DataSheet

vmware®

Cloud Director™

The Leading Cloud Services Platform for Cloud Providers

AT A GLANCE

VMware Cloud Director® (VCD) is a leading cloud service-delivery platform used by some of the world's most popular cloud providers to operate and manage successful cloud-service businesses. VMware Cloud Director helps cloud providers derive maximum efficiency from their cloud infrastructure and enables the creation and provisioning of differentiated and value-added cloud services. VMware Cloud Director is available globally through the VMware Cloud Provider Program.

KEY BENEFITS

- VMware Cloud Director delivers a hyperscale-class cloud platform in and across Cloud Provider's datacenters helping save operational cost and capital expenditure.
- VMware Cloud Director is highly automated, extremely operationally efficient, and scale-tested for global cloud environments
- VMware Cloud Director bears a suite of native cloud services, along with custom self service capabilities. Hundreds of cloud providers across the world have used VMware Cloud Director to up-level from pure IaaS / hosting to a full-fledged portfolio of profitable cloud services
- VMware Cloud Director delivers a unified platform to manage applications, VMs as well as containers. VCD offers several ways to code and extend its functions in a developer environment such as python and REST API as well as Terraform Provider support to drive infrastructure as code.
- VMware Cloud Director has proven cost saves and revenue generation for Cloud Providers, enabling business growth with minimal operational headcount increase

What is VMware VMware Cloud Director?

VMware VMware Cloud Director is VMware's flagship cloud services platform for Cloud Providers. It is a pervasive cloud infrastructure control plane for cloud providers' service-delivery needs, and the management entity for a global VMware cloud estate. VMware Cloud Director allows seamless provisioning and consumption of cloud computing resources and services to geographically distributed lines of business and IT teams in an API-driven approach.

What are the key features of VMware VMware Cloud Director?

Multi-tenant Resource Pooling: VMware Cloud Director helps create virtual datacenters from common or distributed infrastructure to cater to heterogeneous enterprise customer needs. With VMware Cloud Director, a Cloud Provider can host and serve multiple customers from a single vCenter that may be stretched across distributed physical servers.

Cloud-native Offerings: VMware Cloud Director provides an easy on-ramp to cloud-native application development for enterprise DevOps by delivering enterprise-grade Kubernetes, lifecycle management of K8 clusters managed by any K8 provider (CSE/WCP/Tanzu/Ent-PKS). With Kubernetes delivered by self-service, tenants can deploy k8s clusters with or without the VMware Cloud Director Container Services Extension, they can spin up, scale in/out, one or more standards compliant vSphere Kubernetes k8s clusters via native GUI or API and CLI.

Deep Automation: VMware Cloud Director delivers unparalleled infrastructure efficiencies with context-aware automation across workflows. Terraform Provider for VMware Cloud Director enables complete provisioning of compute and network resources as code, and integration with Cloud Provider Pod enables simple architecture design of a service-ready cloud stack.

Service Suite and Service Stitching: VMware Cloud Director has an open extensible form-factor that is leveraged by leading data protection, storage, network, security, and other cloud software vendors to natively integrate their offerings VMware Cloud Director UI. Moreover, cloud providers can offer each of their customers bespoke user experiences by publishing their own custom services and user-views in App Launchpad 2.0 with automatic delivery on both containers and VM.

Policy-driven Approach to Cloud Management: VMware Cloud Director ensures enterprises have secure, isolated virtual resources, independent role-based authentication at the levels of cloud providers and their customers, and fine-grained access control across datacenters, sites, virtual machines, and applications. Moreover, intelligent workload-placement allows cloud providers to drive higher efficiency from their cloud infrastructure licensing and utilization while delivering outstanding performance and exceeding SLAs.

Global Hybrid Cloud Management: VMware Cloud Director helps cloud providers manage and gain deep visibility into datacenters across sites and geographies, and monitor cloud resources across sites from a single pane of glass. VMware Cloud Director is proven to scale seamlessly across thousands of sites. Multi-site is a core requirment for hybrid customers and is supported by Cloud Director and Cloud Director service bi-directionally.

Cloud Migration and Availability: VMware Cloud Director helps enable simple, secure VM migration and data center extension with VMware Cloud Availability. This allows for secure hybridity, simple connectivity and cold or warm migrations. The integration with VMware Cloud Availability makes it easy for cloud providers to run data protection offerings compatible with enterprise environments.

Networking and Security as an inclusive offering: VMware Cloud Director supports NSX-T with distributed firewalling, cross VDC networking, overlapping IP support for tenants using VRF-lite, IPv4 and v6 coverage and layer 2 VPN services natively. NSX advanced load balancer brings application intelligence to load balancing services for customers and combined with self-service from VMware Cloud Director, fully covers the services that used to be provided by NSX-V.

Operational Visibility and Insights: Leveraging integration with VMware vRealize Operations' Tenant App for VMware Cloud Director, cloud providers can use multi-layer analytics and predictive remediation to better serve their enterprise customers. The integration also provides visibility into virtual machine costs and accountability to understand granular costs of virtual infrastructure required to support business services.

What are the key benefits of VMware Cloud Director for the Cloud Provider?

Operational Efficiency: VMware Cloud Director enables cloud providers to obtain extreme operational efficiencies out of their cloud infrastructure, and also reduces operational overheads that come with maintaining silo'd private and multi-cloud environments. VMware Cloud Director significantly reduces time-to-market for cloud providers' services and scales these services globally without external dependencies and ballooning costs.

Service-expansion and Monetization: VMware Cloud Director enables cloud providers to spin up new cloud services on Day 1. Cloud providers can drive more revenue by publishing their own service suite, or 3rd party ISV-provided backup, DR, security, migration, and other leading cloud services that are tenant and site-aware. Services can also be launched by App Launchpad, negating customer knowledge of infrastructure and security to any end point; containers and VMs. VMware Cloud Director forms a unified management plane for the entire service portfolio of a cloud provider. VMware Cloud Director is also a key element to getting the 'Cloud Verified' certification, a mark of the most capable and differentiated VMware Cloud Providers in the world.

Developer-Readiness: VMware Cloud Director provides an open platform for cloud providers and customer developers to build on. Using the programmatic interfaces, automation tools, and extensibility frameworks of VMware Cloud Director, cloud providers can not only differentiate themselves by providing unique experiences to their customers but also help them get to application-building faster. Using VMware Cloud Director, providers are able to offer tenants various tiers of cloud native services, secure K8 infrastructures and application portfolios / interfaces to meet developer needs.

What are the key benefits of VMware Cloud Director to the end-customer?

VMware Cloud-as-a-Service: Consume turnkey cloud services, including the full VMware Software-Defined Datacenter, as a service from a trusted VMware Cloud Provider, with full self-service controls or delivered as part of a managed service.

Easy-to-Provision and Easy-to-Consume VMware Cloud: Experience a single access point for all your virtual datacenters via an intuitive UI or APIs. Enjoy easy, self-service consumption and provisioning of cloud services, including 3rd-party services and cloud provider-built services through a single pane of glass to any target platform. Leverage simplified workflows and container services to build better and faster.

Easy Workload Migration Across Virtual Datacenters: Backup, evacuate, or replicate VMs or entire datacenters in a few clicks to a resilient VCD-powered cloud

Fast Path to Hybrid Services: VMware Cloud Director provides a feature-rich, self- service and modern cloud environment with on-demand elasticity, streamlined on-boarding and hybrid cloud operations across multiple clouds.

Developer Ready Clouds: VMware Cloud Director provides Terraform Provider infrastructure-as-Code a range of API capabilities and Kubernetes K8 native cluster services from the Container Service Extension supporting VMWare PKS or native Kubernetes that can be consumed by enterprise developers as code. Tenants can deploy any type of K8 cluster (native/pacific/ent-pks) using VMware Cloud Director cluster API/CLI/UI (with or without Container Service Extension). Equally now Cloud Providers can offer Platform as a Service VMware Marketplace or custom applications to consumers via the App Launchpad, essentially negating the need for customers to understand underlying infrastructure.

What is new in VMware Cloud Director 10.2?

NSX-T support

VMware Cloud Director 10.2 has focused on getting NSX-T support parity with NSX-V so that providers can migrate to NSX-T without losing service capabilities. Now Cloud Providers are able to offer their tenants EDGE Load Balancing, like they have always, now using NSX Avi Advanced Load Balancer. Load Balancing is a key obstacle for digital transformation as more applications equates to more changes and more domains to manage the applications in. The new NSX Avi Load Balancer addresses lots of these with Core Load Balancer updates – wildcard VIP, GSLB, DNS, and IPAM updates and full-feature support for Google Cloud Platform. Supporting Web Application Firewall (WAF) threat feeds, rate limiting enhancements, OSCP certificate stapling and SAML 2.0 support. Avi Pulse also helps minimize troubleshooting with proactive case management call home capabilities. NSX Avi Advanced Load Balancer addresses scalable modern application demands with a new ingress architecture for highly scalable, multi-cluster, multi-site K8S/OpenShift networking services.

Cloud Director 10.2 brings NSX-T parity to provide networking services and security. NSX-T L4-7 firewalling and distributed firewall make the security offerings available within Cloud Director. Tenants are able to create, read, update and delete distributed firewall rules for VM/vAPP in an NSX-T backed Org VDC, given tenants control on 'microsegmentation' is a core differentiator that no other clouds can supply. Further Networking and Security UI enhancements in 10.2 provide the cloud admin the ability to provide cross VDC networking stretching networks across multiple VDCs in different data centers allowing common distributed firewall policies across hybrid environments. Tenant networks from on-premise to the cloud provider can now be connected by layer 2 VPN, no matter if the on-premise NSX version is NSX-V or NSX-T.

Other NSX-T services such as VRF-lite (now available at 1pt as a part of NSX Professional), which is a core requirement for Cloud Director allow cloud admins to provision a T0 NSX-T gateway to be shared among different tenant org VDCs whilst the tenant VDC can use overlapping IP address ranges and isolated routing tables. Tenants can also use IPv6 and IPv4 in the same org VDC, allowing complete flexibility of IP usage. Tenants developing applications or requiring applications to be in close proximity can use vAPPs now with vAPP edge networking supporting NAT and vAPP edge firewalls, securing the application environments.

From an update and migration perspective, support for NSX-T is improved and there is a free migration tool from NSX-V to NSX-T, this has been improved since the prior release with VCD 10.1.

Object Storage Extension (OSE 2.0)

For many providers offering storage that caters for unstructured, large volumes of data within a reasonable price is hard, with the hyperscale object storage services providing immense competition. Now in Cloud Director 10.2 the Object Storage Extension (OSE) has been improved to 2.0 release. This release provides more feature richness in S3 services, integration directly from VCD to Amazon S3 services, especially useful for Cloud Director service (CDs) in VMware Cloud on AWS where CDs can connect to S3 via the provider ENI and benefit from no egress charges. With AWS S3 integration Cloud Director tenants can login to the OSE portal in VCD to consume S3 storage, obtain access and secret keys and make S3 API calls to the OSE endpoint. The Provider admin can invite a tenant AWS account for object storage use and enable the tenant account by reusing the existing provider AWS accounts. To the tenant, API clients can consume all S3 services, like bucket request payment, they can also make use of object lock options to prevent malware spread and fulfil use cases like legal hold and retentions on objects. They can get, set, and apply lifecycle, access controls and server-side encryption to buckets. Lastly Dell ECS 3.4 and Cloudian Hyperstore 7.1.6-7.2.x are now also supported for object storage end points.

Storage controls

Cloud Director 10.2 now supports vCenter level IOPS settings and allows the configuration and management of vSphere Storage IO controls for storage I/O resources on a per VM basis directly from the Cloud Director administrator UI. It exceeds the vSphere version of IOPS limited and provides much more control over IOPS. Now providers can limit IOPS in provider VDC enforcing Org VDC to inherit the policies with optional over-write.

With Cloud Director 10.2, the placement engine takes IOPS into account when placing disks. A toggle per-Storage Policy controls whether IOPS is considered during placement or is just a pass through to vCenter to manage. Prior to 10.2, service providers could only enable and set IOPS settings on individual Org VDC storage policies from the API. IOPS placement was also always enabled, which meant that datastores associated with these policies needed to have IOPS capacities configured on them in vCenter, and storage pods/SDRS could not be used, causing a lot of setup.

Kubernetes services

Following the demand in Kubernetes, Cloud Providers now offer a cost effective, easy to use, and feature rich multi-tenant Kubernetes service to their tenants using open standards based k8s leveraging vSphere Kubernetes (Project Pacific) for k8s cluster life cycle management. They can enable tenants to self-serve, k8s clusters through Container Services Extension (CSE) 2.0 to Cloud Director.

In this update tenants are able to spin up, scale in/out, and upgrade-in-place one or more standards compliant vSphere Kubernetes k8s clusters easily. K8s clusters created by a dev-ops user are multi-tenant safe by consuming resources only from the org VDC that they are deployed into, and are limited by the VDC's allocated compute and storage resources; they are also isolated at the L3 network level with NSX-T. Tenant created k8s clusters are isolated from each other administratively as well; only k8s clusters owned or shared with are accessible to a vCD user and others are not. Tenants can manage clusters via a native GUI as well as an API and CLI.

Tenants can create clusters of different node sizes as published to Org VDC by the provider. Tenants have new choices of creating enterprise-grade vSphere with Kubernetes managed TKG clusters, or upstream compatible Container Service Extension 2.0 managed clusters, and TKGI (aka VMware PKS) managed clusters. Tenants can deploy pre-built curated containerized applications packaged as helm charts directly into CSE created k8s clusters using App Launchpad 2.0.

Using Cloud Director 10.2 and/or Container Service Extension 2.0, cloud admins carve up vSphere Kubernetes capacity that is created from a host cluster, into a k8s policy for tenants to create k8s clusters in. A k8s policy encapsulates placement, sizing, infrastructure quality (big v/s fast disk e.g.), and available persistent volume storage classes which enable persistent volumes. Compute (memory & CPU and including count of k8s node vCPU) and storage limits may be applied to each k8s policy. One or k8s policies may be published (assigned) to an org VDC. A k8s policy may be published to more than one Org VCD. A k8s policy may be changed to increase or decrease resource allocation by provider and tenant. Using vRealize Operations Tenant App for Cloud Director, providers may apply a pricing policy on Container Service Extension created k8s clusters so that providers and tenants would have the capability of charging and viewing usage respectively.

Cloud admins must first upgrade to Cloud Director 10.2 and ensure vSphere 7 or greater is used, install vSphere add-on for Kubernetes and install NSX-T 3.0 or greater before they can offer a modern Kubernetes container service to their tenants.

App Launchpad 2.0

App Launchpad 2.0 brings a number of key enhancements for cloud providers looking to offer their tenants extended catalogs of applications in a platform as a service manner in Cloud Director and Cloud Director service. Now tenants can point and click on applications directly sync'ed from the Bitanmi marketplace or custom applications in their TenantApp portal, which in turn are delivered as container applications into existing Kubernetes clusters using helm charts or VMs. Providers are able to connect to existing container registries so that existing repositories can be presented as tiles in the user UI. Container apps and helm charts can be presented from VMware Cloud Marketplace or from custom repositories. K8S created through Project Pacific can also be an endpoint for container applications.

Lifecycle management was a key requirement for consumption, in 2.0, when a new version of an app is released in the VMware Marketplace, the Provider Admin is able to select whether to add it as a new app, or replace the existing catalog item with the new version, this can be managed using a new Cloud Marketplace auto-sync feature.

"As a SP Admin, I can select to replace vCD vApp Templates with the new version when it is released in the VMware Cloud Marketplace. I can make this setting the default, and then enable auto-sync in Marketplace. Then when a new version of an app is added to Marketplace, it will automatically replace the existing vApp Template in vCD with the new version."

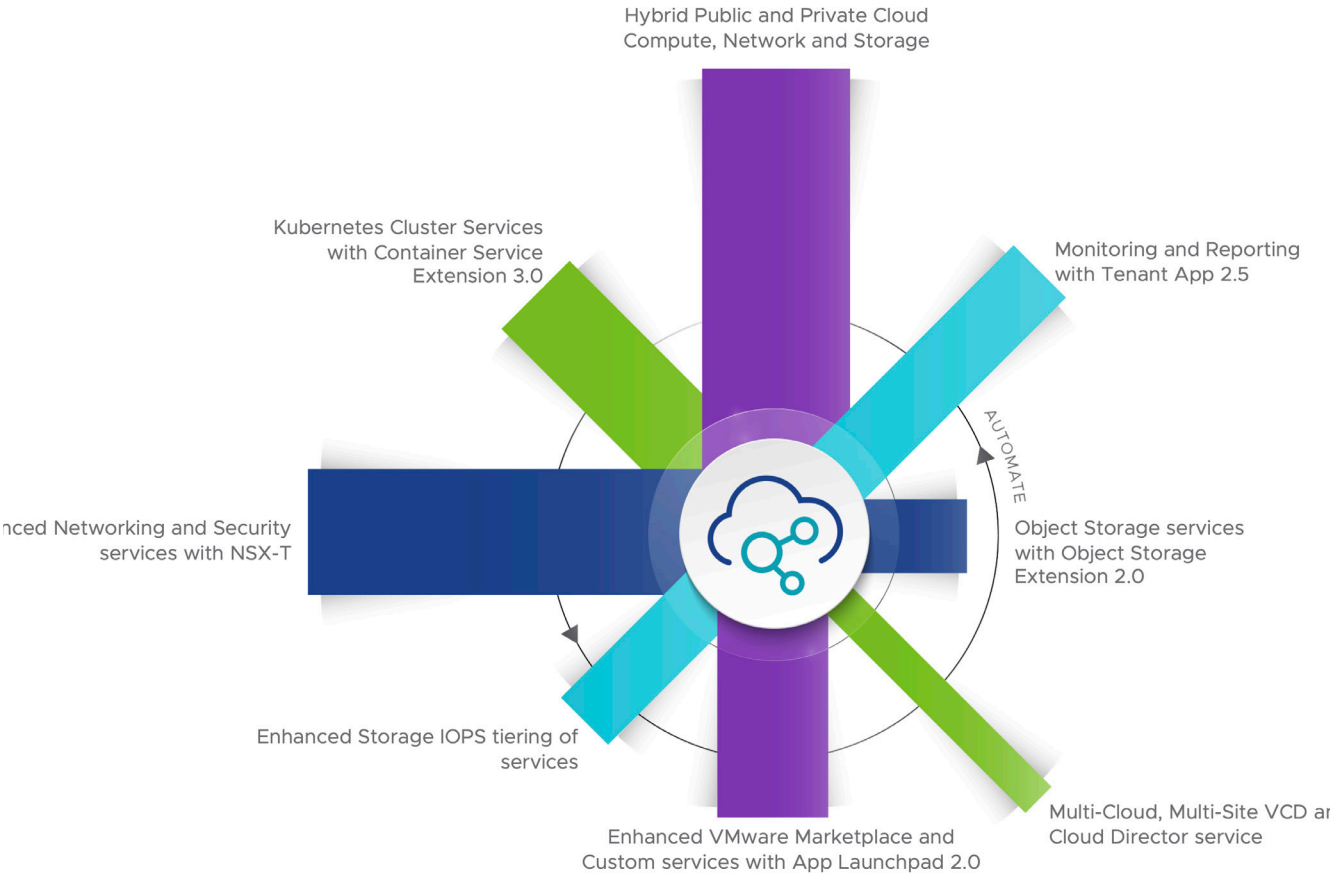
Other VMware Cloud Director Enhancements

It is now simpler than ever to deploy Cloud Director appliances, building on the 10.1 enhancements for OVA deployment, health status, automatic failover and recovery and appliance cluster management from the UI and API, HA status reporting and Improved failover resiliency and stability. 10.2 introduces new features including full validation of user input during OVA deployment in a custom deployment UI, documented backup and restore flows, access to appliance deployment, configuration logs in CLI and in management UI for essential operations and monitoring.

Further efficiency gains are provided in improved usability for provider and tenants: VMware Cloud Director 10.2 continues to improve the usability with new features in provider and tenant portal. New '**Guided Tours**' help new users to find their way through the UI, and providers to highlight offered services and features. With new '**Advisories**', providers can notify tenants, for instance about planned maintenance. And a new **Quick Search** simplifies the navigation through a large number of objects.

Increased customer visibility into their clouds

With every growing customer demand for public cloud services, increased visibility into the capacity and performance of their virtual data center resources is required. The vRealize Operations Tenant App 2.5 covers a number of areas of improvements; support for the Container Service Extension Kubernetes Clusters allows tenant administrators to better understand their Kubernetes cluster usage. The ability to provide custom reports to the tenant dashboard means providers can tune the reports to the tenants needs, providing more specialization and value-added services for partners to offer. Equally customizable email notifications mean tenants are informed when conditions are met regarding their infrastructure services, great for self-service public cloud offerings where the provider wants minimal management of the service.



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