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Management in the Cloud

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Program Agenda

- What is this “cloud” stuff?
- Cloud computing
 - Essential characteristics
 - Service models
 - Deployment models
- Q & A



NIST Definition of Cloud Computing



Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

This cloud model is composed of:

5 Essential Characteristics

- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

3 Service Models

- IaaS
- PaaS
- SaaS

4 Deployment Models

- Private Cloud
- Community Cloud
- Public Cloud
- Hybrid Cloud

Stakeholder Management

Stakeholders, Goals & Cloud Benefits



As an Architect,
I want platform
standardisation,
To reduce number
of technologies



As a Procurement
Mgr,
I want platform
standardisation,
To reduce number of
vendors



As an Application
Owner,
I want self-service
on demand,
To achieve faster
provisioning



As a CFO,
I want public
cloud,
To convert CAPEX
to OPEX



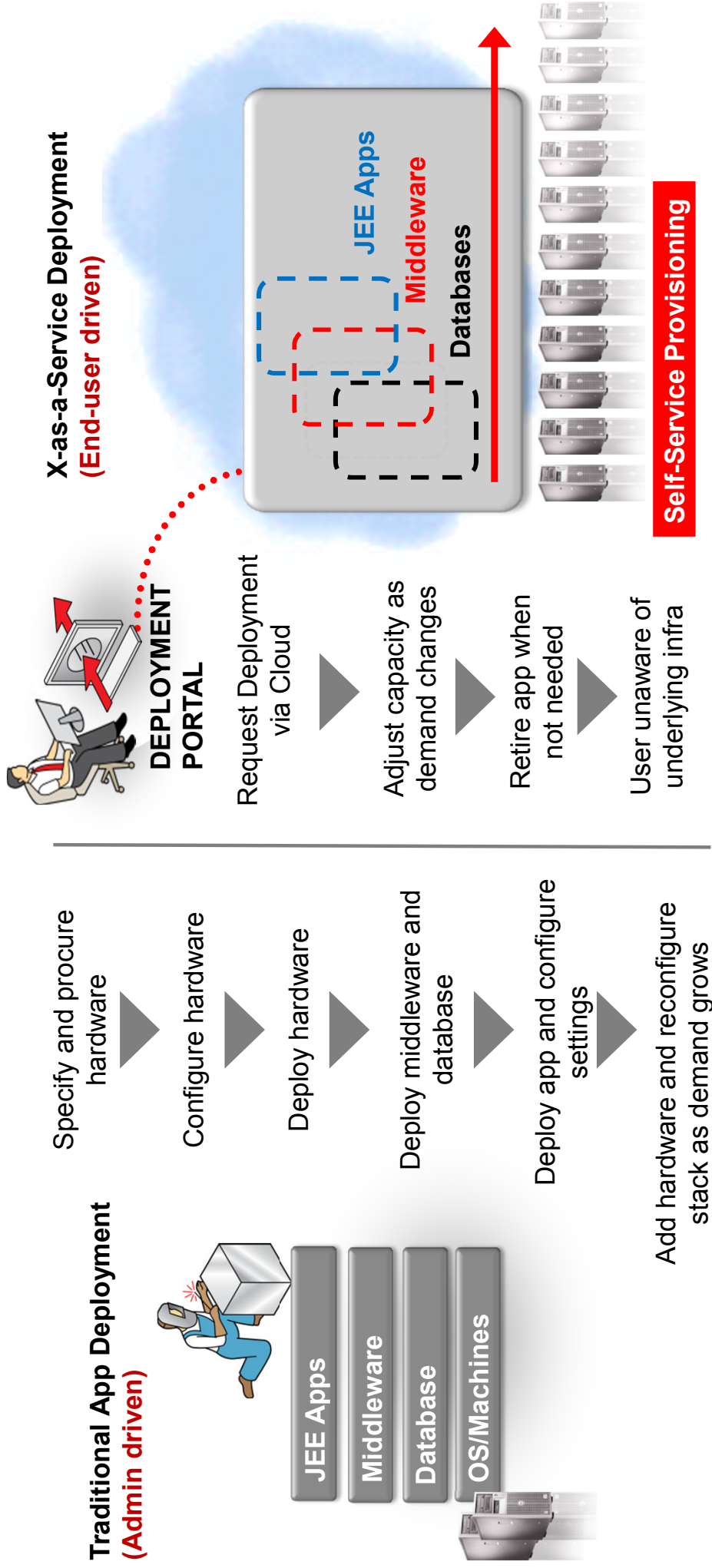
As a Risk Mgr,
I want internal
private cloud,
To preserve data
security



NIST Essential Cloud Characteristics

- On-demand self-service
 - A consumer can **unilaterally provision computing capabilities**, such as server time and network storage, **as needed automatically without requiring human interaction** with each service's provider.

Self Service vs Traditional IT Operations



IaaS Example



Infrastructure Cloud Self Service Portal

Manage My Servers My Databases My Middleware

Home My Requests My Servers Storage Chargeback My Library Policies

My Preferences

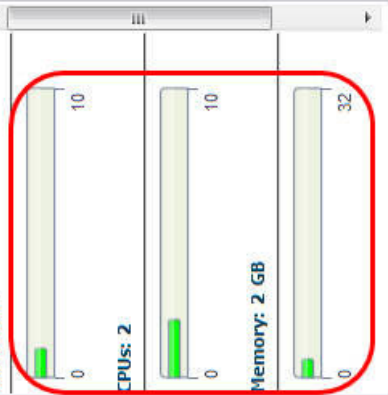
Notifications

Servers Due to Expire in Next 7 Days 1
Software Published in Last 7 Days 1

Usage

You have permission to use these cumulative quota allowances when making server and storage requests.

Servers: 1



10 Last Requested Servers

Action	View	Status	Zone	CPUs	Memory (MB)	Storage (GB)	Charge	Creation Date	Expiry Date
			EastCoastZone	2	2048	27.25		Sep 24, 2012 1:04:16 AM EDT	Sep 25, 2012 12:57:36 AM

10 Latest Requests

Name	Status	Submission Date	Start Date	End Date	Type	Serv	Total CPUs	Total Memory (MB)	Total Storage (GB)
JOHN.SMITH1 - Mon	Successful	Sep 24, 2012 1:02:4: Sep 24, 2012 1:02:4: Sep 25, 2012 12:57: Assembly Deployment	Sep 24, 2012 1:02:4: Sep 24, 2012 1:02:4: Sep 25, 2012 12:57: Assembly Deployment	Sep 25, 2012 12:57: Assembly Deployment	Assembly Deployment	1	2	2048	26.63
JOHN.SMITH1 - Sun	Ended	Sep 23, 2012 11:26: Sep 23, 2012 11:26: Sep 23, 2012 5:24: Assembly Deployment	Sep 23, 2012 11:26: Sep 23, 2012 11:26: Sep 23, 2012 5:24: Assembly Deployment	Sep 23, 2012 5:24: Assembly Deployment	Assembly Deployment	1	1	2048	26.63
JOHN.SMITH1 - Sat	Ended	Sep 22, 2012 11:57: Sep 22, 2012 11:57: Sep 23, 2012 11:53: Assembly Deployment	Sep 22, 2012 11:57: Sep 22, 2012 11:57: Sep 23, 2012 11:53: Assembly Deployment	Sep 23, 2012 11:53: Assembly Deployment	Assembly Deployment	1	1	2048	26.63
JOHN.SMITH1 - Sat	Ended	Sep 22, 2012 10:35: Sep 22, 2012 10:35: Sep 23, 2012 10:33: Assembly Deployment	Sep 22, 2012 10:35: Sep 22, 2012 10:33: Assembly Deployment	Sep 23, 2012 10:33: Assembly Deployment	Assembly Deployment	1	1	2048	26.63
JOHN.SMITH1 - Sat	Ended	Sep 22, 2012 1:07:4: Sep 22, 2012 1:07:4: Sep 22, 2012 5:06: Assembly Deployment	Sep 22, 2012 1:07:4: Sep 22, 2012 1:07:4: Sep 22, 2012 5:06: Assembly Deployment	Sep 22, 2012 5:06: Assembly Deployment	Assembly Deployment	1	1	2048	26.63



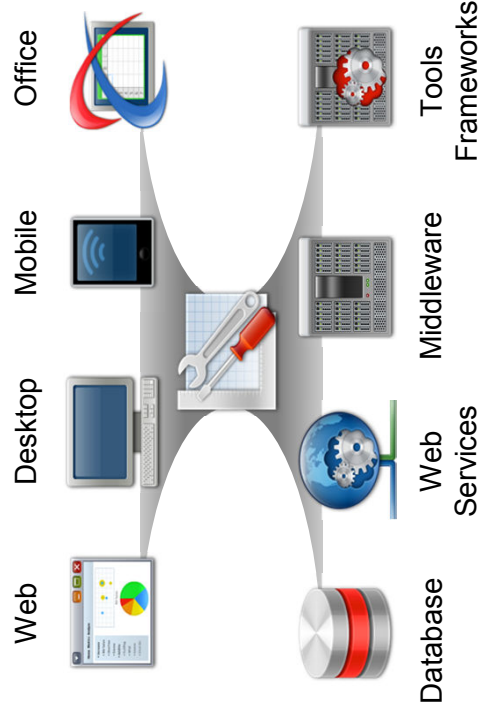
NIST Essential Cloud Characteristics

- Broad network access
 - Capabilities are available **over the network** and accessed through standard mechanisms that promote use by **heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations)**.

Competing Priorities at Odds

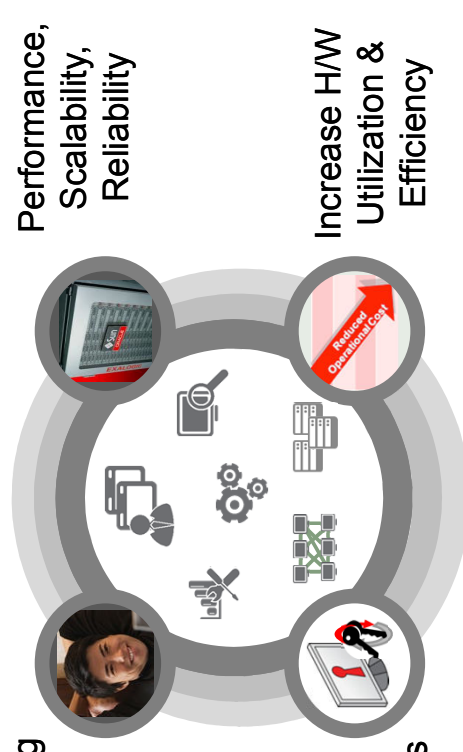
Developers Demand Flexibility **BUT** IT Requires Standardization

- Rapid development
- Choice of components and configurations



- Supported products and frameworks
- Known environments and patterns
- Common standards for security, monitoring, management, and HA

Rapid Provisioning and Management



Security Best Practices

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Incident Management Examples

ORACLE Enterprise Manager Cloud Control 12c

Enterprise > Targets > Favorites > History > Incident Manager: All open incidents

Setup > Help > PSHARMAN > Log Out

11:36 AM

VPN

Aug 12, 2011 3:21:00 PM GMT

Count of targets not uploading exceeded the cri...

adc2121058.us.oracle.com:3872

Aug 12, 2011 3:21:00 PM GMT

Count of targets not uploading exceeded the cri...

dadvmn0620.us.oracle.com:3872

Tap the range to list all increments

1 - 5

Previous Next Done

11 - 15

16 - 20

21 - 25

26 - 30

31 - 33

Select a new range to display

Escalated No

Priority None

Status New

Last Inode

Comment GMT

This incident will

Severity/Summary

Target

Priority

Status

Last Updated

Severity/Summary	Target	Priority	Status	Last Updated
The Oracle HTTP Server instance is down	/EMGC_GCDc	None	New	Oct 15, 2012 11:11
The Oracle HTTP Server instance is down	/EMGC_GCDc	None	New	Oct 15, 2012 6:11
The current status of the target is Down	/EMGC_GCDc	None	New	Oct 15, 2012 11:11
Target is down; 1 members are down: /EMGC_GCDc/FinanceSyste	None	None	New	Oct 15, 2012 11:11
The heap usage is 92%.	/tdM_slcdImp	None	New	Oct 15, 2012 5:38
Agent is Unreachable (REASON = unable to connect sta00308.us.	None	None	New	Oct 15, 2012 5:38
The percentage of requests that resulted in errors is /FA_Interna	None	None	New	Oct 15, 2012 3:34
version (TNS-1189).. Please check log for details. LISTENER_	ac	None	New	Oct 15, 2012 9:31
Test CRM_Sales3 is now down: CRM_Sales3 has stat CRMFusionA	None	None	New	Oct 14, 2012 3:55
CRM_Sales3 from Beatson from RUEI Host is down; D CRMFusionA	None	None	New	Oct 14, 2012 3:57
Test CRM_Sales is now down: CRM_Sales has status CRMFusionA	None	None	New	Oct 14, 2012 11:11
CRM_Sales from FromFAHost is down; Details: Playyb CRMFusionA	None	None	New	Oct 14, 2012 11:11

Rows Selected 1 Columns Hidden 21

The percentage of requests that resulted in errors is 22.857%

General Events My Oracle Support Knowledge Updates Related Events And Incidents

Incident Details

ID 200664

Metric Error Rate (%)

Metric Group OHS Server Metrics

Target /FA_Interna/CommonDomain/CommonDomain_webtbr/dhs1 (Oracle HTTP Server)

Incident Created Oct 15, 2012 3:34:31 PM GMT

Last Updated Oct 15, 2012 3:34:31 PM GMT

Summary The percentage of requests that resulted in errors is 22.857%

Tracking

Escalated No

Priority None

Status New

Last Inode

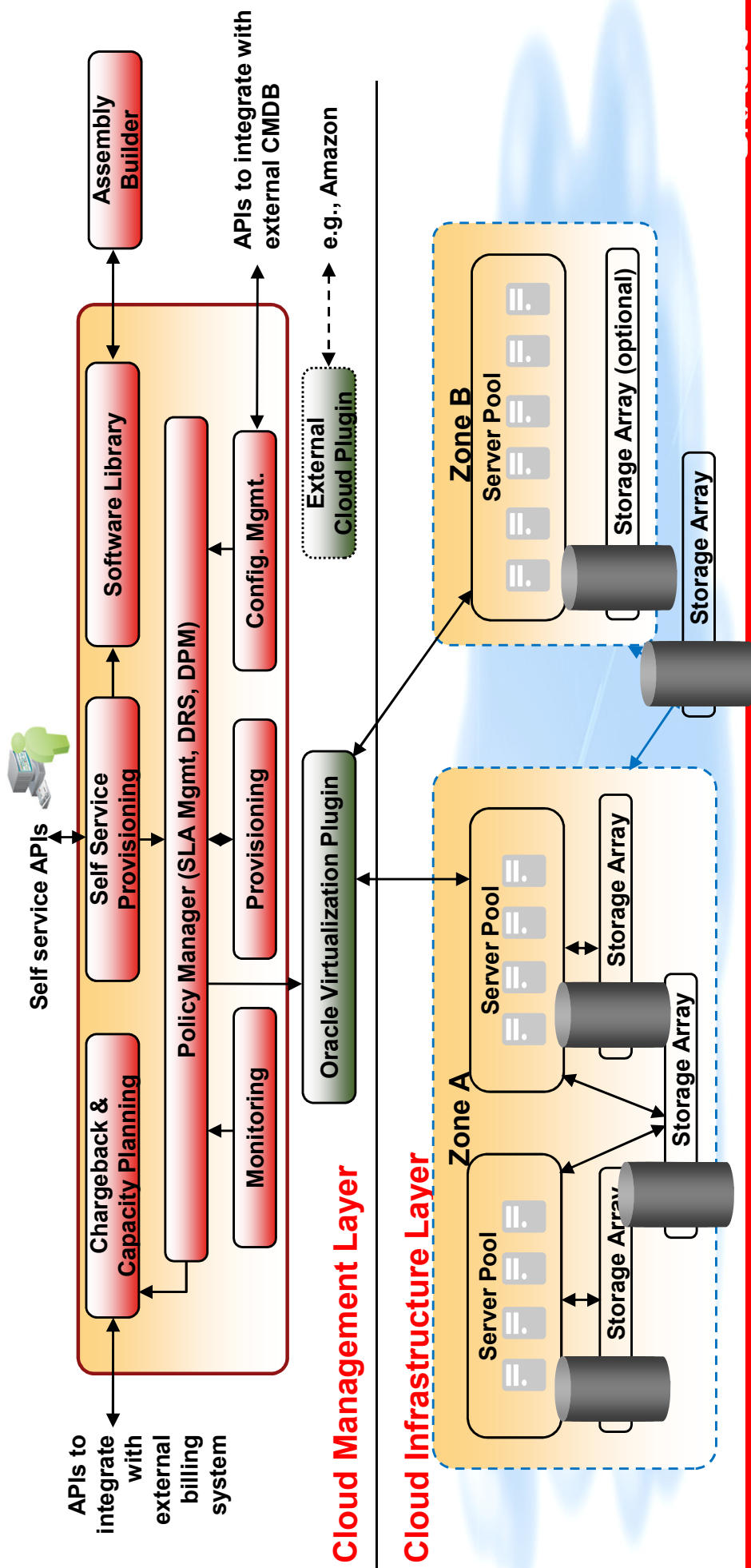
Comment GMT

This incident will

NIST Essential Cloud Characteristics

- Resource pooling
 - The provider's **computing resources are pooled to serve multiple consumers using a multi-tenant model**, with different physical and virtual resources **dynamically assigned and reassigned** according to consumer demand. There is a sense of **location independence** in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, and network bandwidth.

Cloud Management Architecture

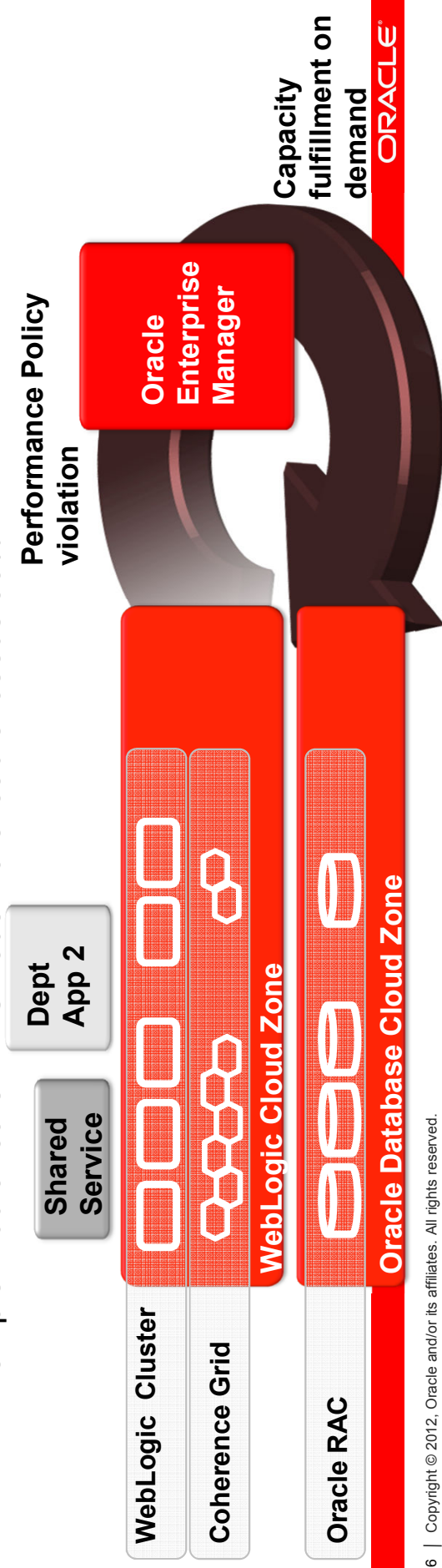


NIST Essential Cloud Characteristics

- Rapid elasticity
 - Capabilities can be **rapidly and elastically provisioned**, in some cases **automatically**, to **scale rapidly outward and inward commensurate with demand**. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.

Policy-based Elasticity (Software Assemblies)

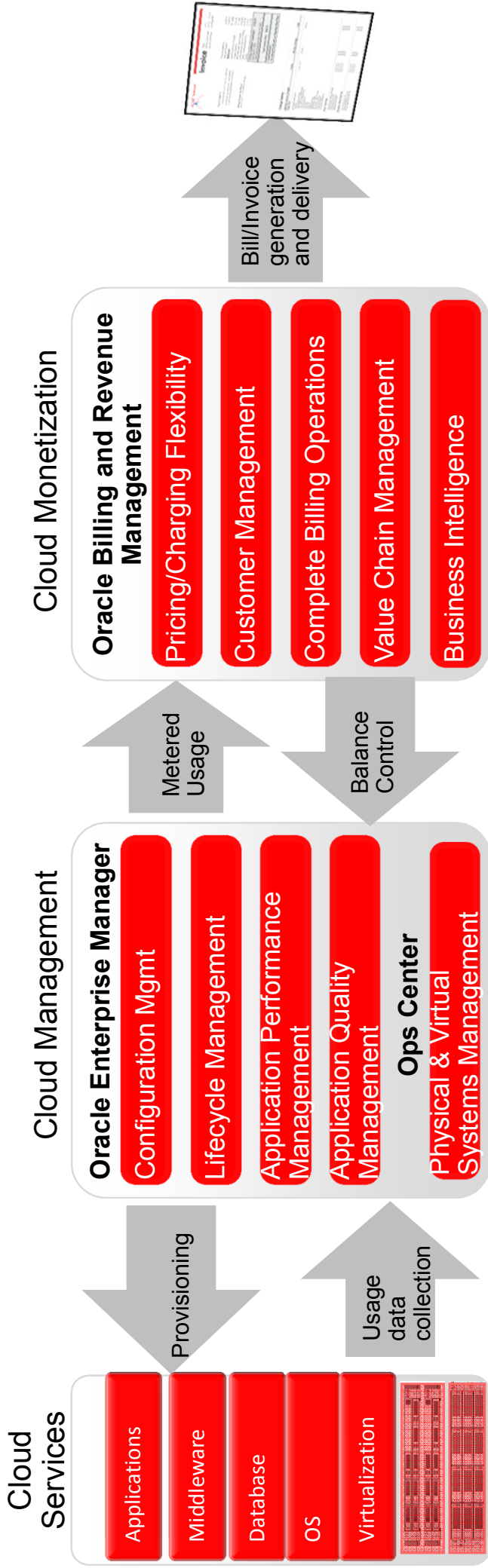
- Dynamically allocate resources based on pre-defined policies
 - Scale out and scale back actions to support Capacity On Demand
- There are two policy categories:
 - Schedule based: Invoke actions based on schedules
 - Example: Quiesce VMs on weekends
 - Performance based: Invoke actions based on performance (metrics) of targets
 - Example: Add another RAC node if the load exceeds 90%



NIST Essential Cloud Characteristics

- Measured service
 - Cloud systems **automatically control and optimize resource use by leveraging a metering capability** at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). **Resource usage can be monitored, controlled, and reported**, providing transparency for both the provider and consumer of the utilized service.

Metering and Resource Usage



NIST Service Models

- Infrastructure as a Service (IaaS)
 - The capability provided to the consumer is to **provision processing, storage, networks, and other fundamental computing resources** where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. **The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications; and possibly limited control of select networking components (e.g., host firewalls).**

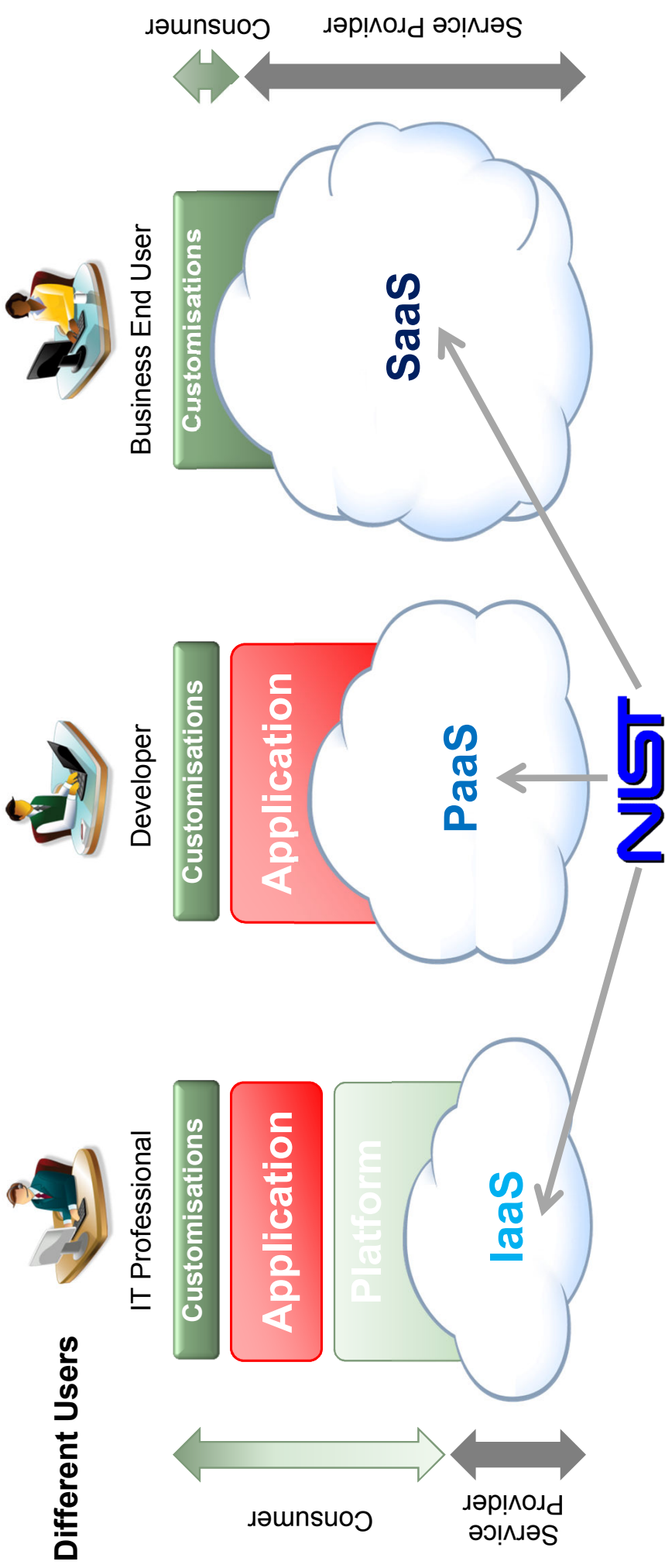
NIST Service Models

- Platform as a service (PaaS)
 - The capability provided to the consumer is to **deploy onto the cloud infrastructure consumer-created or -acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.**

NIST Service Models

- Software as a Service (SaaS)
 - The capability provided to the consumer is to **use the provider's applications running on a cloud infrastructure**. The applications are accessible from various client devices through a thin client interface such as a Web browser (e.g., Web-based email), or a program interface. **The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities**, with the possible exception of limited user-specific application configuration settings.

Cloud Service Models



NIST Deployment Models

- Private cloud
 - The cloud infrastructure is **provisioned for exclusive use by a single organization** comprising multiple consumers (e.g., business units). It may be owned, managed, and operated by the organization, a third party, or some combination of them, and **it may exist on or off premises.**

NIST Deployment Models

- Community cloud
 - The cloud infrastructure is **provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns** (e.g., mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and **it may exist on or off premises.**

NIST Deployment Models

- Public cloud
 - The cloud infrastructure is **provisioned for open use by the general public**. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. **It exists on the premises of the cloud provider.**

NIST Deployment Models

- Hybrid cloud
 - The cloud infrastructure is a **composition of two or more distinct cloud infrastructures** (private, community, or public) that remain **unique entities**, but are **bound together by standardized or proprietary technology** that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

Service Host

***Any +**



Enterprise



Cloud Provider

Service Owner

***Any +**



Enterprise



Cloud Provider

Tenancy Model

***Any =**



Single Tenant

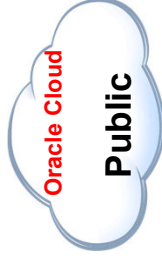


Multi Tenant



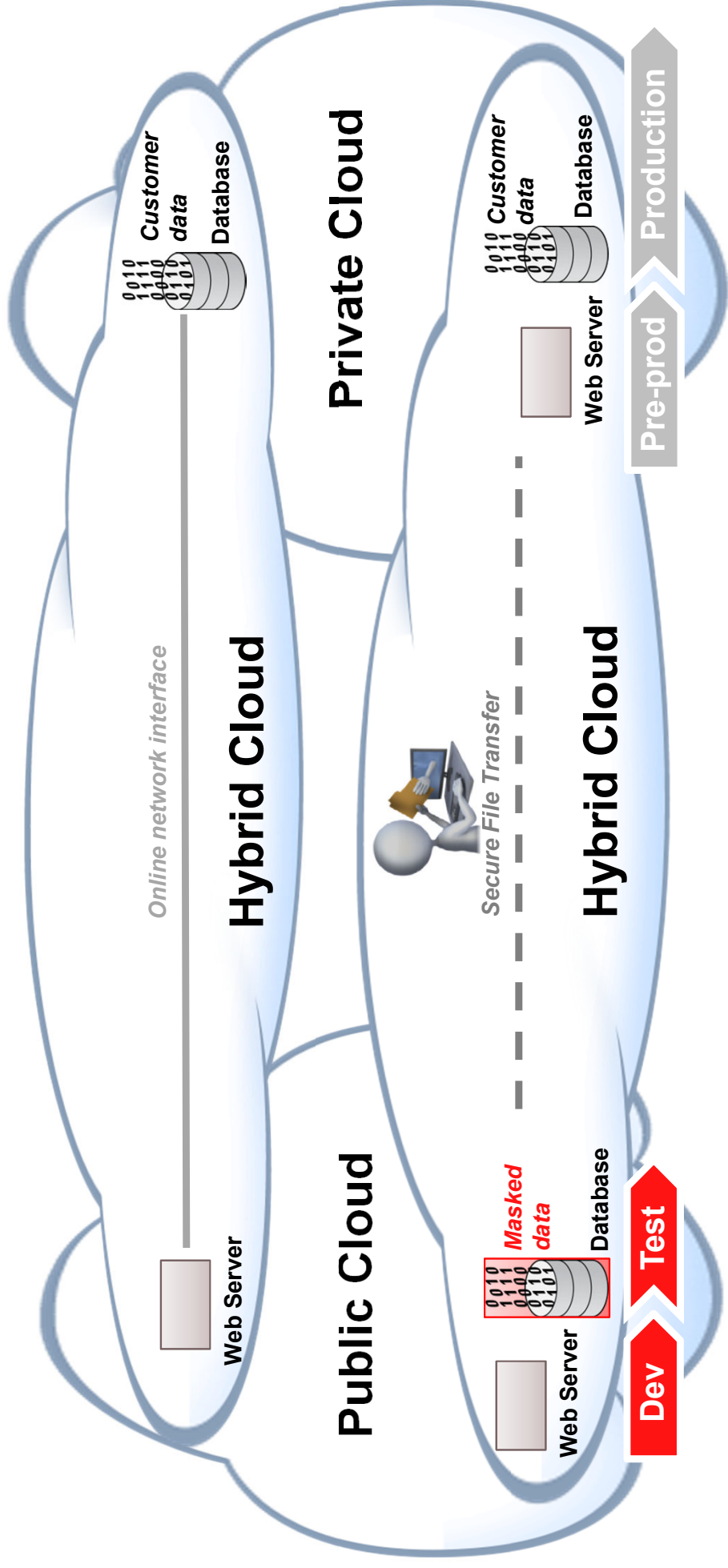
Community of related entities

Cloud Type



Oracle Cloud Public

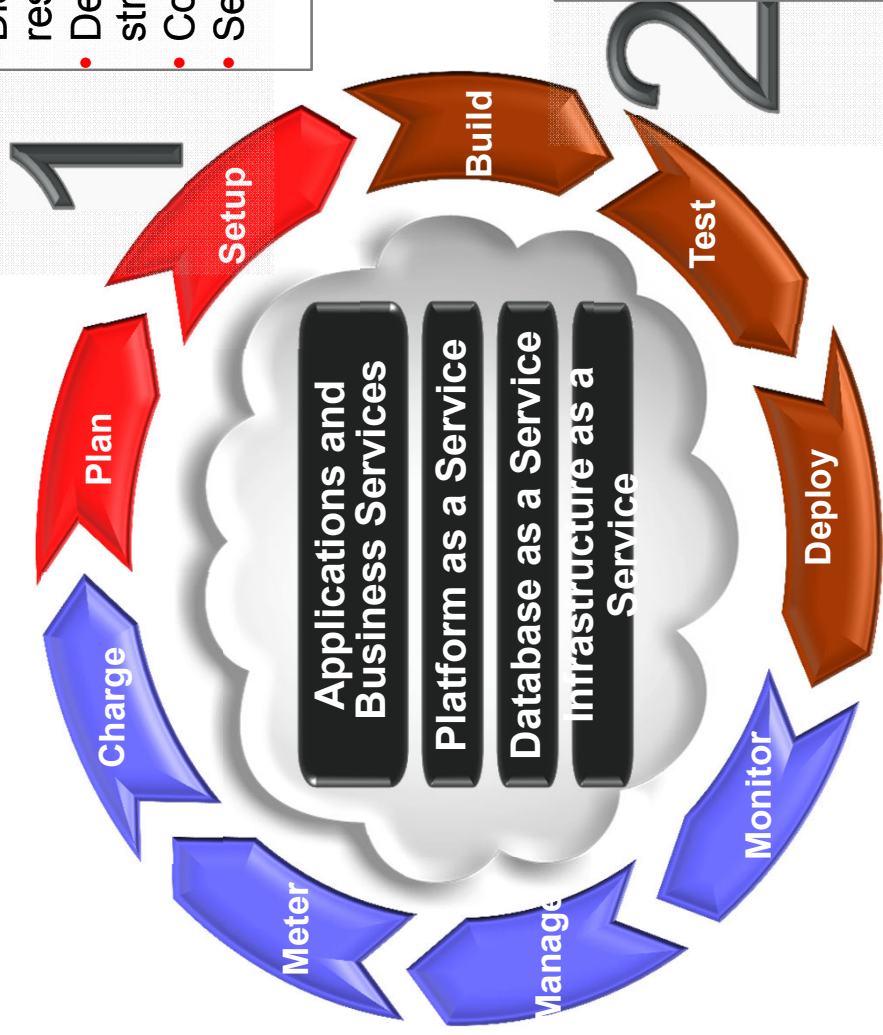
Traversing a Hybrid Cloud



Cloud in 3 Simple Steps

3

- Deliver services
- Monitor from end user, app owner and admin perspectives
- Operate, maintain and patch cloud
- Meter and optionally chargeback



- Discover and baseline resources
- Devise a Consolidation strategy
- Consolidate resources
- Setup Cloud

- Build standard platforms
- Package the applications
- Populate service catalog
- Enable self-service use

Cloud Computing: Complete Choice

Recommendations

1. Develop a cloud strategy and roadmap that's right for you
2. For private clouds, start with consolidation
3. Extend to self-service private cloud
4. Use public cloud if requirements are met

oracle.com/cloud



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Q&A

Hardware and Software



Engineered to Work Together

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