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HYBRID CLOUD WITH CASTLEROCK VMWARE CLOUD

Castlerock VMware Cloud

On-premises data centers and private clouds will always have their place in organizations, especially where more control over a system is required, but they're asset-heavy and they can be slow to accommodate change and growth, hampering agility.

Castlerock VMware Cloud provides access to all cloud infrastructure resources, offering a unified experience and integrating clouds into your environment so you can:

Consume cloud with total flexibility

Run apps in their ideal venues

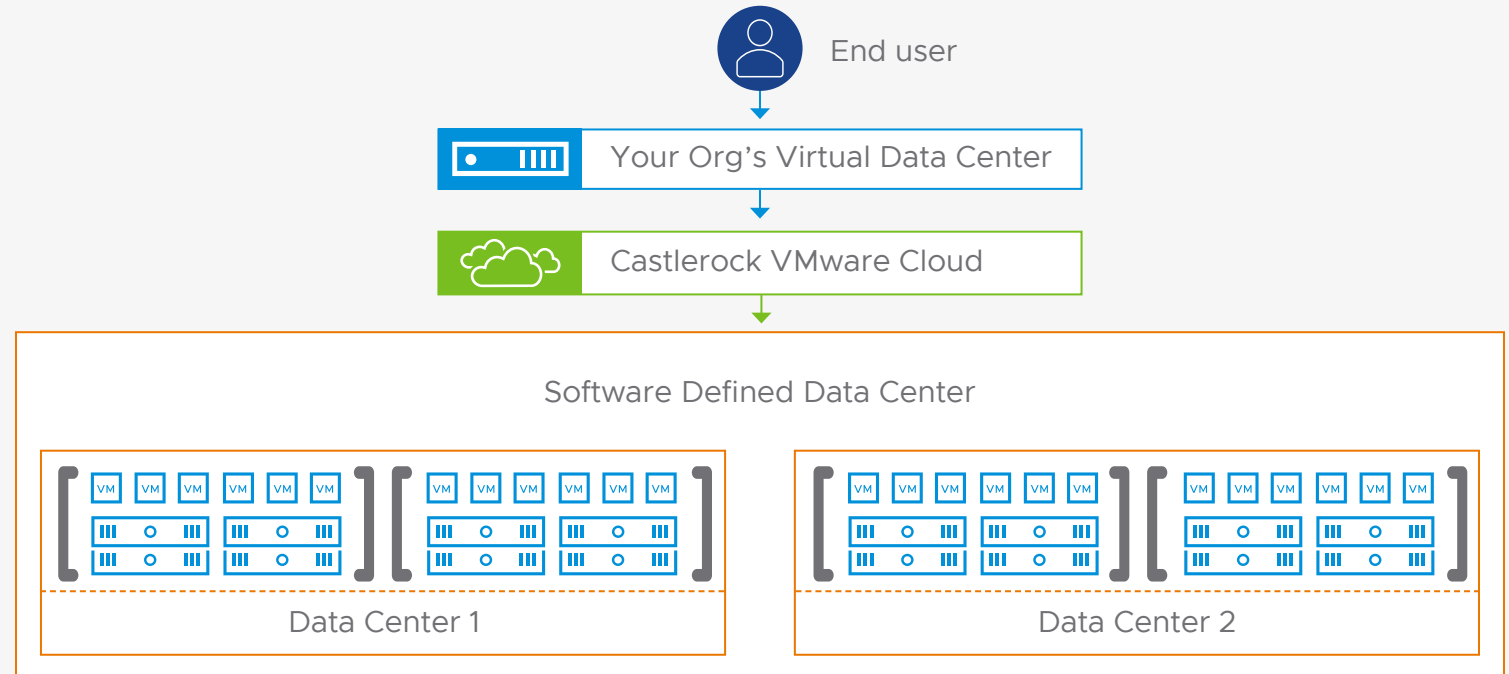Maximize cloud cost-effectiveness

Ensure app performance

Improve overall business agility

Support your digital transformation agenda

End user

Your Org's Virtual Data Center

Castlerock VMware Cloud

Software Defined Data Center

VM VM VM VM VM VM   VM VM VM VM VM VM

Data Center 1

VM VM VM VM VM VM   VM VM VM VM VM VM

Data Center 2

2

3

Cloud Your Way with Castlerock VMware Cloud

Clean Migration
Leverage your team's existing skill sets—some apps needn't be refactored to move to our cloud

Managed or Self-Service
Get Disaster Recovery, Migration, Backup services and more, as self-service or managed

Buy What You Need
Only pay for what you need Completely flexible cloud storage at your fingertips

Key Features

Greater Elasticity
Provision new resources in minutes and handle peaks and seasonality with ease

Get a Choice of Storage
Robust, flexible storage options to meet different demands

Reduce Overheads
Control your resources across private and public clouds through a unified single pane of glass

Always-on Security
Get policy-driven security and compliance with always-on features, like encryption

More Control
Unlike hyperscalers, you can control your cloud experience with storage policies, firewall polices, and more

Advanced Metering and Billing
View performance and capacity dashboards via the free metering and billing plugin

Accelerate Digital Transformation

Manage Multi-Cloud Infrastructures
Deal with today's ever-changing infrastructure environment—manage all multi-cloud applications and resources from one pane of glass

Accelerate App Deployment
Click to deploy hundreds of validated apps with security and infrastructure already configured

Drive Digital Transformation
Click to deploy Kubernetes clusters in your cloud and manage lifecycle from UI and API

Use Infrastructure as Code
Infrastructure as code deployment of cloud resources and components
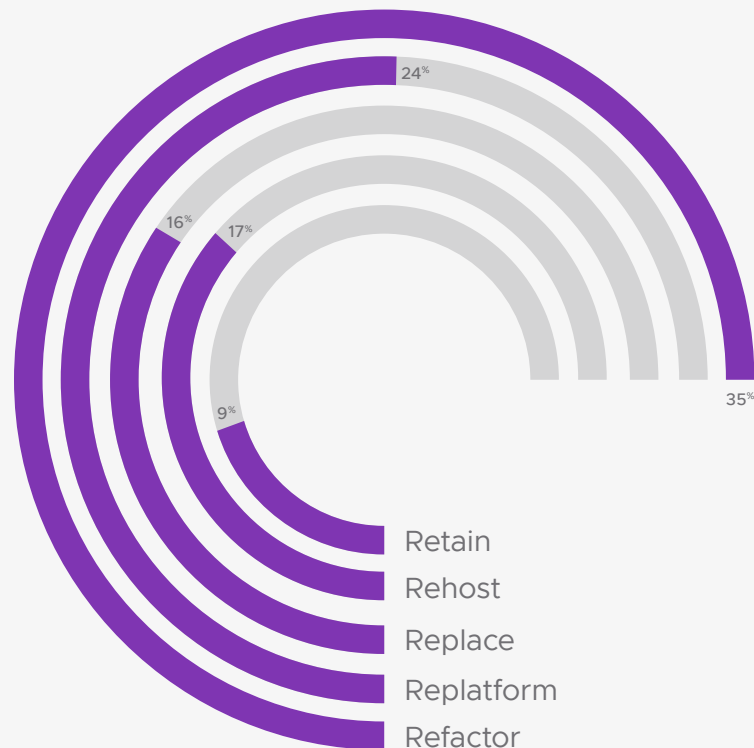
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The Future of Your Workloads

Castlerock VMware Cloud provides a unified, software-defined infrastructure, which gives you the freedom to **modernize apps at your pace**. The future of each app is often guided by the "5Rs" which outlines your transformation options. The option you select will depend on business priority, how long it would take, and resources.

Whatever path you choose, Castlerock VMware Cloud can support your digital transformation ambitions.

The 5 Rs for App Modernization

These %s represent the average response for enterprise workload estate modernization direction

24%
16%
17%
35%
9%

Retain
Rehost
Replace
Replatform
Refactor

Retain
Keep workload as is on-premises; we can help manage these workloads for you

Rehost
Migrate "as-is" to the cloud for immediate infrastructure benefits

Replace
Rehost to cloud then replace with cloud-native options

Replatform
Move to cloud and optimize infrastructure; containerize applications

Refactor
The application is rewritten, typically to a microservices architecture

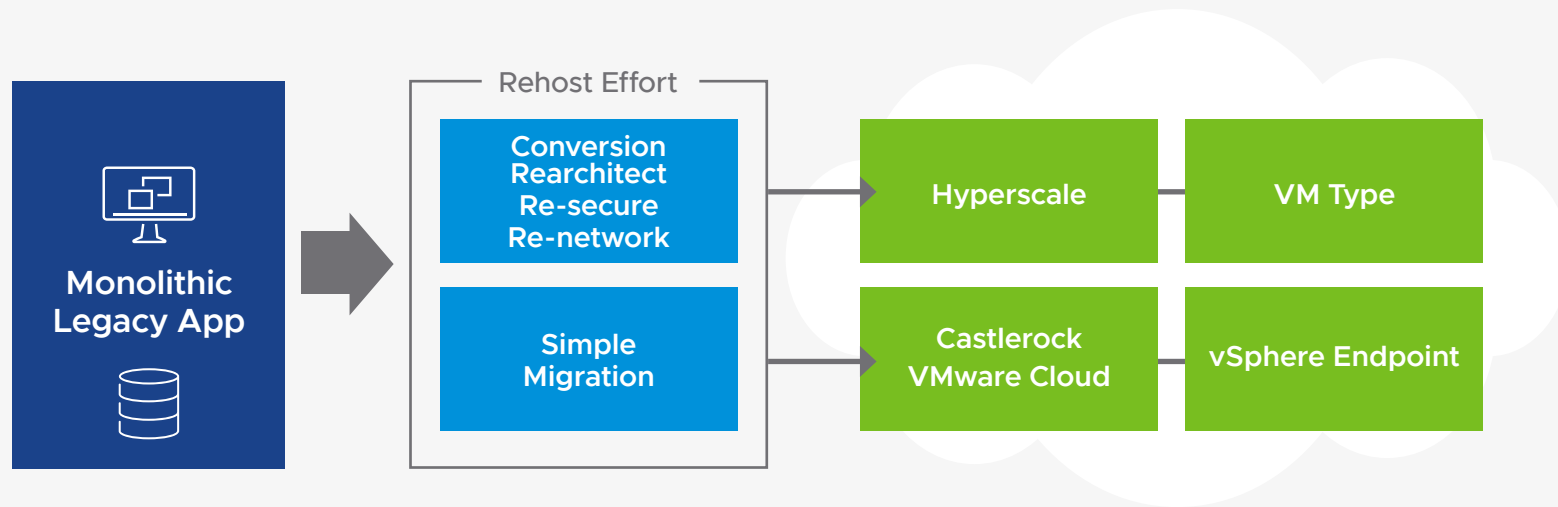Lower cost
Faster

Higher value
Higher cost
Takes longer

Source: VMware research

Rehost (also Called "Lift and Shift")

Rehost means migrating an existing application to a cloud without changing its code or architecture. Rehosting delivers the benefit of a cloud operating model without the cost or effort of changing the application itself. This is a common choice when a business is looking to reduce its data center footprint quickly, or there isn't justification to spend a lot of time or resources to modify the application code.

Remember the value of a hybrid cloud, lowering risk vs. when migrating to a non-VMware based cloud, complex disk, network and security conversion is required to work with the cloud's proprietary hypervisor. No conversion is required to move to vSphere-based workloads to Castlerock VMware Cloud. We also offer Cloud Migration Services to accelerate your move to cloud safely with the least amount of disruption.
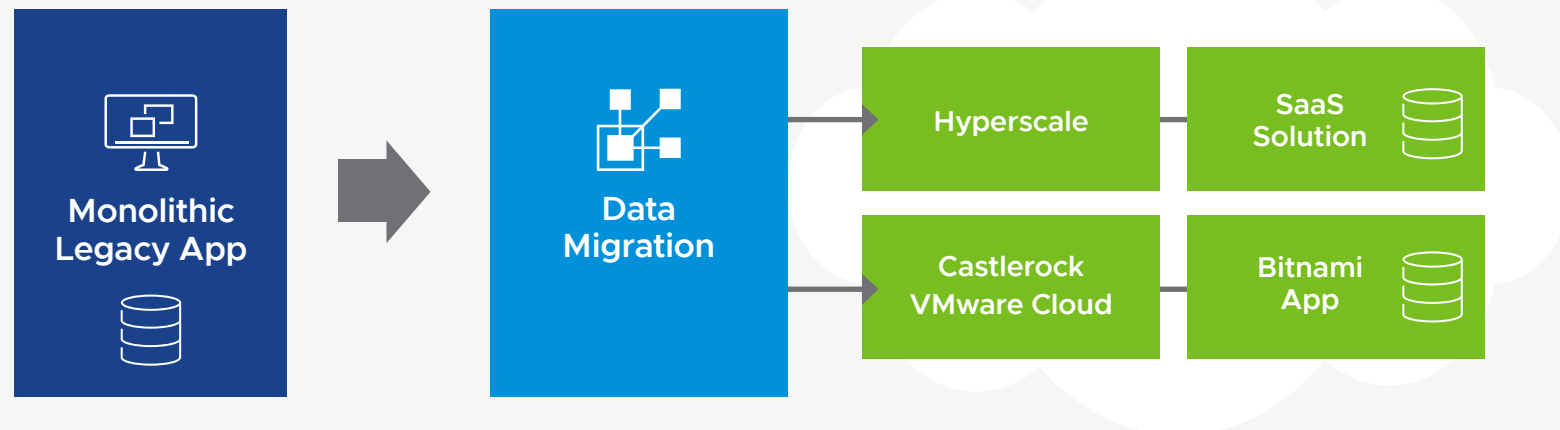
Replace

Step one in replacing an application is often to rehost it first to cloud, later to replace it using cloud-native technologies. This two-step process means you get the immediate infrastructure benefits of cloud without having to change the application at all, then take your time to determine the best way to modernize the application from there. This can include replatforming, refactoring, or moving to a SaaS alternative.

We can help facilitate this journey with our Cloud Migration Services. We also have services to help you migrate your data to a new SaaS solution.

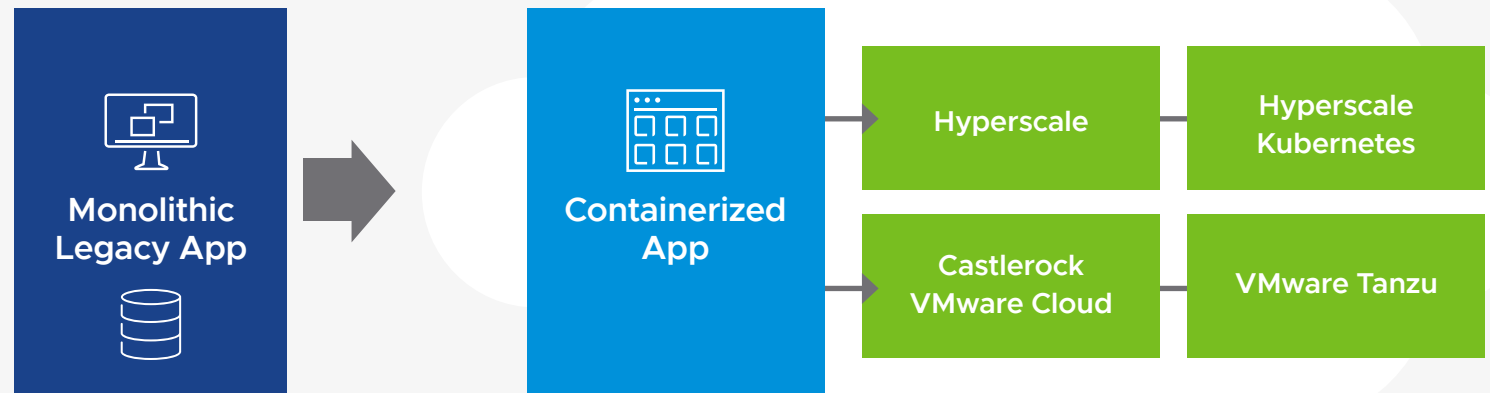# Replatform

Replatform typically plays out in one of two ways. It can mean moving your IT to a private cloud platform and optimizing your infrastructure (different from a simple rehost). It can also mean moving an application or application component to a new infrastructure, possibly changing the application code a bit to take advantage of that new environment. Most commonly, this translates to moving apps into a Kubernetes environment. Containerizing delivers many of the key benefits of automated deployment, bringing speed and agility to legacy applications that don't need to be fully cloud-native.

Castlerock VMware Cloud offers a Kubernetes Service to manage both your containerized apps and your vSphere-based apps.
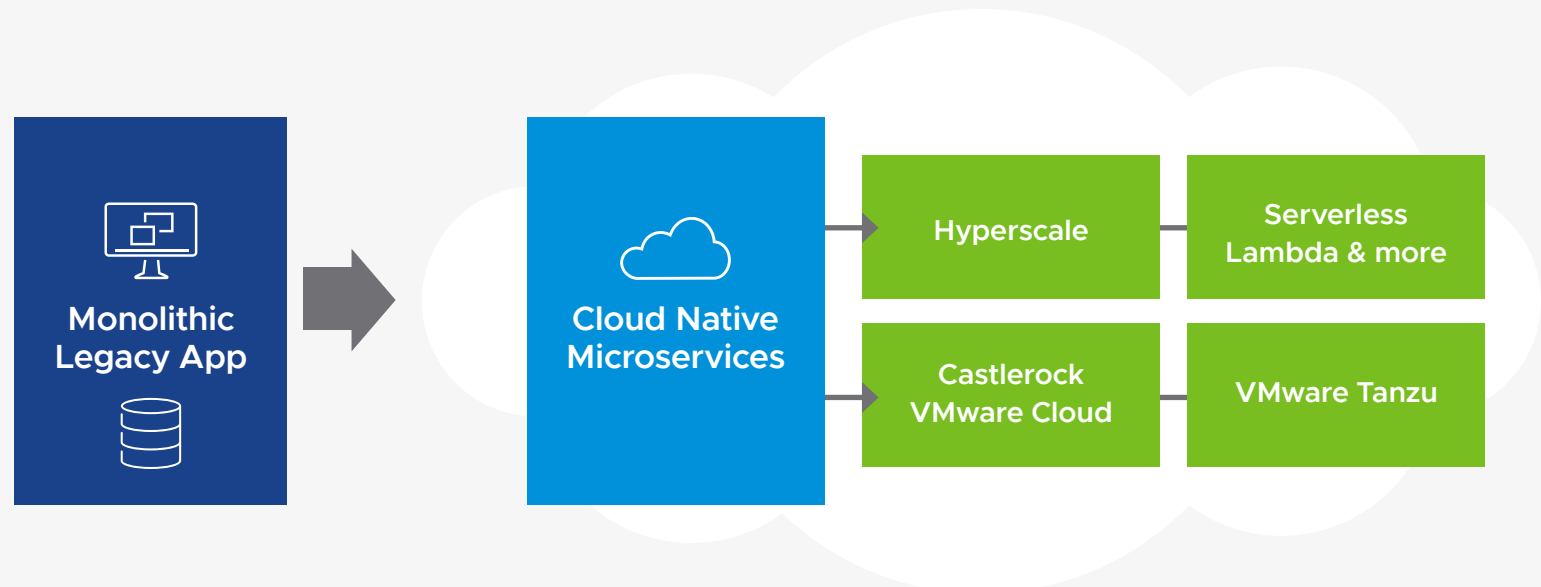
Monolithic Legacy App → Containerized App → Hyperscale | Hyperscale Kubernetes | Castlerock VMware Cloud | VMware Tanzu

Refactor (or Build New)

A refactor approach means that one or more of the application components, or the entire app, is rewritten using modern, cloud-enabled techniques, services and application architectures. The programming language may change, the application architecture will likely change, and the build process will almost certainly change.

Because of the high effort and longer timeline, refactoring is not appropriate for every app. Many can simply be rehosted or replatformed to take advantage of modern cloud infrastructure.

Castlerock VMware Cloud is a Developer Ready Cloud that drives automation with modernized infrastructure, Kubernetes service, Terraform infrastructure as code along with easy application portfolio services and extensible tooling that helps your developers take advantage of the cloud programmatically.

Monolithic Legacy App → **Cloud Native Microservices**

- Hyperscale
- Serverless Lambda & more
- Castlerock VMware Cloud
- VMware Tanzu

Castlerock VMware Cloud Models with Simplified Access

Access everything, across all our VMware clouds through Castlerock VMware Cloud

Choose from secure flexible resource pools and resource allocations or single Flex t-shirt-sized VMs
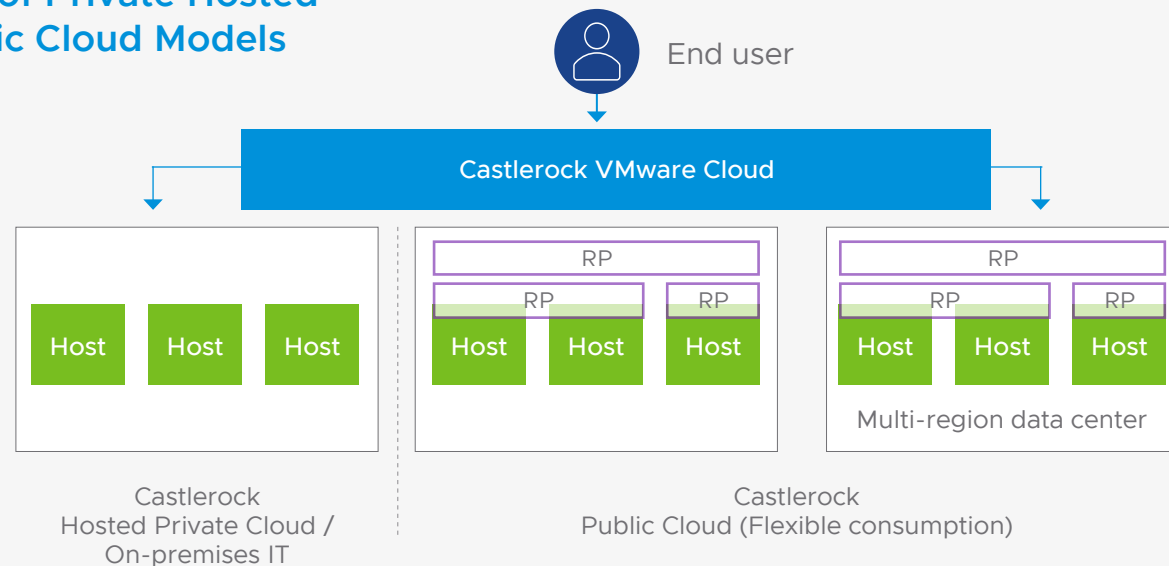
Choose from secure shared infrastructure (public cloud) or dedicated infrastructure (private cloud)

Complete control of your clouds, including:

• Rules to establish VM/host relationships and control workload placement
• Protect your data with Edge Firewall and distributed application perimeter firewalls
• Access essential IP services like NAT, DHCP and VPN
• Manage and provision Kubernetes Clusters and dev-ready cloud capabilities
• Consumption monitoring and metering dashboards
• Storage freedom with S3 Object storage bucket controls and visibility

A Range of Private Hosted and Public Cloud Models

End user

Castlerock VMware Cloud

Host	Host	Host

RP
RP | RP
| Host | Host | Host |

RP
RP | RP
| Host | Host | Host |
Multi-region data center

Castlerock
Hosted Private Cloud /
On-premises IT

Castlerock
Public Cloud (Flexible consumption)

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RP   Securely isolated, virtualized infrastructure resource pool

Multi-Tenant Public Cloud

With Castlerock VMware Cloud, you have access to an allocation model that works differently than you'll find with the hyperscale providers.

Hyperscaler

If you want the cost benefit of a longer-term contract, you have to buy a VM type for the full term—meaning you have to know what size you need now and in the future and commit to it. If your forecast is off, the outcome is typically overprovisioning and wasted spend, complicated exchanges, or early termination fees if you cancel.

Castlerock VMware Cloud

We offer flexibility, even in a longer-term contract. You can have an allocated pool of resources of any size and you're free to spin up and down as many VMs of whatever size you wish. Resources can be flexed on demand to meet application needs as they change. No complex economics; it's a simple "per-resource" allocation model priced at the resource unit for any Consumption Model.

Stability
Castlerock VMware Cloud is the technology you've known and trusted in your environment for years. And we don't force downtime; we move your resources from the hosts when maintenance is required—you won't feel a thing.

Automated Infrastructure
Need a common way to drive your infrastructure? Developers want infrastructure as code, automatic security, and networking. In our cloud, there are APIs for everything to fully automate your infrastructure processes.

Secure & Compliant
Castlerock VMware Cloud includes VMware NSX-based security for out-of-the-box virtualized edge firewalls. You're not limited to the number of connected VMs or the amount of bandwidth—it's just simple, robust edge security. Lift your security posture to bring the edge to the VM. Improve inter-application communication with secured east-west traffic and no "hair pinning". Castlerock VMware Cloud is not only from VMware's software standards, but also from our data center standards; and as your local provider, we know what's required for your region.

Simplicity
You know VMware, which means you already know how to use our cloud. Streamline deployments with access to a catalogue of OS builds or bring your own. Same for OS licenses. You also have visibility, chargeback and monitoring of your resources out of the box.

Hybrid Portability
Need to move workloads across clouds? Simply migrate workloads on and off a VMware cloud. No complex re-networking, no different architecture or hypervisors means a simple, risk-free migration.

Private Cloud

The Best of Both Worlds

Public cloud experience
- Self-service access
- High degrees of automation
- Rapid deployment
- Consumption-based pricing
- Secure shared infrastructure

+

Private cloud control
- Ideal for sensitive data
- Avoid "noisy neighbors"
- Provide services to your internal organization
- Dedicated or shared hardware

Visibility
See how much your organization is consuming. Whether a shared resource or dedicated setup, you can create different organization Virtual Data Centers and even make them accountable for their usage.

Protected
Give your internal customers what they need, but in a secure manner. For example, do you want developers using infrastructure when you don't know where it is, or checking in code to public repositories? In a private cloud, you know exactly where your resources are, and you can give your developers tools for their CI/CD pipeline in a secure and isolated manner.

Unburden IT
What's the burden on IT to manage your infrastructure, your backups, your disaster recovery, and your underlying cloud operational support systems? With Private Cloud, we do all this for you. You simply consume services; the underlying fabric of the cloud is managed and maintained by us. We keep you up and running so you can focus on the more important things to your business.

Segregated
If logical segregation isn't enough, we can physically separate you too. Often private cloud is thought of a separate hardware, complete isolation, but it needn't be. However, if your business demands it and has sensitive data, you can. And you can migrate to and from the private cloud with ease as it's all vSphere.

Become the Provider
With a private cloud, you have the option to enable your IT organization to provide cloud services to your internal business units. In a public cloud, there are different customers secured on shared infrastructure. In a private cloud, there is only one customer—you–on shared or dedicated hardware (depending on how private need to be). You can provide internal organizations with resources they need to do their jobs.

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Consumption Models & Resource Pools

Castlerock VMware Cloud offers total flexibility to meet application requirements for resources and performance. Options range from Pay-as-You-Go to a predictable Reservation Pool, or choose a Flex Model with predefined sizes. Pricing available monthly or get a price break with longer term contracts. Note that with longer term contracts, consumption is still flexible! You don't have to worry about over-provisioning trying to forecast needs for the length of the term.
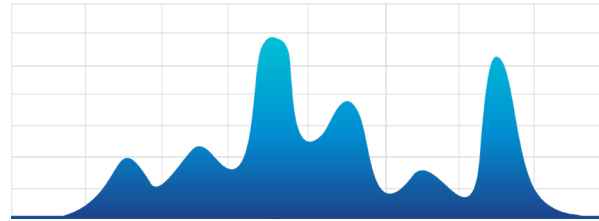
Ideal for variable demand
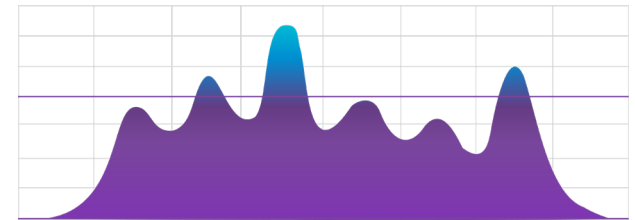
Allocation Pools

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, such as databases.
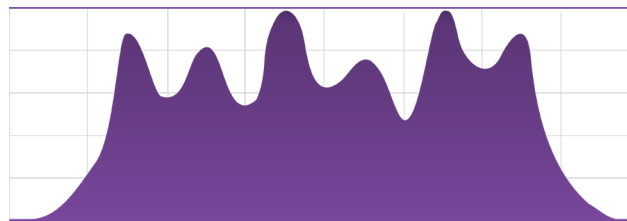
**Provides a fixed pool of guaranteed
resources for optimal performance**

Pay-as-you-go

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

**Provides an allocated pool of
resources with the option to burst**

Reservation Pools

Reservation Pools guarantee 100% of reserved capacity which is ideal for business-critical applications that need completely reserved resources and deliberate underutilization to ensure a smooth service.

The perfect combination: Flex

Flex VMs provides a pre-fixed menu of popular size or custom VMs that are on-demand and easy to deploy, with policy-based control over VM resources.

Edge Firewall

The Castlerock Edge Firewall gateway controls and monitors north-south traffic to provide perimeter security as well as Network Address Translation (NAT) and site-to-site IPSec VPN functionality.

Robust set of firewall and edge services with no additional hardware required

Single-pane firewall management so you can respond knowledgeably and quickly to security concerns

Easily deploy multiple edge firewalls to create domains for different lines of business or sites

User-defined edge firewall rules on Edge Gateways to accept, reject, or deny specific types of traffic

Since COVID-19, the FBI's Internet Crime Center has received **3-4x** the number of cybersecurity complaints[1]

Natural Security with NAT

Network address translation (NAT) allows a single, unique IP address to represent your entire network, boosting security. You must configure NAT rules on the Edge Gateway to provide access to services running on virtual machines inside your company's private network.

Least Privilege and Zero-Trust

Castlerock offers a number of professional services to help you design and deploy your edge firewall. We can help you setup 'least-privilege' rules and other gateway configurations to support your Zero-Trust security goals.

1. https://thehill.com/policy/cybersecurity/493198-fbi-sees-spike-in-cyber-crime-reports-during-coronavirus-pandemic

Distributed Firewall

Micro-segmentation, also known as distributed firewalling (DFW), allows organizations to segment and control Layer 4 and Layer 7 workloads based on application profiles.

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Better data visibility and protection
Understand where data exists and which users need to access it

Enable network security controls
Quickly identify and adjust privileges for certain data types through micro-segmentation

Stop lateral spread of threats
Create micro-perimeters around specific sets of data and information

Layer 4 and Layer 7 Distributed Firewalling is available with our cloud offering through either a self-service portal or as a managed service.

Features
- Virtual firewalls embedded in the hypervisor kernel, meaning workloads are always protected
- No VM can circumvent the firewall (egress and ingress packets are always processed)
- Policies are attached to the VM for secure mobility
- Avoids routing traffic to the edge (and back) for inspection
- Inter-application routing improves app performance
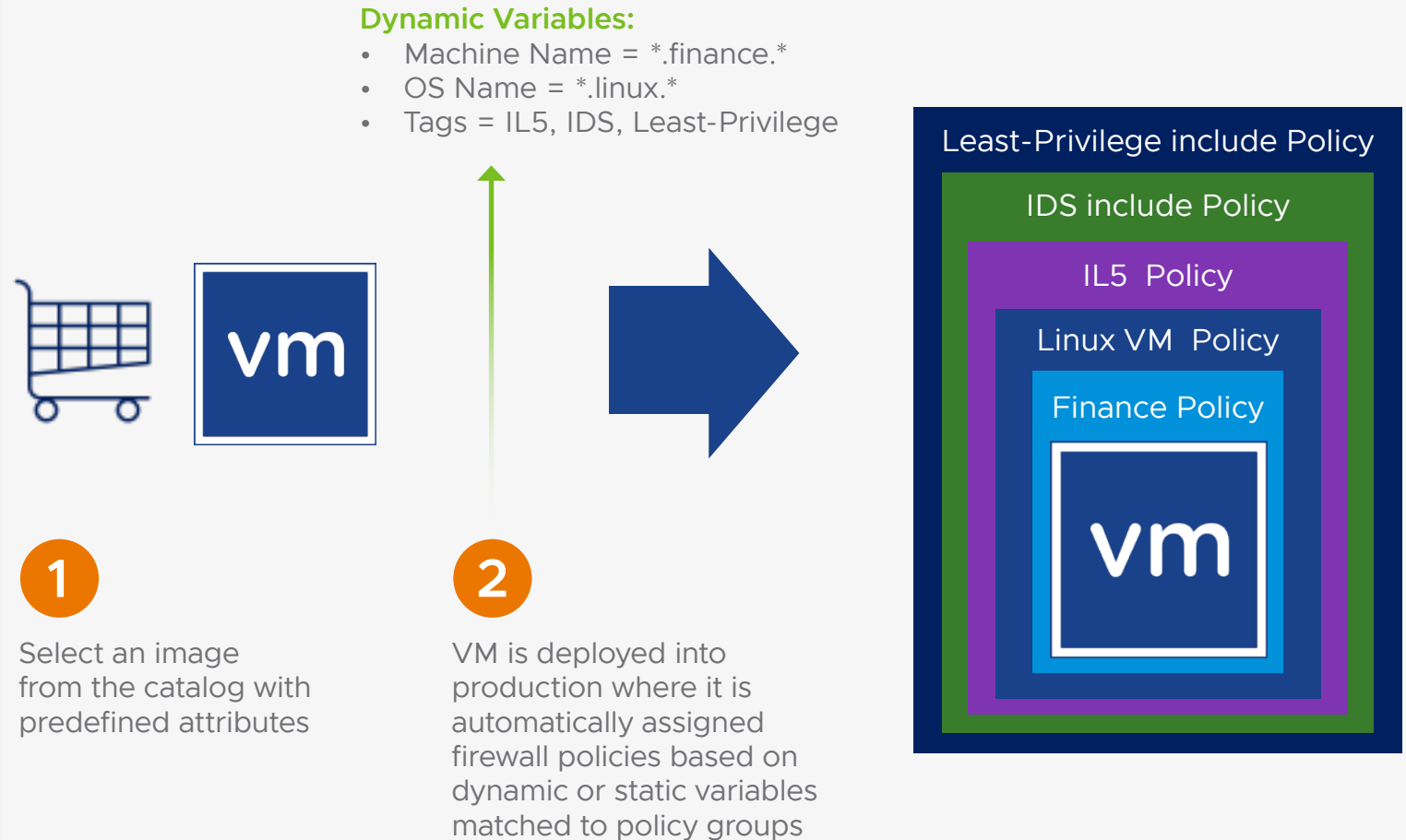
Why Use Castlerock Distributed Firewall?
- No 'choke point' or single point of failure
- Being software-based, it is easy to scale out
- Enforcement sits as close to the VM as possible
- Enhanced context-aware protection for applications

Distributed Firewall Dynamic Membership

Achieving Zero Trust need not be that hard. Our customers can ensure of their security, even when users don't. You can use dynamic groups to create distributed firewall rules and edge gateway firewall rules applied per-VM in a data center group networking context.

By using dynamic security groups in distributed firewall rules, you can micro-segment network traffic and effectively secure the workloads in your organization wherever they move to in the data center

Dynamic Variables:
- Machine Name = *.finance.*
- OS Name = *.linux.*
- Tags = IL5, IDS, Least-Privilege

Least-Privilege include Policy

IDS include Policy

IL5 Policy

Linux VM Policy

Finance Policy

1 Select an image from the catalog with predefined attributes

2 VM is deployed into production where it is automatically assigned firewall policies based on dynamic or static variables matched to policy groups

Intrinsic Security with Firewall-as-a-Service

Castlerock offers professional and managed services to help you design, deploy, and manage your distributed firewalls.

Features

✔ Assess on-premises networks, applications and dependencies

✔ Design and deploy stretched networks for hybrid cloud and multi-cloud environments

✔ Define and implement firewall policies

✔ Migrate existing workloads and applications

✔ Transform security and networking to improve business agility and outcomes

Now you can deploy a distributed, scale-out internal firewall to:

Secure east-west traffic across multi-cloud environments	Achieve superior protection against lateral movement of malware with stateful Layer 7 security controls and advanced threat detection	Gain a unique, intrinsic approach to security that simplifies deployments and streamlines firewalling of every workload—at a fraction of the cost

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Encryption

Using Castlerock VMware Cloud, users can encrypt and decrypt VMs and disks and view the encryption status via the API as well as through the user interface. Castlerock will manage the encryption keys for you as a part of this service.

Features

✔ Enable and configure encryption policies

✔ Encrypt VMs through the Castlerock VMware Cloud interface and API

✔ Apply encryption to VMs or individual disks

Works with Leading Key Management Servers (KMS)

HYTRUST   DELLEMC   Fortanix®
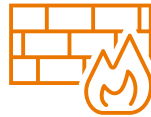
Networking Services

Castlerock offers a variety of software-defined networking, security, and edge gateway services with the Castlerock VMware Cloud.

Firewall

Rule configuration with IP, port ranges, grouping objects, policy control

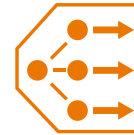**Network Address Translation (NAT)**

Source and destination NAT capabilities

DHCP[1]

Configuration of IP pools, gateways, DNS servers and search domains

Routing

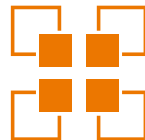Access via Public IP or can configure to use Direct Connect via BGP[2]

Load Balancing

Configure virtual servers and backend pools using IP addresses or objects

Site-to-Site VPN

IPSec site-to-site VPN between two edges or other VPN terminators

L2 VPN

Stretch your Layer 2 across environments

High Availability

Active-standby HA capability which works well with vSphere HA

1. Dynamic Host Configuration protocol (DHCP)
2. Border Gateway Protocol (BGP)

Advanced Load Balancing

Adding hardware or virtual load balancers whenever extra capacity is needed can lead to appliance sprawl, higher costs, wasted time and capacity, and complex management, especially in high-availability configurations.

Load balancers also need to deliver applications effectively in multi-cloud environments; something that is almost impossible to achieve with hardware load balancing.

The answer is **NSX Advanced Load Balancer (ALB)**, an enterprise-grade software-defined load balancer that can deliver any app, on any cloud, at any scale.

Benefits to you vs. physical infrastructure

ROI up
573%
in just
3 years

97% Faster to
scale capacity

47% Lower cost
of operating

Your data center footprint

52% reduction in
application delivery
controller solution costs

43% more efficient application
delivery controller
management

8% higher productivity
for app developers

Source: IDC "The Business Value of Avi Vantage: A Study of Enterprises Using Next-Generation Application Delivery"

Cloud Object Storage

Castlerock VMware Cloud offers a choice of storage options as well as Cloud Object Storage (COS) from Cloudian, Dell and Amazon S3. COS is highly scalable and can be more cost-effective for unstructured data, such as video generated from surveillance cameras or high volumes of data too large for normal storage.

Benefits of Cloud Object Storage (COS)

Customizable Storage Tiers
Cut your COS costs by tiering your storage to align with the frequency of data access. Data that is infrequently accessed could be moved to lower-cost storage.
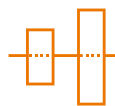
Unlimited Scalability
COS is suitable for cloud scalability and grows with your data without limitation.

Lower Cost
Due to the unlimited ability to scale out with COS, it is less costly to store all types of data.

Faster Data Access Anywhere
Retrieve data much faster compared to other storage types as COS does not have file hierarchy and is usually delivered as a service.
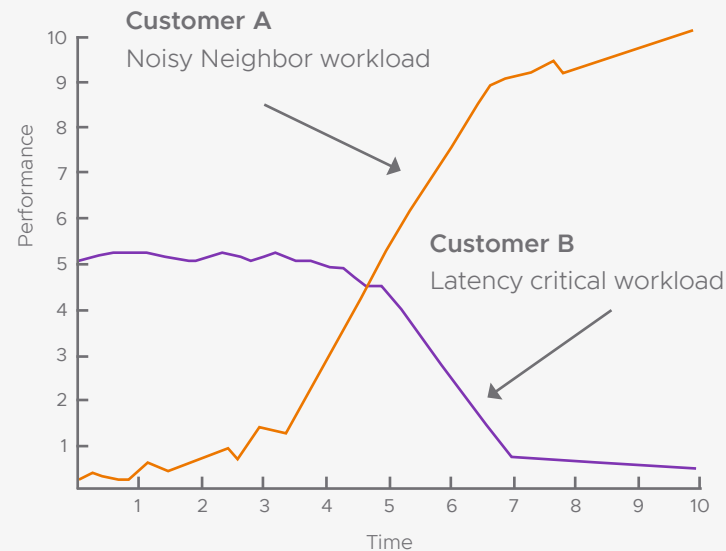
Better Business Insight
COS enables improved insight, as each object is driven by metadata and can be analyzed for cataloging and insights.
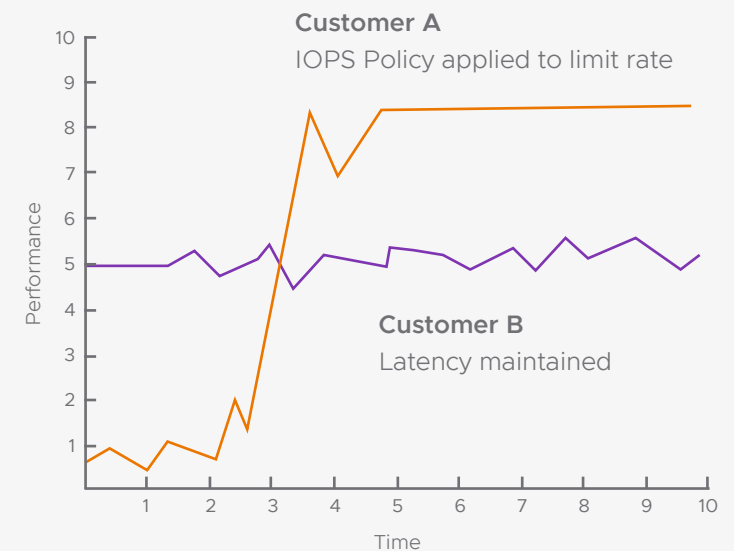
Enhanced Storage Performance

Unless you've secured dedicated hosts for your workloads, you can sometimes have challenges with 'noisy neighbors'—other workloads that spike and pull system resources away from you.

With Castlerock VMware Cloud, you can control your application experience and choose from a selection of tiered host-based IOPS rules on storage policies to protect the performance of your workload Flex VMs.

No Performance Protection

Customer A
Noisy Neighbor workload

Customer B
Latency critical workload

Enhanced Storage Performance

Customer A
IOPS Policy applied to limit rate

Customer B
Latency maintained

Monitoring Services

Recent events have tested the resiliency and agility of businesses to respond and pivot. Organizations crunched months, even years of planned digital projects into a few short weeks. Now that the technology is deployed and adopted, it's time to pause and evaluate:

- What do you have?
- What's your visibility from end to end?
- Where and how did cloud use grow?
- Where have you grown in complexity?
- How are applications performing?
- How difficult is it to troubleshoot a problem?
- Is everything under the right governance?

Your IT environment was already complex. While your IT operations staff and budget likely stayed the same (or reduced), the job of managing IT operations has gotten harder.

Equip your teams with end-to-end Monitoring Services that establish unified visibility, supports multi-cloud strategies, and gives you greater confidence in capacity/cost management, application performance management, proactive remediation, and meeting compliance.

Performance Optimization
Self-driving, continuous optimization based on operational and business intent, automatically balancing workloads to avoid contention as well as optimize utilization

Capacity Management and Optimization
Manage and optimize cloud infrastructure to get more VMs out of the same hardware and manage data center growth using capacity planning and modeling

Proactive Remediation
Predict, prevent and troubleshoot faster with actionable insights correlating metrics and logs with unified visibility from applications to infrastructure

Integrated Compliance and SLAs
Reduce risk and enforce IT and regulatory standards with integrated compliance and automated drift remediation

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Baseline Reporting

The Organization Overview Dashboard is available for baseline reporting on your organization's resources. This includes:

- ✓ Summary of your virtual clouds/ organizations, vApps and VMs

- ✓ Capacity overview for CPU, memory and storage

- ✓ System status of the criticality of alerts

- ✓ List of virtual clouds/organizations and their vApp and VM information

- ✓ vApp utilization summary

- ✓ Virtual cloud/organization utilization summary
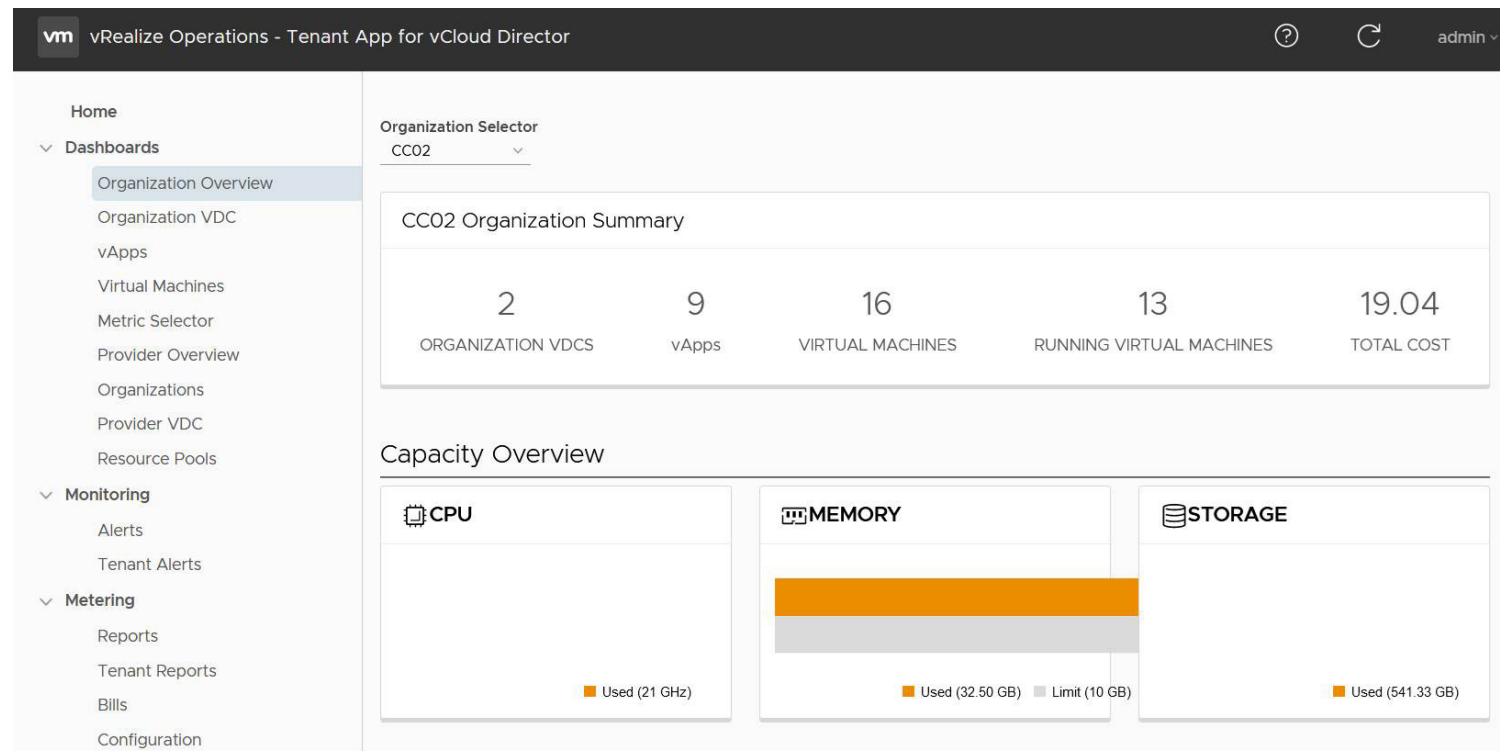
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Monitoring for Systems and Infrastructure

Reporting and alerts for system management, including compute, storage and network.

Uplevel your visibility with access to enhanced troubleshooting and optimization of your dedicated cloud infrastructure with visualizations and workflows to assist you in managing your cloud, if needed. For example, you can optimize performance with predictive distributed resource scheduling.

Coverage for alerts and reports include:

- Near real-time monitoring within 20 seconds
- OS metrics for Windows and Linux
- Support for any cloud as well as on-prem
- Includes bare metal and virtual machines

Custom Reporting: Get Exactly What You Need
We can develop custom reporting to augment the out of the box options. Examples where this is helpful include views to create unique workflows across infrastructure, operations, and applications teams, and specialized reports for right sizing or capacity.

System, storage and network support includes:

Compute

Cisco UCS
Dell EMC PowerEdge
Dell EMC OpenManage Ent
HPE ProLiant
HPE OneView
Lenovo Compute

Storage

Dell EMC Isilion
Dell EMC VMAX
Dell EMC VNX
Dell EMC XtremIO
Dell EMC Unity
Cohesity
HPE 3PAR StoreServ

HPE Nimble
IBM SVC & Storwize
NetApp E-Series
NetApp FAS/AFF
NetApp SolidFire
Pure Storage FlashArray

Network

Arista EOS
Cisco Catalyst
Cisco MDS
Cisco Nexus
Citrix ADC
F5 BIG-IP
Palo Alto Networks
Networking Devices

*Note supported technology list can change over time. Please refer to https://www.vmware.com/products/vrealize-operations/true-visibility-suite.html for up to date management packs.

Applications and Databases

Optimize performance of Web, App and Database servers. Note that metrics may vary by application.

Web application server management

Gain deep analysis and insight into over 200 metrics for web applications including average response time, active connection count and percent in use, to simplify troubleshooting and optimize performance. Extend visibility and see insights into relationships with VMs, website, application pools and more.

Support includes coverage for Microsoft IIS, Apache Tomcat, RedHat Jboss.

Database server management

Customers can gain critical actionable insight into database performance, query designs, and queries through over 800 key metrics. Reports, dashboards and alerts deliver performance, health and availability analysis and provide increased visibility into DB components to help detect issues before they are problems. Insights help you write better queries and optimize query designs for faster information retrieval and reporting.

Support includes SAP HANA, Microsoft SQL, MongoDB, MySQL, PostgreSQL, Oracle, as well as cloud hyperscale databases for Amazon and Azure.

Kubernetes management

Container monitoring enables virtual infrastructure administrators to monitor Kubernetes clusters along with auto-discovery of the Kubernetes clusters deployed with PKS.

Complete Kubernetes topology of Namespaces, Clusters, Replica Sets, Nodes, Pods, and Containers for monitoring clusters.

Overview of Kubernetes ecosystem and facilitates troubleshooting by highlighting KPIs and alerts for various objects pertaining to Kubernetes clusters that are monitored.

Supported Kubernetes distributions include VMware Tanzu Kubernetes Grid, Red Hat OpenShift, Kubernetes on Amazon EC2, Azure, Google VMs and others.

Active Directory management

Monitoring Microsoft Active Directory is crucial, but a lot of companies don't do it. Reports, dashboards and alerting are available to simplify monitoring and facilitate troubleshooting for performance bottlenecks and more. Metrics include server, authentication, and LDAP server metrics.

App Monitoring Integrations

Integrate monitoring feeds from other APM tools to create reports, dashboards and alerts for a consolidated view of your application health. Integrations supported include AppDynamics, Datadog, Dynatrace, New Relic.

*Note supported technology list can change over time. Please refer to https://www.vmware.com/products/vrealize-operations/true-visibility-suite.html for up to date management packs.

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Physical, Virtual and Hyperscale Cloud Monitoring

Integrate monitoring across hybrid environment and extend to the cloud in confidence.

One View
Unified visibility and monitoring and planning for workloads across <partner> cloud, (vCenter enabled) customer data center and public cloud

Multi-cloud
Support multi-cloud strategies with unified monitoring across clouds including support for AWS, Azure, Google Cloud and VMware Clouds

Insights
Get insights to help with workload balancing, capacity/ cost management, performance management, troubleshooting, compliance, planning and assessment

Support includes:

Virtualization, App mgt.
Citrix Virtual Apps & Desktops
Docker
IBM PowerVC
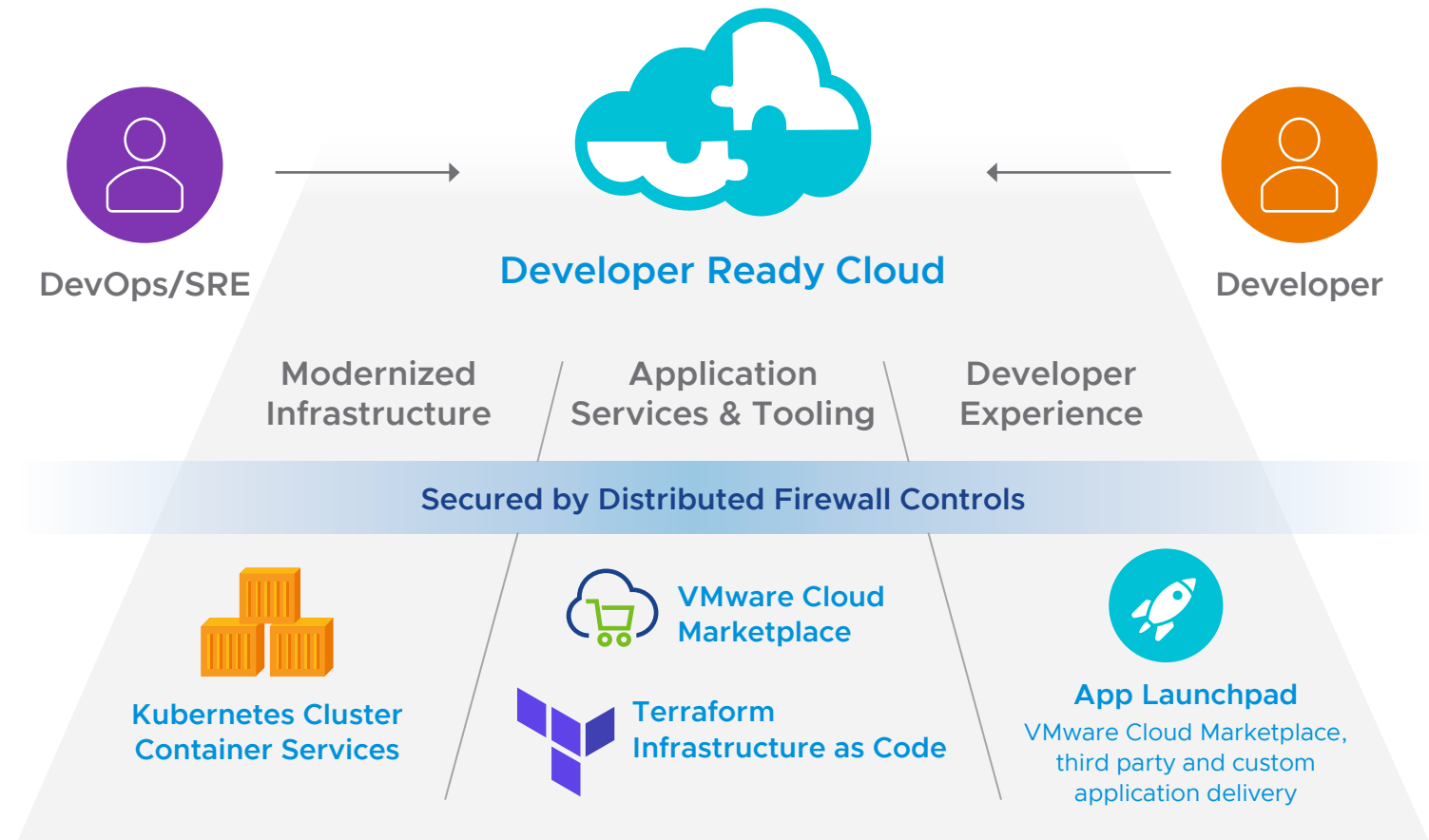IBM HMC
Microsoft Hyper-V
VMware Tanzu Application Service

Hyperconverged
Cisco HyperFlex
NetApp HCI
VMware vSAN

*Note supported technology list can change over time. Please refer to https://www.vmware.com/products/vrealize-operations/true-visibility-suite.html for up to date management packs.

Secure Application Services for Developers within Your Cloud

Modernize and develop cloud-native applications with support for Kubernetes in your secure cloud environment. Give developers easy access to validated, secure apps while streamlining deployments with security, networking, and compliance controls built in.

DevOps/SRE

Developer Ready Cloud

Developer

Modernized Infrastructure

Application Services & Tooling

Developer Experience

Secured by Distributed Firewall Controls

Kubernetes Cluster Container Services

VMware Cloud Marketplace

Terraform Infrastructure as Code

App Launchpad
VMware Cloud Marketplace, third party and custom application delivery

Keep Your Business Running on Secure Kubernetes Clusters

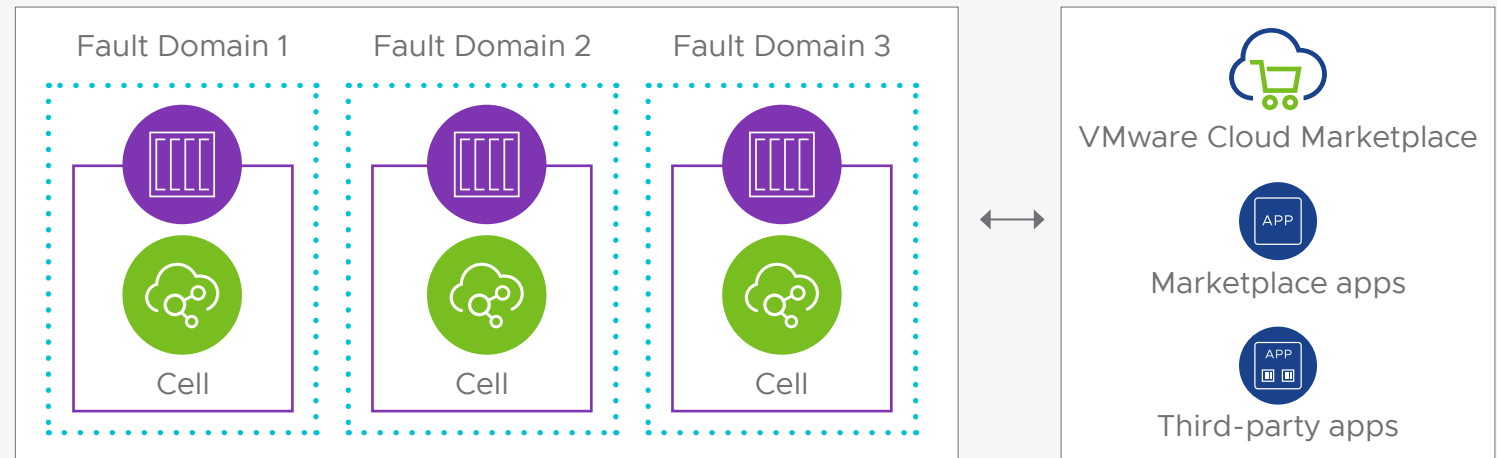**Develop** → **Test** → **Run** → **Production Kubernetes**

Kubernetes as-a-Service on Castlerock VMware Cloud provides low overhead and high app performance.

Elastic infrastructure with on-demand provisioning, scaling, patching and updating	Consistent Kubernetes experience across environments plus easy-to-use UI for creating clusters
More control over resources with storage and compute policies	Underlying infrastructure is automated and managed for you

Fault Domain 1   Fault Domain 2   Fault Domain 3

Cell   Cell   Cell

VMware Cloud Marketplace

Marketplace apps

Third-party apps

Highly Available Kubernetes Cluster

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Access to the VMware Cloud Marketplace
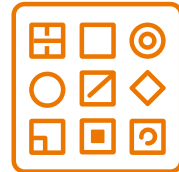
Support rapid development for modern containerized apps

More than 180 open source, dev-centric applications

Tested and checked for security to keep your application development safe and secure

Applications, components, frameworks, templates and more, including Managed Databases, Managed Web/Blogs, Managed API Gateways, Managed AI/ML and Managed Analytics.

The Castlerock
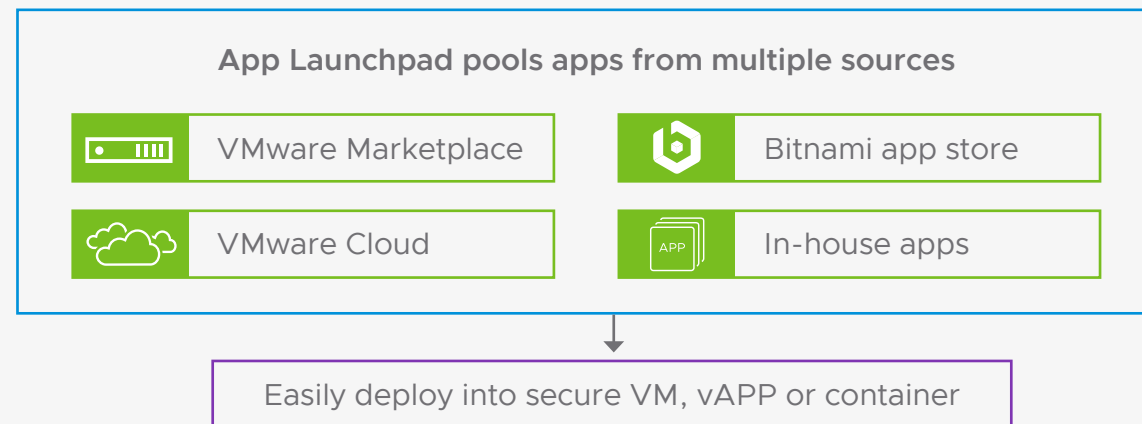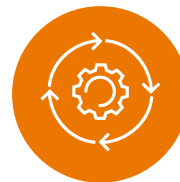# VMware Cloud App Launchpad

Deliver a simple app deployment experience to the cloud that further accelerates your development lifecycles and helps you launch new services and apps.

Let your users drive their own destiny, give them access to the app marketplace to deploy what they want when they want without necessitating infrastructure and security knowledge.

App Launchpad pools apps from multiple sources

| VMware Marketplace | Bitnami app store |
| VMware Cloud | In-house apps |

Easily deploy into secure VM, vAPP or container

1-click deployments for applications

Automates VM, vApp or container creation, networking, firewalling, assigns public IP

No knowledge of underlying infrastructure required

Terraform Infrastructure as Code

Quickly spin up and wind down the infrastructure you need for build, test and production phases.

Developers want to stay in code and access infrastructure to support their build and test activities. Terraform is an efficient automation tool that allows DevOps engineers to define their infrastructure as code within Terraform configuration files.

Terraform supports the latest Castlerock VMware Cloud objects for complete automation of compute, storage, network and security.
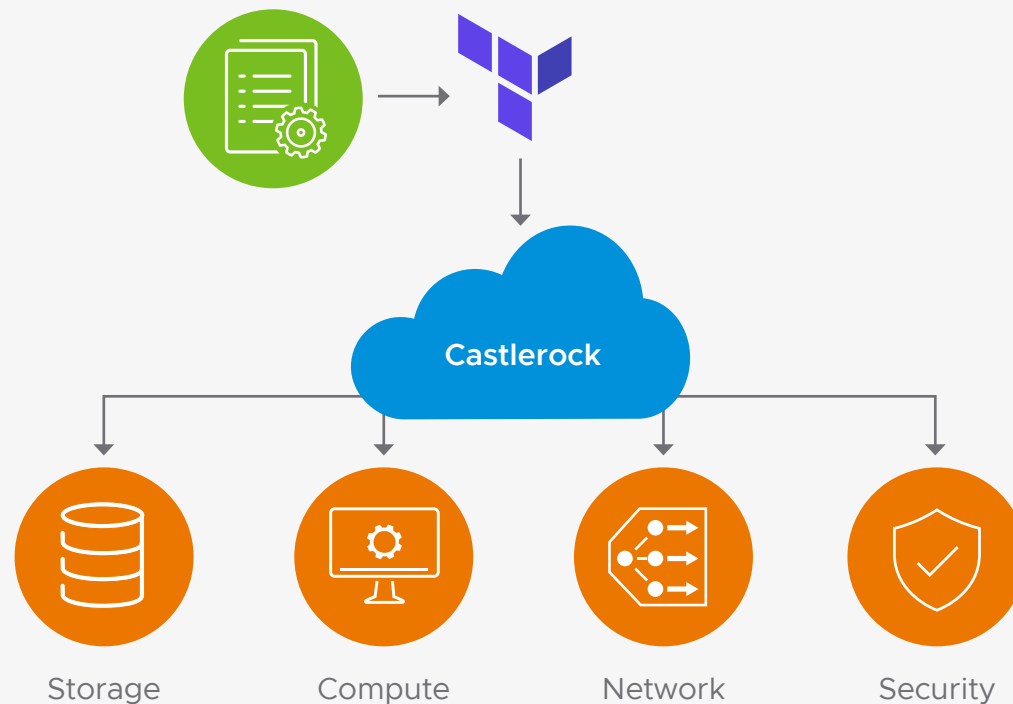
Castlerock

Storage   Compute   Network   Security

Data Protection

As businesses continue to transform and become more digital, they also increase their dependency on technology—putting them at risk.

The dangers of downtime

53% of global IT decision makers

think it's likely their company will experience a brownout or outage so severe that it makes national media headlines.

LogicMonitor

Most common causes of significant disasters or major business disruption

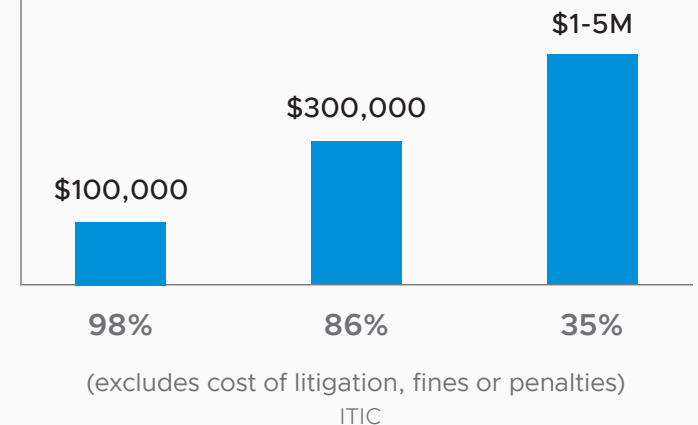- **Technology failure: 37%**
- **Cyberattack: 24%**
- **Power failure: 18%**
- **Network failure: 18%**

Forrester

Ransomware attacks cause an average of

21 days of downtime

Coveware

The cost of 1 hour of downtime (USD)

| 98% | 86% | 35% |

(excludes cost of litigation, fines or penalties)
ITIC

Cloud-based recovery services are growing in popularity

**Disaster Recovery as a Service** is expected to grow 15.4% CAGR through 2023

IDC

Cloud Backup is expected to grow 24% CAGR through 2026

Mordor Intelligence

Castlerock Backup Services with Leading Partners

Castlerock Backup Services deliver availability for all your cloud, virtual and physical workloads so you can easily achieve fast, flexible and reliable backup, recovery and replication for all your applications and data, including support for vSAN.
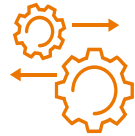
Automated Backup
Automate the protection of vOrgs, vDCs, vApps and VMs. Flexible data protection options enable backups to be run automatically through policies or on-demand.

Granular Recovery
Speed vApp and VM recovery to their original or alternate locations, on-premises or across multi-clouds. Restore a subset of VMs, individual files, or an entire vApp instantly.

Self-Service
Self-service controls to manage your own VMs and vAPPS, as well as the scheduling of backup and restore operations.

Advanced Deduplication
Minimize your operating cost with industry-leading duplication.

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DELL Technologies   **rubrik**   **COHESITY**   **COMMVAULT**   **veeam**

Disaster Recovery

In a world where cloud-first has become the prevailing strategy, businesses need the ability to protect and recover apps and data in the cloud—just like on-premises workloads.

Castlerock VMware Cloud offers numerous disaster recovery benefits:

✓ Metering and performance analysis of storage consumption

✓ Public APIs and automation for on-prem-to-cloud disaster recovery

✓ Tiered disaster recovery services that match the criticality of customer workloads at the most competitive price point

✓ DRaaS offer with a >5min RTO

✓ Managed services and/or self-serve options

vmware®

Cloud Director
Availability™

Provides a simple, cost-effective and secure onboarding, migration and disaster recover as a service solution, including cloud-to-cloud disaster recovery.

Zerto

Disaster recovery and backup in one platform based on continuous data protection (CDP). CDP gives you any point-in-time recovery for the entire length of the journal, with a granularity measured in seconds.

Migrate to Cloud

Workload migration, the risks and the solution

Migration to cloud is the process of moving resources such as virtual machines (VMs) or virtual applications (vApps) from one place (an on-premises site or a cloud site) to a cloud computing environment. This might seem like an easy thing to do but, in reality, can turn out more complicated than expected.

Some of the main technical risks faced by the majority of organizations who migrate to non-vSphere clouds are:

Replatforming – Is the cloud environment compatible with the on-premises infrastructure? Are security, networking, and the data disk format the same?

Right-sizing – Is the cloud offering flexible enough? Castlerock VMware Cloud can accommodate any size VM - you are not forced down a particular route.

Size – Are the migrated workloads too big, and will this slow down the process significantly?

Security – Is the migration process secure enough?

Stability – Is there a guarantee that the migration will be successful?

Downtime – How long can companies afford to have their critical applications powered off?
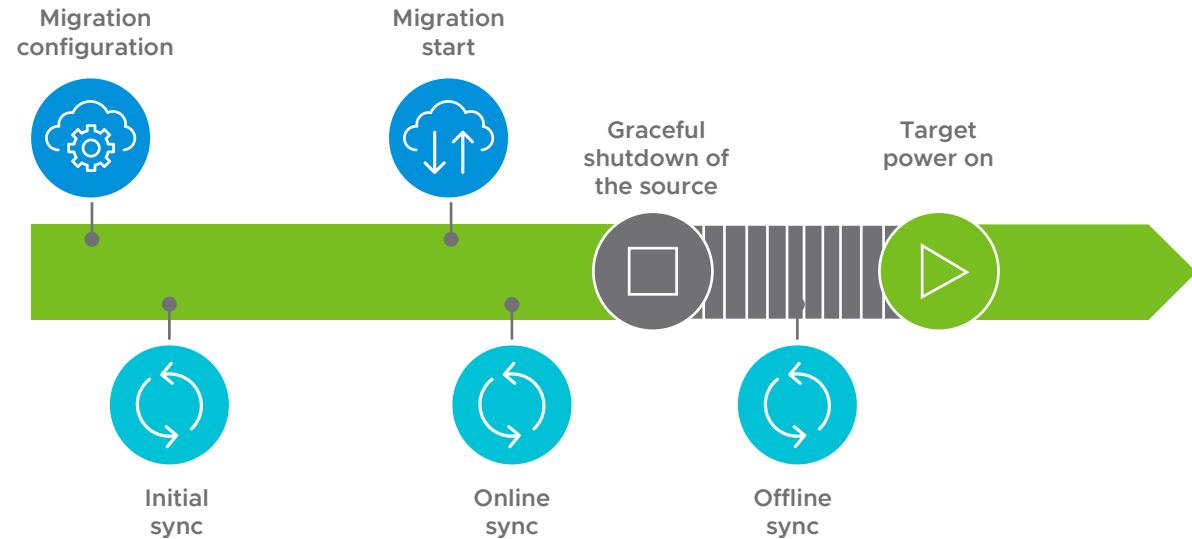
Level of customization – Are there many dependencies between the different elements of the vApp?

Not all migrations are equal. VMware Cloud migration process is simple and low risk. Using our vSphere based cloud, there is no need to replatform, meaning shortening your duration for migration and reducing risk of failed conversion or security exposure.

With complete flexibility, you can drive a self-service migration using your vSphere console, to our secure target cloud. In our cloud, you get to choose the appropriate-sized resources to suit your machine, and are not forced to fit into constrained and/or unsuitable sizing.

Migrate to Cloud

Migration configuration

Migration start

Graceful shutdown of the source

Target power on

Initial sync

Online sync

Offline sync

Pre-step: Arrange virtual data center resources on our Cloud, obtain connectivity credentials and deploy the vSphere DRaaS Plugin and components on your premises.

Step 1
Migration configuration

Once the migration is configured in the DRaaS vCenter plugin, or directly in our Cloud, the initial data sync will be complete. It has no impact on the source workloads, and they continue running without any interruptions. When the initial sync is complete, the workloads are ready to be switched to the destination site. During this 'wait period', changes are synchronized once every 24 hours.

Step 2
Migration start

After the preparation for the migration is done, it can be started by the user. At the time of switchover, online sync is executed first, followed by a graceful shutdown. If the graceful shutdown fails with a timeout, a forced power off will be triggered. When the machine is offline, a rapid sync is performed to capture any changes since the previous one.

Step 3
Start the migrated VM

The final step is to compose the VM and power it on at the destination site.

This sequence of actions minimizes the VM/vApp downtime to almost that of a graceful restart.

Welcome to cloud made easy!

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Want to find out more?

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Email: hello@castlerock.co.za