

**Dell EMC™ Unisphere for PowerMax™ 9.0**  
**REST API Change Log**

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[www.DellEMC.com](http://www.DellEMC.com)

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# 1 Design

## 2 Design Overview

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This document describes the changes in the current release of the public Unisphere for 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](#).

### 2.1 Overall

- N/A

### 2.2 Performance

- Add new 9.0 Metrics to existing Categories
  1. IP Interface
  2. iSCSI Target
  3. Storage Group
  4. Array

### 2.3 SLO Provisioning

- Additional URLs, parameters or both
- Removal of Director & Director-Port implementations

### 2.4 Provisioning

- N/A

### 2.5 Replication

- Addition of filtering for GET list lookup of SRDF Groups
- Addition of PUT action to allow Move Pairs functionality for SRDF Groups
- Adding WWNs for SRDF ports
- Changed StorageGroupRdfg attribute names
  - srcR1InvalidTracksHop1 to localR1InvalidTracksHop1
  - srcR2InvalidTracksHop1 to localR2InvalidTracksHop1
  - tgtR1InvalidTracksHop1 to remoteR1InvalidTracksHop1
  - tgtR2InvalidTracksHop1 to remoteR2InvalidTracksHop1

### 2.6 Migration

- N/A

### 2.7 VVOL

- N/A

### 2.8 WLP

- N/A

## 2.9 System

- Addition of iSCSI IP Route implementation for GET(Object), GET(List), POST and DELETE
- Addition of Director implementation for GET(Object), GET(List)
- Addition of iSCSI Target (Port) implementation for GET(Object), GET(List), POST, PUT and DELETE
- Addition of IP Interface implementation for GET(Object), GET(List), POST, PUT and DELETE

## 2.10 DSA

- N/A

## 2.11 Management

- N/A

## 2.12 Common

- N/A

## 3 Design Details

---

### 3.1 Overall

- N/A

### 3.2 Performance

#### 3.2.1 IPInterface 9.0 Additional metrics

<b>User Story</b>				
<b>Resource</b>	IPInterface			
<b>Request Type:</b>	POST			
<b>Description:</b>	This POST queries a list of performance data for a specific IP Interface and metrics for a given time range			
<b>URL:</b>	.../restapi/performance/IPInteface/metrics			
<b>User Roles:</b>	Admin/Storage Admin/Security Admin/Monitor/Auditor/Performance Monitor			
<b>Perquisites:</b>	symmetrixId must be a local symm that is registered for stats collection and there must be an ISCSI Director with IO activity			
<b>Path Parameters:</b>	N/A			
<b>Query Parameters:</b>	N/A			
<b>Request Parameters:</b>	Object	projectionParam		
	Name	Type	Optional	Description

	symmetrixId	String	No	The Id of the Symmetrix to be queried
	startDate	long	No	Starting Date in milliseconds since epoch
	endDate	long	No	End Date in milliseconds since epoch
	ipInterfaceId	String	No	ipInterfaceId from IPInterface/keys call
	metrics	List <ISCSIClientMetric>		
<b>Response Parameters:</b>				
	Object		HostKeyResultType	
	Name	Type	Optional	Description

### 3.2.1.1 Sample JSON Request:

```
{
  "symmetrixId": "000297000453",
  "ipInterfaceId": "SE-1E:24:9:192.168.0.42",
  "endDate": 1509462300000,
  "dataFormat": "Average",
  "metrics": ["Reads",
    "Writes",
    "IoRate",
    "TotalReadTime",
    "TotalWriteTime",
    "ResponseTime"],
}
```



```
"startDate": 1509452400000
}
```

### 3.2.1.2 Sample JSON Response:

```
{
  "resultList": {
    "result": [
      {
        "Reads": 0,
        "Writes": 0,
        "IoRate": 0,
        "TotalReadTime": 0,
        "TotalWriteTime": 0,
        "ResponseTime": 0,
        "timestamp": 1509452400000
      }
    ]
  }
}
```

### 3.2.2 ISCSITarget 9.0 Additional metrics

<b>User Story</b>	
<b>Resource</b>	ISCSITarget
<b>Request Type:</b>	POST
<b>Description:</b>	This POST call queries a list of performance data for a specific ISCSI Target and metrics for a given time range
<b>URL:</b>	.../restapi/performance/ISCSITarget/metrics
<b>User Roles:</b>	Admin/Storage Admin/Security Admin/Monitor/Auditor/Performance Monitor

<b>Perquisites:</b>	symmetrixId must be a local symm that is registered for stats collection and there must be active hosts for the passed in time range			
<b>Path Parameters:</b>	N/A			
<b>Query Parameters:</b>	N/A			
<b>Request Parameters:</b>	<b>Object</b>	ISCSITargetParam		
	<b>Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	The Id of the Symmetrix to be queried
	startDate	long	No	Starting Date in milliseconds since epoch
	endDate	long	No	End Date in milliseconds since epoch
	dataFormat	String	No	Average or Maximum
	iSCSITargetId	String	No	iSCSITargetId
	metrics	List <ISCSITargetMetric>	No	List of Metrics as defined in RESTAPI documentation
<b>Response Parameters:</b>	<b>Object</b>	ISCSITargetResult		
	<b>Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	MBs	float	Yes	
	PacketCount	float	Yes	
	Reads	float	Yes	
	Writes	float	Yes	
	IoRate	float	Yes	
	TotalReadTime	float	Yes	
	TotalWriteTime	float	Yes	
	ResponseTime	float	Yes	

	timestamp	DateType	Yes	
--	-----------	----------	-----	--

### 3.2.2.1 Sample JSON Request:

```
{
  "symmetrixId": "000197800128",
  "endDate": 1484151300000,
  "dataFormat": "Average",
  "metrics": [
    "Reads",
    "Writes",
    "IoRate",
    "TotalReadTime",
    "TotalWriteTime",
    "ResponseTime"
  ],
  "iSCSITargetId": "iqn.1992-04.com.emc:600009700bca30c01f86011800000000",
  "startDate": 1484149500000
}
```

### 3.2.2.2 Sample JSON Response:

```
{
  "resultList": {
    "result": [
      {
        "Reads": 0,
        "Writes": 0,
        "IoRate": 0,
        "TotalReadTime": 0,
        "TotalWriteTime": 0,

```

```

    "ResponseTime": 0,
    "timestamp": 1484149500000
  }
]
}
}

```

### 3.2.3 Storage Group 9.0 Additional metrics

<b>User Story</b>				
<b>Resource</b>	StorageGroup			
<b>Request Type:</b>	POST			
<b>Description:</b>	This POST call queries a list of performance data for a specific storage group and specific metrics for a given time range			
<b>URL:</b>	.../restapi/performance/StorageGroup/metrics			
<b>User Roles:</b>	Admin/Storage Admin/Security Admin/Monitor/Auditor/Performance Monitor			
<b>Perquisites:</b>	symmetrixId must be a local symm that is registered for stats collection and the symm must be set up for Storage Group			
<b>Path Parameters:</b>	N/A			
<b>Query Parameters:</b>	N/A			
<b>Request Parameters:</b>	<b>Object</b>	StorageGroupParam		
	<b>Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	The Id of the Symmetrix to be queried
	startDate	long	No	Starting Date in milliseconds since epoch
	endDate	long	No	End Date in milliseconds since epoch
	storageGroupId	String	No	storageGroupId

	dataFormat	String Enum: Average or maximum	No	Average or maximum values
	Metrics	List<StorageGroupMetric>	No	See RESTAPI Documents for list of Possible Values
<b>Response Parameters:</b>				
	Object	Iterator<StorageGroupResult>		
	Name	Type	Optional	Description
				See RESTAPI Documents for list of Possible Values

### 3.2.3.1 Sample JSON Request:

```
{
  "symmetrixId": "000197800128",
  "endDate": 1484151300000,
  "dataFormat": "Average",
  "storageGroupId": "irco2sd1",
  "metrics": [
    "PPAvgResponseTime",
    "PPObservedDeltaRT",
    "PPRelativeRT"
  ],
  "startDate": 1484149500000
}
```

### 3.2.3.2 Sample JSON Response:

```
{
  "resultList": {
```

```

"result": [
  {
    "PPAvgResponseTime": 0,
    "PPObservedDeltaRT": 0,
    "PPRelativeRT": 0,
    "timestamp": 1484149500000
  }
]
}
}

```

**3.2.4 Array 9.0 Additional metrics**

<b>User Story</b>				
<b>Resource</b>	Array			
<b>Request Type:</b>	POST			
<b>Description:</b>	This POST call queries a list of performance data for a specific Array and metrics for a given time range			
<b>URL:</b>	.../restapi/performance/Array/metrics			
<b>User Roles:</b>	Admin/Storage Admin/Security Admin/Monitor/Auditor/Performance Monitor			
<b>Perquisites:</b>	symmetrixId must be a local symm that is registered for stats collection and there must be active hosts for the passed in time range			
<b>Path Parameters:</b>	N/A			
<b>Query Parameters:</b>	N/A			
<b>Request Parameters:</b>	<b>Object</b>	arrayParam		
	<b>Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	The Id of the Symmetrix to be queried
	startDate	long	No	Starting Date in milliseconds since epoch

	endDate	long	No	End Date in milliseconds since epoch
	dataFormat	String	No	Average or Maximum
	metrics	List < ArrayMetric>	No	List of Metrics as defined in RESTAPI documentation
<b>Response Parameters:</b>				
	Object	ArrayType		
	Name	Type	Optional	Description
	See RESTAPI Documents for list of Possible Values			

### 3.2.4.1 Sample JSON Request:

```
{
  "symmetrixId": "000197800128",
  "endDate": 1484151300000,
  "dataFormat": "Average",
  "metrics": [
    "HWConfigHS",
    "CapacityHS",
    "SubscribedCapacityTB",
    "UsableCapacityTB",
    "AllocatedCapacityTB",
    "PercentMetaBEUsed",
    "PercentMetaFEUsed",
    "SnapModifiedCapGB",
    "SnapModifiedCapTB",
  ]
}
```

```
"SnapCapGB",
"SnapCapTB",
"UsedUsableCapGB",
"UsedUsableCapTB",
"SubscribedAllocatedCapGB",
"SubscribedAllocatedCapTB"
],
"startDate": 1484149500000
}
```

#### 3.2.4.2 Sample JSON Response:

```
{
  "resultList": {
    "result": [
      {
        "HWConfigHS": 0,
        "CapacityHS": 100,
        "SubscribedCapacityTB": 36.74133,
        "UsableCapacityTB": 19.507324,
        "AllocatedCapacityTB": 1.8861599,
        "PercentMetaBEUsed": 0,
        "PercentMetaFEUsed": 0,
        "SnapModifiedCapGB": 0,
        "SnapModifiedCapTB": 0,
        "SnapCapGB": 0,
        "SnapCapTB": 0,
        "UsedUsableCapGB": 1931,
        "UsedUsableCapTB": 1.8857422,
```



```
"SubscribedAllocatedCapGB": 3568,  
"SubscribedAllocatedCapTB": 3.484375,  
"timestamp": 1484149500000
```

```
}
```

```
]
```

```
}
```

```
}
```

### 3.3 SLO Provisioning

#### 3.3.1 Symmetrix

##### 3.3.1.1 GET (Object)

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	symmetrix
<b>Request Type:</b>	GET
<b>Description:</b>	<p>Adding the following entities to the Symmetrix object</p> <ul style="list-style-type: none"><li>• system_capacity<ul style="list-style-type: none"><li>○ subscribed_allocated_tb</li><li>○ subscribed_total_tb</li><li>○ usable_used_tb</li><li>○ usable_total_tb</li><li>○ snapshot_modified_tb</li><li>○ snapshot_total_tb</li><li>○ subscribed_usable_capacity_percent</li></ul></li><li>• system_efficiency<ul style="list-style-type: none"><li>○ overall_efficiency_ratio_to_one</li><li>○ data_reduction_ratio_to_one</li><li>○ data_reduction_enabled_percent</li><li>○ virtual_provisioning_savings_ratio_to_one</li><li>○ snapshot_savings_ratio_to_one</li></ul></li></ul> <p>Removing the following attributes to the Symmetrix object:</p> <ul style="list-style-type: none"><li>• overall_efficiency_ratio_to_one</li><li>• VP_overall_efficiency_ratio_to_one</li><li>• VP_saved_percent</li><li>• VP_shared_ratio_to_one</li><li>• snapshot_overall_efficiency_ratio_to_one</li><li>• snapshot_saved_percent</li><li>• snapshot_shared_ratio_to_one</li><li>• compression_overall_ratio_to_one</li><li>• compression_VP_ratio_to_one</li></ul>

	<ul style="list-style-type: none"> <li>• compression_snapshot_ratio_to_one</li> <li>• compression_enabled</li> <li>• system_meta_data_used_percent</li> <li>• replication_cache_used_percent</li> <li>• total_subscribed_cap_gb</li> <li>• total_allocated_cap_gb</li> <li>• total_usable_cap_gb</li> <li>• effective_used_capacity_percent</li> </ul>			
<b>URL:</b>	<u>... /90/sloprovisioning/symmetrix/{symmetrixId}/</u>			
<b>User Roles:</b>	No change			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	No change			
<b>Query Parameters:</b>	No change			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>		<b>SymmetrixType</b>	
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	system_capacity	SystemCapacityType	Yes	Contains the System level capacity information
	system_efficiency	SystemEfficiencyType	Yes	Contains the System level Efficiency information
	overall_efficiency_ratio_to_one	double	Yes	
	VP_overall_efficiency_ratio_to_one	double	Yes	
	VP_saved_percent	double	Yes	

VP_shared_ratio_to_one	double	Yes	
snapshot_overall_efficiency_ratio_to_one	double	Yes	
snapshot_saved_percent	double	Yes	
snapshot_shared_ratio_to_one	double	Yes	
compression_overall_ratio_to_one	double	Yes	
compression_VP_ratio_to_one	double	Yes	
compression_enabled	double	Yes	
system_meta_data_used_percent	double	Yes	
replication_cache_used_percent	double	Yes	
total_subscribed_cap_gb	double	Yes	
total_allocated_cap_gb	double	Yes	
total_usable_cap_gb	double	Yes	
effective_used_capacity_percent	double	Yes	

Object	SystemCapacityType		
Attribute Name	Type	Optional	Description
subscribed_allocated_tb	double	Yes	Host allocated plus eNas allocated capacity in TBs
subscribed_total_tb	double	Yes	Host subscribed capacity plus eNas subscribed capacity in TBs
usable_used_tb	double	Yes	Total Capacity in TBs used by Host, eNas and System after Data reduction is applied
usable_total_tb	double	Yes	Total system usable capacity in TBs
snapshot_modified_tb	double	Yes	Host snapshot modified capacity plus

			eNas snapshot modified capacity in TBs
snapshot_total_tb	double	Yes	Host snapshot capacity plus eNas snapshot capacity in TBs
subscribed_usable_capacity_percent	double	Yes	percentage of Usable Capacity that is currently Subscribed. Can be over 100% due to Virtual Provisioning.
<b>Object</b>			
<b>SystemEfficiencyType</b>			
<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
overall_efficiency_ratio_to_one	double	Yes	Overall Efficiency Ratio is the ratio between the sum of subscribed and snapshot capacity for user devices and the user used capacity. Format: "1.0:1" will be returned as 1.0.
data_reduction_ratio_to_one	double	Yes	Data Reduction Ratio is the ratio between the sum of owned and RDP logical (128K track size) capacity for all compression enabled devices and the user used capacity for all compression enabled devices. Format: "1.0:1"

				will be returned as 1.0.
	data_reduction_enabled_percent	double	Yes	Data Reduction Enabled Percent represents the combined effect of compression and deduplication.
	virtual_provisioning_savings_ratio_to_one	double	Yes	Virtual Provisioning Savings Ratio is the ratio between the subscribed capacity for user devices and the difference between allocated and shared capacity for user devices. Format: "1.0:1" will be returned as 1.0.
	snapshot_savings_ratio_to_one	double	Yes	Snapshot Savings Ratio is the ratio between snapshot capacity and the difference between modified snapshot capacity and non shared snapshot capacity. Format: "1.0:1" will be returned as 1.0.

### 3.3.2 Storagegroup

#### 3.3.2.1 PUT

User Story	
------------	--

<b>(for Internal use only)</b>	
<b>Resource</b>	storagegroup
<b>Request Type:</b>	PUT
<b>Description:</b>	<p>Adds new functionality to an existing storage group</p> <ul style="list-style-type: none"> <li>• <b>Move Volume To Storage Group:</b> Moves specified volumes from the specified storage group to another storage group</li> <li>• <b>Split Child Storage Group:</b> Splits a child Storage Group from its parent storage group and creates a new masking view for the child storage group.</li> <li>• <b>Split Storage Group Volumes:</b> Splits volumes from a standalone storage group and adds them to a new storage group and new masking view.</li> <li>• <b>Merge Storage Group:</b> Merge a defined standalone storage group into the chosen parent or standalone storage group.</li> </ul>
<b>URL:</b>	<u>... /90/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}</u>
<b>User Roles:</b>	Administrator/Storage Administrator
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No change
<b>Query Parameters:</b>	Not applicable

<b>Request Parameters:</b>	<b>Object</b>	<b>MoveVolumeToStorageGroupParamType</b>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	volumeld	Array<VolumeldType>	No	A list of Volumes to be moved
	storageGroupld	StorageGroupldTypeVer2	No	Storage group to which the volumes will be moved to.
	force	boolean	Yes	Force move True or False
	<b>Object</b>	<b>SplitChildStorageGroupParamType</b>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	storageGroupld	StorageGroupldTypeVer2	No	The Child storage group Name to split from selected parent Storage Group.
	maskingViewld	MaskingViewldTypeVer2	Yes	The New Masking View Name
	<b>Object</b>	<b>SplitStorageGroupVolumesParamType</b>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	volumeld	Array<VolumeldType>	No	Volume(s) to be split
	storageGroupld	StorageGroupldTypeVer2	No	The New Storage group to which the volumes will be added.
	maskingViewld	MaskingViewldTypeVer2	Yes	The New Masking View Name
	<b>Object</b>	<b>MergeStorageGroupParamType</b>		
<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>	



	storageGroupld	StorageGroupldTypeVer2	No	The Standalone Storage Group that will be merged into the selected Standalone or Parent Storage Group
<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>			
	Object	storagegroup		
	Attribute Name	Type	Optional	Description
	No change			
	<b>ASYNCHRONOUS:</b>			
	Object	job		
Attribute Name	Type	Optional	Description	
No change				

**3.3.2.1.1 Sample Move Volumes JSON Request**

```
{
  "editStorageGroupActionParam": {
    "moveVolumeToStorageGroupParam":{
      "volumeId": ["00001","0002"],
      "storageGroupld": "SG_NAME",
    }
  }
}
```

```
}  
}
```

### 3.3.2.1.2 Sample Split Child Storage Group and Create MV JSON Request

```
{  
  "editStorageGroupActionParam": {  
    "splitChildStorageGroupParam": {  
      "storageGroupId": "SG_NAME"  
      "maskingViewId": "MV_NAME",  
    }  
  }  
}
```

### 3.3.2.1.3 Sample Split Storage Group Volumes into new Storage Group and Create MV JSON Request

```
{  
  "editStorageGroupActionParam": {  
    "splitStorageGroupVolumesParam": {  
      "volumeId": ["00001", "0002"],  
      "storageGroupId": "SG_NAME"  
      "maskingViewId": "MV_NAME",  
    }  
  }  
}
```

### 3.3.2.1.4 Sample Merge Standalone Sg into Sg JSON Request

```
{  
  "editStorageGroupActionParam": {  
    "mergeStorageGroupParam": {  
      "storageGroupId": "SG_NAME"  
    }  
  }  
}
```

### 3.3.2.2 GET (List)

<b>User Story</b> (for Internal use only)	<a href="#">US21393</a>											
<b>Resource</b>	storagegroup											
<b>Request Type:</b>	GET											
<b>Description:</b>	Adds the following filter options to storage Group list: <ul style="list-style-type: none"> <li>powerPathHostId</li> </ul>											
<b>URL:</b>	... /84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup											
<b>User Roles:</b>	No change											
<b>Prerequisite:</b>	Not applicable											
<b>Path Parameters:</b>	No change											
<b>Query Parameters:</b>	<table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>powerPathHostId</td> <td>String</td> <td>Optional value that filters returned list to display Storage Group Names that are associated with Power Path Host Names equal to or &lt;like&gt; specified powerPathHostId e.g. powerPathHostId=&lt; like&gt;pp_</td> </tr> <tr> <td colspan="3">Existing attributes</td> </tr> </tbody> </table>			Attribute Name	Type	Description	powerPathHostId	String	Optional value that filters returned list to display Storage Group Names that are associated with Power Path Host Names equal to or <like> specified powerPathHostId e.g. powerPathHostId=< like>pp_	Existing attributes		
	Attribute Name	Type	Description									
	powerPathHostId	String	Optional value that filters returned list to display Storage Group Names that are associated with Power Path Host Names equal to or <like> specified powerPathHostId e.g. powerPathHostId=< like>pp_									
Existing attributes												
<b>Request Parameters:</b>	Not applicable											
<b>Response Parameters:</b>	No change											

### 3.3.2.3 PUT (Expand volumes).

<b>User Story</b> (for Internal use only)	<a href="#">US24707</a>		
<b>Resource</b>	volumes		
<b>Request Type:</b>	PUT		
<b>Description:</b>	Adds new functionality to an existing volumes <ul style="list-style-type: none"> <li>Expands volumes size when in rdf (expanding the remote and the local volumes).</li> </ul>		
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/volume/{volumeId}		

<b>User Roles:</b>	Administrator/Manager			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	No change			
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	<b>Object</b>	ExpandVolumeParamType		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	rdfGroupNumber	long	Yes	The rdf group number
<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>			
	<b>Object</b>	volume		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	No change			
	<b>ASYNCHRONOUS:</b>			
	<b>Object</b>	job		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
No change				

### 3.3.2.3.1 Sample Expand Volumes JSON Request

```

{
  "editVolumeActionParam":
  {
    "expandVolumeParam" :
    {
      "volumeAttribute":
      {
        "capacityUnit": "GB",
        "volume_size": 7
      },
      "rdfGroupNumber" : 2
    }
  }
}

```

### 3.3.3 PowerPathHost

#### 3.3.3.1 GET (Object)

<b>User Story</b> (for Internal use only)	<a href="#">US21393</a>			
<b>Resource</b>	powerpathhost			
<b>Request Type:</b>	GET			
<b>Description:</b>	Returns a PowerPath Host Object			
<b>URL:</b>	<u>... /90/sloprovisioning/symmetrix/{symmetrixId}/powerpathhost/{powerPathHostId}</u>			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	powerPathHostId	String	No	The PowerPath Host Name
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>				

Object	powerpathHost		
Attribute Name	Type	Optional	Description
powerPathHostId	String	No	The PowerPath Host Name
version	String	Yes	The PowerPath Host Version
patch_level	String	Yes	The PowerPath Host Patch Level
os_version	String	Yes	The PowerPath Host Operating System Version
os_revision	String	Yes	The PowerPath Host Operating System Revision
os_patch_level	String	Yes	The PowerPath Host Operating System Patch Level
vendor	String	Yes	The PowerPath Host Hardware Vendor
license_info	String	Yes	The PowerPath Host License Info
registration_date	String	Yes	The PowerPath Host Registration Date on the VMAX
registration_date_milliseconds	long	Yes	The PowerPath Host Registration Date in milliseconds since EPOCH on the VMAX
connectivity_type	String	Yes	The PowerPath Host Connectivity Type (iSCSI or Fibre)
cluster_name	String	Yes	The PowerPath Host Cluster Name
cluster_node_name	String	Yes	The PowerPath Host Cluster Node Name

	num_of_wwns	long	Yes	Number of wwns associated with the PowerPath Host
	wwns	Array<String>	Yes	A list of associated wwns
	num_of_hosts	long	Yes	Number of hosts associated with the PowerPath Host
	hosts	Array<String>	Yes	A list of associated Host Ids
	num_of_vms	long	Yes	Number of vms associated with the PowerPath Host
	vms	Array<String>	Yes	A list of associated vms

### 3.3.3.1.1 Sample JSON response

```
{
  "powerPathHostId": "pp_host_Name",
  "version": "2.5.6",
  "patch_level": "1.56",
  "os_version": "2.6.2",
  "os_revision": "194.58",
  "os_patch_level": "1.2.3.4",
  "vendor": "Dell",
  "license_info": "pp_license_info",
  "registration_time": "Mar-05-2017 14:20:12.000",
  "registration_time_milliseconds": 151131651651651,
  "connectivity_type": "Fibre",
  "cluster_name": "pp_cluster_name",
  "cluster_node_name": "pp_cluster_node_name",
}
```

```

"num_of_wwns": 0,
"num_of_hosts": 0,
"num_of_vms": 0,
"hosts ":[ "Host1" ],
"wwns ":[ "1253689578899569","7896554464645656" ],
"vms ":[ "vm_1","vm_2" ]
}

```

**3.3.3.2 GET (List)**

<b>Resource</b>	<a href="#">US21393</a>		
<b>Resource</b>	powerpathhost		
<b>Request Type:</b>	GET		
<b>Description:</b>	Lists all PowerPath Hosts On the specified Symmetrix		
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/powerpathhost		
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor		
<b>Prerequisite:</b>	Not applicable		
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>
	symmetrixId	String	Unique identifier of the symmetrix
<b>Query Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>
	powerPathHostId	String	Optional value that filters returned list to display PowerPath Host Names that are equal to or <like> specified powerPathHostId e.g. powerPathHostId=< like>pp_
	version	String	Optional value that filters returned list to display PowerPath Host Names that have a version equal to or <like> specified version e.g. version=< like>123
	patch_level	String	Optional value that filters returned list to display PowerPath Host Names that have a patch_level equal to or <like> specified patch_level e.g. patch_level=< like>123



os_version	String	Optional value that filters returned list to display PowerPath Host Names that have a os_version equal to or <like> specified os_version e.g. os_version=< like>123
os_revision	String	Optional value that filters returned list to display PowerPath Host Names that have a os_revision equal to or <like> specified os_revision e.g. os_revision=< like>123
os_patch_level	String	Optional value that filters returned list to display PowerPath Host Names that have a os_patch_level equal to or <like> specified os_patch_level e.g. os_patch_level =<like>123
vendor	String	Optional value that filters returned list to display PowerPath Host Names that have a vendor equal to or <like> specified vendor e.g. vendor =< like>123
license_info	String	Optional value that filters returned list to display PowerPath Host Names that have a license_info equal to or <like> specified license_info e.g. license_info=< like>123
registration_date	String	Optional value that filters returned list to display PowerPath Host Names that contain greater than(">1"), Less than("<1") or equal to the specified date "MMM-dd-yyyy HH:mm:ss.SSS"
registration_date_milliseconds	String	Optional value that filters returned list to display PowerPath Host Names that contain greater than(">1"), Less than("<1") or equal to the specified date in milliseconds
connectivity_type	String	Optional value that filters returned list to display PowerPath Host Names that have a connectivity_type equal to or <like> specified connectivity_type e.g. connectivity_type=< like>123
cluster_name	String	Optional value that filters returned list to display PowerPath Host Names that have a cluster_name equal to or <like> specified cluster_name e.g. cluster_name=< like>123

	cluster_node_name	String	Optional value that filters returned list to display PowerPath Host Names that have a cluster_node_name equal to or <like> specified cluster_node_name e.g. cluster_node_name=< like>123	
	num_of_wwns	String	Optional value that filters returned list to display PowerPath Host Names that contain greater than(">1"), Less than("<1") or equal to the num_of_wwns	
	num_of_hosts	String	Optional value that filters returned list to display PowerPath Host Names that contain greater than(">1"), Less than("<1") or equal to the num_of_hosts	
	num_of_vms	String	Optional value that filters returned list to display PowerPath Host Names that contain greater than(">1"), Less than("<1") or equal to the num_of_vms	
	hostId	String	Optional value that filters returned list to display PowerPath Host names that are associated with the specified host e.g. equal to "hostId=abc" or contains "hostId=<like>a"	
	wwn	String	Optional value that filters returned list to display PowerPath Host names that are associated with the specified wwn e.g. equal to "wwn=abc" or contains "wwn=<like>a"	
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	Object	ListPowerPathHostResult		
	Attribute Name	Type	Optional	Description
	powerPathHostId	String array	No	A list of PowerPath Host names

### 3.3.4 Host

#### 3.3.4.1 GET (List)

<b>User Story (for Internal use only)</b>	<a href="#">US21393</a>
---	-------------------------

<b>Resource</b>	host		
<b>Request Type:</b>	GET		
<b>Description:</b>	Adds the following filter options to Host list: <ul style="list-style-type: none"> <li>• powerPathHostId</li> <li>• num_of_powerpath_hosts</li> </ul>		
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/host		
<b>User Roles:</b>	No change		
<b>Prerequisite:</b>	Not applicable		
<b>Path Parameters:</b>	No change		
<b>Query Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>
	powerPathHostId	String	Optional value that filters returned list to display Host Names that are associated with Power Path Host Names equal to or <like> specified powerPathHostId e.g. powerPathHostId=< like>pp_
	num_of_powerpath_hosts	String	Optional value that filters returned list to display Host names that contain greater than("num_of_powerpath_hosts =>1"), Less than("num_of_powerpath_hosts =<1") or equal to the specified num_of_powerpath_hosts
	Existing attributes		
<b>Request Parameters:</b>	Not applicable		
<b>Response Parameters:</b>	No change		

### 3.3.4.2 GET (Object)

<b>User Story (for Internal use only)</b>	<a href="#">US21393</a>
<b>Resource</b>	host
<b>Request Type:</b>	GET
<b>Description:</b>	Adding the following to the Host objects: <ul style="list-style-type: none"> <li>• powerpathhosts</li> <li>• num_of_powerpath_hosts</li> </ul>
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/host/{hostId}

<b>User Roles:</b>	Not applicable			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	Not applicable			
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	Object		Host	
	Attribute Name	Type	Optional	Description
	powerpathhosts	Array<String>	Yes	A list of associated Powerpath hosts
	num_of_powerpath_hosts	long	Yes	The number of associated Powerpath Hosts
	Existing attributes			

#### 3.3.4.2.1 Sample JSON response

```
{
  "powerpathhosts": [ "Host1" ],
  "num_of_powerpath_hosts": 1
}
```

### 3.3.5 Initiators

#### 3.3.5.1 GET (List)

<b>User Story (for Internal use only)</b>	<a href="#">US21393</a>
<b>Resource</b>	initiator
<b>Request Type:</b>	GET
<b>Description:</b>	<p>Adds the following filter options to Host list:</p> <ul style="list-style-type: none"> <li>powerPathHostId</li> <li>num_of_powerpath_hosts</li> </ul>
<b>URL:</b>	<a href="#">.../90/sloprovisioning/symmetrix/{symmetrixId}/initiator</a>
<b>User Roles:</b>	No change

<b>Prerequisite:</b>	Not applicable		
<b>Path Parameters:</b>	No change		
<b>Query Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>
	powerPathHostId	String	Optional value that filters returned list to display Initiator Names that are associated with Power Path Host Names equal to or <like> specified powerPathHostId e.g. powerPathHostId=< like>pp_
	num_of_powerpath_hosts	String	Optional value that filters returned list to display Initiator names that contain greater than("num_of_powerpath_hosts =>1"), Less than("num_of_powerpath_hosts =<1") or equal to the specified num_of_powerpath_hosts
	Existing attributes		
<b>Request Parameters:</b>	Not applicable		
<b>Response Parameters:</b>	No change		

### 3.3.5.2 GET (Object)

<b>User Story (for Internal use only)</b>	<a href="#">US21393</a>
<b>Resource</b>	initiator
<b>Request Type:</b>	GET
<b>Description:</b>	Adding the following to the Initiator object: <ul style="list-style-type: none"> <li>• powerpathhosts</li> <li>• num_of_powerpath_hosts</li> </ul>
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/initiator/{initiatorId}
<b>User Roles:</b>	Not applicable
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	Not applicable

<b>Query Parameters:</b>		Not applicable			
<b>Request Parameters:</b>		Not applicable			
<b>Response Parameters:</b>					
		Object	Initiator		
		Attribute Name	Type	Optional	Description
		powerpathhosts	Array<String>	Yes	A list of associated Powerpath hosts
		num_of_powerpath_hosts	long	Yes	The number of associated Powerpath Hosts
	Existing attributes				

### 3.3.5.2.1 Sample JSON response

```
{
  "powerpathhosts": [ "Host1" ],
  "num_of_powerpath_hosts": 1
}
```

## 3.3.6 Volume

### 3.3.6.1 GET

<b>User Story (for Internal use only)</b>	
<b>Resource</b>	volume
<b>Request Type:</b>	GET
<b>Description:</b>	<p>Change to existing functionality:</p> <ul style="list-style-type: none"> <li>• Reponse code for invalid volume Id has changed from 500 to 404, see sample output below.</li> <li>• Removed label from RdfGroupIdType</li> </ul>

<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/volume/{volumeId}			
<b>User Roles:</b>	No Change			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	No Change			
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>			
	RdfGroupIdType			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	rdf_group_number	long	Yes	The rdf group number
	label	string	Yes	The rdf group label

### 3.3.6.1.1 Sample for invalid or non existing volume in 8.4

<p><b>TYPE:</b> GET</p> <p><b>URL:</b> ...84/sloprovisioning/symmetrix/{symmetrixId}/volume/888888888</p> <p><b>Response Code:</b> 500</p> <p><b>Response Messages:</b></p> <pre>{   "message": "A problem occurred retrieving the volume resource: VolumeId must consist of 5 hexadecimal characters" }</pre>
--

### 3.3.6.1.2 NEW Sample for invalid or non existing volume in 9.0

<p><b>TYPE:</b> GET</p> <p><b>URL:</b> ...90/sloprovisioning/symmetrix/{symmetrixId}/volume/888888888</p> <p><b>Response Code:</b> 404</p>
--

**Response Messages:**

```
{
"message": "Volume [888888888] on Symmetrix [{symmetrixId}] cannot be found"
}
```

**3.3.6.2 DELETE**

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	volume
<b>Request Type:</b>	GET
<b>Description:</b>	<p>Change to existing functionality:</p> <ul style="list-style-type: none"> <li>• Reponse code for invalid or non existing volume has changed from 400 to 404, see sample output below.</li> </ul>
<b>URL:</b>	<u>... /90/sloprovisioning/symmetrix/{symmetrixId}/volume/{volumeId}</u>
<b>User Roles:</b>	No Change
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No Change
<b>Query Parameters:</b>	Not applicable
<b>Request Parameters:</b>	Not applicable
<b>Response Parameters:</b>	

**3.3.6.2.1 Sample for invalid or non existing volume in 8.4****TYPE:** DELETE**URL:** ...84/sloprovisioning/symmetrix/{symmetrixId}/volume/888888888**Response Code:** 400**Response Messages:**

```
{
"message": "Invalid VolumeId 8888888 specified for Symmetrix 000197800128"
```



```
}

```

**3.3.6.2.2 NEW Sample for invalid or non existing volume in 9.0**

```

TYPE: GET
URL: .../90/sloprovisioning/symmetrix/{symmetrixId}/volume/888888888
Response Code: 404
Response Messages:
{
"message": "Volume [888888888] on Symmetrix [{symmetrixId}] cannot be found"
}

```

**3.3.6.3 PUT**

<b>User Story (for Internal use only)</b>	<a href="#">US24707</a>
<b>Resource</b>	volume
<b>Request Type:</b>	PUT
<b>Description:</b>	<p>Adds new functionality to an existing volumes</p> <ul style="list-style-type: none"> <li>Expands volumes size when in rdf (expanding the remote and the local volumes).</li> </ul> <p>Change to existing functionality:</p> <ul style="list-style-type: none"> <li>Reponse code for invalid or non existing volume has changed from 500 to 404, see sample output below.</li> </ul>
<b>URL:</b>	<u>... /90/sloprovisioning/symmetrix/{symmetrixId}/volume/{volumeld}</u>
<b>User Roles:</b>	Administrator/Manager
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No change
<b>Query Parameters:</b>	Not applicable

<b>Request Parameters:</b>	Object	ExpandVolumeParamType		
	Attribute Name	Type	Optional	Description
	rdfGroupNumber	long	Yes	The rdf group number
<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>			
	Object	volume		
	Attribute Name	Type	Optional	Description
	No change			
	<b>ASYNCHRONOUS:</b>			
	Object	job		
	Attribute Name	Type	Optional	Description
	No change			

### 3.3.6.3.1 Sample Expand Volumes JSON Request

```

{
  "editVolumeActionParam":
  {
    "expandVolumeParam" :
    {
      "volumeAttribute":
      {

```

```

        "capacityUnit": "GB",
        "volume_size": 7
    },
    "rdfGroupNumber" : 2
}
}
}

```

### 3.3.6.3.2 Sample for invalid or non existing volume in 8.4

**URL:** ...84/sloprovisioning/symmetrix/{symmetrixId}/volume/888888888

**Response Code:** 500

**Response Messages:**

```

{
"message": "A problem occurred modifying the volume resource: Symmetrix DeviceName is invalid."
}

```

### 3.3.6.3.3 NEW Sample for invalid or non existing volume in 9.0

**URL:** ...90/sloprovisioning/symmetrix/{symmetrixId}/volume/888888888

**Response Code:** 404

**Response Messages:**

```

{
"message": "Volume [888888888] on Symmetrix [{symmetrixId}] cannot be found"
}

```

## 3.3.7 SRP

### 3.3.7.1 GET (Object)

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	srp
<b>Request Type:</b>	GET
<b>Description:</b>	Adding the following entities to the SRP object

- srp\_capacity
  - subscribed\_allocated\_tb
  - subscribed\_total\_tb
  - usable\_used\_tb
  - usable\_total\_tb
  - snapshot\_modified\_tb
  - snapshot\_total\_tb
  
- srp\_efficiency
  - overall\_efficiency\_ratio\_to\_one
  - data\_reduction\_ratio\_to\_one
  - data\_reduction\_enabled\_percent
  - virtual\_provisioning\_savings\_ratio\_to\_one
  - snapshot\_savings\_ratio\_to\_one

Removing the following attributes to the SRP object:

- srpSgDemandId
- srpSloDemandId
- overall\_efficiency
- total\_usable\_cap\_gb
- total\_subscribed\_cap\_gb
- total\_allocated\_cap\_gb
- total\_snapshot\_allocated\_cap\_gb
- num\_of\_srp\_slo\_demands
- num\_of\_srp\_sg\_demands
- fba\_total\_capacity
- fba\_free\_capacity
- fba\_used\_capacity
- fba\_snapshot\_allocated\_capacity
- fba\_srdf\_dse\_allocated\_capacity
- ckd\_total\_capacity
- ckd\_free\_capacity
- ckd\_used\_capacity
- ckd\_snapshot\_allocated\_capacity
- ckd\_srdf\_dse\_allocated\_capacity
- compression\_overall\_ratio\_to\_one
- compression\_vp\_ratio\_to\_one
- compression\_snapshot\_ratio\_to\_one

	<ul style="list-style-type: none"> <li>• overall_efficiency_ratio_to_one</li> <li>• vp_saved_percent</li> <li>• vp_overall_ratio_to_one</li> <li>• vp_shared_ratio_to_one</li> <li>• snapshot_saved_percent</li> <li>• snapshot_overall_ratio_to_one</li> <li>• snapshot_shared_ratio_to_one</li> </ul>			
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/srp/{srpId}			
<b>User Roles:</b>	No change			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	No change			
<b>Query Parameters:</b>	No change			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>	<b>SrpType</b>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	srp_capacity	SrpCapacityType	Yes	Contains the SRP level capacity information
	srp_efficiency	SrpEfficiencyType	Yes	Contains the SRP level Efficiency information
	srpSgDemandId	Array<String>	Yes	The list of Storage Groups in the Demand
srpSloDemandId	Array<String>	Yes	The list of Service Levels in the Demand	

total_usable_cap_gb	double	Yes	
total_subscribed_cap_gb	double	Yes	
total_allocated_cap_gb	double	Yes	
total_snapshot_allocated_cap_gb	double	Yes	
num_of_srp_slo_demands	double	Yes	
num_of_srp_sg_demands	double	Yes	
fba_total_capacity	double	Yes	
fba_free_capacity	double	Yes	
fba_used_capacity	double	Yes	
fba_snapshot_allocated_capacity	double	Yes	
fba_srdf_dse_allocated_capacity	double	Yes	
ckd_total_capacity	double	Yes	
ckd_free_capacity	double	Yes	
ckd_used_capacity	double	Yes	
ckd_snapshot_allocated_capacity	double	Yes	
ckd_srdf_dse_allocated_capacity	double	Yes	
ecompression_overall_ratio_to_one	double	Yes	
compression_vp_ratio_to_one	double	Yes	
compression_snapshot_ratio_to_one	double	Yes	
overall_efficiency_ratio_to_one	double	Yes	
vp_saved_percent	double	Yes	
vp_overall_ratio_to_one	double	Yes	
snapshot_saved_percent	double	Yes	
snapshot_overall_ratio_to_one	double	Yes	
snapshot_shared_ratio_to_one	double	Yes	

Object	SRPCapacityType			
Attribute Name	Type	Optional	Description	
subscribed_allocated_tb	double	Yes	SRP allocated	Host plus

			eNas allocated capacity in TBs
subscribed_total_tb	double	Yes	SRP Host subscribed capacity plus eNas subscribed capacity in TBs
usable_used_tb	double	Yes	SRP Total Capacity in TBs used by Host, eNas and System after Data reduction is applied
usable_total_tb	double	Yes	SRP Total system usable capacity in TBs
snapshot_modified_tb	double	Yes	SRP Host snapshot modified capacity plus eNas snapshot modified capacity in TBs
snapshot_total_tb	double	Yes	SRP Host snapshot capacity plus eNas snapshot capacity in TBs
<b>Object</b>			
<b>Attribute Name</b>		<b>SRPEfficiencyType</b>	
	<b>Type</b>	<b>Optional</b>	<b>Description</b>
overall_efficiency_ratio_to_one	double	Yes	SRP Overall Efficiency Ratio is the ratio between the sum of subscribed and snapshot capacity for user devices and the user used capacity. Format: "1.0:1" will be returned as 1.0.

	data_reduction_ratio_to_one	double	Yes	SRP Data Reduction Ratio is the ratio between the sum of owned and RDP logical (128K track size) capacity for all compression enabled devices and the user used capacity for all compression enabled devices. Format: "1.0:1" will be returned as 1.0.
	data_reduction_enabled_percent	double	Yes	SRP Data Reduction Enabled Percent represents the combined effect of compression and deduplication.
	virtual_provisioning_savings_ratio_to_one	double	Yes	SRP Virtual Provisioning Savings Ratio is the ratio between the subscribed capacity for user devices and the difference between allocated and shared capacity for user devices. Format: "1.0:1" will be returned as 1.0.
	snapshot_savings_ratio_to_one	double	Yes	SRP Snapshot Savings Ratio is the ratio between snapshot



				capacity and the difference between modified snapshot capacity and non shared snapshot capacity. Format: "1.0:1" will be returned as 1.0.
--	--	--	--	---

### 3.3.7.2 GET – Service level Demand Report

<b>User Story (for Internal use only)</b>				
<b>Resource</b>	service_level_demand_report			
<b>Request Type:</b>	GET			
<b>Description:</b>	Adding a new endpoint to expose the Service Level demand report			
<b>URL:</b>	<u>...</u> <u>/90/sloprovisioning/symmetrix/{symmetrixId}/srp/{srpld}/service_level_demand_report</u>			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	Unique identifier of the symmetrix
	srpld	String	No	The SRP Name
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	Object	ServiceLevelDemandReportResult		
	Attribute Name	Type	Optional	Description
	serviceLevelDemands	Array<ServiceLevelDemandType>	Yes	A list of service

			level demands
Object	ServiceLevelDemandType		
Attribute Name	Type	Optional	Description
serviceLevelId	ServiceLevelIdType	No	The Service Level Name
workloadId	WorkloadIdType	No	The workload Name, where applicable
fba_subscribed_gb	double	Yes	The FBA subscribed Capacity in GBs
fba_allocated_gb	double	Yes	The FBA allocated Capacity in GBs
fba_allocated_percent	int	Yes	The FBA allocated Capacity in %
ckd_subscribed_gb	double	Yes	The CKD subscribed Capacity in GBs
ckd_allocated_gb	double	Yes	The CKD allocated Capacity in GBs
ckd_allocated_percent	int	Yes	The CKD allocated Capacity in %
total_subscribed_gb	double	Yes	The Total subscribed Capacity in GBs
total_allocated_gb	double	Yes	The Total allocated Capacity in GBs
total_allocated_percent	int	Yes	The Total allocated Capacity in %

### 3.3.7.2.1 Sample JSON response

```
{
  "serviceLevelDemands": [
    {
      "serviceLevelId": "Diamond",
      "workloadTypeId": "OLTP",
      "fba_subscribed_gb": 100.00,
      "fba_allocated_gb": 50.00,
      "fba_allocated_percent": 50,
      "ckd_subscribed_gb": 100.00,
      "ckd_allocated_gb": 50.00,
      "ckd_allocated_percent": 50,
      "total_subscribed_gb": 100.00,
      "total_allocated_gb": 50.00,
      "total_allocated_percent": 50
    }
  ]
}
```

### 3.3.7.3 GET – Storage Group Demand Report

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	storage_group_demand_report
<b>Request Type:</b>	GET
<b>Description:</b>	Adding a new endpoint to expose the Storage Group demand report
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/srp/{srpId}/storage_group_demand_report
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor
<b>Prerequisite :</b>	Not applicable

<b>Path Parameters:</b>	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	Unique identifier of the symmetrix
	srpId	String	No	The SRP Name
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	Object	StorageGroupDemandReportResult		
	Attribute Name	Type	Optional	Description
	storageGroupDemands	Array<StorageGroupDemandType>	Yes	A list of storage group demands
	Object	StorageGroupDemandType		
	Attribute Name	Type	Optional	Description
	storageGroupId	StorageGroupIdTypeVer 2	No	The Storage Group Name
	emulation	String	Yes	The Storage Group Emulation
	subscribed_gb	double	Yes	The subscribed Capacity in GBs
	allocated_gb	double	Yes	The allocated Capacity in GBs
	allocated_percent	int	Yes	The allocated

				Capacity in %
	used_gb	double	Yes	The used Capacity in GBs
	compression_ratio_to_one	double	Yes	The Compression Ratio in relation to one e.g 8.0:1 where 8.0 will be returned
	snapshot_allocated_gb	double	Yes	The snapshot allocated Capacity in GBs
	snapshot_used_gb	double	Yes	The used Capacity in GBs
	snapshot_compression_ratio_to_one	double	Yes	The Compression Ratio in relation to one e.g 8.0:1 where 8.0 will be returned

### 3.3.7.3.1 Sample JSON response

```
{
  "storageGroupDemand": [
    {
      "storageGroupId": "SG_NAME",
      "emulation": "FBA",
      "subscribed_gb": 100.00,
      "allocated_gb": 50.00,
      "allocated_percent": 50,
      "compression_ratio_to_one": 8.0,
    }
  ]
}
```

```

    "used_gb": 50.00,
    "snapshot_allocated_gb": 50.00,
    "snapshot_used_gb": 50.00,
    "snapshot_compression_ratio_to_one": 8.0
  }
]
}

```

### 3.3.8 Director

#### 3.3.8.1 GET (List/Object)

<b>User Story</b> (for Internal use only)	<a href="#">US24687</a>
<b>Resource</b>	director
<b>Request Type:</b>	GET
<b>Description:</b>	Remove the director functionality from SLO Provisioning and move its GET(List/Object) implementations to System
<b>URL:</b>	... /90/sloprovisioning/symmetrix/{symmetrixId}/director ... /90/sloprovisioning/symmetrix/{symmetrixId}/director/{directorId}
<b>User Roles:</b>	No change
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No change
<b>Query Parameters:</b>	No change
<b>Request Parameters:</b>	Not applicable
<b>Response Parameters:</b>	Not applicable

### 3.3.9 Port

#### 3.3.9.1 GET (List/Object)

<b>User Story</b>	<a href="#">US24687</a>
-------------------	-------------------------

(for Internal use only)	
Resource	port
Request Type:	GET
Description:	Remove the director-port functionality from SLO Provisioning and move its GET(List/Object) implementations to System
URL:	... /90/sloprovisioning/symmetrix/{symmetrixId}/director/{directorId}/port ... /90/sloprovisioning/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}
User Roles:	No change
Prerequisite:	Not applicable
Path Parameters:	No change
Query Parameters:	No change
Request Parameters:	Not applicable
Response Parameters:	Not applicable

### 3.4 Provisioning

#### 3.4.1 Symmetrix

##### 3.4.1.1 GET (Object)

User Story (for Internal use only)	
Resource	symmetrix
Request Type:	GET
Description:	<p>Adding the following entities to the Symmetrix object</p> <ul style="list-style-type: none"> <li>• system_capacity <ul style="list-style-type: none"> <li>○ thin_subscribed_total_tb</li> <li>○ thin_subscribed_used_tb</li> <li>○ thin_usable_total_tb</li> <li>○ thin_usable_used_tb</li> <li>○ physical_total_tb</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ physical_used_tb</li> </ul> <p>Removing the following attributes to the Symmetrix object:</p> <ul style="list-style-type: none"> <li>• physicalCapacity <ul style="list-style-type: none"> <li>○ used_capacity_gb</li> <li>○ total_capacity_gb</li> </ul> </li> <li>• virtualCapacity <ul style="list-style-type: none"> <li>○ used_capacity_gb</li> <li>○ total_capacity_gb</li> </ul> </li> </ul>			
<b>URL:</b>	<u>... /90/provisioning/symmetrix/{symmetrixId}/</u>			
<b>User Roles:</b>	No change			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	No change			
<b>Query Parameters:</b>	No change			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>		<b>SymmetrixType</b>	
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	system_capacity	SystemCapacityType	Yes	Contains the System level capacity information
	physicalCapacity	PhysicalCapacityType	No	Contains the System level physical capacity information
	virtualCapacity	VirtualCapacityType	Yes	Contains the System level physical capacity information
	<b>Object</b>		<b>SystemCapacityType</b>	
<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>	



	physical_total_tb	double	Yes	Total Physical capacity in TBs
	physical_used_tb	double	Yes	Total Physical capacity used in TBs
	thin_subscribed_total_tb	double	Yes	Total Thin Subscribed capacity in TBs, (TDEVs)
	thin_subscribed_used_tb	double	Yes	Total Allocated Thin Subscribed capacity) in TBs, (TDEVs)
	thin_usable_total_tb	double	Yes	Total Usable capacity in TBs, (TDATs)
	thin_usable_used_tb	double	Yes	Total Used Usable capacity in TBs, (TDATs)

### 3.4.1.1.1 Sample JSON response

```
{
  "symmetrix": [
    {
      "symmetrixId": "000111111111",
      "system_capacity": {
        "thin_subscribed_used_tb": 0.17,
        "physical_used_tb": 14.22,
        "thin_usable_total_tb": 1.15,
        "physical_total_tb": 26.0,
        "thin_subscribed_total_tb": 9.93,
        "thin_usable_used_tb": 0.17
      }
    }
  ],
}
```

```

"model": "VMAX",
"ucode": "5876.001.001",
"device_count": 100,
"local": false
}
],
"success": true
}

```

### 3.4.2 Storagegroup

#### 3.4.2.1 PUT

<b>User Story</b> (for Internal use only)	<a href="#">US24707</a>
<b>Resource</b>	storagegroup
<b>Request Type:</b>	PUT
<b>Description:</b>	<p>Adds new functionality to an existing storage group</p> <ul style="list-style-type: none"> <li>• Split Child Storage Group: Splits a child Storage Group from its parent storage group and creates a new masking view for the child storage group.</li> <li>• Split Storage Group Volumes: Splits volumes from a standalone storage group and adds them to a new storage group and new masking view.</li> <li>• Merge Storage Group: Merge a defined standalone storage group into the chosen parent or standalone storage group.</li> </ul>
<b>URL:</b>	<u>... /90/provisioning/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}</u>
<b>User Roles:</b>	Administrator/Storage Administrator
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No change
<b>Query Parameters:</b>	Not applicable

<b>Request Parameters:</b>	<b>Object</b>			
	SplitChildStorageGroupParamType			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	storageGroupId	StorageGroupIdTypeVer2	No	The Child storage group Name to split from selected parent Storage Group.
	maskingViewId	MaskingViewIdTypeVer2	Yes	The New Masking View Name
	<b>Object</b>			
	SplitStorageGroupVolumesParamType			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	volumelId	Array<VolumelIdType>	No	Volume(s) to be split
	storageGroupId	StorageGroupIdTypeVer2	No	The New Storage group to which the volumes will be added.
maskingViewId	MaskingViewIdTypeVer2	Yes	The New Masking View Name	
<b>Object</b>				
MergeStorageGroupParamType				
<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>	
storageGroupId	StorageGroupIdTypeVer2	No	The Standalone Storage Group that will be merged into the selected Standalone or Parent Storage Group	
<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>			
	<b>Object</b>	storagegroup		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	No change			

	ASYNCHRONOUS:			
	Object	job		
	Attribute Name	Type	Optional	Description
	No change			

#### 3.4.2.1.1 Sample Move Volumes JSON Request

```
{
  "editStorageGroupActionParam": {
    "moveVolumeToStorageGroupParam": {
      "volumeId": ["00001", "0002"],
      "storageGroupId": "SG_NAME",
    }
  }
}
```

#### 3.4.2.1.2 Sample Split Child Storage Group and Create MV JSON Request

```
{
  "editStorageGroupActionParam": {
    "splitChildStorageGroupParam": {
      "storageGroupId": "SG_NAME",
      "maskingViewId": "MV_NAME",
    }
  }
}
```

#### 3.4.2.1.3 Sample Split Storage Group Volumes into new Storage Group and Create MV JSON Request

```
{
  "editStorageGroupActionParam": {
    "splitStorageGroupVolumesParam": {
      "volumeId": ["00001", "0002"],
      "storageGroupId": "SG_NAME",
      "maskingViewId": "MV_NAME",
    }
  }
}
```

```

    }
  }
}

```

**3.4.2.1.4 Sample Merge Standalone Sg into Sg JSON Request**

```

{
  "editStorageGroupActionParam": {
    "mergeStorageGroupParam": {
      "storageGroupId": "SG_NAME"
    }
  }
}

```

**3.4.3 Volume**

**3.4.3.1 GET**

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	volume
<b>Request Type:</b>	GET
<b>Description:</b>	<p>Change to existing functionality:</p> <ul style="list-style-type: none"> <li>• Reponse code for invalid or non existing volume has changed from 400 to 404, see sample output below.</li> <li>• Adding PoolId to GetVolumeResultObject</li> </ul>
<b>URL:</b>	<u>... /90/provisioning/symmetrix/{symmetrixId}/volume/{volumeId}</u>
<b>User Roles:</b>	No Change
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No Change
<b>Query Parameters:</b>	Not applicable
<b>Request Parameters:</b>	Not applicable

**Response Parameters:**

Object	GetVolumeResultObject		
Attribute Name	Type	Optional	Description
poolId	PoolIdType	Yes	The name of the bound pool if defined
Existing attributes			

**3.4.3.1.1 Sample for invalid or non existing volume in 8.4**

**TYPE:** GET

**URL:** ...84/provisioning/symmetrix/{symmetrixId}/volume/888888888

**Response Code:** 500

**Response Messages:**

```
{  
  "message": "Invalid Volumeld 888888888 specified for Symmetrix {symmetrixId}"  
}
```

**3.4.3.1.2 NEW Sample for invalid or non existing volume in 9.0**

**TYPE:** GET

**URL:** ...90/provisioning/symmetrix/{symmetrixId}/volume/888888888

**Response Code:** 404

**Response Messages:**

```
{  
  "message": "Volume [888888888] on Symmetrix [{symmetrixId}] cannot be found"  
}
```

**3.4.3.1.3 Sample JSON response**

```
{  
  "poolId": "Pool_Name"  
}
```

### 3.4.3.2 DELETE

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	volume
<b>Request Type:</b>	GET
<b>Description:</b>	Change to existing functionality: <ul style="list-style-type: none"><li>• Reponse code for invalid or non existing volume has changed from 400 to 404, see sample output below.</li></ul>
<b>URL:</b>	<code>... /90/provisioning/symmetrix/{symmetrixId}/volume/{volumeId}</code>
<b>User Roles:</b>	No Change
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No Change
<b>Query Parameters:</b>	Not applicable
<b>Request Parameters:</b>	Not applicable
<b>Response Parameters:</b>	

#### 3.4.3.2.1 Sample for invalid or non existing volume in 8.4

<b>TYPE:</b> DELETE <b>URL:</b> <code>...84/provisioning/symmetrix/{symmetrixId}/volume/888888888</code> <b>Response Code:</b> 400 <b>Response Messages:</b> { "message": "Invalid VolumeId 8888888 specified for Symmetrix 000197800128" }
---

#### 3.4.3.2.2 NEW Sample for invalid or non existing volume in 9.0

<b>TYPE:</b> GET <b>URL:</b> <code>...90/provisioning/symmetrix/{symmetrixId}/volume/888888888</code> <b>Response Code:</b> 404 <b>Response Messages:</b>
--

```
{
  "message": "Volume [888888888] on Symmetrix [{symmetrixId}] cannot be found"
}
```

**3.4.3.3 PUT**

<b>User Story (for Internal use only)</b>													
<b>Resource</b>	volume												
<b>Request Type:</b>	PUT												
<b>Description:</b>	<p>Change to existing functionality:</p> <ul style="list-style-type: none"> <li>• Reponse for invalid or non existing volume has changed, see sample output below.</li> </ul>												
<b>URL:</b>	<u>... /90/provisioning/symmetrix/{symmetrixId}/volume/{volumeId}</u>												
<b>User Roles:</b>	Administrator/Manager												
<b>Prerequisite:</b>	Not applicable												
<b>Path Parameters:</b>	No change												
<b>Query Parameters:</b>	Not applicable												
<b>Request Parameters:</b>													
<b>Response Parameters:</b>	<table border="1"> <tr> <td>Object</td> <td colspan="3">volume</td> </tr> <tr> <th>Attribute Name</th> <th>Type</th> <th>Optional</th> <th>Description</th> </tr> <tr> <td colspan="4">No change</td> </tr> </table>	Object	volume			Attribute Name	Type	Optional	Description	No change			
	Object	volume											
	Attribute Name	Type	Optional	Description									
	No change												
	<b>ASYNCHRONOUS:</b>												
	<table border="1"> <tr> <td>Object</td> <td colspan="3">job</td> </tr> <tr> <th>Attribute Name</th> <th>Type</th> <th>Optional</th> <th>Description</th> </tr> <tr> <td colspan="4">No change</td> </tr> </table>	Object	job			Attribute Name	Type	Optional	Description	No change			
Object	job												
Attribute Name	Type	Optional	Description										
No change													



### 3.4.3.3.1 Sample for invalid or non existing volume in 8.4

```
TYPE: PUT
URL: ...84/provisioning/symmetrix/{symmetrixId}/volume/888888888
Response Code: 404
Response Messages:
{
"message": "Cannot find Volume '888888888' for Symmetrix {symmetrixId}"
}
```

### 3.4.3.3.2 NEW Sample for invalid or non existing volume in 9.0

```
TYPE: PUT
URL: ...90/provisioning/symmetrix/{symmetrixId}/volume/888888888
Response Code: 404
Response Messages:
{
"message": "Volume [888888888] on Symmetrix [{symmetrixId}] cannot be found"
}
```

## 3.5 Replication

### 3.5.1 SRDF Group

#### 3.5.1.1 GET

<b>User Story</b> (for Internal use only)	
<b>Resource</b>	RdfGroup
<b>Request Type:</b>	GET
<b>Description:</b>	Adds new filtering options to the SRDF Group list getter call
<b>URL:</b>	.../90/replication/symmetrix/{symmetrixId}/rdf_group
<b>User Roles:</b>	Monitor
<b>Prerequisite:</b>	Not applicable

<b>Path Parameters:</b>	No change
<b>Query Parameters:</b>	<ul style="list-style-type: none"> <li>remote_symmetrix_id – return groups where the remote Symmetrix ID matches this parameter</li> <li>group_type – return groups which are “Static”, “Dynamic” or “Witness”</li> <li>rdf_mode – return groups where the SRDF pair modes for the group contains “AdaptiveCopy”, “Synchronous”, “Asynchronous”, “Active”</li> <li>volume_count – return groups with the matching volume count</li> </ul>
<b>Response Parameters</b>	No change

### 3.5.1.2 PUT

<b>User Story (for Internal use only)</b>				
<b>Resource</b>	RdfGroupUpdate			
<b>Request Type:</b>	PUT			
<b>Description:</b>	Add functionality to Move Pairs from one SRDF group to another			
<b>URL:</b>	.../90/replication/symmetrix/{symmetrixId}/rdf_group/{rdfgNumId}			
<b>User Roles:</b>	Storage Admin			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<ul style="list-style-type: none"> <li>symmetrixId</li> <li>rdfgNum</li> <li>RdfGroupUpdate</li> </ul>			
<b>Request Parameters</b>	<b>Object</b>	RdfGroupUpdate		
	<b>Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	action	RdfGroupAction	No	<ul style="list-style-type: none"> <li>MovePairs</li> </ul>
	move	RdfGroupMovePairPa ram		<ul style="list-style-type: none"> <li>targetRdfGroup</li> <li>volumesToMove</li> <li>halfMove</li> <li>force</li> <li>symForce</li> <li>star</li> <li>bypass</li> <li>exempt</li> <li>keepR1</li> <li>keepR2</li> </ul>

<b>Query Parameters</b>	N/A
<b>Response Parameters</b>	N/A

### 3.5.2 SRDF Port

#### 3.5.2.1 GET

<b>User Story (for Internal use only)</b>	
<b>Resource</b>	RdfDirectorPort
<b>Request Type:</b>	GET
<b>Description:</b>	Adds WWN information for the SRDF port or remote SRDF port
<b>URL:</b>	.../90/replication/symmetrix/{symmetrixId}/rdf_director/{directorId}/port/{portId} .../90/replication/symmetrix/{symmetrixId}/rdf_director/{directorId}/port/{portId}/remote_port
<b>User Roles:</b>	Monitor
<b>Prerequisite:</b>	Not applicable
<b>Path Parameters:</b>	No change
<b>Query Parameters:</b>	No change
<b>Response Parameters</b>	Added a “wwn” field.

### 3.6 Migration

- N/A

### 3.7 VVol

- N/A

### 3.8 WLP

- N/A

## 3.9 System

### 3.9.1 IpRoute

#### 3.9.1.1 GET (Object)

<b>User Story</b> (for Internal use only)	<a href="#">US24684</a>			
<b>Resource</b>	ipRoute			
<b>Request Type:</b>	GET			
<b>Description:</b>	Gets details about an iscsi ip route			
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/iproute/{ipRouteId}			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	directorId	String	No	Unique identifier of the director
	ipRouteId	String	No	Unique identifier of the ip route
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>	ipRoute		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ipRouteId	String	No	Unique identifier of the ip route. Combination of destinationIp, prefix and networkId delimited by '-'. E.g. 10.10.10.10-24-5.
	destination_ip	String	No	The IPv4 or IPv6 destination IP address of the IP Route
	prefix	int	No	The IPv4 or IPv6 network mask prefix of the IP Route
	gateway_ip	String	No	The gateway IPv4 or IPv6 address of the IP Route

	network_id	int	No	The network identity of the IP Route
	director	String	No	The director with which the IP Route is associated. E.g. SE-2E.

### 3.9.1.1.1 Sample JSON response

```
{
  "ipRouteId": "10.73.28.12-24-1",
  "destination_ip": "10.73.28.12",
  "prefix": 24,
  "gateway_ip": "10.0.0.0",
  "network_id": 1,
  "director": "SE-2E"
}
```

### 3.9.1.2 GET (List)

<b>User Story</b> (for Internal use only)	<a href="#">US24684</a>		
<b>Resource</b>	ipRoute		
<b>Request Type:</b>	GET		
<b>Description:</b>	Gets a list of iscsi ip routes		
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/iproute		
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor		
<b>Prerequisite:</b>	Not applicable		
<b>Path Parameters:</b>	Attribute Name	Type	Description
	symmetrixId	String	Unique identifier of the symmetrix
	directorId	String	Unique identifier of the director
<b>Query Parameters:</b>	Attribute Name	Type	Description
	destination_ip	String	Optional value that filters the returned list to display ip route with the given IPv4 or IPv6 destination IP address

	prefix	int	Optional value that filters the returned list to display ip route with the given IPv4 or IPv6 network mask prefix	
	gateway_ip	String	Optional value that filters the returned list to display ip route with the given gateway IP	
	network_id	int	Optional value that filters the returned list to display ip route with the given network identity	
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	Object	listIpRouteResult		
	Attribute Name	Type	Optional	Description
	ipRouteId	List<String>	No	List of ip route ids

### 3.9.1.3 POST

<b>User Story (for Internal use only)</b>	<a href="#">US24684</a>			
<b>Resource</b>	ipRoute			
<b>Request Type:</b>	POST			
<b>Description:</b>	Adds an IP route			
<b>URL:</b>	<u>... /90/system/symmetrix/{symmetrixId}/director/{directorId}/iproute</u>			
<b>User Roles:</b>	Administrator, Storage administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	Parameter name	Type	Description	
	symmetrixId	String	Unique identifier of the symmetrix	
	directorId	String	Unique identifier of the director	
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Object	createIpRouteParam extends: ConfigurationManagementParamType ( <a href="#">See the Appendix for details.</a> )		
	Attribute Name	Type	Optional	Description

	destinationIp	String	No	The IPv4 or IPv6 destination IP address of the IP Route
	prefix	int	No	The IPv4 or IPv6 network mask prefix of the IP Route
	gatewayIp	String	No	The gateway IP address of the IP Route in IPv4 or IPv6 format.
	networkId	int	Yes	The network id of the IP Route. Default value is 1.
	executionOption	String enum: SYNCHRONOUS ASYNCHRONOUS	Yes	SYNCHRONOUS by default.

<b>Response Parameters:</b>	SYNCHRONOUS:			
	Object	ipRoute		
	Attribute Name	Type	Optional	Description
	ipRouteId	String	No	Unique identifier of the ip route
	destination_ip	String	No	The IPv4 or IPv6 destination IP address of the IP Route
	prefix	int	No	The IPv4 or IPv6 network mask prefix of the IP Route
	gateway_ip	String	No	The gateway IP address of the IP Route
	network_id	int	No	The network id of the IP Route
	director	String	No	The director with which the IP Route is associated
	ASYNCHRONOUS:			
Object	job			
Attribute Name	Type	Optional	Description	
<a href="#">See Job details under Common Objects in the Appendix.</a>				

### 3.9.1.3.1 Sample JSON Request

```
{
  "destinationIp": "10.73.28.12",
```

```
" prefix": 24,
" gatewayIp": "10.0.0.0",
"networkId": 2, //(optional – 1 by default)
"executionOption" : "ASYNCHRONOUS" //(optional – SYNCHRONOUS by default)
}
```

### 3.9.1.3.2 Sample Synchronous Response

```
{
  " ipRouteId ": "10.73.28.12-24-2",
  " destination_ip ": "10.73.28.12",
  " prefix": 24,
  " gateway_ip": "10.0.0.0",
  "network_id": 2,
  "director": "SE-1E"
}
```

### 3.9.1.3.3 Sample Asynchronous Response

```
{
  "jobId": "1503300709831",
  "name": "Create IP Route",
  "status": "UNSCHEDULED",
  "username": "C:b1d90714-b493-42f8-a6b4-ce28bbd70f54\\smc",
  "last_modified_date": "Aug-21-2017 13:01:49.832",
  "last_modified_date_milliseconds": 1503300709832,
  "completed_date_milliseconds": 0,
  "task": [
    {
      "execution_order": 1,
      "description": "Create IP Route [10.73.28.12-24-2] \n"
    }
  ],
  "resourceLink":
  "https://IP_ADDRESS:8443/univmax/restapi/90/system/symmetrix/{symmetrixId}/director/{directorId}/iprou
  te/10.73.28.12-24-2"
}
```



### 3.9.1.4 DELETE

<b>User Story (for Internal use only)</b>	<a href="#">US24684</a>			
<b>Resource</b>	ipRoute			
<b>Request Type:</b>	DELETE			
<b>Description:</b>	Removes an IP Route			
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/iproute/{ipRouteId}			
<b>User Roles:</b>	Administrator, Storage administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	directorId	String	No	Unique identifier of the director
	ipRouteId	String	No	Unique identifier of the ip route
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	No content			

### 3.9.2 Director

#### 3.9.2.1 GET (Object)

<b>User Story (for Internal use only)</b>	<a href="#">US24687</a>
<b>Resource</b>	director
<b>Request Type:</b>	GET
<b>Description:</b>	Gets details about the symmetrix director. NOTE: This functionality was moved as is from SLO Provisioning.
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}

<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	directorId	String	No	Unique identifier of the director
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	No change			

### 3.9.2.1.1 Sample JSON response

```
{
  "availability": "Offline",
  "director_number": 65,
  "director_slot_number": 1,
  "directorId": "SE-1E",
  "num_of_ports": 4,
  "num_of_cores": 4
}
```

### 3.9.2.2 GET (List)

<b>User Story (for Internal use only)</b>	<a href="#">US24687</a>
<b>Resource</b>	director
<b>Request Type:</b>	GET
<b>Description:</b>	Gets the list of symmetrix directors. NOTE: This functionality was moved as is from SLO Provisioning.
<b>URL:</b>	<u>... /90/system/symmetrix/{symmetrixId}/director</u>
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor
<b>Prerequisite:</b>	Not applicable

<b>Path Parameters:</b>	Attribute Name	Type	Description	
	symmetrixId	String	Unique identifier of the symmetrix	
<b>Query Parameters:</b>	No change			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	Object	ListDirectors		
	Attribute Name	Type	Optional	Description
	directorId	List<String>	No	List of director ids

### 3.9.3 iSCSI Target (Port)

#### 3.9.3.1 GET (Object)

<b>User Story</b> (for Internal use only)	<a href="#">US24687</a>			
<b>Resource</b>	port			
<b>Request Type:</b>	GET			
<b>Description:</b>	Gets details about a symmetrix port (as well as virtual port i.e., iSCSI target) NOTE: This functionality was moved as is from SLO Provisioning.			
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	Unique identifier of the symmetrix
	directorId	String	No	Unique identifier of the director
	portId	String	No	Unique identifier of the port
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	In addition to the existing properties, an additional property, iscsi_target was introduced.			
	Object	DirectorPort		
	Attribute Name	Type	Optional	Description

	iscsi_target	Boolean	Yes	Indicates whether the given port is an iSCSI target (virtual port) or not.
--	--------------	---------	-----	--

### 3.9.3.1.1 Sample JSON response

```

{
  "symmetrixPort": {
    "symmetrixPortKey": {
      "directorId": "SE-1E",
      "portId": "1"
    },
    "port_status": "ON",
    "director_status": "Offline",
    "type": "GigE",
    "num_of_cores": 4,
    "identifier": "iqn.2",
    "negotiated_speed": "0",
    "num_of_port_groups": 0,
    "num_of_masking_views": 0,
    "num_of_mapped_vols": 0,
    "vcm_state": "Enabled",
    "aclx": true,
    "vnx_attached": false,
    "avoid_reset_broadcast": true,
    "environ_set": true,
    "disable_q_reset_on_ua": false,
    "soft_reset": true,
    "scsi_3": false,
    "scsi_support1": true,
    "spc2_protocol_version": true,
  }
}

```

```

    "max_speed": "0",
    "iscsi_target": true
  }
}

```

### 3.9.3.2 GET (List)

<b>User Story (for Internal use only)</b>	<a href="#">US24687</a>			
<b>Resource</b>	port			
<b>Request Type:</b>	GET			
<b>Description:</b>	Gets a list of ports (which includes virtual ports i.e., iSCSI targets as well) NOTE: This functionality was moved as is from SLO Provisioning.			
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>	
	symmetrixId	String	Unique identifier of the symmetrix	
	directorId	String	Unique identifier of the director	
<b>Query Parameters:</b>	In addition to the existing query parameters, an additional query param, iscsi_target is introduced.			
	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>	
	iscsi_target	String	(Front End Port Only) Optional value that filters returned list to display ports that are iSCSI targets (true/false)	
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>	DirectorPortList		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	portId	List<String>	No	List of port ids

### 3.9.3.3 POST

<b>User Story</b>	<a href="#">US24686</a>
-------------------	-------------------------

(for Internal use only)				
Resource	iSCSITarget			
Request Type:	POST			
Description:	Creates a new iSCSI Target under the specified SE director			
URL:	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port			
User Roles:	Administrator, Storage administrator			
Prerequisite :	Not applicable			
Path Parameters:	Parameter name	Type	Description	
	symmetrixId	String	Unique identifier of the symmetrix	
	directorId	String	Unique identifier of the director	
Query Parameters:	Not applicable			
Request Parameters:	Object	createISCSITargetParam extends: <a href="#">ConfigurationManagementParamType (See the Appendix for details.)</a>		
	Attribute Name	Type	Optional	Description
	iqn	String	Yes	Unique name of iSCSITarget on the storage system
	network_id	long	No	Network id of the iSCSITarget Default value is 1.
	tcp_port	long	Yes	TCP Port used by the iSCSITarget. Default value is 3260.
	volume_set_addressing	boolean	Yes	Volume set addressing mode for iSCSITarget.
	avoid_reset_broadcast	boolean	Yes	SCSI bus reset to only occur to the port that received the reset (not broadcast to all channels)
	environ_set	boolean	Yes	Environmental error reporting by the storage system to the host on the specific port.

	disable_q_reset_on_ua	boolean	Yes	Unit Attention (UA) that is propagated from another director does not flush the queue for this volume on this director
	soft_reset	boolean	Yes	SCSI soft reset on a Storage System port
	scsi_3	boolean	Yes	Storage System supports SCSI-3 / SCSI-2 protocol.
	scsi_support1	boolean	Yes	Provides a stricter compliance with SCSI standards
	spc2_protocol_version	boolean	Yes	Has to be enabled (default) in a Windows 2003 environment running Microsoft HCT test version 12.1. Port must be offline, when set.
	open_vms	boolean	Yes	Enables an Open VMS fiber connection.
	isid_protected	boolean	Yes	Protected initiator session identifier.
	executionOption	String enum: SYNCHRONOUS ASYNCHRONOUS	Yes	SYNCHRONOUS by default.
<b>Response Parameters:</b>	SYNCHRONOUS: No Content			
	ASYNCHRONOUS:			
	Object	job		
	Attribute Name	Type	Optional	Description
<a href="#">See Job details under Common Objects in the Appendix.</a>				

### 3.9.3.3.1 Sample JSON Request

```
{
  "iqn":"iqn.uniquename",
  "network_id":"2",
  "tcp_port":"3200",
```

```

"volume_set_addressing":"true",
"avoid_reset_broadcast":"false",
"environ_set":"false",
"disable_q_reset_on_ua":"false",
"soft_reset":"false",
"scsi_3":"false",
"scsi_support1":"true",
"spc2_protocol_version":"true",
"open_vms":"false",
"isid_protected":"true",
"executionOption" : "ASYNCHRONOUS"
}

```

### 3.9.3.3.2 Sample Asynchronous Response

```

{
  "jobId": "1513534662588",
  "name": "IQN iqn.uniquename",
  "status": "SCHEDULED",
  "username": "C:b1d90714-b493-42f8-a6b4-ce28bbd70f54\\smc",
  "last_modified_date": "Dec-17-2017 23:47:42.589",
  "last_modified_date_milliseconds": 1513534662589,
  "completed_date_milliseconds": 0,
  "task": [
    {
      "execution_order": 1,
      "description": "Create iSCSITarget in symm [symmetrixId] and director number [directorNum]"
    }
  ]
}

```

### 3.9.3.4 PUT

<b>User Story</b> (for Internal use only)	<a href="#">US24686</a>
<b>Resource</b>	iSCSITarget



<b>Request Type:</b>	PUT			
<b>Description:</b>	Modifies an existing iSCSI Target			
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}			
<b>User Roles:</b>	Administrator/Storage Administrator			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	directorId	String	No	Unique identifier of the director
	portId	String	No	Unique identifier of the iSCSI Target
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	<b>Object</b>	editISCSITargetParam extends: <a href="#">ConfigurationManagementParamType</a> ( <a href="#">See the Appendix for details.</a> )		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	editISCSITargetActionParam	<a href="#">EditISCSITargetActionParamType</a>	No	Select one of the Edit Options to modify the specified iSCSI target
	<b>Object</b>	EditISCSITargetActionParam		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	renameISCSITargetParam	<a href="#">RenameISCSITargetParamType</a>	Yes	Renames the specified iSCSI Target's IQN
	modifyISCSITargetParam	<a href="#">ModifyISCSITargetParamType</a>	Yes	Modifies the specified iSCSI Target's properties
	modifyPortFlagsParam	<a href="#">ModifyPortFlagsParamType</a>	Yes	Set/Reset port flags of the specified iSCSI Target
	attachIPInterfaceParam	<a href="#">AttachIPInterfaceParamType</a>	Yes	Attaches one or more IP interfaces to the specified iSCSI Target
	detachIPInterfaceParam	<a href="#">DetachIPInterfaceParamType</a>	Yes	Detaches one or more IP interfaces from the specified iSCSI Target

enableDisableISCSITargetParam	<a href="#">EnableDisableISCSITargetParamType</a>	Yes	Enable/Disable the specified iSCSI Target
Object		RenameISCSITargetParam	
Attribute Name	Type	Optional	Description
new_iqn	String	No	The New IQN of iSCSI Target.
Object		ModifyISCSITargetParam	
Attribute Name	Type	Optional	Description
network_id	long	No	New network ID for specified iSCSi Target.
tcp_port	long	Yes	New TCP port number for specified iSCSI Target.
Object		ModifyPortFlagsParam	
Attribute Name	Type	Optional	Description
volume_set_addressing	boolean	Yes	Volume set addressing mode for iSCSITarget.
avoid_reset_broadcast	boolean	Yes	SCSI bus reset to only occur to the port that received the reset (not broadcast to all channels)
environ_set	boolean	Yes	Environmental error reporting by the storage system to the host on the specific port.
disable_q_reset_on_ua	boolean	Yes	Unit Attention (UA) that is propagated from another director does not flush the queue for this volume on this director
soft_reset	boolean	Yes	SCSI soft reset on a Storage System port
scsi_3	boolean	Yes	Storage System supports SCSI-3 / SCSI-2 protocol.
scsi_support1	boolean	Yes	Provides a stricter compliance with SCSI standards
spc2_protocol_version	boolean	Yes	Has to be enabled (default) in a Windows 2003 environment running Microsoft HCT test version 12.1. Port must be offline, when set.

	open_vms	boolean	Yes	Enables an Open VMS fiber connection.
	isid_protected	boolean	Yes	Protected initiator session identifier.
	<b>Object</b> AttachIPInterfaceParam			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ipInterfaceParam	<a href="#">IPInterfaceParamType</a>	No	A list of IP Interfaces that will be used for attach.
	<b>Object</b> DetachIPInterfaceParam			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ipInterfaceParam	<a href="#">IPInterfaceParamType</a>	No	A list of IP Interfaces that will be used for detach.
	<b>Object</b> IPInterfaceParam			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ip_interface_id	<a href="#">ipInterfaceIdType</a>	No	IP Interface ID with IP Address and Network ID separated by '-'.
	ip_interface_port	long	No	Physical iSCSI Port where the IP Interface exists.
	<b>Object</b> EnableDisableISCSITargetParam			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	port_enable	Boolean	No	iSCSI Target's new port state(online/offline).
<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>			
	<b>Object</b>	iSCSITarget		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	<a href="#">See Response as detailed in the GET method of iSCSITarget.</a>			
	<b>ASYNCHRONOUS:</b>			
<b>Object</b>	job			

	Attribute Name	Type	Optional	Description
	<a href="#">See Job details under Common Objects in the Appendix.</a>			

#### 3.9.3.4.1 Sample JSON Requests

```

{
  "editISCSITargetActionParam":{
    "renameISCSITargetParam":{
      "new_iqn":"iqn.unique.com"
    }
  },
  "executionOption" : "ASYNCHRONOUS"
}

{
  "editISCSITargetActionParam":{
    "attachIPInterfaceParam":{
      "ipInterfaceParam":{
        "ip_interface_id":"10.10.10.10-2",
        "ip_interface_port":24
      },
      {
        "ip_interface_id":"100.100.100.100-2",
        "ip_interface_port":25
      }
    }
  }
}

```

#### 3.9.3.4.2 Sample Asynchronous Response

```

{
  "jobId": "1513538890970",
  "name": "Modify iSCSI Target",

```

```
"status": "SCHEDULED",
"username": "C:b1d90714-b493-42f8-a6b4-ce28bbd70f54\\smc",
"last_modified_date": "Dec-18-2017 00:58:10.971",
"last_modified_date_milliseconds": 1513538890971,
"completed_date_milliseconds": 0,
"task": [
  {
    "execution_order": 1,
    "description": "Rename iSCSI target"
  }
]
}
```

### 3.9.3.4.3 Sample Synchronous Response

```
{
  "symmetrixPort": {
    "symmetrixPortKey": {
      "directorId": "SE-1E",
      "portId": "1"
    },
    "port_status": "OFF",
    "director_status": "Offline",
    "type": "GigE",
    "num_of_cores": 4,
    "identifier": "iqn.unique.com",
    "negotiated_speed": "0",
    "num_of_port_groups": 0,
    "num_of_masking_views": 0,
    "num_of_mapped_vols": 0,
    "vcm_state": "Enabled",
    "aclx": true,
    "vnx_attached": false,
  }
}
```

```

"avoid_reset_broadcast": false,
"environ_set": false,
"disable_q_reset_on_ua": false,
"soft_reset": false,
"scsi_3": false,
"scsi_support1": true,
"spc2_protocol_version": true,
"max_speed": "0",
"iscsi_target": true,
"ip_addresses": [
  "10.10.10.10",
  "100.100.100.100"
]
}
}

```

### 3.9.3.5 DELETE

<b>User Story</b> (for Internal use only)	<a href="#">US24686</a>			
<b>Resource</b>	iSCSITarget			
<b>Request Type:</b>	DELETE			
<b>Description:</b>	Removes an existing iSCSI Target			
<b>URL:</b>	<a href="#">... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}</a>			
<b>User Roles:</b>	Administrator, Storage administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	Attribute Name	Type	Optional	Description
	symmetrixId	String	No	Unique identifier of the symmetrix

	directorId	String	No	Unique identifier of the director	
	portId	String	No	Unique identifier of the iSCSI Target	
<b>Query Parameters:</b>	Not applicable				
<b>Request Parameters:</b>	Not applicable				
<b>Response Parameters:</b>	No content				

### 3.9.4 Ip Interface

#### 3.9.4.1 GET (Object)

<b>User Story (for Internal use only)</b>	<a href="#">US24685</a>				
<b>Resource</b>	ipinterface				
<b>Request Type:</b>	GET				
<b>Description:</b>	Gets details about an ip interface				
<b>URL:</b>	<a href="#">...</a> <a href="#">/90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}/ipinterface/{ipinterfaceId}</a>				
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor				
<b>Prerequisite :</b>	Not applicable				
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>	
	symmetrixId	String	No	Unique identifier of the symmetrix	
	directorId	String	No	Unique identifier of the director	
	portId	String	No	Unique identifier of the port	
	ipinterfaceId	String	No	Unique identifier of the ip interface	
<b>Query Parameters:</b>	Not applicable				
<b>Request Parameters:</b>	Not applicable				

<b>Response Parameters:</b>	<b>Object</b>			
	<b>IpInterface</b>			
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ip_interface_id	String	No	Unique identifier of the IP interface. Combination of IP address and network id delimited by '-'. E.g. 10.100.100.110-20.
	ip_address	String	No	The IPv4 or IPv6 IP address
	network_id	Long	No	The network id of the IP interface
	ip_prefix_length	Integer	No	The prefix length for the IPv4 or IPv6 address
	vlan_id	Long	No	The VLAN ID of the IP interface
	mtu	Long	No	The MTU configured for the IP interface
	iscsi_target_director	String	Yes	If attached, the iSCSI target director with which the IP interface is associated
iscsi_target_port	Integer	Yes	If attached, the iSCSI target virtual port with which the IP interface is associated	

#### 3.9.4.1.1 Sample JSON response

```
{
  "ip_interface_id": "10.100.100.110-20",
  "ip_address": "10.100.100.110",
  "network_id": 20,
  "ip_prefix_length": 8,
  "vlan_id": 20,
  "mtu": 1500
}
```

#### 3.9.4.2 GET (List)

<b>User Story (for Internal use only)</b>	<a href="#">US24685</a>
<b>Resource</b>	ipinterface
<b>Request Type:</b>	GET



<b>Description:</b>	Gets a list of ip interfaces			
<b>URL:</b>	<u>... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}/ipinterface</u>			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>	
	symmetrixId	String	Unique identifier of the symmetrix	
	directorId	String	Unique identifier of the director	
	portId	String	Unique identifier of the port	
<b>Query Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>	
	ip_address	String	Optional value that filters returned list to display Ip interfaces that has the ip_address associated	
	network_id	String	Optional value that filters returned list to display Ip interfaces that has the network_id associated	
	ip_prefix_length	String	Optional value that filters returned list to display Ip interfaces that has the ip_prefix_length associated	
	vlan_id	String	Optional value that filters returned list to display Ip interfaces that has the vlan_id associated	
	mtu	String	Optional value that filters returned list to display Ip interfaces that has the mtu (Maximum Transmission Unit) associated	
	iscsi_target_director	String	Optional value that filters returned list to display Ip interfaces that has the iscsi_target_director associated	
	iscsi_target_port	String	Optional value that filters returned list to display Ip interfaces that has the iscsi_target_port associated	
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>	IpInterfaceList		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ipinterfaceId	List<String>	No	List of ip interface ids

### 3.9.4.3 POST

<b>User Story</b> (for Internal use only)	<a href="#">US24685</a>			
<b>Resource</b>	ipinterface			
<b>Request Type:</b>	POST			
<b>Description:</b>	Adds an IP Interface			
<b>URL:</b>	... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}/ipinterface			
<b>User Roles:</b>	Administrator, Storage administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	<b>Parameter name</b>	<b>Type</b>	<b>Description</b>	
	symmetrixId	String	Unique identifier of the symmetrix	
	directorId	String	Unique identifier of the director	
	portId	String	Unique identifier of the port	
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	<b>Object</b>	createIpInterfaceParam extends: ConfigurationManagementParamType ( <a href="#">See the Appendix for details.</a> )		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	ipaddress	String	No	The IPv4 or IPv6 address of the IP Interface
	prefix	int	No	The IPv4 or IPv6 network mask prefix for the IP Interface
	vlanId	int	No	The VLAN ID for the IP Interface
	networkId	int	No	The network id of the IP Interface.
	mtu	Int	No	MTU value for the IP Interface.
	executionOption	String enum: SYNCHRONOUS ASYNCHRONOUS	Yes	SYNCHRONOUS by default.

<b>Response Parameters:</b>	SYNCHRONOUS:			
	Object	ipInterface		
	Attribute Name	Type	Optional	Description
	ipInterfaceId	String	No	Unique identifier of the ip interface
	ipaddress	String	No	The IPv4 or IPv6 address of the IP Interface
	prefix	int	No	The IPv4 or IPv6 network mask prefix for the IP Interface
	vlanId	int	No	The VLAN ID for the IP Interface
	networkId	int	No	The network id of the IP Interface.
	mtu	int	No	MTU value for the IP Interface.
	ASYNCHRONOUS:			
Object	job			
Attribute Name	Type	Optional	Description	
<a href="#">See Job details under Common Objects in the Appendix.</a>				

### 3.9.4.3.1 Sample JSON Request

```
{
  "ip_address": "11.100.12.11",
  "ip_prefix_length": "3",
  "vlan_id": "35",
  "network_id": "55",
  "mtu": "1600",

  "executionOption": "ASYNCHRONOUS" //(optional – SYNCHRONOUS by default)
}
```

### 3.9.4.3.2 Sample Synchronous Response

```
{
```

```

"ip_interface_id": "11.100.12.11-55",
"ip_address": "11.100.12.11",
"network_id": 55,
"ip_prefix_length": 3,
"vlan_id": 35,
"mtu": 1600
}

```

**3.9.4.3.3 Sample Asynchronous Response**

```

{
  "jobId": "1513580022408",
  "name": "IP Address: 11.100.12.11",
  "status": "SCHEDULED",
  "username": "C:b1d90714-b493-42f8-a6b4-ce28bbd70f54\\smc",
  "last_modified_date": "Dec-18-2017 12:23:42.409",
  "last_modified_date_milliseconds": 1513580022409,
  "completed_date_milliseconds": 0,
  "task": [
    {
      "execution_order": 1,
      "description": "Create IP Interface with ip [11.100.12.11], prefix [3] and network id [57]"
    }
  ],
  "resourceLink":
  "http://localhost:8080/univmax/restapi/90/system/symmetrix/000197900046/director/SE-1E/port/24/ipinterface/11.100.12.11-57"
}

```

**3.9.4.4 PUT**

<b>User Story (for Internal use only)</b>	<a href="#"><u>US24685</u></a>
<b>Resource</b>	ipinterface
<b>Request Type:</b>	PUT
<b>Description:</b>	Modifies an ipinterface

<b>URL:</b>	<code>... /90/system/symmetrix/{symmetrixId}/director/{directorId}/port/{portId}/ipinterface/{ipInterfaceId}</code>			
<b>User Roles:</b>	Administrator/Storage Administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	directorId	String	No	Unique identifier of the director
	portId	String	No	Unique identifier of the port
	ipInterfaceId	String	No	Unique identifier of the ip interface
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	<b>Object</b>	editIPInterfaceParam extends: <a href="#">ConfigurationManagementParamType (See the Appendix for details.)</a>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	editIPInterfaceActionParam	<a href="#">EditIPInterfaceActionParamType</a>	No	Select the Edit Options to modify the specified IPInterface
	<b>Object</b>	<a href="#">EditIPInterfaceParamType</a>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	editIPInterfaceOptionsParam	<a href="#">EditIPInterfaceOptionsParamType</a>	Yes	Edits the params for the specified ip interface
	<b>Object</b>	<a href="#">editIPInterfaceOptionsParam</a>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>

	ip_address	string	No	The IPv4 or IPv6 address of the IP Interface
	Network_id	int	No	The network id of the IP Interface.
	prefix	int	No	The IPv4 or IPv6 network mask prefix for the IP Interface
	mtu	int	No	MTU value for the IP Interface.

<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>			
	Object	ipInterface		
	Attribute Name	Type	Optional	Description
	<Insert the noun or noun phrase that describes what is detailed> is <a href="#">detailed in the GET method.</a>			
	<b>ASYNCHRONOUS:</b>			
	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.				

#### 3.9.4.4.1 Sample edit IP Interface JSON Request

```
{
  "editIPInterfaceActionParam": {
    "editIPInterfaceOptionsParam":{
      "ip_address": "11.100.12.11",
      "network_id": 53,
      "ip_prefix_length": 3,
      "mtu":"1800"
    }
  }
}
```

#### 3.9.4.5 DELETE

<b>User Story</b>	<a href="#">US24685</a>
-------------------	-------------------------

(for Internal use only)					
Resource	ipinterface				
Request Type:	DELETE				
Description:	Deletes an IP Interface				
URL:	...90/system/symmetrix/{symmetrixId}/iscsi/ipinterface/{ipinterfaceid}				
User Roles:	Not applicable				
Prerequisite :	Not applicable				
Path Parameters:	Attribute Name	Type	Optional	Description	
	symmetrixId	String	No	Unique identifier of the symmetrix	
	directorId	String	No	Unique identifier of the director	
	portId	String	No	Unique identifier of the port	
	ipInterfaceId	String	No	Unique identifier of the ip interface	
Query Parameters:	Not applicable				
Request Parameters:	Not applicable				
Response Parameters:	Not applicable				

### 3.10 DSA

- N/A

### 3.11 Management

- N/A

### 3.12 Common

- N/A

## 4 Appendix

---

### 4.1 Basic Authentication

Unisphere for PowerMax 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 PowerMax 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 PowerMax users:

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

## 4.2 Request Types

### 4.2.1 GET (OBJECT)

#### 4.2.1.1 Sample

<b>User Story (for Internal use only)</b>	US12345			
<b>Resource</b>	storagegroup			
<b>Request Type:</b>	GET			
<b>Description:</b>	Gets details about a storage group			
<b>URL:</b>	<u>... /84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storagegroupId}</u>			
<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor			
<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	storageGroupId	String	No	The Storage Group Name
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	<b>Object</b>	storageGroup		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	storageGroupId	String	No	Unique identifier of the storage group instance
	slo	String	Yes	SLO that is associated with the storage group



SRP	srp	String	Yes	SRP that is associated with the storage group	
	hostIOLimit	HostIOLimitType	Yes	SRP that is associated with the storage group	
	And so on				
	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

#### 4.2.1.2 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>

#### 4.2.1.3 Error codes:

Future work

### 4.2.2 GET (LIST)

#### 4.2.2.1 Sample

User Story (for Internal use only)	US12345
Resource	storagegroup
Request Type:	GET
Description:	Gets a list of storage group names
URL:	.../84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup

<b>User Roles:</b>	Administrator/Storage Administrator/Security Administrator/Monitor/Auditor/Performance Monitor		
<b>Prerequisite:</b>	Not applicable		
<b>Path Parameters:</b>	Attribute Name	Type	Description
	symmetrixId	String	Unique identifier of the symmetrix
<b>Query Parameters:</b>	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		
<b>Request Parameters:</b>	Not applicable		
<b>Response Parameters:</b>	Object	ListStorageGroupResult	
	Attribute Name	Type	Optional
	storageGroupId	String array	No
			Description
			A list of storage group names

#### 4.2.2.2 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>

#### Exception:

If the list of objects does not include a symmetrixId in the URL, a 200 response code is returned with an array of authorized objects, for example, ...84//sloprovisioning/symmetrix returns only the VMAXs that the user has permissions on.

#### 4.2.2.3 Error codes:

Future work

## 4.2.3 POST

### 4.2.3.1 Sample

<b>User Story (for Internal use only)</b>	US12345			
<b>Resource</b>	storagegroup			
<b>Request Type:</b>	POST			
<b>Description:</b>	Creates a storage group			
<b>URL:</b>	... /84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup			
<b>User Roles:</b>	Administrator/Storage Administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>	
	symmetrixId	String	Unique identifier of the symmetrix	
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	<b>Object</b>	createStorageGroupParam extends: ConfigurationManagementParamType ( <a href="#">See the Appendix for details.</a> )		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optiona l</b>	<b>Description</b>
	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	<a href="#">SloBasedStorageGroupParamType</a>	Yes	This parameter is required to create a SLO-based storage group. Multiple occurrences create multiple child storage groups.
And so on			

Object	SloBasedStorageGroupParamType		
Attribute Name	Type	Optional	Description
slold	String	No	The SLO that is to be associated with the storage group
volumeAttribute	<a href="#">VolumeAttributeType</a>	No	Size of each volume that is to be added to the storage group
And so on			

Object	VolumeAttributeType		
Attribute Name	Type	Optional	Description
volume_size	String	No	The size of the volume
capacityUnit	String enum: CYL MB GB TB	No	Unit of capacity

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

#### 4.2.3.2 Response Codes

Response status code	Description
201	Created, returned when Resource is created using <b>SYNCHRONOUS</b> execution option.
202	Accepted, returned when the request to create the resource is accepted using the <b>ASYNCHRONOUS</b> execution option.
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 creating the <STORAGE_GROUP> resource: <STORAGE_GROUP_Name>

#### 4.2.3.3 Error codes:

Future work

#### 4.2.3.4 Response Header

##### Asynchronous

The URL of the job

- Example: restapi/84/system/job/{jobId}

##### Synchronous:

The URL of the resource that is being created:

- Example:restapi/84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storageGroupId}

## 4.2.4 PUT

### 4.2.4.1 Sample

<b>User Story (for Internal use only)</b>	US12345			
<b>Resource</b>	storagegroup			
<b>Request Type:</b>	PUT			
<b>Description:</b>	Edits a storage group			
<b>URL:</b>	... /84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storageGroupID}			
<b>User Roles:</b>	Administrator/Storage Administrator			
<b>Prerequisite :</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Description</b>	
	symmetrixId	String	Unique identifier of the symmetrix	
	storageGroupID	String	The Storage Group Name	
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	<b>Object</b>	editStorageGroupParam extends: <a href="#">ConfigurationManagementParamType (See the Appendix for details.)</a>		
	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	editStorageGroupActionParam	<a href="#">EditStorageGroupParamType</a>	No	Select one of the Edit Options to modify the specified storage group
	<b>Object</b>	<a href="#">EditStorageGroupParamType</a>		
<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>	

	renameStorageGroupParam	RenameStorageGroupParamType	Yes	Renames the specified storage group															
	editStorageGroupSLOParam	EditStorageGroupSLOParamType	Yes	Edit the SG SLO Applicable to stand-alone and child storage groups only															
	and so on.																		
<table border="1"> <tr> <td>Object</td> <td colspan="4">RenameStorageGroupParamType</td> </tr> <tr> <td>Attribute Name</td> <td>Type</td> <td>Optional</td> <td colspan="2">Description</td> </tr> <tr> <td>new_storage_Group_name</td> <td>String</td> <td>No</td> <td colspan="2">The New Storage Group Name.</td> </tr> </table>					Object	RenameStorageGroupParamType				Attribute Name	Type	Optional	Description		new_storage_Group_name	String	No	The New Storage Group Name.	
Object	RenameStorageGroupParamType																		
Attribute Name	Type	Optional	Description																
new_storage_Group_name	String	No	The New Storage Group Name.																
<table border="1"> <tr> <td>Object</td> <td colspan="4">EditStorageGroupSLOParamType</td> </tr> <tr> <td>Attribute Name</td> <td>Type</td> <td>Optional</td> <td colspan="2">Description</td> </tr> <tr> <td>slold</td> <td>String</td> <td>No</td> <td colspan="2">The New SLO Selection</td> </tr> </table>					Object	EditStorageGroupSLOParamType				Attribute Name	Type	Optional	Description		slold	String	No	The New SLO Selection	
Object	EditStorageGroupSLOParamType																		
Attribute Name	Type	Optional	Description																
slold	String	No	The New SLO Selection																
<b>Response Parameters:</b>	<b>SYNCHRONOUS:</b>																		
	Object	storageGroup																	
	Attribute Name	Type	Optional	Description															
<p>&lt;Insert the noun or noun phrase that describes what is detailed&gt; is <a href="#">detailed in the GET method.</a></p>																			
<b>ASYNCHRONOUS:</b>																			
Object	job																		
Attribute Name	Type	Optional	Description																
<p>&lt;Insert the noun or noun phrase that describes what is detailed&gt; is <a href="#">detailed in the Common Objects</a> section.</p>																			

#### 4.2.4.2 Response Codes

Response status code	Description
200	Ok, returned when Resource is edited using <b>SYNCHRONOUS</b> execution option.
202	Accepted, returned when the request to edit the resource is accepted using the <b>ASYNCHRONOUS</b> 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
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>

#### 4.2.4.3 Error codes:

Future work

#### 4.2.4.4 Response Header:

##### Asynchronous:

The URL of the job

- For example, restapi/84/system/job/{jobId}

##### Synchronous:

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

#### 4.2.5 DELETE

##### 4.2.5.1 Sample

<b>User Story</b> (for Internal use only)	US12345
<b>Resource</b>	storagegroup
<b>Request Type:</b>	DELETE
<b>Description:</b>	Deletes a storage group
<b>URL:</b>	... /84/sloprovisioning/symmetrix/{symmetrixId}/storagegroup/{storagegroupId}
<b>User Roles:</b>	Administrator/Storage Administrator



<b>Prerequisite:</b>	Not applicable			
<b>Path Parameters:</b>	<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
	symmetrixId	String	No	Unique identifier of the symmetrix
	storageGroupId	String	No	The Storage Group Name
<b>Query Parameters:</b>	Not applicable			
<b>Request Parameters:</b>	Not applicable			
<b>Response Parameters:</b>	No content			

#### 4.2.5.2 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>

#### 4.2.5.3 Error codes:

Future work

## 4.3 Common Objects

### 4.3.1 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](#)

<b>Object</b>	iterator		
<b>Attribute Name</b>	<b>Type</b>	<b>Optional</b>	<b>Description</b>
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

#### 4.3.1.1 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

#### 4.3.1.1.1 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
}

```

### 4.3.2 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 SUCCEEDED FAILED ABORTED UNKNOWN VALIDATING VALIDATED VALIDATE_FAILED INVALID RETRIEVING_PICTURE	No	Current status of the job
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

#### 4.3.2.1 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/84/sloprovisioning/symmetrix/{symmetrixId}/portgroup/SAMPLE\_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",
}
```

#### 4.3.2.2 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>

#### 4.3.2.3 Error codes:

Future work

#### 4.3.3 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

#### 4.4 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 24 hours 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 24-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 24. 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.