
}
```

Sample json response

```

{
  "messages": [
    {
      "severity": "Error",
      "message": "Failed to send email to mailto7@domain.com",
      "dto": {
        "email": {
          "recipients": [
            "mailto1@domain.com",
            "mailto2@domain.com",
            "mailto3@domain.com",
            "mailto4@domain.com",
            "mailto5@domain.com",
            "mailto6@domain.com",
            "mailto7@domain.com"
          ]
        }
      }
    }
  ]
}

```

2.5.1.5.4 agent_details

2.5.1.5.4.1 GET

Resource	Agent_details
Request Type:	GET

New Endpoint Description:	The endpoint retrieves details needed for the customer to configure the SNMP manager and syslog server to receive notifications from Unisphere.			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
Not applicable				
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/alert/notification/agent_details			
User Roles:	Admin, Manager			
Prerequisite:	None			
Path Parameters:	None			
Query Parameters:	None			
Response Parameters:				
	Object	AlertNotificationAgentDetail		
	Attribute Name	Type	Optional	Description
	engine_id	String	No	The engine id
	storevntd_cert	String	No	The storevntd daemon certificate in Base64 string format

Sample json response

```

"engine_id": "0x80000473010a3ca8c2",
"storevnt_cert":
"LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUVrekNDQTN1Z0F3SUJBZ0lKQVB4WkNwZlJCZj
V6TUEwR0NTcUdTSWlZRFFFQkN3VUFNSUhyTVN3d0tnWUQKVIFRRERDTIRiMngxZEsdmJuTWdSV
zVoWW14bGNpQINiMjkwSUVOQklGWmxjbk5wYjI0Z01qRVdNQIFHQTFVRQpDQXdoVfDGMMyRmph
SFZ6WlhmSMGN6RUxNQWtHQTFVRUJoTUNWVk14RWpBUUJnTIZCQWNNQ1VodmNHdHBibIJ2CmJqR
WVNQndHQ1Nxr1NjYjNEUUVKQVJZUGMzVndjRzI5ZEVcbGJXTXVZMjI0TVlwd0d3WURWUUVFLREJS
RVpXeHMKSUUVWTF5QkRiM0p3YjNkaGRHbHJiZiV2TUMwR0ExVUVBd3dtUkdWc2JDQkZUVU1nUlc1
MFpYSndjbWx6WlNCVApkRzI5WVdkbEiFRjFkRzI0WVhScGlyNHdlaGNOTVRnd01URXINVFV5TWpFMld
oY05Namd3TVRFd01UVXINakUyCldqQ0lxeKVzTUNvR0ExVUVBd3dqVTI5c2RYUnBiMjV6SUUVWdVIXSn
NaWElnVW05dmRDQkRRU0JXWlhKemFXOXUKSURJeEZqQVVCZ05WQkFnTURVMWhjM05oWTJoM
WMYVjBkSE14Q3pBSkNjTIZCQVIUQWxWVE1SSXdfQVIEVFRSApEQWxjYjNCcmFXNTBiMjR4SGpBY
0Jna3Foa2lHOXcwQkNRRVdEM04xY0hCdMNUkFavZfTG1OdmJURWRNQNhHCkExVUVDZ3dVUkd
Wc2JDQkZUVU1nUTI5eWNHOXIZWFJwYjI0eX6QXRCZ05WQkFzTUprUmxiR3dnUIUxREIFVnUKZEdW
eWNISnBjMlVnVTNSdmNtRm5aU0JCZFhSdmJXRjBhVzI1TUIJQklqQU5CZ2taGtpRzI3MEJBUUVGQUF
PQwpBUThtBTUIJQkNnS0NBuUUVBM2lRjVwYUUt2Q2lybm9oWjIjZlI0eX6QXRCZ05WQkFzTUprUmxiR3dnUIUxREIFVnUKZEdW
Q2VWfMmZ3FQCNlSSFI3Um0weXVKdVIJZTNEWC9FSXMzdTJualhtK2FyYUdaRjdnbnZdUK004UIEvcW5O
bkW5MmpiTGhrbnFqQ3EKRVY4aDcvSm9wZCtTeXBRSy9ydTRQSFBUUmVUV1N2RVhDZkVmbEtudWtv
YjRsaEZJSgtUTkU3b3JTYUVOSjA3dQppQ0lCbUQ4ZWVhM3ZCdnBwbmxxSDZFTmU5RVp2SWVhM3V
2a01SOGs2WFFiMGE0dVJdEIRM2RVbU1DN09lNk5JCicxQTVMSnRwWDk5cmVjSGxCOGluZkVQUg1
oaVFjYUR1dIBPWDdUNEKzbW9oTjc1Q29Xd1hYmFIWlU2TUUVbksKRzdXTzNwbEJtQ2t1TXlwM1N4ej
RvNS8wMmdxUW5ZMDNzcVJGeVFJREFRQUJvMkF3WGpBZEJnTIZiUTRFRmdRVQowdWtqemJqc3VO
OVU4QVpBNTArb0VreXhrOE13SHdZRFZSMGpCQmd3Rm9BVTB1a2p6YmpzdU45VThBWkE1MCtvCkV
reXhrOE13RHdZRFZSMFRBUUgVQkFVd0F3RUIvekFMQmdOVkhROEVCQU1DQVFZd0RRWUpLb1pJa
HZjTkFRRUwKQIFBRGdnRUJBTWZGUfYxOW9Xb25lbW5OZlplYl0hLdk9IVGRVdHVXbnU4cFI1WjY4UU
plSStpbHNHUmduKS2szNQpRMEZaOTVYdnY0WktTaTBmSWRaTW85N2Nkc1Z5am85TVJMbUVYbGw2
RVk3MVJEVUc4enEydksweGJGZzNNM3NmCit0UHE1MmFkSXJXWnNiazJFanJyNGFiRi9NQZHL2s0Y
2M4U2FTdjAwBgz1RVFEREkzc1RRbThrb1dTRHBYMHgKRi9JRzhlc0g1OUNINTBOQ2JORDInaUt6c3h5
THcyakhkQ3BVNkd0SWYybVNrWEJwMIFBaE5xdjlyVndpR3NBcAo2U2laSkMzaHFvRkpQKzhhbWlraFhi
VXlxMGNaLzRoVUptNERsd0trVmwvanp0U1N6VFZOU3V3d0dzekV4M3BBcm9hbERJaVVE1VhRHdое
HZRZGNjbm5RcXdOQklyejQ9Ci0tLS0tRU5EIENFUlRJRkdQVRFLS0tLS0K"
}

```

2.5.1.5.5 symmetrix/alert/notification

2.5.1.5.5.1 GET

Resource	notification
Request Type:	GET
New Endpoint Description:	The endpoint retrieves system specific notification settings. This includes the notification of alerting severity for the storage array and individual email recipient subscriptions.

Modify Endpoint Description:	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/alert/notification			
User Roles:	Admin, Manager			
Prerequisite:	None			
Path Parameters:	symmetrixId – identifier for the storage array			
Query Parameters:	None			
Response Parameters:	Object	AlertNotificationsConfiguration		
	Attribute Name	Type	Optional	Description
	alert_severity	Object	No	Alerting severity configuration
	system	Nested object	No	Alerting severity configuration for system alerts
	fatal	Nested boolean	No	Whether notifications should be sent for system alerts with “fatal” severity for the storage array.
	critical	Nested boolean	No	Whether notifications should be sent for system alerts with “critical” severity

				for the storage array.
	warning	Nested boolean	No	Whether notifications should be sent for system alerts with “warning” severity for the storage array.
	normal	Nested boolean	No	Whether notifications should be sent for system alerts with “normal” severity for the storage array.
	info	Nested boolean	No	Whether info system alerts are enabled or disabled for WAR
	performance	Nested object	No	Alerting severity configuration for performance alerts
	critical	Nested boolean	No	Whether notifications should be sent for performance alerts with “critical” severity for the storage array.
	warning	Nested boolean	No	Whether notifications should be sent for performance alerts with “warning” severity for the storage array.
	info	Nested boolean	No	Whether notifications should be sent for performance alerts with “info” severity for the storage array.
	subscriptions	Nested object	No	Email subscriptions

				details for the storage array
	system	Nested List<String>	No	List of email recipients that will receive email notifications for the storage array when a system alert with configured severity occurs on the system.
	performance	Nested List<String>	No	List of email recipients that will receive email notifications for the storage array when a performance alert with configured severity occurs on the system.
	jobs	Nested List<String>	No	A list of email addresses to receive job status notifications
	reports	Nested List<String>	No	A list of email addresses to receive performance reports
	none	Nested List<String>	No	A list of email addresses that have no email notification subscriptions on the storage array

Sample json response

```
{
  "alert_severity": {
    "system": {
      "fatal": true,
      "critical": true,
      "warning": true,
      "normal": true,

```

```

    "info": true
  },
  "performance": {
    "critical": true,
    "warning": true,
    "info": true
  }
},
"subscriptions": {
  "system": [
    "a.c1@d.cm",
    "a.1@c.com"
  ],
  "performance": [
    "a.c1@d.cm"
  ],
  "jobs": [
    "a.b1@c.com"
  ],
  "reports": [
    "a.b@c.com"
  ],
  "none": []
}
}

```

2.5.1.5.5.2 PUT

Resource	notification
Request Type:	PUT
New Endpoint Description:	Endpoint that configures system specific notification settings. This includes the notification of alerting severity for the system and individual email recipients' subscriptions
Modify Endpoint Description:	
	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable

	Removed in this Release			
	Not applicable			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/alert/notification			
User Roles:	Admin, Manager			
Prerequisite:	None			
Path Parameters:	symmetrixId – identifier for the storage array			
Query Parameters:	Not applicable			
Request and Response body:				
	Object	AlertNotificationsConfiguration		
	Attribute Name	Type	Optional	Description
	alert_severity	Object	Yes	Alerting severity configuration
	system	Nested object	Yes	Alerting severity configuration for system alerts
	fatal	Nested boolean	Yes	Whether notifications should be sent for system alerts with “fatal” severity for the storage array.
	critical	Nested boolean	Yes	Whether notifications should be sent for system alerts with “critical” severity for the storage array.
	warning	Nested boolean	Yes	Whether notifications should be sent for system alerts with “warning” severity

				for the storage array.
	normal	Nested boolean	Yes	Whether notifications should be sent for system alerts with “normal” severity for the storage array.
	info	Nested boolean	Yes	Whether info system alerts are enabled or disabled for WAR
	performance	Nested object	Yes	Alerting severity configuration for performance alerts
	critical	Nested boolean	Yes	Whether notifications should be sent for performance alerts with “critical” severity for the storage array.
	warning	Nested boolean	Yes	Whether notifications should be sent for performance alerts with “warning” severity for the storage array.
	info	Nested boolean	Yes	Whether notifications should be sent for performance alerts with “info” severity for the storage array.
	subscriptions	Nested object	Yes	Email subscriptions details for the storage array
	system	Nested List<String>	Yes	List of email recipients that will receive email notifications for

				the storage array when a system alert with configured severity occurs on the system.
	performance	Nested List<String>	Yes	List of email recipients that will receive email notifications for the storage array when a performance alert with configured severity occurs on the system.
	jobs	Nested List<String>	Yes	A list of email addresses to receive job status notifications
	reports	Nested List<String>	Yes	A list of email addresses to receive performance reports
	none	Nested List<String>	Yes	Not configurable. The property is listed as the GET response can be used as PUT request body.

Sample json request

```
{
  "alert_severity": {
    "system": {
      "fatal": true,
      "critical": true,
      "warning": true,
      "normal": true,
      "info": true
    },
    "performance": {
      "critical": true,
      "warning": true,
      "info": true
    }
  }
}
```

```

    }
  },
  "subscriptions": {
    "system": [
      "a.c1@d.cm",
      "a.1@c.com"
    ],
    "performance": [
      "a.c1@d.cm"
    ],
    "jobs": [
      "a.b1@c.com"
    ],
    "reports": [
      "a.b@c.com"
    ],
    "none": [
      "x.y@c.com"
    ]
  }
}

```

Sample json response

204 <<No Content>>

2.5.2 access_control

2.5.2.1 hostaccess

2.5.2.1.1 GET (List)

Resource	host_access
Request Type:	GET
New Endpoint Description:	The endpoint retrieves the list of host names linked to an access ID, that have been configured for a storage array. Only first 3 digits are displayed for the access id.

Modify Endpoint Description:	Added in this Release		
	Not applicable		
	Modified in this Release		
	Not applicable		
	Removed in this Release		
	Not applicable		
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/system/{{symmetrixld}}/access_control/host_access		
User Roles:	Admin, Auditor, Security Admin		
Prerequisite:	None		
Path Parameters:	symmetrixld – identifier for the storage array		
Query Parameters:	Not applicable		
Response Parameters:	Object	HostAccessControlConfiguration	
	Attribute Name	Type	Optional
	hosts	Object	No
	host_name	String	Yes
	host_access_id	String	Yes
			Description
			List of host ids to attach to the storage array.
			Name of the host.
			The first 3 digits of id of the host.

2.5.2.1.1.1 Sample json response

```
{
```

```

"hosts": [
  {
    "host_name": "saleshost",
    "host_access_id": "2C6"
  },
  {
    "host_name": "marketinghost",
    "host_access_id": "5D9"
  }
]
}

```

2.5.2.1.2 POST

Resource	host_access						
Request Type:	POST						
New Endpoint Description:	A new endpoint that attaches a list of hosts and host IDs to a storage array. The id may be obtained by executing symacl -unique command on the host.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/system/{{symmetrixId}}/access_control/host_access						
User Roles:	Admin, Security Admin. Auditor						
Prerequisite:	None						
Path Parameters:	symmetrixId – identifier for the storage array						

Query Parameters:	Not applicable			
Request Parameters:	Object	HostAccessParam		
	Attribute Name	Type	Optional	Description
	hosts	Object	No	List of host ids to attach to the storage array.
	host_name	String	No	Name of the host.
	host_access_id	String	No	The id of the host. The host ID must be in the format xxxxxxxx-xxxxxxx-xxxxxxx. It uniquely identifies a host. The id may be obtained by executing symacl - unique command on the host.

2.5.2.1.2.1 Sample json request

```
{
  "hosts": [
    {
      "host_name": "saleshost",
      "host_access_id": "2C64567-89ABCDEF-01234567"
    },
    {
      "host_name": "marketinghost",
      "host_access_id": "5D965432-89ABCDEF-01234567"
    }
  ]
}
```

2.5.2.1.2.2 Sample json response

204 <<No Content>>

2.5.2.1.3 DELETE

Resource	host_access						
Request Type:	DELETE						
New Endpoint Description:	A new endpoint that detaches a single host id from a storage array.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/system/{{symmetrixId}}/access_control/host_access/host/{{hostname}}						
User Roles:	Admin, Security Admin. Auditor						
Prerequisite:	A host id must have been previously attached to the storage array.						
Path Parameters:	symmetrixId – identifier for the storage array hostname – identifier for the host name						
Query Parameters:	Not applicable						
Request Parameters:	Not applicable						
Response Parameters:	Not Applicable						

2.5.2.1.3.1 Sample json response

204 <<No Content>>

2.5.2.2 block_security_api

2.5.2.2.1 PUT

Resource	block_security api						
Request Type:	PUT						
New Endpoint Description:	Blocks any calls to the settings/access_control/authorization_rule REST API. Once blocked the access can be reenabled via GUI in Settings Dialog under Security > Preferences						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/access_control/block_security_api						
User Roles:	Admin, Security Admin						
Prerequisite:	None						
Path Parameters:	Not applicable						
Query Parameters:	Not applicable						
Response Parameters:	Not applicable						

2.5.2.2.1.1 Sample json response

204 <<No Content>>

2.5.2.3 authentication

2.5.2.3.1 GET (Object)

Resource	authentication																											
Request Type:	GET																											
New Endpoint Description:	The endpoint retrieves the status of authentication settings configuration. Currently only LDAP SSL is supported via REST API.																											
Modify Endpoint Description:	<table><tr><td colspan="4">Added in this Release</td></tr><tr><td colspan="4">Not applicable</td></tr><tr><td colspan="4">Modified in this Release</td></tr><tr><td colspan="4">Not applicable</td></tr><tr><td colspan="4">Removed in this Release</td></tr><tr><td colspan="4">Not applicable</td></tr></table>				Added in this Release				Not applicable				Modified in this Release				Not applicable				Removed in this Release				Not applicable			
Added in this Release																												
Not applicable																												
Modified in this Release																												
Not applicable																												
Removed in this Release																												
Not applicable																												
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/access_control/authentication																											
User Roles:	Admin, Security Admin																											
Prerequisite:	None																											
Path Parameters:	Not applicable																											
Query Parameters:	Not applicable																											
Response Parameters:	<table><tr><td>Object</td><td>AuthorizationEnablement</td><td></td><td></td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr></table>				Object	AuthorizationEnablement			Attribute Name	Type	Optional	Description																
Object	AuthorizationEnablement																											
Attribute Name	Type	Optional	Description																									

	Idap	boolean	No	Whether Idap authentication is configured and enabled.	
--	------	---------	----	--	--

2.5.2.3.1.1 Sample json response

{ "Idap": true }

2.5.2.3.2 PUT

Resource	authentication						
Request Type:	PUT						
New Endpoint Description:	The endpoints configures authentication settings. Currently only LDAP SSL is supported via REST API.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/access_control/authentication						
User Roles:	Admin, Security Admin						
Prerequisite:	None						
Path Parameters:	Not applicable						

Query Parameters:	Not applicable			
Response Parameters:				
	Object	AuthorizationConfigParams		
	Attribute Name	Type	Optional	Description
	action	enum	No	Enum to indicate that LDAP SSL authentication is to be enabled. Only "Enable" value is possible.
	enable_ldap_authority	Object	No	LDAP SSL configuration.
	server	String	No	IP address or hostname of the LDAP server to use for authentication.
	port	integer	No	Port number of the LDAP service.
	bind_dn	String	No	Distinguished name of the privileged account used to perform operations, such as searching users and groups, on the LDAP directory.

	bind_password	String	No	Password of the privileged account.
	user_search_path	String	No	Distinguished name of the node at which to begin user searches.
	user_object_class	String	No	Object class identifying users in the LDAP hierarchy.
	user_id_attribute	String	No	Attribute identifying the user login ID within the user object.
	group_search_path	String	No	Distinguished name of the node at which to begin group searches.
	group_name_attribute	String	No	Attribute identifying the group name.
	group_member_attribute	String	No	Attribute indicating group membership for a user within the group object.
	group_object_class	String	No	Object class identifying groups in the LDAP hierarchy.
	ssl_certificate	String	No	Root Certificate of LDAP

				Server in Base64 string format.
	limit_authentication_to_ldap_group_members	boolean	No	Specifies whether to limit authentication to members of LDAP groups.
	ldap_group_names	String	Yes	LDAP groups separated by commas

2.5.2.3.2.1 Sample json request

```
{
  "action": "Enable",
  "enable_ldap_authority": {
    "server": "myldapserver.lab.emc.com",
    "port": 3269,
    "bind_dn": "Cn=Administrator,CN=Users,DC=hop,DC=ad,DC=local",
    "bind_password": "myPassword",
    "user_search_path": "DC=hop,DC=ad,DC=local",
    "user_object_class": "user",
    "user_id_attribute": "Samaccountname",
    "group_search_path": "DC=hop,DC=ad",
    "group_name_attribute": "cn",
    "group_member_attribute": "member",
    "group_object_class": "group",
    "ssl_certificate": "
LS0tLS1CRUdJTiBDRVJUSUZJQ0FURSB0tLS0tCk1JSUc5VENDQk4yZ0F3SUJBZ0IURIFBQUFBWFQvU0
9NVmNzL05BQUFBQUFBQUFBQkRBTklna3Foa2IHOXcwQkFRMEYKQURCYU1SVXdfd1ILQ1pJbWlaUHIMR1
FCR1JZRmJHOWpZV3d4RWpBUUJnb0praWFKay9Jc1pBRVpGZ0poWkRFVApNQkVHQ2dtU0pvbVQ4a
XhrQVJrV0EyaHZjREVZTUJZR0ExVUVBeE1QYUc5d0xVdzBVMFV6TVRnNEExVTk1JNQjRYCkRUSXpNR
Gd3TWpFek16QXhNMW9YRFRJMU1EZ3dNakV6TkRBeE0xb3dJekVoTUI4R0ExVUVBeE1ZYkRSelpUT
XgKT0RndWFHOXdMbXhoWWk1bGJXTXVZMjI0TUIJQklqQU5CZ2txaGtpRzl3MEJBUUVGQUFPQ0FRO
EFNSUICQ2dLQwpBUUVBN2NCUEpESnRuTVRaejB5OEVI3dIcEtoSWUwRmF3Qk9yb1BjZXBuQ2N4V
zVjZFltV08yZkZ5cnZnOEtJCKJBbjRxdTQreG5QWEFNRVc1N0FGdkN6ZVdBRE5hWHYyciNtZHRUOU9Y
V2ZQeFFjL0M0NHdmckNLQ250L0FnYU8KMzU5dGY0aVVOTkxoMk9vbXVvWmF2",
    "limit_authentication_to_ldap_group_members": false,
    "ldap_group_names": ""
  }
}
```

2.5.2.3.2.2 Sample json response

204 <<No Content>>

2.5.2.4 authorization_rule

2.5.2.4.1 GET (List)

Resource	authorization_rule			
Request Type:	GET			
New Endpoint Description:	The endpoint retrieves the list of authorization rules			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/access_control/authorization_rule			
User Roles:	Admin, Security Admin			
Prerequisite :	None			
Path Parameters:	symmetrixId – identifier for the storage array			
Query Parameters:	Object	AuthorizationRuleFilter		
	Attribute Name	Type	Description	
	name	String	The user or group name for the Authorization rule	
	account_type	String	The account type. Valid values are User and Group.	
	authority	String	The authentication authority which	

			can be Local Directory, WindowsAD, LDAP-SSL, SSO or Host.	
	qualifier	String	Domain or hostname depending on the authority type.	
	role	String	Type of privilege to filter by. Possible values are: admin, security_admin, storage_admin, mainframe_admin, monitor, auditor, perf_monitor, none, local_rep, device_manage, remove_rep	
Response Parameters:				
	Object	AuthorizationConfigurationList		
	Attribute Name	Type	Optional	Description
	authorization_rules	List of Objects	No	List of authorization rules for the storage array
	AuthorizationConfiguration	Object	No	An access rule for a user or user group
	name	String	No	The user or group name for the Authorization rule
	account_type	String	No	The account type. Valid values are User and Group.
	authority	String	No	The authentication authority which can be Local Directory, WindowsAD.

			LDAP-SSL, SSO or Host.
qualifier	String	No	Domain or hostname depending on the authority type.
roles	Object	No	Assigned privileges
admin	Nested Boolean	No	User/group has Admin role
security_admin	Nested Boolean	No	User/group has SecurityAdmin role
storage_admin	Nested Boolean	No	User/group has StorageAdmin role
mainframe_admin	Nested Boolean	No	User/group has MainframeAdmin role
monitor	Nested Boolean	No	User/group has Monitor role
auditor	Nested Boolean	No	User/group has Auditor role
perf_monitor	Nested Boolean	No	User/group has PerfMonitor role
none	Nested Boolean	No	User/group has revoked privileges.
local_rep	Nested Object	No	User/group has local replication role. The role can be narrowed down to specific storage_groups.
device_manage	Nested Object	No	User/group has device manage role. The role can be narrowed down to specific storage_groups.
remote_rep	Nested Object	No	User/group has remote replication role.

				The role can be narrowed down to specific storage_groups.
	enabled	Nested Boolean	No	Enable/disable the authorization role.
	storage_groups	Nested String[]	Yes	List of storage groups to narrow down privileges to.
	wildacrd	Nested String[]	Yes	List of wildcards matching storage group names to narrow down privileges to.

2.5.2.4.1.1 Sample json response

```
{
  "authorization_rules": [
    {
      "name": "host115",
      "account_type": "user",
      "authority": "host",
      "qualifier": "myhostname",
      "roles": {
        "admin": true,
        "security_admin": false,
        "storage_admin": false,
        "mainframe_admin": false,
        "monitor": false,
        "auditor": false,
        "perf_monitor": false,
        "none": false,
        "local_rep": {
          "enabled": false
        },
        "device_manage": {
          "enabled": false
        },
        "remote_rep": {
          "enabled": false
        }
      }
    }
  ]
}
```

```

    },
    {
      "name": "mylocalDirUser",
      "account_type": "user",
      "authority": "localDirectory",
      "qualifier": "myDoamin",
      "roles": {
        "admin": true,
        "security_admin": false,
        "storage_admin": false,
        "mainframe_admin": false,
        "monitor": false,
        "auditor": false,
        "perf_monitor": false,
        "none": false,
        "local_rep": {
          "enabled": false
        },
        "device_manage": {
          "enabled": false
        },
        "remote_rep": {
          "enabled": false
        }
      }
    }
  ],
  {
    "name": " myLDAPUSer",
    "account_type": "user",
    "authority": " ldapSSL",
    "qualifier": "myDomain",
    "roles": {
      "admin": true,
      "security_admin": false,
      "storage_admin": false,
      "mainframe_admin": false,
      "monitor": false,
      "auditor": false,
      "perf_monitor": false,
      "none": false,
      "local_rep": {
        "enabled": false
      },
      "device_manage": {
        "enabled": false
      },
      "remote_rep": {
        "enabled": false
      }
    }
  }
}

```

```

    }
  ]
}

```

2.5.2.4.2 POST

Resource	authorization_rule														
Request Type:	POST														
New Endpoint Description:	The endpoint creates new authorization rule for a user or user group on the storage array.														
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>			Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable						
Added in this Release															
Not applicable															
Modified in this Release															
Not applicable															
Removed in this Release															
Not applicable															
URL:	{{protocol}}://{{server}}{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix/{{symmetrixId}}/access_control/authorization_rule														
User Roles:	Admin, Security Admin														
Prerequisite:	None														
Path Parameters:	symmetrixId – identifier for the storage array														
Query Parameters:	Not applicable														
Response Parameters:	<table><tr><td>Object</td><td>AuthorizationConfiguration</td><td></td><td></td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr><tr><td>name</td><td>String</td><td>No</td><td>The user or group name for the Authorization rule</td></tr></table>			Object	AuthorizationConfiguration			Attribute Name	Type	Optional	Description	name	String	No	The user or group name for the Authorization rule
Object	AuthorizationConfiguration														
Attribute Name	Type	Optional	Description												
name	String	No	The user or group name for the Authorization rule												

	account_type	String	No	The account type. Valid values are User and Group.
	authority	String	No	The authentication authority which can be Local Directory, WindowsAD, LDAP-SSL, SSO or Host.
	qualifier	String	No	Domain or hostname depending on the authority type.
	roles	Object	No	Assigned privileges
	admin	Nested Boolean	No	User/group has Admin role
	security_admin	Nested Boolean	No	User/group has SecurityAdmin role
	storage_admin	Nested Boolean	No	User/group has StorageAdmin role
	mainframe_admin	Nested Boolean	No	User/group has MainframeAdmin role
	monitor	Nested Boolean	No	User/group has Monitor role
	auditor	Nested Boolean	No	User/group has Auditor role
	perf_monitor	Nested Boolean	No	User/group has PerfMonitor role
	none	Nested Boolean	No	User/group has revoked privileges.
	local_rep	Nested Object	No	User/group has local replication role. The role can be narrowed

				down to specific storage_groups.
	device_manage	Nested Object	No	User/group has device manage role. The role can be narrowed down to specific storage_groups.
	remote_rep	Nested Object	No	User/group has remote replication role. The role can be narrowed down to specific storage_groups.
	enabled	Nested Boolean	No	Enable/disable the authorization role.
	storage_groups	Nested String[]	Yes	List of storage groups to narrow down privileges to.
	wildacrd	Nested String[]	Yes	List of wildcards matching storage group names to narrow down privileges to.

2.5.2.4.2.1 Sample json request

```
{
  "name": "myUser", //name for user of group
  "account_type": "user", //user or group
  "authority": "localDirectory", //ldapSSL or localDirectory, windowsAD, sso or host
  "qualifier": "mydomain.lab.dell.com", //domain or hostname
  "roles": { //max 4 roles that can be specified
    "admin": true,
    "security_admin": true,
    "storage_admin": false,
    "mainframe_admin": false,
    "monitor": false,
    "auditor": false,
    "perf_monitor": false,
    "local_rep": {
      "enabled": false,
```

```

    "storage_groups": [], //optional
    "wildcard": "" //optional
  },
  "device_manage": {
    "enabled": false,
    "storage_groups": [], //optional
    "wildcard": "" //optional
  },
  "remote_rep": {
    "enabled": false,
    "storage_groups": [], //optional
    "wildcard": "" //optional
  },
  "none": false
}
}

```

2.5.2.4.2.2 Sample json response

204 <<No Content>>

2.5.2.4.3 PUT

Resource	authorization_rule						
Request Type:	PUT						
New Endpoint Description:	The endpoint updates privileges for an existing authorization rule on the storage array.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/symmetrix						

	/{{symmetrixId}}/access_control/authorization_rule		
User Roles:	Admin, Security Admin		
Prerequisite:	The authorization rule must have been previously created.		
Path Parameters:	symmetrixId – identifier for the storage array		
Query Parameters:	Not applicable		
Response Parameters:			
	Object	AuthorizationConfiguration	
	Attribute Name	Type	Optional Description
	name	String	No The user or group name for the Authorization rule
	account_type	String	No The account type. Valid values are User and Group.
	authority	String	No The authentication authority which can be Local Directory, WindowsAD, LDAP-SSL, SSO or Host.
	qualifier	String	No Domain or hostname depending on the authority type.
	roles	Object	No Assigned privileges
	admin	Nested Boolean	No User/group has Admin role
	security_admin	Nested Boolean	No User/group has SecurityAdmin role
	storage_admin	Nested Boolean	No User/group has StorageAdmin role

	mainframe_admin	Nested Boolean	No	User/group has MainframeAdmin role
	monitor	Nested Boolean	No	User/group has Monitor role
	auditor	Nested Boolean	No	User/group has Auditor role
	perf_monitor	Nested Boolean	No	User/group has PerfMonitor role
	none	Nested Boolean	No	User/group has revoked privileges.
	local_rep	Nested Object	No	User/group has local replication role. The role can be narrowed down to specific storage_groups.
	device_manage	Nested Object	No	User/group has device manage role. The role can be narrowed down to specific storage_groups.
	remote_rep	Nested Object	No	User/group has remote replication role. The role can be narrowed down to specific storage_groups.
	enabled	Nested Boolean	No	Enable/disable the authorization role.
	storage_groups	Nested String[]	Yes	List of storage groups to narrow down privileges to.
	wildacrd	Nested String[]	Yes	List of wildcards matching storage group names to narrow down privileges to.

2.5.2.4.3.1 Sample json request

```
{
  "name": "myUser", //name for user of group
  "account_type": "user", //user or group
  "authority": "localDirectory", //ldapSSL or localDirectory, windowsAD, sso or host
  "qualifier": "mydomain.lab.dell.com", //domain or hostname
  "roles": { //max 4 roles that can be specified
    "admin": true,
    "security_admin": true,
    "storage_admin": false,
    "mainframe_admin": false,
    "monitor": false,
    "auditor": false,
    "perf_monitor": false,
    "local_rep": {
      "enabled": false,
      "storage_groups": [], //optional
      "wildcard": "" //optional
    },
    "device_manage": {
      "enabled": false,
      "storage_groups": [], //optional
      "wildcard": "" //optional
    },
    "remote_rep": {
      "enabled": false,
      "storage_groups": [], //optional
      "wildcard": "" //optional
    },
    "none": false
  }
}
```

2.5.2.4.3.2 Sample json response

```
204 <<No Content>>
```

2.5.2.5 local_user

2.5.2.5.1 PUT

Resource	user
Request Type:	PUT

New Endpoint Description :	The endpoint is used to change password for a local user.			
Modify Endpoint Description :				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
Not applicable				
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/access_control/local_user			
User Roles:	Any role			
Prerequisite:	Not applicable			
Path Parameters :	Not applicable			
Query Parameters :	Not applicable			
Response Parameters :				
	Object	LocalUserPasswordConfiguration		
	Attribute Name	Type	Optional	Description
	name	String	No	The name of the local user
	set_password	Object	No	Password configuration
	current_password	Nested String	No	Current password for the user
	new_password	Nested String	No	New Password for the local user
	action	String	No	Action to set password with

				value "SetPassword"
--	--	--	--	------------------------

2.5.2.5.1.1 Sample json request

```
{
  "username": "myLocalUserName",
  "set_password": {
    "current_password": "smc",
    "new_password": "test"
  },
  "action": "SetPassword"
}
```

2.5.2.5.1.2 Sample json response

204 <<No Content>>

2.5.3 Registration

2.5.3.1 performance/Array/register

2.5.3.1.1 POST

Resource	performance/Array/register
Request Type:	POST
New Endpoint Description:	Moved {{protocol}}://{{server}}:{{port}}/univmax/restapi/performance/Array/register from performance to settings for zero touch management
Modify Endpoint Description:	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
	Not applicable

URL:	{{protocol}}://{{server}}:{{port}}/univmax/restapi/103/settings/registration/performance			
User Roles:	Admin, Manager, Performance Monitor			
Prerequisite :	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:				
	Object	ArrayRegisterParam		
	Attribute Name	Type	Optional	Description
	systemId	String	No	System Id or ALL for all systems
	realtime	boolean	Yes	Collect 5 sec data
	diagnostic	boolean	Yes	Collect 5-minute data
	metric	boolean	Yes	the threshold metric
	file	boolean	Yes	register for file data
	selectedSGs	string	Yes	comma separated list of SGs you want registered for Real Time stats
Response Parameters				
	Object	ArrayRegisterResult		
	Attribute Name	Type	Optional	Description
	message	List of Strings	Yes	List of messages

2.5.3.1.1.1 Sample json request and response

```
{
  "systemId": "{{v4SystemId}}",
```

<pre> "realtime": true, "diagnostic": true, "file": false, "selectedSGs": "{{storageGroupFirstV4Key}}" } </pre>
<pre> { "message": ["Successfully applied registration changes for 000220002429 array(s)."] } </pre>

2.5.3.2 scg

2.5.3.2.1 GET

Resource	scg						
Request Type:	GET						
New Endpoint Description:	Retrieves information on an SCG registration. If Unisphere is not registered it will return with only one property “ unisphere_registered”: false.						
Modify Endpoint Description:	<table><tr><td>Added in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Modified in this Release</td></tr><tr><td>Not applicable</td></tr><tr><td>Removed in this Release</td></tr><tr><td>Not applicable</td></tr></table>	Added in this Release	Not applicable	Modified in this Release	Not applicable	Removed in this Release	Not applicable
Added in this Release							
Not applicable							
Modified in this Release							
Not applicable							
Removed in this Release							
Not applicable							
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/registration/scg						
User Roles:	Admin, Manager, Performance Monitor, Monitor, Auditor, Security Admin						
Prerequisite:	None						

Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Response Parameters:				
	Object	SettingsScgConfiguration		
	Attribute Name	Type	Optional	Description
	143nisphere_registered	boolean	Yes	whether the Unisphere instance is registered for SCG
	143nisphere_ip_addresses	String	Yes	The IP address of Unisphere instance
	gateway_host	String	Yes	The IP address of gateway host.
	Gateway_port	Integer	Yes	the gateway port
	scg_serial_number	String	Yes	the serial number of the scg
	model	String	Yes	The model

2.5.3.2.1.1 Sample json response

```
{
  "143nisphere_registered": true,
  "143nisphere_ip_address": "10.60.141.222",
  "gateway_host": "10.246.80.77",
  "gateway_port": 9443
  "scg_serial_number": "ELMUSP07242YS3",
  "model": "UNISPHERE"
}
```

2.5.3.2.2 POST

Resource	scg			
Request Type:	POST			
New Endpoint Description:	Endpoint to register Unisphere with an SCG server. For Embedded Unisphere “internal_connection” flag set to True can be used instead of “gateway_host” when not connecting to an external SCG gateway. For standalone Unisphere an external “gateway_host” is always required. The SCG gateway server certificate can be supplied as a base64 encoded String in the optional property “server_cert”.			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	{{protocol}}//{{server}}//{{port}}/univmax/restapi/{{restapi_version}}/settings/registration/scg			
User Roles:	Admin, Manager			
Prerequisite:	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:				
	Object	SettingsScgConfiguration		
	Attribute Name	Type	Optional	Description
	gateway_host	String	Yes	The ip address of the gateway port

	gateway_port	String	Yes	The gateway port
	internal_connection	boolean	Yes	Whether is it an internal connection or an external
	access_key	String	Yes	Access_key used to authenticate the SCG connection. The key is alphanumeric value no more and no less than 8 characters long.
	pin	String	Yes	PIN number used to authenticate the SCG connection. It is exactly 4 digits long.
	server_cert	String	Yes	The server certificate

2.5.3.2.2.1 Sample json request

```
{
  "gateway_host": "10.246.80.77",
  "gateway_port": 9443
  "internal_connection": false,
  "access_key": "21F4983A",
  "pin": "1234",
  "server_cert":
  "LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUZuVENDQTRXZ0F3SUJBZ0IK..."
}
```

2.5.3.2.3 DELETE

Resource	scg
Request Type:	DELETE
New Endpoint Description:	Endpoint to unregister Unisphere with an SCG server. Will return a 204 response code if scg is successfully unregistered.
Modify Endpoint Description:	
	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
	Not applicable
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/register/scg
User Roles:	Admin, Manager
Prerequisite:	Not applicable
Path Parameters:	Not applicable
Query Parameters:	Not applicable
Request Parmeters:	Not applicable
Response Parameters:	Not applicable

2.5.3.2.4 server_cert

2.5.3.2.4.1 GET

Resource	server_cert
-----------------	-------------

Request Type:	GET			
New Endpoint Description :	Retrieves information on if an SCG registration server certificate is being used.			
Modify Endpoint Description :				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/registration/scg/server_cert			
User Roles:	Admin, Manager, Performance Monitor, Monitor, Auditor, Security Admin			
Prerequisite:	None			
Path Parameters :	Not applicable			
Query Parameters :	Not applicable			
Response Parameters :				
	Object	SettingsScgServerCertConfiguration		
	Attribute Name	Type	Optional	Description
	unisphere_registered	boolean	Yes	Whether the unisphere is registered for SCG
	certificate_validation_enabled	boolean	Yes	Whether certificate

				validation is enabled or disabled
	server_cert_provided	boolean	Yes	Whether a server certificate is provided or not

Sample json response

```
{
  "unisphere_registered": true,
  "certificate_validation_enabled ": true,
  "server_cert_provided": true
}
```

2.5.3.2.4.2 PUT

Resource	server_cert
Request Type:	PUT
New Endpoint Description :	Endpoint to update if Unisphere should use server certificate when communicating with SCG. Only available when Unisphere is not using an internal connection to communicate with SCG. Allows set server certificate being used by providing a base64 encoded server certificate in the "server_cert" parameter. If a server certificate supplied or currently existing on the Unisphere instance user can enable sever certificate validation using the "certificate_validation_enabled " parameter.
Modify Endpoint	Added in this Release

Description :	Not applicable		
	Modified in this Release		
	Not applicable		
	Removed in this Release		
	Not applicable		
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/registration/scg/server_cert		
User Roles:	Admin, Manager		
Prerequisite:	Not applicable		
Path Parameters :	Not applicable		
Query Parameters :	Not applicable		
Request Parameters :			
	Object	SettingsScgServerCertParam	
	Attribute Name	Type	Optional
	certificate_validation_enabled	boolean	Yes
	server_cert	String	Yes

Sample json request

```
{
  "certificate_validation_enabled ": true,
```

```

    "server_cert
    "LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUZuVENDQTRXZ0F3SUJBZ0IK..."
  }

```

2.5.3.3 cloudiq

2.5.3.3.1 GET

Resource	Array																											
Request Type:	GET																											
New Endpoint Description:	Retrieves information on if sending data to CloudIQ is enabled and which local arrays are configured for data collection. If Unisphere is not registered for SCG it will return with only one property “unishphere_registered”: false																											
Modify Endpoint Description:	<table><tr><td colspan="4">Added in this Release</td></tr><tr><td colspan="4">Not applicable</td></tr><tr><td colspan="4">Modified in this Release</td></tr><tr><td colspan="4">Not applicable</td></tr><tr><td colspan="4">Removed in this Release</td></tr><tr><td colspan="4">Not applicable</td></tr></table>				Added in this Release				Not applicable				Modified in this Release				Not applicable				Removed in this Release				Not applicable			
Added in this Release																												
Not applicable																												
Modified in this Release																												
Not applicable																												
Removed in this Release																												
Not applicable																												
URL:	{protocol}://{server}/{port}/univmax/restapi/{restapi_version}/settings/registration/cloudiq																											
User Roles:	Admin, Manager, Performance Monitor, Monitor, Auditor, Security Admin																											
Prerequisite :	None																											
Path Parameters:	Not applicable																											
Query Parameters:	Not applicable																											
Response Parameters:	<table><tr><td>Object</td><td>CloudiqRegistration</td><td></td><td></td></tr></table>				Object	CloudiqRegistration																						
Object	CloudiqRegistration																											

	Attribute Name	Type	Optional	Description
	unisphere_registered	boolean	Yes	whether the unisphere is registered for SCG
	send_data	boolean	Yes	Whether send data to cloud iq is enabled or disabled
	data_collection_disabled	List<String>	Yes	List of symmetrix id's that have data collection disabled

2.5.3.3.1.1 Sample json response

```
{
  "unisphere_registered": true,
  "send_data": true,
  "data_collection_disabled": [
    "000220002163",
    "000220002429"
  ]
}
```

2.5.3.3.2 PUT

Resource	Array
Request Type:	PUT

New Endpoint Description:	Configures if Unisphere will send data to CloudIQ, can also be used to configure data collection for local arrays managed by Unisphere. If “data_collection_disabled” property is set to an empty array “[]” it is the equivalent of setting data collection enabled for all local Arrays			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	{{protocol}}://{{server}}/{{port}}/univmax/restapi/{{restapi_version}}/settings/registration/cloudiq			
User Roles:	Admin, Manager			
Prerequisite :	Not applicable			
Path Parameters:	Not applicable			
Query Parameters:	Not applicable			
Request Parameters:				
	Object	CloudiqRegistrationParam		
	Attribute Name	Type	Optional	Description
	send_data	boolean	Yes	Whether to enable or disable sending data to cloud iq
	data_collection_disabled	List<String>	Yes	List of symmetrix id's to disable data collection on

2.5.3.3.2.1 Sample json request


```
{  
  "send_data": true,  
  "data_collection_disabled": []  
}
```

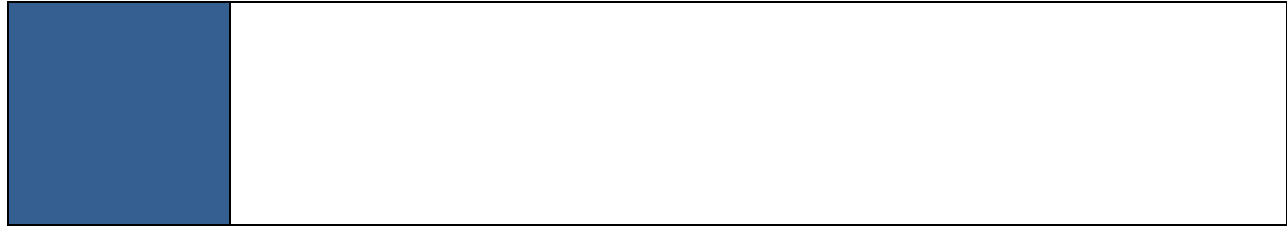
2.6 Enhanced Endpoints

2.6.1 storage-groups

2.6.1.1 GET

Resource	storage-groups				
Request Type:	GET				
New Endpoint Description:	Not applicable				
Modify Endpoint Description:	Added in this Release Adding the following Attributes: - StorageGroup_ChildStorageGroup - num_of_volumes - volumes - num_of_non_gk_volumes - non_gk_volumes Modified in this Release Modifying existing attributes: - unreducible_data_gb - Updated and correct value is 1/10th the previous value e.g.: - Pre 10.3 value: 9 - Updated value in 10.3: 0.9 Removed in this Release Not applicable				
URL:	<u>v1/system/{id}/storage-groups</u>				
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor				
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3				
Path Parameters:	Attribute Name	Type	Optional	Description	
	id	String	No	The System identifier	
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes				

	Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400			
Request Parameters:	Not applicable			
Response Parameters:				
	Object	StorageGroup_ChildStorageGroup		
	Attribute Name	Type	Optional	Description
	volumes	Array[StorageGroup_Volume]	YES	The Volumes associated with the Child Storage Group
	num_of_volumes	number	YES	The number of volumes associated with the child storage group
	non_gk_volumes	Array[StorageGroup_Volume]	YES	The Non Gate Keeper Volumes associated with the Child Storage Group
	num_of_non_gk_volumes	number	YES	The number of Non Gate Keeper volumes associated with the child storage group



2.6.1.1.1 Sample JSON Response

```
{
  "id": "ParentSG",
  "child_storage_groups": [
    {
      "id": "ChildSG_1",
      "resource_type": "storage-groups",
      "num_of_volumes": 1,
      "volumes": [
        {
          "resource_type": "volumes",
          "id": "00852",
          "wwn": "60000970000220200145533030383532",
          "effective_wwn": "60000970000220002163533030333739"
        }
      ],
      "num_of_non_gk_volumes": 1,
      "non_gk_volumes": [
        {
          "resource_type": "volumes",
          "id": "00852",
          "wwn": "60000970000220200145533030383532",
          "effective_wwn": "60000970000220002163533030333739"
        }
      ]
    },
    {
      "id": "ChildSG_2",
      "resource_type": "storage-groups",
      "num_of_volumes": 1,
      "volumes": [
        {
          "resource_type": "volumes",
          "id": "00857",
```

```

        "wwn": "60000970000220200145533030383537",
        "effective_wwn": "60000970000220200145533030383535"
    }
],
    "num_of_non_gk_volumes": 1,
    "non_gk_volumes": [
        {
            "resource_type": "volumes",
            "id": "00857",
            "wwn": "60000970000220200145533030383537",
            "effective_wwn": "60000970000220200145533030383535"
        }
    ]
}
]
}
]
}

```

2.6.2 volumes

2.6.2.1 GET

Resource	volumes
Request Type:	GET
New Endpoint Description:	Not applicable
Modify Endpoint Description:	Added in this Release Adding the following Attributes: • volume_host_paths • num_of_volume_host_paths Modified in this Release Not applicable Removed in this Release Not applicable
URL:	<u>v1/system/{id}/volumes</u>
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor

Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3				
Path Parameters:	Attribute Name	Type	Optional	Description	
	id	String	No	The System identifier	
Query Parameters:	See appendix for General Query Param Details Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400				
Request Parameters:	Not applicable				
Response Parameters:					
	Object		Volume		
	Attribute Name		Type	Optional	Description
	volume_host_paths		Array[Volume_Host_Path]	YES	The hosts this volume is masked to and associated path info such as consistent lun id
	num_of_volume_host_paths		number	YES	The number of hosts this volume is masked to
	Object		Volume_Host_Path		
	Attribute Name		Type	Optional	Description
	id		String	NO	The Base 64(no padding) identifier of the Volume Host Path which includes the volume host e.g., "00123 host1" equals "MDAxMjN8aG9zdDE"

	resource_type	String	YES	The type of resource
	Host	Volume_Host_Path_Host	YES	The Associated Host
	consistent_lun_address	String	YES	The host lun address of the volume if consistent across all Initiator and Director port combinations for this host, otherwise null

Object	Volume_Host_Path_Host		
Attribute Name	Type	Optional	Description
id	String	NO	The Host identifier
resource_type	String	YES	The type of resource
all_initiator_paths_on_fabric	Boolean	No	specifies if the initiators through all director ports are on fabric,
all_initiator_paths_logged_in	Boolean	No	specifies if the initiators through all ports are logged in

2.6.2.1.1 Sample JSON Response

```
{
  "volumes": [
    {
      "id": "00845",
      "volume_host_paths": [
        {
          "id": "MDA4NDV8aG9zdDE",
          "resource_type": "volume-host-paths",
          "host": {
            "id": "host1",
            "resource_type": "hosts",

```

```

        "all_initiator_paths_on_fabric": true,
        "all_initiator_paths_logged_in": true
    },
    "consistent_lun_address": "0009"
}
],
"num_of_volume_host_paths": 1
}
]
}

```

2.6.3 directors

2.6.3.1 GET

Resource	directors			
Request Type:	GET			
New Endpoint Description:	This endpoint will return a collection of Director objects.			
Modify Endpoint Description:	Not applicable			
URL:	<u>v1/system/{id}/directors</u>			
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3			
Path Parameters:	Attribute Name	Type	Optional	Description
	id	String	No	The System identifier
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400			
Request Parameters:	Not applicable			
Response Parameters:				

	Object	Director		
	Attribute Name	Type	Optional	Description
	id	String	NO	The name of the Director
	resource_type	String	YES	The type of resource
	system	Director_System	YES	The associated system
	type	String	Yes	The type of director
	status	String	Yes	The current Status of the Director
	director_number	Number	Yes	The physical number of the director
	engine_number	Number	Yes	The Engine number associated with the director
	slot_number	Number	Yes	The slot number associated with the director
	num_of_ports	Number	Yes	The total number of Ports associated with the Director
	ports	Array [Director_Port]	Yes	List of Ports associated with the Director

	Object	Director_System		
	Attribute Name	Type	Optional	Description
	id	String	NO	The System identifier
	resource_type	String	YES	The type of resource
	Object	Director_Port		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Port identifier
	resource_type	String	YES	The type of resource
	director	Director_Port_Director	No	The Associated Director
	port_number	Number	No	The director port number
	Object	Director_Port_Director		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Director identifier
	resource_type	String	YES	The type of resource

2.6.3.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "FA-1D",
      "resource_type": "directors",
      "system": {"id": "000197200107"},
    }
  ]
}
```

```

    "type": "OSHostFibreChannel",
    "status": "Online",
    "director_number": 49,
    "slot_number": 1,
    "engine_number": 1,
    "num_of_ports": 1,
    "ports": [
      {
        "id": "8cb02249784f804b930a0d25ea06b658",
        "director": {"id": "FA-1D"},
        "port_number": 10,
        "port_identifier": "50000975b0175404",
        "resource_type": "ports"
      }
    ]
  }
}

```

2.6.4 ports

2.6.4.1 GET

Resource	ports				
Request Type:	GET				
New Endpoint Description:	This endpoint will return a collection of Port objects.				
Modify Endpoint Description:	Not applicable				
URL:	<u>v1/system/{id}/ports</u>				
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor				
Prerequisite :	Minimum Unisphere for PowerMAX version: 10.3				
Path Parameters:	Attribute Name	Type	Optional	Description	
	id	String	No	The System identifier	
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes				

	Order Query Params: All Top-level Response Attributes			
	Note: Any invalid Query Param will return an error and response code 400			
Request Parameters:	Not applicable			
Response Parameters:				
	Object	Port		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Base64 encoded identifier of the port
	resource_type	String	YES	The type of resource
	port_number	Number	NO	The associated Port Number
	port_identifier	String	YES	The associated port WWN
	director	Port_Director	NO	The associated Director
	system	Port_System	YES	The associated system
	type	String	YES	The port Type, e.g., OSHostGigE
	protocol	String	YES	The Port protocol e.g. Host_SCSI_FC
	port_status	String	YES	The current status of the port
	director_status	String	YES	The current Status of the director
	vcm_state	String	Yes	Specifies if VCM is enabled, disabled or n/a

	aclx	String	Yes	Specifies if ACLX is enabled, disabled or n/a
	common_serial_number	String	Yes	Specifies if CSM is enabled, disabled or n/a
	unique_wwn	String	Yes	Specifies if Unique WWN is enabled, disabled or n/a
	init_point_to_point	String	Yes	Specifies if Initiator Point to Point is enabled, disabled or n/a
	volume_set_addressing	String	Yes	Specifies if VSA is enabled, disabled or n/a
	vnx_attached	String	Yes	Specifies if VNX attached is enabled, disabled or n/a
	avoid_reset_broadcast_state	String	Yes	Specifies if ARB is enabled, disabled or n/a
	negotiate_reset	String	Yes	Specifies if Negotiate Reset is enabled, disabled or n/a
	enable_auto_negotiate	String	Yes	Specifies if Enable Auto Negotiate is enabled, disabled or n/a
	environ_set	String	Yes	Specifies if Environ Set is enabled or not (true/false)
	disable_q_reset_on_ua	String	Yes	Specifies if Disable Q Reset on UA is

				enabled, disabled or n/a
	soft_reset	String	Yes	Specifies if Soft Reset is enabled, disabled or n/a
	scsi3	String	Yes	Specifies if SCSI3 is enabled, disabled or n/a
	scsi_support1	String	Yes	Specifies if SCSI Support 1 is enabled, disabled or n/a
	no_participating	String	Yes	Specifies if No Participating is enabled, disabled or n/a
	spc2_protocol_version	String	Yes	Specifies if SPC 2 Protocol Version is enabled, disabled or n/a
	hp_3000	String	Yes	Specifies if HP3000 is enabled, disabled or n/a
	sunapee	String	Yes	Specifies if Sunapee is enabled, disabled or n/a
	siemens	String	Yes	Specifies if Siemens is enabled, disabled or n/a
	open_vms	String	Yes	Specifies if Open VMS is enabled, disabled or n/a
	rx_power_level_mw	Number	Yes	The port received light power level

	tx_power_level_mw	Number	Yes	The port Transmit light power level
	power_levels_last_sampled_date_ms	Number	Yes	The last time the light levels were recorded in ms
	max_speed	Number	Yes	The max speed of the port
	negotiated_speed	Number	Yes	The Negotiated Speed of the Port
	iscsi_endpoint	Boolean	Yes	Specifies if the port is an iscsi endpoint or not
	virtual			Specifies if the port is a Virtual port as opposed to a physical one
	nvmtcp_endpoint	Boolean	Yes	Specifies if the port is a NVMe TCP port or not
	port_group_candidate	Boolean	Yes	Specifies if the port can be added to a port Group
	num_of_cores	Number	YES	Specifies the number of cores
	num_of_ip_interfaces	Number	YES	The total number of Ip Interfaces associated with the iSCSI Endpoint
	ip_interfaces	Array [Port_IpInterface]	YES	List of Ip Interfaces associated with the iSCSI Endpoint

	num_of_volumes	Number	YES	The total number of Volumes associated with the Port
	volumes	Array [Port_Volume]	YES	List of Volumes associated with the Port
	num_of_port_groups	Number	YES	The total number of Port Groups associated with the Port
	port_groups	Array [Port_Volume]	YES	List of Port Groups associated with the Port
	num_of_masking_views	Number	YES	The total number of Masking Views associated with the Port
	masking_views	Array [Port_Masking_View]	YES	List of masking Views associated with the Port
	ipv4_address	String	Yes	The IPv4 Address assigned to the Port
	ipv4_prefix_length	String	Yes	The IPv4 Netmask Prefix assigned to the Port
	domain_name	String	Yes	The Ipv4 Domain Name assigned to the Port
	default_gateway	String	Yes	The Ipv4 Default Gateway of the Port
	ipv6_address	String	Yes	The IPv6 Address

				assigned to the Port
	ipv6_prefix_length	String	Yes	The IPv6 Netmask Prefix assigned to the Port
	isns_ip_address	String	Yes	The ISNS IP Address of the Port
	network_id	Number	Yes	The iSCSI Endpoint network Id
	tcp_port	Number	Yes	The iSCSI Endpoint TCP Port Number

Object	Port_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

Object	Port_Director		
Attribute Name	Type	Optional	Description
id	String	NO	The Director identifier
resource_type	String	YES	The type of resource
director_number	Number	Yes	The System Director Number

Object	Port_Volume		
Attribute Name	Type	Optional	Description
id	String	NO	The Volume identifier
resource_type	String	YES	The type of resource

Object	Port_PortGroup		
Attribute Name	Type	Optional	Description
id	String	NO	The Port Group identifier
resource_type	String	YES	The type of resource

Object	Port_MaskingView		
Attribute Name	Type	Optional	Description
id	String	Yes	The Masking View identifier
resource_type	String	YES	The type of resource

Object	Port_IpInterface		
Attribute Name	Type	Optional	Description
id	String	NO	The Ip Interface identifier
resource_type	String	YES	The type of resource
ip_address	String	YES	The Ip address of the IP Interface
network_id	String	YES	The Network Id associated with the Ip Interface
prefix_length	Number	YES	The Netmask Prefix Length of the Ip Address
vlan_id	Number	YES	The VLAN Id associated with the Ip Interface
mtu	Number	YES	The Maximum Transmission Unit (MTU) of the Ip Interface

	last_modified_time_ms	Number	YES	The Time the Ip Interface was last updated

2.6.4.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "T1ltM0N8Ng",
      "resource_type": "ports",
      "port_number": "6",
      "port_identifier": "5000097410024486",
      "director": {
        "id": "OR-3C",
        "resource_type": "directors",
        "director_number": 35
      },
      "system": {
        "resource_type": "systems",
        "id": "0000000000000"
      },
      "type": "OSHostAndRDF",
      "protocol": "Host_SCSI_FC",
      "port_status": "ON",
      "director_status": "Online",
      "vcm_state": "enabled",
      "aclx": "enabled",
      "common_serial_number": "disabled",
      "unique_wwn": "enabled",
      "init_point_to_point": "enabled",
      "volume_set_addressing": "disabled",
      "vnx_attached": "disabled",
      "avoid_reset_broadcast_state": "disabled",
      "negotiate_reset": "disabled",
      "enable_auto_negotiate": "enabled",
      "environ_set": "disabled",
      "disable_q_reset_on_ua": "disabled",
      "soft_reset": "disabled",
    }
  ]
}
```

```

"scsi3": "enabled",
"scsi_support1": "enabled",
"no_participating": "disabled",
"spc2_protocol_version": "enabled",
"hp_3000": "disabled",
"sunapee": "disabled",
"siemens": "disabled",
"open_vms": "disabled",
"rx_power_level_mw": 0,
"tx_power_level_mw": 1,
"power_levels_last_sampled_date_ms": 1711722726000,
"max_speed": 32,
"negotiated_speed": 32,
"iscsi_endpoint": false,
"virtual": false,
"nvmetcp_endpoint": false,
"port_group_candidate": true,
"num_of_cores": 16,
"num_of_ip_interfaces": 0,
"ip_interfaces": [],
"num_of_volumes": 0,
"volumes": [],
"num_of_port_groups": 1,
"port_groups": [
  {
    "id": "PG1",
    "resource_type": "port-groups"
  }
],
"num_of_masking_views": 1,
"masking_views": [
  {
    "id": "MV1",
    "resource_type": "masking-views"
  }
]
}

```

2.6.5 ip-routes

2.6.5.1 GET

Resource	ip-routes				
Request Type:	GET				
New Endpoint Description:	This endpoint will return a collection of IP Routes objects.				
Modify Endpoint Description:	Not applicable				
URL:	<u>v1/system/{id}/ip-routes</u>				
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor				
Prerequisite :	Minimum Unisphere for PowerMAX version: 10.3				
Path Parameters:	Attribute Name	Type	Optional	Description	
	id	String	No	The System identifier	
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400				
Request Parameters:	Not applicable				
Response Parameters:					
	Object	IpRoute			
	Attribute Name	Type	Optional	Description	
	id	String	NO	The Base 64(no padding) identifier of the Ip Route which includes the director destination_ip_address prefix_length network_id e.g., "OR-3C 192.168.1.2 24 11" equals	

			"T1tM0N8MTkyLjE2OC4xLjJ8MjR8MT E" </xs:documentation>
resource_type	String	YES	The type of resource
system	IpRoute_System	YES	The associated system
destination_ip	String	Yes	The IP route destination IP Address
prefix_length	Number	Yes	The Netmask prefix length
network_id	Number	Yes	List of Masking Views associated with the Port Group
gateway_ip_addresses	String	Yes	The IP route Gateway IP Address
director	IpRoute_Director	Yes	The Director associated with the IP Route

Object	IpRoute_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

Object	IpRoute_Director		
Attribute Name	Type	Optional	Description
id	String	Yes	The Director identifier
resource_type	String	YES	The type of resource
director_number	Number	YES	The System Director Number

2.6.5.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "T1ltM0N8MS4xLjEuMXwzMHw0",
      "resource_type": "ip-routes",
      "destination_ip_address": "1.1.1.1",
      "network_id": "4",
      "prefix_length": 30,
      "gateway_ip_address": "2.2.2.2",
      "system": {
        "resource_type": "systems",
        "id": "000000000000"
      },
      "director": {
        "id": "OR-3C",
        "resource_type": "directors",
        "director_number": 35
      }
    }
  ]
}
```

2.6.6 ip-interfaces

2.6.6.1 GET

Resource	ip-interfaces
Request Type:	GET
New Endpoint Description:	This endpoint will return a collection of IP Interfaces objects.
Modify Endpoint Description:	Not applicable
URL:	<u>v1/system/{id}/ip-interfaces</u>
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3

Path Parameters:	Attribute Name	Type	Optional	Description
	id	String	No	The System identifier
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400			
Request Parameters:	Not applicable			
Response Parameters:	Object	IpInterface		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Base 64(no padding) identifier of the Ip Interface which includes the director port ip_address network_id e.g., "OR-3C 8 192.168.1.2 11" equals "T1ltM0N8OHwxOTluMTY4LjEuMnwxMQ"</xs:documentation>
	resource_type	String	YES	The type of resource
	ip_address	String	NO	The Ip Address of the IP Interface
	network_id	Number	NO	The unique network identifier of the ip interface
	system	IpInterface_System	YES	The associated system
	prefix_length	Number	Yes	The Netmask prefix length
	vlan_id	String	YES	The assigned VLAN Identifier
	mtu	Number	YES	The Maximum Transmission Unit of the IP Interface
	protocol	String	YES	The Protocol of the Ip interface, e.g. RDF_GigE
	cdc_ip_address	String	YES	The CDC IP Address

cdc_port_number	String	YES	The CDC Port Number
cdc_connection_status	String	YES	The CDC connection Status
cdc_state	String	YES	The CDC State
mdns_state	String	YES	The MDNS State
num_of_ports	Number	YES	The Total Number of ports associated with the ip interface
port	IpInterface_Port	Yes	the Port associated with the IP Interface
num_of_volumes	Number	Yes	The total number of Volumes Views associated with the IP Interface
Volumes	Array [IpInterface_Volume]	Yes	List of Volumes associated with the Ip Interface

Object	IpInterface_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

Object	IpInterface_Volume		
Attribute Name	Type	Optional	Description
id	String	NO	The Volume identifier
resource_type	String	YES	The type of resource

Object	IpInterface_Port		
Attribute Name	Type	Optional	Description

	id	String	NO	The Base 64(no padding) identifier of the Port which includes the director port e.g., "OR-3C 8" equals "T1ItM0N8OA"
	resource_type	String	YES	The type of resource
	port_number	String	YES	The Port Number
	iscsi_endpoint	Boolean	YES	Specifies if the Port is and iSCSI endpoint or not
	nvmecp_endpoint	Boolean	YES	Specifies if the port is a NVMe TCP Port of not.
	port_identifier	String	YES	The System Identifier for the Port (WWN)
	director	Port_Director	NO	The associated Director

Object		IpRoute_Director		
Attribute Name		Type	Optional	Description
id		String	Yes	The Director identifier
resource_type		String	YES	The type of resource

2.6.6.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "T1ItNEN8OXwxOTluMTY4LjAuMTlwfDk",
      "resource_type": "ip-interfaces",
      "ip_address": "192.168.0.120",
      "network_id": 9,
      "system": {
        "id": "000000000000",
        "resource_type": "systems"
      },
      "prefix_length": 24,
    }
  ]
}
```

```
{
  "vlan_id": 0,
  "mtu": 1500,
  "protocol": "RDF_GigE",
  "cdc_ip_address": "",
  "cdc_port_number": "0",
  "cdc_connection_status": "N/A",
  "cdc_state": "N/A",
  "mdns_state": "N/A",
  "ports": [
    {
      "id": "T1ltNEN8OQ",
      "resource_type": "ports",
      "port_number": "9",
      "iscsi_endpoint": false,
      "nvmecp_endpoint": false,
      "port_identifier": "0000000000000000",
      "director": {
        "id": "OR-4C",
        "resource_type": "directors"
      }
    }
  ],
  "num_of_ports": 1,
  "num_of_volumes": 0,
  "volumes": []
}
```

2.6.7 rdf-groups

2.6.7.1 GET

Resource	rdf-groups
Request Type:	GET
New Endpoint Description:	This endpoint will return a collection of RDF Group objects.
Modify Endpoint Description:	Not applicable
URL:	<u>v1/system/{id}/rdf-groups</u>

User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3			
Path Parameters:	Attribute Name	Type	Optional	Description
	id	String	No	The System identifier
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400			
Request Parameters:	Not applicable			
Response Parameters:	Object			
	RdfGroup			
	Attribute Name	Type	Optional	Description
	id	String	NO	The Rdf Group identifier
	resource_type	String	YES	The type of resource
	system	RdfGroup_System	YES	The associated system
	type	String	YES	The SRDF group type. E.g. Static, Dynamic, Witness
	label	String	YES	The assigned label of the RDF Group
	modes	Array [String]	YES	The SRDF modes for the volumes in the group. Asynchronous or Metro are group specific, Synchronous and Adaptive Copy can exist

				at the same time.
	offline	Boolean	Yes	Specifies if the DRF Group is Offline or not
	metro	boolean	YES	Indicates that the SRDF group devices are configured for SRDF/Metro.
	async	boolean	YES	Indicates that the SRDF group devices are configured for Asynchronous mode
	cap_gb	Number	YES	The Total capacity in GB of all the volume in the RDF Group
	remote_rdf_group	RdfGroup_RemoteRdfGroup	Yes	The RDF Group on the Remote System
	num_of_volumes	Number	Yes	The total number of Volumes associated with the RDF Group
	volumes	Array[RdfGroup_Volume]	Yes	The Volumes associated with the RDF Group
	num_of_ports	Number	Yes	The total number of Local Ports associated with the RDF Group
	ports	Array [RdfGroup_Port]	Yes	List of Local Ports associated with the RDF Group
	witness	boolean	YES	Indicates that the SRDF group is a witness group

	witness_name	String	YES	The Witness System ID for this SRDF/Metro group
	witness_protected_physical	boolean	YES	Is the SRDF group protected by a physical witness
	witness_protected_virtual	boolean	YES	Is the SRDF group protected by a virtual witness
	witness_configured	boolean	YES	Indicates that the SRDF group is configured to use witness. This means that when the establish/restore was issued both the R1 and R2 sides had a witness RDF group that was both defined and online to the same witness System.
	witness_effective	boolean	YES	Indicates that the SRDF group is witness protected
	bias_configured	boolean	YES	Indicates that the SRDF group is configured to use bias. This means that when the establish/restore was issued the use bias option was given .
	bias_effective	boolean	YES	Indicates that the SRDF group is bias protected.

	witness_degraded	boolean	YES	Indicates that the SRDF group is witness protected but the witness System can only be reached by either the R1 or the R2 System, but not by both
	vasa_group	boolean	YES	Indicates that the group is a VASA replication group
	link_limbo	Number	YES	Indicates the Link Limbo of the SRDF Group
	hardware_compression	boolean	YES	Is Hardware Compression enabled for the SRDF Group
	software_compression	boolean	YES	Is Software Compression enabled for the SRDF Group
	device_polarity	String	YES	The SRDF polarity of the volumes in the group [RDF1 RDF2 Mixed]
	rdfa_properties	RdfGroup_RdfaProperties	YES	The SRDF/A properties for the group

Object	RdfGroup_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

	Object	RdfGroup_RemoteRdfGroup		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Remote RDF Group identifier
	resource_type	String	YES	The type of resource
	system	RdfGroup_RemoteRdfGroup_System	YES	The associated system
	label	String	YES	The assigned label of the RDF Group
	num_of_ports	Number	Yes	The total number of Ports associated with the RDF Group
	ports	Array [RdfGroup_RemoteRdfGroup_Port]	Yes	List of Ports associated with the RDF Group
	Object	RdfGroup_RemoteRdfGroup_System		
	Attribute Name	Type	Optional	Description
	id	String	NO	The System identifier
	resource_type	String	YES	The type of resource
	Object	RdfGroup_RemoteRdfGroup_Port		
	Attribute Name	Type	Optional	Description

id	String	NO	The port identifier
resource_type	String	YES	The type of resource
director	RdfGroup_RemoteRdfGroup_Port_Director	NO	The Director associated with the Port
port_number	String	NO	The port Number

Object	RdfGroup_RemoteRdfGroup_Port_Director		
Attribute Name	Type	Optional	Description
id	String	NO	The director identifier
resource_type	String	YES	The type of resource

Object	RdfGroup_Port		
Attribute Name	Type	Optional	Description
id	String	NO	The port identifier
resource_type	String	YES	The type of resource
director	RdfGroup_Port_Director	NO	The Director associated with the Port
port_number	String	NO	The port Number

Object	RdfGroup_Port_Director		
Attribute Name	Type	Optional	Description
id	String	NO	The director identifier
resource_type	String	YES	The type of resource

	Object	RfgGroup_Volume		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Volume identifier
	resource_type	String	YES	The type of resource
	Object		RdfGroup_RdfaProperties	
	Attribute Name		Type	Optional
			Description	
	session_uncommitted_tracks		Number	Yes
				The number of tracks not yet committed in the SRDF/A session
	r1_to_r2_lag_time		Number	Yes
				How long behind the R1 is the R2 side
	duration_of_last_cycle_secs		Number	Yes
				Amount of time (seconds) that the last cycle lasted. If the R1 side is reachable, this is the number of seconds the cycle was the Capture (active) cycle. On the R2 side, this is 0 for ucode >= 5773
	average_cycle_time_secs		Number	Yes
				Average cycle time (seconds) When the

				R1 side is reachable, it is the average time that a cycle spends as the Capture (active) cycle. This includes the overhead of deciding to do the switch. If the R1 is not reachable, it is the average time that a cycle spends as the Apply (active) cycle on the R2 side	
	minimum_cycle_time_secs	Number	Yes	Minimum cycle time (seconds)	
	duration_of_last_transmit_cycle_secs	Number	Yes	How long the last transmit cycle took	
	transmit_queue_depth	Number	Yes	Number of cycles waiting to be transmitted to the R2 side. It does not include the Capture (active) cycle. This field is only valid if the R1 side is reachable, else it is 0.	

				In Legacy mode, this will always be 1 on the R1 side	
	cycle_number	Number	Yes	The current cycle number	
	transmit_idle_state	String	Yes	Identifies if transmit idle is enabled or disabled on this side	
	transmit_idle_time	Number	Yes	The time the transmit cycle has been idle	
	consistency_protection	Boolean	Yes	Indicates whether or not consistency protections is enabled	
	dse_active	Boolean	Yes	Is DSE active for the SRDF Group	
	dse_threshold	Number	Yes	Indicates the DSE Threshold for the SRDF Group	
	dse_autostart	Boolean	Yes	Indicates whether DSE Autostart is active on the SRDF Group	
	session_priority	Number	Yes	Indicates the SRDF/A session priority for the SRDF Group	

	consistency_exempt_volumes	Boolean	YES	Indicates the SRDF/A session has volumes which are consistency exempt	
--	----------------------------	---------	-----	---	--

2.6.7.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "11",
      "resource_type": "rdf-groups",
      "system": {
        "resource_type": "systems",
        "id": "000220002163"
      },
      "type": "Dynamic",
      "label": "cd23858010",
      "modes": [
        "Asynchronous"
      ],
      "offline": false,
      "metro": false,
      "async": true,
      "cap_gb": 5.13,
      "remote_rdf_group": {
        "id": "11",
        "resource_type": "rdf-groups",
        "system": {
          "resource_type": "systems",
          "id": "000220200145"
        },
        "label": "cd23858010",
        "num_of_ports": 2,
        "ports": [
          {
            "resource_type": "ports",
            "id": "T1ltNEN8Mg",
            "port_number": "2",

```

```

    "director": {
      "resource_type": "directors",
      "id": "OR-4C"
    }
  },
  {
    "resource_type": "ports",
    "id": "T1ltMUN8MQ",
    "port_number": "1",
    "director": {
      "resource_type": "directors",
      "id": "OR-1C"
    }
  }
],
"num_of_volumes": 1,
"volumes": [
  {
    "resource_type": "volumes",
    "id": "00442"
  }
],
"num_of_ports": 2,
"ports": [
  {
    "id": "T1ltMUN8Mg",
    "resource_type": "ports",
    "port_number": "2",
    "director": {
      "resource_type": "directors",
      "id": "OR-1C"
    }
  },
  {
    "id": "T1ltNEN8Mg",
    "resource_type": "ports",
    "port_number": "2",
    "director": {
      "resource_type": "directors",
      "id": "OR-4C"
    }
  }
]

```

```

    }
  ],
  "witness": false,
  "witness_name": "",
  "witness_protected_physical": false,
  "witness_protected_virtual": false,
  "witness_configured": false,
  "witness_effective": false,
  "bias_configured": false,
  "bias_effective": false,
  "witness_degraded": false,
  "vasa_group": false,
  "hardware_compression": false,
  "software_compression": false,
  "link_limbo": 10,
  "device_polarity": "RDF1",
  "rdfa_properties": {
    "session_uncommitted_tracks": 0,
    "r1_to_r2_lag_time": 0,
    "duration_of_last_cycle_secs": 0,
    "average_cycle_time_secs": 0,
    "minimum_cycle_time_secs": 15,
    "duration_of_last_transmit_cycle_secs": 0,
    "transmit_queue_depth": 0,
    "cycle_number": 0,
    "transmit_idle_state": "Enabled",
    "transmit_idle_time": 0,
    "consistency_protection": true,
    "dse_active": false,
    "dse_threshold": 50,
    "dse_autostart": false,
    "session_priority": 33,
    "consistency_exempt_volumes": false
  }
}
}]
}

```

2.6.8 port-groups

2.6.8.1 GET

Resource	port-groups
----------	-------------

Request Type:	GET			
New Endpoint Description:	This endpoint will return a collection of Port Group objects.			
Modify Endpoint Description:	Not applicable			
URL:	<u>v1/system/{id}/port-groups</u>			
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3			
Path Parameters :	Attribute Name	Type	Optional	Description
	id	String	No	The System identifier
Query Parameters :	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400			
Request Parameters :	Not applicable			
Response Parameters :	Object	PortGroup		
	Attribute Name	Type	Optional	Description
	id	String	NO	The name of the Port Group
	resource_type	String	YES	The type of resource
	uuid	String	Yes	The unique identifier of the port group

	protocol	String	Yes	The port group protocol, i.e. NVMe/TCP, SCSI_FC, iSCSI
	system	PortGroup_System	YES	The associated system
	last_modified_time_ms	Number	Yes	time since last group update
	num_of_ports	Number	Yes	The total number of Ports associated with the Port Group
	ports	Array [PortGroup_Port]	Yes	List of Ports associated with the Port Group
	num_of_masking_views	Number	Yes	The total number of Masking Views associated with the Port Group
	masking_views	Array [PortGroup_MaskingView]	Yes	List of Masking Views associated with the Port Group

Object	PortGroup_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

Object	PortGroup_Port		
Attribute Name	Type	Optional	Description
id	String	NO	The Base64 encoded port
resource_type	String	YES	The type of resource
port_number	Number	YES	The associated Port Number
port_identifier	String	YES	The associated port WWN
type	String	YES	The Port Type
protocol	String	Yes	The Port Protocol, i.e. Host_SCSI_FC
director	Port_Director	YES	The associated Director

Object	PortGroup_MaskingView		
Attribute Name	Type	Optional	Description
id	String	Yes	The Masking View identifier
resource_type	String	YES	The type of resource
port_group	PortGroup_MaskingView_PortGroup	Yes	The associated Port Group
host	PortGroup_MaskingView_Host	Yes	The associated Host
storage_group	PortGroup_MaskingView_StorageGroup	Yes	The associated Storage Group
uuid	String	Yes	The uuid of the

				masking view
	last_update_time	Number	Yes	The Date the Masking View was Last updated
	masking_view_last_update_time	Number	Yes	The Date any component of this masking view was updated
	num_of_initiators	Number	Yes	The total number of initiators associated with this Masking View

Object	PortGroup_MaskingView_PortGroup		
Attribute Name	Type	Optional	Description
id	String	NO	The Port Group identifier
resource_type	String	YES	The type of resource

Object	PortGroup_MaskingView_Host		
Attribute Name	Type	Optional	Description
id	String	NO	The Host identifier
resource_type	String	YES	The type of resource

Object	PortGroup_MaskingView_StorageGroup		
Attribute Name	Type	Optional	Description

	id	String	NO	The Storage Group identifier
	resource_type	String	YES	The type of resource

2.6.8.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "Port_Group_For_Host",
      "resource_type": "port-groups",
      "uuid": "00000000000000000000000000000000",
      "protocol": "SCSI_FC",
      "system": {
        "resource_type": "systems",
        "id": "000000000000"
      },
      "last_modified_time_ms": 2118362000,
      "num_of_ports": 1,
      "ports": [
        {
          "id": "1111111111111111",
          "resource_type": "ports",
          "port_number": "3",
          "protocol": "Host_SCSI_FC",
          "director": {
            "resource_type": "directors",
            "id": "OR-1C"
          }
        }
      ],
      "num_of_masking_views": 1,
      "masking_views": [
        {
          "id": "Masking_View_For_Host",
          "resource_type": "masking-views",
          "host": {
```

```

    "resource_type": "hosts",
    "id": "Host"
  },
  "storage_group": {
    "resource_type": "storage-groups",
    "id": "Storage_Group_For_Host"
  },
  "port_group": {
    "resource_type": "port-groups",
    "id": "Port_Group_For_Host"
  },
  "uuid": "00000000000000000000000000000000",
  "last_update_time_ms": 2118362000,
  "masking_view_last_update_time_ms": 0,
  "num_of_initiators": 0
}
]
}]
}

```

2.6.9 masking-views

2.6.9.1 GET

Resource	masking-views
Request Type:	GET
New Endpoint Description:	This endpoint will return a collection of Masking Views objects.
Modify Endpoint Description:	Not applicable
URL:	<u>v1/system/{id}/masking-views</u>
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3

Path Parameters:	Attribute Name	Type	Optional	Description	
	id	String	No	The System identifier	
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400				
Request Parameters:	Not applicable				
Response Parameters:					
	Object		MaskingView		
	Attribute Name		Type	Optional	Description
	id		String	Yes	The Masking View identifier
	resource_type		String	YES	The type of resource
	system		MaskingView_System	YES	The associated System
	port_group		MaskingView_PortGroup	Yes	The associated Port Group
	host		MaskingView_Host	Yes	The associated Host
	storage_group		MaskingView_StorageGroup	Yes	The associated Storage Group
	uuid		String	Yes	The uuid of the masking view

last_update_time	Number	Yes	The Date the Masking View was Last updated
masking_view_last_update_time	Number	Yes	The Date any component of this masking view was updated

Object	MaskingView_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

Object	MaskingView_Host		
Attribute Name	Type	Optional	Description
id	String	NO	The name of the Host
resource_type	String	YES	The type of resource
host_group	Boolean	YES	Specifies if the host is a host group or not
type	String	YES	The Host Type, i.e Fibre, ISCSI
port_flags_override	Boolean	YES	Specifies if the port flags have been

				overridden or not
	enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	consistent_lun	Boolean	YES	Specifies if the Host consistent LUN flag is enabled or not.
	last_modified_time_ms	Number	YES	Time since the last update
	bw_limit	Number	YES	The Bandwidth Limit defined for this host
	num_of_initiators	Number	YES	The number of initiators associated with the host
	initiators	Array[MaskingView_Host_Initiator]	YES	The initiators associated with the host
	num_of_hosts	Number	YES	The number of hosts associated with the host

	hosts	Array[MaskingView_Host_Host]	YES	The hosts associated with the host if this host is a host group
	num_of_powerpath_hosts	Number	YES	The number of Powerpath Hosts associated with the host
	powerpath_hosts	Array[MaskingView_Host_Powerpath_Host]	YES	The initiators associated with the host
	num_of_masking_views	Number	YES	The number of initiators associated with the host
	masking_views	Array[MaskingView_Host_MaskingView]	YES	The initiators associated with the host
	Object	MaskingView_Host_Initiator		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Base64 encoding of the initiator name
	resource_type	String	YES	The type of resource
	name	String	Yes	The unique identifier of the initiator
	type	String	Yes	The Initiator Type, i.e Fibre, iSCSI

alias	String	Yes	The assigned alias of the initiator
protocol	String	Yes	The Protocol of the Initiator on relevant Systems, i.e. Host_SCSI_FC, Host_NVMe/TCP
host_id	String	Yes	The Host Id of the NVMe/TCP Initiator
num_of_initiator_paths	Number	Yes	The total number of Initiator Paths with the Initiator
Initiator_paths	Array [MaskingView_Host_Initiator_InitiatorPath]	Yes	List of Initiator Paths associated with the Initiator, an initiator path is the director port route that the initiator is connected to

Object	MaskingView_Host_Initiator_InitiatorPath		
Attribute Name	Type	Optional	Description
id	String	NO	The base64 encode port e.g. “OR-4C 0 100000109bf8337e” equals “T1ltNEN8MHwxMDAwMDAxMDliZjgzMzdI”
resource_type	String	YES	The type of resource
port	MaskingView_Host_Initiator_InitiatorPath_Port	YES	The associated Port

	on_fabric	Boolean	YES	Defines if the Initiator is connected to the associated port on the SAN
	logged_in	Boolean	YES	Defines if the initiator is connected and zoned to the associated port in a SAN environment.
	ip_address	String	YES	The port associated ip address in a iscsi environment, V3 and above systems use iscsi targets instead of ip address on the physical port.
	port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not
	enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	Flags_in_effect	Array[String]	YES	A list of flags that are set for this initiator and port
	Object	MaskingView_Host_Initiator_InitiatorPath_Port		
	Attribute Name	Type	Optional	Description
	id	String	NO	The base64 encode port e.g. "OR-3C 8" equals "T1ltM0N8OA"
	resource_type	String	YES	The type of resource
	port_number	String	YES	The Port Number
	port_identifier	String	YES	The port identifier(WWN)
	type	String	YES	The Port Type

director	MaskingView_Host_Initiator_InitiatorPath_Port_Director		Yes	The Director associated with the port
----------	--	--	-----	---------------------------------------

Object	MaskingView_Host_Initiator_InitiatorPath_Port_Director			
Attribute Name	Type	Optional	Description	
id	String	NO	The id of the director	
resource_type	String	YES	The type of resource	

Object	MaskingView_Host_MaskingView			
Attribute Name	Type	Optional	Description	
id	String	NO	The Port Group identifier	
resource_type	String	YES	The type of resource	

Object	MaskingView_Host_Host			
Attribute Name	Type	Optional	Description	
id	String	NO	The name of the Host	
resource_type	String	YES	The type of resource	
type	String	YES	The Host Type, i.e Fibre, ISCSI	
port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not	
enabled_flags	Array[String]	YES	A list of enabled flags for this	

				initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	consistent_lun	Boolean	YES	Specifies if the Host consistent LUN flag is enabled or not.
	last_modified_time_ms	Number	YES	Time since the last update
	bw_limit	Number	YES	The Bandwidth Limit defined for this host
	num_of_initiators	Number	YES	The number of initiators associated with the host
	initiators	Array[MaskingView_Host_Host_Initiator]	YES	The initiators associated with the host
	num_of_hosts	Number	YES	The number of hosts associated with the host
	hosts	Array[MaskingView_Host_Host]	YES	The hosts associated with the host if this host is a host group

num_of_powerpath_hosts	Number	YES	The number of Powerpath Hosts associated with the host
powerpath_hosts	Array[MaskingView_Host_Powerpath_Host]	YES	The initiators associated with the host
num_of_masking_views	Number	YES	The number of initiators associated with the host
masking_views	Array[MaskingView_Host_MaskingView]	YES	The initiators associated with the host

Object	MaskingView_Host_Host_Initiator		
Attribute Name	Type	Optional	Description
id	String	NO	The Base64 encoding of the initiator name
resource_type	String	YES	The type of resource
name	String	Yes	The unique identifier of the initiator

Object	MaskingView_PortGroup		
Attribute Name	Type	Optional	Description
id	String	NO	The name of the Port Group

resource_type	String	YES	The type of resource
protocol	String	Yes	The port group protocol, i.e. NVMe/TCP, SCSI_FC, iSCSI
num_of_ports	Number	Yes	The total number of Ports associated with the Port Group
ports	Array [MaskingView_PortGroup_Port]	Yes	List of Ports associated with the Port Group

Object	MaskingView_PortGroup_Port		
Attribute Name	Type	Optional	Description
id	String	NO	The Base64 encoded port
resource_type	String	YES	The type of resource
port_number	Number	YES	The associated Port Number
port_identifier	String	YES	The associated port WWN
type	String	YES	The Port Type
protocol	String	Yes	The Port Protocol, i.e. Host_SCSI_FC
director	MaskingView_Port_Director	YES	The associated Director

Object	MaskingView_Port_Director		
Attribute Name	Type	Optional	Description
id	String	NO	The Director identifier

	resource_type	String	YES	The type of resource
	Object	MaskingView_StorageGroup		
	Attribute Name	Type	Optional	Description
	id	String	NO	The name of the Storage Group
	resource_type	String	YES	The type of resource
	num_of_volumes	Number	Yes	The total number of Volumes associated with the Storage Group
	volumes	Array [MaskingView_StorageGroup_Volume]	Yes	List of Volumes associated with the Storage Group
	num_of_non_gk_volumes	Number	Yes	The total number of Non-Gatekeeper Volumes associated with the Storage Group
	non_gk_volumes	Array [MaskingView_StorageGroup_Volume]	Yes	List of Non-Gatekeeper Volumes associated with the

				Storage Group																				
	num_of_child_storage_groups	Number	Yes	The total number of Child Storage Groups associated with the Storage Group																				
	child_storage_groups	Array [MaskingView_StorageGroup_ChildStorageGroup]	Yes	List of Child Storage Group associated with the Storage Group																				
	num_of_parent_storage_groups	Number	Yes	The total number of Parent Storage Groups associated with the Storage Group																				
	parent_storage_groups	Array [MaskingView_StorageGroup_ParentStorageGroup]	Yes	List of Parent Storage Group associated with the Storage Group																				
<table><tr><td>Object</td><td colspan="3">MaskingView_StorageGroup_Volume</td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr><tr><td>id</td><td>String</td><td>Yes</td><td>The name of the Volume</td></tr><tr><td>resource_type</td><td>String</td><td>YES</td><td>The type of resource</td></tr><tr><td>wwn</td><td>String</td><td>Yes</td><td>The wwn of the Volume</td></tr></table>					Object	MaskingView_StorageGroup_Volume			Attribute Name	Type	Optional	Description	id	String	Yes	The name of the Volume	resource_type	String	YES	The type of resource	wwn	String	Yes	The wwn of the Volume
Object	MaskingView_StorageGroup_Volume																							
Attribute Name	Type	Optional	Description																					
id	String	Yes	The name of the Volume																					
resource_type	String	YES	The type of resource																					
wwn	String	Yes	The wwn of the Volume																					

	effective_wwn	String	YES	The effective WWN of the volume
	Object	MaskingView_StorageGroup_ChildStorageGroup		
	Attribute Name	Type	Optional	Description
	id	String	NO	The name of the Storage Group
	resource_type	String	YES	The type of resource
	num_of_volumes	Number	Yes	The total number of Volumes associated with the Storage Group
	volumes	Array [MaskingView_StorageGroup_Volume]	Yes	List of Volumes associated with the Storage Group
	num_of_non_gk_volumes	Number	Yes	The total number of Non-Gatekeeper Volumes associated with the Storage Group
	non_gk_volumes	Array [MaskingView_StorageGroup_Volume]	Yes	List of Non-Gatekeeper Volumes associated with the Storage Group
	Object	MaskingView_StorageGroup_ParentStorageGroup		

	Attribute Name	Type	Optional	Description
	id	String	NO	The Storage Group identifier
	resource_type	String	YES	The type of resource

2.6.9.1.1 Sample JSON Response

```
{
  "results": [
    {
      "id": "MV1",
      "resource_type": "masking-views",
      "uuid": "600009700D1FFCD156E90177000000E6",
      "system": {
        "id": "0000000000000",
        "resource_type": "systems"
      },
      "last_update_time_ms": 26941024000,
      "masking_view_last_update_time_ms": 26941024000,
      "host": {
        "id": "host1",
        "resource_type": "hosts",
        "type": "Fibre",
        "host_group": false,
        "port_flags_override": false,
        "enabled_flags": [],
        "disabled_flags": [],
        "consistent_lun": false,
        "last_modified_time_ms": 1697802542,
        "bw_limit": 0,
        "num_of_initiators": 1,
        "initiators": [
          {
            "id": "MTAwMDAwMTA5YjkwOWVjYW",
            "resource_type": "initiators",
            "name": "100000109b909ecc",
            "type": "Fibre",

```

```

"alias": "100000109b909ecc/100000109b909ecc",
"protocol": "Host_SCSI_FC",
"host_id": "N/A",
"num_of_initiator_paths": 2,
"initiator_paths": [
  {
    "id": "T1ItNEN8MHwxMDAwMDAxMDIiOTA5ZWNj",
    "resource_type": "initiator-paths",
    "port": {
      "id": "T1ItNEN8MA",
      "resource_type": "ports",
      "port_number": "0",
      "port_identifier": "50000974100244c0",
      "type": "OSHostAndRDF",
      "director": {
        "id": "OR-4C",
        "resource_type": "directors"
      }
    }
  },
  {
    "ip_address": "N/A",
    "logged_in": true,
    "on_fabric": true,
    "port_flags_override": false,
    "enabled_flags": [],
    "disabled_flags": [],
    "flags_in_effect": [
      "SCSI_3(SC3)",
      "Common_Serial_Number(C)",
      "SPC2_Protocol_Version(SPC2)",
      "SCSI_Support1(OS2007)"
    ]
  },
  {
    "id": "T1ItMUN8MHwxMDAwMDAxMDIiOTA5ZWNj",
    "resource_type": "initiator-paths",
    "port": {
      "id": "T1ItMUN8MA",
      "resource_type": "ports",
      "port_number": "0",
      "port_identifier": "5000097410024400",
      "type": "OSHostAndRDF",
      "director": {

```

```

        "id": "OR-1C",
        "resource_type": "directors"
    }
},
"ip_address": "N/A",
"logged_in": true,
"on_fabric": true,
"port_flags_override": false,
"enabled_flags": [],
"disabled_flags": [],
"flags_in_effect": [
    "SCSI_3(SC3)",
    "Common_Serial_Number(C)",
    "SPC2_Protocol_Version(SPC2)",
    "SCSI_Support1(OS2007)"
]
}
]
}
],
"num_of_hosts": 0,
"hosts": [],
"num_of_masking_views": 10,
"masking_views": [
    {
        "id": "AutoRSnow_MV",
        "resource_type": "masking-views"
    },
    {
        "id": "DH_Temp1_MV",
        "resource_type": "masking-views"
    },
    {
        "id": "DH_Metro_Sync_Conv_MV",
        "resource_type": "masking-views"
    },
    {
        "id": "DH_UntickCheck_MV",
        "resource_type": "masking-views"
    },
    {
        "id": "Hop2_DG_MV",

```

```

    "resource_type": "masking-views"
  },
  {
    "id": "Hop2_DH_MV",
    "resource_type": "masking-views"
  },
  {
    "id": "SnowAutoRecovery_MV",
    "resource_type": "masking-views"
  },
  {
    "id": "DH_Sync_Metro_Conv_MV",
    "resource_type": "masking-views"
  },
  {
    "id": "irco2sd42_hba4",
    "resource_type": "masking-views"
  },
  {
    "id": "DHSnapSuspend_MV",
    "resource_type": "masking-views"
  }
]
},
"storage_group": {
  "id": "SG1",
  "resource_type": "storage-groups",
  "num_of_volumes": 1,
  "volumes": [
    {
      "id": "00355",
      "resource_type": "volumes",
      "wwn": "60000970000220200145533030333535",
      "effective_wwn": "60000970000220200145533030333535"
    }
  ],
  "num_of_non_gk_volumes": 1,
  "non_gk_volumes": [
    {
      "id": "00355",
      "resource_type": "volumes",
      "wwn": "60000970000220200145533030333535",

```

```

    "effective_wwn": "60000970000220200145533030333535"
  }
],
"num_of_child_storage_groups": 0,
"child_storage_groups": [],
"num_of_parent_storage_groups": 0,
"parent_storage_groups": []
},
"port_group": {
  "id": "PG1",
  "resource_type": "port-groups",
  "protocol": "SCSI_FC",
  "num_of_ports": 2,
  "ports": [
    {
      "id": "T1ItNEN8MA",
      "resource_type": "ports",
      "port_number": "0",
      "port_identifier": "50000974100244c0",
      "type": "OSHostAndRDF",
      "protocol": "Host_SCSI_FC",
      "director": {
        "id": "OR-4C",
        "resource_type": "directors"
      }
    }
  ],
  {
    "id": "T1ItMUN8MA",
    "resource_type": "ports",
    "port_number": "0",
    "port_identifier": "5000097410024400",
    "type": "OSHostAndRDF",
    "protocol": "Host_SCSI_FC",
    "director": {
      "id": "OR-1C",
      "resource_type": "directors"
    }
  }
]
}
}
]

```

```
}
```

2.6.10 hosts

2.6.10.1 GET

Resource	hosts				
Request Type:	GET				
New Endpoint Description:	This endpoint will return a collection of Host objects.				
Modify Endpoint Description:	Not applicable				
URL:	<u>v1/system/{id}/hosts</u>				
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor				
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3				
Path Parameters:	Attribute Name	Type	Optional	Description	
	id	String	No	The System identifier	
Query Parameters:	See appendix for General Query Param Details Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400				
Request Parameters:	Not applicable				
Response Parameters:					
	Object	Host			
	Attribute Name	Type		Optional	Description

	id	String	NO	The name of the Host
	resource_type	String	YES	The type of resource
	system	Host_System	YES	The system associated with the Host
	host_group	Boolean	YES	Specifies if the host is a host group or not
	type	String	YES	The Host Type, i.e Fibre, iSCSI
	port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not
	enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	consistent_lun	Boolean	YES	Specifies if the Host consistent LUN flag is enabled or not.
	last_modified_time_ms	Number	YES	Time since the last update
	bw_limit	Number	YES	The Bandwidth Limit defined for this host
	num_of_initiators	Number	YES	The number of initiators associated with the host
	initiators	Array[Host_Initiator]	YES	The initiators associated with the host
	num_of_hosts	Number	YES	The number of hosts associated with the host
	hosts	Array[Host_Host]	YES	The hosts associated with the host if this host is a host group
	num_of_powerpath_hosts	Number	YES	The number of Powerpath Hosts

			associated with the host
powerpath_hosts	Array[Host_Powerpath_Host]	YES	The initiators associated with the host
num_of_masking_views	Number	YES	The number of initiators associated with the host
masking_views	Array[Host_MaskingView]	YES	The initiators associated with the host

Object	Host_System		
Attribute Name	Type	Optional	Description
id	String	NO	The System identifier
resource_type	String	YES	The type of resource

Object	Host_Host		
Attribute Name	Type	Optional	Description
id	String	NO	The name of the Host
resource_type	String	YES	The type of resource
type	String	YES	The Host Type, i.e Fibre, iSCSI
port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not
enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
consistent_lun	Boolean	YES	Specifies if the Host consistent

			LUN flag is enabled or not.
last_modified_time_ms	Number	YES	Time since the last update
bw_limit	Number	YES	The Bandwidth Limit defined for this host
num_of_initiators	Number	YES	The number of initiators associated with the host
initiators	Array[Host_Host_Initiator]	YES	The initiators associated with the host
num_of_powerpath_hosts	Number	YES	The number of Powerpath Hosts associated with the host
powerpath_hosts	Array[Host_Powerpath_Host]	YES	The initiators associated with the host
num_of_masking_views	Number	YES	The number of initiators associated with the host
masking_views	Array[Host_Host_MaskingView]	YES	The initiators associated with the host

Object	Host_Host_Initiator		
Attribute Name	Type	Optional	Description
id	String	NO	The Base64 encoding of the initiator name
resource_type	String	YES	The type of resource
name	String	Yes	The unique identifier of the initiator

	Object	Host_Initiator		
	Attribute Name	Type	Optional	Description
	id	String	NO	The Base64 encoding of the initiator name
	resource_type	String	YES	The type of resource
	name	String	Yes	The unique identifier of the initiator
	type	String	Yes	The Initiator Type, i.e Fibre, iSCSI
	alias	String	Yes	The assigned alias of the initiator
	protocol	String	Yes	The Protocol of the Initiator on relevant Systems, i.e. Host_SCSI_FC, Host_NVMe/TCP
	host_id	String	Yes	The Host Id of the NVMe/TCP Initiator
	num_of_initiator_paths	Number	Yes	The total number of Initiator Paths with the Initiator
	Initiator_paths	Array [Host_Initiator_InitiatorPath]	Yes	List of Initiator Paths associated with the Initiator, an initiator path is the director port route that the initiator is connected to
	Object	Host_Initiator_InitiatorPath		

	Attribute Name	Type	Optional	Description
	id	String	NO	The base64 encode port e.g. "OR-4C 0 100000109bf8337e" equals "T1ItNEN8MHwxMDAwMDAxMDIIZjgzMzdI"
	resource_type	String	YES	The type of resource
	port	Host_Initiator_InitiatorPath_Port	YES	The associated Port
	fcid	String	YES	The fcid of the Initiator on the associated port
	fcid_value	String	YES	The fcid value of the Initiator on the associated port
	fcid_lockdown	Boolean	Yes	Specifies if the FDID value is overridden or not.
	fabric_name	String	YES	The Fabric Name of the Initiator on the associated port
	on_fabric	Boolean	YES	Defines if the Initiator is connected to the associated port on the SAN
	logged_in	Boolean	YES	Defines if the initiator is connected and zoned to the associated port in a SAN environment.
	ip_address	String	YES	The port associated ip address in a iscsi environment, V3 and above systems use iscsi targets instead of ip address on the physical port.
	port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not
	enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	Flags_in_effect	Array[String]	YES	A list of flags that are set for this initiator and port
Object		Host_Initiator_InitiatorPath_Port		
Attribute Name		Type	Optional	Description

	id	String	NO	The base64 encode port e.g. "OR-3C 8" equals "T1ltM0N8OA"
	resource_type	String	YES	The type of resource
	port_number	String	YES	The Port Number
	port_identifier	String	YES	The port identifier(WWN)
	type	String	YES	The Port Type
	director	Host_Initiator_InitiatorPath_Port_Director	Yes	The Director associated with the port

Object	Host_Initiator_InitiatorPath_Port_Director		
Attribute Name	Type	Optional	Description
id	String	NO	The id of the director
resource_type	String	YES	The type of resource

Object	Host_Powerpath_Host		
Attribute Name	Type	Optional	Description
id	String	Yes	The PowerPath Host identifier
resource_type	String	YES	The type of resource

Object	Host_Host_MaskingView		
Attribute Name	Type	Optional	Description
id	String	Yes	The Masking View identifier

	resource_type	String	YES	The type of resource
	Object	Host_MaskingView		
	Attribute Name	Type	Optional	Description
	id	String	Yes	The Masking View identifier
	resource_type	String	YES	The type of resource
	port_group	Host_MaskingView_PortGroup	Yes	The associated Port Group
	host	Host_MaskingView_Host	Yes	The associated Host
	storage_group	Host_MaskingView_StorageGroup	Yes	The associated Storage Group
	uuid	String	Yes	The uuid of the masking view
	last_update_time	Number	Yes	The Date the Masking View was Last updated
	masking_view_last_update_time	Number	Yes	The Date any component of this masking view was updated
	num_of_initiators	Number	Yes	The total number of

				initiators associated with this Mssking View
--	--	--	--	--

Object	Host_MaskingView_PortGroup		
Attribute Name	Type	Optional	Description
id	String	NO	The Port Group identifier
resource_type	String	YES	The type of resource

Object	Host_MaskingView_Host		
Attribute Name	Type	Optional	Description
id	String	NO	The Host identifier
resource_type	String	YES	The type of resource

Object	Host_MaskingView_StorageGroup		
Attribute Name	Type	Optional	Description
id	String	NO	The Storage Group identifier
resource_type	String	YES	The type of resource

2.6.10.1.1 Sample JSON Response

```
{
  "results": [
    {
```



```

    "id": "Host1",
    "resource_type": "hosts",
    "system": {
      "id": "000220200145",
      "resource_type": "systems"
    },
    "type": "Fibre",
    "host_group": false,
    "port_flags_override": false,
    "enabled_flags": [],
    "disabled_flags": [],
    "consistent_lun": false,
    "last_modified_time_ms": 1702378448,
    "bw_limit": 0,
    "num_of_initiators": 1,
    "initiators": [
      {
        "id": "MTAwMDAwOTBmYTFjZjA2Zg",
        "resource_type": "initiators",
        "name": "10000090fa1cf06f",
        "type": "Fibre",
        "alias": "10000090fa1cf06f/10000090fa1cf06f",
        "protocol": "Host_SCSI_FC",
        "host_id": "N/A",
        "num_of_initiator_paths": 2,
        "initiator_paths": [
          {
            "id": "T1ltNEN8MHwxMDAwMDA5MGZhMWNmMDZm",
            "resource_type": "initiator-paths",
            "port": {
              "id": "T1ltNEN8MA",
              "resource_type": "ports",
              "port_number": "0",
              "port_identifier": "50000974100244c0",
              "type": "OSHostAndRDF",
              "protocol": "Host_SCSI_FC",
              "director": {
                "id": "OR-4C",
                "resource_type": "directors"
              }
            },
            "ip_address": "N/A",

```

```

    "logged_in": true,
    "on_fabric": true,
    "port_flags_override": false,
    "enabled_flags": [],
    "disabled_flags": [],
    "flags_in_effect": [
        "SCSI_3(SC3)",
        "Common_Serial_Number(C)",
        "SPC2_Protocol_Version(SPC2)",
        "SCSI_Support1(OS2007)"
    ]
},
{
    "id": "T1ltMUN8MHwxMDAwMDA5MGZhMWNmMDZm",
    "resource_type": "initiator-paths",
    "port": {
        "id": "T1ltMUN8MA",
        "resource_type": "ports",
        "port_number": "0",
        "port_identifier": "5000097410024400",
        "type": "OSHostAndRDF",
        "protocol": "Host_SCSI_FC",
        "director": {
            "id": "OR-1C",
            "resource_type": "directors"
        }
    },
    "ip_address": "N/A",
    "logged_in": true,
    "on_fabric": true,
    "port_flags_override": false,
    "enabled_flags": [],
    "disabled_flags": [],
    "flags_in_effect": [
        "SCSI_3(SC3)",
        "Common_Serial_Number(C)",
        "SPC2_Protocol_Version(SPC2)",
        "SCSI_Support1(OS2007)"
    ]
}
]
}

```

```
],
  "num_of_hosts": 0,
  "hosts": [],
  "num_of_masking_views": 1,
  "masking_views": [
    {
      "id": "MV1",
      "resource_type": "masking-views",
      "host": {
        "id": "host1",
        "resource_type": "hosts"
      },
      "storage_group": {
        "id": "sg1",
        "resource_type": "storage-groups"
      },
      "port_group": {
        "id": "pg1",
        "resource_type": "port-groups"
      },
      "uuid": "00000000000000000000000000000000",
      "last_update_time_ms": 18668394000,
      "masking_view_last_update_time_ms": 7340764000,
      "num_of_initiators": 1
    }
  ]
}
```

2.6.11 initiators

2.6.11.1 GET

Resource	initiators
Request Type:	GET
New Endpoint Description:	This endpoint will return a collection of Initiators objects.

Modify Endpoint Description:	Not applicable																																							
URL:	<u>v1/system/{id}/initiators</u>																																							
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor																																							
Prerequisite:	Minimum Unisphere for PowerMAX version: 10.3																																							
Path Parameters:	Attribute Name	Type	Optional	Description																																				
	id	String	No	The System identifier																																				
Query Parameters:	<u>See appendix for General Query Param Details</u> Select Query Params: All Response Attributes Filter Query Params: All Response Attributes Order Query Params: All Top-level Response Attributes Note: Any invalid Query Param will return an error and response code 400																																							
Request Parameters:	Not applicable																																							
Response Parameters:	<table><tr><th>Object</th><th colspan="4">Initiator</th></tr><tr><th>Attribute Name</th><th>Type</th><th>Optional</th><th colspan="2">Description</th></tr><tr><td>id</td><td>String</td><td>NO</td><td colspan="2">The Base64 encoding of the initiator name</td></tr><tr><td>resource_type</td><td>String</td><td>YES</td><td colspan="2">The type of resource</td></tr><tr><td>name</td><td>String</td><td>Yes</td><td colspan="2">The unique identifier of the initiator</td></tr><tr><td>type</td><td>String</td><td>Yes</td><td colspan="2">The Initiator Type, i.e Fibre, iSCSI</td></tr><tr><td>system</td><td>Initiator_System</td><td>YES</td><td colspan="2">The associated system</td></tr></table>					Object	Initiator				Attribute Name	Type	Optional	Description		id	String	NO	The Base64 encoding of the initiator name		resource_type	String	YES	The type of resource		name	String	Yes	The unique identifier of the initiator		type	String	Yes	The Initiator Type, i.e Fibre, iSCSI		system	Initiator_System	YES	The associated system	
Object	Initiator																																							
Attribute Name	Type	Optional	Description																																					
id	String	NO	The Base64 encoding of the initiator name																																					
resource_type	String	YES	The type of resource																																					
name	String	Yes	The unique identifier of the initiator																																					
type	String	Yes	The Initiator Type, i.e Fibre, iSCSI																																					
system	Initiator_System	YES	The associated system																																					

	alias	String	Yes	The assigned alias of the initiator
	protocol	String	Yes	The Protocol of the Initiator on relevant Systems, i.e. Host_SCSI_FC, Host_NVMe/TCP
	host_id	String	Yes	The Host Id of the NVMe/TCP Initiator
	num_of_initiator_paths	Number	Yes	The total number of Initiator Paths with the Initiator
	Initiator_paths	Array [Initiator_InitiatorPath]	Yes	List of Initiator Paths associated with the Initiator, an initiator path is the director port route that the initiator is connected to
	num_of_hosts	Number	Yes	The total number of Hosts associated with the Initiator
	hosts	Array [Initiator_Host]	Yes	List of Hosts associated with the Initiator

	num_of_masking_views	Number	Yes	The total number of Masking Views associated with the Initiator																
	masking_views	Array [Initiator_MaskingView]	Yes	List of Masking Views associated with the Initiator																
	num_of_powerpath_hosts	Number	Yes	The total number of Powerpath Hosts associated with the Initiator																
	powerpath_hosts	Array [Initiator_Powerpath_Host]	Yes	List of Powerpath Hosts associated with the Initiator																
	<table><tr><td>Object</td><td colspan="3">Initiator_System</td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr><tr><td>id</td><td>String</td><td>NO</td><td>The System identifier</td></tr><tr><td>resource_type</td><td>String</td><td>YES</td><td>The type of resource</td></tr></table>				Object	Initiator_System			Attribute Name	Type	Optional	Description	id	String	NO	The System identifier	resource_type	String	YES	The type of resource
	Object	Initiator_System																		
	Attribute Name	Type	Optional	Description																
	id	String	NO	The System identifier																
	resource_type	String	YES	The type of resource																
<table><tr><td>Object</td><td colspan="3">Initiator_InitiatorPath</td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr><tr><td>id</td><td>String</td><td>NO</td><td>The base64 encode port e.g. "OR-4C 0 100000109bf8337e" equals "T1ltNEN8MHwxMDAwMDAxMDliZjczMzdl"</td></tr></table>				Object	Initiator_InitiatorPath			Attribute Name	Type	Optional	Description	id	String	NO	The base64 encode port e.g. "OR-4C 0 100000109bf8337e" equals "T1ltNEN8MHwxMDAwMDAxMDliZjczMzdl"					
Object	Initiator_InitiatorPath																			
Attribute Name	Type	Optional	Description																	
id	String	NO	The base64 encode port e.g. "OR-4C 0 100000109bf8337e" equals "T1ltNEN8MHwxMDAwMDAxMDliZjczMzdl"																	

	resource_type	String	YES	The type of resource
	port	Initiator_InitiatorPath_Port	YES	The associated Port
	fcid	String	YES	The fcid of the Initiator on the associated port
	fcid_value	String	YES	The fcid value of the Initiator on the associated port
	fcid_lockdown	Boolean	Yes	Specifies if the FDID value is overridden or not.
	fabric_name	String	YES	The Fabric Name of the Initiator on the associated port
	on_fabric	Boolean	YES	Defines if the Initiator is connected to the associated port on the SAN
	logged_in	Boolean	YES	Defines if the initiator is connected and zoned to the associated port in a SAN environment.
	ip_address	String	YES	The port associated ip address in a iscsi environment, V3 and above sytems use iscsi targets instead of ip address on the physical port.
	port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not
	enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	Flags_in_effect	Array[String]	YES	A list of flags that are set for this initiator and port

Object	Initiator_InitiatorPath_Port		
Attribute Name	Type	Optional	Description
id	String	NO	The base64 encode port e.g. "OR-3C 8" equals "T1ltM0N8OA"
resource_type	String	YES	The type of resource
port_number	String	YES	The Port Number

	port_identifier	String	YES	The port identifier(WWN)
	type	String	YES	The Port Type
	director	Initiator_InitiatorPath_Port_Director	Yes	The Director associated with the port
	Object	Initiator_InitiatorPath_Port_Director		
	Attribute Name	Type	Optional	Description
	id	String	NO	The id of the director
	resource_type	String	YES	The type of resource
	Object	Initiator_Host		
	Attribute Name	Type	Optional	Description
	id	String	NO	The name of the Host
	resource_type	String	YES	The type of resource
	host_group	Boolean	YES	Specifies if the host is a host group or not
	type	String	YES	The Host Type, i.e Fibre, ISCSI
	port_flags_override	Boolean	YES	Specifies if the port flags have been overridden or not
	enabled_flags	Array[String]	YES	A list of enabled flags for this initiator and port
	disabled_flags	Array[String]	YES	A list of disabled flags for this initiator and port
	consistent_lun	Boolean	YES	Specifies if the Host consistent LUN flag is enabled or not.
	last_modified_time_ms	Number	YES	Time since the last update
	bw_limit	Number	YES	The Bandwidth Limit defined for this host
	num_of_initiators	Number	YES	The number of initiators associated with the host

initiators	Initiator_Host_Initiator	YES	The initiators associated with the host
num_of_hosts	Number	YES	The number of hosts associated with the host
hosts	Array[Initiator_Host_Host]	YES	The hosts associated with the host if this host is a host group
num_of_powerpath_hosts	Number	YES	The number of Powerpath Hosts associated with the host
powerpath_hosts	Initiator_Host_Powerpath_Host	YES	The initiators associated with the host
num_of_masking_views	Number	YES	The number of initiators associated with the host
masking_views	Initiator_Host_MaskingView	YES	The initiators associated with the host

Object	Initiator_Host_Initiator		
Attribute Name	Type	Optional	Description
id	String	Yes	The base 64 encoded identifier of the initiator
resource_type	String	YES	The type of resource
name	String	YES	The name of the initiator i.e. 1258965785245879

Object	Initiator_Host_Host		
Attribute Name	Type	Optional	Description
id	String	Yes	The Host identifier
resource_type	String	YES	The type of resource

	Object	Initiator_Host_Powerpath_Host		
	Attribute Name	Type	Optional	Description
	id	String	Yes	The PowerPath Host identifier
	resource_type	String	YES	The type of resource
	Object	Initiator_Powerpath_Host		
	Attribute Name	Type	Optional	Description
	id	String	Yes	The PowerPath Hosty identifier
	resource_type	String	YES	The type of resource
	Object	Initiator_Host_MaskingView		
	Attribute Name	Type	Optional	Description
	id	String	Yes	The Masking View identifier
	resource_type	String	YES	The type of resource
	Object	Initiator_MaskingView		
	Attribute Name	Type	Optional	Description
	id	String	Yes	The Masking View identifier
	resource_type	String	YES	The type of

				resource
	port_group	Initiator_MaskingView_PortGroup	Yes	The associated Port Group
	host	Initiator_MaskingView_Host	Yes	The associated Host
	storage_group	Initiator_MaskingView_StorageGroup	Yes	The associated Storage Group
	uuid	String	Yes	The uuid of the masking view
	last_update_time	Number	Yes	The Date the Masking View was Last updated
	masking_view_last_update_time	Number	Yes	The Date any component of this masking view was updated
	num_of_initiators	Number	Yes	The total number of initiators associated with this Masking View

	Object		Initiator_MaskingView_PortGroup	
	Attribute Name	Type	Optional	Description
	id	String	NO	The Port Group identifier
	resource_type	String	YES	The type of resource
	Object		Initiator_MaskingView_Host	
	Attribute Name	Type	Optional	Description
	id	String	NO	The Host identifier
	resource_type	String	YES	The type of resource
	Object		Initiator_MaskingView_StorageGroup	
	Attribute Name	Type	Optional	Description
	id	String	NO	The Storage Group identifier
	resource_type	String	YES	The type of resource

2.6.11.2 Sample JSON Response

```
{
  "results": [
    {
      "id": "MTExMTExMTExMTExMTExMQ",
      "name": "1111111111111111",
      "resource_type": "initiators",
      "system": {
        "resource_type": "systems",
        "id": "00000000000000"
      }
    },
  ],
}
```

```

"type": "Fibre",
"alias": "1111111111111111/1111111111111111",
"num_of_initiator_paths": 1,
"initiator_paths": [
{
  "id": "T1ltMkN8NXwxMTExMTExMTExMTExMTEx",
  "resource_type": "initiator-paths",
  "port": {
    "id": "T1ltMkN8NQ",
    "resource_type": "ports",
    "port_number": "5",
    "port_identifier": "5000097410024445",
    "type": "OSHostAndRDF",
    "protocol": "Host_SCSI_FC",
    "director": {
      "id": "OR-2C",
      "resource_type": "directors"
    }
  }
},
"fcid": "N/A",
"fcid_value": "N/A",
"fcid_lockdown": false,
"fabric_name": "N/A",
"ip_address": "N/A",
"logged_in": false,
"on_fabric": false,
"port_flags_override": false,
"enabled_flags": [],
"disabled_flags": [],
"flags_in_effect": [
  "SCSI_3(SC3)",
  "Common_Serial_Number(C)",
  "SPC2_Protocol_Version(SPC2)",
  "SCSI_Support1(OS2007)"
]
},
],
"num_of_hosts": 1,
"hosts": [
{
  "id": "host1",
  "resource_type": "hosts",

```

```

"host_group": false,
"type": "Fibre",
"port_flags_override": false,
"enabled_flags": [],
"disabled_flags": [],
"consistent_lun": false,
"last_modified_time_ms": 1699435454,
"bw_limit": 0,
"num_of_initiators": 1,
"initiators": [
  {
    "id": "MTExMTExMTExMTExMTExMQ",
    "resource_type": "initiators",
    "name": "111111111111111111"
  }
],
"num_of_hosts": 0,
"hosts": [],
"num_of_masking_views": 1,
"masking_views": [
  {
    "id": "mv1",
    "resource_type": "masking-views"
  }
]
},
"num_of_masking_views": 1,
"masking_views": [
  {
    "id": "MV1",
    "resource_type": "masking-views",
    "host": {
      "id": "host1",
      "resource_type": "hosts"
    },
    "storage_group": {
      "id": "sg1",
      "resource_type": "storage-groups"
    },
    "port_group": {
      "id": "pg1",

```

```

        "resource_type": "port-groups"
    },
    "uuid": "00000000000000000000000000000000",
    "last_update_time_ms": 24554760000,
    "masking_view_last_update_time_ms": 24554760000,
    "num_of_initiators": 1
}
],
"protocol": "Host_SCSI_FC",
"host_id": "N/A"
}
]
}

```

3 Appendix

3.1 Basic Authentication

Unisphere for VMAX REST API authorization is implemented using HTTP Basic Access Authentication. Basic Access Authentication allows the user to send an unencrypted Base64-encoded string that contains a username and password to the Unisphere for VMAX server.

Anonymous requests for a protected resource are rejected with a 401 (Access Denied) status code.

Known requests are validated against the existing Unisphere for VMAX users:

- Administrator
- Storage administrator
- Security administrator
- Monitor
- Auditor
- Performance monitor

3.2 Request Types

3.2.1 GET (OBJECT)

3.2.1.1 Sample

Resource	storagegroup
Request Type:	GET
New Endpoint Description:	Get a storage group object

Modify Endpoint Description:	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	... /103/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storagegroupId}			
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
Prerequisite:	Not applicable			
Path Parameters:	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	Unique identifier of the symmetrix
	storageGroupId	String	No	The Storage Group Name
Query Parameters:	Not applicable			
Header Parameters:	Not Applicable			
Request Parameters:	Not applicable			
Response Parameters:	Object storageGroup			
	Attribute Name	Type	Optional	Description
	storageGroupId	String	No	Unique identifier of the storage group instance
	slo	String	Yes	SLO that is associated with the storage group
	srp	String	Yes	SRP that is associated with the storage group
	hostIOLimit	HostIOLimitType	Yes	SRP that is associated with the storage group
	Object HostIOLimitType			
	Attribute Name	Type	Optional	Description

	host_io_limit_mb_sec	String	No	The Host MB/s limit for the storage group
	host_io_limit_io_sec	String	Yes	The Host IO/s limit for the storage group
	dynamicDistribution	String	Yes	The dynamic distribution type, which can have "never", "always", or "on_failure" values

3.2.1.2 Response Codes

Response status code	Description
200	OK. The request is successful
401	Returned if an incorrect username, password, or both are specified
403	Returned if the specified username and password are correct, but the user is not authorized to make this request
404	Returned if the storage group [storageGroupId] on the Symmetrix [SymmetrixId] system cannot be found.
500	Returned if a problem occurred when the system was retrieving the <STORAGE_GROUP> resource: <STORAGE_GROUP_Name>
503	Returned if the server was unable to fulfill the request

3.2.2 GET (LIST)

3.2.2.1 Sample

Resource	storagegroup
Request Type:	GET
New Endpoint Description:	Get a list of storage group names
Modify Endpoint Description:	
	Added in this Release
	Not applicable
	Modified in this Release
	Not applicable
	Removed in this Release
	Not applicable
URL:	... /103/sloprovisioning/symmetrix/{symmetrixId}/storagegroup
User Roles:	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor

Prerequisite:	Not applicable		
Path Parameters:	Attribute Name	Type	Description
	symmetrixId	String	Unique identifier of the symmetrix
Query Parameters:	Attribute Name	Type	Description
	storageGroupId	String	An optional value that filters the returned list so it displays storage group names that contain the specified volume names only, for example, equal to "storageGroupId=gold_SG" or contain "storageGroupId=< like>gold"
	sym_vol_name	String	An optional value that filters the returned list so it displays storage group names that contain the specified volumes names only, for example, equal to "sym_vol_name=00123" or contain "sym_vol_name=< like>12"
	And so on		
Header Parameters:	Not Applicable		
Request Parameters:	Not applicable		
Response Parameters:	Object	ListStorageGroupResult	
	Attribute Name	Type	Optional
	storageGroupId	String array	No
			Description
			A list of storage group names

3.2.2.2 Response Codes

Response status code	Description
200	OK. The request is successful
401	Returned if an incorrect username, password, or both are specified
403	Returned if the specified username and password are correct, but the user is not authorized to make this request
500	Returned if a problem occurred when the system was retrieving the <STORAGE_GROUP> resource: <STORAGE_GROUP_Name>
503	Returned if the server was unable to fulfill the request

3.2.3 POST

3.2.3.1 Sample

Resource	storagegroup
-----------------	--------------

Request Type:	POST			
New Endpoint Description:	Create a storage group			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	... /103/sloprovisioning/symmetrix/{symmetrixId}/storagegroup			
User Roles:	Administrator/Storage Administrator			
Prerequisite :	Not applicable			
Path Parameters:	Attribute Name	Type	Description	
	symmetrixId	String	Unique identifier of the symmetrix	
Query Parameters:	Not applicable			
Header Parameters:	Not Applicable			
Request Parameters:				
	Object	createStorageGroupParam		
	Attribute Name	Type	Optional	Description
	storageGroupId	String	No	Unique identifier of the new storage group instance

	create_empty_storage_group	boolean	Yes	An empty storage group is created if you set this parameter to true. This parameter overrides any other create setting.															
	sloBasedStorageGroupParam	SloBasedStorageGroupParamType	Yes	This parameter is required to create a SLO-based storage group. Multiple occurrences create multiple child storage groups.															
<table><tr><td>Object</td><td colspan="3">SloBasedStorageGroupParamType</td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr><tr><td>slold</td><td>String</td><td>No</td><td>The SLO that is to be associated with the storage group</td></tr><tr><td>volumeAttribute</td><td>VolumeAttributeType</td><td>No</td><td>Size of each volume that is to be added to the storage group</td></tr></table>				Object	SloBasedStorageGroupParamType			Attribute Name	Type	Optional	Description	slold	String	No	The SLO that is to be associated with the storage group	volumeAttribute	VolumeAttributeType	No	Size of each volume that is to be added to the storage group
Object	SloBasedStorageGroupParamType																		
Attribute Name	Type	Optional	Description																
slold	String	No	The SLO that is to be associated with the storage group																
volumeAttribute	VolumeAttributeType	No	Size of each volume that is to be added to the storage group																
<table><tr><td>Object</td><td colspan="3">VolumeAttributeType</td></tr><tr><td>Attribute Name</td><td>Type</td><td>Optional</td><td>Description</td></tr><tr><td>volume_size</td><td>String</td><td>No</td><td>The size of the volume</td></tr><tr><td>capacityUnit</td><td>String enum:</td><td>No</td><td>Unit of capacity</td></tr></table>				Object	VolumeAttributeType			Attribute Name	Type	Optional	Description	volume_size	String	No	The size of the volume	capacityUnit	String enum:	No	Unit of capacity
Object	VolumeAttributeType																		
Attribute Name	Type	Optional	Description																
volume_size	String	No	The size of the volume																
capacityUnit	String enum:	No	Unit of capacity																

		CYL MB GB TB		
Response Parameters:	SYNCHRONOUS:			
	Object	storageGroup		
	Attribute Name	Type	Optional	Description
	<Insert the noun or noun phrase that describes what is detailed> is detailed in the GET method.			
	ASYNCHRONOUS:			
	Object	job		
	Attribute Name	Type	Optional	Description
	<Insert the noun or noun phrase that describes what is detailed> is detailed in the Appendix.			

3.2.3.2 Response Codes

Response status code	Description
200	OK, returned when endpoint is used for operations that do NOT create a Resource using SYNCHRONOUS execution option.
201	Created, returned when Resource is created using SYNCHRONOUS execution option.
202	Accepted, returned when the request to create the resource is accepted using the ASYNCHRONOUS execution option.
207	Multi-Status, indicates that a request involving multiple operations or resources has returned various results.
400	Returned when an error occurs with the validation of the Request payload , for example:<STORAGE_GROUP> must be 1-64 alphanumeric, '_', or '-' characters
401	Returned if an incorrect username, password, or both are specified
403	Returned if the specified username and password are correct, but the user is not authorized to make this request
409	Returned if the requested <STORAGE_GROUP> resource already exists.
412	Returned if preconditions in the request cannot be met
500	Returned if a problem occurred when the system was creating the <STORAGE_GROUP> resource: <STORAGE_GROUP_Name>
503	Returned if the server was unable to fulfill the request

3.2.3.3 Response Header

Asynchronous

The URL of the job

- Example: restapi/103/system/job/{jobId}

Synchronous:

The URL of the resource that is being created:

- Example:restapi/103/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}

3.2.4 PUT

3.2.4.1 Sample

Resource	storagegroup			
Request Type:	PUT			
New Endpoint Description:	Modifies a storage group			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	... /103/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}			
User Roles:	Administrator/Storage Administrator			
Prerequisite :	Not applicable			
Path Parameters:	Attribute Name	Type	Description	
	symmetrixId	String	Unique identifier of the symmetrix	
	storageGroupId	String	The Storage Group Name	
Query Parameters:	Not applicable			
Header Parameters:	Not Applicable			
Request Parameters:				

	Object	editStorageGroupParam		
	Attribute Name	Type	Optional	Description
	editStorageGroupActionParam	EditStorageGroupParamType	No	Select one of the Edit Options to modify the specified storage group
	Object	EditStorageGroupParamType		
	Attribute Name	Type	Optional	Description
	renameStorageGroupParam	RenameStorageGroupParamType	Yes	Renames the specified storage group
	editStorageGroupSLOParam	EditStorageGroupSLOParamType	Yes	Edit the SG SLO Applicable to stand-alone and child storage groups only
	Object	RenameStorageGroupParamType		
	Attribute Name	Type	Optional	Description
	new_storage_Group_name	String	No	The New Storage Group Name.
	Object	EditStorageGroupSLOParamType		
	Attribute Name	Type	Optional	Description
	slold	String	No	The New SLO Selection

Response Parameters:	SYNCHRONOUS:			
	Object	storageGroup		
	Attribute Name	Type	Optional	Description
	<Insert the noun or noun phrase that describes what is detailed> is detailed in the GET method.			
	ASYNCHRONOUS:			
	Object	job		
	Attribute Name	Type	Optional	Description
	<Insert the noun or noun phrase that describes what is detailed> is detailed in the Common Objects section.			

3.2.4.2 Response Codes

Response status code	Description
200	Ok, returned when Resource is edited using SYNCHRONOUS execution option.
202	Accepted, returned when the request to edit the resource is accepted using the ASYNCHRONOUS execution option. <u>Note:</u> In some rare circumstances, such as unmapping all volumes from a cu image, the cu image no longer exists; hence, there is no object or content to be returned. In these circumstances, a 204: No content will be returned after the job completes
207	Multi-Status, indicates that a request involving multiple operations or resources has returned various results.
400	Returned when an error occurs with the validation of the Request payload , for example:<STORAGE_GROUP> must be 1-64 alphanumeric, '_', or '-' characters
401	Returned if an incorrect username, password, or both are specified
403	Returned if the specified username and password are correct, but the user is not authorized to make this request
409	Returned if the requested <STORAGE_GROUP> resource already exists.
500	Returned if a problem occurred when the system was editing the <STORAGE_GROUP> resource: <STORAGE_GROUP_Name>
503	Returned if the server was unable to fulfill the request

3.2.4.3 Response Header:

Asynchronous:

The URL of the job

- For example, restapi/103/system/job/{jobId}

Synchronous:

A URI Header cannot be passed back in a 200(ok) Response

3.2.5 DELETE

3.2.5.1 Sample

Resource	storagegroup			
Request Type:	DELETE			
New Endpoint Description:	Deletes a storage group			
Modify Endpoint Description:				
	Added in this Release			
	Not applicable			
	Modified in this Release			
	Not applicable			
	Removed in this Release			
	Not applicable			
URL:	... /103/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storagegroupId}			
User Roles:	Administrator/Storage Administrator			
Prerequisite:	Not applicable			
Path Parameters:	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	Unique identifier of the symmetrix
	storageGroupId	String	No	The Storage Group Name
Query Parameters:	Not applicable			
Header Parameters:	Not Applicable			
Request Parameters:	Not applicable			
Response Parameters:	No content			

3.2.5.2 Response Codes:

Response status code	Description
204	No Content, returned when Resource is deleted successfully
401	Returned if an incorrect username, password, or both are specified

403	Returned if the specified username and password are correct, but the user is not authorized to make this request
404	Returned if the requested <STORAGE_GROUP> resource cannot be found
500	Returned if a problem occurred when the system was deleting the <STORAGE_GROUP> resource: <STORAGE_GROUP_Name>
503	Returned if the server was unable to fulfill the request

3.3 Common Objects

3.3.1 Iterator

An Iterator is a paged list of objects that is cached for a set period of time. Until the expiry time has been reached, the list of objects can be queried by page from the following locations:

[.../restapi/common/iterator/{iteratorId}](#)

[.../restapi/common/iterator/{iteratorId}/page?from=1050&to=1100](#)

Object	iterator		
Attribute Name	Type	Optional	Description
id	String	No	Unique iterator identifier that is used to look up the result until the expiry time is reached
count	int	No	Total number of result objects
ExpirationTime	String	No	Unix timestamp that shows when the result will be removed from cache and no longer queryable
maxPageSize	int	No	Maximum number of results that is allowed per result list page
result	Object Array	No	Array of objects that is returned

3.3.1.1 Sample Object Array:

Object	Iterator that contains list of: daysToFullResultType		
Attribute Name	Type	Optional	Description
projectionDaysToFull	float	Yes	Number of days until the specified category will be full, - to a maximum of 180 days
ProjectionMaxProjectedData	float	Yes	Maximum number of days that will be projected
ProjectionCapacityTrend	float	Yes	Projected capacity
PercentUsedCapacity	double	Yes	Current percentage of used capacity

TotalPoolCapacityGB	double	Yes	Current total capacity
instanceId	String	No	The unique identifier of the returned category object

3.3.1.1.1 Sample JSON Response:

```
{
  "resultList": {
    "result": [
      {
        "ProjectionDaysToFull": 181,
        "ProjectionMaxProjectedData": 180,
        "ProjectionCapacityTrend": 0,
        "PercentUsedCapacity": 35.10973774908589,
        "TotalPoolCapacityGB": 45727.2,
        "instanceId": "000000000001"
      }
    ],
    "from": 1,
    "to": 1
  },
  "id": "31d90275-c8d3-42d2-ab98-0343a3b3b16e_0",
  "count": 1,
  "expirationTime": 1474474773510,
  "maxPageSize": 1000
}
```

3.3.2 Job

Object	job		
Attribute Name	Type	Optional	Description
jobId	String	No	Unique identifier of the job instance
name	String	Yes	Name of the job
status	JobStatus enum: CREATED SCHEDULED RUNNING	No	Current status of the job

	SUCCEEDED FAILED ABORTED UNKNOWN VALIDATING VALIDATED VALIDATE_FAILED INVALID RETRIEVING_PICTURE		
username	string	No	User who initiated the job
last_modified_date	String	Yes	Date the job was last modified
last_modified_date_milliseconds	String	Yes	Date the job was last modified in milliseconds
scheduled_date	String	No	Date the job was last scheduled
scheduled_date_milliseconds	String	Yes	Date the job was last scheduled in milliseconds
completed_date	String	Yes	Date the job was completed
completed_date_milliseconds	String	Yes	Date the job was last completed in milliseconds
task	<u>TaskType</u>	Yes	Current status of the job
resourceLink	String	Yes	URL of the object that is created, when applicable
result	String	Yes	Description of the job outcome, its failure or success

Object	TaskType		
Attribute Name	Type	Optional	Description
execution_order	int	Yes	Order of the task
description	String	Yes	Description of the task

3.3.2.1 Sample JSON Response:

```
{
  "jobId": "1476181321815",
  "name": "Create SAMPLE_REST_PG ",
  "status": " SUCCEEDED ",
  "username": "smc",
  "last_modified_date": "Oct-11-2016 11:22:01.817",
}
```

```

"last_modified_date_milliseconds": 1476181321817,
"scheduled_date": "",
"scheduled_date_milliseconds": 0,
"completed_date": " Oct-11-2016 11:22:01.817",
"completed_date_milliseconds": 1476181321817,
"task": [
{
  "execution_order": 1,
  "description": "Create Port Group : SAMPLE_REST_PG"
}
],
"resourceLink":
https://IP_ADDRESS:8443/univmax/restapi/103/sloprovisioning/symmetrix/{symmetrixId}/portgroup/SAMP
LE_REST_PG,
"result": "SUCCEEDED - Started job execution on Fri 27 Jan 2017 07:57:59 AM GMT
Finished job execution on Fri 27 Jan 2017 07:58:49 AM GMT
Successfully created volume(s): 01076",
}

```

3.3.2.2 Response Codes:

Response status code	Description
200	Ok, returned when Resource is retrieved successfully
401	Returned if an incorrect username, password, or both are specified
403	Returned if the specified username and password are correct, but the user is not authorized to make this request
404	Returned if the requested resource cannot be found
500	Returned if a problem occurred when the system was retrieving the resource: <RESOURCE_NAME>
503	Returned if the server was unable to fulfill the request

3.3.3 Configuration Management Type

Object	ConfigurationManagementParamType		
Attribute Name	Type	Optional	Description
executionOption	String enum: SYNCHRONOUS ASYNCHRONOUS	Yes	Indicates whether the requested configuration management request should run synchronously

			or asynchronously
--	--	--	----------------------

3.4 Automatic Cleanup of REST API jobs

All asynchronous and synchronous configuration change requests that are made through the REST API create a Job resource. Over time, the number of completed jobs accumulates and, without a mechanism to delete those jobs via the REST API, system performance might be impacted.

Because REST API jobs can be considered temporary resources that are relevant only while jobs run and to preempt any performance degradation, an automatic REST API cleanup task could perform a valuable function by deleting completed jobs.

The following list provides the functional requirements for implementing the automatic cleanup of REST API jobs:

- Only jobs that are created for REST API requests are eligible for automatic deletion.
- A cleanup task runs at a default of every 1 hour and deletes any eligible REST API jobs.
- A REST API job is eligible for deletion if it meets the following requirements:
 - Its status is one of SUCCEEDED, FAILED, or ABORTED.
 - At least the 1-hour default has passed since the job completed.
- The minimum time that must pass before a job is eligible for deletion is specified in hours, with a default value of 1. The valid range of values is from 1 to 32,767. The interval is configurable, and a new configuration requires an offline change to become active.
- Automatic cleanup of REST API jobs is enabled by default, but it is configurable. Cleanup can be disabled, and any new configuration requires an offline change to become active.
- If the Unisphere server is shutdown for any reason the REST API jobs on the system do not persist and will be deleted.

3.5 Enhanced Endpoints

PowerAPI style endpoints return all defined attributes in a single call instead of the traditional approach of querying for the id(s) of an object and then issuing another request to get the complete list of defined attributes.

It also allows for a common approach to filtering, sorting and selecting the desired attributes of the object, see below example and details of this Query approach.

Old style (using 2 requests):

```

../storagegroup?cap_gb=>100
{
    "storageGroupId": [
        "SG1",
        "SG2",
        .
    ]
}
../storage/SG1
{
    "storageGroupId": "SG1",
    "cap_gb": 100.01,
    .
}

```

```
}
```

New PowerAPI style:

```
../storage-groups?select=cap_gb&filter=cap_gb gt 100&order=id.asc
```

```
{
  "storage_groups":[
    {
      "id": "SG1",
      "cap_gb": 101
    },
    {
      "id": "SG2",
      "cap_gb": 150
    }
  ]
}
```

3.5.1 Base URL

3.5.1.1 <https://{ipaddress}:{port}/univmax/rest/>

3.5.2 Query Details:

3.5.2.1 Filtering:

filter (<i>row filtering</i>)	<attribute> <operator> <value>	?filter=age ge 13
---------------------------------	--------------------------------	-------------------

Operator	Meaning	Notes	Numeric	String	Enum
eq	equal		y	y	y
ne	not equal		y	y	y
gt	greater than		y	y	y
ge	greater than or equal		y	y	y
lt	less than		y	y	y
le	less than or equal		y	y	y
like	Simple substring match			y	
ilike	case insensitive substring match			y	

3.5.2.2 Ordering:

order (<i>sorting</i>)	<property>[.asc .dsc]	?order=last_name,age.dsc
--------------------------	-----------------------	--------------------------

3.5.2.3 Selecting:

select (<i>column filtering</i>)	<property>,<property>.<nested_property>	?select=id,name,volumes.id
------------------------------------	---	----------------------------

3.5.2.4 Sample

Below is a sample definition of how all query params will be handled, this will be used as the reference point for each query param.

Attribute Name	Optional	Type	Description
object_id	NO	String	this Attribute is <u>mandatory</u>, therefore there is no need to define it in the 'select' statement An optional value that can be used to 'filter' the response list ?filter=object_id eq string_value (see other options in the filter table defined above) An optional value that can be used to 'order' the response list: ?order=object_id.dsc
attribute_name	YES	String	An optional value that <u>must</u> be defined in the 'select' to be included in the response objects: ?select=attribute_name An optional value that can be used to 'filter' the response list: ?filter=attribute_name eq attribute_value (see other options in the filter table defined above) An optional value that can be used to 'order' the response list: ?order= attribute_name.dsc
nested_attribute_name	YES	Nested String	An optional value that <u>must</u> be defined in the 'select' to be included in the response objects: ?select=attribute_name.nested_attribute_name An optional value that can be used to 'filter' the response list: ?filter=attribute_name.nested_attribute_name eq attribute_value

			(see other options in the filter table defined above) // todo: should we only sort on top level attributes ? An optional value that can be used to 'order' the response list: ?order= attribute_name.dsc
--	--	--	--

3.5.2.4.1 Example query

3.5.2.4.1.1 URL

../storage-groups?**select**=snapshots.num_of_volumes,cap_gb&**filter**=cap_gb gt 100&**order**=id.asc

3.5.2.4.1.2 Response:

```
{
  "storage_groups":[
    {
      "id": "SG1",
      "cap_gb": 101,
      "snapshots": {
        "num_of_volumes": 12
      }
    },
    {
      "id": "SG2",
      "cap_gb": 150,
      "snapshots": {
        "num_of_volumes": 3
      }
    }
  ]
}
```

3.5.3 Pagination

3.5.3.1 Description:

Starting from 10.3 Unisphere for PowerMAX, the ability to “page” the response from enhanced endpoints was added.

This feature allows users to break down or limit the response result set into customizable page sizes.

A user can do this by simply adding one of the following query params to any of the existing enhanced endpoints (expect performance):

- **limit:** Number of instances per page

- <https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?limit=2>
- or
- **limit_kb**: Total size of the response in KBs per page
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?limit_kb=200

A response “resume_token” is then returned to the user which is the identifier of the next page in the list, a user can then iterate through each page using subsequent resume tokens until the end of the list is reached i.e.:

- https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?resume_token=5e7fe55e-80b6-40b1-8c51-d8e80322847a&limit=2

Users have a default of 10 seconds to query the next page once the response has been sent from the server, but this can be increased by adding the following query parameter:

- **expiration_delay_secs** (delays the date a resume token will expire in seconds)
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?limit=2&expiration_delay_secs=30

3.5.3.2 Request Query Params

Attribute Name	Optional	Type	Description
limit	NO	Number	The number of instances that the page should be limited to.
limit_kb	NO	Number	The total size of the response in KBs that the page should be limited to.
resume_token	NO	String	The unique identifier for the page
expiration_delay_secs	NO	Number	The default expiry time of the response resume token is 10secs, if this is not enough time, the user can delay the expiry time up to the max defined below.

3.5.3.2.1 Sample

- https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?resume_token=5e7fe55e-80b6-40b1-8c51-d8e80322847a&limit=2

3.5.3.3 Response

Paging			
Attribute Name	Optional	Type	Description

total_instances	NO	Number	The Total Number of instances in the Response.
remaining_instances	NO	Number	The Total Number of instances remaining in the result list
resume_token	NO	String	The unique identifier for the next page, where applicable
resume_token_expiration_date_ms	NO	Number	The Date, in milliseconds from EPOCH, when the resume token will expire, hence no longer available to be queried.
next	NO	String	The URL of the next page, which will include the resume token and any other inputs.

3.5.3.3.1 Sample

```
{
  "storage_groups": [
    {
      "id": "Bulk_Test_StorageGroup"
    },
    {
      "id": "Bulk_Test_StorageGroup2"
    }
  ],
  "paging": {
    "total_instances": 466,
    "remaining_instances": 464,
    "resume_token_expiration_date_ms": 1720689041688,
    "resume_token": "5e7fe55e-80b6-40b1-8c51-d8e80322847a",
    "next": "/rest/v1/systems/xxxxxxxxxxxx/storage-groups?resume_token=5e7fe55e-80b6-40b1-8c51-d8e80322847a&limit=2&expiration_delay_secs=10"
  }
}
```

3.5.3.3.2 Sample Expired Token Error:

```
{
  "message": "A problem occurred retrieving the Storage Groups resource: No entry found for specified resume token, token could be expired",
  "http_status_code": 400,
  "messages": [
```

```
{
  "code": "0x0309",
  "timestamp_ms": 1720615449598,
  "severity": "ERROR",
  "message": "A problem occurred retrieving the Storage Groups resource: No entry found for specified resume token, token could be expired"
}
```

3.5.3.4 Limits:

- limit
 - Min: **0**
 - Max: **none**,
- limit_kb
 - Min: **50kb**
 - Max: **none**,
- expiration_delay_secs
 - Min: **10**
 - Max: **120 (2 mins)**

3.5.3.4.1 Edge Case:

There may be a scenario where the first instance of the result set is bigger than the limit_kb defined; in this edge case where we cannot return any item or instance in the list, we will return the following error.

```
{
  "message": "A problem occurred retrieving the Storage Groups resource: Invalid 'limit_kb' input, first instance size[60] is greater than min limit_kb[50]",
  "http_status_code": 400,
  "messages": [
    {
      "code": "0x0310",
      "timestamp_ms": 1720432301836,
      "severity": "ERROR",
      "message": "A problem occurred retrieving the Storage Groups resource: Invalid 'limit_kb' input, first instance size[60] is greater than min limit_kb[50]"
    }
  ]
}
```

3.5.3.5 Sample Behavioural Use Case:

- Limit response to generate a resume token (paging mode enabled)
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?limit=2&expiration_delay_secs=30
 - Gives you resume token to next page e.g. 111111111
- Then use token 111111111 to get “next” page
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?resume_token=111111111&limit=2&expiration_delay_secs=30
 - should give you token to next page e.g. 22222222
- Run the same endpoint again without changing any query params
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?resume_token=111111111&limit=2&expiration_delay_secs=30

- Considering no inputs (limit, limit_kb and expiration_delay_secs) have changed it should give you back the same token as above: 22222222, but the expiry date gets pushed on to whatever you specify.
- Run the same endpoint again with changes to any query params
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?resume_token=111111111&limit=4&expiration_delay_secs=30
 - Considering inputs (limit, limit_kb and expiration_dealy_secs) have changed it should give you back a new token, 33333333, and expiry date gets pushed on to whatever you specify
- Get next page using new token 33333333
 - https://localhost:8443/univmax/rest/v1/systems/xxxxxxxxxxx/storage-groups?resume_token=33333333&limit=4&expiration_delay_secs=30
 - tokens 11111111 and 22222222 are deleted.
 - new token 44444444 is created for the remainder of 33333333

3.5.4 Enhanced Error Messages

3.5.4.1 Description:

Starting from 10.3 Unisphere for PowerMAX, the error messages returned from the Enhanced endpoints will include more details, specifically error codes that will be permanently associated with a particular error i.e.:

- **0x0309:**
A problem occurred retrieving the Storage Groups resource: No entry found for specified resume token, token could be expired
- **0x0310:**
A problem occurred retrieving the Storage Groups resource: Invalid 'limit_kb' input, first instance size [60] is greater than min limit_kb[50]

The complete list of available error codes can be seen on:

- https://developer.dell.com/apis/4458/versions/10.3.0/docs/Getting%20Started/6.enhanced_endpoints.md

3.5.4.2 Response

Attribute Name	Optional	Type	Description
message	NO	String	The description of the error message. (This is duplicated here for backward compatibility)
http_status_code	NO	Number	The HTTP status code associated with the error messages
messages	NO	Array[ErrorMessage]	An Array of error messages

			associated with the error.
--	--	--	----------------------------

ErrorMessage			
Attribute Name	Optional	Type	Description
code	NO	String	The unique code associated with this error
timestamp_ms	NO	Number	The date in milliseconds from EPOCH of when the error occurred
severity	NO	String	The severity of the error: ERROR, WARN,INFO
message	NO	String	The description of the error message.

3.5.4.2.1 Sample

```
{
  "message": "A problem occurred retrieving the Storage Groups resource: No entry found for specified resource token, token could be expired",
  "http_status_code": 400,
  "messages": [
    {
      "code": "0x0309",
      "timestamp_ms": 1720615449598,
      "severity": "ERROR",
      "message": "A problem occurred retrieving the Storage Groups resource: No entry found for specified resource token, token could be expired"
    }
  ]
}
```