

# VMWARE CLOUD FOUNDATION 2.3

## General FAQ

### GENERAL

#### Q. Where can I find more information and resources?

- Product Page: [vmware.com/go/cloudfoundation](http://vmware.com/go/cloudfoundation)
- Documentation: [vmware.com/go/cloudfoundation-docs](http://vmware.com/go/cloudfoundation-docs)
- Hands-on-Labs: [vmware.com/go/cloudfoundation-hol](http://vmware.com/go/cloudfoundation-hol)
- Compatibility Guide: [vmware.com/go/cloudfoundation-vcg](http://vmware.com/go/cloudfoundation-vcg)

#### Q. What is VMware Cloud Foundation?

- A. [VMware Cloud Foundation™](#) provides the simplest path to hybrid cloud through an integrated software platform that is the foundation for both private and public cloud environments. Cloud Foundation provides a complete set of software-defined services for compute, storage, network and security, along with cloud management capabilities. The end result is simple, secure and agile cloud infrastructure that can be deployed on premises and consumed as a service from public cloud.

#### Q. How can I use Cloud Foundation in the public cloud?

- A. Select service providers from the VMware Cloud Provider program offer cloud services powered by VMware Cloud Foundation, including [CenturyLink](#), [IBM Cloud](#), [OVH](#) and [Rackspace](#). Reach out to the specific service providers for more information.

[VMware Cloud on AWS](#) is a new on-demand service operated, managed and sold by VMware. VMware Cloud on AWS is powered by VMware Cloud Foundation.

*All following Q & A focus on Cloud Foundation for on-premises deployment.*

#### Q. How can I deploy Cloud Foundation for private cloud?

- A. There are two main categories of private cloud deployment: (1) Integrated systems that include hardware and pre-loaded Cloud Foundation software. Integrated systems currently available are [Dell EMC VxRack SDDC](#), [Fujitsu PRIMEFLEX](#), [Hitachi UCP RS](#) and [QCT QxStack](#). (2) Deploy Cloud Foundation software on certified vSAN™ ReadyNodes from leading OEMs. Deployment can be achieved through self-installation or working with your Solution Provider / System Integrator. Refer to the [VMware](#)

[Compatibility Guide](#) for more information.

#### Q. What server and switching hardware is supported?

- A. Cloud Foundation is supported on certified vSAN ReadyNode server hardware from a variety of vendors, including Cisco, Dell EMC, Cisco, Fujitsu, Hitachi Vantara, HPE and QCT, and on certified hardware switches from Cisco and Arista. Refer to the [VMware Compatibility Guide](#) for the current list of certified hardware.

#### Q. Do Integrated Systems support all the features of the latest version of Cloud Foundation?

- A. OEM partners must undertake a qualification process of the integrated system hardware upon new releases of the Cloud Foundation software. For specific information about supported software versions and features, refer to the product documentation on each OEM's product page.

#### Q. Who supports Cloud Foundation software and hardware?

- A. When purchasing an integrated system, the OEM partner will be the Single Point of Contact (SPOC) for support of both hardware and software. When Cloud Foundation software is purchased from VMware separately from the certified hardware, the support model will follow the standard practice of VMware products with VMware GSS delivering support for the Cloud Foundation software.

#### Q. How can I purchase Cloud Foundation software?

- A. There are four ways to purchase Cloud Foundation software:
- (1) directly from VMware,
  - (2) from VMware channel partners
  - (3) as part of an integrated system from OEM vendors and
  - (4) as a subscription service from a public cloud service provider.

#### Q. Can I install the Cloud Foundation software myself?

- A. Yes. VMware provides documentation for customers to deploy the Cloud Foundation software on their own. You can also work with VMware Professional Services or your Solution Provider to receive assistance with your deployment. Visit the [Documentation page](#) for more information on how to deploy Cloud Foundation.

**Q. Does Cloud Foundation include cloud management capabilities?**

- A. Cloud Foundation can deploy the full SDDC, including cloud management software based on the capabilities of VMware vRealize Suite. SDDC Manager can automatically deploy vRealize Automation, vRealize Operations and vRealize Log Insight as part of the Cloud Foundation standardized architecture. Customers must purchase a Cloud Foundation package that includes cloud management, or purchase vRealize Suite separately to license this functionality.

**Q. What is the difference between SDDC Manager and vRealize Automation?**

- A. SDDC Manager and vRealize Automation automate different aspects of building and running private and public clouds. SDDC Manager automates the lifecycle of the VMware software stack (from bring-up and configuration to patching and upgrading), making it simple for the cloud admin to build and maintain the SDDC. vRealize Automation automates the delivery and management of the virtual machines and apps, enabling end users to consume these as services and at scale. vRealize Automation is one of the software components of the Cloud Foundation platform for which SDDC Manager automates the deployment.

**Q. Does SDDC Manager replace other existing management tools, such as vCenter Server, vRealize Operations Manager, vRealize Log Insight?**

- A. No. SDDC Manager complements vCenter Server and vRealize Suite products by delivering new functionality that helps cloud admins build and maintain the SDDC. The cloud admin will continue to use vCenter Server as the primary management interface for the virtualized environment.

**Q. Which software components of the Cloud Foundation platform are automated by SDDC Manager?**

- A. SDDC Manager provides full lifecycle management automation (automated deployment plus patching/upgrading) for VMware vSphere, vSAN, NSX, and SDDC Manager itself. Additionally, SDDC Manager provides automated deployment for vRealize Automation, vRealize Operations, vRealize Log Insight and VMware Horizon. vCenter Server and Horizon are sold and licensed separately from Cloud Foundation.

**Q. Can I deploy SDDC Manager on top of existing vSphere environments?**

- A. No. The lifecycle automation capabilities are predicated on SDDC Manager automating the bring up process of the entire Cloud Foundation platform. This means that SDDC Manager cannot be used to manage existing environments.

**Q. Does Cloud Foundation implement a VMware Validated Design?**

- A. Yes. Cloud Foundation implements a prescriptive data center design using software bill of material that is consistent with the guidance of the VMware Validated Designs.

**PRICING AND PACKAGING****Q. What are the software components in Cloud Foundation?**

- A. Cloud Foundation includes at a minimum software-defined compute (vSphere), storage (vSAN), networking (NSX), and lifecycle management automation (SDDC Manager). Cloud operations (vRealize Suite Std) and cloud automation (vRealize Suite Adv) are available with higher end editions of Cloud Foundation. Although part of the platform deployed by Cloud Foundation, vCenter Server and Horizon are sold and licensed separately.

**Q. What is the licensing model for Cloud Foundation?**

- A. Cloud Foundation is sold on a per CPU licensing metric with a perpetual license model. A Cloud Foundation with Horizon package is also available, and it is licensed per concurrent user (CCU) metric.

**Q. Can I use existing licenses for components of Cloud Foundation I already own?**

- A. Yes. Customers who possess unused licenses for individual components (vSphere, vSAN, NSX or vRealize Suite) can use them to complete the licensing of the Cloud Foundation environment and just purchase the missing components.

**Q. Can I buy SDDC Manager separately?**

- A. SDDC Manager is only available for Cloud Foundation. In situations where the customer possesses licenses for all other software components, SDDC Manager licenses can be purchased incrementally.

**Q. Is vCenter Server included with Cloud Foundation?**

- A. No. Customers must provide a vCenter Server license for a Cloud Foundation environment. Only one vCenter Server

license is needed per Cloud Foundation instance, regardless of the number of vCenter Server instances accompanying each workload domain in the environment. *Note: SDDC Manager deploys and configures a vCenter Server instance as part of each workload domain.*

**Q. Do I need to renew SnS for all the components of Cloud Foundation?**

A. In order to continue to use Cloud Foundation, all underlying components must be properly licensed and have active SnS contracts. However, if a customer should want to move away from Cloud Foundation, they have the option to renew the support contract for the software components they want to continue using.

**Q. Is SDDC Manager part of vCloud Suite?**

A. No. SDDC Manager is not part of VMware vCloud Suite. SDDC Manager is available exclusively with and for Cloud Foundation.

## TECHNICAL GENERAL

**Q. What is VMware SDDC Manager?**

A. SDDC Manager is the centralized management software in Cloud Foundation used to automate the entire lifecycle of the SDDC, from bring-up, to configuration, to infrastructure provisioning to upgrades/patches.

**Q. vRealize Suite has lifecycle management capabilities of its own. How do SDDC Manager and the vRealize Suite's lifecycle management capabilities work with / complement one another?**

A. SDDC Manager calls into the APIs of vRealize Lifecycle Manager to automate the deployment and configuration of vRealize Automation and vRealize Operations. SDDC Manager is directly in charge of automating the deployment and configuration of all other components of the platform including vSphere, vSAN, NSX and vRealize Log Insight.

**Q. What is the VIA?**

A. The VIA is an imaging virtual appliance used to perform the initial imaging of a new Cloud Foundation hardware in preparation to being configured by the SDDC manager. Visit the [Documentation page](#) for more information about the VIA.

**Q. How are multiple physical racks managed?**

A. In a multiple rack configuration, the separate racks are

interconnected using a high-speed network topology. All the systems across the different racks are managed as a logical pool of resources from a single instance of the SDDC Manager running in the Management Workload Domain.

## Hardware

**Q. What are the physical hardware requirements for a Cloud Foundation private cloud?**

A. A Cloud Foundation environments is comprised of between 1 to 8 physical racks. Each rack is comprised of between 4 to 32 1U or 4 to 16 2U qualified servers (subject to power constraints), a pair of redundant Top-of-Rack (ToR) switches and a single management switch. In a multi-rack configuration, a pair of redundant inter-rack switches is used to interconnect the racks. Integrated Systems may have other boundaries. For example, VxRack SDDC has at least 8 servers per rack, and at most 24 server per rack.

**Q. What are the physical server requirements?**

A. The building block of the Cloud Foundation private cloud is the vSAN ReadyNode. Cloud Foundation provides flexibility when selecting vendors and server models as well as when choosing CPU speeds, core counts, memory sizing. Refer to the [VMware Compatibility Guide](#) for a list of certified vSAN ReadyNodes and guidance minimum server configuration requirements.

**Q. What are the physical network requirements?**

A. Cloud Foundation implements a self-contained network topology using redundant Top-of-Rack switches in each rack that are interconnected using a pair of redundant inter-rack switches. Access to external networks is achieved through a pair of redundant uplinks configured on the ToR switches in the first rack.

**Q. Can the qualified vSAN ReadyNodes be used with any of the qualified networking switches?**

A. Yes. The qualified vSAN ReadyNodes can be used with any of the qualified switches. The only requirement is for both the ToR and inter-rack switches to be from the same vendor.

**Q. Are inter-rack switches required even if there is only one rack?**

A. No, inter-rack switches are only required when expanding beyond a single physical rack.

**Q. What are the physical switch requirements for the**

**Top-of-Rack (TOR) and Inter-Rack switches?**

- A. Only qualified ToR and inter-rack switches can be used with Cloud Foundation. Refer to the [VMware Compatibility Guide](#) for a list of qualified switch vendors.

**Q. What are the physical switch requirements for the management switch?**

- A. Only qualified management switches can be used with Cloud Foundation. Refer to the [VMware Compatibility Guide](#) for a list of qualified switch vendors.

**Q. What does the Cloud Foundation server qualification involve? Why can't all vSAN ReadyNodes be automatically certified for Cloud Foundation?**

- A. Cloud Foundation uses the VIA (imaging appliance) to image the server with the appropriate version of ESXi including the server specific configuration e.g., the appropriate VIBs to be included for that server (this information is obtainable from the server vendor). Other server specific configuration includes how to number the NICs for Cloud Foundation operation. This server specific information is validated and then included as part of the imaging bundle for Cloud Foundation.

In addition, the server needs to be validated with HMS. This involves server configuration and management using both the inband and out of band management interfaces. To perform this validation, a pre-requisite is for the server to be imaged with the correct ESXi version and the appropriate VIBs as indicated earlier.

After tests are run successfully with both the VIA and HMS based management using the bundle updated with the server specific VIBs, the server is a candidate for certification. The bundles are published by VMware and the server added to the [VMware Compatibility Guide](#).

**Workload Domains****Q. What is a workload domain?**

- A. A workload domain is a subset of resources carved out of the Cloud Foundation infrastructure based on specific capacity and availability characteristics. Each workload domain comprises a single vSphere cluster and can span multiple physical racks.

**Q. What is a management domain?**

- A. The management domain is a special purpose workload domain that is used to host the infrastructure components needed to instantiate, manage, and monitor the Cloud

Foundation infrastructure. The management domain is automatically created using SDDC Manager when the first rack is initially configured.

**Q. How many Workload Domains can be created?**

- A. Up to 15 workload domains can be created. This limit is imposed by the max number of vCenter Server instances that can be configured in enhanced linked mode.

**Q. How many nodes are required for the management domain?**

- A. The management domain leverages vSAN for storage and requires a minimum of 4 nodes.

**Q. What types of workload domains can be created?**

- A. There are two types of workload domains at this time:
1. A Virtual Infrastructure (VI) workload domain which consists of a single vSphere cluster with a dedicated vCenter Server instance.
  2. A Virtual Desktop Infrastructure (VDI) workload domain which consists of a dedicated vSphere cluster with a dedicated vCenter Server Instance along with the Horizon software components.

**Q. How many vSphere clusters can I have in a workload domain?**

- A. Currently, Cloud Foundation supports one vSphere cluster per workload domain.

**Q. How many vCenter Server instances can be deployed in a workload domain?**

- A. Each workload domain has one dedicated vCenter Sever instance. (Pricing and Packaging note: Only one vCenter Server license is needed per Cloud Foundation instance)

**Q. What is the minimum and maximum number of vSphere hosts that can be in a Virtual Infrastructure Workload Domain?**

- A. Workload domains leverage vSAN and as such require a minimum of three hosts. The current maximum is 64 hosts.

**Q. What is the minimum and maximum number of vSphere hosts that can be in a Virtual Desktop Infrastructure Workload Domain?**

- A. Workload domains leverage vSAN and as such require a minimum of three hosts. The current maximum number of hosts in a VMware Horizon cluster is 20 hosts.

**Q. How does Cloud Foundation determine how many hosts to use when creating a VDI workload domain?**

A. The number of hosts assigned to a VDI workload domain is based on the number of desktops and the size of each. The hosts for VI workload domains are selected explicitly.

**Q. Can I extend/delete a workload domain after it has been created?**

A. Yes, Cloud Foundation provides a fully automated process for creating, extending, and deleting workload domains using SDDC Manager.

**Q. Can I reduce the size of a workload domain?**

A. Cloud Foundation does not yet provide an automated capability for reducing the size of a workload domain. A manual process can be used to evacuate hosts from a workload domain.

## Networking

**Q. In the network topology, do the ToR to inter-rack links use L2 or L3? Is Spanning Tree used?**

A. In Cloud Foundation all the physical racks are on the same L2 network. The ToR switches are dual connected to two inter-rack switches through redundant 40Gbps links configured in a Multi-Chassis Link Aggregation Group (MC-LAG). There is no Spanning Tree Protocol used as looping is avoided using MC-LAG.

**Q. Do all the switches (ToR, Inter-Rack and Management) need to be from the same vendor?**

A. The ToR and inter-rack switches must be from the same vendor so that the plugins can work seamlessly. The management switch can be from any supported vendor as listed on the [VMware Compatibility Guide](#).

## Storage

**Q. Is vSAN required with Cloud Foundation?**

A. Yes, vSAN is required.

**Q. Does Cloud Foundation support all-flash vSAN storage?**

A. Yes, Cloud Foundation supports both the Hybrid and All-Flash vSAN configurations. Note that mixing Hybrid and All-Flash nodes in a single workload domain is not supported.

**Q. Can I use Network Attached Storage (NAS) with Cloud****Foundation?**

A. Yes, you can connect to external IP based storage (NFS/iSCSI) from a Cloud Foundation based deployment. Design and implementation of the networking paths for access to external storage needs to be done outside of the Cloud Foundation automaton/management.

**Q. Can I use FCoE or Fibre Channel with Cloud Foundation?**

A. No, FCoE and Fibre Channel are not currently supported with Cloud Foundation.

## Patching and Upgrades

**Q. What software components can be patched/upgraded using SDDC Manager?**

A. Currently, vSphere, vSAN, NSX, vCenter Server and SDDC Manager components are patched/upgraded.

**Q. How am I notified when patches/upgrades become available?**

A. Users are automatically notified from the SDDC Manager user interface when patches and upgrades become available.

**Q. How often will VMware release software updates?**

A. Patches are released as they become available and based on criticality (e.g. a security patch). Upgrades are typically released on a quarterly cadence.

**Q. Can I schedule when patches and upgrades are applied?**

A. Yes, SDDC Manager allows patches and upgrades to be scheduled as to coincide with regular maintenance windows.

**Q. Can I patch/upgrade workload domains independent of each other?**

A. Yes, patches and upgrades are scheduled on a per-workload domain basis allowing updates to be “rolled-in” over time.

## Miscellaneous

**Q. Does SDDC Manager automate the deployment of other management components, such as vRealize Business for Cloud or vRealize Network Insight?**

A. Currently, SDDC Manager does not automate the deployment of vRealize Business for Cloud and vRealize Network Insight. These components can be manually deployed and externally integrated with Cloud Foundation.

**Q. Does Cloud Foundation perform firmware updates?**

A. No. Firmware updates are not included as part of the Cloud Foundation capabilities. Use vendor provided tools to update firmware.

**Q. What logs are sent to the vRealize Log Insight in the Cloud Foundation management cluster?**

A. Cloud Foundation sends event logs for vSphere, vSAN, NSX, SDDC Manager, vCenter and Horizon into vRealize Log Insight.

**Q. Do I need to pay for vRealize Log Insight for the logs sent in the management cluster?**

A. No. Each instance of Cloud Foundation includes the right to use 50 OSI instances of vRealize Log Insight to capture logs from the management domain components only. The edition used is the full vRealize Log Insight, which includes features such as log forwarding and HA for those management domain components. If a customer want to use vRealize Log Insight functionality for actual workloads, the customer must acquire the appropriate vRealize Log Insight licenses.

