Red Hat OpenShift Container Platform
On Oracle Database Appliance

Deployment Guide

17 March 2026, Version 1.47

Contents

1. Introduction

Red Hat OpenShift Container Platform is an enterprise-grade Kubernetes distribution designed to automate the deployment, scaling, and lifecycle management of containerized applications across hybrid and multi-cloud environments. Its built-in operational tooling and developer productivity enhancements make it a preferred platform for modern application workloads.

The **Red Hat OpenShift Assisted Installer**—delivered through the Red Hat Hybrid Cloud Console—provides a simplified, guided workflow for provisioning clusters. It supports Single Node OpenShift (SNO) as well as Highly Available (HA) multi-node clusters. It eliminates the need for a dedicated bootstrap node by leveraging the control plane nodes for cluster initialization.

The **Oracle Database Appliance (ODA)** is an engineered system optimized to deliver superior Oracle Database performance, availability, and simplicity. With built-in virtualization (KVM) capabilities, ODA can also host application VMs—including Red Hat OpenShift control plane and worker nodes—alongside database workloads. However, Oracle databases must be deployed on ODA using its native DB systems and must not be hosted within the OpenShift cluster.

Many Oracle Database customers already run Red Hat OpenShift for their application workloads. ODA is now a validated platform for OpenShift, joining OCI, C3, and Oracle Private Cloud Appliance (PCA) as part of Oracle's consistent hybrid cloud containerization story. This means customers can run the same containerized application workloads, using identical container images, tooling, and operational practices across any of these environments.

The primary value for existing ODA customers is consolidation. If your ODA has available CPU, memory, or SSD capacity beyond what your Oracle Database workloads currently consume, you can now use that spare capacity to run OpenShift. There is no need for a separate application server. This delivers:

- **Lower latency**: applications run on the same hardware as the database, eliminating network roundtrips for data-intensive operations
- **Better resource utilization**: unused ODA capacity is put to work rather than sitting idle
- **Operational consistency**: customers who already use OpenShift elsewhere bring their existing licenses, skills, and tooling to ODA without learning a new platform

Deployment model covered in this guide:
This guide covers **Single Node OpenShift (SNO)**, a self-contained cluster where the control plane and application layers run on a single ODA. This is the validated configuration and is fully production-supported by Red Hat. It is well-suited for edge sites, remote locations, or environments where the application itself provides its own redundancy.

This guide details the end-to-end process of deploying **OpenShift Container Platform** on **Oracle Database Appliance X10/X11**.

1.1. Recommended Oracle Database Appliance Configuration for Red Hat OpenShift

1.1.1. Oracle Database Appliance (ODA) Requirements

- **Model**: X10 or X11 (Single Node)
- **Memory**: Minimum 512 GB
- **CPU**: All cores enabled (64 cores)
- **ODA Release Version**: 19.28 or later

1.1.2. Storage Requirements

- **VM Storage:** Minimum 1 TB for vmstorage to host Application KVMs (control plane and worker nodes)

1.1.3. OpenShift Cluster Deployment

Node Type	Count	vCPU	Memory	Disk
Control Plane	3	20	24 GB	200 GB
Worker Node	3	16	24 GB	200 GB

- This is a Red Hat requirement based on observed cluster behavior during validation. A minimum of 20 vCPUs per control plane node provides the headroom needed for reliable cluster management. Worker node CPU requirements are entirely dependent on the application workload and can be adjusted up or down accordingly. The values in the table above are reference sizing, not fixed requirements.

1.1.4. Deployment Options

This technical brief focuses on a single-node deployment; however, the same Assisted Installer workflow applies to multi-node deployments.

- Single-node deployment
  - Deploy all control plane and worker components on a single-node Oracle Database Appliance (ODA), or on a single node within an ODA HA system.
- Multi-node deployment
  - Minimum footprint: three single-node ODAs.
  - Control plane and worker nodes are distributed across the physical machines.
  - Each control plane node must be deployed on a separate single-node ODA.
  - Ensure etcd performance and sizing meet minimum requirements.
  - Reference: https://www.redhat.com/en/blog/a-guide-to-etcd
- Hybrid deployment
  - Add ODA capacity to an existing OpenShift cluster running on a different platform.
  - The existing OpenShift cluster must be deployed using a platform-agnostic (“**Any Platform**”) installation method.

- Reference: https://docs.redhat.com/en/documentation/openshift_container_platform/4.21/html/installing_on_any_platform/index

1.1.5. Additional Recommendations:

- Use **dedicated CPU pools** for each VM to ensure predictable performance.
- Recommendation for multi-node deployments: Use external DHCP, DNS, and load balancer services.

1.1.6. Supported Workloads

- OpenShift on ODA is intended for containerized non-database application workloads running alongside the native Oracle Database.
- **Supported:**
  - Containerized application workloads (APIs, microservices, middleware, web tiers, etc.)
  - Any application that would ordinarily run in a customer's existing OpenShift cluster
- **Not supported:**
  - Running Oracle Databases inside the OpenShift cluster or in containers. Oracle Databases on ODA must be deployed using ODA's native DB system management (odacli / BUI). Databases in containers are not supported for production use.
- **Note:** ODA's native KVM-based application VM capability remains available alongside OpenShift. OpenShift is an additional option, not a replacement for direct KVM application VMs.

1.2. Additional Prerequisites

- A Red Hat account with an active OpenShift subscription
- Internet connectivity for downloading images and accessing Red Hat services
- Installation of DHCP, DNS, and HAProxy if using ODA-local infrastructure

Note: Before ODA patching, remove any manually installed system packages (DHCP, DNS, HAProxy) if flagged by the pre-patch report. Removing these services will disrupt OpenShift cluster functionality—plan maintenance windows accordingly. After patching is complete, re-add the removed packages to restore required services.

1.3. Modifying resources for Control Plane and Worker nodes

OpenShift nodes run as KVM guests inside ODA. Resources such as CPU, memory, virtual disks, and network interfaces must be configured through:

- odacli modify-vm commands
- ODA Browser User Interface (BUI)

Note: Refer to the ODA documentation for detailed usag

2. Pre-deployment tasks

Note: Perform the following steps on bare metal layer.

2.1. Add all Control Plane and Worker nodes to /etc/hosts file

```
# cat /etc/hosts

127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6
127.0.0.1 oak0
10.10.60.77 oda.example.com
192.168.16.24 oda-priv.example.comoda-priv dcs0-priv

10.10.60.123        oda-os01.example.com        api.ocp1.example.com        api-int.ocp1.example.com
*.apps.ocp1.example.com

# Master Nodes (Control Plane)
10.10.60.125   oda-os03.example.com
10.10.60.126   oda-os04.example.com
10.10.60.127   oda-os05.example.com

# Worker Nodes
10.10.60.128    oda-os06.example.com
10.10.60.129    oda-os07.example.com
10.10.60.130    oda-os08.example.com
```

2.2. HAProxy Configuration for Load Balancer

The example below demonstrates a load balancer configuration running on the ODA.

Install haproxy package if there is no external load balancer.

```
# dnf install -y haproxy
```

```
# cat /etc/haproxy/haproxy.cfg

global
   log 127.0.0.1:514 local0
   maxconn 2000
defaults
   log global
   mode tcp
   timeout connect 10s
   timeout client 1m
   timeout server 1m
   retries 3
```

```
# API Server Load Balancer (Port 6443)
frontend api_frontend
   bind 10.10.60.123:6443
   default_backend api_backend
backend api_backend
   balance roundrobin
   option tcp-check
   default-server check inter 10s fall 3 rise 2
   server oda-os03 10.10.60.125:6443 check
   server oda-os04 10.10.60.126:6443 check
   server oda-os05 10.10.60.127:6443 check

# Machine Config Server (Port 22623)
frontend mcs_frontend
   bind 10.10.60.123:22623
   default_backend mcs_backend
backend mcs_backend
   balance roundrobin
   option tcp-check
   default-server check inter 10s fall 3 rise 2
   server oda-os03 10.10.60.125:22623 check
   server oda-os04 10.10.60.126:22623 check
   server oda-os05 10.10.60.127:22623 check
# Ingress Load Balancer (80)
frontend ingress_http_frontend
   bind 10.10.60.123:80
   mode tcp
   default_backend ingress_http_backend
backend ingress_http_backend
   mode tcp
   balance roundrobin
   default-server check inter 10s fall 3 rise 2
   server oda-os06 10.10.60.128:80 check
   server oda-os07 10.10.60.129:80 check
   server oda-os08 10.10.60.130:80 check
# Ingress Load Balancer (443)
frontend ingress_https_frontend
   bind 10.10.60.123:443
   mode tcp
   default_backend ingress_https_backend

backend ingress_https_backend
   mode tcp
   balance roundrobin
   default-server check inter 10s fall 3 rise 2
   server oda-os06 10.10.60.128:443 check
   server oda-os07 10.10.60.129:443 check
   server oda-os08 10.10.60.130:443 check
```

Enable and start haproxy

```
# systemctl enable haproxy
# systemctl start haproxy
# systemctl status haproxy
```

2.3. DHCP Configuration

The example below demonstrates a DHCP configuration running on the ODA.

Install DHCP server package

```
# dnf install -y dhcp-server
```

Configure DHCP server with static reservations for all VMs.

```
# cat /etc/dhcp/dhcpd.conf
authoritative;
ddns-update-style interim;
allow booting;
allow bootp;
allow unknown-clients;
ignore client-updates;
default-lease-time 14400;
max-lease-time 14400;
subnet 10.10.60.0 netmask 255.255.252.0 {
 option routers                  10.10.60.1; # lan
 option subnet-mask              255.255.252.0;
 option domain-name              "example.com";
 option domain-name-servers      10.10.60.77;
 range 10.10.60.123 10.10.60.138;
}
host oda-os03 {
 hardware ethernet 52:54:00:ad:2b:57;
 fixed-address 10.10.60.125;
}
host oda-os04 {
 hardware ethernet 52:54:00:f6:89:5a;
 fixed-address 10.10.60.126;
}
host oda-os05 {
 hardware ethernet 52:54:00:9d:a2:d4;
 fixed-address 10.10.60.127;
}

host oda-os06 {
 hardware ethernet 52:54:00:b5:9f:20;
 fixed-address 10.10.60.128;
}
```

```
host oda-os07 {
 hardware ethernet 52:54:00:33:c5:d2;
 fixed-address 10.10.60.129;
}
host oda-os08 {
 hardware ethernet 52:54:00:1a:6e:e2;
 fixed-address 10.10.60.130;
}
```

```
# systemctl stop dhcpd
```

Important: Do not restart DHCP until all VMs have been created and MAC addresses updated.

2.4. Configure DNS server

Install BIND packages:
```
# dnf install -y bind bind-utils
```

Configure:

- Forward lookup zone
- Reverse lookup zone
- API and ingress endpoints

Ensure:

- All A and PTR records match the OpenShift Assisted Installer configuration.
- DNS resolves both forward and reverse for every node.

```
# cat /etc/named.conf
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
// See the BIND Administrator's Reference Manual (ARM) for details about the
// configuration located in /usr/share/doc/bind-{version}/Bv9ARM.html

options {
        listen-on port 53 { 127.0.0.1; 10.10.60.77; };
#       listen-on-v6 port 53 { ::1; };
        directory       "/var/named";
        dump-file       "/var/named/data/cache_dump.db";
        statistics-file "/var/named/data/named_stats.txt";
        memstatistics-file "/var/named/data/named_mem_stats.txt";
        recursing-file  "/var/named/data/named.recursing";
        secroots-file   "/var/named/data/named.secroots";
        allow-query     { localhost; 10.10.60.0/22; };

        /*
         - If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.
         - If you are building a RECURSIVE (caching) DNS server, you need to enable
           recursion.
         - If your recursive DNS server has a public IP address, you MUST enable access
           control to limit queries to your legitimate users. Failing to do so will
           cause your server to become part of large scale DNS amplification
           attacks. Implementing BCP38 within your network would greatly
           reduce such attack surface
        */
        recursion yes;

        dnssec-enable yes;
        dnssec-validation no;

        # Using Google DNS
        forwarders {
         10.10.0.4;
        };

        /* Path to ISC DLV key */
        bindkeys-file "/etc/named.root.key";

        managed-keys-directory "/var/named/dynamic";

        pid-file "/run/named/named.pid";
        session-keyfile "/run/named/session.key";
};

logging {
    channel default_debug {
         file "data/named.run";
         severity dynamic;
    };
};

zone "." IN {
        type hint;
        file "named.ca";
};

# Include ocp zones

zone "example.com" {
  type master;
  file "/etc/named/zones/db.example.com"; # zone file path
};

#zone "211-212.91.10.in-addr.arpa" IN {
#    type master;
#    file "/etc/named/zones/10.91.211-212.rev";
#    allow-update { none; };
#};

zone "60.10.10.in-addr.arpa" {
  type master;
  file "/etc/named/zones/db.reverse";
};
```

```
include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
```

2.4.1. Set up reverse DNS resolution

```
# cat /etc/named/zones/db.reverse

$TTL 1W
@       IN      SOA     ns1.example.com.        root (
                        2019070701      ; serial
                        3H              ; refresh (3 hours)
                        30M             ; retry (30 minutes)
                        2W              ; expiry (2 weeks)
                        1W )            ; minimum (1 week)
        IN      NS      ns1.example.com.
;
; -----------------------------------------------------
; Load Balancer & API Endpoints  (10.91.211.249)
; -----------------------------------------------------
123    IN     PTR    lb.ocp1.example.com.
123    IN     PTR    api.ocp1.example.com.
123    IN     PTR    api-int.ocp1.example.com.
124    IN     PTR    ingress.ocp1.example.com.
; -----------------------------------------------------
; Control Plane Nodes
; -----------------------------------------------------
125    IN     PTR    oda-os03.example.com.
126    IN     PTR    oda-os04.example.com.
127    IN     PTR    oda-os05.example.com.
; -----------------------------------------------------
; Worker Nodes
; -----------------------------------------------------
128    IN     PTR    oda-os06.example.com.
129    IN     PTR    oda-os07.example.com.
130    IN     PTR    oda-os08.example.com.
```

2.4.2. Set up DNS resolution

```
# cat db.example.com

$TTL    604800
@       IN      SOA     lb.ocp1.example.com. contact.ocp1.example.com. (
                3     ; Serial (Increment every change)
           604800     ; Refresh
            86400     ; Retry
          2419200     ; Expire
```

```
        604800     ; Minimum
)
       IN      NS      lb.ocp1.example.com.
ingress.ocp1.example.com.     IN      A       10.10.60.124
lb.ocp1.example.com.          IN      A       10.10.60.123
; Control Plane Nodes
oda-os03.example.com.        IN      A       10.10.60.125
oda-os04.example.com.        IN      A       10.10.60.126
oda-os05.example.com.        IN      A       10.10.60.127
; Worker Nodes
oda-os06.example.com.        IN      A       10.10.60.128
oda-os07.example.com.        IN      A       10.10.60.129
oda-os08.example.com.        IN      A       10.10.60.130
; OpenShift Internal - Load balancer
api.ocp1.example.com.       IN    A    10.10.60.123
api-int.ocp1.example.com.    IN    A    10.10.60.123
*.apps.ocp1.example.com.     IN    A    10.10.60.123
oauth-openshift.apps.ocp1.example.com.             IN     A     10.10.60.123
console-openshift-console.apps.ocp1.example.com.     IN     A     10.10.60.123
```

2.5. Configure resolv.conf for name resolution

This step is necessary only if a local DNS server is being used for the OpenShift deployment. If not, the DNS server specified in resolv.conf was already configured during the initial ODA deployment.

```
# cat /etc/resolv.conf

search example.com
nameserver 10.10.60.77
```

3. Deploying OpenShift on ODA

3.1. Create vmstorage for the VM guests

```
# odacli create-vmstorage -n kvmvmstore -s 2T -dg DATA
```

3.2. Create dedicated CPU pools for all nodes

Each node gets its own CPU pool to ensure resource isolation and predictable performance. Control plane nodes are allocated more vCPUs than worker nodes because the OpenShift control plane requires a reliable resource floor to maintain cluster stability, see Section 1.3.3 for details.

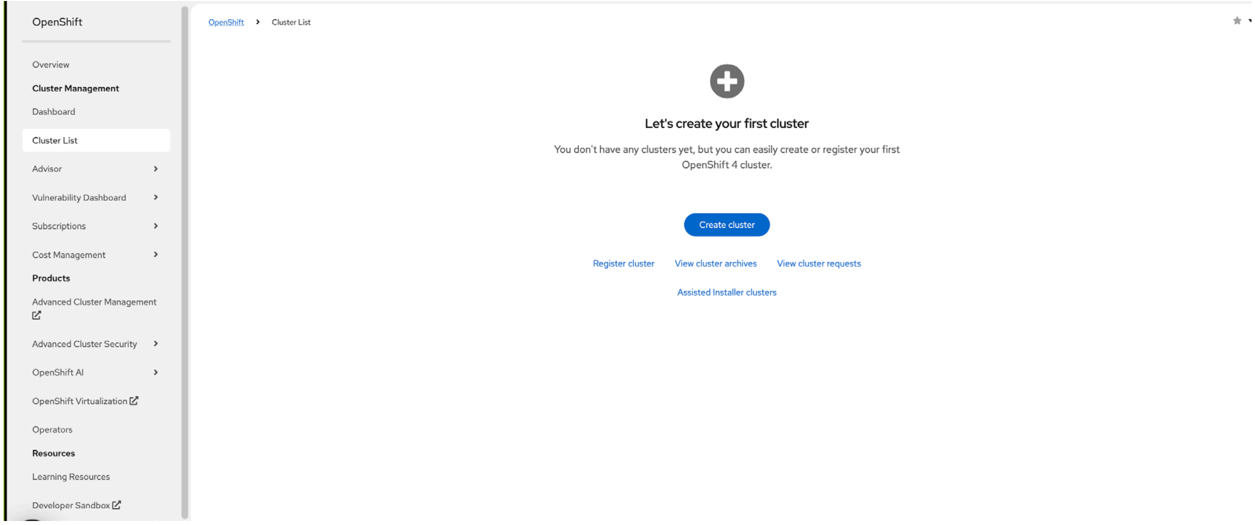
```
# odacli create-cpupool -c 10 -vm -n controlplane1
# odacli create-cpupool -c 10 -vm -n controlplane2
# odacli create-cpupool -c 10 -vm -n controlplane3
```

```
# odacli create-cpupool -c 8 -vm -n worker1
# odacli create-cpupool -c 8 -vm -n worker2
# odacli create-cpupool -c 8 -vm -n worker3
```

Note: The CPU pool sizes above reflect the minimum validated configuration. Worker pool sizes should be adjusted based on your application workload requirements.

3.3. Setup OpenShift Cluster using OpenShift Console

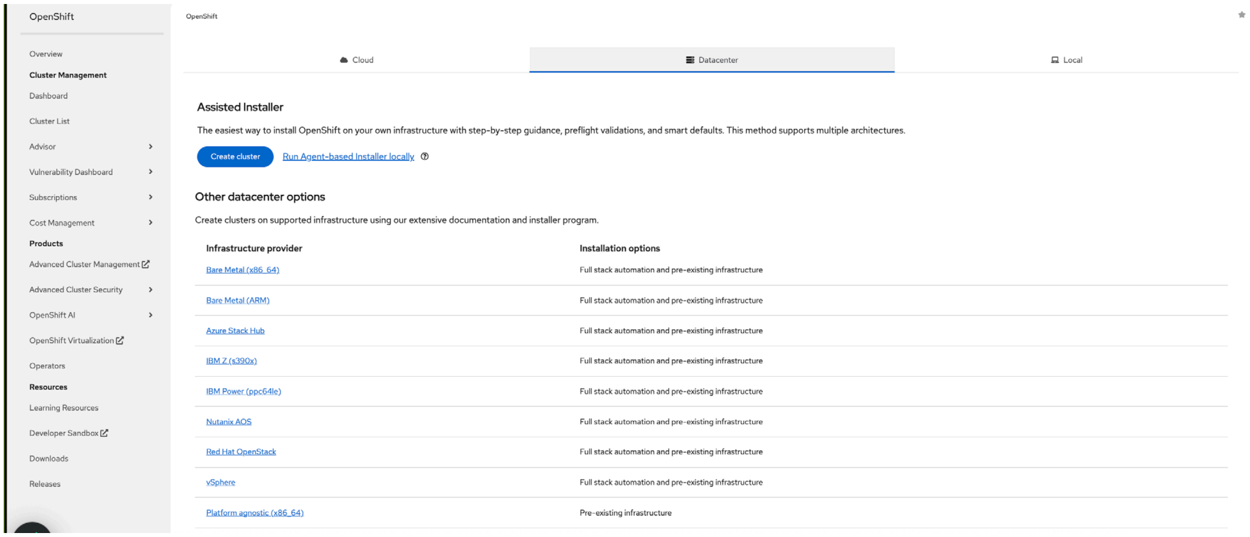
Log in to the Red Hat Hybrid Cloud Console.
https://console.redhat.com/openshift/cluster-list



Let's create your first cluster

You don't have any clusters yet, but you can easily create or register your first OpenShift 4 cluster.

Navigate to Assisted Installer → Create Cluster.



Assisted Installer

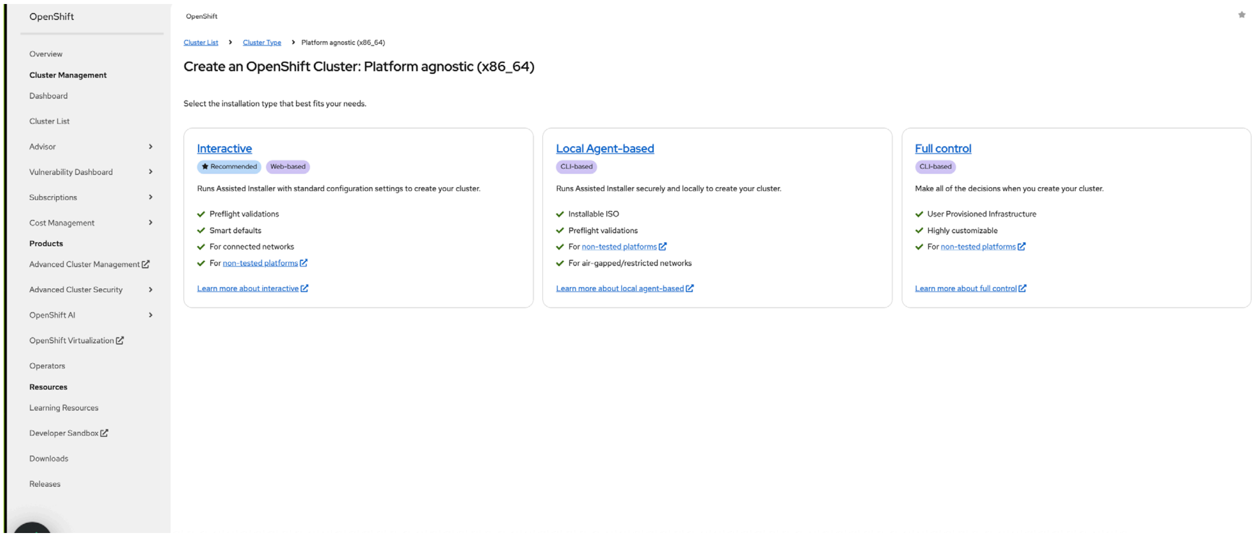
The easiest way to install OpenShift on your own infrastructure with step-by-step guidance, preflight validations, and smart defaults. This method supports multiple architectures.

Run Agent-based Installer locally

Other datacenter options

Create clusters on supported infrastructure using our extensive documentation and installer program.

Infrastructure provider	Installation options
Bare Metal (x86_64)	Full stack automation and pre-existing infrastructure
Bare Metal (ARM)	Full stack automation and pre-existing infrastructure
Azure Stack Hub	Full stack automation and pre-existing infrastructure
IBM Z (s390x)	Full stack automation and pre-existing infrastructure
IBM Power (ppc64le)	Full stack automation and pre-existing infrastructure
Nutanix AOS	Full stack automation and pre-existing infrastructure
Red Hat OpenStack	Full stack automation and pre-existing infrastructure
vSphere	Full stack automation and pre-existing infrastructure
Platform agnostic (x86_64)	Pre-existing infrastructure



Create an OpenShift Cluster: Platform agnostic (x86_64)

Select the installation type that best fits your needs.

Interactive

★ Recommended | Web-based

Runs Assisted Installer with standard configuration settings to create your cluster.

- ✓ Preflight validations
- ✓ Smart defaults
- ✓ For connected networks
- ✓ For non-tested platforms

Learn more about interactive

Local Agent-based

CLI-based

Runs Assisted Installer securely and locally to create your cluster.

- ✓ Installable ISO
- ✓ Preflight validations
- ✓ For non-tested platforms
- ✓ For air-gapped/restricted networks

Learn more about local agent-based

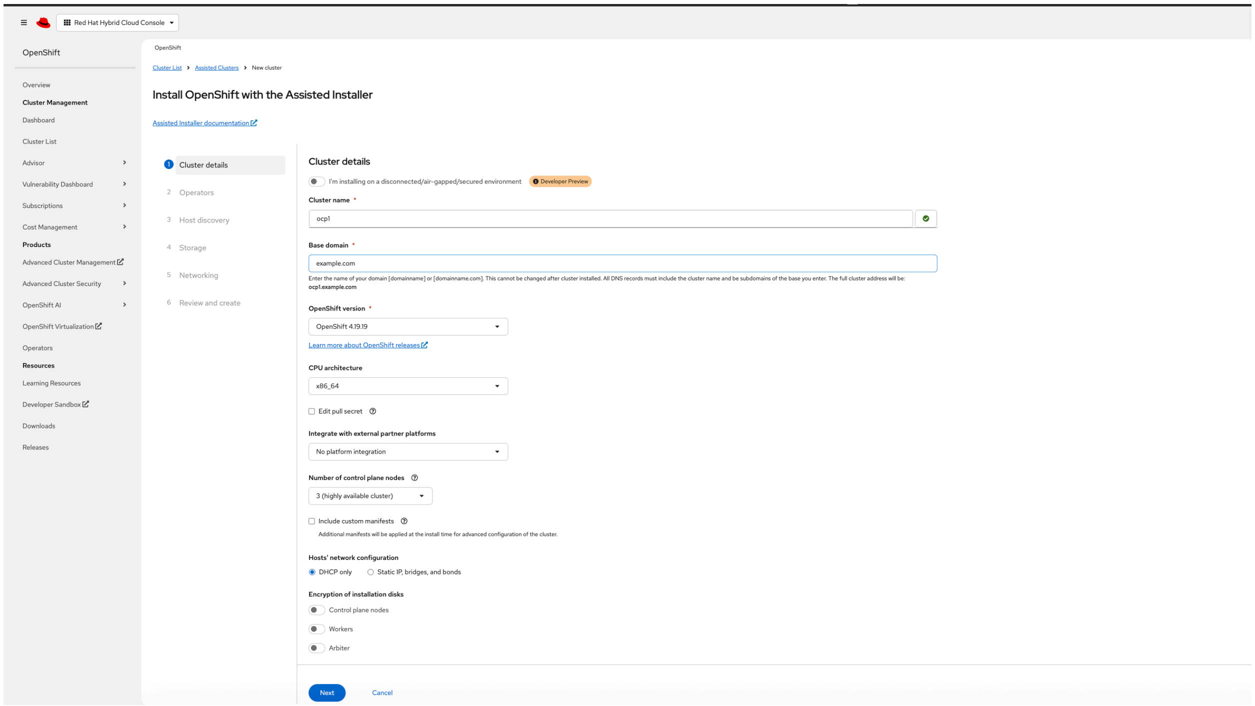
Full control

CLI-based

Make all of the decisions when you create your cluster.

- ✓ User Provisioned Infrastructure
- ✓ Highly customizable
- ✓ For non-tested platforms

Learn more about full control



Install OpenShift with the Assisted Installer

Assisted Installer documentation

1 Cluster details
2 Operators
3 Host discovery
4 Storage
5 Networking
6 Review and create

Cluster details

○ I'm installing on a disconnected/air-gapped/secured environment   Developer Preview

Cluster name *

ocp1 ✓

Base domain *

example.com

Enter the name of your domain [domainname] or [domainname.com]. This cannot be changed after cluster installed. All DNS records must include the cluster name and be subdomains of the base you enter. The full cluster address will be: **ocp1.example.com**

OpenShift version *

OpenShift 4.19.19

Learn more about OpenShift releases

CPU architecture

x86_64

□ Edit pull secret

Integrate with external partner platforms

No platform integration

Number of control plane nodes

3 (highly available cluster)

□ Include custom manifests

Additional manifests will be applied at the install time for advanced configuration of the cluster.

Hosts' network configuration

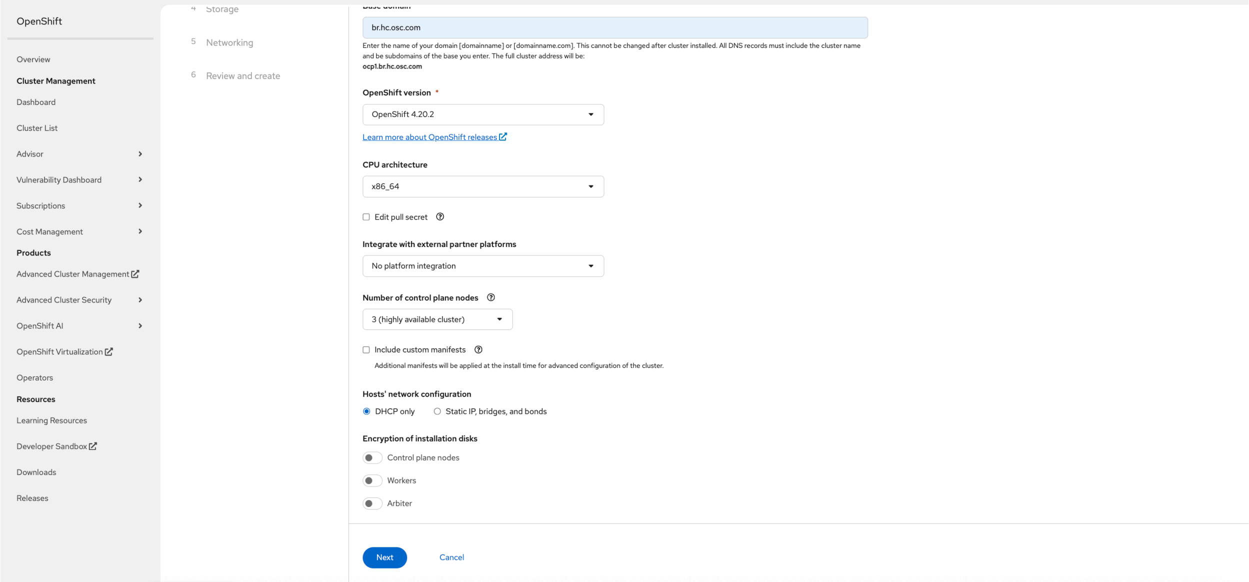
● DHCP only   ○ Static IP, bridges, and bonds

Encryption of installation disks

○ Control plane nodes

○ Workers

○ Arbiter



Base domain

br.hc.osc.com

Enter the name of your domain [domainname] or [domainname.com]. This cannot be changed after cluster installed. All DNS records must include the cluster name and be subdomains of the base you enter. The full cluster address will be: **ocp1.br.hc.osc.com**

OpenShift version *

OpenShift 4.20.2

Learn more about OpenShift releases

CPU architecture

x86_64

□ Edit pull secret

Integrate with external partner platforms

No platform integration

Number of control plane nodes

3 (highly available cluster)

□ Include custom manifests

Additional manifests will be applied at the install time for advanced configuration of the cluster.

Hosts' network configuration

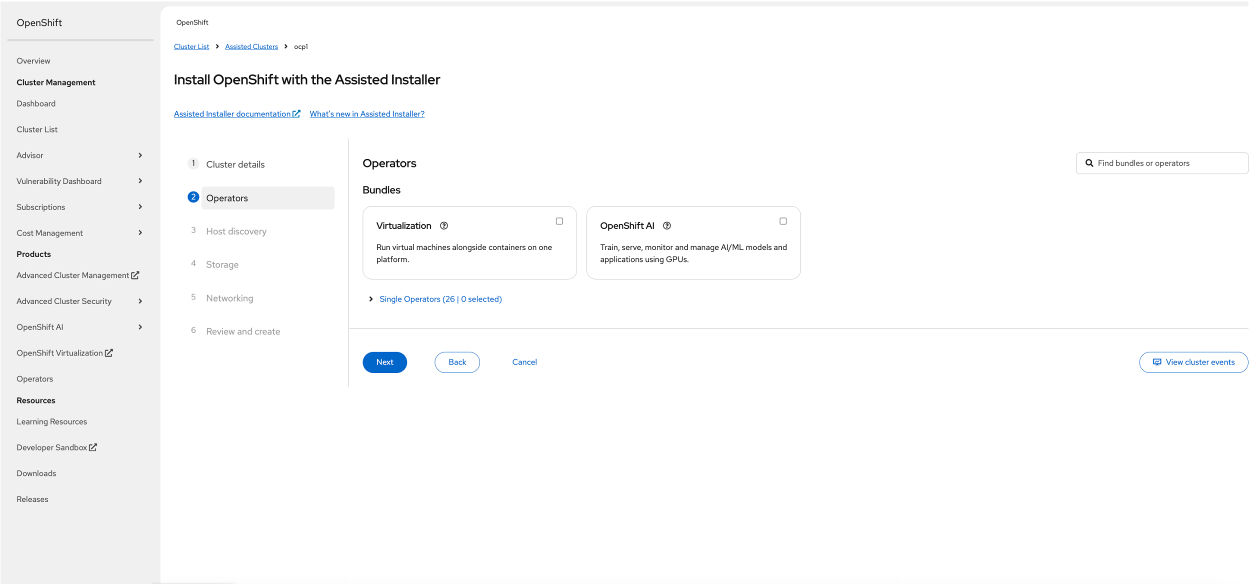
● DHCP only   ○ Static IP, bridges, and bonds

Encryption of installation disks

○ Control plane nodes

○ Workers

○ Arbiter



Install OpenShift with the Assisted Installer

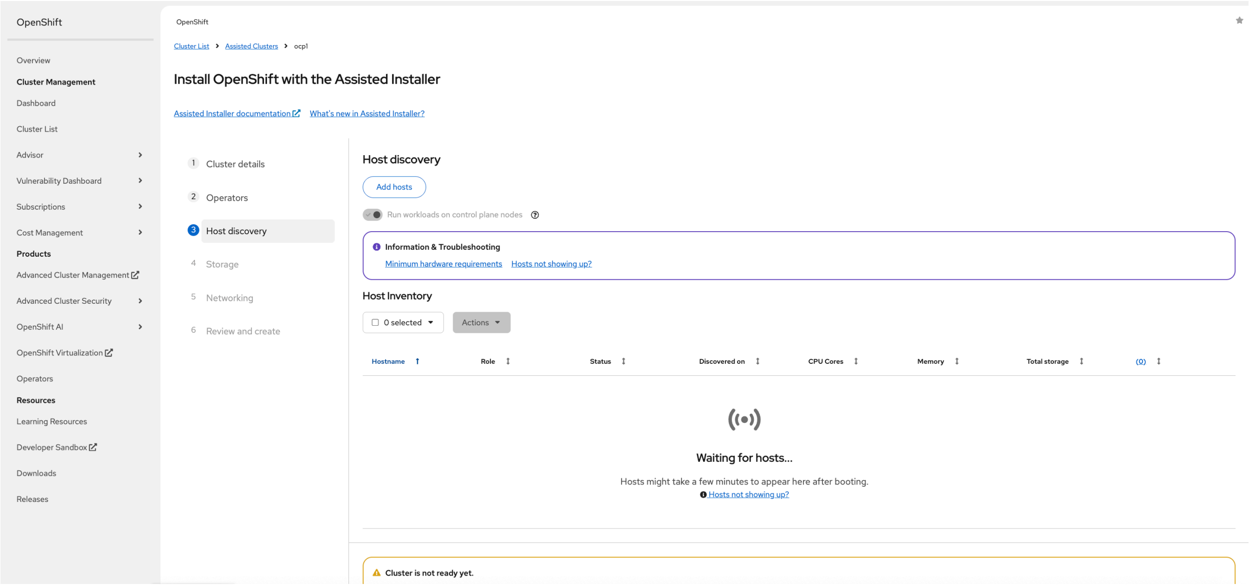
Operators

Bundles

□ Virtualization: Run virtual machines alongside containers on one platform.

□ OpenShift AI: Train, serve, monitor and manage AI/ML models and applications using GPUs.

Single Operators (26 | 0 selected)



Install OpenShift with the Assisted Installer

Host discovery

Run workloads on control plane nodes

Information & Troubleshooting: Minimum hardware requirements | Hosts not showing up?

Host Inventory

Hostname	Role	Status	Discovered on	CPU Cores	Memory	Total storage	(0)

Waiting for hosts...

Hosts might take a few minutes to appear here after booting.

Hosts not showing up?

Cluster is not ready yet.

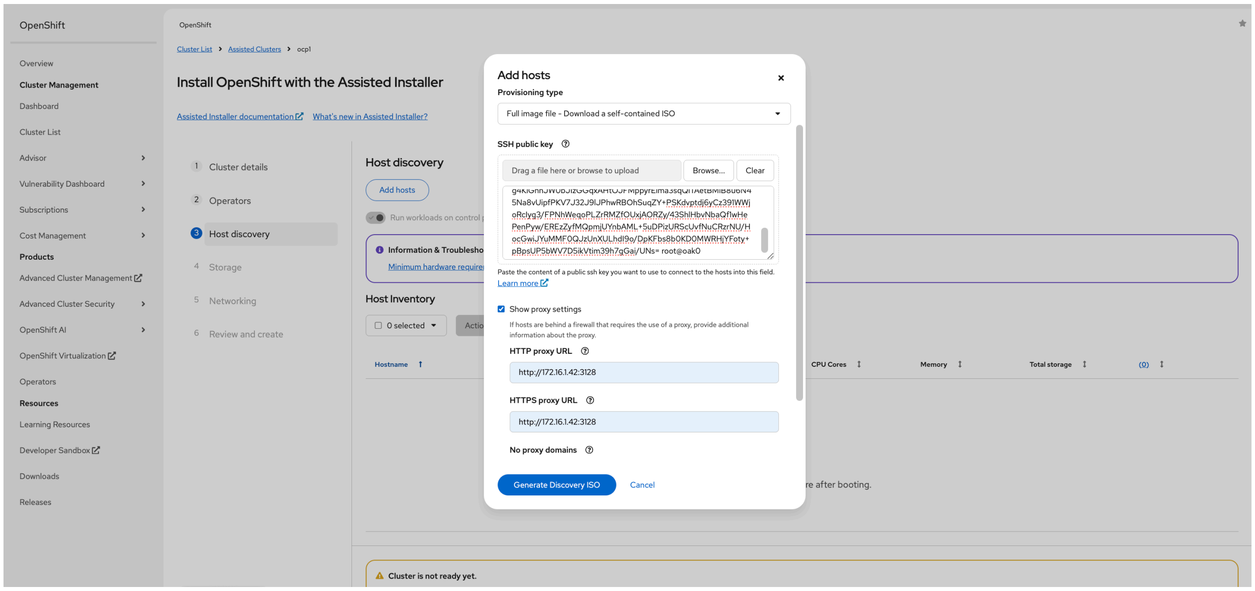
Generate an SSH key and create a backup copy to ensure it is safely preserved.

```
# ssh-keygen -b 2048 -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
.our identification has been saved in
.pub.public key has been saved in
The key fingerprint is:
SHA256:SUzkQcyB+gG3qeSYT+LRL+ZbrOe8Xe4pql+OhYrad5s root@oda.example.com

The key's randomart image is:
+---[RSA 2048]----+
|      **.       |
|   . o+o.      |
|    + o+       |
|   o +. .      |
|  * o .S       |
| =.=..         |
| ..=..o.  .    |
|.o.o===o.o .   |
|= o=BOEo.o+    |

+----[SHA256]-----+
```

Upload SSH key.



Add hosts

Provisioning type: Full image file - Download a self-contained ISO

SSH public key

```
5Na8vUipfPKV7J32J9lJPhwRBOhSuqZY+PSKdvptdj6yCz391WWj
oRclyg3/FPNhWeqoPLZrRMZfOUxjAORZy/43ShlHbvNbaQf1wHe
PenPyw/EREzZyfMQpmjUYnbAML+5uDPizURScUvfNuCRzrNU/H
ocGwiJYuMMF0QJzUnXULhdl9o/DpKFbs8b0KD0MWRHjYFoty+
pBpsUP5bWV7D5ikVtim39h7gGai/UNs= root@oak0
```

Paste the content of a public ssh key you want to use to connect to the hosts into this field.

☑ Show proxy settings

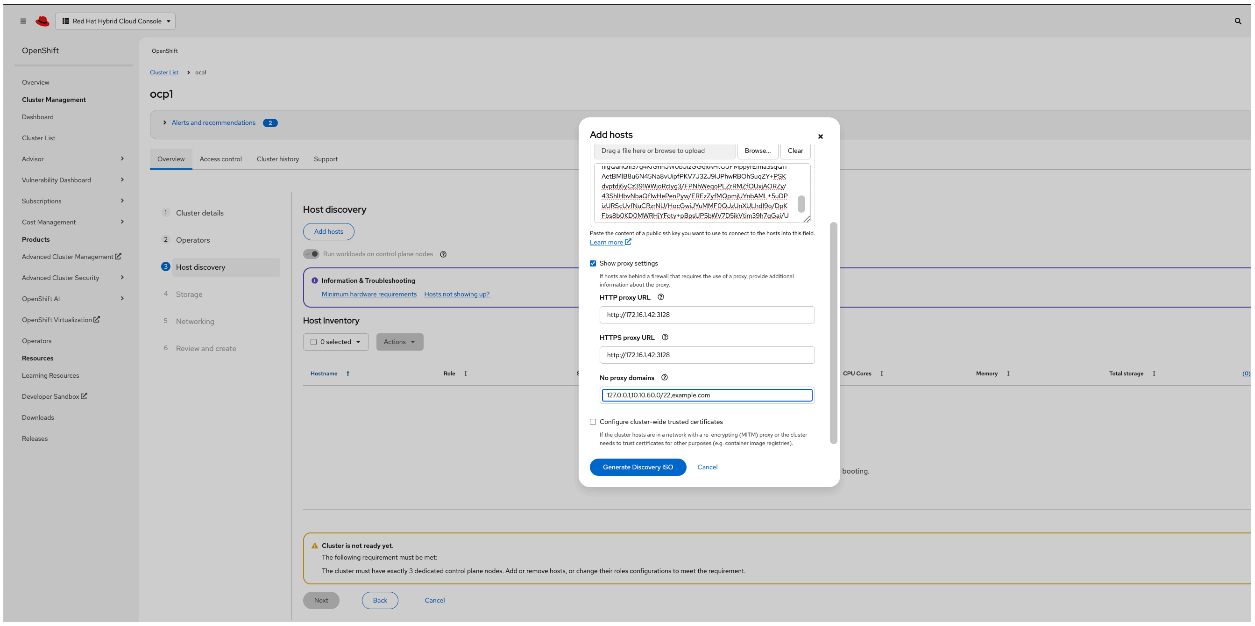
If hosts are behind a firewall that requires the use of a proxy, provide additional information about the proxy.

HTTP proxy URL: http://172.16.1.42:3128

HTTPS proxy URL: http://172.16.1.42:3128

No proxy domains

Cluster is not ready yet.



Add hosts

```
AetBMlB8u6N45Na8vUipfPKV7J32J9lJPhwRBOhSuqZY+PSK
dvptdj6yCz391WWjoRclyg3/FPNhWeqoPLZrRMZfOUxjAORZy/
43ShlHbvNbaQf1wHePenPyw/EREzZyfMQpmjUYnbAML+5uDP
izURScUvfNuCRzrNU/HocGwiJYuMMF0QJzUnXULhdl9o/DpK
Fbs8b0KD0MWRHjYFoty+pBpsUP5bWV7D5ikVtim39h7gGai/U
```

Paste the content of a public ssh key you want to use to connect to the hosts into this field.

☑ Show proxy settings

If hosts are behind a firewall that requires the use of a proxy, provide additional information about the proxy.

HTTP proxy URL: http://172.16.1.42:3128

HTTPS proxy URL: http://172.16.1.42:3128

No proxy domains: 127.0.0.1,10.10.60.0/22,example.com

☐ Configure cluster-wide trusted certificates

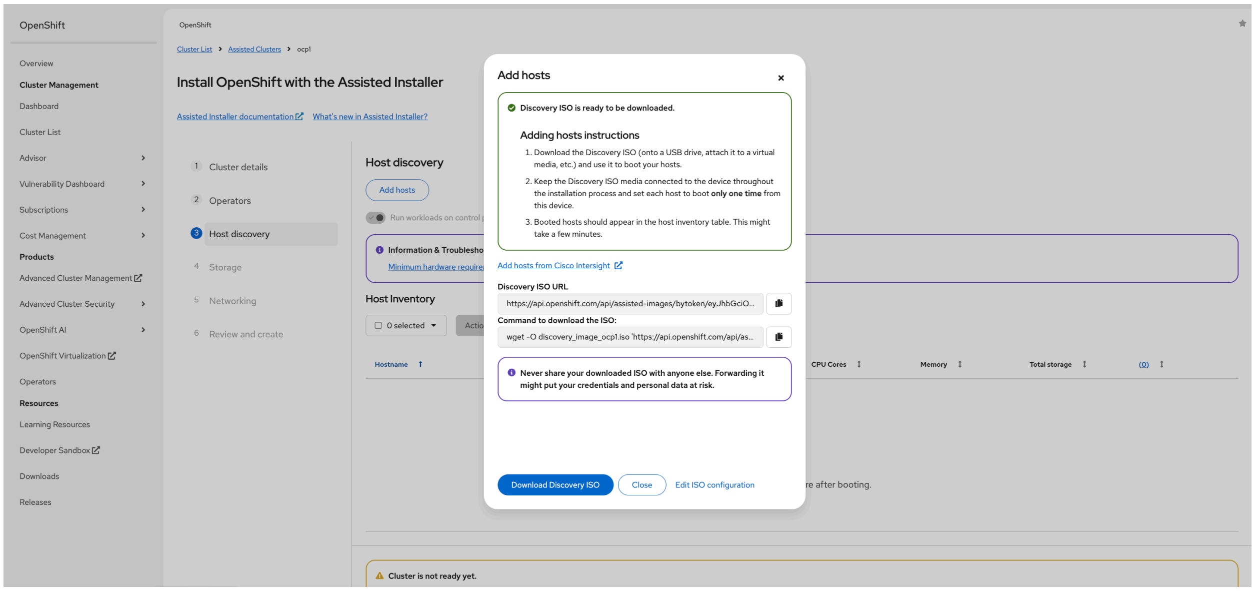
If the cluster hosts are in a network with a re-encrypting (MITM) proxy or the cluster needs to trust certificates for other purposes (e.g. container image registries).

Cluster is not ready yet.

The following requirement must be met:

The cluster must have exactly 3 dedicated control plane nodes. Add or remove hosts, or change their roles configurations to meet the requirement.

Download the Discovery ISO.



Install OpenShift with the Assisted Installer

Host discovery

Host Inventory

Add hosts

Discovery ISO is ready to be downloaded.

Adding hosts instructions

1. Download the Discovery ISO (onto a USB drive, attach it to a virtual media, etc.) and use it to boot your hosts.
2. Keep the Discovery ISO media connected to the device throughout the installation process and set each host to boot **only one time** from this device.
3. Booted hosts should appear in the host inventory table. This might take a few minutes.

Add hosts from Cisco Intersight

Discovery ISO URL

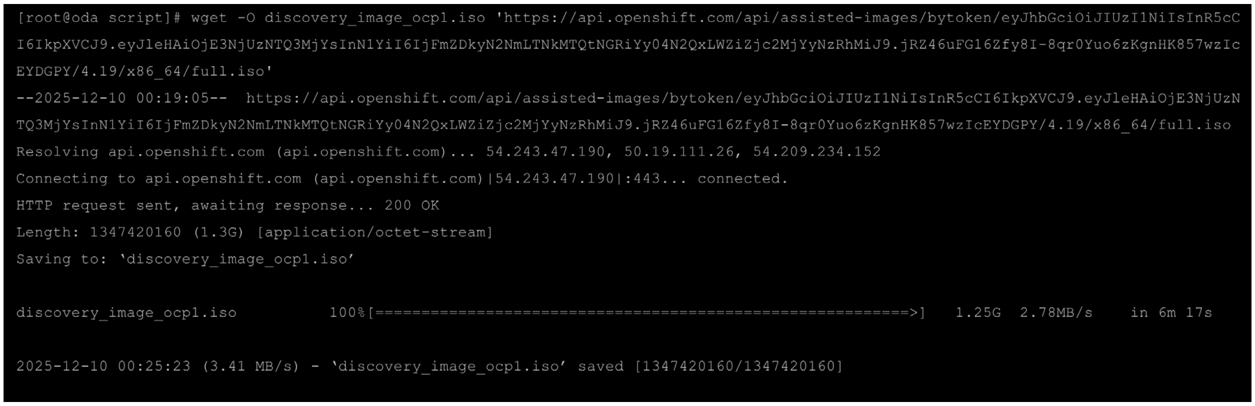
https://api.openshift.com/api/assisted-images/bytoken/eyJhbGciO...

Command to download the ISO:

wget -O discovery_image_ocp1.iso 'https://api.openshift.com/api/as...

Never share your downloaded ISO with anyone else. Forwarding it might put your credentials and personal data at risk.

Cluster is not ready yet.



```
[root@oda script]# wget -O discovery_image_ocp1.iso 'https://api.openshift.com/api/assisted-images/bytoken/eyJhbGciOiJIUzI1NiIsInR5cC
I6IkpXVCJ9.eyJleHAiOjE3NjUzNTQ3MjYsInN1YiI6IjFmZDkyN2NmLTNkMTQtNGRiYy04N2QxLWZiZjc2MjYyNzRhMiJ9.jRZ46uFG16Zfy8I-8qr0Yuo6zKgnHK857wzIc
EYDGPY/4.19/x86_64/full.iso'
--2025-12-10 00:19:05--  https://api.openshift.com/api/assisted-images/bytoken/eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJleHAiOjE3NjUzN
TQ3MjYsInN1YiI6IjFmZDkyN2NmLTNkMTQtNGRiYy04N2QxLWZiZjc2MjYyNzRhMiJ9.jRZ46uFG16Zfy8I-8qr0Yuo6zKgnHK857wzIcEYDGPY/4.19/x86_64/full.iso
Resolving api.openshift.com (api.openshift.com)... 54.243.47.190, 50.19.111.26, 54.209.234.152
Connecting to api.openshift.com (api.openshift.com)|54.243.47.190|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1347420160 (1.3G) [application/octet-stream]
Saving to: 'discovery_image_ocp1.iso'

discovery_image_ocp1.iso          100%[=========================================================>]   1.25G  2.78MB/s    in 6m 17s

2025-12-10 00:25:23 (3.41 MB/s) - 'discovery_image_ocp1.iso' saved [1347420160/1347420160]
```

3.4. Script to create control nodes

Execute the script below to create the Control Plane nodes

```
=== control.sh ===
#!/bin/bash

# Function to monitor VM creation
monitor_vm_creation() {
  while true; do
    # Get the last line containing both "VM" and "creation"
    line=$(odacli list-jobs | grep 'VM' | grep 'creation' | tail -n 1)

    # Extract the status (assumes status is the last word in the line)
    status=$(echo "$line" | awk '{print $NF}')

    # Print current status (optional)
    echo "Current status: $status"

    # Check status
    if [[ "$status" == "Success" ]]; then
      echo "VM creation completed successfully."
      break
    elif [[ "$status" == "Running" ]]; then
      # Continue waiting
      sleep 30
    else
      echo "VM creation failed or has an unexpected status: $status"
      echo " You can use odacli describe-job -i <jobId> to help identify the reason for the failure. "
      return 1  # Abort the script with a failure code
    fi
  done
}

# Function to create a VM and assign CPU pool
create_vm() {
  local vm_name=$1
  local cpupool=$2
  echo "Creating VM: $vm_name in CPU pool: $cpupool"
  # Create the VM
  odacli create-vm --name "$vm_name" --memory 24G --vcpus 20 -vms kvmvmstore -s 200G \
    --os-variant rhel9.0 -vn pubnet --source /var/lib/libvirt/images/discovery_image_ocp1.iso \
    --graphics vnc,listen=0.0.0.0 -cp $cpupool
}
# Create OpenShift VMs and assign to different CPU pools
create_vm "oda-os03" "controlplane1"
monitor_vm_creation
create_vm "oda-os04" "controlplane2"
monitor_vm_creation
create_vm "oda-os05" "controlplane3"
monitor_vm_creation

# List all created VMs
echo "Listing all created VMs..."
odacli list-vms
=== EOF ===
```

3.5. Script to create worker nodes

Execute the script below to create the Worker nodes
=== worker.sh ===

```
#!/bin/bash

# Function to monitor VM creation
monitor_vm_creation() {
  while true; do
    # Get the last line containing both "VM" and "creation"
    line=$(odacli list-jobs | grep 'VM' | grep 'creation' | tail -n 1)
    # Extract the status (assumes status is the last word in the line)
    status=$(echo "$line" | awk '{print $NF}')
    # Print current status (optional)
    echo "Current status: $status"
    # Check status
    if [[ "$status" == "Success" ]]; then
      echo "VM creation completed successfully."
      break
    elif [[ "$status" == "Running" ]]; then
      # Continue waiting
      sleep 30
    else
      echo "VM creation failed or has an unexpected status: $status"
      echo " You can use odacli describe-job -i <jobId> to help identify the reason for the failure. "
      return 1  # Abort the script with a failure code
    fi
  done
}

# Function to create a VM and assign CPU pool
create_vm() {
  local vm_name=$1
  local cpupool=$2
  echo "Creating VM: $vm_name in CPU pool: $cpupool"
  # Create the VM
  odacli create-vm --name "$vm_name" --memory 24G --vcpus 16 -vms kvmvmstore -s 200G \
    --os-variant rhel9.0 -vn pubnet --source /var/lib/libvirt/images/discovery_image_ocp1.iso \
    --graphics vnc,listen=0.0.0.0 -cp $cpupool
}

# Create OpenShift VMs and assign to different CPU pools
```

```
create_vm "oda-os06" "worker1"
monitor_vm_creation
create_vm "oda-os07" "worker2"
monitor_vm_creation
create_vm "oda-os08" "worker3"
monitor_vm_creation

# List all created VMs
echo "Listing all created VMs..."
odacli list-vms

=== EOF ===
```

3.6. Update the MAC address for each node in dhcpd.conf

```
=== get.sh ===

#!/bin/bash

# Define the list of VM names
VM_NAMES=("oda-os03" "oda-os04" "oda-os05" "oda-os06" "oda-os07" "oda-os08")

# Loop through each VM and fetch its MAC address
for VM in "${VM_NAMES[@]}"; do
  MAC=$(odacli describe-vm -n "$VM" | tail -n 2 | grep -oP '(?<=pubnet:)[0-9a-fA-F:]{17}' | head -n 1)

  if [[ -z "$MAC" ]]; then
    echo "$VM: MAC address not found"
  else
    echo "$VM: $MAC"
  fi
done

=== EOF ===
```

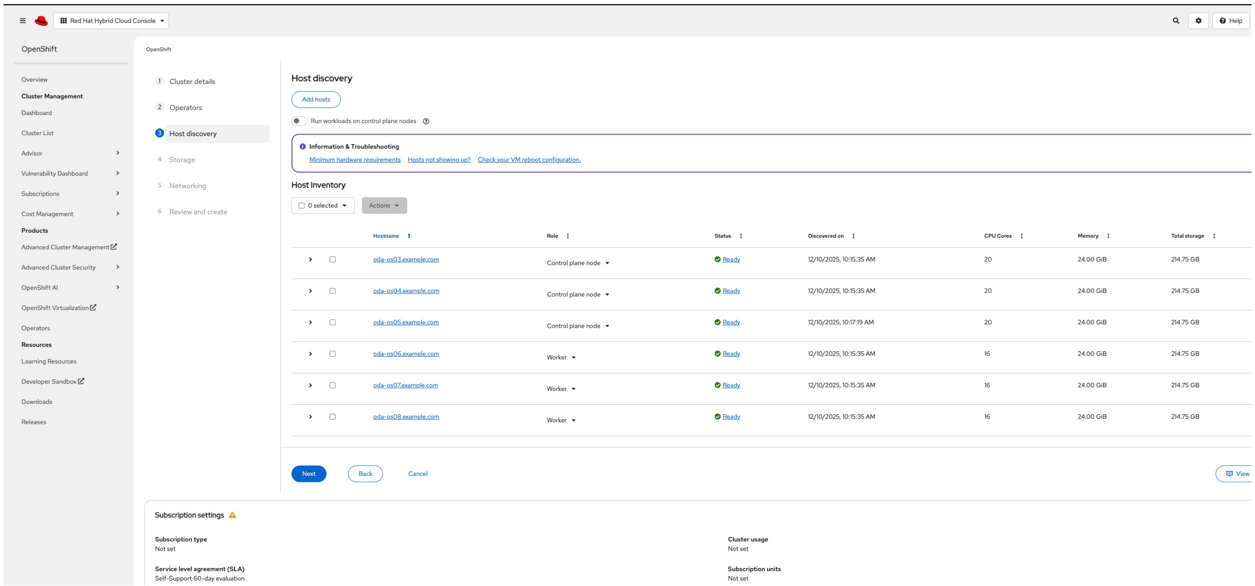
Execute get.sh to determine which MAC address corresponds to each host.

```
# ./get.sh
oda-os03: 52:54:00:94:96:f1
oda-os04: 52:54:00:53:d0:59
oda-os05: 52:54:00:69:a2:93
oda-os06: 52:54:00:04:e2:91
oda-os07: 52:54:00:b3:e4:c6
oda-os08: 52:54:00:17:98:83
```

Update the MAC addresses in /etc/dhcp/dhcpd.conf, then start the DHCPD service.

#systemctl start dhcpd

The hosts will become visible in the OpenShift Console after a few minutes.
Assign roles (Control Plane / Worker).



Host discovery

Run workloads on control plane nodes

Information & Troubleshooting

Minimum hardware requirements   Hosts not showing up?   Check your VM reboot configuration.

Host Inventory

□ 0 selected   Actions

		Hostname	Role	Status	Discovered on	CPU Cores	Memory	Total storage
›	□	oda-os03.example.com	Control plane node	Ready	12/10/2025, 10:15:35 AM	20	24.00 GiB	214.75 GB
›	□	oda-os04.example.com	Control plane node	Ready	12/10/2025, 10:15:35 AM	20	24.00 GiB	214.75 GB
›	□	oda-os05.example.com	Control plane node	Ready	12/10/2025, 10:17:19 AM	20	24.00 GiB	214.75 GB
›	□	oda-os06.example.com	Worker	Ready	12/10/2025, 10:15:35 AM	16	24.00 GiB	214.75 GB
›	□	oda-os07.example.com	Worker	Ready	12/10/2025, 10:15:35 AM	16	24.00 GiB	214.75 GB
›	□	oda-os08.example.com	Worker	Ready	12/10/2025, 10:15:35 AM	16	24.00 GiB	214.75 GB

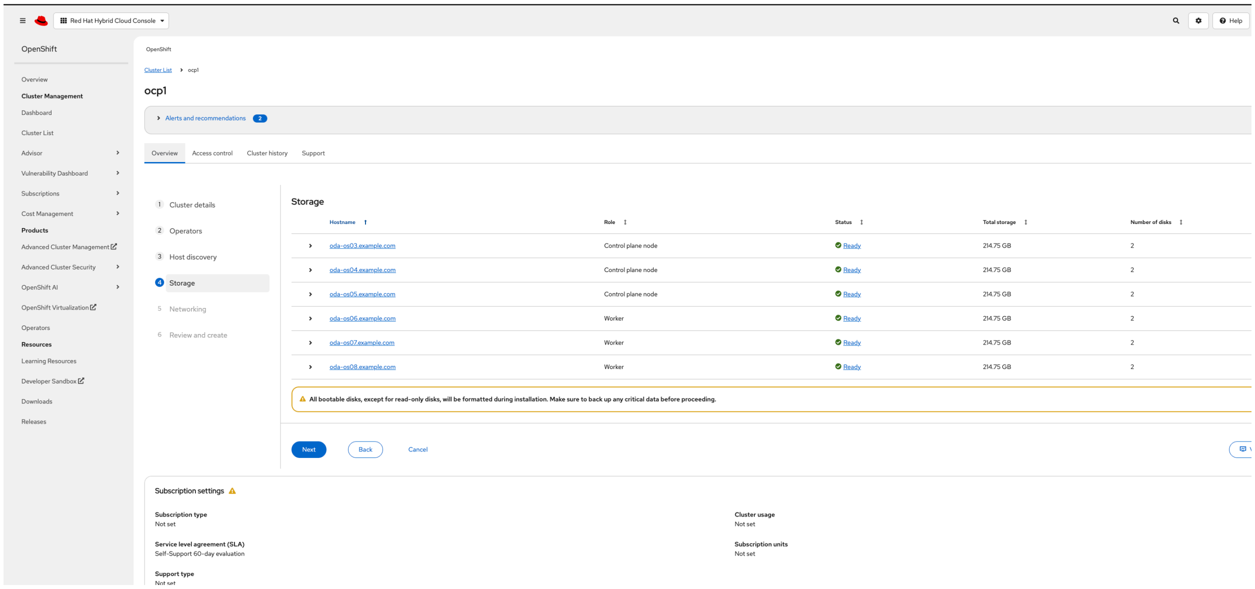
Subscription settings

Subscription type
Not set

Service level agreement (SLA)
Self-Support 60-day evaluation

Cluster usage
Not set

Subscription units
Not set



ocp1

Storage

	Hostname	Role	Status	Total storage	Number of disks
›	oda-os03.example.com	Control plane node	Ready	214.75 GB	2
›	oda-os04.example.com	Control plane node	Ready	214.75 GB	2
›	oda-os05.example.com	Control plane node	Ready	214.75 GB	2
›	oda-os06.example.com	Worker	Ready	214.75 GB	2
›	oda-os07.example.com	Worker	Ready	214.75 GB	2
›	oda-os08.example.com	Worker	Ready	214.75 GB	2

All bootable disks, except for read-only disks, will be formatted during installation. Make sure to back up any critical data before proceeding.

Subscription settings

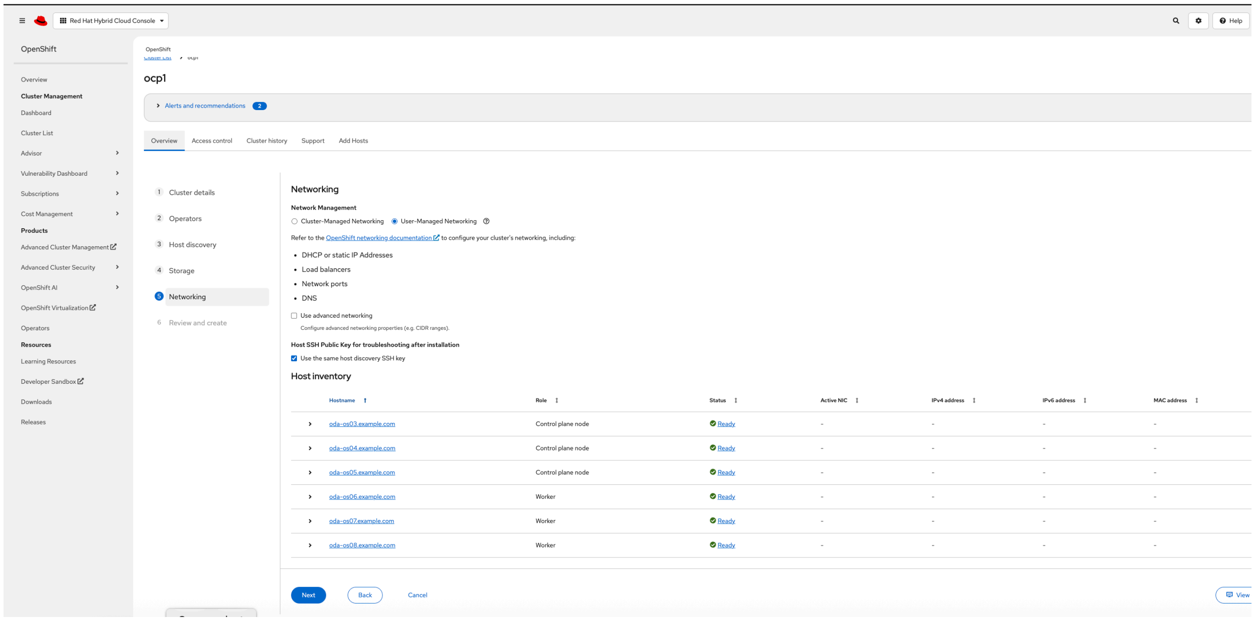
Subscription type
Not set

Service level agreement (SLA)
Self-Support 60-day evaluation

Support type
Not set

Cluster usage
Not set

Subscription units
Not set



ocp1

Alerts and recommendations 2

Networking

Network Management

○ Cluster-Managed Networking ● User-Managed Networking

Refer to the OpenShift networking documentation to configure your cluster's networking, including:

- DHCP or static IP Addresses
- Load balancers
- Network ports
- DNS

□ Use advanced networking

Configure advanced networking properties (e.g. CIDR ranges).

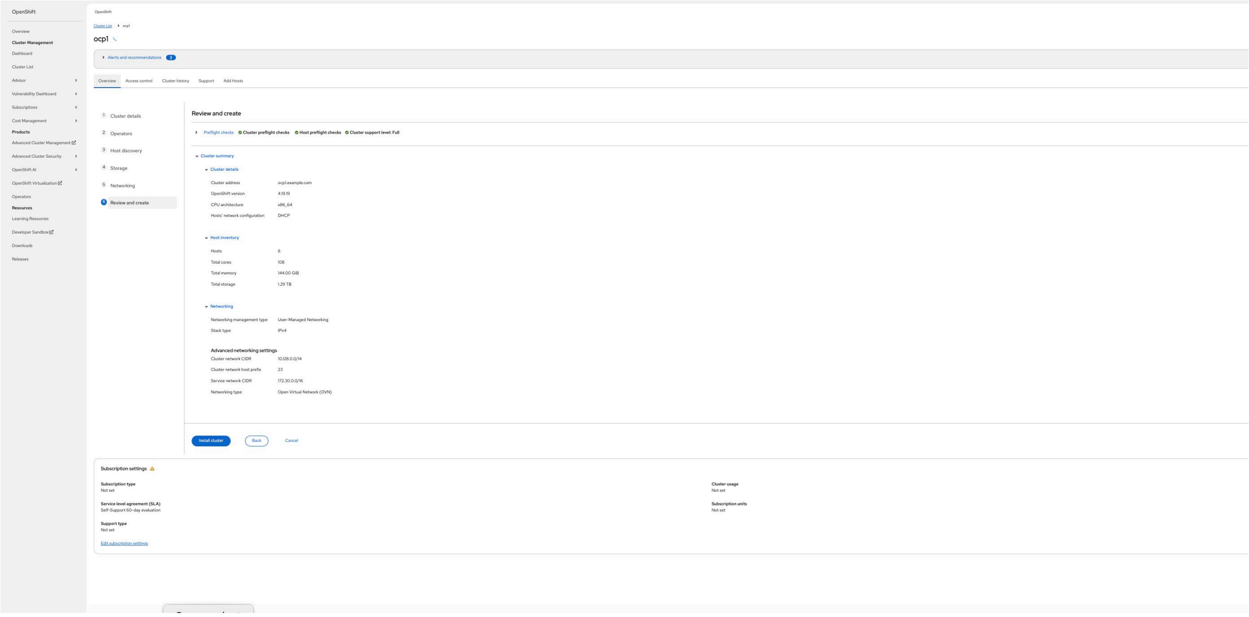
Host SSH Public Key for troubleshooting after installation

☑ Use the same host discovery SSH key

Host inventory

Hostname	Role	Status	Active NIC	IPv4 address	IPv6 address	MAC address
oda-os03.example.com	Control plane node	✓ Ready	-	-	-	-
oda-os04.example.com	Control plane node	✓ Ready	-	-	-	-
oda-os05.example.com	Control plane node	✓ Ready	-	-	-	-
oda-os06.example.com	Worker	✓ Ready	-	-	-	-
oda-os07.example.com	Worker	✓ Ready	-	-	-	-
oda-os08.example.com	Worker	✓ Ready	-	-	-	-

Validate networking and disk checks and start the installation.



ocp1

Alerts and recommendations 2

Review and create

Preflight checks ✓ Cluster preflight checks ✓ Host preflight checks ✓ Cluster support level: Full

Cluster summary

Cluster details

Cluster address	ocp1.example.com
OpenShift version	4.19.19
CPU architecture	x86_64
Hosts' network configuration	DHCP

Host inventory

Hosts	6
Total cores	108
Total memory	144.00 GiB
Total storage	1.29 TB

Networking

Networking management type	User-Managed Networking
Stack type	IPv4

Advanced networking settings

Cluster network CIDR	10.128.0.0/14
Cluster network host prefix	23
Service network CIDR	172.30.0.0/16
Networking type	Open Virtual Network (OVN)

Subscription settings ⚠

Subscription type
Not set

Service level agreement (SLA)
Self-Support 60-day evaluation

Support type
Not set

Cluster usage
Not set

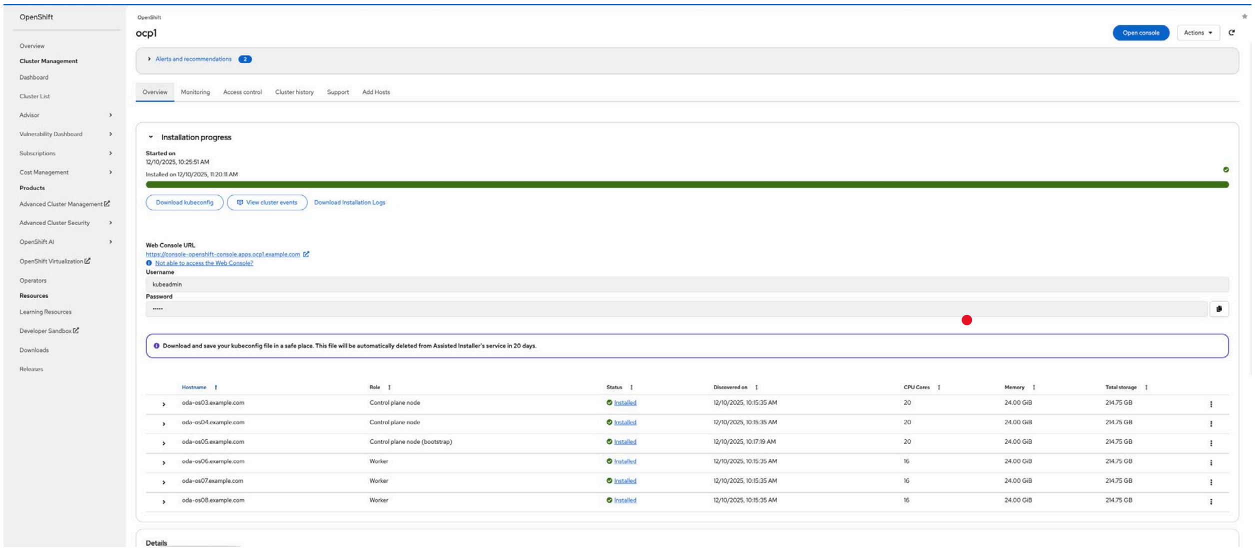
Subscription units
Not set

Edit subscription settings

3.7. Monitor Deployment

Using the Assisted Installer dashboard:

- Wait for all nodes to reach Ready state.
- Installation completes automatically.



ocp1

Installation progress

Started on
12/10/2025, 10:25:51 AM

Installed on 12/10/2025, 11:20:11 AM

Web Console URL
https://console-openshift-console.apps.ocp1.example.com

Username
kubeadmin

Password
·····

Download and save your kubeconfig file in a safe place. This file will be automatically deleted from Assisted Installer's service in 20 days.

Hostname	Role	Status	Discovered on	CPU Cores	Memory	Total storage
oda-os03.example.com	Control plane node	Installed	12/10/2025, 10:15:35 AM	20	24.00 GiB	214.75 GB
oda-os04.example.com	Control plane node	Installed	12/10/2025, 10:15:35 AM	20	24.00 GiB	214.75 GB
oda-os05.example.com	Control plane node (bootstrap)	Installed	12/10/2025, 10:17:19 AM	20	24.00 GiB	214.75 GB
oda-os06.example.com	Worker	Installed	12/10/2025, 10:15:35 AM	16	24.00 GiB	214.75 GB
oda-os07.example.com	Worker	Installed	12/10/2025, 10:15:35 AM	16	24.00 GiB	214.75 GB
oda-os08.example.com	Worker	Installed	12/10/2025, 10:15:35 AM	16	24.00 GiB	214.75 GB

4. Conclusion

Deploying Red Hat OpenShift on Oracle Database Appliance enables organizations to run enterprise containerized applications on the same system as their Oracle Database workloads without additional hardware. By co-locating applications with the database, customers eliminate inter-system network latency, improve resource utilization across their existing ODA investment, and maintain operational consistency with their existing OpenShift skills and tooling.

This guide covers the validated Single Node OpenShift configuration on ODA X10/X11.