Cisco Smart PHY Deployment Overview

This guide provides information about the deployment of Cisco Smart PHY application in offline environments without the Internet connectivity.

Offline Deployment

Cisco Smart PHY software image is a compressed tarball file that contains all the scripts, helm charts, and container images required for installing the Cisco Operations Hub cluster and the Cisco Smart PHY application. It also contains a copy of these instructions and configuration examples.

Use the `deployer` script available in the software image to set up the Deployer virtual machine (VM) and clusters.

The installation process creates the following components:

- Deployer: The controller used to configure and deploy the cluster.

- Cisco Operations Hub Cluster: The Cisco Smart PHY application runs on this cluster.

The Deployer VM supports two types of Cisco Smart PHY deployments:

- All-in-one (AIO) cluster: Runs as a single VM.

- Multinode cluster: Consists of 12 VMs deployed across three VMware ESXi hosts. Each VMware ESXi host server hosts a control-plane VM, etcd VM, Infra VM, and Operations VM.

  The multinode cluster provides complete support for high availability (HA) and supports two sizes of clusters: small and normal for production environments. The default size is small, when the `size` is not specified.

  For the current number of RPDs supported on the Cisco Smart PHY application, we recommend the small multinode cluster for production deployments due to their increased resiliency.

The following table shows the minimum resources for deployer and AIO.

VM Type	CPU Cores	RAM Size (GB)	SSD Storage Size (GB)
Deployer	8	16	320

VM Type	CPU Cores	RAM Size (GB)	SSD Storage Size (GB)
All-in-one	18	96	1541

The following table shows the minimum resources for each type of VM when the cluster size is set to multinode `small`:

VM Type	CPU Cores	RAM Size (GB)	SSD Storage Size (GB)
Control Plane	2	16	125
etcd	2	16	125
infra	8	64	1000
ops	8	64	320

The following table shows the minimum resources for each type of VM when the cluster size is set to multinode `normal`:

VM Type	CPU Cores	RAM Size (GB)	SSD Storage Size (GB)
Control Plane	2	16	125
etcd	2	16	125
infra	14	96	1500
ops	16	176	620

Prerequisites for Cluster Deployment

The following prerequisite components are required to install, operate, and manage the Cisco Smart PHY application running on a Cisco Operations Hub cluster.

- Staging server: Physical or virtual machine to run the installation script
- An ESXi host to run the Deployer VM.
- VMware vSphere virtualization platform

Prerequisites for ESXi Hosts

Three ESXi hosts are required to run a Cisco Operations Hub multinode cluster.

The minimum compute, storage, and networking requirements for the VMware ESXi host are listed in the following table:

Component	Small Size Cluster	Normal Size Cluster
Processor	20 vCPUs	34 vCPUs
Memory	160 GB	304 GB

Component	Small Size Cluster	Normal Size Cluster
Storage	1640 GB Minimum 50000 IOPS (Input/output operations per second) Latency of < 5 ms	2440 GB Minimum 50000 IOPS (Input/output operations per second) Latency of < 5 ms
NIC	2x 10G vNIC	2x 10G vNIC

Prerequisites for VMware vSphere

VMware ESXi and VMware Center Server are mandatory components of a Cisco Smart PHY cluster deployment.

- Hypervisor: VMware ESXi 7.0

- Host Management: VMware vCenter Server 7.0

Deploy Cisco Smart PHY

Deploying Cisco Smart PHY in an offline environment involves the following process.

1. (Optional) Configure UCS server: Not required if you are deploying using third party servers. For details, see Configure UCS Servers.

2. Prepare a staging server.

3. Prepare a cluster configuration file.

4. Deploy the cluster.

If required, repeat the step 3 and 4 to deploy another cluster.