NetApp

Getting started with Active IQ Unified Manager

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NetApp
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Table of Contents

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Active IQ Unified Manager provides a set of APIs to manage your storage resources on the supported storage systems through a RESTful web service interface for any third-party integration.

The *Unified Manager API Developer's Guide* provides you with information about APIs and sample codes. The information provided in the guide enables you to create RESTful clients of NetApp Manageability software solutions for managing NetApp systems. The APIs are based on the Representational State Transfer (REST) architectural style.

Unified Manager provides API offerings for storage management in your NetApp environment. All the four REST operations Create, Read, Update, and Delete (also known as CRUD) are supported.

Audience for this guide

This guide is intended for developers creating applications that interface with the Active IQ Unified Manager software through REST APIs.

The guide is also intended for storage administrators and architects who want to gain a basic understanding of how the REST APIs that are provided in Unified Manager can be used to build client applications to manage and monitor NetApp storage systems.

You should use this guide if you want to use the storage provider, ONTAP cluster, and management administration APIs for managing your storage.

> ⓘ You must have one of the following roles: Operator, Storage Administrator, or Application Administrator. You must know the IP address or fully qualified domain name of the Unified Manager server on which you want to execute the REST APIs.

Active IQ Unified Manager API access and categories

The Active IQ Unified Manager APIs enable you to manage and provision storage objects in your environment. You can also access the Unified Manager web UI to perform some of these functions.

Constructing a URL to directly access REST APIs

You can access the REST APIs directly through a programming language, such as Python, C#, C++, JavaScript, and so forth. Enter the host name or IP address and the URL to access the REST APIs in the format

https://<hostname>/api

> ⓘ The default port is 443. You can configure the port as required by your environment.

Accessing the online API documentation page

You can access the *API Documentation* reference content page that is packaged along with the product to

display the API documentation, as well as to manually issue an API call (on the interface, for example, Swagger). You can access this documentation on clicking the **Menu Bar** > **Help button** > **API Documentation**

Alternatively, enter the host name or IP address and the URL to access the REST API page in the format

https://<hostname>/docs/api/

Categories

The API calls are organized into functionally based on the areas or categories. To locate a specific API, click the applicable API category.

The REST APIs provided with Unified Manager help you to perform administrative, monitoring, and provisioning functions. The APIs are grouped under the following categories.

- **datacenter**

  This category contains the APIs that help you in datacenter storage management and analytics using tools, such as Work Flow Automation and Ansible. The REST APIs under this category provide information about the clusters, nodes, aggregates, volumes, LUNs, file shares, namespaces, and other elements in your data center.

- **management-server**

  The APIs under the **management-server** category contain the `jobs, system,` and `events` APIs. Jobs are operations that are scheduled for asynchronous execution related to managing of storage objects or workloads on Unified Manager. The `events` API returns events in your data center, and the `system` API returns the Unified Manager instance details.

- **storage-provider**

  This category contains all of the provisioning APIs required for managing and provisioning file shares, LUNs, Performance Service Levels, and Storage Efficiency Policies. The APIs also enable you to configure access endpoints, Active Directories, as well as assign Performance Service Levels and Storage Efficiency Policies on storage workloads.

- **administration**

  This category contains the APIs used for running administrative tasks, such as maintaining backup settings, viewing trust store certificates for the Unified Manager datasources, and managing ONTAP clusters as datasources for Unified Manager.

- **gateway**

  Unified Manager enables you to invoke ONTAP REST APIs through the APIs under the gateway category and manage the storage objects in your data center.

- **security**

  This category contains APIs for managing Unified Manager users.

REST services offered in Active IQ Unified Manager

You should be aware of the REST services and operations offered, before you start using

the Active IQ Unified Manager APIs.

The provisioning and administrative APIs that are used for configuring the API server support the read (GET) or write (POST, PATCH, DELETE) operations. The following are some examples of the GET, PATCH, POST, and DELETE operations that are supported by the APIs:

- Example for GET: `GET /datacenter/cluster/clusters` retrieves cluster details in your data center. The maximum number of records that is returned by the `GET` operation is 1000.

  > ⓘ The APIs enable you to filter, sort, and order the records by supported attributes.

- Example for POST: `POST /datacenter/svm/svms` creates a custom Storage Virtual Machine (SVM).

- Example for PATCH: `PATCH /datacenter/svm/svms/{key}` modifies the properties of an SVM, using its unique key.

- Example for DELETE: `DELETE /storage-provider/access-endpoints/{key}` deletes an access endpoint from a LUN, SVM, or file share by using its unique key.

The REST operations that can be performed by using the APIs depend on the role of the Operator, Storage Administrator, or Application Administrator user.

User role	Supported REST method
Operator	Read-only access to data. Users with this role can run all GET requests.
Storage Administrator	Read access to all data. Users with this role can run all GET requests. Additionally, they have write access (to run PATCH, POST, and DELETE requests) to perform specific activities, such as managing, storage service objects, and storage management options.
Application Administrator	Read and write access to all data. Users with this role can run GET, PATCH, POST, and DELETE requests for all functions.

For more information about all the REST operations, see the *Online API documentation*.

API version in Active IQ Unified Manager

The REST API URIs in Active IQ Unified Manager specifies a version number. For example, `/v2/datacenter/svm/svms`. The version number `v2` in `/v2/datacenter/svm/svms` indicates the API version used in a specific release. The version number minimizes the impact of API changes on the client software by sending back a response that the client can process.

The numerical part of this version number is incremental with respect to releases. URIs with a version number provide a consistent interface that maintains backward compatibility in future releases. You also find the same

APIs without a version, for example `/datacenter/svm/svms,` that indicate the base APIs without a version. The base APIs are always the latest version of the APIs.

> ⓘ On the top right corner of your Swagger interface, you can select the version of the API to use. The highest version is selected by default. It is recommended that you use the highest version of a particular API (with respect to the incremental integer) available in your Unified Manager instance.

For all requests, you must explicitly request the API version that you want to use. When the version number is specified, the service does not return response elements that your application is not designed to handle. In REST requests, you should include the version parameter. The earlier versions of the APIs are eventually deprecated after a few releases. In this release, the `v1` version of the APIs is deprecated.

Storage resources in ONTAP

The storage resources in ONTAP can be broadly classified into *physical storage resources* and *logical storage resources.* To effectively manage your ONTAP systems using the APIs provided in Active IQ Unified Manager, you must understand the storage resource model and the relationship between various storage resources.
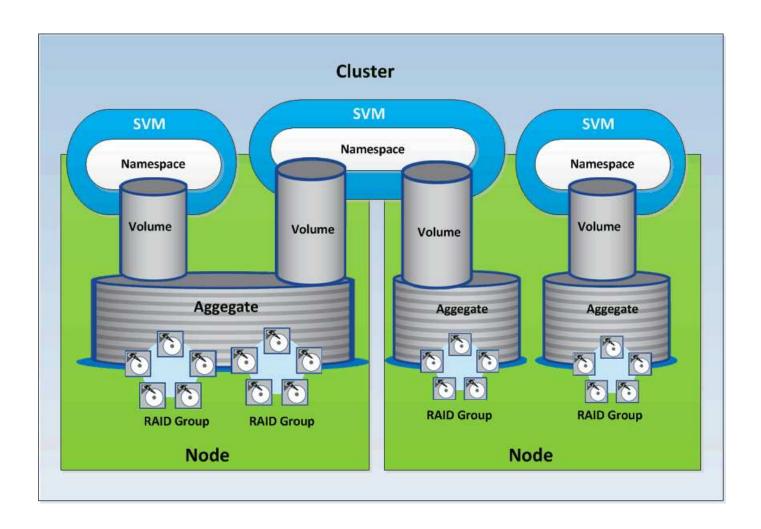
- **Physical storage resources**

  Refers to the physical storage objects provided by ONTAP. Physical storage resources include disks, clusters, storage controllers, nodes, and aggregates.

- **Logical storage resources**

  Refers to the storage resources provided by ONTAP that are not tied to a physical resource. These resources are associated with a storage virtual machine (SVM, formerly known as Vserver), and they exist independently of any specific physical storage resource such as a disk, array LUN, or aggregate.

  Logical storage resources include volumes of all types and qtrees, as well as the capabilities and configurations you can use with these resources, such as Snapshot copies, deduplication, compression, and quotas.

The following illustration shows the storage resources in a 2-node cluster:

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