



# VMware vCloud Director<sup>®</sup> Configuration Maximums

**vCloud Director 8.20 and 9.0**

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## VMware vCloud Director Management Maximums

This section covers maximums related to the entities managed directly by VMware vCloud Director®.

A description for each category of maximums listed in Table 1 is included here:

- VMware vCenter Server® systems  
vCloud Director is tested up to a certain number of vCenter Server instances. This is a recommended maximum validated as part of vCloud Director scale and performance testing. Exceeding this limit is acceptable but might result in performance degradation. The impact on performance and stability depends on many factors and varies from environment to environment. Extensive testing is recommended to make sure that system performance meets your standards.
- vCloud Director cells  
Number of vCloud Director cells deployed within a single vCloud Director instance. Increasing the number of cells generally improves performance, supported infrastructure scale, and concurrency characteristics, and might improve uptime.
- Users  
Total number of users managed by vCloud Director in all organizations.
- Organizations  
Total number of tenant organizations managed by vCloud Director.
- Users per organization  
Maximum number of users supported per organization.
- Org VDCs  
Maximum number of organization VDCs.
- VMs per vApp  
Virtual machines per vApp.
- vApps per organization  
Maximum number of vApps in an organization.
- vApps  
Total number of vApps managed by vCloud Director.
- Catalogs  
Total number of catalogs in all organizations.
- Media  
Total number of media files in all catalogs.
- Independent disks  
Independent disks are stand-alone virtual disks that can be created in organization VDCs. Administrators and users who have adequate rights can create, remove, and update independent disks, and attach them to or detach them from virtual machines using the API.
- Resource pools per provider VDC  
Number of top-level resource pools per provider VDC.

## VMware vCloud Director Configuration Maximums

- **External networks**  
External networks connecting organization VDCs to physical networks. Backed by VMware vSphere® port group, VLAN, or distributed virtual switch (dvSwitch) objects.
- **Routed networks**  
Routed organization VDC or vApp networks connecting to an external network through an edge gateway.
- **Isolated networks**  
Isolated organization VDC or vApp network.
- **Direct organization VDC networks**  
Organization VDC networks connecting directly to an external network.
- **Network pools**  
Each provider VDC has a VXLAN network pool that has been automatically created. The system admin also has the option to create additional VLAN-backed network pools.

**Table 1. vCloud Director Management Maximums**

Item	Maximum per vCloud Director	
	Release 8.20	Release 9.0
vCenter Server systems	20 (see note 1)	20 (see note 1)
vCloud Director cells	(see note 2)	(see note 2)
Users	25,000	25,000
Organizations	10,000	10,000
Users per organization	5000	5000
Organization VDCs	10,000	10,000
Provider VDCs	100	100
Independent disks	1000	1000
VMs per vApp	128	128
vApps	40,000	40,000
vApps per organization	5000	5000
Catalogs	8000	8000
Media	1000	1000
Resource pools per provider VDC	64	64

## VMware vCloud Director Configuration Maximums

Item	Maximum per vCloud Director	
	Release 8.20	Release 9.0
External networks	1999 (SQL Server); 999 (Oracle)	1999 (SQL Server); 999 (Oracle); 2500 (PostgreSQL)
Routed networks (Org VDC and vApp)	Total of routed networks + isolated networks is limited by edge gateways in underlying VMware NSX® Manager™	Total of routed networks + isolated networks is limited by edge gateways in underlying NSX Manager
Isolated networks (Org VDC and vApp)		
Direct Org VDC networks	10,000	10,000
Network pools	100	100

### Note 1

There is no inherent limit on the number of vCenter Server instances in vCloud Director. Larger number of vCenter instances will increase the load on vCloud Director services and will require a larger number of cells. VMware recommends running [# of vCenter instances] +1 cells for best performance.

### Note 2

There is no fixed limit on the number of vCloud Director cells. Cells should be deployed to match the expected load from running VMs and managed vCenter instances ([# of vCenter instances] +1 cells). Note that each vCloud Director cell creates 75 connections to the database.

## Infrastructure Maximums Associated with vCenter Server and NSX

vCenter Server instances and NSX Manager instances under vCloud Director impose scale limits on the underlying infrastructure and managed entities. The limits might vary for different versions of vSphere. Be sure to consult appropriate vSphere documentation (*vSphere Configuration Maximums*).

The overall vCloud Director powered system inherits the limits of the underlying vCenter Server instances and NSX Manager instances. In most cases, the limits can be related to the configuration maximums in the underlying vCenter Server instances. Some of the entities are co-managed by vCenter Server and vCloud Director and might also be subject to vCloud Director imposed limits. When vCenter Server and vCloud Director limits apply, both are noted in the table. The lower limit of the two is the actual limit in the given environment.

A description for each category of maximums listed in Table 2 is included here:

- Network latency from vCloud Director to vCenter Server instances and VMware ESXi™ hosts  
Recommended maximum round-trip network latency. Exceeding this limit might impact stability and responsiveness of the system. If you choose to exceed the limit, perform extensive testing to establish whether the performance impact is acceptable. The actual impact of latency on performance depends on a large number of factors and might vary significantly between environments.
- Hosts  
Total number of ESXi hosts that can be managed by vCloud Director. Primarily constrained by vCenter Server limits. vCloud Director can generally support the maximum number of hosts allowed by the underlying vCenter Server instances.
- Clusters  
Total number of ESXi clusters managed by vCloud Director.
- Datastores  
Total number of datastores under vCloud Director management. Constrained by the limits of the underlying vCenter Server instances. vCloud Director imposes its own overall maximum.
- Storage policies  
All storage policies exposed to vCloud Director by managed vCenter instances.
- Registered VMs  
VM managed in vCloud Director inventory.
- Powered-on VMs  
Powered-on VM managed by vCloud Director.
- Edge Gateways  
Edge gateways provided by NSX in managed vCenter Server instances.



**Table 2. Infrastructure Maximums Associated with vCenter Server and NSX**

Item	Maximum per vCloud Director	
	Release 8.20	Release 9.0
Round-trip network latency from vCloud Director to vCenter Server and ESXi hosts	40 ms	100 ms
ESXi hosts	vSphere maximum	vSphere maximum
ESXi clusters	vSphere maximum	vSphere maximum
Datastores	vSphere maximum vCloud Director max = 1024	vSphere maximum vCloud Director max = 1024
Storage policies	vSphere maximum; vCloud Director limit = 65	vSphere maximum; vCloud Director limit = 65
Registered VMs	vSphere maximum; vCloud Director limit = 40,000	vSphere maximum; vCloud Director limit = 40,000
Powered-on VMs	vSphere maximum; vCloud Director limit = 25,000	vSphere maximum; vCloud Director limit = 25,000
Edge gateways	1000 per vCloud Director	1000 per vCloud Director

## Concurrency Maximums

This section covers the limits for concurrent API and UI operations and concurrent console sessions. These characteristics generally depend on the number of vCloud Director cells. Concurrency limits listed in the following table are recommended for best performance. Exceeding the limits is possible but will impact user experience and responsiveness of the system. The impact depends on many variables. Extensive testing is recommended to determine performance characteristics in your environment.

A description for each category of maximums listed in Table 3 is included here:

- **Concurrent VM consoles**  
Total number of concurrent VM console connections per vCloud Director. The recommended maximum is determined by many factors, including the number of vCloud Director cells.
- **Concurrent user operations (invoked in UI or API)**  
Total number of concurrent operations (tasks) being processed by vCloud Director. Includes API and UI initiated user operations. This limits scales nearly linearly with the number of cells.

**Table 3. Concurrency Maximums**

Item	Maximum per vCloud Director	
	Release 8.20	Release 9.0
Concurrent user tasks (invoked in UI or API)	256 per cell	256 per cell