Introduction to VMware Cloud Director Availability

Adoption of cloud and Internet of things have grown exponentially in the last two decades but since the pandemic the cloud computing marketing has been on a rapid upward trajectory when it comes to cloud adoption, infrastructure and spending. Many businesses have been compelled to rethink and shift their strategy to accommodate a new wave of working, communicating and operating business functions. Therefore, most businesses are now hybrid, some however, are still thinking about shifting gears and moving their on-premises environment to the cloud. If cross collaboration is key for businesses, they will ultimately need access and control over workloads that are accommodated on commercial public, private clouds or across hybrid infrastructures. The ‘as-a-Service’ segments of cloud spending, combining shared Cloud as-a-Service and dedicated Cloud as-a-Service, will account for the majority of all cloud spending growing from 55.7% in 2021 to 64.1% in 2025. These as-a-Service segments will also see the fastest growth in spending, with a five-year CAGR of 21.3% (IDC Report, 2021).

Whether the business is transiting partially or fully from on-premises to cloud environment, VMware Cloud Director Availability offers disaster recovery and migration capabilities that can be implemented across a number of scenarios and use cases. VMware Cloud Director Availability has inspired cloud transformation and modernization for an array of businesses, with over 300 partners in production managing 1000’s of monthly migrations. Between multi-tenant clouds and on-premises, with replications and protections, VMware Cloud Director Availability migrates, protects, fails over, and reverses failover of customer vApps and virtual machines. VMware Cloud Director Availability is available through the VMware Cloud Provider Program and is designed with Cloud Providers and tenants in mind with competitive managed as well as self-service capabilities.

It introduces a unified architecture for disaster recovery and migration of VMware vSphere® workloads. With VMware Cloud Director Availability, Cloud Providers and their tenants can migrate and protect vApps and virtual machines:
Introducing VMware Cloud Director Availability

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VMware Cloud Director Availability offers Disaster Recovery & Migration solutions to sites leveraging VMware Cloud Director up until version 4.3. However, version 4.4 is a trailblazer as many technical barriers have been broken to reignite this solution. The latest version comprises of highly interoperable DR and Migration offerings designed especially for multi-tiered cloud services. This release also brings the highest number of features to the market with highlights such as vSphere DR & Migration, One-Click Migration, Advanced reporting features along with L2 Stretch to VMware Cloud on AWS and much more.

**Key New Features**

**vSphere DR & Migration**

VMware Cloud Director Availability 4.4 release changes the paradigm for VMware Disaster Recovery and Migration service offering landscape. With 4.4 we have introduced support for on-premises to Cloud vCenter Replication using the existing underlying technology and the vCenter Replication Management Appliance. This new replication functionality can directly be enabled from the vSphere 6.7 and 7.0 UI, vSphere client plug-in and VMware Cloud Director Availability portal. Please note, vSphere 6.5 is also supported but the feature can’t be accessed through the vSphere plug-in.

After pairing an on-premises site to a cloud, the tenant can seamlessly one-click migrate or protect their workloads. In case of failover, the protected VMs can also be reversed to the source site post a disaster recovery event. This feature has single-handedly broadened the horizon for Cloud Providers supporting clouds based on vCenter Server and accommodate vSphere-based tenants at zero implementation cost. In future, this will allow more opportunities for revenue through a new approach to onboarding and consequently new service offerings.
vSphere DR & Migration Metering
To accelerate quick adoption, tiering and monetization of vSphere DR & Migration, vCenter to vCenter (v2v) manager service mimics the cloud appliance Usage Meter APIs to meter vSphere replications and migration. To meter incoming and outgoing replications at manager level it is mandatory to install Usage Meter on “cloud” side as the target is client dedicated vCenter server. Furthermore, with the help of Usage Meter 4.4 or later Cloud Providers can get visibility on diagnostic and health of the overall process. By mapping capability, Cloud Providers can differentiate between the types of v2v replication use cases (migration or disaster recovery). For example, UM will record a Cloud-to-Cloud replication item for v2v provider to provider replication, On-premise to Cloud for v2v on-premise to provider and Cloud to vSphere for provider to on-premise replication.

One-Click Migration
VMware Cloud Director Availability is very nimble and delivers highly competitive self-service migration features for single vSphere and multi-tenanted Cloud Director environment. The single click migration is a crowning feature built in to empower tenants to configure a migration straight from vSphere UI with basic replication settings. This feature is a hit amongst administrators and users as it is simple and doesn’t require advanced replication setting configuration.
Recovery Plans Execution Reports and Monitoring

In 4.3 we announced the availability of DR and Migrations plans and in version 4.4 we’ve enhanced this feature by adding the reporting capability to offer admins deeper visibility into the recovery plan execution process. This allows Cloud Providers and tenants a readable report regarding the status and outcome of the executions along with error and warning in case of any failover discrepancy, especially important in fast Recovery Point Objective environments. The execution offers a real-time HTML reports on replication and the resulting state of each step in the execution.

RPO Compliance

For Cloud Providers maintaining SLA requirements and ensuring Recovery Point Objective (RPO) compliance with predefined policies is integral to their business performance. With 4.4. Cloud Providers can generate and export RPO compliance reports in different formats (JSON, HTML & CSV) listing any violation of the existing protections associated at an organization level for any timeframe. This feature can be continually used to track, monitor, and audit RPO practices to align with your business policy.

Additional Features & Operational Improvements

Network Extension to VMware Cloud on AWS

With VMware Cloud Director Availability 4.4, Cloud Providers can stretch L2 network to a software-defined data centre in VMware Cloud on AWS by using the existing process for stretching on-premises Layer 2 networks in the Cloud. This process requires the Cloud Provider to use Cloud Director Service.

Remote site compatibility pre-upgrade check

During and prior to any upgrade it is important for Cloud Providers to have visibility of different VMware Cloud Director Availability versions being used in their customer on-premises sites to confirm compatibility. Therefore, in the 4.4 release VMware Cloud Director Availability introduces a wizard which displays a list of sites and replicators that would become incompatible after the upgrade. The Cloud Provider is then able to “prompt” the tenants that are running older versions to upgrade to the latest version of VMware Cloud Director Availability to ensure service consistency.

In-Product Feedback

To improve user experience and engagement, VMware Cloud Director Availability team has added a new feature for users to submit feedback, ratings, and comments in real-time. Cloud Providers and Tenants navigate to the top right dropdown menu in VMware Cloud Director Availability dashboard and add in their comments by clicking on the ‘Feedback’ call to action.
Endpoints resource capacity filter
VMware Cloud Director Availability 4.4 has built-in endpoint resource capacity filter to understand which resources (compute, and RAM will be required at the destination cloud to support the protected workloads. This is especially useful to ensure that Cloud Providers maintain enough resources on the failover site for Disaster Recovery events. For information about monitoring the required resources: as a tenant, see: Monitor the Required Resources as a Tenant and as a provider, see: Monitor the Required Resources as a Provider.

Replication alignment with the destination storage profile
Before version 4.4, storage needed to be manually aligned to the Cloud Director storage profiles used. Now in 4.4 when creating new replications, the disk type is provisioned and mapped automatically to the Cloud Director storage profile of the organization VDC. After creating a replication, the disk provisioning type never changes.

Managed service replication assignment
You can now select the tenant organization as a default owner for new replications or leave the system administrator as a default owner. This is especially helpful for Cloud Providers delivering DRaaS or Migration as a Service as a managed service for their tenants.

Cloud Collection of support bundles
During the initial configuration and pairing of the on-premises appliance and during re-pairing with a cloud site, now you can allow log collection from the cloud site. To simplify troubleshooting, activate log collection from the cloud site. This allows the provider to easily obtain new on-premises support bundles for VMware Global Support Services troubleshooting if necessary.
Migrating vApp Templates
When migrating vApp templates, you can now migrate the vApp networks with their connectivity and migrate the statuses of General > Gold Master and of Customize VM settings.

Simple, Capable Disaster Recovery as a Service
From the installation in the provider cloud to implementation on premise, VMware Cloud Director Availability is a simplified very capable architecture making it easy for customers and providers to implement. Customers can now find and setup DRaaS with a partner with our new vSphere plugin for DRaaS and Migration. Qualified DRaaS validated and Cloud Verified partners are listed in distance priority to the customer vSphere console, with integrated lead generation a customer can click on the partner and through form fill out request more about their service.

Once a customer has an agreement with partner and the destination details, they can self-serve deploy a replication appliance into their vCenter and connect to the provider Virtual Data Center via an encrypted tunnel, then start protecting their workloads directly from vCenter or from the Provider UI using the symmetric nature of the solution. VMware Cloud Director Availability allows customers to configure and manage both incoming and outgoing replication from the source and recovery site.

Importantly there are no agents to deploy on ESXi hosts and starting replication is a quick activity, equally the networking is vastly simplified to make it straightforward to deploy and use. Providers who enable VMware Cloud Director Availability for customers, enable customers to understand their protected status and run DR workflows directly in VMware Cloud Director UI, thereby driving more consumption and better user experience for customers.

VMware Cloud Director Availability provides coverage for 2 main use cases; on-premise to cloud Disaster Recovery and / or migration and Cloud to Cloud Disaster Recovery and / or migration.

Migration capability is cold and warm and easily scheduled into maintenance windows to suit your customers. Cold Migration is the complete sync of an offline workload before cutover and warm migration just syncs the differential at the time of cutover and is faster to implement. Many providers use VMware Cloud Director Availability for migration as it is simple, at no charge to VMware, but importantly can be driven by customers and allowing a customer to self-migrate when it suits them is a great experience and selling point.

Usability in this release has been significantly improved and many UI improvements make the solution far more intuitive for customers to enjoy Disaster Recovery as a Service and to manage navigation with new collapsible sections. Having intuitive usage is preferential for customers to be able simply use the solution and drives better consumption. The ‘In product Feedback’ feature is a user centric feature which is especially developed to capture and prioritize customer feature request at scale, improve engagement and increase user satisfaction.

Moreover, VMware Cloud Director Availability is really helping customers drive better protection and testing. In fact, one big aspect of the solution is the ability to test, i.e., the ability to ensure that you have limited any uncertainty in your capability to recovery in the event of a disaster.
Testing frequently is the key to decreasing risk and protecting against a disaster, unfortunately it is perhaps the least used feature in DRaaS. Typically, this is because Disaster Recovery is provided by products that do not suit self-service or because the provider needs to ensure resource availability at the target is managed between multiple customers. In 4.4, ‘Endpoint resource capacity filter’ was added with built-in capacity to identify which resources (compute, and RAM) will be required at the destination cloud to support the protected workloads. This is particularly useful to ensure that Cloud Providers maintain enough resources on the failover site for Disaster Recovery events.

VMware Cloud Director Availability is self-service and can also be a managed service; self-service, and this means a customer can test their failover, non-impacting, at any time on any frequency. Managed service would mean a provider does this testing for the customer and this could be complimented with additional application testing services. As a self-service capability it is important that there are adequate resources at the target end to manage all customers compute requirements as potentially all could choose to failover or test failover at the same time. The recommendation is to promote testing as feature to decrease risk of recovery uncertainty.

**Workload distribution**

It is important to realize that not all workloads are equal in requirements, some may require much higher replication frequency and granular recovery due to the nature of the speed and criticality of the changing data, others may be non-critical and have longer cycles with less granularity. When considering Disaster Recovery, you need to have cost and functionality allocated correctly to cost, i.e., the higher the importance of a workload the more cost it is likely to take to cover it as it will consume more data, more replicants more frequently.

Mission Critical characteristics are defined as affecting the entire business, business will stop quickly in the result of outage. These are applications that have serious impacts on a broad part of the business can be deemed mission critical. For example - financial systems which transact millions of transactions per minute are critical to the business success. Customers for DRaaS need to think about what applications are in their business that the business cannot survive without for even the shortest duration?

Business Critical characteristics are different and affect Line of Business, but overall business can operate and survive. These Line of Business applications can be viewed as business critical. E.g., HR payroll system, although without it, payroll will be interrupted, the business will carry on.

Lastly there are non-critical workloads and applications, they affect people personally and may delay deliverables, but ultimately, they are not affecting the business, nor teams in the business for a short duration. Items such as personal file systems and possibly email could be viewed as non-critical, it all depends on how you run your business.

It is easy to see how the recovery characteristics can be composed for different workload types, the following graphic indicates how customers look at recovery point and time objectives by workload type, although this data is from 2019, it is unlikely to have changed much, if at all:
For a customer to be able to match a workload to a tier of service for Disaster Recovery is important as it will be more cost effective to have the appropriate resource capacity aligned to the workload. Having a single tier DRaaS portfolio does not provide the flexibility to cover mission critical workloads vs noncritical – there will be underused functionality/capacity which may cost the customer more overall. From a partner perspective, consumption will be much higher and better aligned with a tiered offering to customers.

VMware Cloud Director Availability SLA profiles offer out of the box classes of service to offer, the defaults are detailed below and can be added/modified or changed to meet you overall or per customer DRaaS cost to performance needs. With a simple nomenclature, customers understand what they are getting; from a Gold service with a low RPO and long retention time to a Bronze service with a longer RPO for less critical workloads and a short limited retention time.

As already noted the retention time in these SLA profiles is the ‘span’ of the Multiple points in time instances, with 4.4 these are flexible and in 4.3x these are extended with Advanced Retention Policies, permitting even more granularity over the MPIT cycle.

Resources are not unlimited so having the right option choices and taking advantage of the Advanced Retention Policies will mean better coverage overall and more revenue ultimately. SLA profiles in is an important feature that allows providers to start tiering services in this way to tenants, making the decisions for them on the DR capability and functionality at each tier and if required allowing customers to have their own custom profiles.

**Market opportunity**

As more customers move to cloud or find themselves in Cloud Provider VMware clouds, the need to protect their workloads becomes more and more important, not only from disasters, but also from malicious intent as more and more hackers threaten company’s intellectual property.
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For these reasons, the growth in the Disaster Recovery market continues to grow at a CAGR of 36% from 2018-2022\(^1\) and expected to increase to 41.8% from 2022 to 2025.\(^2\) Migration, security and Backup and Disaster Recovery are also some of the highest in demand hosted and cloud managed services organizations are planning to introduce in 2021/2022:

<table>
<thead>
<tr>
<th>Service/Feature</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of applications deployed in cloud infrastructure</td>
<td>9.6%</td>
</tr>
<tr>
<td>Design, management of DevOps tools and practices</td>
<td>10.7%</td>
</tr>
<tr>
<td>Backup and Recovery</td>
<td>13.0%</td>
</tr>
<tr>
<td>Management of containers in cloud</td>
<td>14.7%</td>
</tr>
<tr>
<td>Implementation/management of hybrid-multicloud deployments</td>
<td>15.8%</td>
</tr>
<tr>
<td>Day 2 Day operational monitoring of cloud infra. Performance</td>
<td>17.5%</td>
</tr>
<tr>
<td>Execution of security for cloud deployments/data</td>
<td>18.6%</td>
</tr>
<tr>
<td>Optimization of cloud infrastructure/deployment for cost or performance</td>
<td>20.9%</td>
</tr>
<tr>
<td>Migration of applications/data to cloud</td>
<td>20.9%</td>
</tr>
</tbody>
</table>

\(^{31.1}\%\) None of the above

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With migration to cloud being a primary use case customers are looking for, VMware Cloud Director Availability provides inclusive cold and warm migration at no additional cost, with a simple vSphere plugin or via the VMware Cloud Director user interface, customers can self-manage their own migration or providers can deliver migration as a managed service.

Considering security, malware attacks are prevalent, the ability to restore quickly is key to business recovery. With Cloud Director Availability 4.3 and 4.4, a 1-min RPO and recovery plans are front line to delivering the granularity of restore points and fastest time to recover (RTO), ensuring businesses can get back working as quick as possible. Similarly, with competitive features such as One-Click migration, RPO compliance, Advanced reporting capability Cloud Providers can offer highly efficient DR & migration service with insights that can influence their customers to make informed decisions and mitigate numerous threats and challenges.

The market is neither fragmented nor, at this time, consolidated from a provider selling DRaaS perspective so there is plenty of opportunity for all VMware Cloud Providers. Hybrid (on-premise and cloud based) configurations account for much of the current market share and represents an opportunity this today is provided by several global and regional providers as well as hyperscale providers like AWS and Microsoft Azure. However, solutions to Hyperscale or different target hypervisors are really viewed as migration solutions and not true Disaster Recovery solutions due to disk conversions making failing back very complex and manual. VMware Cloud Providers therefore have a great opportunity to sell DRaaS from a hybrid on-premises customer to their cloud solution with the benefit that it is not a migration (although it could easily be used for this), it is a true self service Disaster Recovery as a service capability.

\(^2\) https://www.mordorintelligence.com/industry-reports/disaster-recovery-service-market
Additional Information

Upgrade

VMware Cloud Director Availability 4.4 supports an in-place upgrade directly from 4.2.1 and 4.3.1. For the exact upgrade steps or in case you need to upgrade from an older version, please refer to the official documentation.

For more information on cloud computing and VMware vCloud Powered services, please visit https://cloud.vmware.com/ or contact your VMware representative.

For more information about VMware Cloud Director Availability 4.x please see https://www.vmware.com/products/cloud-director-availability.html.

If you would like to understand what your opportunity could look like using VMware Cloud Director Availability, please use our online calculators https://cpscalculator.vmware.com/.

Access the VMware Learning Zone for Cloud Providers to learn more about cloud technology you as a provider can use http://bit.ly/VCPPSolutionEnablementLearningPath

If you would like to connect with the VMware Cloud Director Availability team, please use Slack, Facebook, Twitter, LinkedIn.