Cloud Computing and vCloud Director

Module Lessons

Lesson 1: Cloud Computing

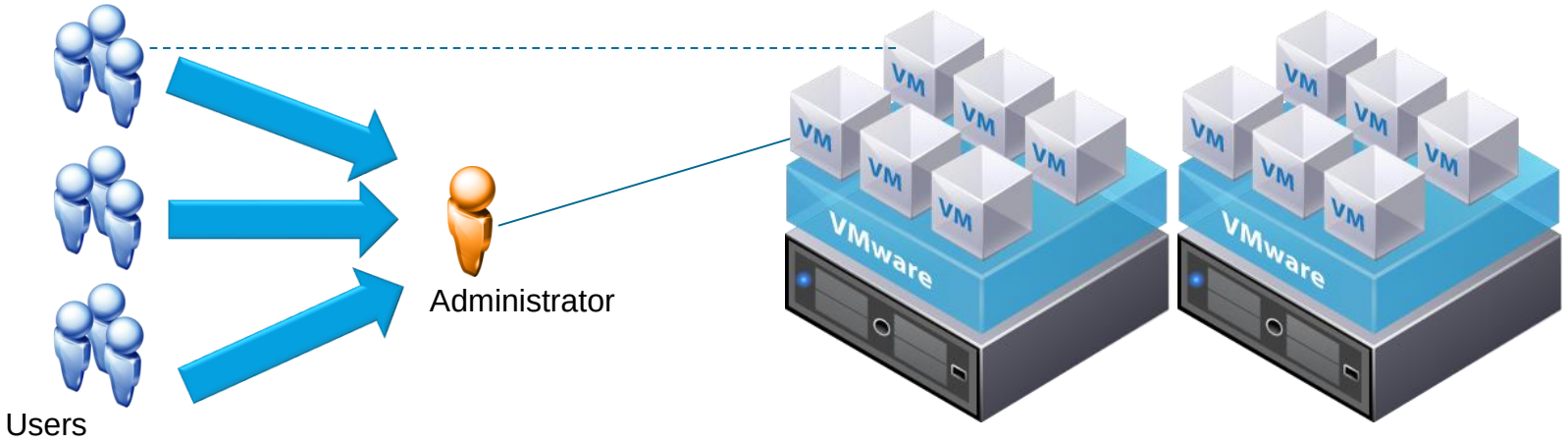
Lesson 2: VMware Cloud

Lesson 1: Cloud Computing

Importance of Cloud Computing

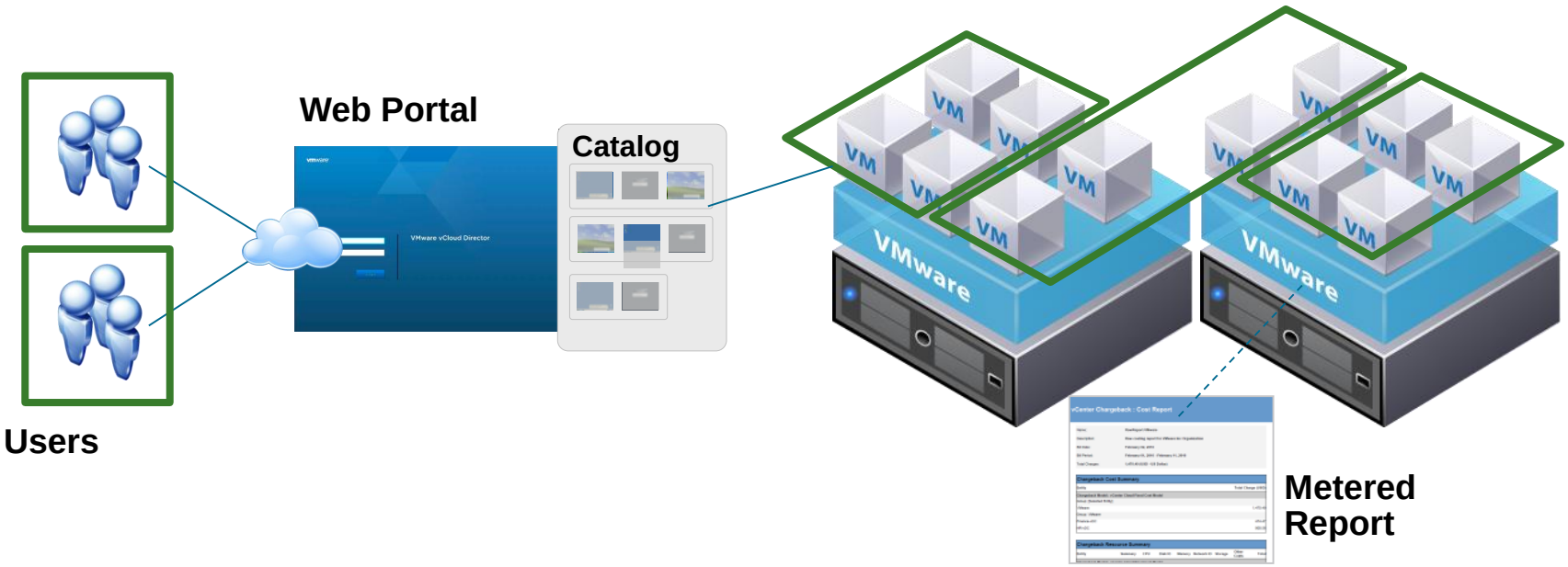
Challenges in a virtualized environment:

- Multitenancy support
- Server sprawl
- IT provisioning bottleneck



Cloud Computing Solutions

Challenge	vCloud Director Solution
Multitenancy support	Secure resource segmentation by user organization
Server sprawl	Metered reports to affect user behavior
IT provisioning bottlenecks	Self-service portal for user provisioning through catalogs



IT Service Consumers and Providers

Consumers

- Do not know or care where resources are
- Do not care who provides resources
- Want access to workloads on demand
- Want easily consumable resources
- Want acceptable performance with simplified pricing

IT Consumed as a Service

Providers

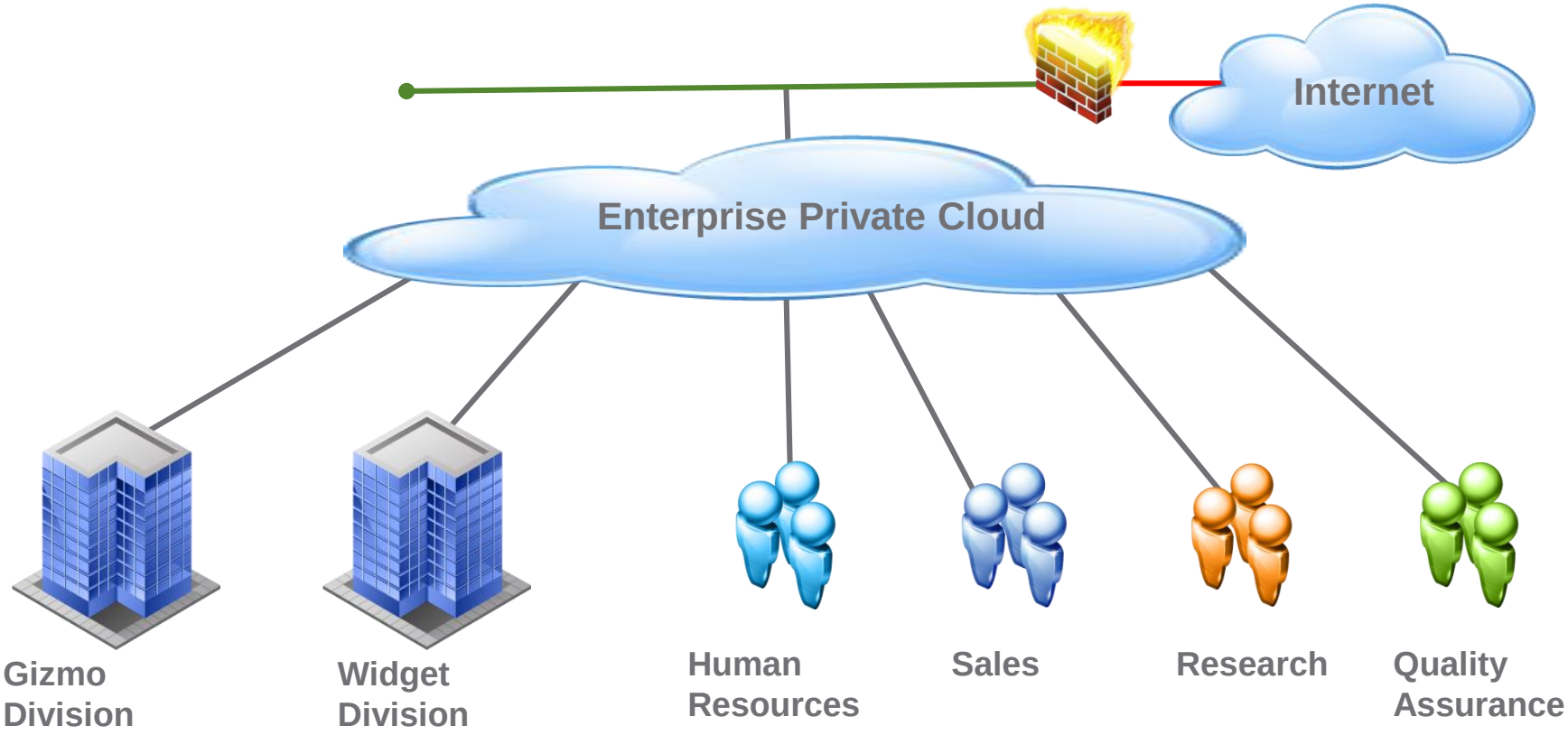
- Provide resources as service offerings appropriately tiered and priced
- Abstract resource location and details
- Group resources behind the scenes so that they are transparent to consumers
- Host multiple tenants securely at negotiated service levels without consumer awareness of each other or conflict to achieve economies of scale
- Deliver resources in private (on- or off-premise), public, or hybrid clouds

Deployment Models of Cloud Computing

- Private cloud
- Community cloud
- Public cloud
- Hybrid cloud

About Enterprise Private Clouds

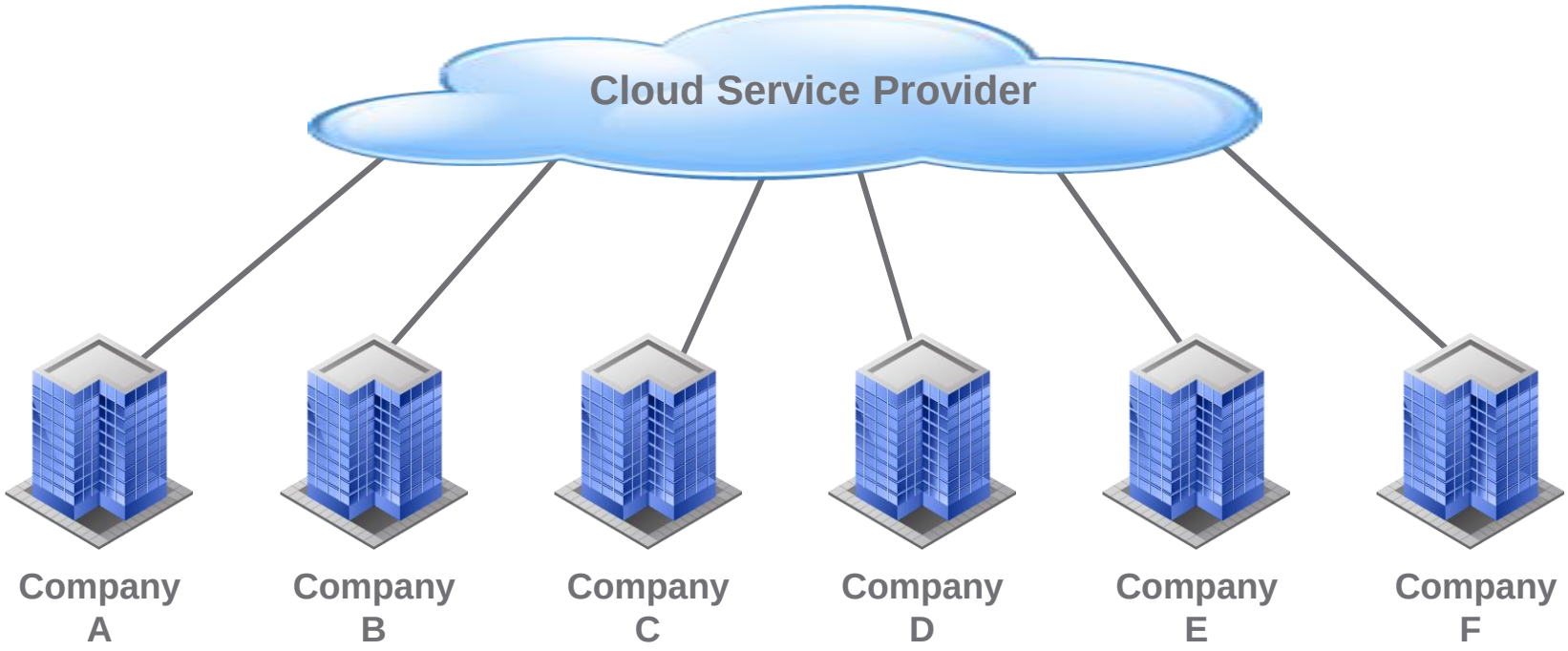
Individual departments or internal corporate organizations (divisions) can deploy and manage IT infrastructure through virtual systems as needed. IT capabilities are provided as a service, over an intranet, within the enterprise, and behind the firewall.



About Public Clouds

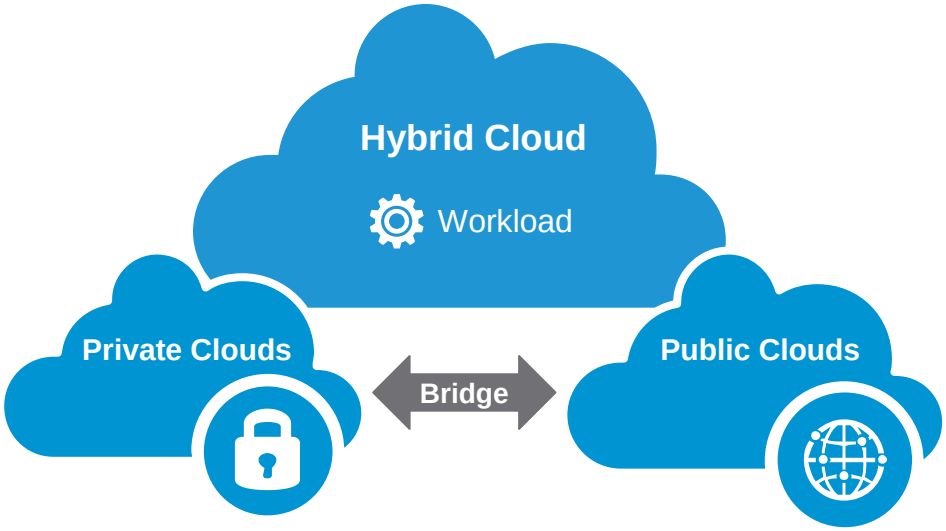
A cloud service provider hosts general IT operations for multiple businesses. IT resources are provided as a service over the Internet.

A public cloud is similar to a utility or an Internet service provider.



About Hybrid Clouds

A hybrid cloud leverages both private cloud and public cloud services where one or more touch points exist between the two environments to create a unified, automated, and well-managed computing environment.



Essential Characteristics of Cloud Computing

On-Demand Self-Service	Unilateral provisioning of computing capabilities.
Broad Network Access	Capabilities are available over the network and accessed through standard mechanisms.
Resource Pooling	Using a multitenant model, providers pool computing resources.
Rapid Elasticity	Capabilities can be elastically provisioned and released, in some cases automatically.
Measured Service	Cloud systems automatically control and optimize resource use through a metering capability.

Service Models of Cloud Computing

Cloud computing is often categorized in the following service models:

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)
- Anything as a service (XaaS)

About IaaS

IaaS is a form of cloud computing that provides virtualized computing resources over the Internet.

A third-party provider hosts highly scalable resources:

- Hardware
- Software
- Servers
- Storage

IaaS providers also provide services for users:

- Host applications
- Provide system maintenance
- Execute backups
- Conduct resiliency planning

IaaS models provide the automation of administrative tasks, dynamic scaling, desktop virtualization and policy-based services.

About PaaS

PaaS is a cloud computing model that delivers applications over the Internet. Cloud providers offer PaaS services to free their customers from having to install in-house hardware and software to develop or run a new application:

- Hosting of hardware and software tools as a service
- Hosting of hardware and software on the customers' own infrastructure

PaaS does not typically replace a business's entire infrastructure. Instead, a business relies on PaaS providers for key services, such as Java development or application hosting.

About SaaS

SaaS is a software distribution model in which a third-party provider hosts applications and makes them available to customers over the Internet.

SaaS removes the need for organizations to install and run applications on their own computers or in their own data centers.

SaaS eliminates the expense of hardware acquisition, provisioning, and maintenance, as well as software licensing, installation, and support.

About XaaS

XaaS is the essence of cloud computing: it combines SaaS, PaaS and IaaS into what is sometimes called the SPI model.

Other examples of XaaS include:

- Storage as a service (SaaS)
- Communication as a service (CaaS)
- Network as a service (NaaS)
- Monitoring as a service (MaaS)

Lesson 2: VMware Cloud

Learner Objectives

By the end of this lesson, you should be able to meet the following objectives:

- Explain vRealize Suite and its products
- Describe the functionality and scope of vCloud Director
- Differentiate between vCloud Director and VMware vRealize® Automation™

VMware Offerings to Enable Cloud-Based Services

vCloud Director for Service Providers:

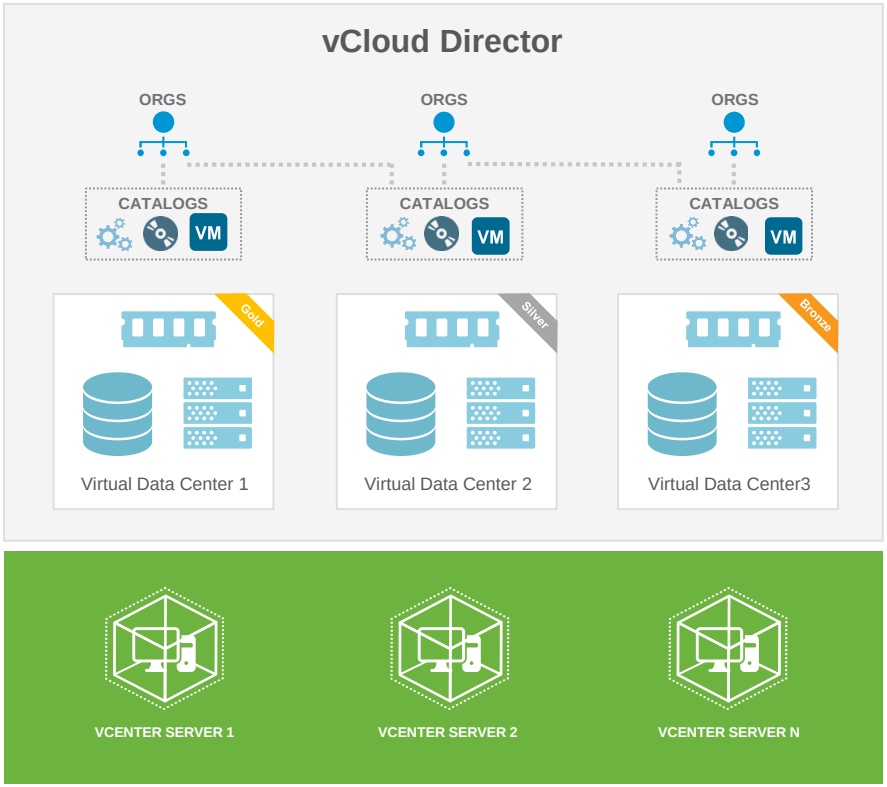
- vCloud Director is a robust, multitenant IaaS platform designed to consume or accumulate compute, network, and storage resources from data centers.
- vCloud Director converts these resources into individual elastic units that can be provided as a service to and consumed by multiple tenants.

vRealize Suite:

- vRealize Automation: Automated delivery of personalized infrastructure, applications, and custom IT services
- VMware vRealize® Operations™: Intelligent health, performance, capacity, and configuration management
- VMware vRealize® Log Insight™: Real-time log management and log analysis
- VMware vRealize® Business™ for Cloud: Automated costing, usage metering, and service pricing of virtualized infrastructure

About vCloud Director

vCloud Director orchestrates the provisioning of hybrid clouds that are ready for consumption within minutes.



vCloud Director: Key High-Level Features and Benefits (1)

Delivers complete infrastructure as virtual data centers:

- Software-defined services that include compute, storage, and network.
- Complete abstraction of the consumption of infrastructure services from the underlying hardware.
- Custom control over VM placement and provisioning.

Enables infrastructure to be consumed in a matter of minutes:

- On-demand provisioning through self-service catalogs.
- Open Virtualization Format-based vApp templates of multitier applications made available for rapid deployment.
- Linked clones and snapshots to dramatically expedite access to infrastructure.
- Guarantee low I/O latency and low jitter for sensitive workloads.

Policy-driven multitenant approach:

- Support multitiered applications as virtual appliances within catalogs for shared consumption (through access control).
- Isolated virtual resources, independent LDAP-authentication, specific policy controls, unique catalogs, and software-defined security allow resource sharing.

vCloud Director: Key High-Level Features and Benefits (2)

Logically group users into organizations:

- Allow grouping of users into organizations based on logical business units.
- Delegate access to catalogs to enable collaboration and workload portability.

Third-party integration to allow access to key capabilities:

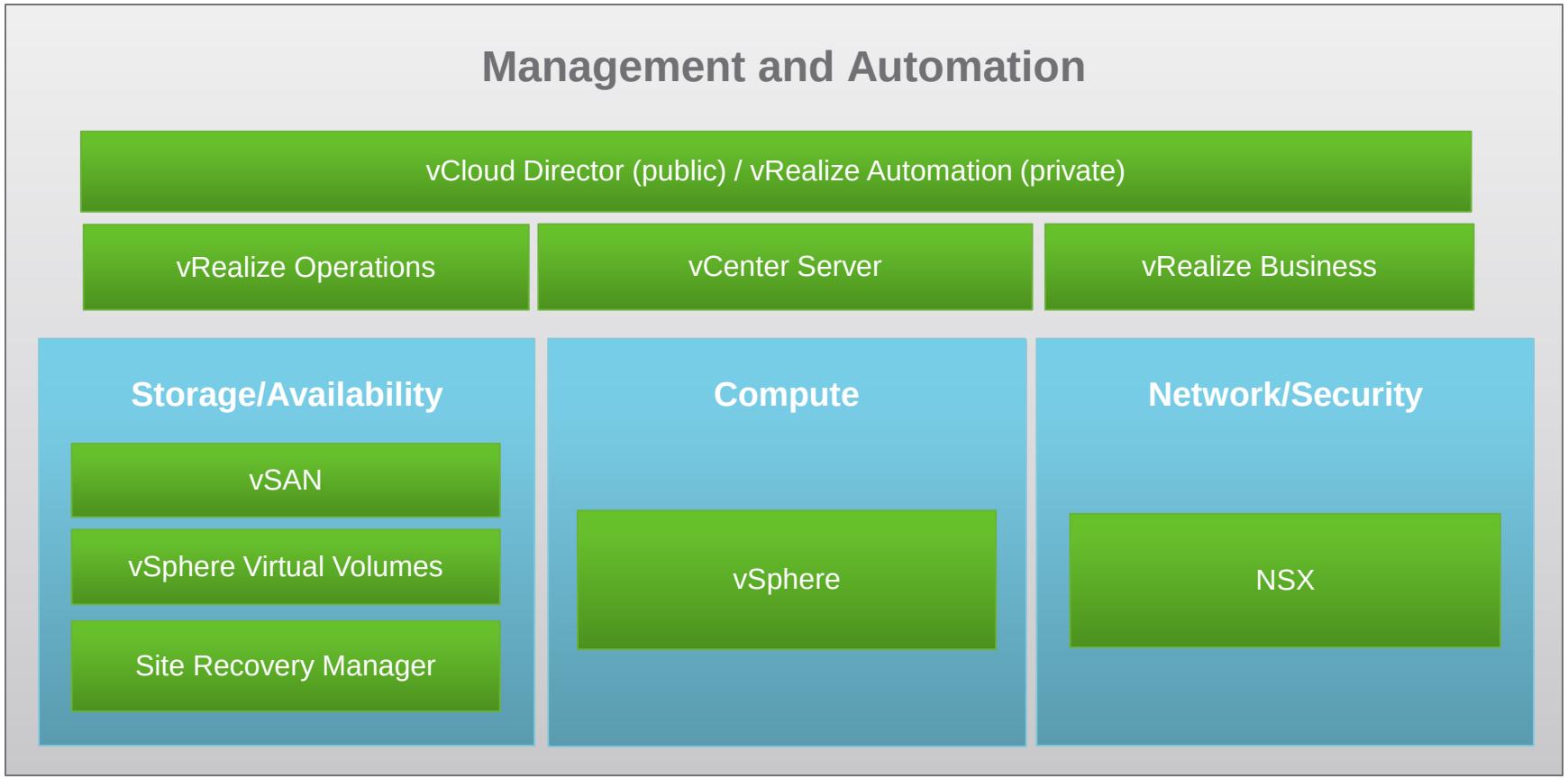
- REST-based APIs allow secure access to cloud resources such as vApp upload and download, catalog management, and other operations.

Tight integration with other VMware products:

- Leverages vCenter Server capabilities to abstract underlying resources.
- Supports NSX 6.x and is compatible with Advanced Networking Services. For example, vCloud Director is integrated with NSX to expose capabilities like distributed firewall and L2 VPN in multitenant capacity.

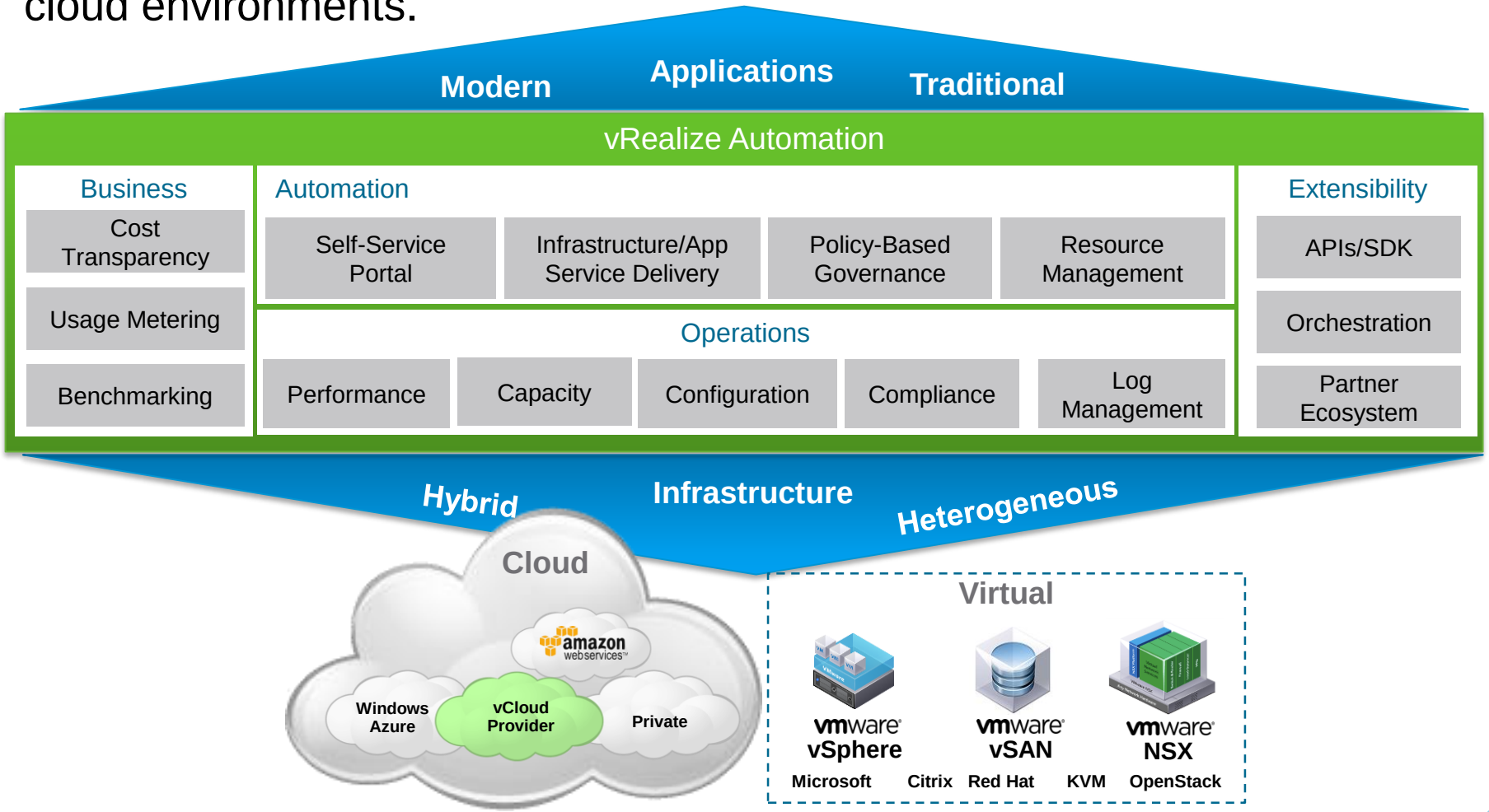
Main Component of the Software-Defined Data Center

vRealize Automation is positioned at the top of the VMware software-defined data center stack.



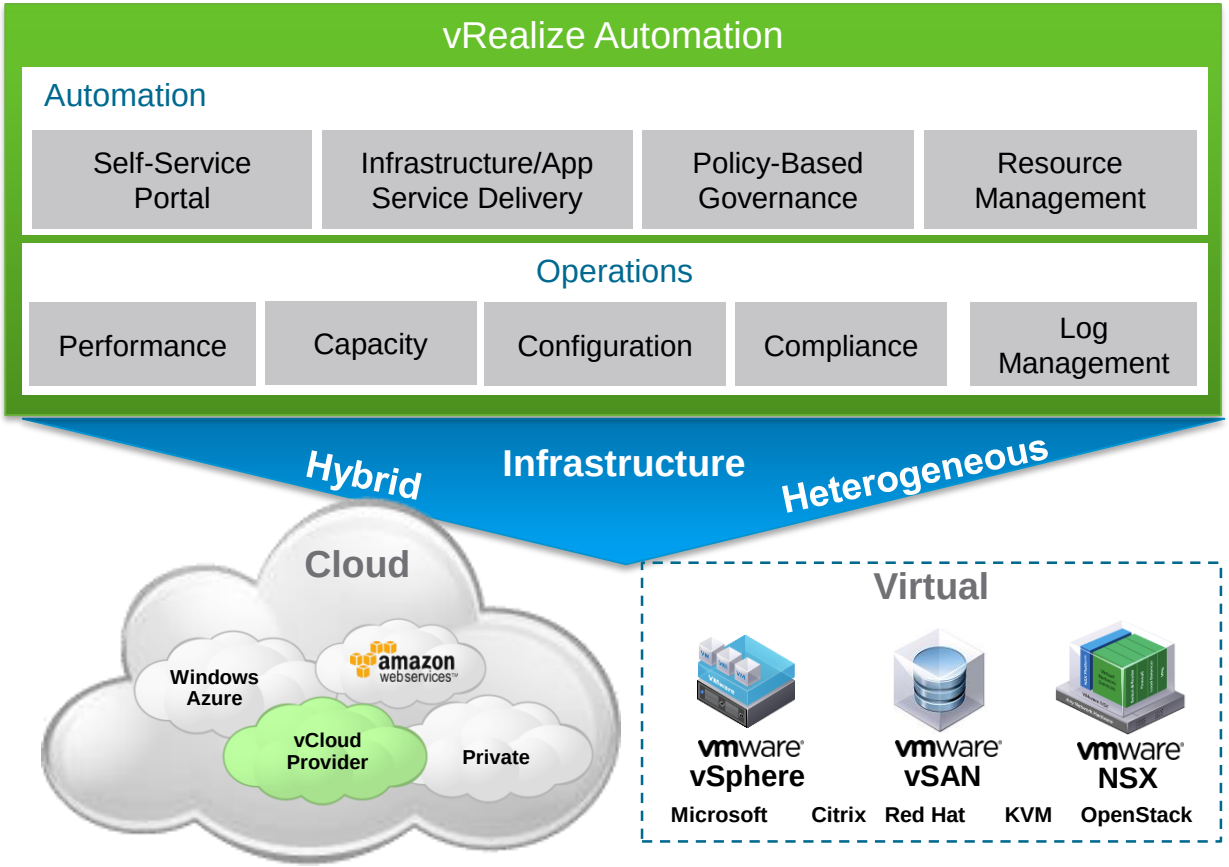
About vRealize Automation

vRealize Automation automates the delivery of personalized IT services with a management solution for heterogeneous data centers and hybrid cloud environments.



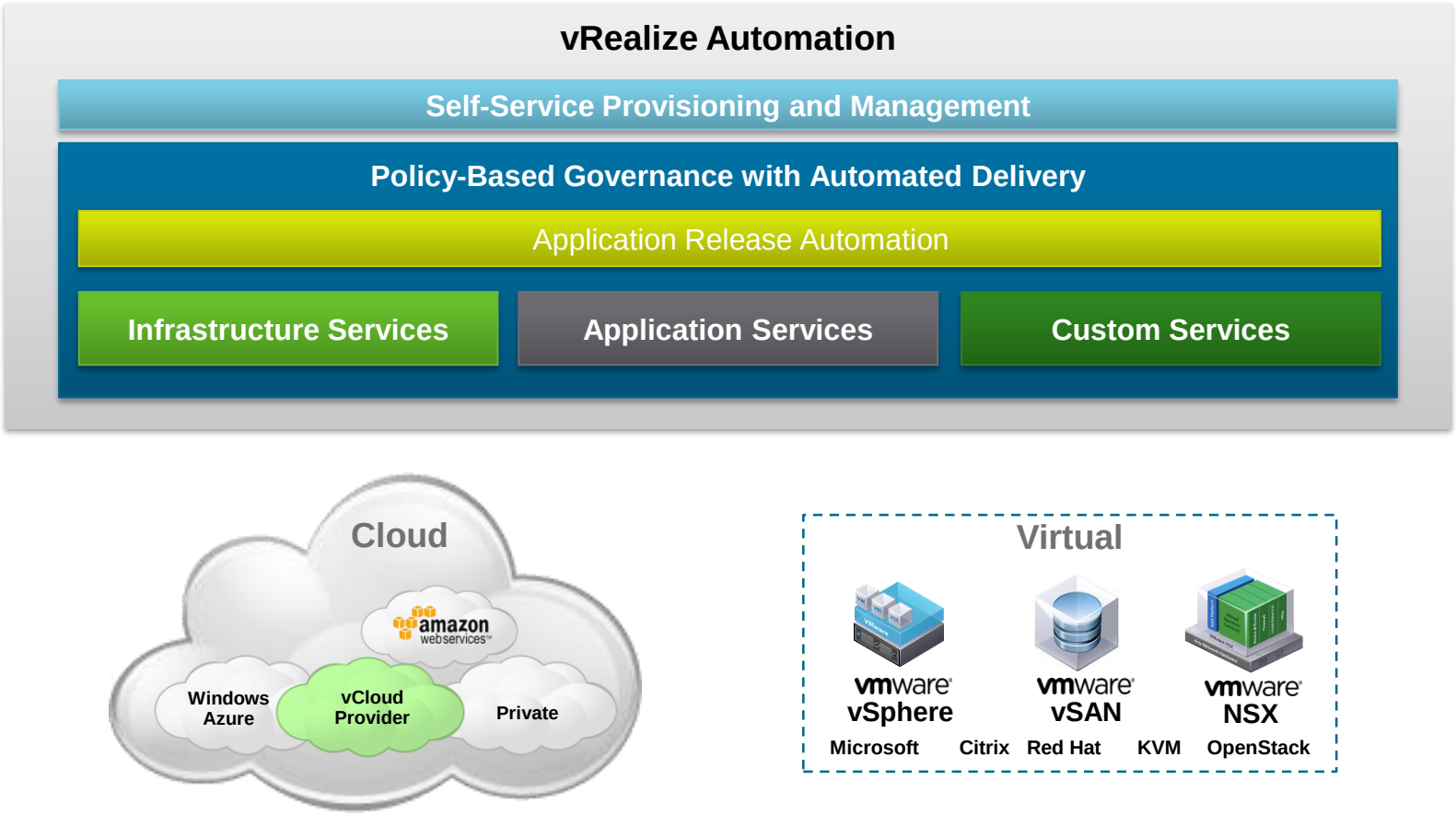
Features of vRealize Automation

vRealize Automation automates the delivery of IT services to users who need those services.



Service Delivery with vRealize Automation

You can use vRealize Automation to provision and manage more machines.



Cloud Operations Management with vRealize Operations

vRealize Operations provides intelligent operations management across physical, virtual, and cloud infrastructures.

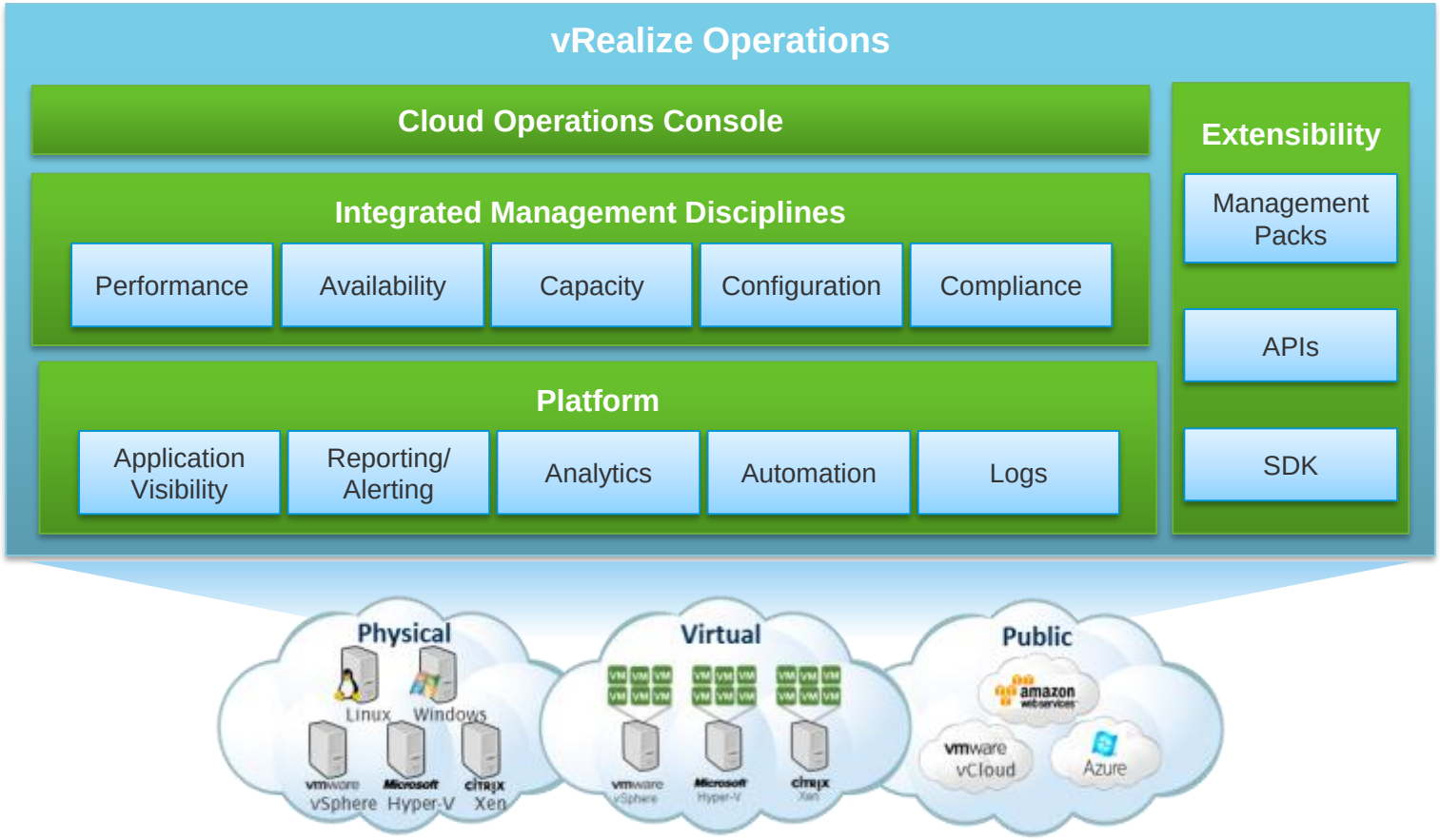
The suite offers the following key benefits:

- Intelligent operations: Improve performance and avoid disruption with self-learning management tools.
- Policy-based automation: Become more efficient by automating key IT processes with policy-based control.
- Unified management: Get comprehensive visibility across applications and infrastructure in one place.

The vRealize Operations suite contains VMware vRealize® Operations Manager™ and VMware vRealize® Infrastructure Navigator™.

Overview of vRealize Operations

vRealize Operations provides heterogeneous management capabilities. Virtual and physical infrastructures as well as public, private, and hybrid clouds are supported.



About vRealize Operations Manager

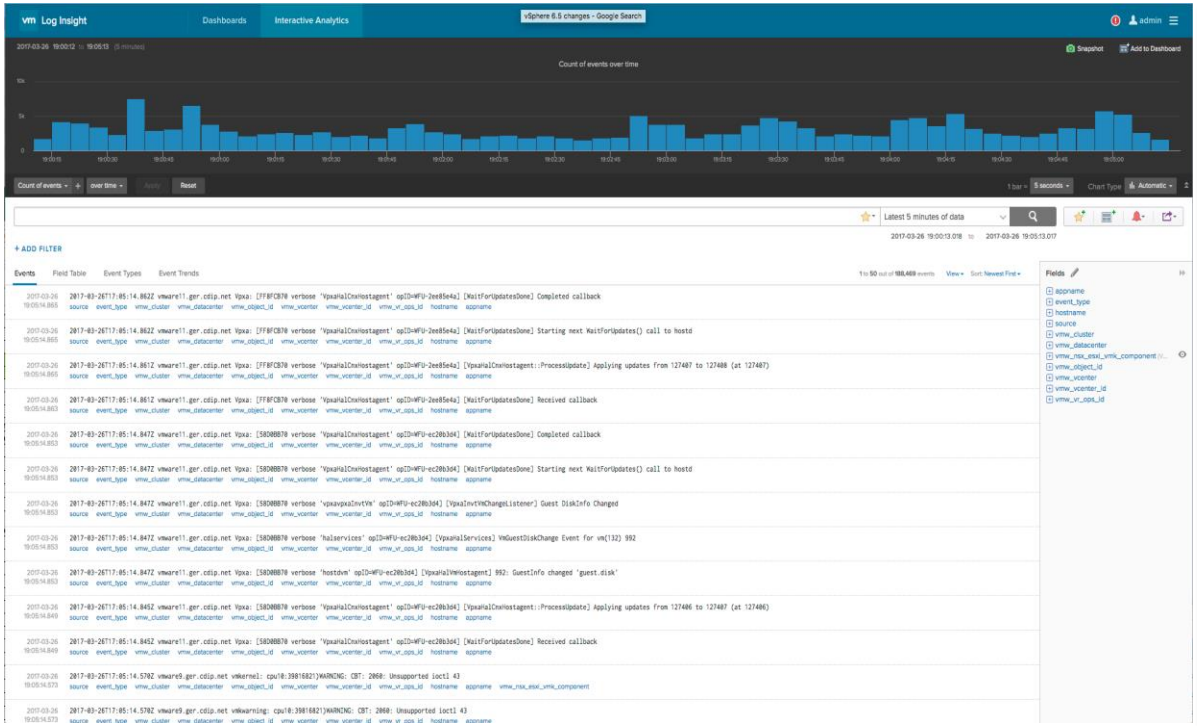
vRealize Operations Manager is the foundation of the suite. It provides insights into the performance, capacity, and health of your environment.

vRealize Operations Manager offers the following benefits:

- Comprehensive cloud operations console
- Understanding of end-to-end operations visibility
- Reduced mean time to investigate and resolve issues across the entire environment
- Predictive capacity modeling
- Integrated compliance
- Content from vSphere and other domains

vRealize Log Insight

vRealize Log Insight delivers automated log management through log analytics, aggregation, and high-performance search. It can analyze terabytes of logs, perform smart parsing to discover structure in unstructured data, and enable interactive, real-time search and analytics through an easy-to-use interface.



Key benefits:

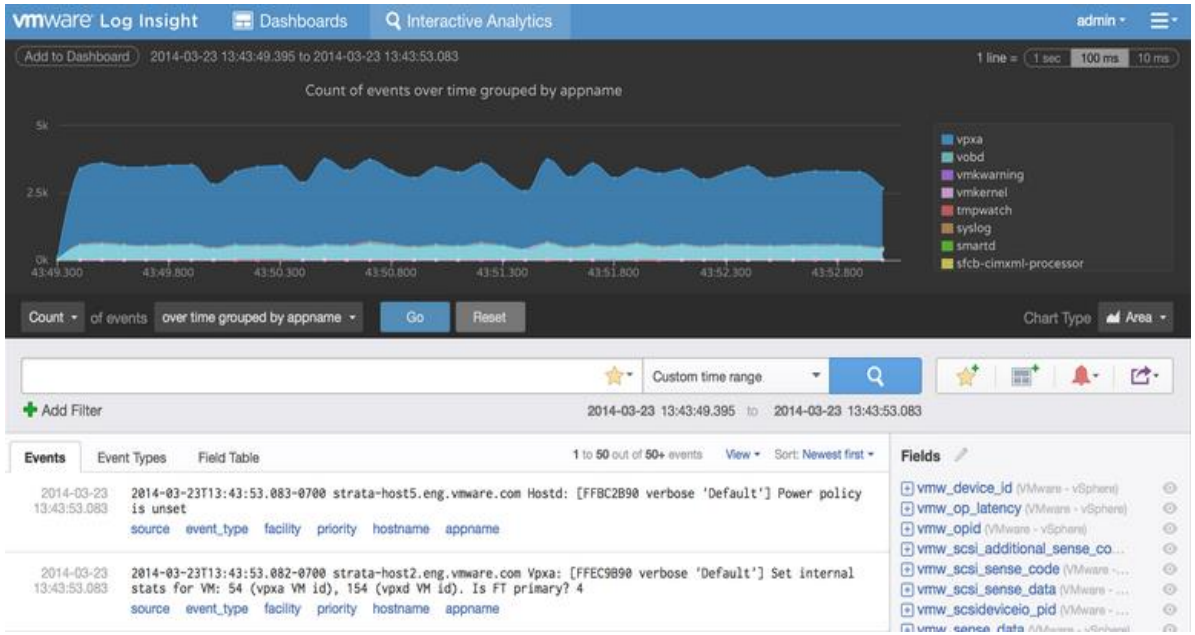
- Extends the power of analytics to log data
- Provides easy-to-use and accessible log management
- Detects problems and root cause faster with machine learning

Analyzing Logs with Interactive Analytics Charts

The charts provide visual representation of data and enable you to perform visual analysis on your query results.

You can select different chart types to graphically analyze log events.

You can modify the aggregation and grouping of query results to correlate events and make the chart meaningful for troubleshooting.



Review of Learner Objectives

You should be able to meet the following objectives:

- Explain vRealize Suite and its products
- Describe the functionality and scope of vCloud Director
- Differentiate between vCloud Director and vRealize Automation

Key Points

- Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction.
- Clouds can be deployed in private, public, community, or hybrid environments.
- Cloud computing models such as IaaS, PaaS, and SaaS provide flexibility.
- VMware provides vRealize Suite (focused on enterprise customers) and vCloud Director for Service Providers.
- vRealize Automation in a private cloud environment can deploy onto a vCloud Director environment.

Questions?