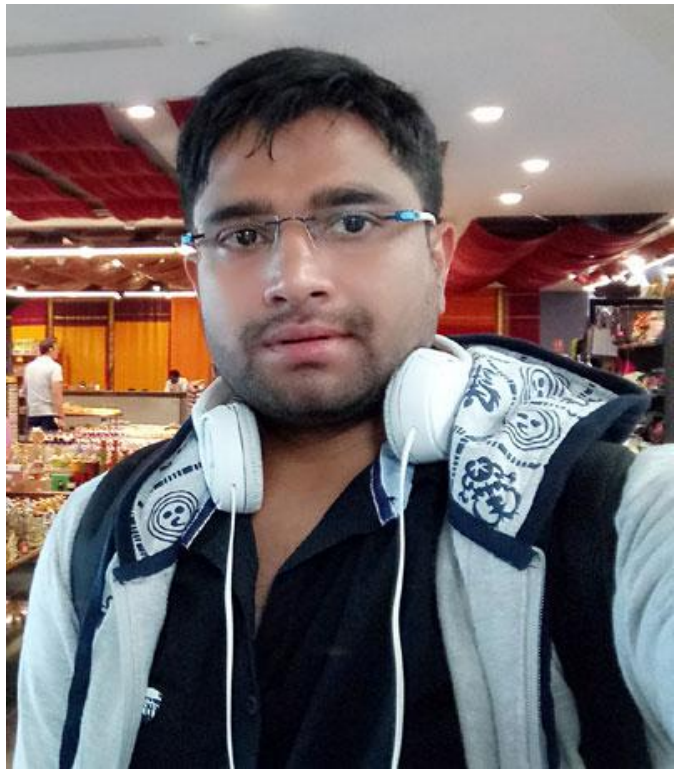


CLOUD COMPUTING

Rajesh Kumar

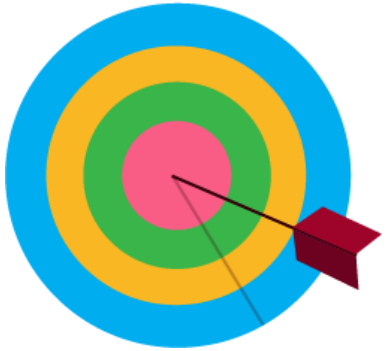
DevOps Architect

@RajeshKumarIN | www.RajeshKumar.xyz

Session Objectives

This session will help you to:

- Introduction to Cloud Computing
- Cloud Computing Architecture
- Cloud Service Models – IAAS, PAAS & SAAS
- Cloud Computing Advantages
- Cloud Computing Users



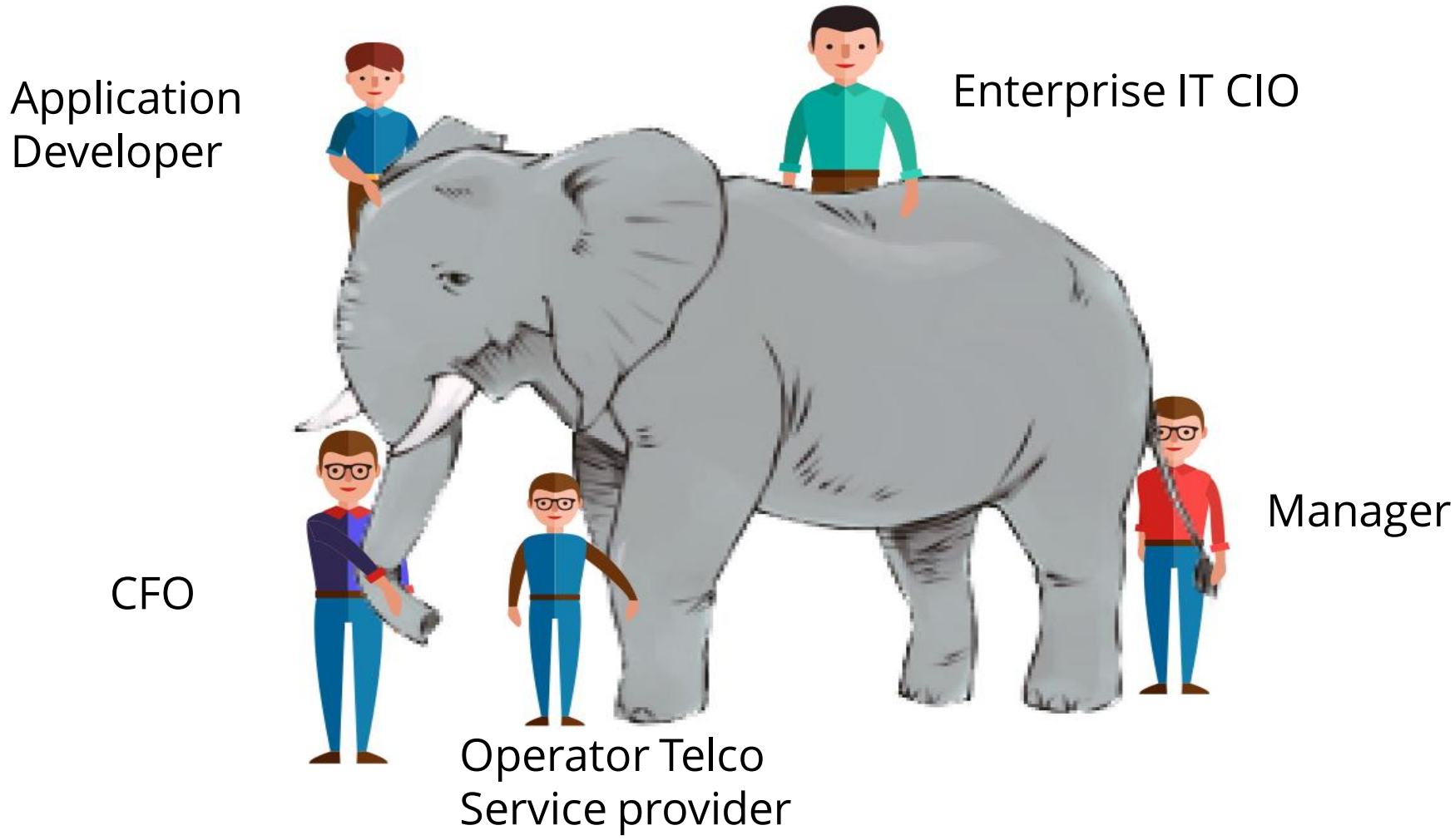
Introduction to Cloud Computing

Cloud computing, often referred to as simply the cloud, is the delivery of on-demand computing resources - everything from applications to data centers -over the Internet on a pay-for-use basis

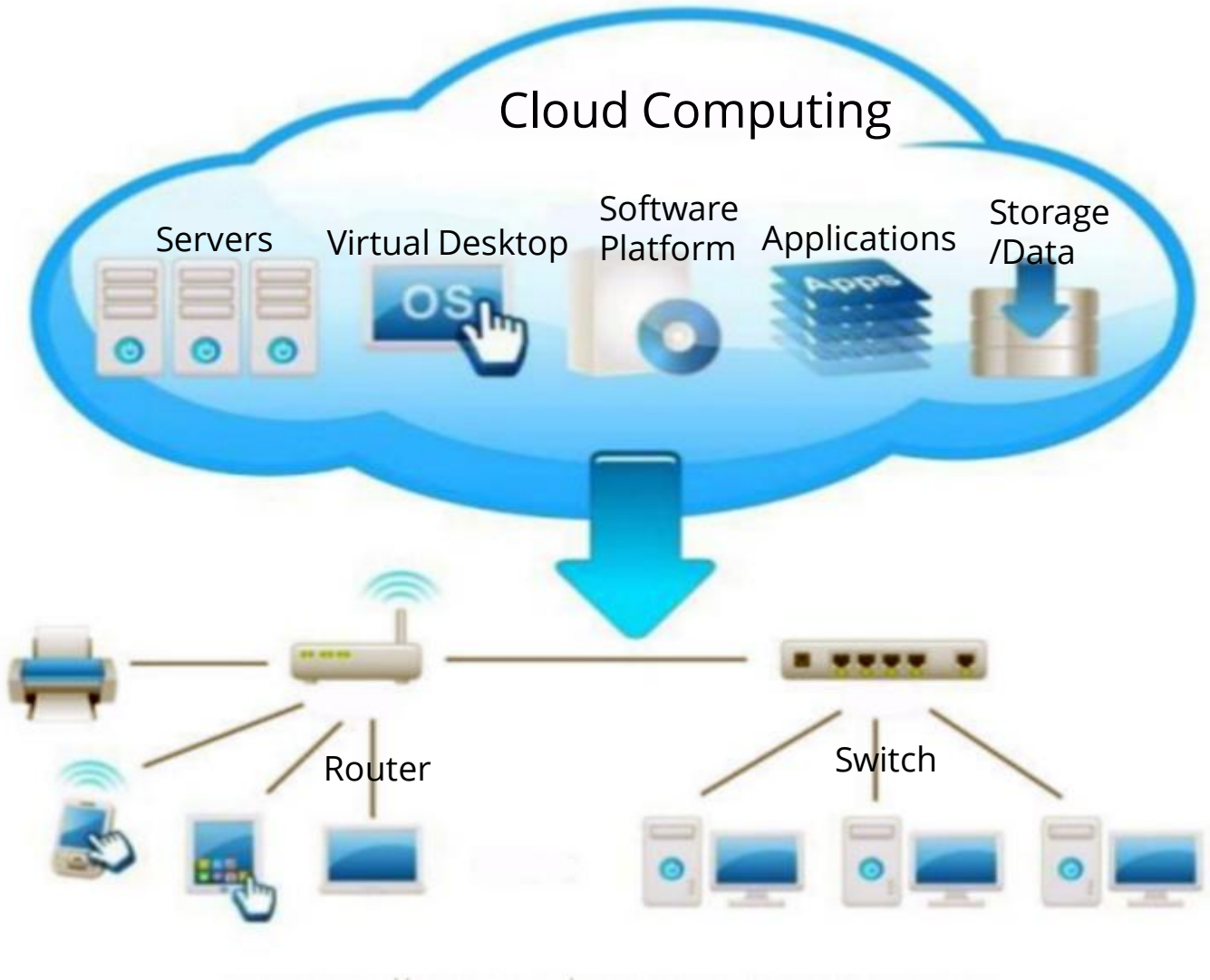
Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider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

Cloud model is composed of five essential characteristics, three service models, and four deployment models

What is Cloud Computing? (Cont'd)



Cloud Architecture



BACK END

INTERNET CONNECTION

FRONT END

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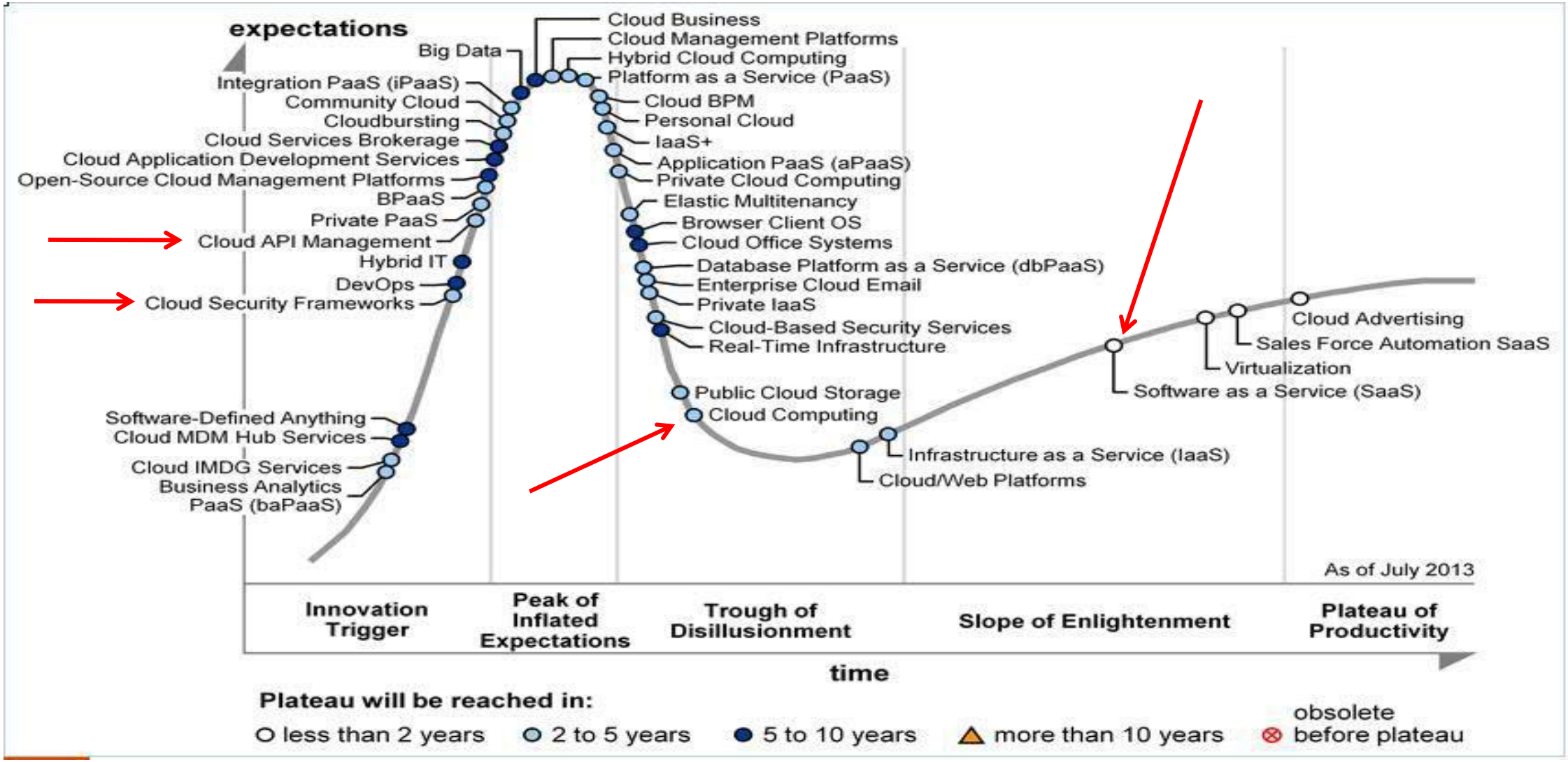
SCM-DevOps-Build-Release



Cloud Delivery Models

Software as a Service (SaaS):

- The application is hosted centrally
- Software testing takes place at a faster rate
- Reduction in IT operational costs
- No need to install new software to release updates

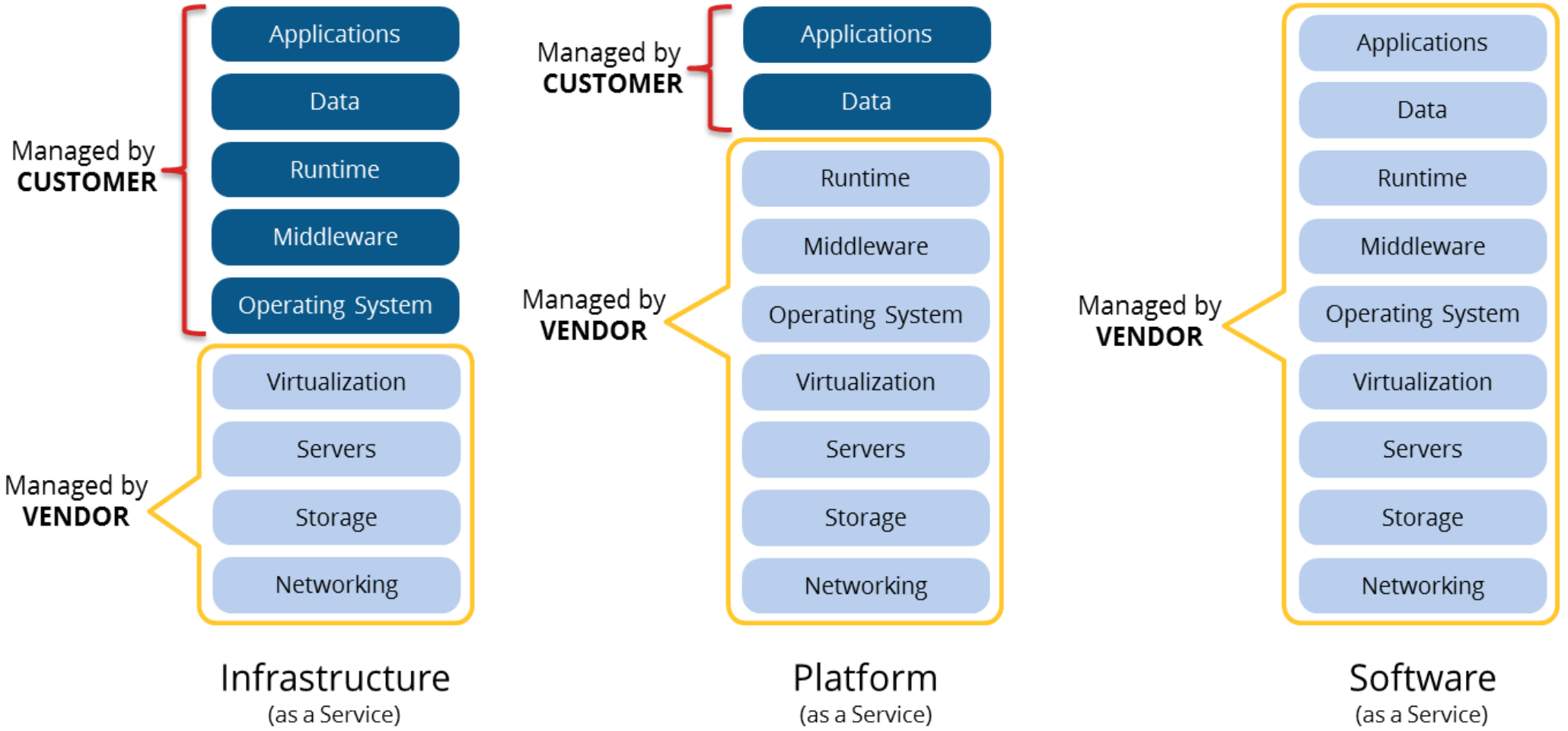
Platform as a Service (PaaS):

- Facilitation of hosting capabilities
- Designing and developing the application
- Integrating web services and databases
- Providing security, scalability and storage

Infrastructure as a Service (IaaS):

- Virtualization of Desktop
- Internet availability
- Use of billing model
- Computerized administrative tasks

Cloud Delivery Models (Cont'd)



Essential Characteristics of Cloud Computing

On-demand self-service: Users are able to provision cloud computing resources without requiring human interaction, mostly done though a web-based self-service portal (management console).

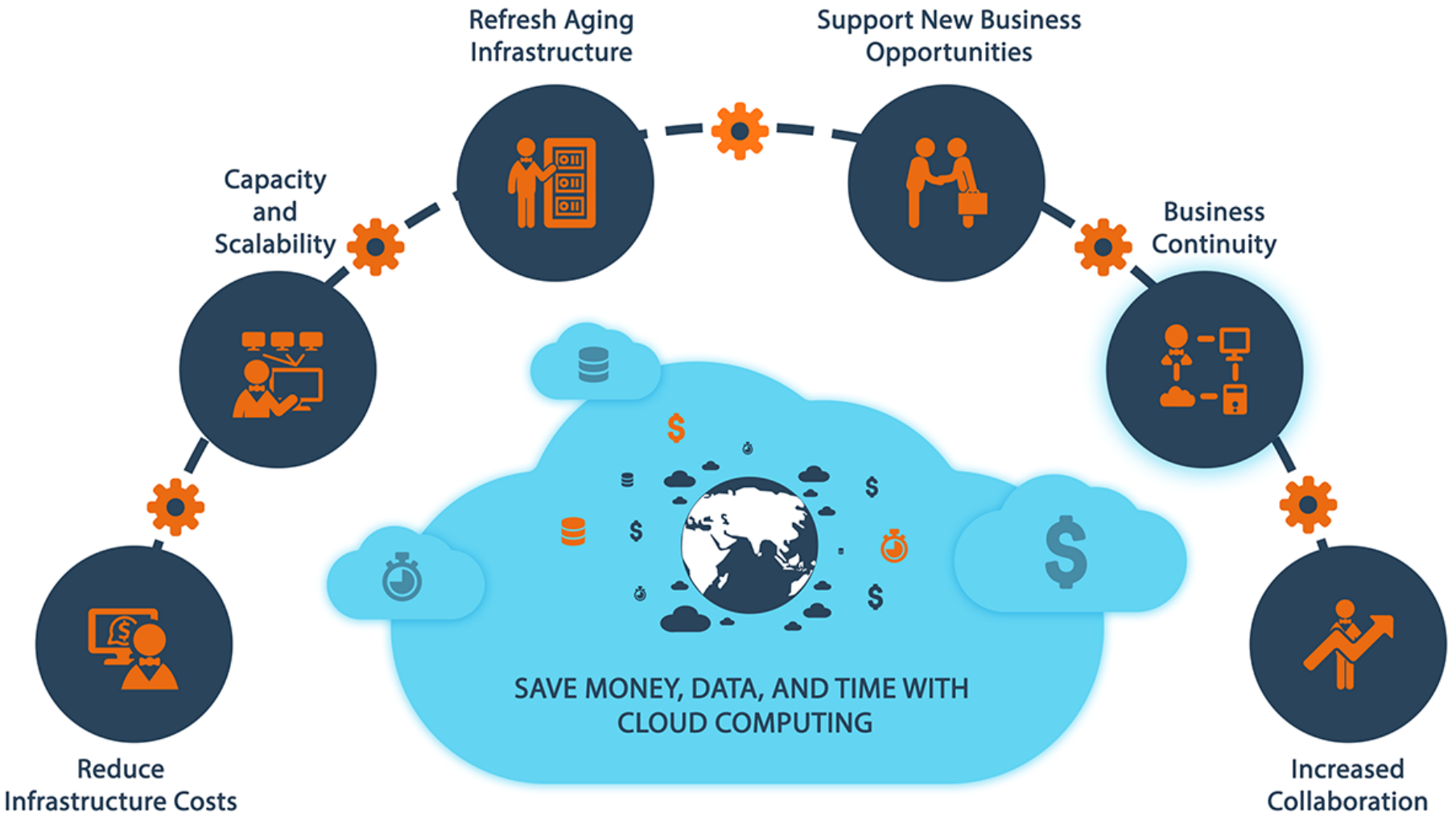
Broad network access: Cloud computing resources are accessible over the network, supporting heterogeneous client platforms such as mobile devices and workstations.

Resource pooling: Service multiple customers from the same physical resources, by securely separating the resources on logical level.

Rapid elasticity: Resources are provisioned and released on-demand and/or automated based on triggers or parameters. This will make sure your application will have exactly the capacity it needs at any point of time.

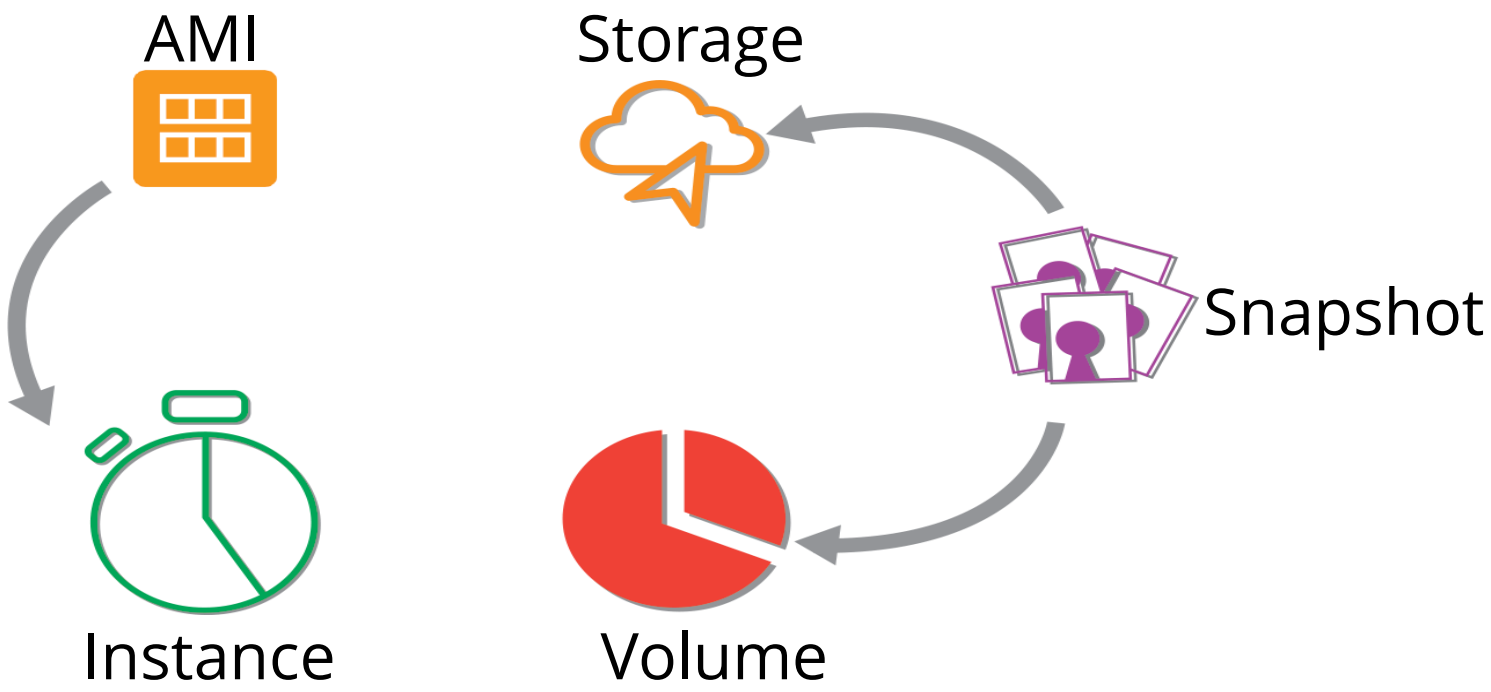
Measured service: Resource usage are monitored, measured, and reported (billed) transparently based on utilization. In short, pay for use.

Cloud Benefits



AWS Definition

- Amazon Web Services (AWS) is a secure cloud services platform, offering compute power, database storage, content delivery and other functionality to help businesses scale and grow.



Amazon Web Services (AWS)

Compute

EC2
Virtual Servers in the Cloud

Lambda PREVIEW
Run Code in Response to Events

Storage & Content Delivery

S3
Scalable Storage in the Cloud

Storage Gateway
Integrates On-Premises IT Environments with Cloud Storage

Glacier
Archive Storage in the Cloud

CloudFront
Global Content Delivery Network

Database

RDS
MySQL, Postgres, Oracle, SQL Server, and Amazon Aurora

DynamoDB
Predictable and Scalable NoSQL Data Store

ElastiCache
In-Memory Cache

Redshift
Managed Petabyte-Scale Data Warehouse Service

Networking

VPC
Isolated Cloud Resources

Direct Connect
Dedicated Network Connection to AWS

Route 53
Scalable DNS and Domain Name Registration

Administration & Security

Directory Service
Managed Directories in the Cloud

Identity & Access Management
Access Control and Key Management

Trusted Advisor
AWS Cloud Optimization Expert

CloudTrail
User Activity and Change Tracking

Config PREVIEW
Resource Configurations and Inventory

CloudWatch
Resource and Application Monitoring

Deployment & Management

Elastic Beanstalk
AWS Application Container

OpsWorks
DevOps Application Management Service

CloudFormation
Templated AWS Resource Creation

CodeDeploy
Automated Deployments

Analytics

EMR
Managed Hadoop Framework

Kinesis
Real-time Processing of Streaming Big Data

Data Pipeline
Orchestration for Data-Driven Workflows

Application Services

SQS
Message Queue Service

SWF
Workflow Service for Coordinating Application Components

AppStream
Low Latency Application Streaming

Elastic Transcoder
Easy-to-use Scalable Media Transcoding

SES
Email Sending Service

CloudSearch
Managed Search Service

Mobile Services

Cognito
User Identity and App Data Synchronization

Mobile Analytics
Understand App Usage Data at Scale

SNS
Push Notification Service

Enterprise Applications

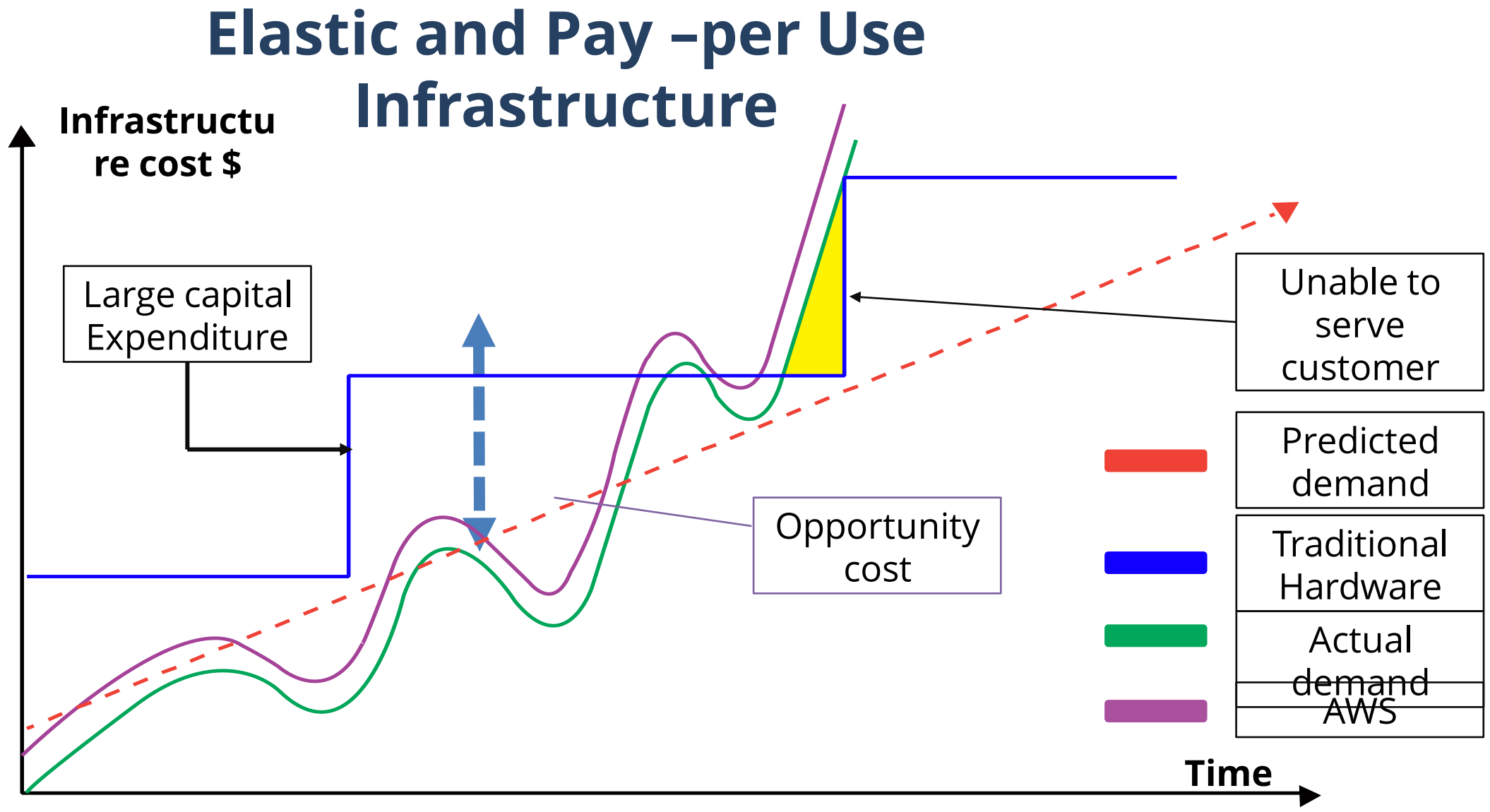
WorkSpaces
Desktops in the Cloud

Zocalo
Secure Enterprise Storage and Sharing Service

Why AWS

Easy to use
Flexible
Cost-Effective
Reliable
Scalable and high-performance
Secure

Why AWS (Contd.)



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NETFLIX

AWS enables Netflix to quickly deploy thousands of servers and terabytes of storage within minutes.

AWS

The company uses AWS to run its website, ingest and store data, and develop and deploy new site features.

CITRIX®

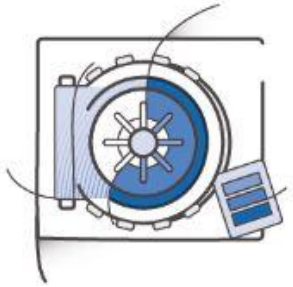
Citrix joined the AWS Marketplace to simplify deployment, pricing, and packaging for its flagship Citrix NetScaler and CloudBridge products.

CSS CORP
Wired to SUPPORT

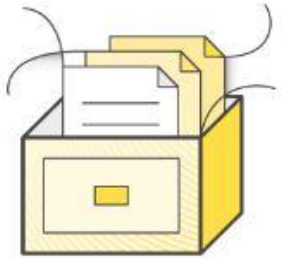
AWS has provided CSS with flexibility in both cost and service management.

AWS Cloud Solution

Websites

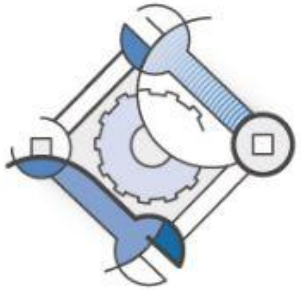


Backup and Recovery



Archiving

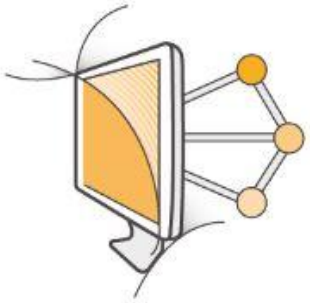
Disaster Recovery



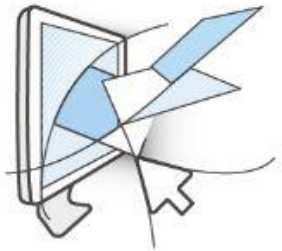
DevOps

Big Data

Financial Services



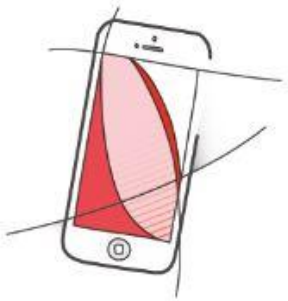
High Performance Computing



Digital Marketing

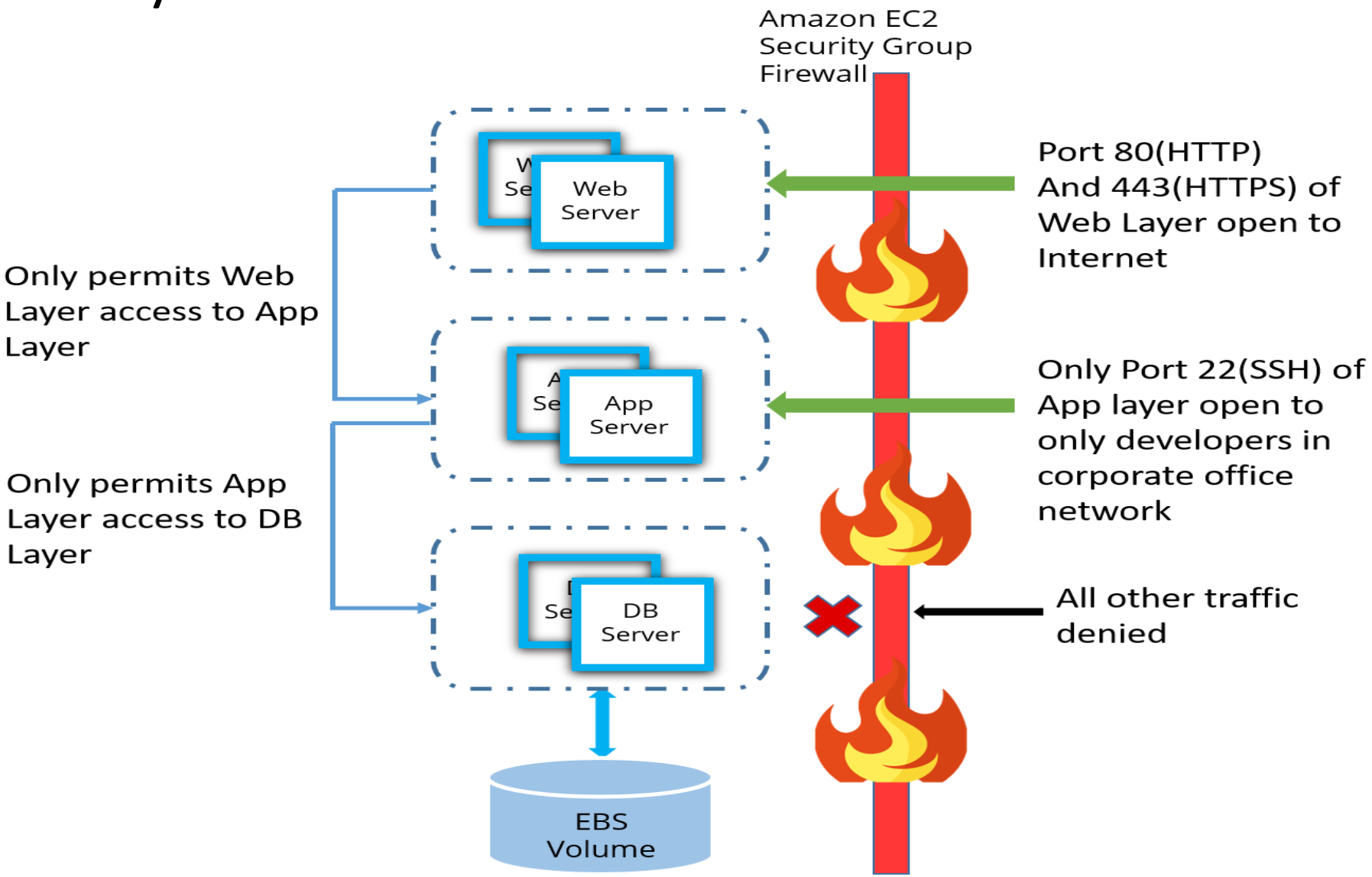
E-Commerce

Media and Entertainment

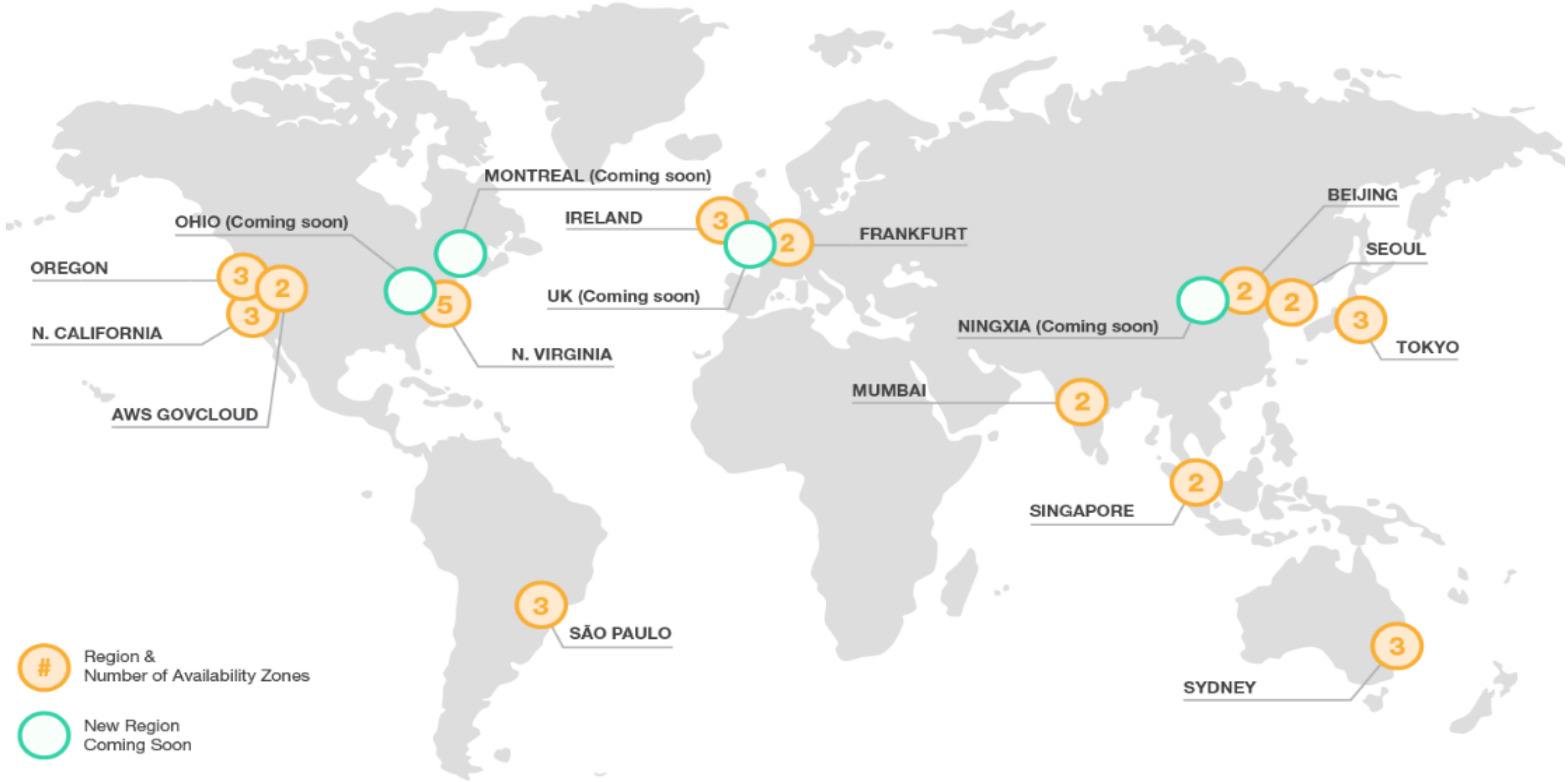


Mobile Services

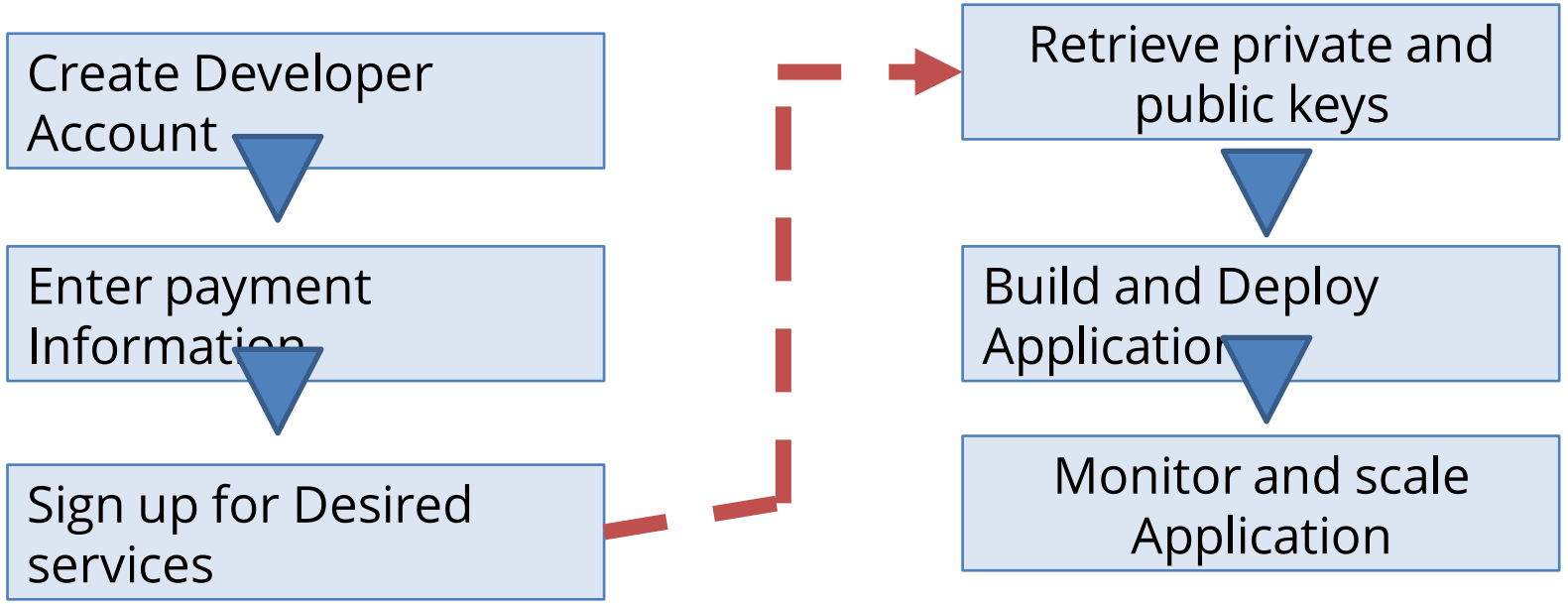
AWS Security



AWS Global Infrastructure



Getting Started with AWS



A Very, Very Longtime

- Since 2003
- It didn't even cross my mind
- One of the hottest certifications out there
- Differentiate yourself

AWS Certification Tracks

AWS Certification page: http://aws.amazon.com/certification/

Benefits of AWS Certification

Individual

- Demonstrate expertise
- Stand out
- Industry visibility
- Customer visibility
- Peer recognition
- Credibility with customers

Employer

- Baseline bar on AWS skills
- Identify expert talent
- Leverage best practices
  - Reduce operational risk
  - Increase business advantage
  - Maximize AWS efficiencies
- Common vocabulary
- Accelerate time to cloud

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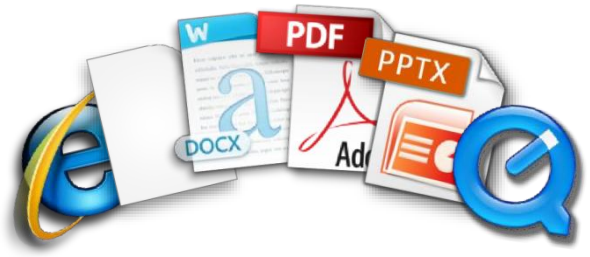
Prerequisites and Getting Started



- An Understanding of Cloud Computing
- Microsoft / Linux Essentials
- Networking Essentials
- Working Knowledge of Virtualization
- Storage Fundamentals
- AWS Newsletter
- Sign up for a Free Account

What Is Cloud Computing?

What Is Cloud Computing?

A model for enabling ubiquitous, 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

(Source: NIST)

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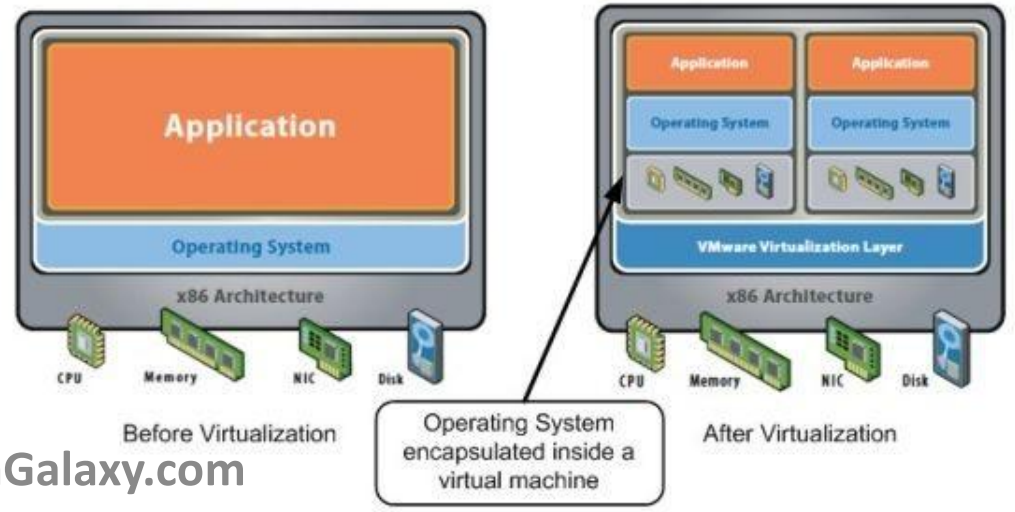
(Source: NIST)

Cloud Basics

What is Hypervisor?

- A **hypervisor** or virtual machine monitor (VMM) is a piece of computer software, firmware or hardware that creates and runs virtual machines. A computer on which a **hypervisor** runs one or more virtual machines is called a host machine, and each virtual machine is called a guest machine.



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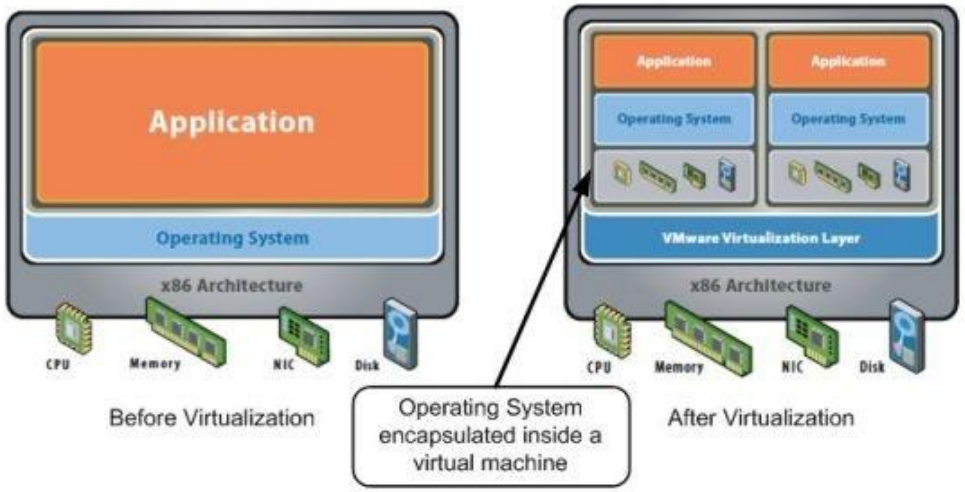
Cloud Basics

What is Virtualization?

- In computing, **virtualization** refers to the act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, operating systems, storage devices, and computer network resources.



Virtual-* Allows for the Scale of Abstraction to Increase Over Time

Run one process within certain resource limits.

Op Sys has virtual memory, virtual CPU, and virtual storage (file system).

Run multiple processes within certain resource limits.

Resource containers (Solaris), virtual servers (Linux), virtual images (Docker)

Run an entire operating system within certain limits.

Virtual machine technology: VMWare, Xen, KVM, etc.

Run a set of virtual machines connected via a private network.

Virtual networks (SDNs) provision bandwidth between virtual machines.

Run a private virtual architecture for every customer.

Automated tools replicate virtual infrastructure as needed.

Cloud Basics

What is Cloud Computing?

- The using of Computation power over the internet is called Cloud.
- Dedicated hosted server is not a cloud server.
- Cloud computing build on elastic mechanism that can increase/decrease computation as per requirement

Cloud Computing at a Glance

5	3	4
Essential characteristics	Service models	Deployment models

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Essential Characteristics

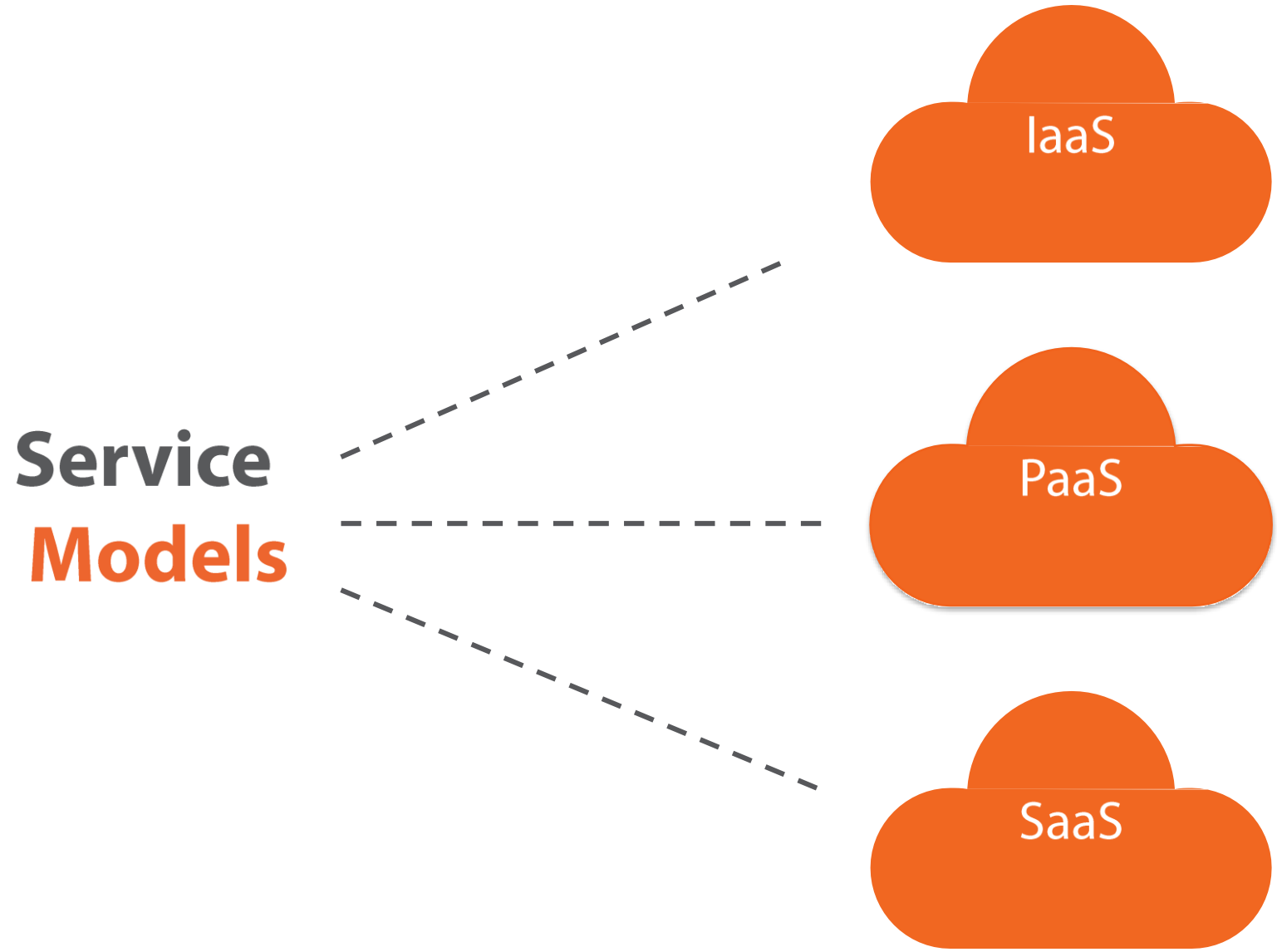
On-demand

Broad Network Access

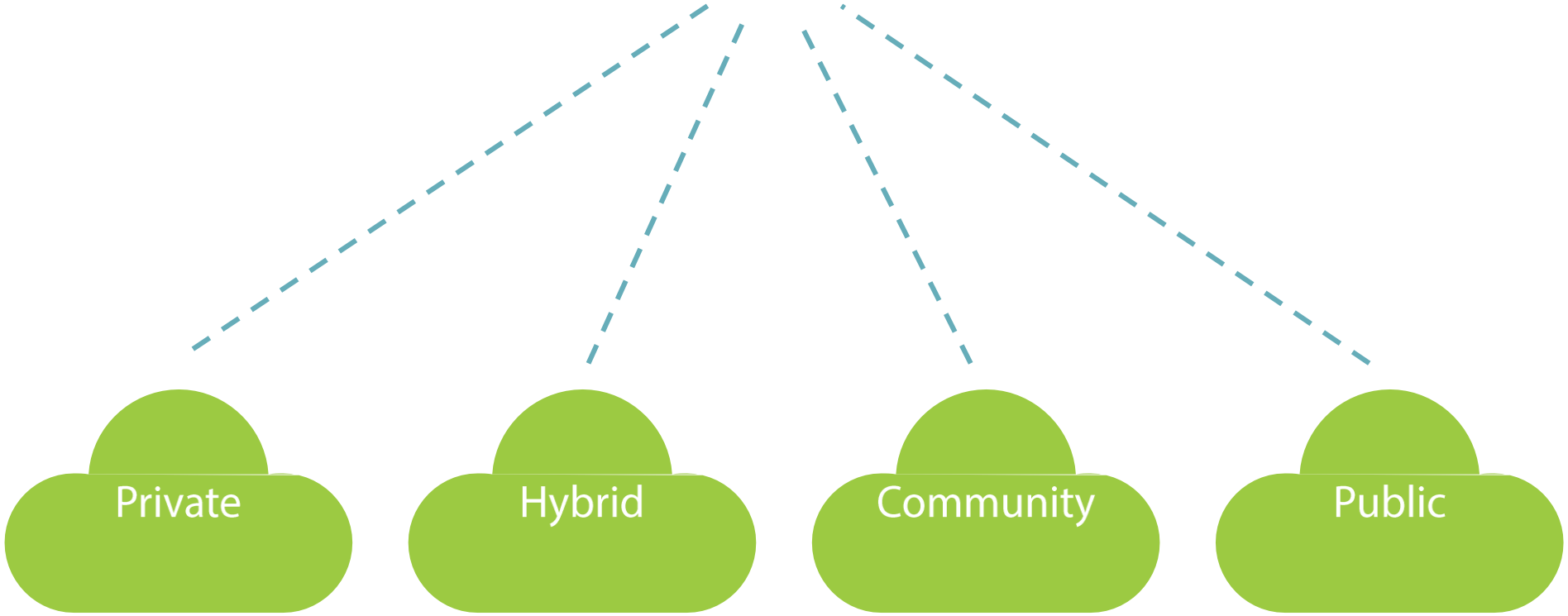
Resource Pooling

Rapid Elasticity

Measured Service

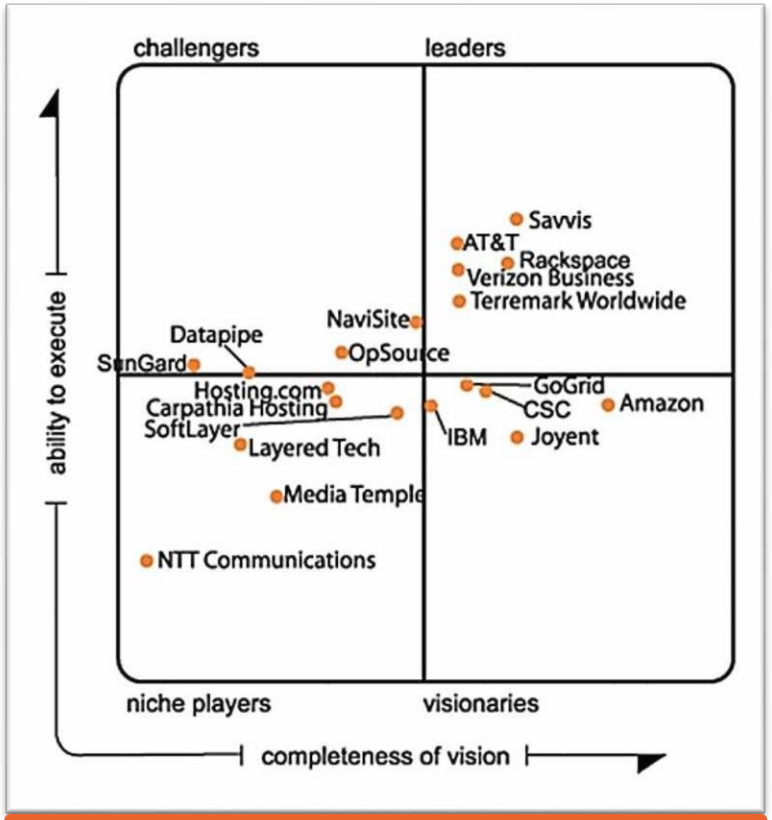

Service
Models
IaaS
PaaS
SaaS

Deployment Models

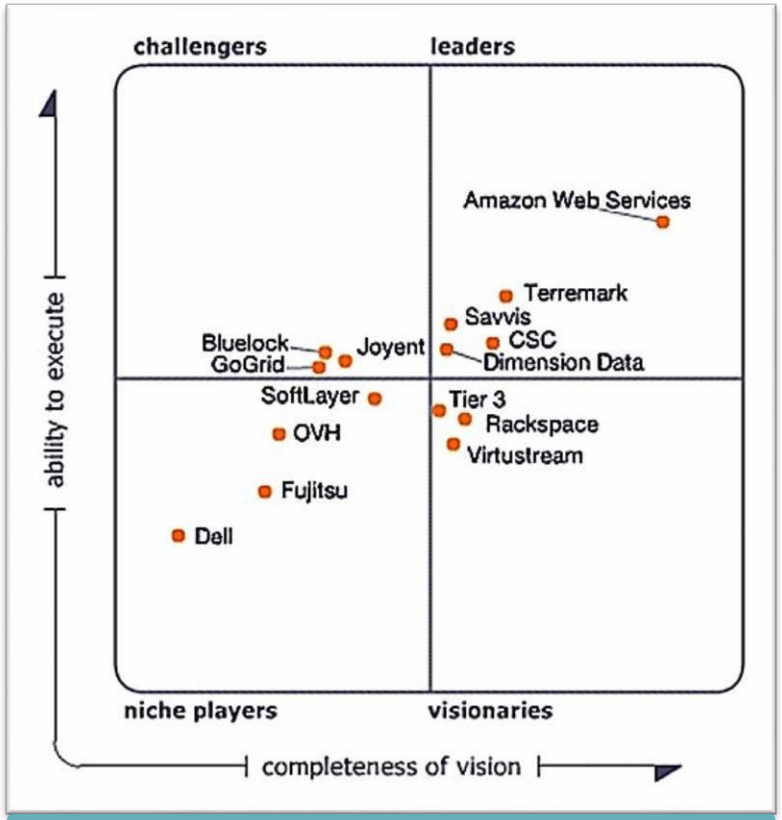


Key Dates in the History of Cloud Computing

Cloud Service Providers



As of December 2010



As of October 2012

As of August 2013

Cloud Service Providers

As of July 2014

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Build and Operate → **Consume**

Summary

AWS Certifications

What Is Cloud Computing?

Build and Operate vs. Consume

Key Dates