

## KumoScale Ansible Modules

This section documents the Ansible modules available for configuring KumoScale storage nodes and provisioning their storage.

### Overview of KumoScale Ansible Modules

Each Kumoscale Ansible module is a Python™ module defined in the file `library/<module name>.py`. The modules provide the basic functionality by abstracting KumoScale software REST APIs or CLI commands to facilitate customizing and deploying a KumoScale solution

The table below lists all the modules available to create playbooks. Most modules have a corresponding playbook defined in the file `examples/<module name>.yaml` that automate the provisioning process. These are included in the section on [Ansible playbooks](#).

KumoScale Software Ansible Modules

Module Name	Description
<a href="#">ks_connect</a>	Connects an initiator to a target as a block device.
<a href="#">ks_host</a>	Deletes initiator from the provisioner. If the initiator cannot be deleted an error will be displayed.
<a href="#">ks_info</a>	<b>Gets</b> information about KumoScale Provisioner entities (system, host, volume).
<a href="#">ks_mirror</a>	Creates the resiliency configuration (replication) from the attached volumes.
<a href="#">ks_publish</a>	Creates a target for a specific initiator (if none exists) on KumoScale software, attaches a volume as a namespace to it, and grants access to the initiator.
<a href="#">ks_replica</a>	Adds or removes a replica from a resilient volume.
<a href="#">ks_snapshot</a>	Takes a snapshot of a volume.
<a href="#">ks_token</a>	Generates a Role-Based Access Control (RBAC) token for accessing KumoScale software or the KumoScale Provisioner Service.
<a href="#">ks_volume</a>	Creates, deletes, or expands volume(s) or snapshot volumes on KumoScale software, according to the requested capacity and storage class.

The following sections provide details on how to use each of the above modules with examples.

#### ks\_token

Validates access to the KumoScale Provisioner and generates a token accordingly. When the authorization mode is

- Local, it creates a token according to the role of the input username.
- OpenIDC, it uses authorization server parameters to generate the authorization token.

Parameter	Expected Input	Description
provisioner_url	string (required)	KumoScale Provisioner URL
ks_url	list (required for Local authorization mode)	KumoScale Appliance Management URL.
username	string (required for Local authorization mode)	The username for the admin user.
password	string (required for Local authorization mode)	The password for using Role-based access control authentication method.
expiration	string (required for Local authorization mode)	The expiration period of the token, in seconds.
token_url	string	The authorization server token URL

	(required for OpenIDC authorization mode)	
client_id	string (required for OpenIDC authorization mode)	The client identifier
client_secret	string (required for OpenIDC authorization mode)	The client secret.
client_scope	string (required for OpenIDC with Active Directory Federation Services, ADFS, authorization mode)	The client scope.
state	<b>mode</b> (default) (optional)	Return the current authorization mode.

### Examples

Generate a token under Local authorization mode:

```
ks_token:
  provisioner_url: https://##.##.##.2:8090
  ks_url: https://##.##.##.1
  username: admin
  password: password
  expiration: 3600
```

Generate a token under OpenIDC authorization mode:

```
ks_token:
  provisioner_url: https://##.##.##.2:8090
  token_url: https://##.##.##.3
  client_id: ansible_client_id
  client_secret: example_ansible_secret
```

Generate a token under OpenIDC with ADFS authorization mode:

```
ks_token:
  provisioner_url: https://##.##.##.2:8090
  token_url: https://##.##.##.3
  client_id: ansible_client_id
  client_secret: example_ansible_secret
  client_scope: example_ansible_scope
```

Determine the current authorization mode:

```
ks_token:
  provisioner_url: https://##.##.##.2:8090
  state: mode
```

### ks\_volume

Create, delete, or modify a KumoScale volume or a create a snapshot volume from a KumoScale snapshot.

Parameter	Expected Input	Description
provisioner_url	String (required)	The KumoScale Provisioner service URL.
vol_name	String  (optional only when creating the volume or when vol_uuid specified)	The name of the volume.
vol_uuid	String (optional only when creating the volume or when vol_name specified.)	The universally unique identifier (UUID) of the volume.
capacity	Integer (required when state is <b>present</b> )	The required volume size in GB.
token	String (required)	The authentication token for the KumoScale Provisioner service.
replicas	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ul> (required when state is <b>present</b> )	Number of replicas.

Parameter	Expected Input	Description
replicable	true, false	Default value is true if the number of replicas > 1, false otherwise.
racks	list of strings (optional)	A list of racks from which the volume should be allocated by the KumoScale Provisioner.
regions	list of strings (optional)	A list of regions from which the volume should be accessible.
zones	list of strings (optional)	A list of zones from which the volume should be accessible.
maxIOPSPerGB	Integer (optional)	The upper limit for input/output operations per second IOPS/Gigabyte <sup>[1]</sup> (GB)– Quality of Service (QoS).
desiredIOPSPerGB	Integer (optional)	The desired IOPS/GB - QoS.
maxBWPerGB	Integer (optional)	The upper limit for bandwidth per GB, in kilobytes per second (KB/s) - QoS.
desiredBWPerGB	Integer (optional)	The desired bandwidth per GB, in KB/s - QoS.
blockSize	<ul style="list-style-type: none"> <li>512</li> <li>4096</li> </ul> (optional)	The required volume block size.
maxReplicaDownTime	Integer <ul style="list-style-type: none"> <li>0 – no automatic recovery; default value</li> <li>180 (3 hours)</li> <li>Minimum: 5 minutes.</li> <li>Maximum: 1440 (1 day)</li> </ul> (optional)	The maximum downtime (in minutes) allowed in the replicated volume before initiating the autonomous self-healing process to recover from the failure. See <a href="#">Maintenance and Monitoring with KumoScale Ansible</a> .
provisioningType	<ul style="list-style-type: none"> <li>thick (default)</li> <li>thin</li> </ul>	Indicates whether the volume be fully pre-allocated (thick) or thin-provisioned (thin).
reservedSpacePercentage	Integer 10 (default value) (optional)	The reserved space as a percentage. Used for a thin-provisioned volume or a writable snapshot volume (the percentage of the parent volume to reserve for the log space).
snap_name	String (required for a snapshot volume when <b>snap_uuid</b> is not provided.)	The snapshot name, when creating a snapshot volume.
snap_uuid	String (required for a snapshot volume when <b>snap_name</b> is not provided.)	The snapshot UUID, used when creating a snapshot volume.
writable	<ul style="list-style-type: none"> <li>true</li> <li>false (default value)</li> </ul>	For snapshot volumes only; indicates whether the snapshot volume is writable or not.
tenant_id	string	The tenant ID (virtual cluster)
storageClassName	string	The name of the storage class
spanAllowed	<ul style="list-style-type: none"> <li>true</li> <li>false</li> </ul>	The volume is allowed to span over multiple SSDs
state	<ul style="list-style-type: none"> <li>present</li> </ul>	The state. present - Create the volume.

Parameter	Expected Input	Description
	<ul style="list-style-type: none"><li>modify</li><li>absent</li></ul> (required)	modify - Expand the volume.  absent - Delete the volume.

Examples

Create a new volume named vol1:

```
ks_volume:
  provisioner_url: https://##.##.##.##:8090
  name: vol1
  vol_uuid: 1234567-abcd-1234-5678-#####
  capacity: 100
  token: token
  replicas: 3
  racks:
  - Rack1
  - Rack2
  - Rack3
  regions:
  - ISR
  zones:
  - Lab1
  storageClassName: CassandraStorageClass
  maxIOPSPerGB: 2000
  desiredIOPSPerGB: 1000
  maxBWPerGB: 30
  desiredBWPerGB: 10
  blockSize: 4096
  provisioningType: thin
  reservedSpacePercentage: 20
  token: token
  state: present
```

Expand vol1’s capacity:

```
ks_volume:
  provisioner_url: https://##.##.##.##:8090
  name: vol1
  vol_uuid: 1234567-abcd-1234-5678-#####
  capacity: 200
  token: token
  state: modify
```

Delete the volume named vol1:

```
ks_volume:
  provisioner_url: https://##.##.##.##:8090
  vol_uuid: 1234567-abcd-1234-5678-#####
  token: token
  state: absent
```

Create a snapshot volume called vol2

```
ks_volume:
  provisioner_url: https://##.##.##.##:8090
  vol_name: vol2
  snap_uuid: 1234567-wxyz-9876-5678-#####
  reservedSpacePercentage: 20
  writable: True
  maxIOPSPerGB: 2000
  maxBWPerGB: 100
  token: token
  state: present
```

ks\_snapshot

Create or delete a snapshot over a volume.

Parameter	Expected Input	Description
provisioner_url	String (required)	The KumoScale Provisioner service URL.
token	String (required)	The authentication token for the KumoScale Provisioner service.
vol_name	String (required when <b>state</b> =present)	The volume name of the parent volume of the snapshot.
vol_uuid	String (required when <b>state</b> =present)	The UUID of the parent volume.
snap_name	string (required when <b>state</b> =present)	The name of the new snapshot.
snap_uuid	string (optional only when creating the volume).	The UUID of the snapshot, if provided by the user
reservedSpacePercentage	Integer <b>10</b> (default value)	The percentage of reserved space to use for the change log.

Parameter	Expected Input	Description
tenant_id	string	The tenant ID (virtual cluster).
state	<ul style="list-style-type: none"><li>absent</li><li>present</li></ul> (required)	The state.  absent: Delete a snapshot.  present: Take a snapshot.

Examples

Create a volume snapshot named snap\_vol1:

```
ks_snapshot:
  provisioner_url: https://##.##.##.2:8090
  vol_uuid: #####-####-####-#####
  snapshot_name: snap_vol1
  token: token
  state: present
```

Delete a volume snapshot named snap\_vol1:

```
ks_snapshot:
  provisioner_url: https://##.##.##.2:8090
  snapshot_uuid: #####-####-####-#####
  token: token
  state: absent
```

ks\_host

Deletes application initiators from the KumoScale Provisioner. If the initiator cannot be deleted, the appropriate error will be displayed.

Parameter	Expected Input	Description
provisioner_url	string (required)	The KumoScale Provisioner service URL.
host_uuid	string (required when <b>host_name</b> is not specified)	UUID for the initiator
host_name	String (required when <b>host_uuid</b> is not specified)	Name of the initiator
token	string (required)	The authentication token for the KumoScale Provisioner service.
state	string <b>absent</b> (default) (required)	The state of absent will delete the host.

Examples

Delete the initiator by specifying the UUID:

```
ks_host:
  provisioner_url: https://##.##.##.2:8090
  host_uuid: 1234567-####-####-####-#####
  token: token
  state: absent
```

Delete the initiator by specifying the initiator name:

```
ks_host:
  provisioner_url: https://##.##.##.2:8090
  host_name: my_host
  token: token
  state: absent
```

ks\_info

Gets information about KumoScale Provisioner entities (system, host, volume).

Parameter	Expected Input	Description
provisioner_url	string (required)	The KumoScale Provisioner service URL.
entity	<ul style="list-style-type: none"><li>system</li><li>host</li><li>volume</li></ul>	The name of the Provisioner entity.

Parameter	Expected Input	Description
	(required)	
token	string (required)	The authentication token for the KumoScale Provisioner service.
state	<ul style="list-style-type: none"><li>is_exist</li><li>is_used</li><li>is_mount</li></ul> (required)	The name of the state as it applies to the entity.
vol_name	string (required when <b>entity</b> =volume and <b>vol_uuid</b> is not specified)	The name of the volume.
vol_uuid	string (required when <b>entity</b> =volume and <b>vol_name</b> is not specified)	The UUID of the volume.
host_name	string (required when <b>entity</b> =host and <b>host_uuid</b> is not specified)	The name of the initiator.
host_uuid	string (required when <b>entity</b> =host and <b>host_name</b> is not specified)	The UUID of the initiator.

**Example:** Show all system information to the screen

```
ks_info:
  provisioner_url: https://##.##.##.2:8090
  entity: system
  fields: authenticationMode
```

displays

```
ok: [host-3] => {
  "msg": "Auth mode - LOCAL"
}
```

**Example:** Show name, uuid, and state of all hosts to the screen

```
ks_info:
  provisioner_url: https://##.##.##.2:8090
  entity: host
  token: token
  state: is_exist
displays
ok: [server] => {
  "msg": "Found - True"
}
```

To save the output above rather than display on the screen, use the **target\_file** parameter to save results to a file.

### ks\_publish

Publishes or unpublishes the volume to a specific initiator.

Parameter	Expected Input	Description
vol_name	String (required when vol_uuid is not specified)	The name of the volume to be (un)published.
vol_uuid	string (required when vol_name is not specified)	The UUID of the volume to be (un)published.
host	string (required)	The name of the host
provisioner_url	string (required)	The URL address of the KumoScale Provisioner service.
tenant_id	string	The tenant ID (virtual cluster).
token	string (required)	The authentication token for the KumoScale Provisioner service.

Parameter	Expected Input	Description
state	<ul style="list-style-type: none"><li>absent</li><li>present</li></ul> (required)	The state.  present: Publish the volume.  absent: Un-publish the volume.

Examples

Publish the volume called vol1 for the initiator called host1:

```
ks_publish:
  provisioner_url: https://##.##.##.2:8090
  vol_name: vol1
  host: host1
  token: token
  state: present
```

Unpublish the volume called vol1 for the initiator called host1:

```
ks_publish:
  provisioner_url: https://##.##.##.2:8090
  vol_name: vol1
  host: host1
  token: token
  state: absent
```

ks\_connect

Connect the application initiator to the volume using NVMe connect or disconnect the initiator from the volume.

Parameter	Expected Input	Description
vol_name	String  (required when <b>vol_uuid</b> is not specified)	The name of the volume that will be created.
vol_uuid	String  (required when <b>vol_name</b> is not specified)	The UUID of the volume that will be created.
provisioner_url	string  (required)	The URL address of the KumoScale Provisioner service.
host	string  (required)	The name of the application initiator.
token	string  (required)	The authentication token for the KumoScale Provisioner service.
tenant_id	string	The tenant ID (virtual cluster).
state	<ul style="list-style-type: none"><li>absent</li><li>present</li></ul> (required)	The state  present: Connect the initiator to the volume.  absent: Disconnect the initiator from the volume.

Examples

Connect a volume called vol1 to the initiator called host1

```
ks_connect:
  provisioner_url: https://##.##.##.2:8090
  vol_name: vol1
  vol_uuid: 1234e567-ff56-####-####-12345678
  token: token
  host: host1
  state: present
```

Disconnect a volume called vol1 from the initiator called host1

```
ks_connect:
  provisioner_url: https://##.##.##.2:8090
  vol_name: vol1
  vol_uuid: 1234e567-ff56-####-####-12345678
  token: token
  host: host1
  state: absent
```

ks\_mirror

Create or delete the RAID over N volumes.

Parameter	Expected Input	Description
vol_name	String  (required when <b>vol_uuid</b> is not specified)	The name of the resilient volume.
vol_uuid	String  (required when <b>vol_name</b> is not specified)	The UUID of the resilient volume.
provisioner_url	string  (required)	The URL address of the KumoScale Provisioner service.
tenant_id	string	The tenant ID (virtual cluster).
token	String  (required)	The authentication token for the KumoScale Provisioner service.
snapshot_volume	<ul style="list-style-type: none"><li><b>false</b> (default)</li><li>true</li></ul>	Indicates whether the volume is a volume of a snapshot.
readonly	<ul style="list-style-type: none"><li><b>false</b> (default)</li><li>true</li></ul>	Indicates whether the volume read-only. Relevant only to a snapshot volume.
state	<ul style="list-style-type: none"><li>absent</li><li>present</li></ul> (required)	The state.  present: Create the RAID (mdadm mirror).  absent: Break the RAID (mdadm mirror).

### Examples

For Simple MD, create a mirror on the initiator:

```
ks_mirror:
provisioner_url: https://##.##.##.2:8090
vol_name: vol1
vol_uuid: 123e4567-####-####-####-#####440000
token: token
state: present
```

For Simple MD, delete a mirror from the initiator:

```
ks_mirror:
provisioner_url: https://##.##.##.2:8090
vol_name: vol1
vol_uuid: 123e4567-####-####-####-#####440000
token: token
state: absent
```

### ks\_replica

Adds or removes a replica to a resilient volume. This function only adds the replica to the KumoScale Provisioner Service. The self-healing process, see [Maintenance and Monitoring with KumoScale Ansible](#), adds or removes it to the RAID.

Parameter	Expected Input	Description
vol_uuid	string  (required)	The UUID of the parent volume.
replica_uuid	string  (required when <b>state</b> =absent)	The UUID of the volume replica.
provisioner_url	string  (required)	KumoScale Provisioner service URL.
sameRackAllowed	<ul style="list-style-type: none"><li><b>false</b> (default)</li><li>true</li></ul>	Indicates whether or not replicas can be allocated on the same rack. Applicable to repciated volumes.
racks	list of strings	List of racks on which the volume(s) should reside.
zones	list of strings	List of zones from which the volume(s) should be accessible.
regions	list of strings	List of regions from which the volumes should be accessible.
tenant_id	string	The tenant ID (virtual cluster).

Parameter	Expected Input	Description
token	string (required)	The authentication token for the KumoScale Provisioner service.
state	<ul style="list-style-type: none"><li>present</li><li>absent</li></ul> (required)	The state.  present: Add a replica on the KumoScale Provisioner service.  absent: Delete the replica on the KumoScale Provisioner service.

Examples

Add a replica to a volume

```
ks_replica:
  provisioner_url: http://##.##.##.2:8090
  vol_uuid: 123e4567-####-####-####-#####440000
  racks: ['Rack3']
  token: token
  state: present
```

Delete a replica from a volume

```
ks_replica:
  provisioner_url: http://##.##.##.2:8090
  vol_uuid: 123e4567-####-####-####-#####440000
  replica_uuid: 9876g123-####-####-####-#####099999
  token: token
  state: absent
```

[1] Definition of capacity - KIOXIA Corporation defines a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes and a terabyte (TB) as 1,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1Gbit = 230 bits = 1,073,741,824 bits, 1GB = 230 bytes = 1,073,741,824 bytes and 1TB = 240 bytes = 1,099,511,627,776 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

Next: [KumoScale Ansible Playbooks](#)