



VMware Cloud Director service for Enterprise Customers

Datasheet

AT A GLANCE

VMware Cloud Director service is a Software as a Service application providing native cloudlike and multi-tenancy support for VMware hyperscale partner cloud SDDC, support into existing Cloud Director instances and on-premises vCenter environments.

VMware Cloud Director service applies tenant isolation and resource pooling over existing SDDC fabric.

VMware Cloud Director service is backed by NSX so that it can connect and manage seamlessly into supported VMware hyperscale partner cloud SDDC instances.

KEY BENEFITS

- Provides multi-tenancy within our organization allowing for self-service VM creation and resource pooling of SDDC resources over multiple tenants.
- Monetize Pay as you Go on-demand virtual servers, Allocation or Reservation Pool Virtual Data Centers depending on tenant tier.
- Quickly provision and scale high availability instances for tenants to achieve 99.9% uptime of VMware Cloud Director service.
- Provides network isolation for each tenant with Firewalls, NAT and Public IP services. Take advantage of IP Space feature to better manage your network IP's.
- Uplift security services with L4 and L7 distributed firewalling securing East-West traffic flow.
- A hybrid operational model for Enterprise Customers and their tenants in multi-site self-service VMware Cloud Director experience.
- Automatic upgrade for new features and release with no downtime impacts.
- Inclusive monitoring of VMware Cloud Director instances with VMware service support & escalation.

The VMware Cloud Director service is a distinctive and specialized Software-as-a-Service (SaaS) solution accessible to our Enterprise Customers.

Tenants within the organization, can take full advantage of the VMware Cloud Director service, a unique and specialized Software-as-a-Service (SaaS) solution available exclusively to our Enterprise Customers. By utilizing this powerful tool, your organization can set itself apart in the market, optimize operational efficiency, and open doors to global expansion. Seamless onboarding onto VMware hyperscale partner clouds and on-premises vCenters ensures a smooth and efficient transition for your internal teams, making the most out of this exceptional service.

Addressing Growth

The VMware Cloud Director service offers Enterprise Customers the capability to harness the potential of a new VMware hyperscale partner cloud Software-Defined Data Centers (SDDC). This allows for the seamless self-service provisioning and utilization of customized resources on a smaller scale. By doing so, it grants the Enterprise Customers remarkable flexibility, particularly when serving smaller business units that may not require a full VMware hyperscale cloud SDDC but need access to a self-service cloud experience and isolation from other business units. VMware Cloud Director service now transforms Enterprise IT admin teams into Cloud Services Providers for the rest of your organization.

The VMware Cloud Director service is a SaaS solution that provides a self-service solution for Enterprise Customers building their own internal clouds. It offers a comprehensive approach, allowing companies to benefit from increased economies of scale and granting business units access to resource pools containing CPU, Memory, and Storage. This empowers business units to deploy Virtual Machines and applications effortlessly. Moreover, the Provider administrator can effectively oversee site themes, plugins, authentication, tenant organizations, and resources.

SERVICE REQUIREMENTS

VMware Cloud Director service

- An instance of the VMware Cloud Director service will be made available once the purchase has been made.
- VMware Cloud Director service availability covers each geo; Americas, EMEA and APJ. Enterprise Customers can connect their SDDC within these GEO to their regional VMware Cloud Director service instance (subject to 150ms latency).
- Enterprise Customers can also connect Cloud Director service to their on-premises Cloud Director instance using site association. Also, Cloud Director service supports connecting to an on-premises vCenter environment to provision services (subject to 150ms latency) providing a single control plane for the customers.
- End SDDC solutions currently supported H2 2022 include VMware Cloud On AWS, sold by VMware, Google Cloud VMware Engine sold and supported by Google directly, Azure VMware Solution A(various use cases) and Oracle CloudVMware Solution IA (various use cases).

Cloud Service Console portal

- Cloud Service Console Portal will be used by the Enterprise Customers.
- From within the Cloud Service Console Portal, a provider administrator can create tenant and managed services and service roles.

Addressing Agility

VMware Cloud Director service is a Cloud Service and hence optimizes expense and agility issues often hindered by operational day two processes by offsetting these to VMware.

VMware Cloud Director service can be purchased to overlay resource pooling and tenancy on VMware hyperscale partner cloud and on-premises SDDC providing a true hybrid management experience using Cloud Director multi-site pairing. You can provide consistency of cloud experience across different VMware hyperscale partner cloud regions and on-premises Cloud Director or vCenter environments. (Less than 150ms latency required) — all regions and availability zones accessible in a single dashboard.

Addressing Customization

Providing a role-based access SaaS tenant portal allows the members of a VMware Cloud Director service organization to interact with the organization's virtual resources. The user experience is also enhanced and customized with the provider's ability to brand and color the UI, meeting their corporate branding requirements.

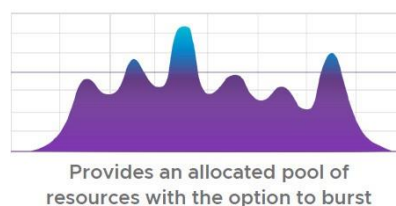
To find out more, please see this [blog](#) and the [video](#).

VMware Cloud Director service Consumption Models

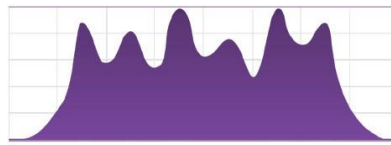
VMware Cloud Director service extends the same management principles as the on-premises VMware Cloud Director solution, providing your tenants with a shared infrastructure solution for a virtual server, virtual data center or dedicated virtual data center cloud models. These tenant resources are applied to an organization in an organization VDC (organization virtual data center) and are dependent on resources from underlying PVDC (provider virtual data center) resources. Enterprise Customers can define service levels for their business units based on the allocation models and resource pooling:



Pay-as-you-go is an on-demand Virtual Server offering with no upfront resource allocation or costs, providing a true public cloud experience. Tenants only pay for what they use, and it is typically targeted for highly seasonal, variable, transient workloads like dev/test.



Allocation Pools provide a predictable cost model by guaranteeing resources and offering burst capacity to ensure workloads can start if resources are running low. This is ideal for stable workloads that need guaranteed resources, like databases, for example.



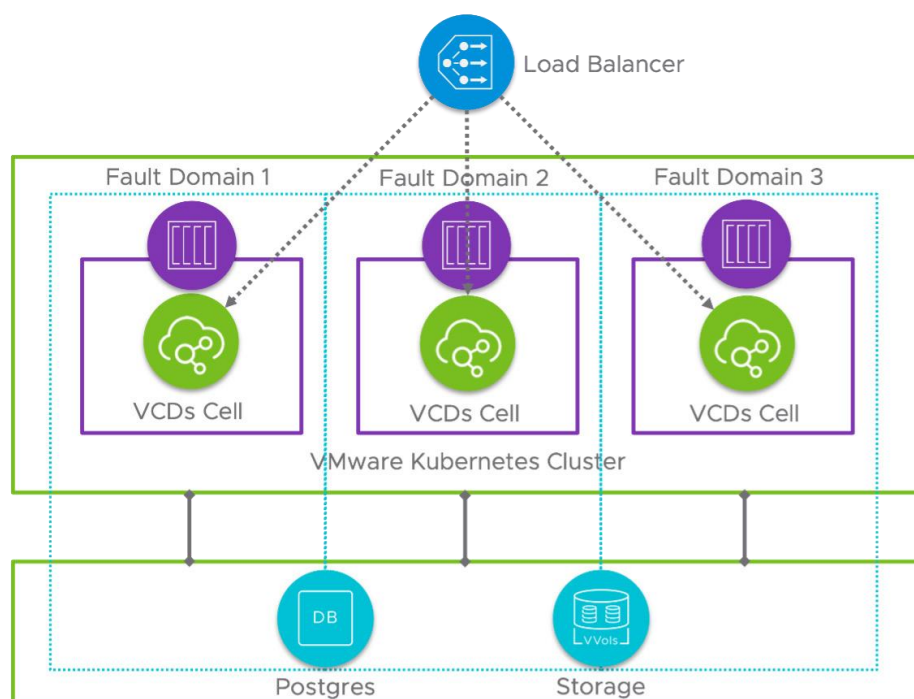
Provides a fixed pool of guaranteed resources for optimal performance

Reservation Pools guarantee 100% of reserved capacity which is ideal for business-critical applications. Reservation Pools are recommended for businesses with predictable and stable workloads to avoid the undesirable potential of underutilized resources.

Go further and define a **flexible pay-go and allocation pool model** with computing policies for exceptions such as business-critical VMs. This model enables the allocation of available unreserved resources within the provider VDC.

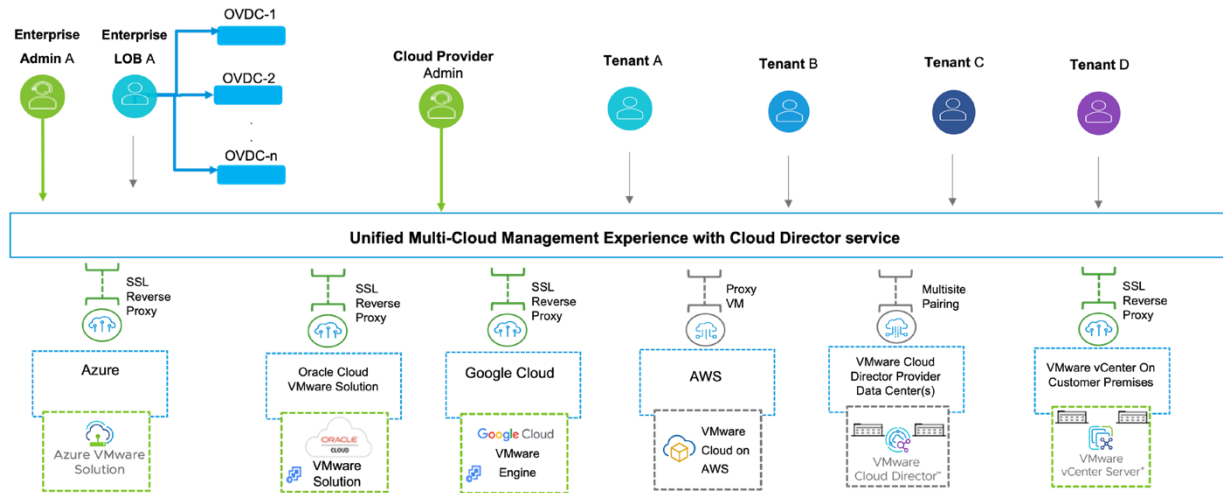
High-Level Architecture

VMware Cloud Director service has been built from the ground up to run in Kubernetes Pods ‘cells’ in a multi-zone cluster managed by VMware. For resiliency, this multi-zone capability is also used for the Postgres database instance, and storage is provided in highly available NFS, giving the Enterprise Customers a 99.9% service uptime. Enterprise IT Admins will access administration via the Cloud Service Console Portal to subscribe and provide service lifecycle and management. The VMware Cloud Director service cells and the supporting services automatically scale on demand and are rapidly created or deleted as necessary.



As of H2 2022, VMware Cloud Director service supports connection to a VMware Cloud on AWS SDDC, a Google Cloud VMware Engine private cloud, Azure VMware Solution, Oracle Cloud VMware Solution and on-premises Cloud Director as well as on-premises

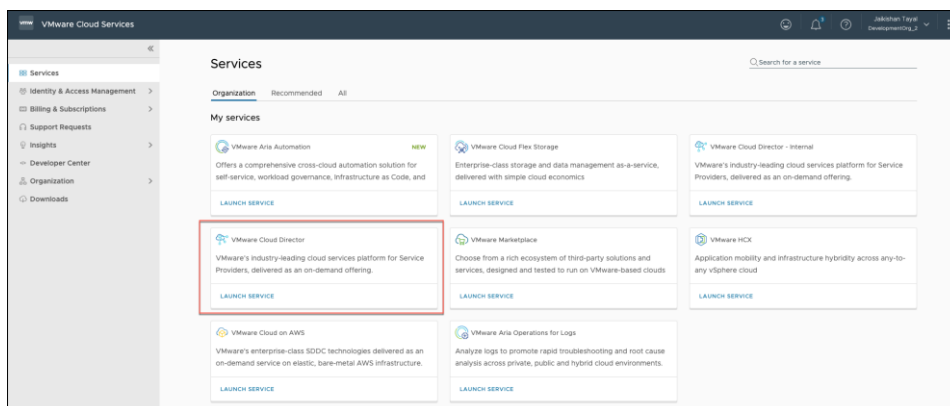
vCenter instances. Tenants have portal access with direct access to VMware hyperscaler services. They will also have access to the vApps, VMs and Kubernetes Clusters in their Virtual Data Centers via their organization.



Essential Features and Capabilities

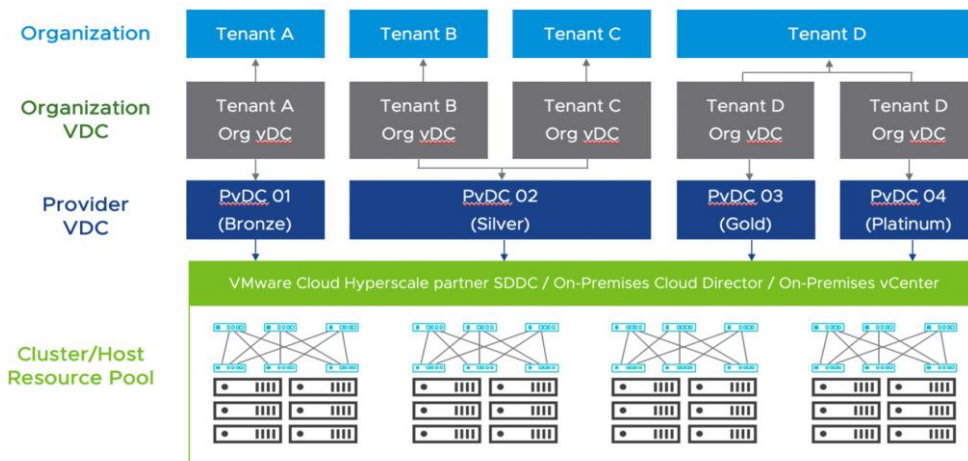
LIFECYCLE OF SERVICE

VMware Cloud Director service is available through the [Cloud Service Console portal](#), a portal that allows Enterprise Customers to deploy, provision and manage VMware XaaS offerings and the tenant lifecycle. Using the [Cloud Service Console portal](#), Enterprise Customers can subscribe to the VMware Cloud Director service, then launch into VMware Cloud Director service to create VMware Cloud Director service instances, join an instance to a VMware Hyperscale partner SDDC infrastructure and then provision organization resources and allocation pools for tenants to consume.



MULTI-TENANCY ON MULTIPLE HYPERSCALERS

VMware Cloud on AWS, Google Cloud VMware Engine, Azure VMware Solution, Oracle Cloud VMware Solution, and other supported hyperscale VMware partner infrastructure provide the foundation for Cloud Director service architecture, providing a consumable set of resources into a Cloud Director Provider Virtual Data Center (PVDC). The PVDC is directly mapped to a vSphere DRS cluster or to a resource pool within a vSphere DRS cluster.



Each tenant Organization Virtual Data Center (OVDC) uses resources from a PVDC. The PVDC associates the OVDC and shared or dedicated vSphere resources. To control how much an OVDC can consume, an allocation model is applied to the OVDC, restricting the vSphere resources and helping balance the needs of other OVDCs sharing the same PVDC.

Fundamentally, Enterprise Customers can partition resources to different organizations based on resource pools as the basic construct of the boundary. This allows different classes of service to be associated with performance, availability, and cost characteristics to be sold or chargeback to your business unit tenants and differing SLAs used to guarantee service.

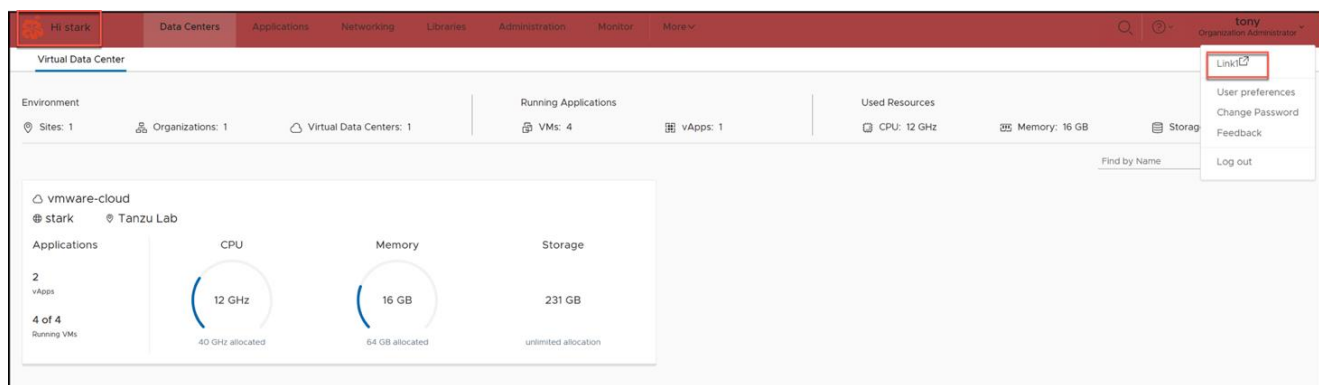
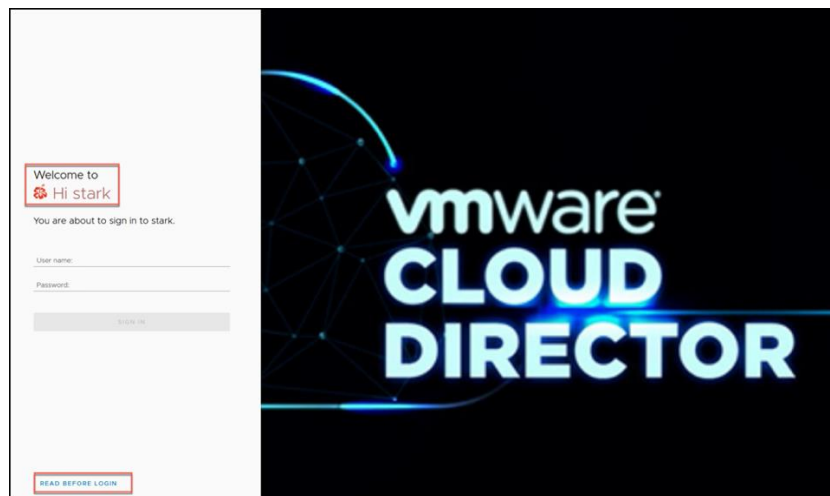
SECURITY

The varying endpoints have different levels of security. The VMware Cloud on AWS service solution is provided by VMware and uses the least privilege, restrictive access model whereby there is no root ESXi access, no VIB installations are permitted, and no VMware Cloud Director service configuration access is allowed, all these layers are managed and serviced by VMware. Other hyperscale partner solution endpoints may vary in terms of root access and VIB installation.



At the backend, VMware manages a shared Kubernetes cluster for VMware Cloud Director service, and tenants cannot see each other's namespaces, providing isolation. One instance of the core services (Provider and Operator) will be run for each deployment (development/staging/production). The services will use Kubernetes autoscaling to adapt to incoming service requests.

BRANDED TENANT / PROVIDER PORTAL



As a SaaS offering, it is important for the service to be personalized to the consumer. The UI portal, from the login splash screen to UI functionality, can be color branded with a company logo throughout to ensure the look and feel of the business is represented.

To find out more, please see this [blog](#) and the [video](#).

NETWORKING

Networking in VMware Cloud Director service within supported hyperscale partner clouds (VMware Cloud on AWS, Google Cloud VMware Engine, Azure VMware Solution and Oracle Cloud VMware Solution) is provided by NSX. (Please check the networking aspects as per individual hyper scaler). Within the VMware Cloud Director service and VMware Cloud Director there are three layers of networks:

- External Networks** – These are networks that are external to Cloud Director. Created in vSphere, then mapped by Cloud Director service to provide external connectivity to Organizations such as accessing the Internet. In Cloud Director service in VMware Cloud on AWS, these networks are created in front of each tenant's T1, and the T1 is responsible for NATing (only in VMware Cloud on AWS) the traffic for inbound and outbound access to workloads.

In Google Cloud VMware Engine, traffic in and out to the internet will go via the IPsec tunnel to the Enterprise Customers Virtual Private Cloud in Google Cloud Platform, and it will not require NAT.

In Azure VMware Solution, traffic in and out to the internet will go via the IPsec tunnel to the Enterprise Customers Microsoft Azure Virtual Network (VNet), in Azure Platform, it will not require NAT.

In the Oracle Cloud VMware Solution, traffic in and out to the internet will go via the IPsec tunnel to the Enterprise Customers Oracle Cloud Virtual Cloud Network (VCN). In the Oracle Platform, it will not require NAT.

- **Organization Virtual Data Center (OVDC) Networks** – These are tenant networks providing connectivity for vApps and VMs and contained within an organization VDC. In Cloud Director service with VMware Cloud on AWS, Google Cloud VMware Engine, Azure VMware Solution and Oracle Cloud VMware Solution, these are the networks created behind the Tenant's T1 gateway and since each one is a separate routing domain, different tenants can have overlapping IP space.
- **vApp Networks:** These networks are contained entirely within a vApp and can be attached to an Organization Network. From a management perspective, the Enterprise Customer will manage the internet gateway and management gateway (T0) for all tenants / Business units and the compute gateway (T1) per Business unit. The tenant Org Edge compute gateway (T1) is mapped to VMware Cloud on AWS, Google Cloud VMware Engine, Azure VMware Solution and Oracle Cloud VMware Solution or hyperscale partner's Compute Gateway (CGW) through which they access the service. Although tenants can self-manage their Edge compute gateway (T1) in VMware Cloud Director service if required.

MIGRATION

Migrating workloads to the cloud is a key use case for Enterprise Customers to grow their cloud consumption with workloads, moving them from on-premises or existing Enterprise Customers Cloud Director instance to Cloud Director service on VMware Cloud on AWS or Google Cloud VMware Engine or Azure VMware Solution or Oracle Cloud VMware Solution endpoints.

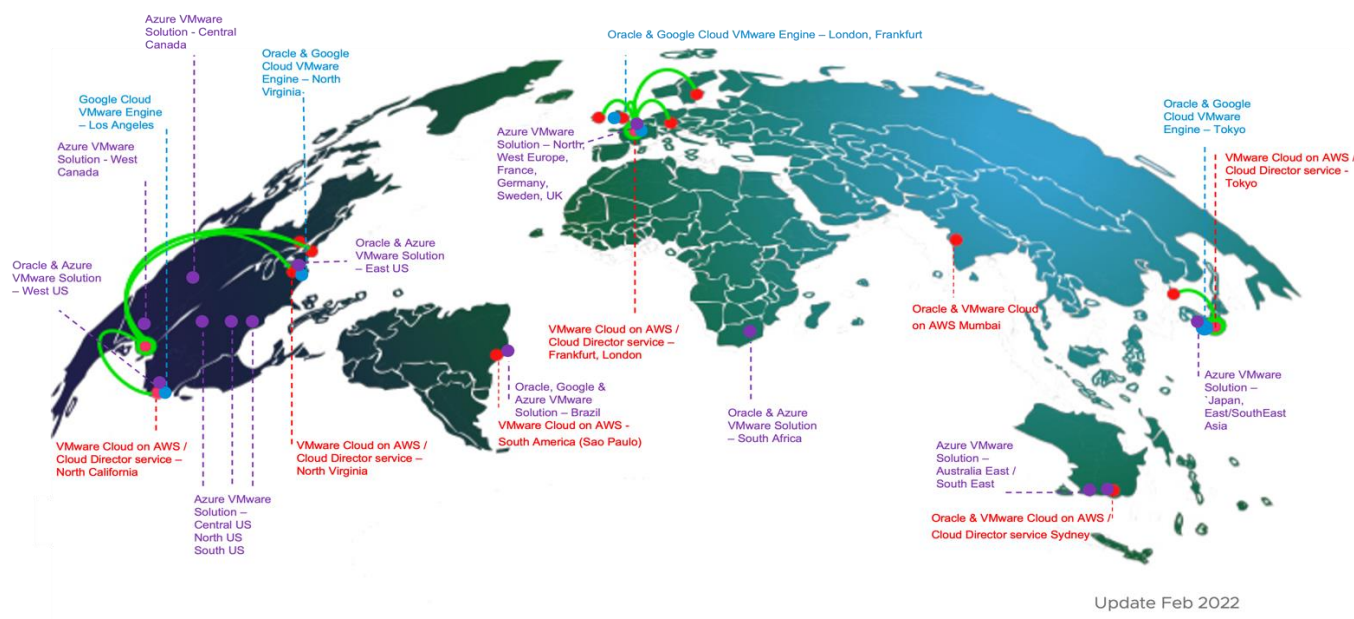
Enterprise Customers can be directly migrated into VMware Cloud on AWS using VMware Cloud Director Availability 4.2 and onwards from an on-premises VMware Cloud Director instance. To migrate to Google Cloud VMware Engine, Cloud Director Availability 4.3 and onwards can also be used, with full support for migration from Cloud Director and on-premises vSphere console. VMware Cloud Director Availability can also be used to migrate the VMware Cloud Director workload into the VMware Cloud Director service on Azure VMware Solution and Oracle Cloud VMware Solution.

CATALOGS

VMware Cloud Director service organizations can use catalogs to store vApp templates and media files. Tenant users in an organization that have access to a catalog can use its vApp templates and media files to create their own vApps. Organization administrators can copy items from provider managed public catalogs to their organization catalog.

GLOBAL PRESENCE, INSTANTLY

With VMware Cloud on AWS available in almost all AWS regions, Cloud Director service has the availability to deliver in the Americas, EMEA and APJ. VMware Cloud Director service can manage cross-region datacenters subject to 150ms latency. The same is true with Google Cloud VMware Engine, Azure VMware Solution and Oracle Cloud VMware Solution endpoints to vCenter on-premises or other Cloud Director instances can also be managed with the same latency prerequisite.



There are some limitations to VMware Cloud Director service, depending on the endpoint. See the configuration maximums guide [here](#). All limits listed are hard limits unless otherwise indicated. A hard limit cannot be changed. Any limit described as a soft limit can be increased upon request. To request an increase of a soft limit, contact VMware Support

THE BUSINESS MODEL FOR CLOUD DIRECTOR SERVICE

By leveraging economies of scale and optimizing resource utilization, the utilization of Cloud Director services for self-service empowers businesses to achieve substantial cost savings. This approach enables efficient and cost-effective provisioning of services, contributing to improved financial efficiency for the organization.

ECONOMIES OF SCALE

Each hyperscale environment has their own minimum footprint SDDC, depending on the level of availability required. This is usually a 3-node cluster sold by VMware in the VMware Cloud on AWS or the hyperscale provider (if the case for GCVE or AVS, or OCVS). As requirements on the SDDC resources grow, nodes can be incrementally added when needed and scaled down when no longer needed.

UNIT OF SERVICE - VMWARE CLOUD DIRECTOR INFRASTRUCTURE SERVICES

With the ability to sell per VM or per org VDC, there are several ways you can construct your infrastructure service, but there needs to be carefully thought about the resource settings for the allocation models and how this relates to services – Allocation, Guarantee and vCPU speed are directly related to vSphere settings for Limit, Reservation, and the limit on CPU on the VM level.

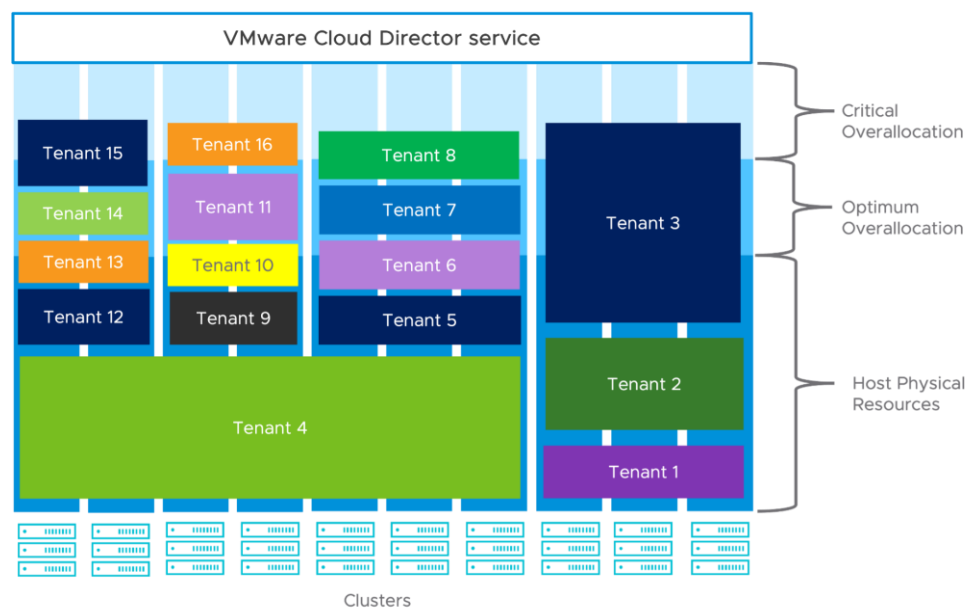
The setting of these consumption models will affect your internal SLA to the business units as there will be differences between guaranteed amounts (reservations) and the maximum amount (limits) of physical resources that are available to the org VDC. To guarantee physical resources, vSphere can set a reservation on the resource pool level and virtual machine level. A limit is set on

the resource pool level and virtual machine level if a maximum number of resources is defined in the organization VDC.

The opportunity for Enterprise Customers to improve cost savings at the infrastructure layer only is dependent on the allocation model chosen and how oversubscribed the resources are. Depending on the chosen allocation model, reservations and limits will be set on the resource pool level, virtual machine level or both. Enterprise Customers can use vSphere DRS to balance tenant workloads across physical resources within provider determined operational limits.

Enterprise Customers can scale out the SDDC nodes and add new clusters. After adding a new cluster to the SDDC instance from the VMC Console and importing the cluster resources into the Cloud Director service, cross-cluster resource management is handled by the Cloud Director service placement engine for elastic organization Virtual Data Center (VDC). Such placement is performed when a workload is (re)deployed, or its resources are reconfigured. Non-elastic org VDCs always use only the primary Resource Pool of a provider VDC and cannot be moved. A provider can migrate workloads between clusters within a PVDC (for elastic org VDC) using the migrate VM option.

If an org VDC outgrows PVDC resources that cannot be scaled anymore, a new PVDC must be created with a new org VDC for the tenant. Since a PVDC does not scale beyond the vCenter datacenter object, an org VDC is always limited by the PVDC. If the tenant has multiple org VDCs that are spread across multiple VCs, they cannot use some features: Live migration, Catalog media ISO mounts and Shared networks.



Please remember that the VMware Cloud Director service uses the terminology “allocations” and “guarantees,” whereas the vSphere layer provides “limits” and “reservations.” Using a Reservation pool, resources are allocated to the org VDC and are completely dedicated. This is identical to an allocation pool with all guarantees set to 100 percent. Reservation pool VDCs map to resource pools with the reservations set equivalent to the limits. Using an allocation pool allocated resources are provided with a certain percentage guaranteed. The percentage guaranteed directly translates into reservations configured on the child resource pool.

The difference between the reservation and the limit is in the resources that can be oversubscribed — this is essential in managing cloud resources and can lead to greater economies of scale, but also provide more risk to SLA.

LEARN MORE

To learn more about the solution please visit

<https://www.vmware.com/products/cloud-director-service.html>

For more information on Cloud Director resource controls please visit:

<https://docs.vmware.com/en/VMware-Cloud-Director/index.html>

FOR MORE INFORMATION OR TO PURCHASE VMWARE PRODUCTS

CALL 877-4 -VMWARE (outside North America, +1-650 -427-5000)

VISIT

<http://www.vmware.com/products> or search online for an authorized reseller. For detailed product specifications and system requirements, refer to the documentation.

PUBLIC CLOUD (SHARED) SERVICES

For customers that are small, only need a few VM, have highly seasonal/variable/transient workloads, or are not interested in a whole org VDC associated with them, a Public Cloud experience is ideal. This would cover a pay-as-you-go consumption model and could be priced per t-shirt size VM/Hour. The pay-as-you-go model provides customers with the illusion of a resource pool with no configured limit of reservations.

Resources are only committed when a vApp is deployed and resources such as CPU and RAM can be guaranteed in the settings.

VIRTUAL PRIVATE CLOUD / VIRTUAL DATA CENTER (SHARED) SERVICES

Using a mix of Reservation and Limits, you can deliver guaranteed resource performance and cloud economics with a ratio of over subscription for stable production workloads with a potential pricing model of per Resource Pool/Month.

PRIVATE CLOUD (DEDICATED) SERVICES

Typically, private clouds use 100% guarantees on resources to ensure an SLA can be met as these types of services are typically for more mission/business critical applications or verticals, for example: ERP, CRM, SCM, Healthcare with increased security and compliance needs. This could be assigned to hosts and priced: Per VMware Cloud on AWS (or VMware Hyperscale partner) Host / Month.