## Ceph Cluster Deployment Guide (Step-by-Step)

### Project Structure

Your working directory structure:

ceph-cluster-deploy/

├── inventory.ini

├── site.yml

└── roles/

├── common/ # System prep

├── docker/ # Container engine setup

├── cephadm/ # Cephadm install & GPG key

├── bootstrap/ # MON & MGR initialization

├── addhosts/ # /etc/hosts propagation

├── mgrs/ # Additional MGRs

├── osds/ # Disk prep & OSD injection

├── dashboards/ # Ceph dashboard setup

├── monitoring/ # Prometheus / Grafana

├── ceph\_post/ # Post-deploy checks

└── finalize/ # Export info / wrap-up

### Step 1: Inventory & SSH Setup

Create/edit inventory.ini:

[ceph\_nodes]

controller1 ansible\_host=172.168.3.11

controller2 ansible\_host=172.168.3.12

controller3 ansible\_host=172.168.3.13

[ceph\_nodes:vars]

ansible\_user=root

ansible\_ssh\_private\_key\_file=~/.ssh/id\_rsa

Make sure passwordless SSH access from controller1 to all others is configured using that SSH key.

### Step 2: Run Common Role

Prepare hosts with packages, kernel params, and network settings:

ansible-playbook -i inventory.ini site.yml --tags common

### Step 3: Set Up Docker Runtime

Installs Docker or Podman and validates container functionality:

ansible-playbook -i inventory.ini site.yml --tags docker

### Step 4: Install Cephadm and Ceph GPG Key

Installs the cephadm binary, adds GPG key, and prepares for bootstrapping:

ansible-playbook -i inventory.ini site.yml --tags cephadm

### Step 5: Bootstrap Monitor and First MGR

Bootstraps a new Ceph cluster on your MON node (controller1):

ansible-playbook -i inventory.ini site.yml --tags bootstrap

Post-run, verify:

ceph -s

Expected output: 1 mon, 1 mgr, cluster status HEALTH\_OK or HEALTH\_WARN.

### Step 6: Propagate /etc/hosts (Optional but Helpful)

This ensures node names resolve correctly cluster-wide:

ansible-playbook -i inventory.ini site.yml --tags addhosts

### Step 7: Deploy Additional MGRs (Optional but Recommended for HA)

Adds additional mgr daemons on non-bootstrap controllers:

ansible-playbook -i inventory.ini site.yml --tags mgrs

### Step 8: Prepare & Add OSD Disks

Manually wipe your intended OSD drives on each node:

lsblk # identify disks

wipefs -a /dev/sdX

Then run:

ansible-playbook -i inventory.ini site.yml --tags osds

### Step 9: Enable the Ceph Dashboard

Set up the web UI and expose it securely:

ansible-playbook -i inventory.ini site.yml --tags dashboards

Then access it at:

https://<controller1-IP>:8443/

You’ll need the password in roles/dashboards/tasks/ceph-dashboard-pass.txt.

### Step 10: Install Monitoring Suite

Installs Prometheus, Alertmanager, and Grafana:

ansible-playbook -i inventory.ini site.yml --tags monitoring

### Step 11: Run Post-Deployment Health Checks

Validates cluster health, OSD pool layout, etc:

ansible-playbook -i inventory.ini site.yml --tags ceph\_post

### Step 12: Finalize Setup

Exports cluster info, ceph.conf, keys, and endpoints:

ansible-playbook -i inventory.ini site.yml --tags finalize

## Verification Checklist

You can run these any time to inspect your cluster:

ceph -s

ceph orch host ls

ceph osd tree

ceph df