VMware Cloud on AWS

Technical Deck

Frank Denneman

Senior Staff Architect – VMware Cloud Platform

March 2018

WE ARE HEADING TO A MULTI-CLOUD WORLD

OF ORGANIZATIONS HAVE A HYBRID CLOUD STRATEGY

"Enterprise Adoption Driving Strong Growth of Public Cloud Infrastructure as a Service, According to IDC." Press release. IDC. July 14, 2016

Cloud Building Challenges

CLOUD CONSISTENCY

EXISTING SKILLSET & TOOLS

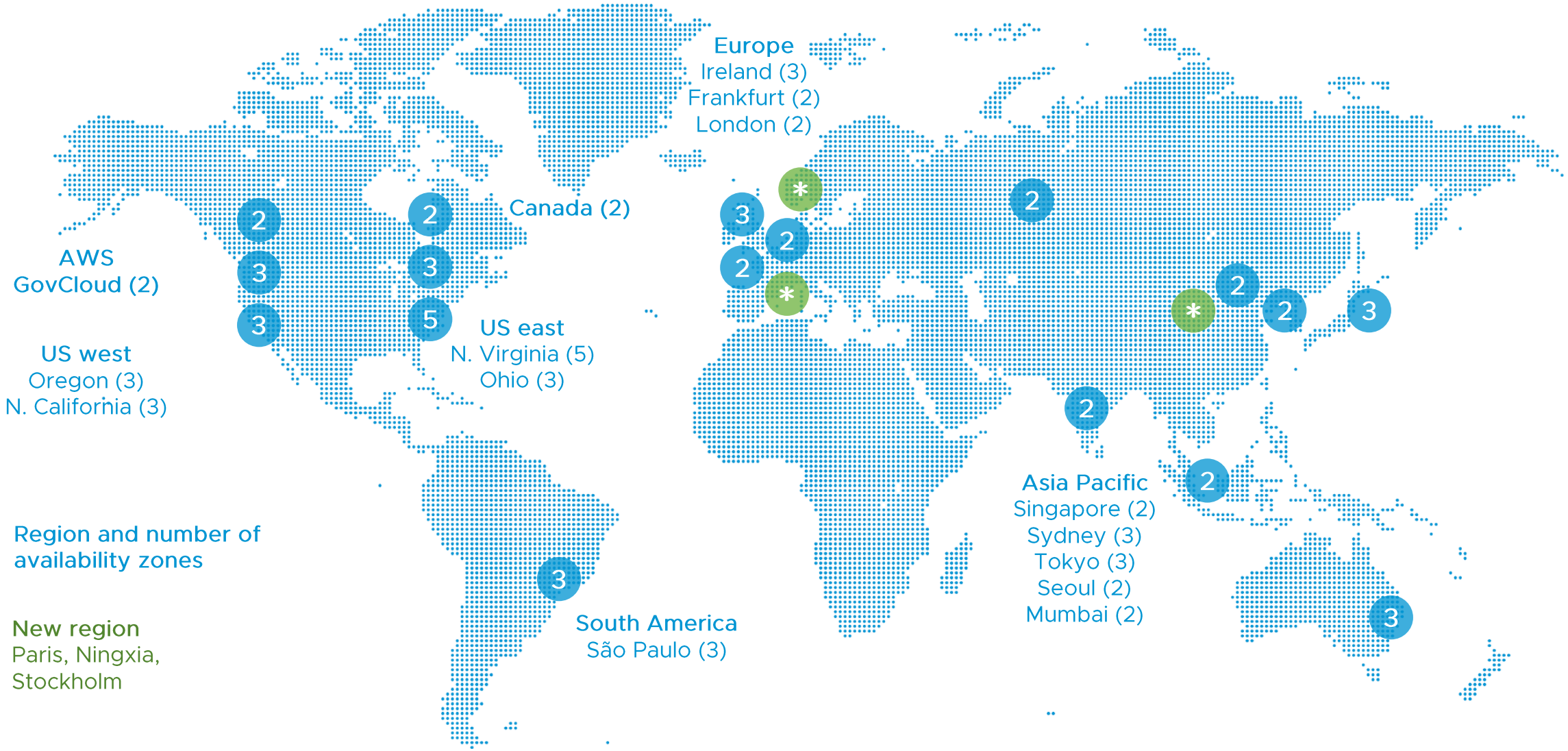
CONTROL, MANAGE & SECURE

ENTERPRISE-CLASS APP SLA

COMPATIBILITY WITH APPS

TWO POWERFUL FORCES
COMING TOGETHER

Global Reach, Delivered Over Time

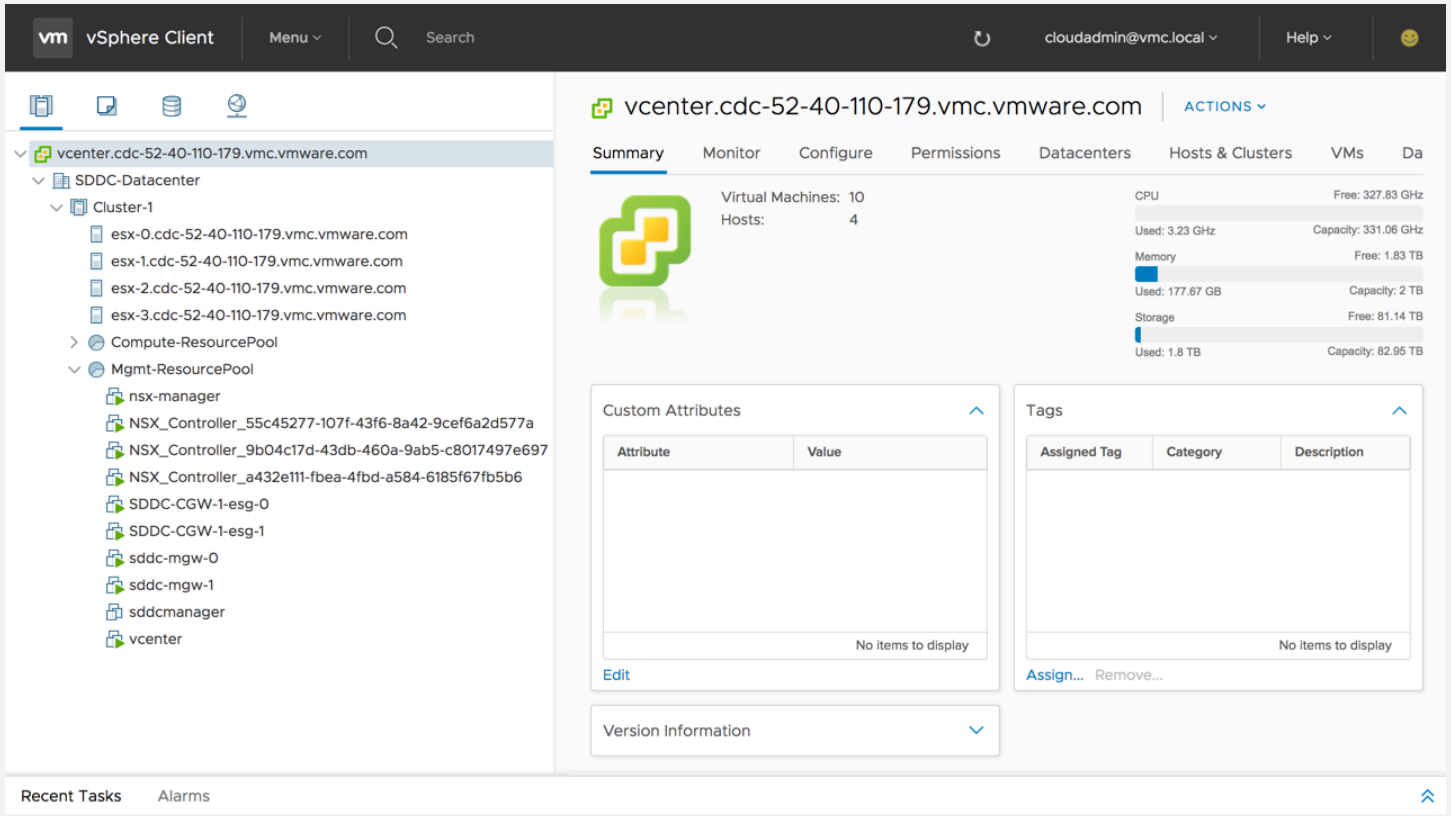


Cloud SDDC Meets AWS Infrastructure

Massive joint effort of both companies

vCenter as Primary Management Platform

Trusted view, known operations



Default cluster is a four host bare-metal vSphere cluster

Management VMs managed and operated by VMware

You decide which and how many workloads you want to run inside a SDDC cluster

VMware Cloud Integration with AWS Infrastructure and Services

Exciting possibilities for future application landscapes

VMware Cloud SDCC

vCenter as main management point

vCenter end-point for existing tooling such as vRealize suite

Mature functionality such as cross vCenter, cross switch, cross datastore vMotion

Ready to deploy and use true cross-cloud environments without steep learning curve and risk

AWS Elasticity

AWS fleet management to our disposal allows us to create new functionalities such as:

- Auto Remediation of hardware faults
- Automated patching

AWS Native Services

Direct connectivity to AWS native services such as S3 and EC2

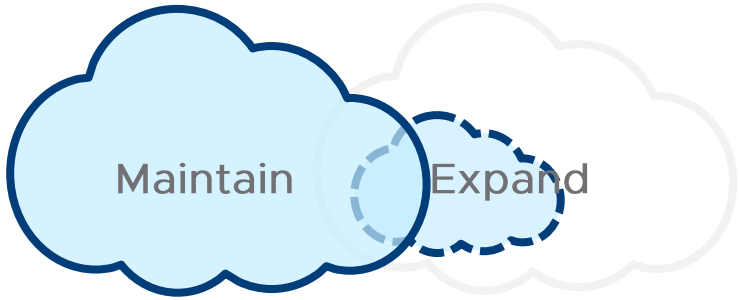
Fast connection

No egress cost

Run Your Workloads Anywhere

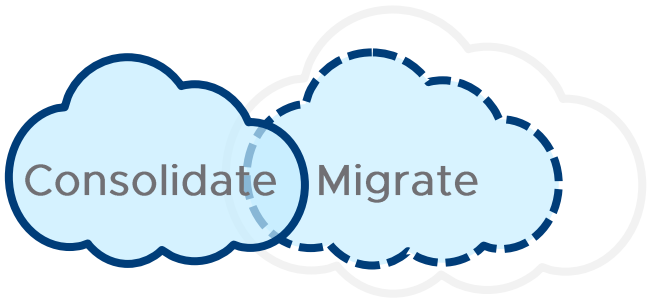
Running VMware Cloud on AWS gives you ultimate cloud flexibility and freedom

Scenario 1: Maintain and Expand



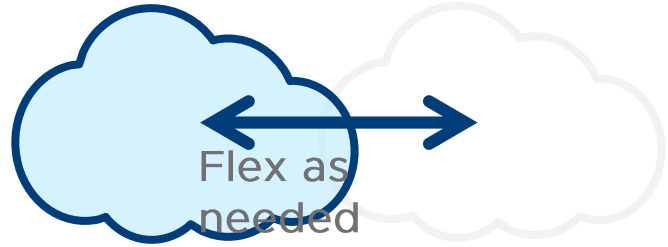
Private Cloud Public Cloud

Scenario 2: Consolidate and Migrate



Private Cloud Public Cloud

Scenario 3: Workload Flexibility

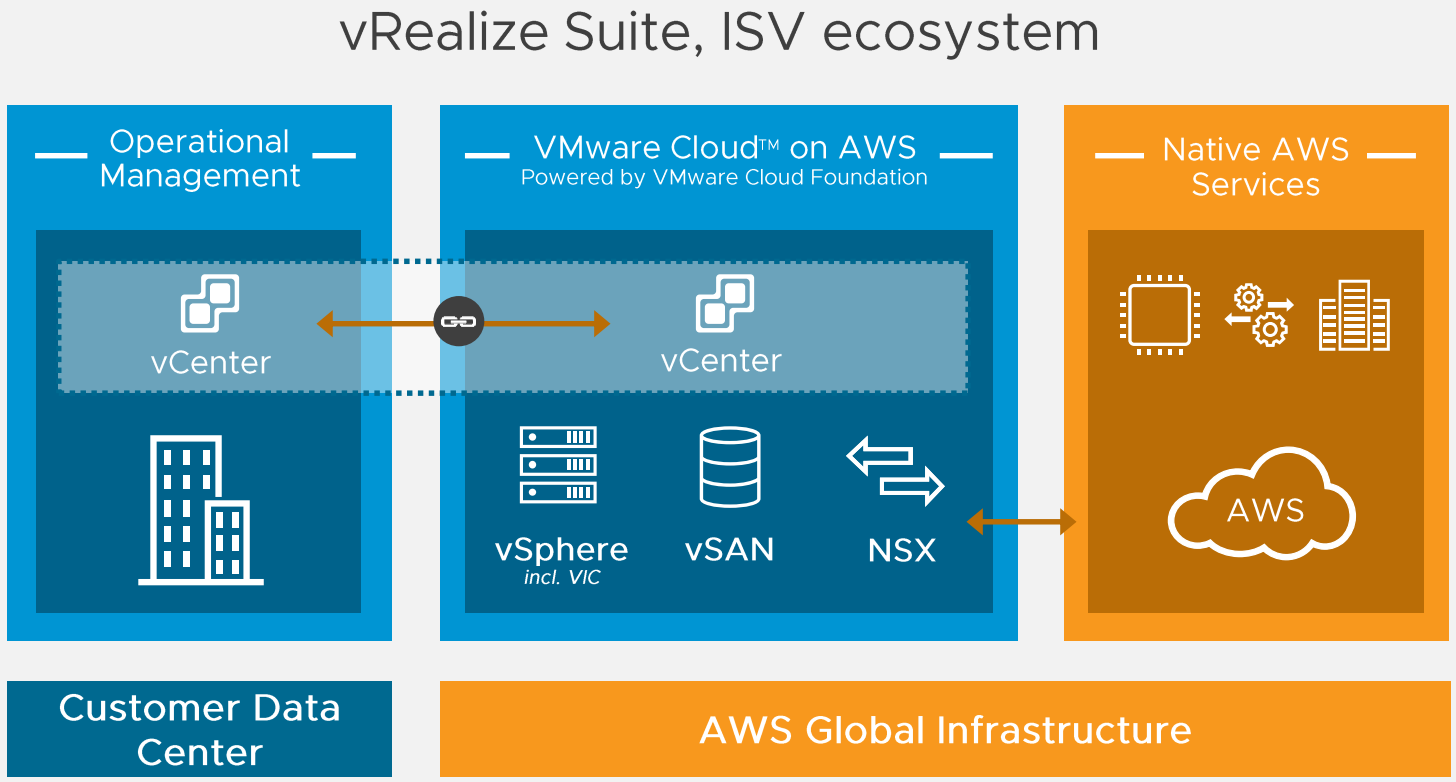


Private Cloud

Customer Has the Choice to Run Workloads Across On-Premises DC and Cloud

VMware Cloud on AWS

Service Overview



Service Highlights

VMware SDDC running on AWS bare metal

Sold, operated and supported by VMware & its partners

Support for containers and VMs

On-demand capacity and flexible consumption

Full operational consistency with on-premises SDDC

Seamless workload portability

Direct access to native AWS services

Global AWS footprint, reach, availability

VMware Cloud on AWS Feature Availability

Features are classified according to the following terms

- *Available* – Feature now available for use by applicable customers. May not be available in all AWS regions
- *Preview* – Feature released in preview to gather feedback. May not be available to all applicable customers or in all AWS regions
- *Developing* – Feature in active development and testing
- *Planning* – Feature under consideration or planning for future development

For the latest information and feature status, please see

- Release Notes: https://docs.vmware.com/en/VMware-Cloud-on-AWS/0/rn/vmc-on-aws-relnotes.html
- FAQ: https://cloud.vmware.com/vmc-aws/faq
- Roadmap: https://cloud.vmware.com/vmc-aws/roadmap

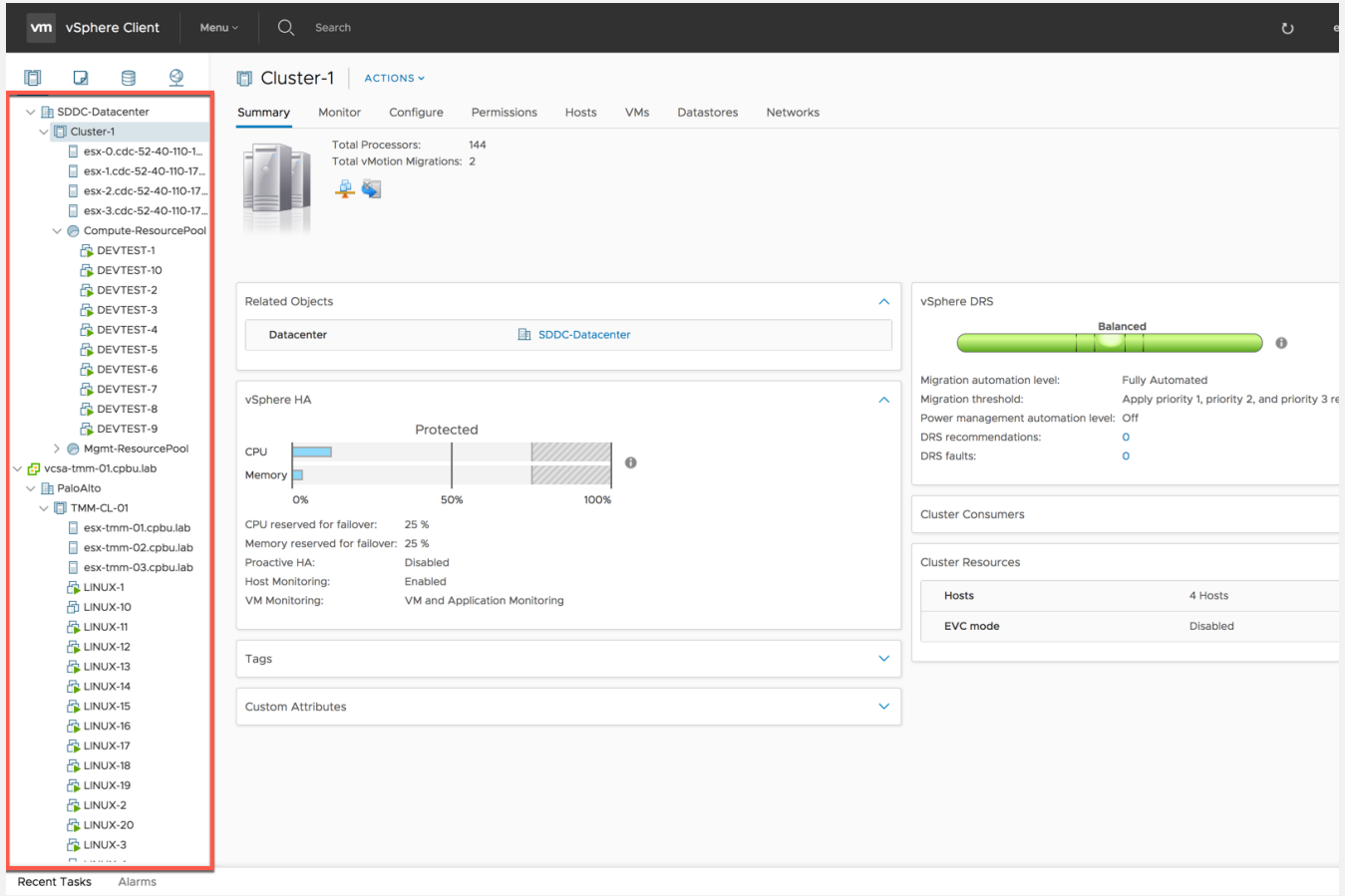
The information in this presentation is for informational purposes only and may not be incorporated into any contract. There is no commitment or obligation that items in 'Preview', ''Developing', and 'Planning', will become 'Available'.

Which location fulfills your application requirements?

Hybrid Linked Mode

Use a single view for your resources around the world

VMware Cloud on AWS Feature



vCenter Hybrid Linked Mode allows linking vCenters running across different SSO domains, different versions, and different topologies

In-Cloud vCenter will be using an embedded vCenter

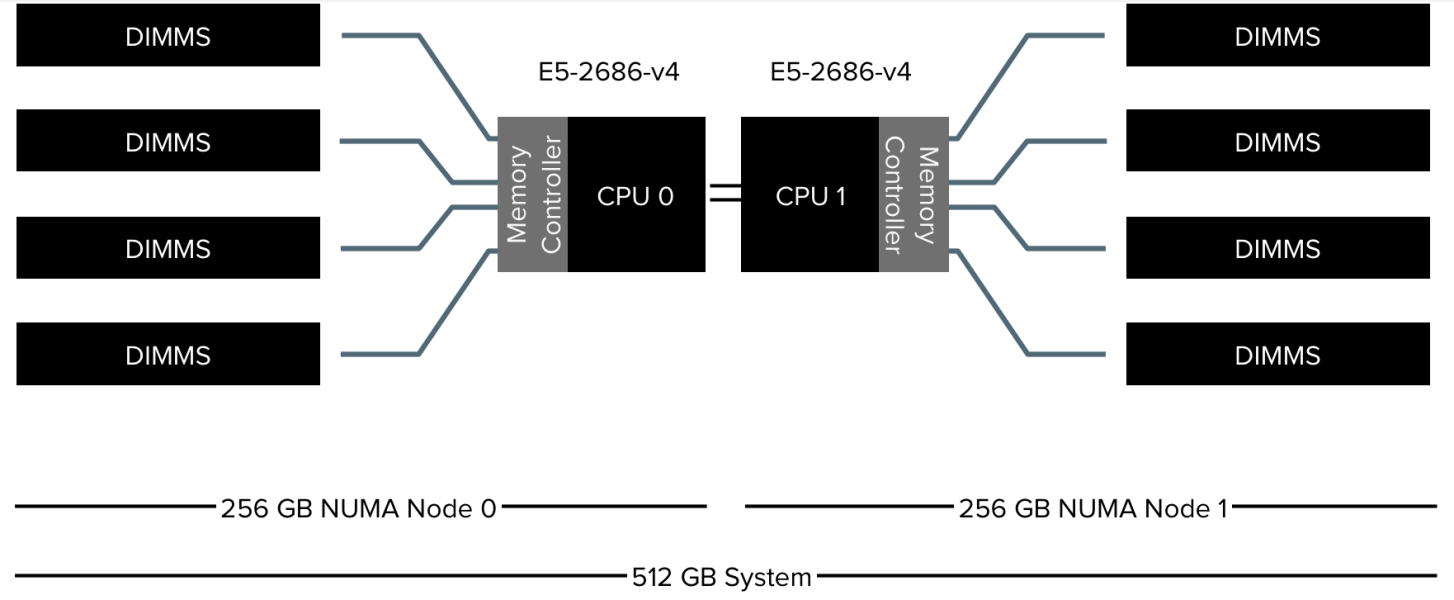
vCenter Hybrid Linked Mode supports both embedded or external deployments on-premises

“What type of workload can I run in a Cloud SDDC?”

- Many people

Compute Configuration in Detail

Single host configuration available for VMware Cloud on AWS SDDC



Dual socket CPU system

Intel Xeon E5-2686 v4

18 Cores per socket at 2.3 GHz

Hyper-Threading enabled

72 Logical processors per host

82.8 GHz per host

512 GB memory per host

Manufacturer: Amazon

Compute Cluster Configuration

Default Cluster Configuration

4 Host Cluster

144 CPU Cores

331.2 GHz of CPU

2048 GB of Memory

Maximum Size Cluster Configuration

32 Host Cluster

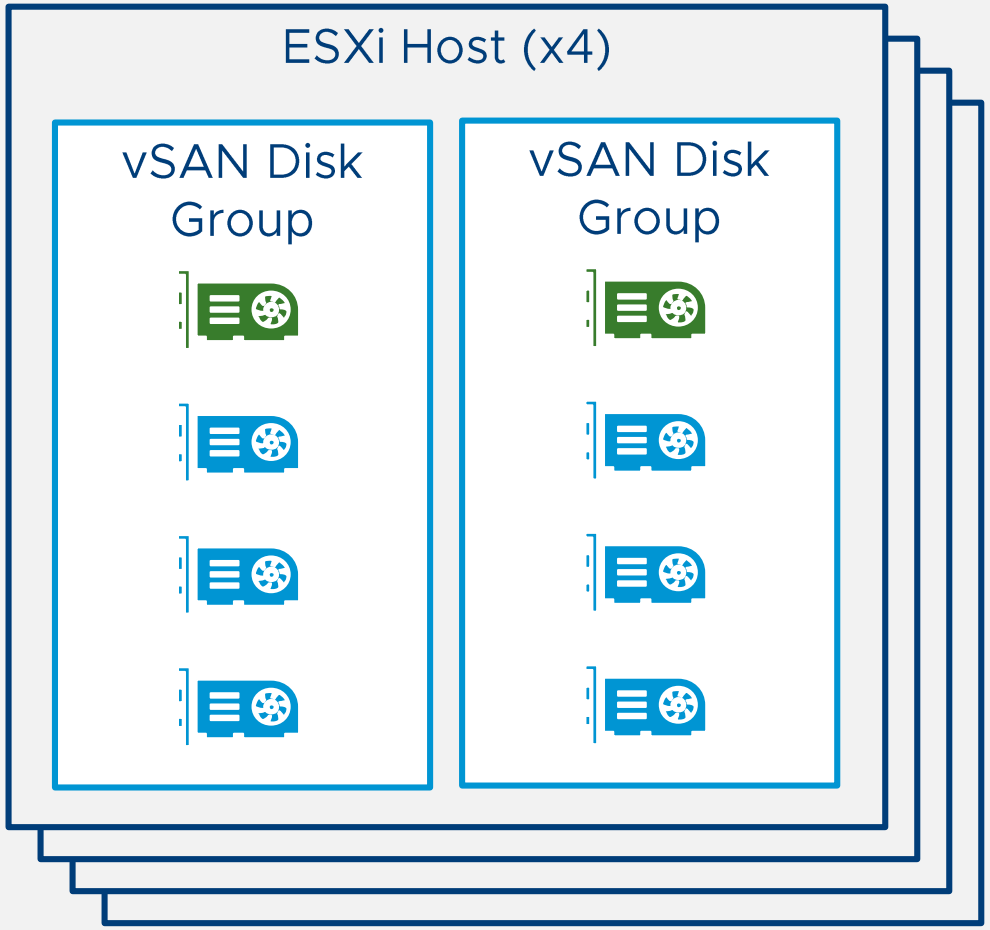
1152 CPU Cores

2649,6 GHz of CPU

16384 GB of Memory

Storage Configuration in Detail

All-Flash vSAN architecture



Each vSAN node contains 8 NVMe devices

2 Disk group configuration

- 2 Devices Write Cache Tier (3.4 TB)
- 6 Devices Capacity Tier (10.2 TB)

vSAN Deduplication and Compression enabled

Usable VM storage capacity depends on Per-VM Storage Policy (RAID 1,5 & 6 available)

Storage Cluster Configuration

Default Cluster Configuration

4 Host Cluster

32 NVMe Devices

40 TB Raw Capacity

Maximum Size Cluster Configuration

32 Host Cluster

256 NVMe Devices

320 TB Raw Capacity

Cluster Configuration in Detail

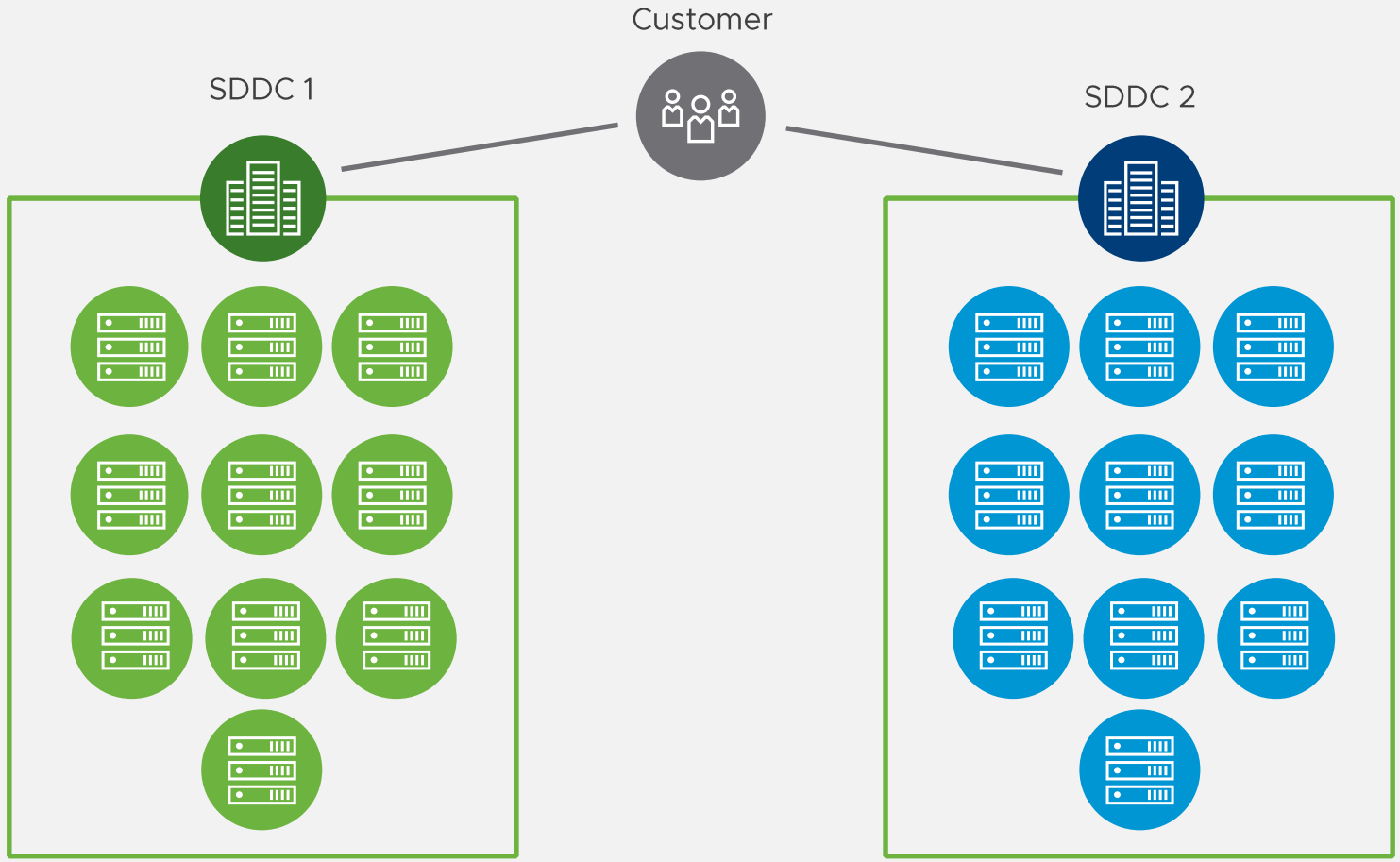
25 Gbps network connectivity per ESXi host

25 Gbps network connectivity between ESXi hosts

Provides optimized access to selected AWS Services such as EC2 and S3

High performance of public access to AWS Services as VMware Cloud on AWS runs on the same AWS Infrastructure

Cloud SDDC Configurations



Each cluster can contain up to 32 ESXi hosts

Up to 10 vSphere clusters per SDDC

Up to 2 SDDCs per customer supported

In total a single customer can allocate up to 21040 CPU cores, 327,68 TB of memory and 6.4 PB of storage.

New connectivity options to create next-level application landscapes

VMware Cloud on AWS Network Connectivity Options

On-premises Data center to Cloud SDDC connections

Internet

Public IP addresses with NAT connectivity for Management and Workloads

Stateful Edge FW for controlling access to Management and Workloads from both on-prem and public internet

On-Prem Datacenter

Encrypted connectivity via IPsec VPN: SDDC to on-prem, SDDC to SDDC, SDDC to VPC

AWS Direct Connect (DX) high-speed, reliable, private connectivity

VMware Cloud ENI

Enables high speed, low latency connectivity between an SDDC and an AWS VPC in the same AZ

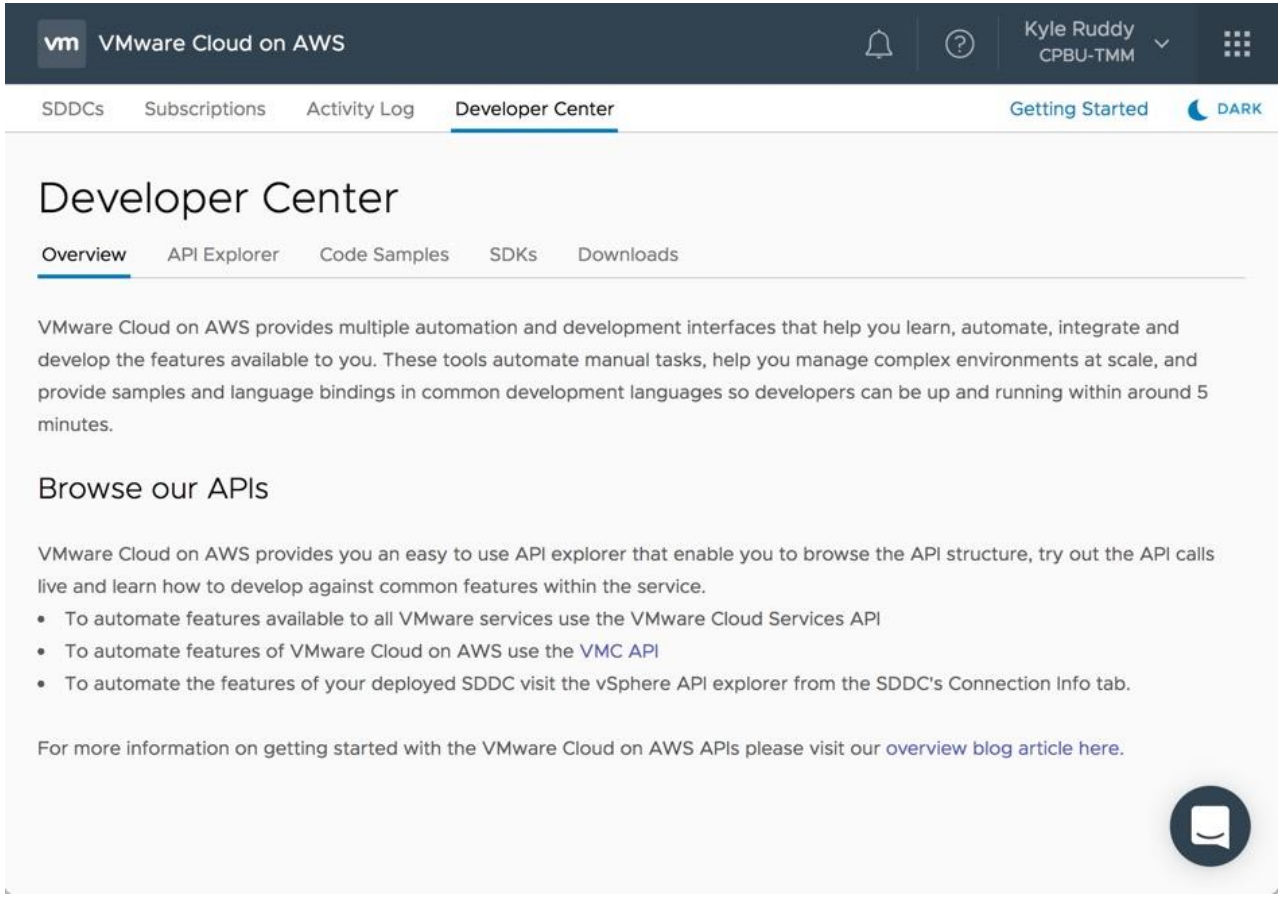
Provides access to AWS regional services as well as private managed AWS services

Shifting from Infra Management to Resource Management

vmware

VMware Cloud on AWS Developer Center Overview

Available directly from the Cloud Console



Easily Access:

- API Explorer
- Community Code Samples
- SDKs
- Downloads

API Explorer

- Automatically authenticates using current user's OAuth token
- Automatically populates certain fields

SDKs include links to their GitHub repo, documentation, samples, getting started blogs

Downloads include links to PowerCLI, Datacenter CLI (CLI), and Terraform resources

VMware Cloud Service API

Simple API model

Preview

Exposes three API surfaces

VMware Cloud on AWS Exposes three API surfaces that work together to provide end-to-end functionality

- Console
- VMware Cloud on AWS
- vCenter

Adhering to modern API standards

RESTful

JSON

OAuth

Allows you to

Create & Remove SDDCs

Add & Remove Hosts

List Org Information

List SDDC Information

List VMware Cloud on AWS tasks

Firewall Rule Management

Infrastructure as Code

SDDC Automation with industry leading tools

Preview

```
{
    "AWSTemplateFormatVersion" : "2010-09-09",

    "Description" : "This template creates an SDDC in VMware Cloud on AWS.",

    "Parameters" : {
        "VMCSDDCName" : {
            "Description" : "The name of the SDDC to be created.",
            "Type" : "String",
            "MinLength" : "3",
            "MaxLength" : "64",
            "AllowedPattern" : "[a-zA-Z0-9]+\\..+"
        },
        "HostCount" : {
            "Description" : "Number of hosts to be deployed in the SDDC.",
            "Type" : "String",
            "MinLength" : "1",
            "MaxLength" : "16",
            "AllowedPattern" : "[0-9]+"
        },
        "Region" : {
            "Description" : "Region to deploy the SDDC into.",
            "Type" : "String",
            "MinLength" : "4",
            "MaxLength" : "10",
            "AllowedValues" : [ "US_WEST_2", "US_EAST_1", "EU_WEST_2"]
        }
    }
}
```

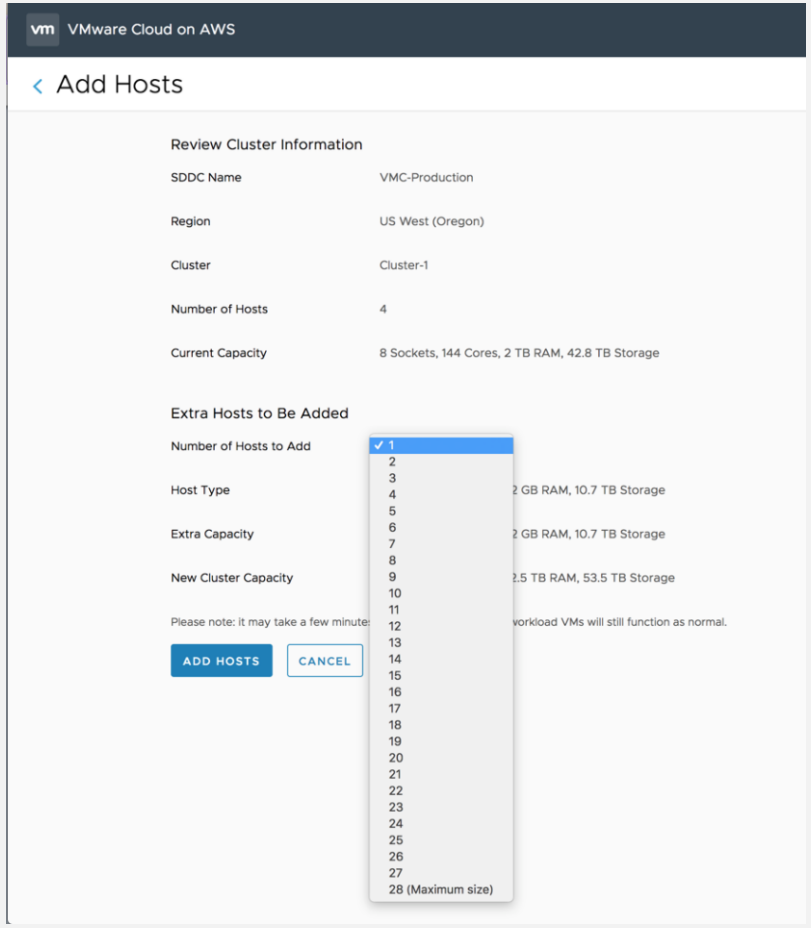
Automate VMware Cloud on AWS SDDC-level provisioning with support for:

- AWS CloudFormation templates
- HashiCorp Terraform Modules

Enables single shot deployment of hybrid environments leveraging on-premises, VMware Cloud on AWS and AWS Services

Deploying physical resources as fast as deploying virtual machines

Cluster Expansion & Contraction



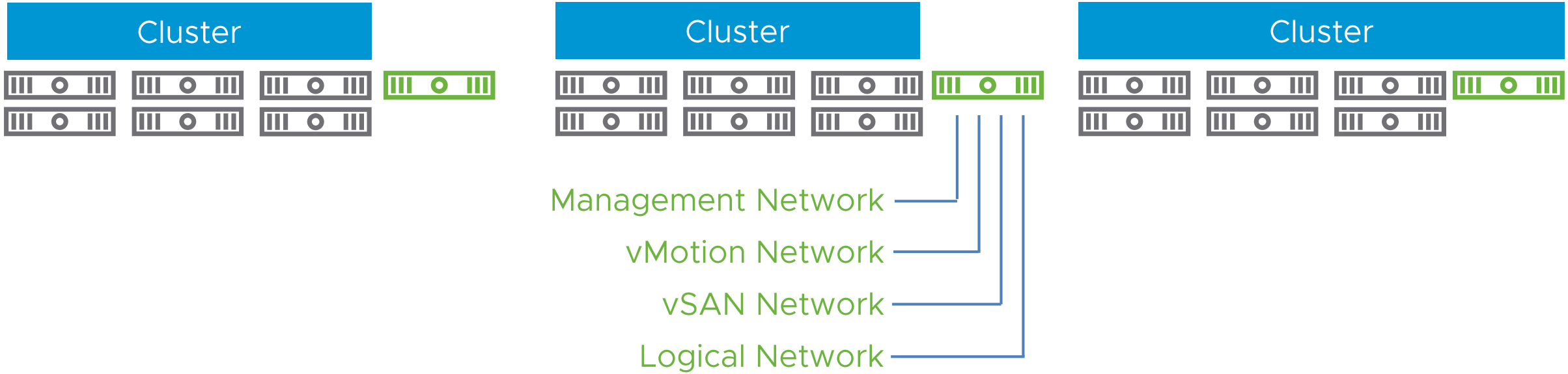
Flexibly expand and contract cluster within minutes

You can specify number of hosts to add or remove to/from their cluster

Hosts removed from the cluster are evacuated of VMs and data prior to their removal

Automatic Cluster Configuration

1. Host is added
2. Automatic network configuration
3. vSan datastore capacity increase



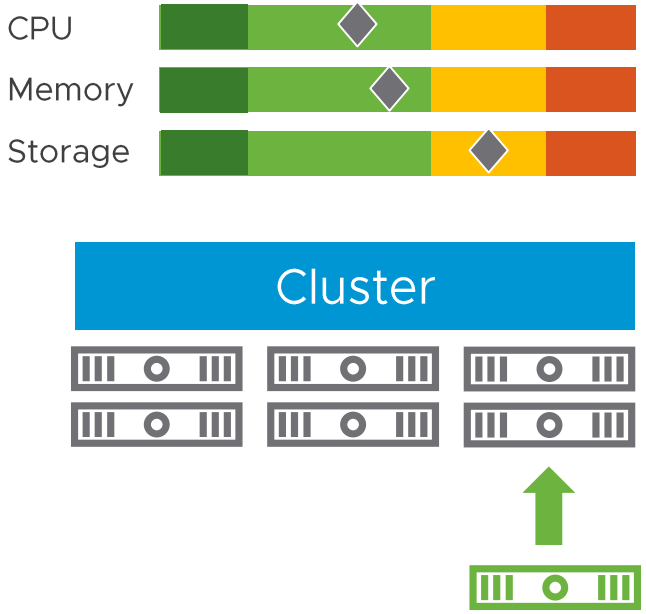
Elastic DRS Integration

Expand the Cloud SDDC automatically when resources are needed

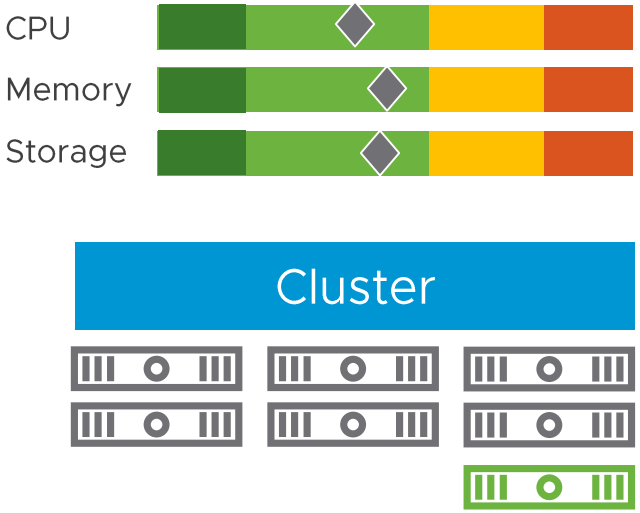
In Development

1. Cluster operating within target thresholds

2. Threshold exceeded? Provision additional host



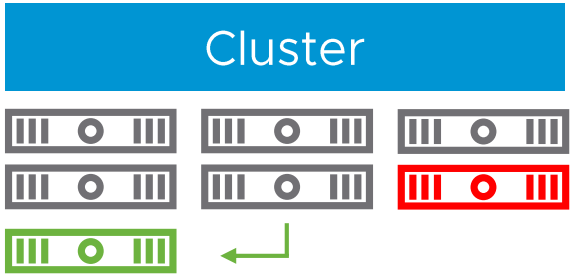
3. Cluster returns to target threshold



Automated Hardware Remediation

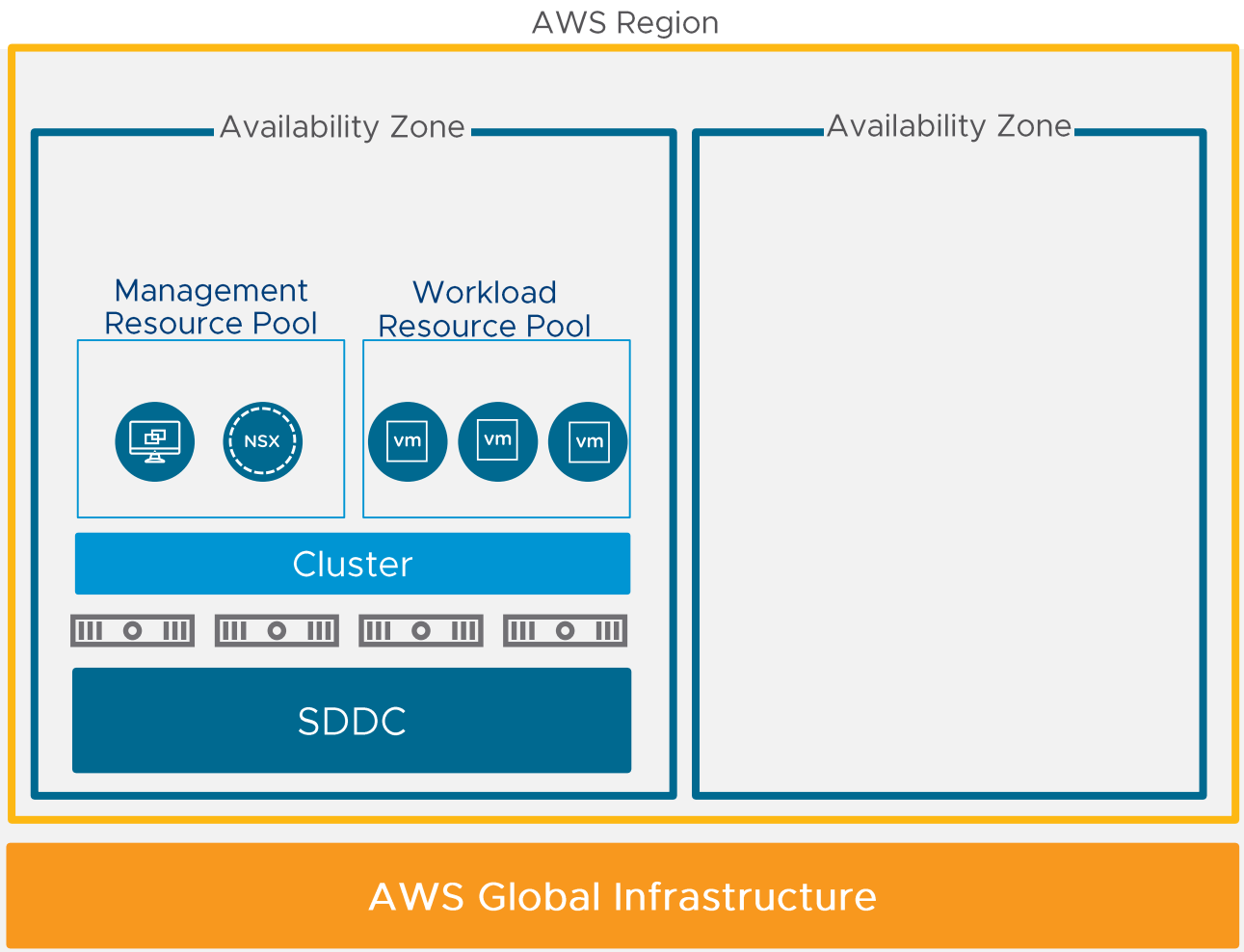
1. Host fails, or problem identified

2. New host added to cluster. Data from problem host rebuilt, and/or migrated



3. Previous host evacuated from cluster, fully replaced by new host

Default Cluster Configuration



Restricted to one AWS Region and Availability Zone (AZ)

Automatically detects failed hardware

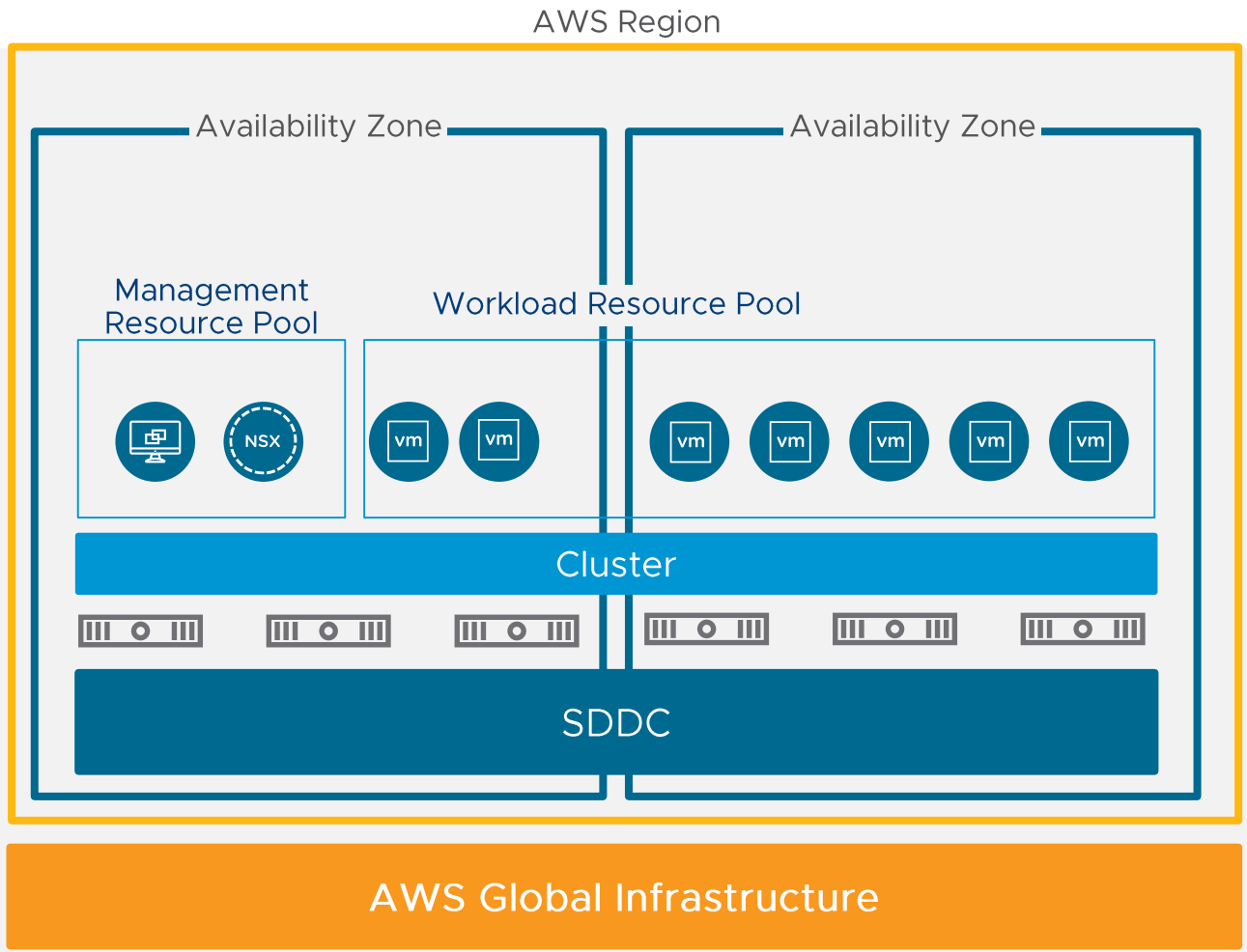
Auto remediation hardware allows automatic recovery from HA events

Provision new host and eject failed node without customer intervention

Stretched Cluster Configuration

Built-in infrastructure layer – no necessity to refactor the application

Preview



Stretched cluster with common logical networks with vSphere HA/DRS enabled

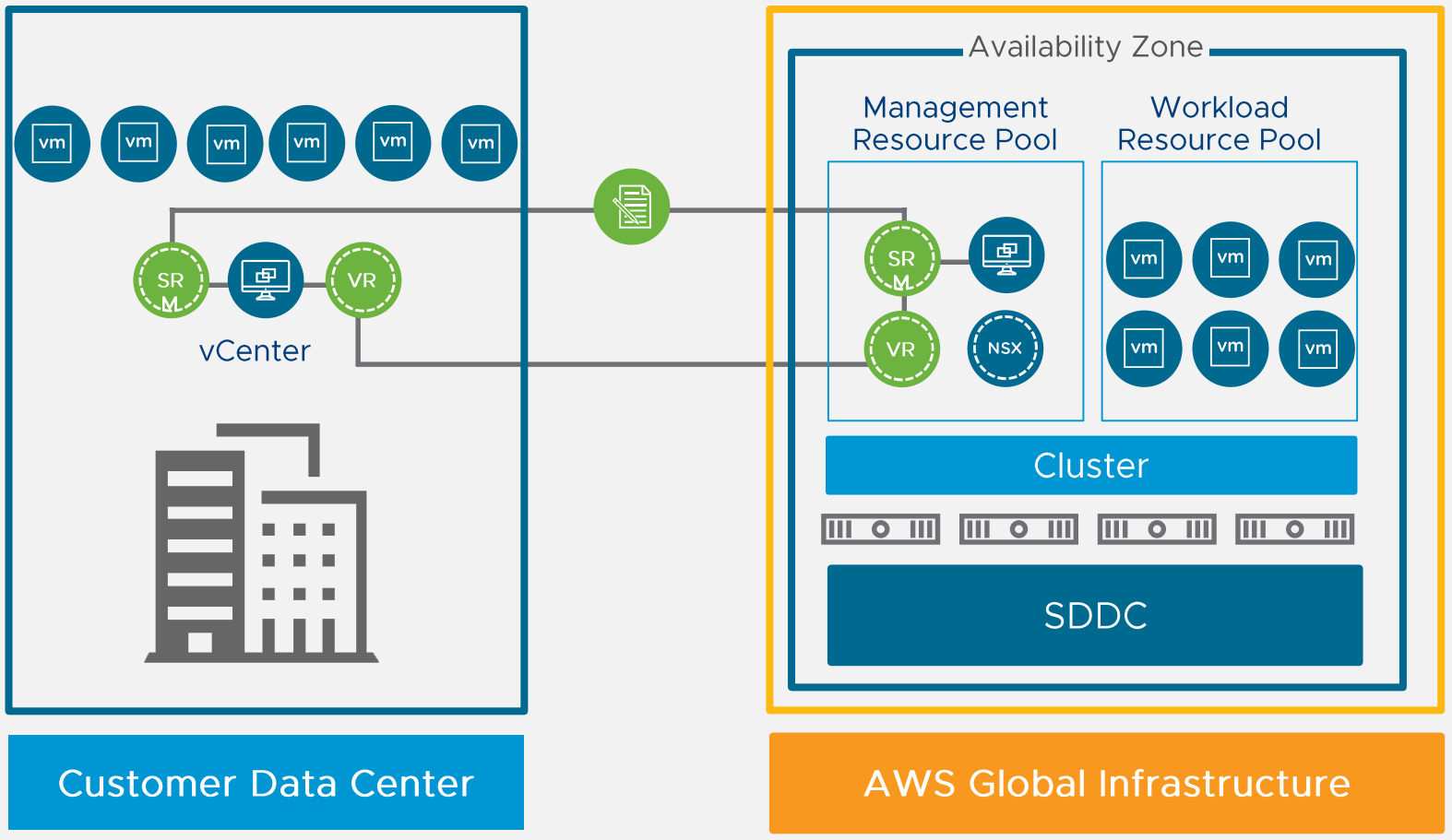
Synchronous replication between AZs for mission-critical applications

If one AZ goes down, it is simply treated as a vSphere HA event and VM is restarted in the other AZ

First time infrastructure level AZ resilience!

VMware Site Recovery

Built for VMware Cloud on AWS



Delivered as an add-on service

Built on VMware's proven disaster recovery solutions

Automated DR runbook with application-centric runbooks

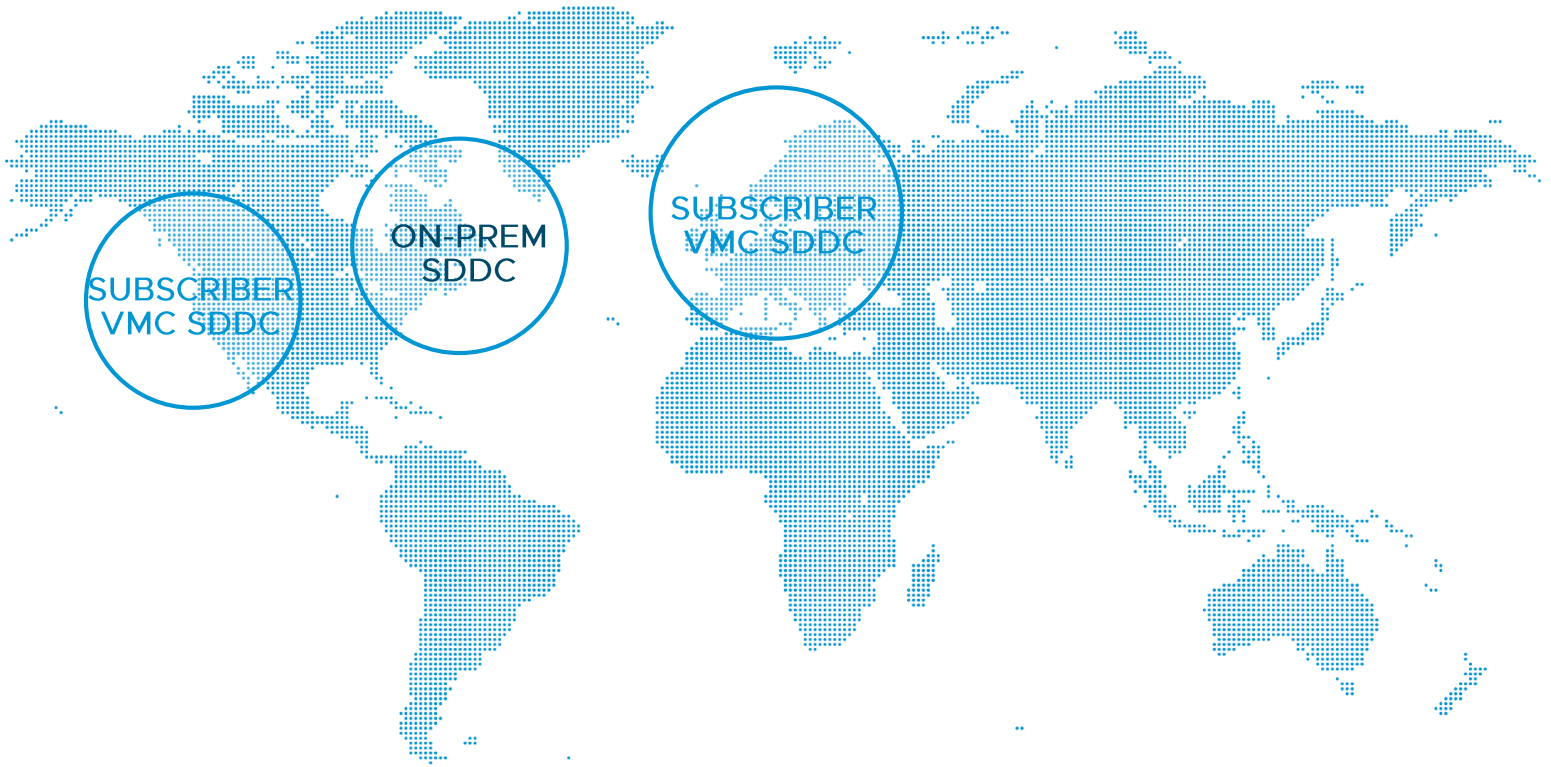
Bi-directional protection between cloud and on-prem as well as between AWS availability zones

Integrated deeply with the VMware Cloud on AWS services

How do you get your applications to the cloud SDDC?

vCenter Content Library

- Automatically synchronize user-content across cloud instances
- Distribute your content effortlessly
  - OVA
  - ISO Images
  - Scripts
  - Templates



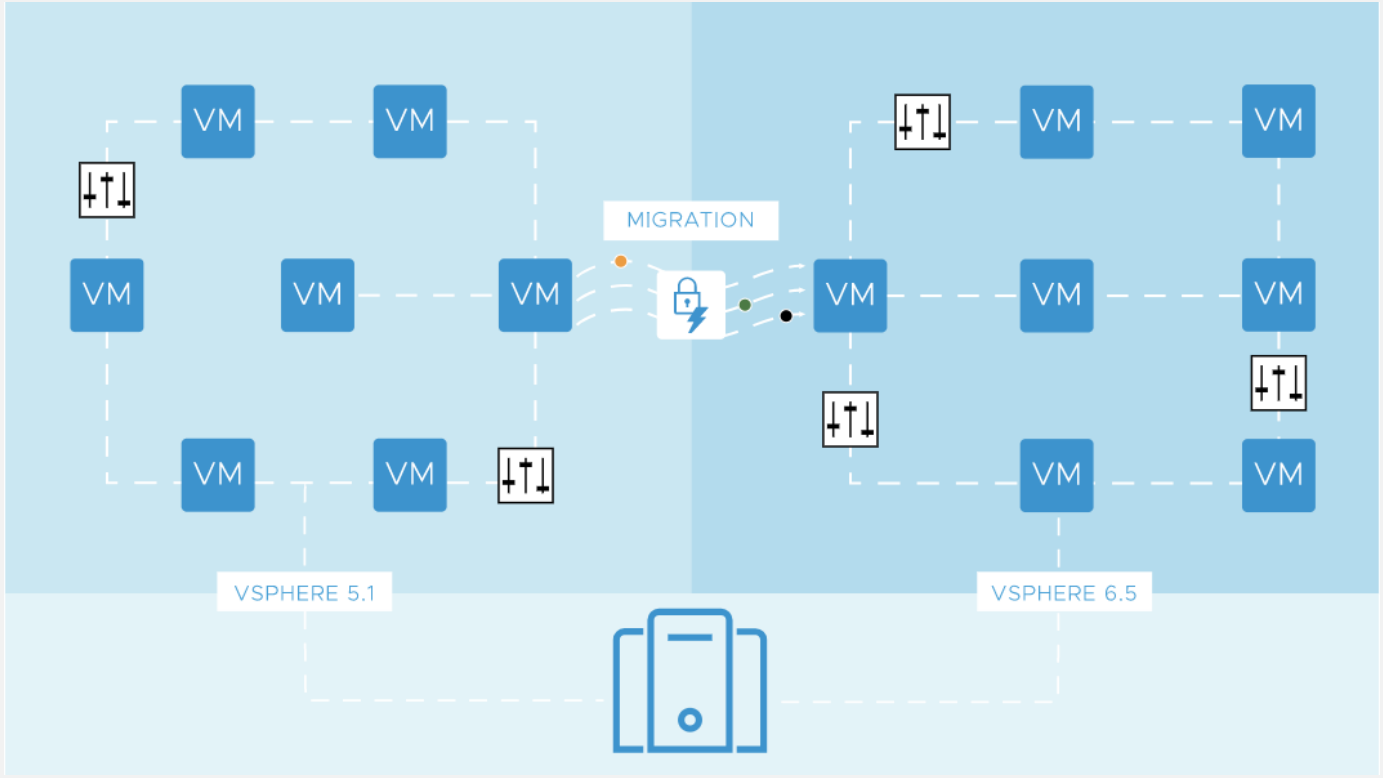
Hybrid Cloud Connectivity & Migration Options

Connectivity Options	Workload Migration Option
L3 IPSEC VPN	Cold Migration
L2 VPN + AWS Direct Connect	Live Migration (vMotion)

Hybrid Cloud Extension Service

Bulk Workload Migration

Preview

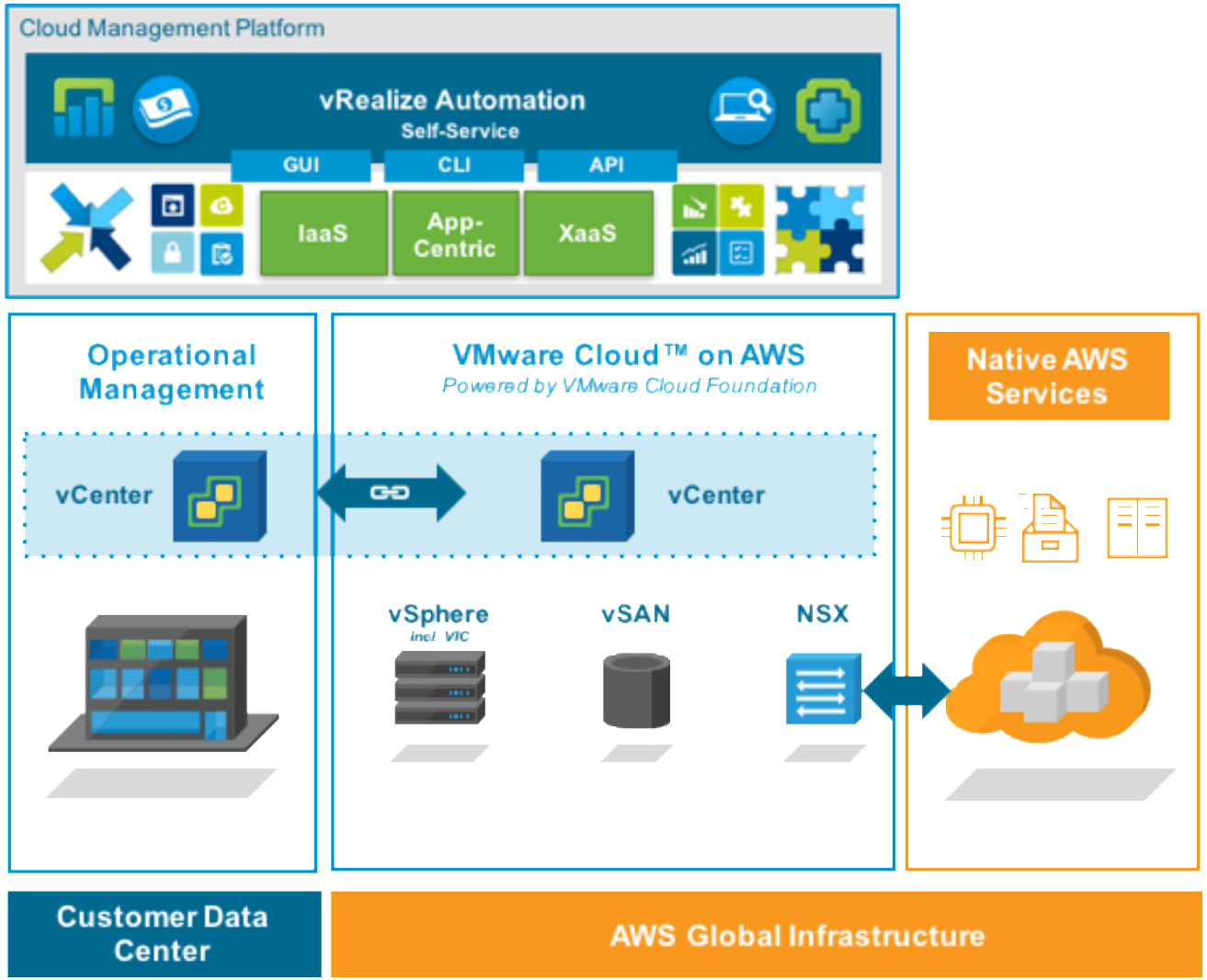


Hybrid Cloud Extension

- Delivered as a Service
- Abstracts on-premises and cloud resources
- App mobility across vSphere 5.x, 6.x
- Zero-downtime live migrations and scheduled large scale warm-migrations

Getting the most out of your VMware Cloud on AWS with vRealize

vRealize Automation: The On-Ramp



1) Seamlessly **Discover**, **Govern** and **Manage** new SDDC resources

2) Build a **Federated** SDDC Fabric

3) Abstract **organizational change** and **complexity**

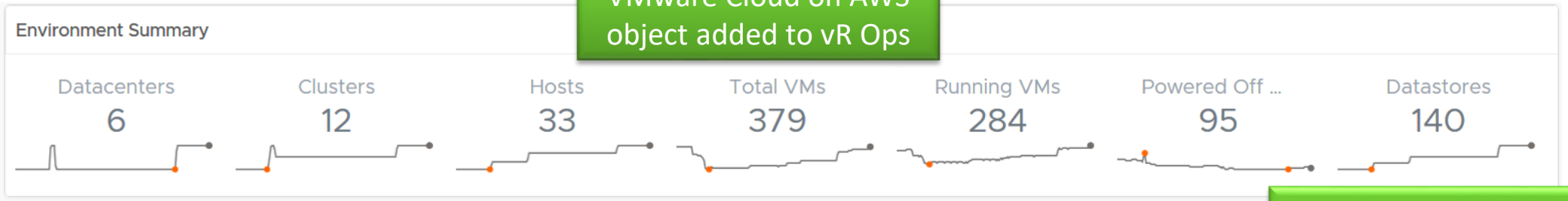
4) **Enhance** and **Extend** with vRA's vast extensibility platform

5) Incorporate **native AWS services**, align with machine lifecycles

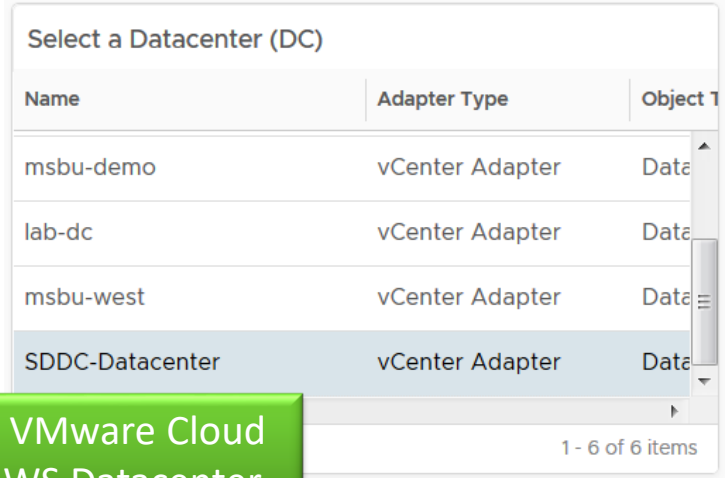
Managing VM workloads in VMware Cloud on AWS

vRealize Operations Dashboards

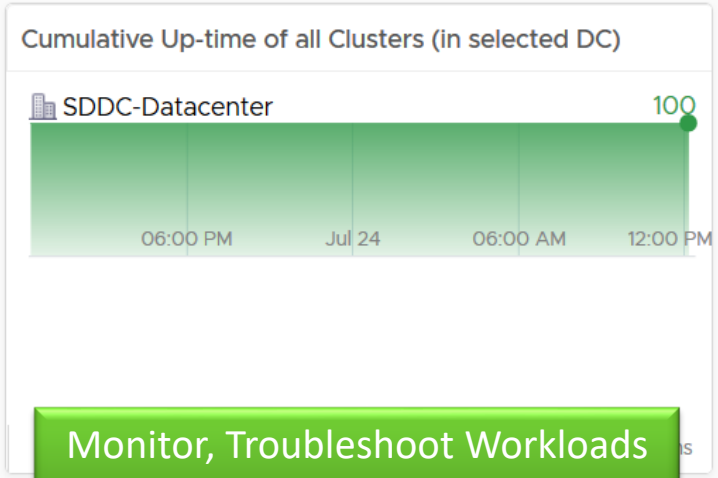
VMware Cloud on AWS object added to vR Ops

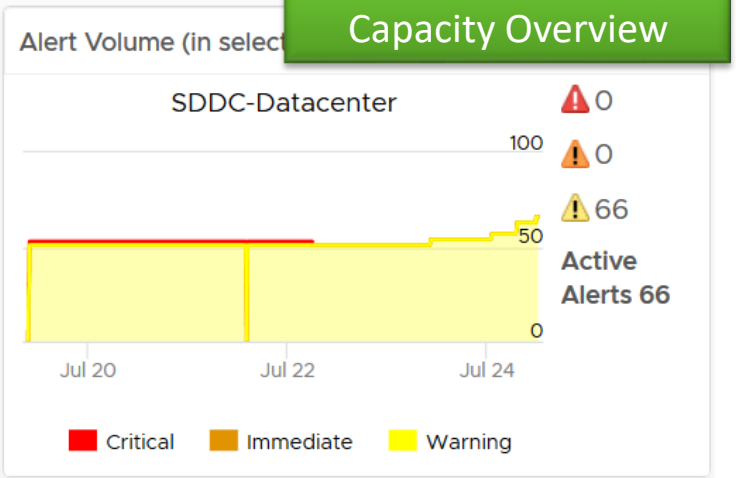


VMware Cloud on AWS Capacity Overview



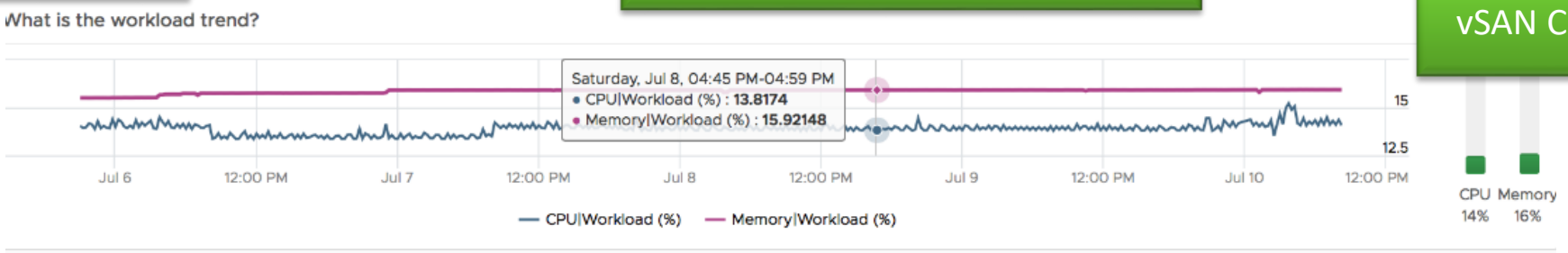
Click VMware Cloud on AWS Datacenter





Monitor, Troubleshoot Workloads in VMware Cloud on AWS SDDC

vSAN Cluster Overview

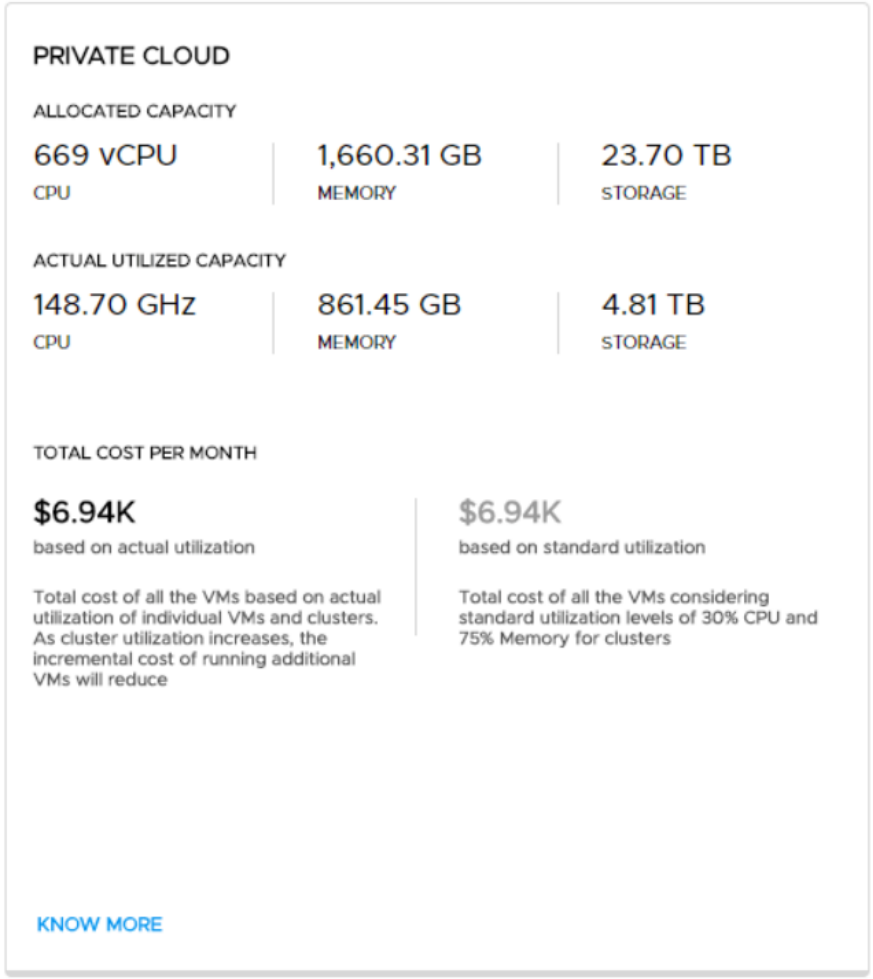


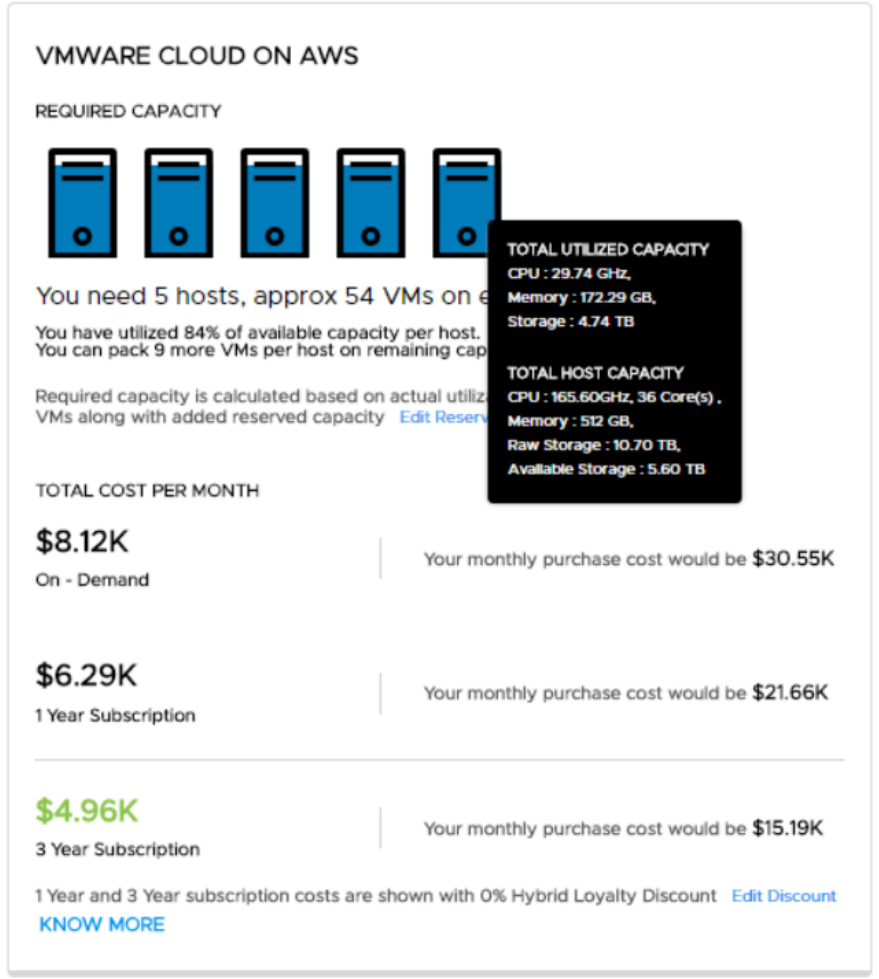
vmware

How much VMware Cloud on AWS do I need?

vRealize Cloud for Business – Private vs VMware Cloud on AWS Assessment

- Run a quick VMware Cloud on AWS Assessment with vRBC
- Supports main Use Cases
  - Migrate Applications
  - Retire Clusters
  - HW refresh for Hosts & Clusters
- Private Cloud Capacity and Costs
- VMware Cloud on AWS
  - Host icons show # of hosts needed
  - Costs for 3 subscription models





Analyze and optimize costs across public and private clouds

Cost Insight

Cost Visibility

- Estimate total cloud spend across public and private clouds
- Compare spend by cloud providers, regions, accounts, or other custom groups
- Share with teams the actual cloud consumption by line of business or user groups

Cost Optimization

- Identify powered off virtual machines
- Identify unused cloud storage resources
- Customize threshold limits for identifying unused resources

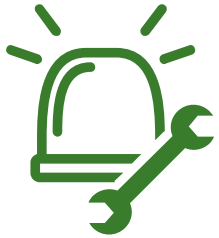
Cloud Migration

- Provides total cost of ownership of workload migration to public clouds including egress and IOPS costs
- Estimate VMware Cloud on AWS capacity and cost required to migrate applications / clusters

Infra, audit and app logs for VMware Cloud on AWS and Native AWS

Log Intelligence - Real-time visibility

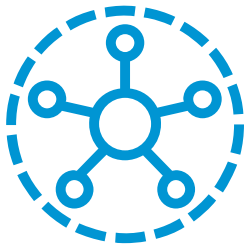
Preview



Faster Troubleshooting

1

- Quickly understand the health of an SDDC environment by identifying anomalies across infrastructure and applications
- Accelerate troubleshooting with out-of-the-box dashboards for VMware SDDC solutions such as vCenter and NSX



Universal Log Collection

2

- Provide robust log aggregation and analytics with enterprise-class scalability
- Ingests logs in a secure and efficient manner and delivers sophisticated analytics

VMware Cloud on AWS Support

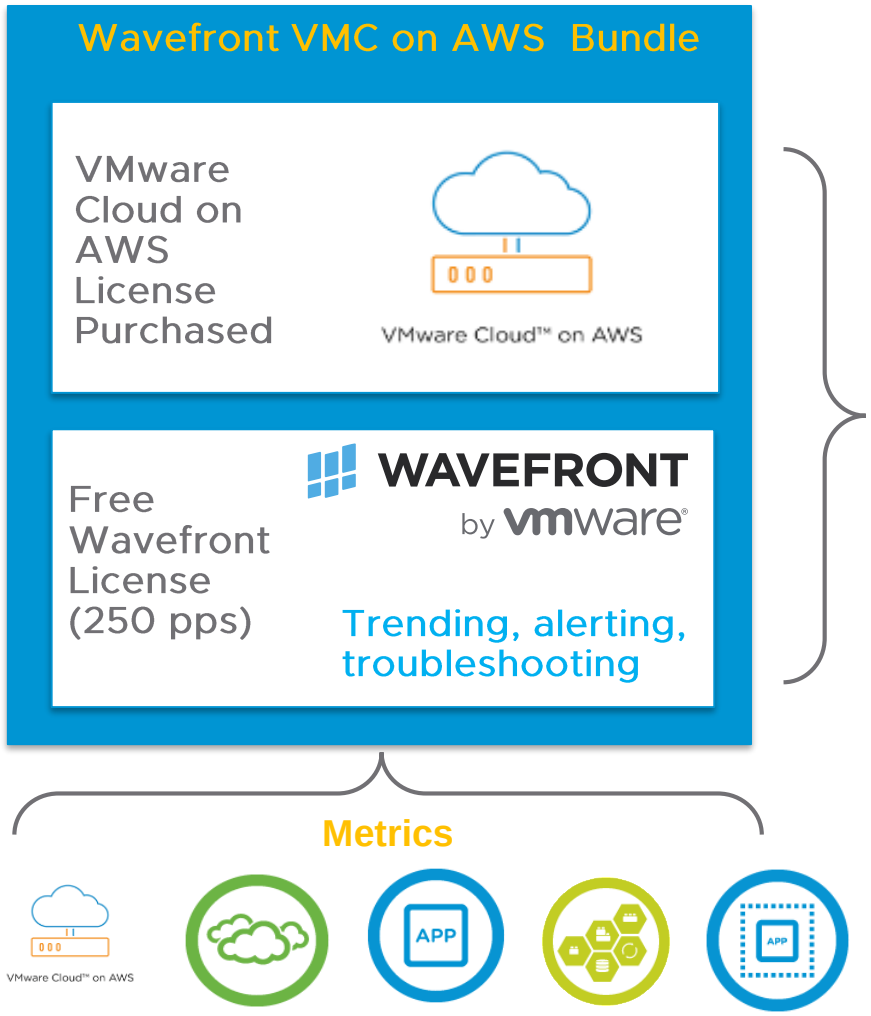
Better Together with VMware Cloud on AWS

- Provide infrastructure audit and application log analytics
- Offer AWS cloud native application troubleshooting
- Deliver SRE monitoring and troubleshooting support

Extend App Monitoring to Traditional IT

Wavefront and vRealize Operations Integration

PPS Available today
Per CPU per VM April 1st



- "Easy Button" in vR Ops connects to Wavefront, so IT controls app monitoring and management
- Developers monitor their apps in Wavefront (no need to manage Wavefront, agents, roles, etc.)
- Over 100 free built-in Wavefront integrations
- $0 SKU of 250 pps Wavefront license included with VMware Cloud on AWS sale
- Free SaaS metrics-driven analytics and monitoring for VMC and cloud applications

vmware

How can you get ready for the hybrid cloud?

Get Ready

Understand how VMware Cloud on AWS will fit into your cloud strategy

Have a conversation with your VMware account team or partner about VMware Cloud on AWS

Get your environment ready to maximize the benefits of VMware Cloud on AWS

Learn more on the web

vmware.com/go/vmc-aws

aws.amazon.com/vmware

Engage on Social Media

Follow us on Twitter

@vmwarecloudaws

@awscloud

Give us a shout on Twitter

#VMWonAWS

Thank you