

## Ansible Module Installation and Configuration

The following sections provide instructions for installing, configuring, and setting up the solution environment.

### Installation and Configuration Requirements

Before you begin to install and configure the KumoScale software Ansible module package confirm the following:

- The Ansible software will be installed on one of the following platforms:
  - CentOS™ 7.x.
  - CentOS 8.x.
  - Ubuntu™x with multipath disabled for the NVMe protocol. To disable multipath for the NVMe protocol:

```
echo "options nvme_core multipath=N" > /etc/modprobe.d/50-nvme_core.conf
```

- The initiator has access to both the management and the KumoScale software data
- The initiator and Ansible software have Python™x or above. Verify the installed version by running the following command:

```
python --version
```

- Ansible module package v2.9.6 is installed on a machine connected to the management port. Verify by running the following command:

```
ansible --version
```

If you need to install the latest version, enter:

```
yum install -y epel-release ansible
yum install -y ansible
```

- The initiator should have these packages installed: **mdadm**, **nvme-cli**, and **dmidecode**. If needed, you can install by entering the appropriate command for your OS:

CentOS 7.x

```
yum install dmidecode mdadm nvme-cli
```

CentOS 8.x

```
dnf install python3 dmidecode mdadm nvme-cli
```

Ubuntu 18.x

```
apt install dmidecode mdadm nvme-cli
```

- The initiator must support the NVMe-oF™ network protocol with Transmission Control Protocol (TCP) or Remote Direct Memory Access (RDMA) transport.
- The initiator NQN (NVMe Qualified Name) must be unique; each initiator must have a distinctive host NQN assigned to it under the file **/etc/nvme/hostnqn**. For example:

```
# cat /etc/nvme/hostnqn
nqn.2014.##.org.nvmeexpress:uuid:123456abcd-efg1-1234-#####
```

- The initiator name must be unique.
- KumoScale software must be configured with the masters for storage cluster and:
  - One or more groups of SSDs.
  - One or more portals using TCP or RDMA transport.

### Installation of the KumoScale Software Ansible Package

To install the Ansible package, complete the steps below:

- Confirm you meet all the requirements** listed in [Installation and Configuration Requirements](#).
- Extract the KumoScale Software Ansible package**, kumoscale-ansible-<version>.tar, containing playbooks and modules, to the current directory. For example:

```
tar -xvf kumoscale-ansible-3.22-473.tar
```

The following table lists the extracted directories and files.

Ansible Package Directories and Files

Directory or File	Description
ansible.cfg	File with custom options for running Ansible modules in addition to /etc/ansible/ansible.cfg.
COPYING	File that describes the license type and terms of use.
examples	Directory containing example Ansible playbooks.
host_support	Directory containing custom files used for running Ansible and support for NVMe modules
library	Directory containing Ansible modules.
README.txt	ReadMe first file containing information on the Ansible package.
templates	Directory containing templates used for generating ks-agent.conf.
version	Ansible package version number
wheels	Contains python packages and requirements.txt file for installing python packages with pip
wheels_p2	Contains python packages and requirements.txt file for installing python packages with pip

3. Set the initiators hosts group with target hosts locally. Edit the `/etc/ansible/hosts` file and add specific values for host name or IP address to the initiators group as shown below:

```
#hosts
[initiators]
host1_name
host2_name
host3_name
<host4 IP address>
<host5 IP address>
```

4. **Modify the variables file.** Update the variables file located at `examples/yml` according to your environment and required configuration. The next step will use the values of the following for installation verification:

For Local authorization mode

- `provisioner_url`
- `token_url`

For OPEN IDC authorization mode

- `provisioner_url`
- `client_id`
- `client_secret`
- `client_scope`
- `token_url`

See [Ansible Variable File](#) for details on the variables.

5. **Prepare the initiator** using theyml playbook. The playbook will prepare the initiator for using Ansible modules and install the **ks-agent** software. There are two ways to run the playbook:

To install the software on all hosts in the host group listed in step 3:

```
ansible-playbook -v install_host.yml
```

To install the software on a single initiator:

```
ansible-playbook -v install_host.yml --limit <HOST NAME>
```

The installation will complete the following tasks:

- Verify the initiator host name according to agent requirements.
- Verify the connection to the KumoScale Provisioner
- Verify the version of Python version and select the corresponding Python tool.
- Verify that the environment (operating system, dependency packages, kernel modules) is compatible with the installation playbook requirements. If not, the installation will terminate with errors showing the reason and missing component.
- Install Python packages, copy files required for KumoScale and NVMe (ssdtoolbox.pem, rc.modules)
- Install the agent rpm or deb.
- Update relevant authentication parameters in agent.conf with values from vars.yml. Under
  - Local authorization mode
    - `provisioner_url`
    - `token_url`
  - OPEN IDC authorization mode
    - `provisioner_url`
    - `client_id`
    - `client_secret`
    - `client_scope`

- `token_url`
- Restart the service.

### Uninstalling the KumoScale Agent

If needed, you can uninstall the KumoScale agent from an initiator using the `uninstall_host` playbook.

```
ansible-playbook -v uninstall_host.yml
```

### Replacing the Ansible Truststore

To replace the key used with Ansible with your own:

1. Create your own Privacy Enhanced Mail (PEM) file as detailed in the KumoScale User Guide. Give it the name **pem**.
2. Replace the existing file in `/etc/ssl/certs/ssdtoolbox.pem` with your own pem file of the same name created in step 1.

Next: [KumoScale Ansible Modules](#)

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