

# CHAPTER 1. PREPARING FOR BARE METAL CLUSTER INSTALLATION

## 1.1. PREREQUISITES

- You reviewed details about the [OpenShift Container Platform installation and update](#) processes.
- You have read the documentation on [selecting a cluster installation method and preparing it for users](#).

## 1.2. PLANNING A BARE METAL CLUSTER FOR OPENSIFT VIRTUALIZATION

If you will use OpenShift Virtualization, it is important to be aware of several requirements before you install your bare metal cluster.

- If you want to use live migration features, you must have multiple worker nodes *at the time of cluster installation*. This is because live migration requires the cluster-level high availability (HA) flag to be set to true. The HA flag is set when a cluster is installed and cannot be changed afterwards. If there are fewer than two worker nodes defined when you install your cluster, the HA flag is set to false for the life of the cluster.



### NOTE

You can install OpenShift Virtualization on a single-node cluster, but single-node OpenShift does not support high availability.

- Live migration requires shared storage. Storage for OpenShift Virtualization must support and use the ReadWriteMany (RWX) access mode.
- If you plan to use Single Root I/O Virtualization (SR-IOV), ensure that your network interface controllers (NICs) are supported by OpenShift Container Platform.

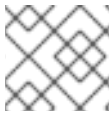
### Additional resources

- [Getting started with OpenShift Virtualization](#)
- [Preparing your cluster for OpenShift Virtualization](#)
- [About Single Root I/O Virtualization \(SR-IOV\) hardware networks](#)
- [Connecting a virtual machine to an SR-IOV network](#)

## 1.3. NIC PARTITIONING FOR SR-IOV DEVICES

OpenShift Container Platform can be deployed on a server with a dual port network interface card (NIC). You can partition a single, high-speed dual port NIC into multiple virtual functions (VFs) and enable SR-IOV.

This feature supports the use of bonds for high availability with the Link Aggregation Control Protocol (LACP).

**NOTE**

Only one LACP can be declared by physical NIC.

An OpenShift Container Platform cluster can be deployed on a bond interface with 2 VFs on 2 physical functions (PFs) using the following methods:

- Agent-based installer

**NOTE**

The minimum required version of **nmstate** is:

- **1.4.2-4** for RHEL 8 versions
- **2.2.7** for RHEL 9 versions

- Installer-provisioned infrastructure installation
- User-provisioned infrastructure installation

**Additional resources**

- [Example: Bonds and SR-IOV dual-nic node network configuration](#)
- [Optional: Configuring host network interfaces for dual port NIC](#)
- [Bonding multiple SR-IOV network interfaces to a dual port NIC interface](#)

## 1.4. CHOOSING A METHOD TO INSTALL OPENSIFT CONTAINER PLATFORM ON BARE METAL

The OpenShift Container Platform installation program offers four methods for deploying a cluster:

- **Interactive:** You can deploy a cluster with the web-based [Assisted Installer](#). This is the recommended approach for clusters with networks connected to the internet. The Assisted Installer is the easiest way to install OpenShift Container Platform, it provides smart defaults, and it performs pre-flight validations before installing the cluster. It also provides a RESTful API for automation and advanced configuration scenarios.
- **Local Agent-based:** You can deploy a cluster locally with the [agent-based installer](#) for air-gapped or restricted networks. It provides many of the benefits of the Assisted Installer, but you must download and configure the [agent-based installer](#) first. Configuration is done with a commandline interface. This approach is ideal for air-gapped or restricted networks.
- **Automated:** You can [deploy a cluster on installer-provisioned infrastructure](#) and the cluster it maintains. The installer uses each cluster host's baseboard management controller (BMC) for provisioning. You can deploy clusters with both connected or air-gapped or restricted networks.
- **Full control:** You can deploy a cluster on [infrastructure that you prepare and maintain](#), which provides maximum customizability. You can deploy clusters with both connected or air-gapped or restricted networks.

The clusters have the following characteristics:

- Highly available infrastructure with no single points of failure is available by default.
- Administrators maintain control over what updates are applied and when.

See [Installation process](#) for more information about installer-provisioned and user-provisioned installation processes.

### 1.4.1. Installing a cluster on installer-provisioned infrastructure

You can install a cluster on bare metal infrastructure that is provisioned by the OpenShift Container Platform installation program, by using the following method:

- **Installing an installer-provisioned cluster on bare metal** You can install OpenShift Container Platform on bare metal by using installer provisioning.

### 1.4.2. Installing a cluster on user-provisioned infrastructure

You can install a cluster on bare metal infrastructure that you provision, by using one of the following methods:

- **Installing a user-provisioned cluster on bare metal** You can install OpenShift Container Platform on bare metal infrastructure that you provision. For a cluster that contains user-provisioned infrastructure, you must deploy all of the required machines.
- **Installing a user-provisioned bare metal cluster with network customizations** You can install a bare metal cluster on user-provisioned infrastructure with network-customizations. By customizing your network configuration, your cluster can coexist with existing IP address allocations in your environment and integrate with existing MTU and VXLAN configurations. Most of the network customizations must be applied at the installation stage.
- **Installing a user-provisioned bare metal cluster on a restricted network** You can install a user-provisioned bare metal cluster on a restricted or disconnected network by using a mirror registry. You can also use this installation method to ensure that your clusters only use container images that satisfy your organizational controls on external content.