Session Objectives

This session will help you to:

▶ Introduction to Cloud Computing

▶ Cloud Computing Architecture

▶ Cloud Service Models – IAAS, PAAS & SAAS
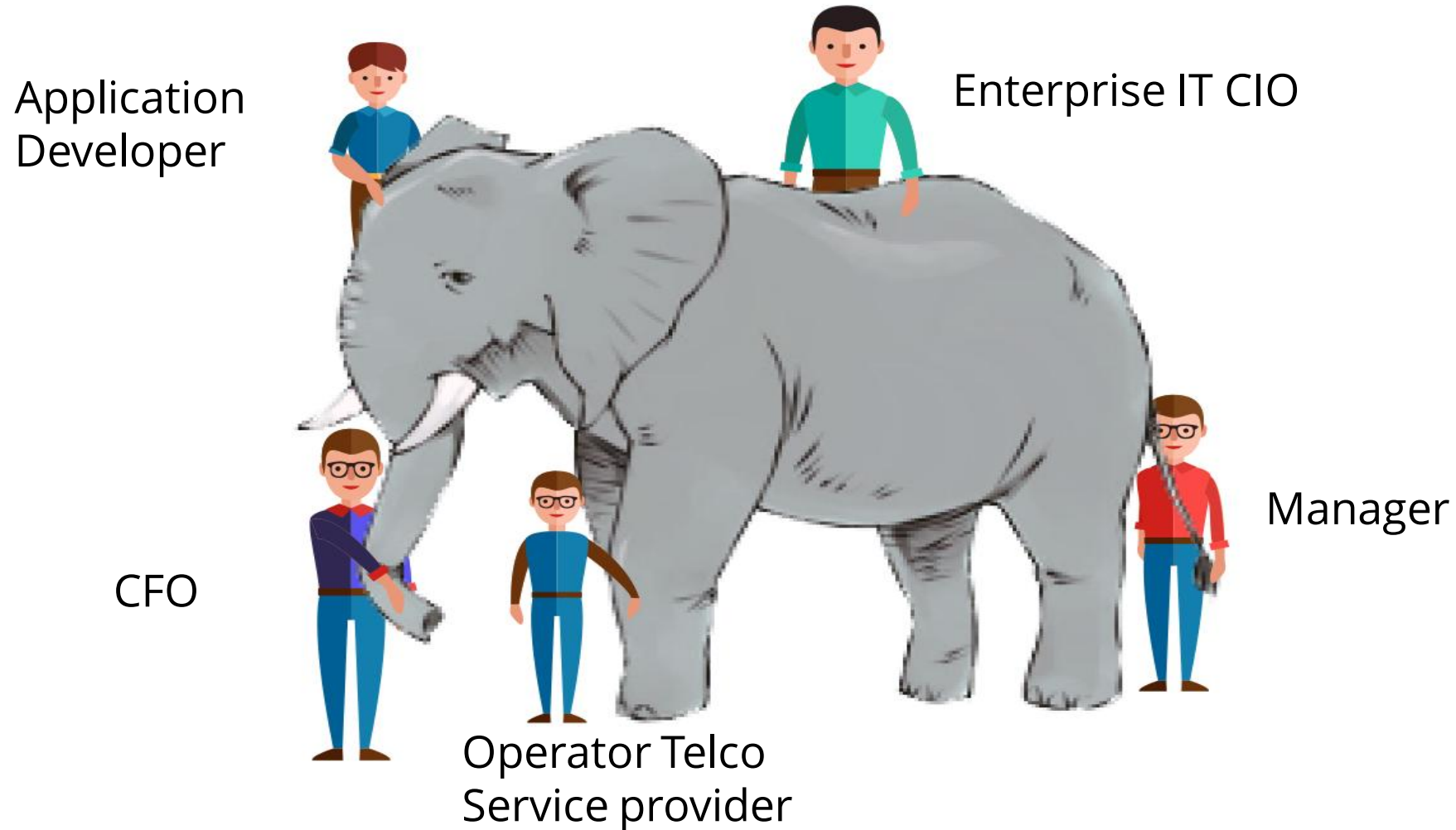
▶ Cloud Computing Advantages

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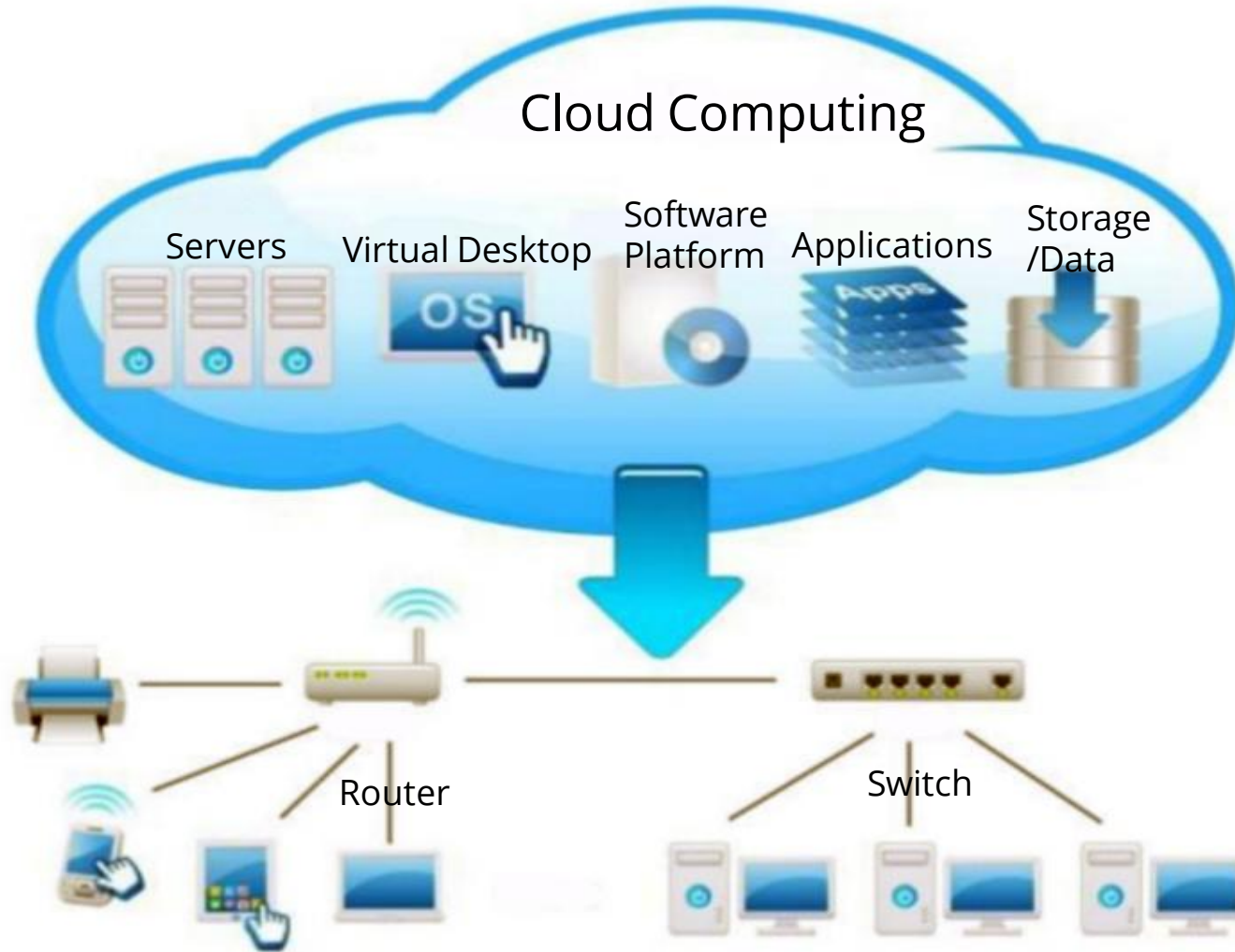
Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider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

Cloud model is composed of five essential characteristics, three service models, and four deployment models
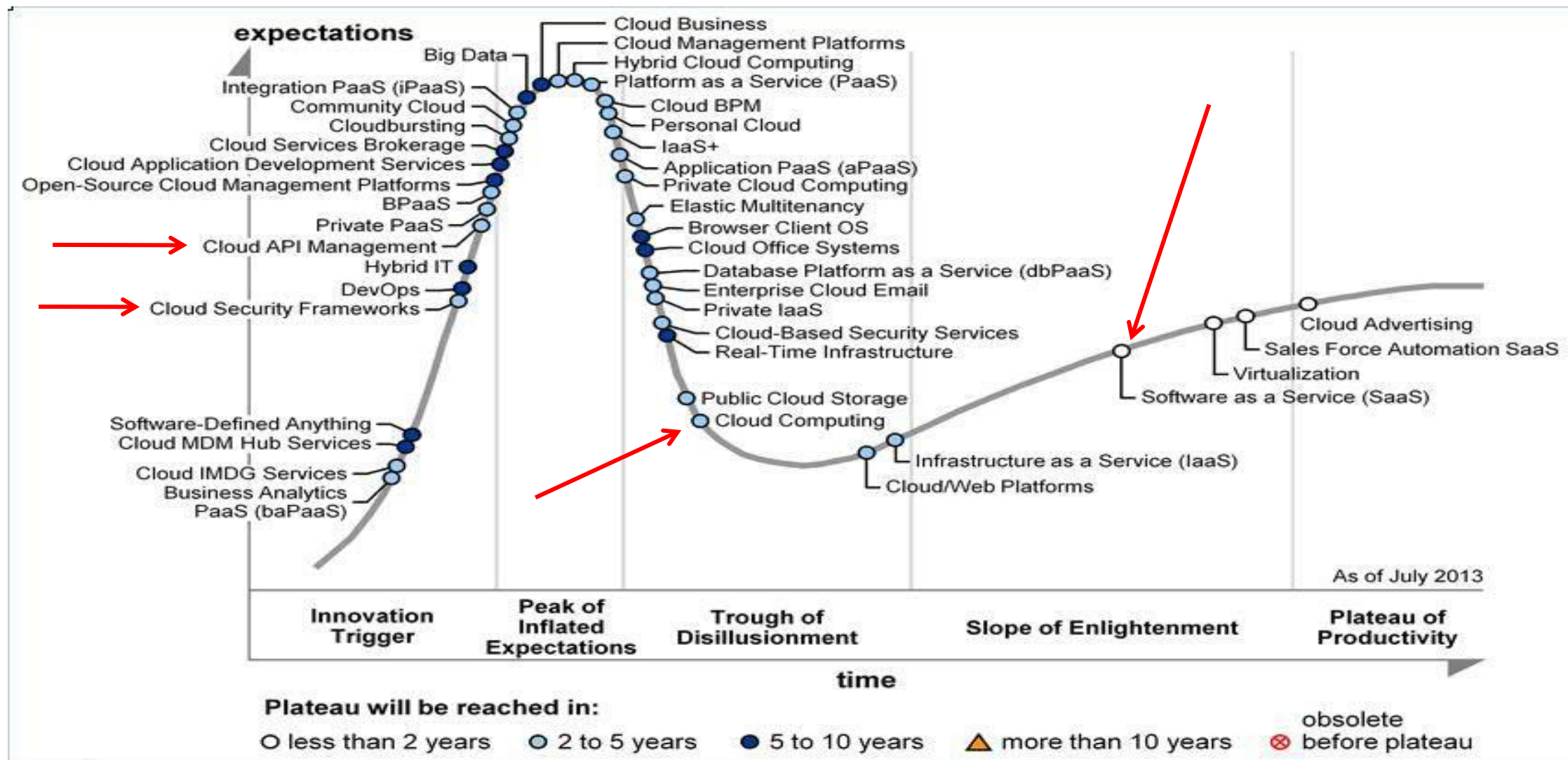
What is Cloud Computing? (Cont'd)

Application Developer

Enterprise IT CIO

Manager

CFO

Operator Telco Service provider

Cloud Architecture

Cloud Computing

Servers
Virtual Desktop
OS
Software Platform
Applications
Apps
Storage /Data

Router

Switch

BACK END

INTERNET CONNECTION

FRONT END

expectations

Big Data

Integration PaaS (iPaaS)
Community Cloud
Cloudbursting
Cloud Services Brokerage
Cloud Application Development Services
Open-Source Cloud Management Platforms
BPaaS
Private PaaS
Cloud API Management
Hybrid IT
DevOps
Cloud Security Frameworks

Cloud Business
Cloud Management Platforms
Hybrid Cloud Computing
Platform as a Service (PaaS)
Cloud BPM
Personal Cloud
IaaS+
Application PaaS (aPaaS)
Private Cloud Computing
Elastic Multitenancy
Browser Client OS
Cloud Office Systems
Database Platform as a Service (dbPaaS)
Enterprise Cloud Email
Private IaaS
Cloud-Based Security Services
Real-Time Infrastructure

Cloud Advertising
Sales Force Automation SaaS
Virtualization
Software as a Service (SaaS)

Public Cloud Storage
Cloud Computing

Software-Defined Anything
Cloud MDM Hub Services

Cloud IMDG Services
Business Analytics
PaaS (baPaaS)

Infrastructure as a Service (IaaS)
Cloud/Web Platforms

As of July 2013

| Innovation Trigger | Peak of Inflated Expectations | Trough of Disillusionment | Slope of Enlightenment | Plateau of Productivity |

time

Plateau will be reached in:
O less than 2 years   ◔ 2 to 5 years   ● 5 to 10 years   △ more than 10 years   ⊗ obsolete before plateau

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
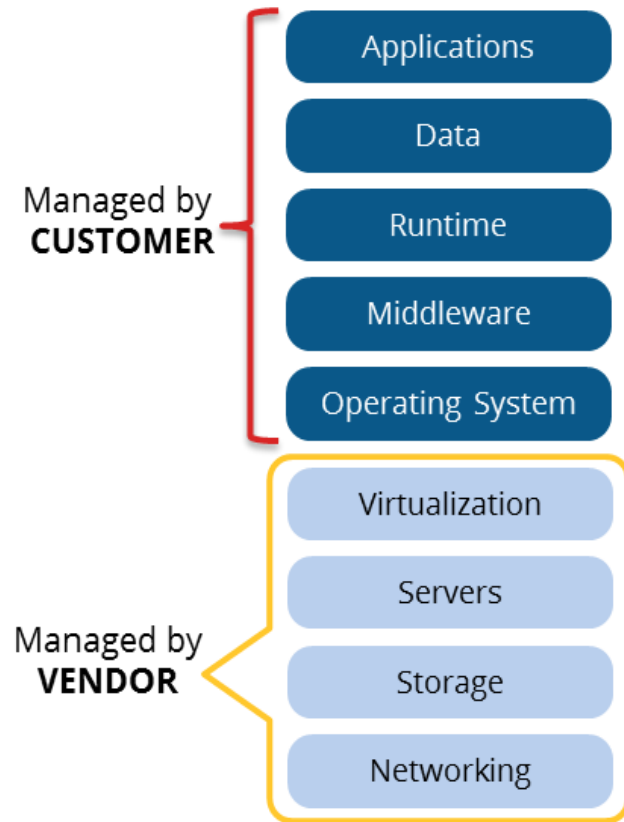
Platform as a Service (PaaS):

      Facilitation of hosting capabilities

      Designing and developing the application

      Integrating web services and databases
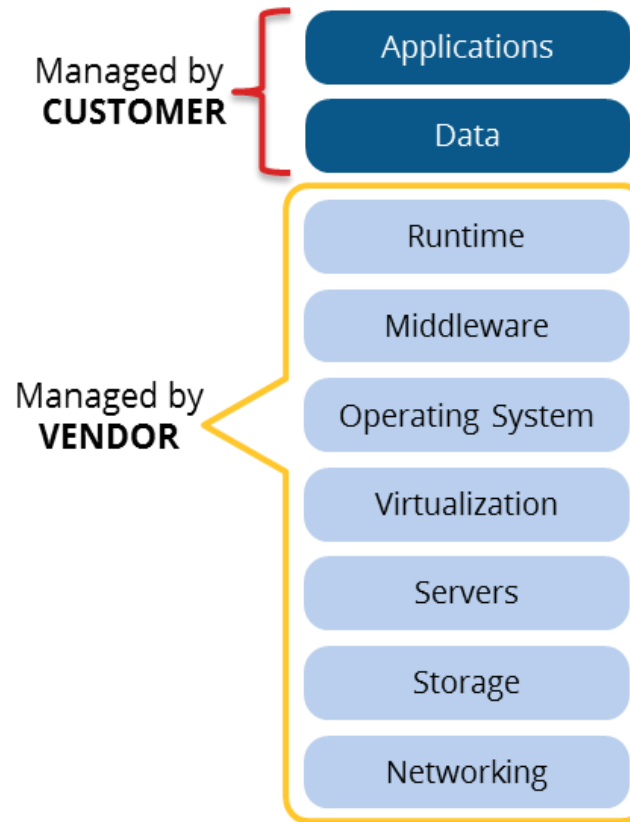
      Providing security, scalability and storage

Infrastructure as a Service (IaaS):

      Virtualization of Desktop

      Internet availability

      Use of billing model

      Computerized administrative tasks

Cloud Delivery Models (Cont'd)

Infrastructure (as a Service)

Platform (as a Service)
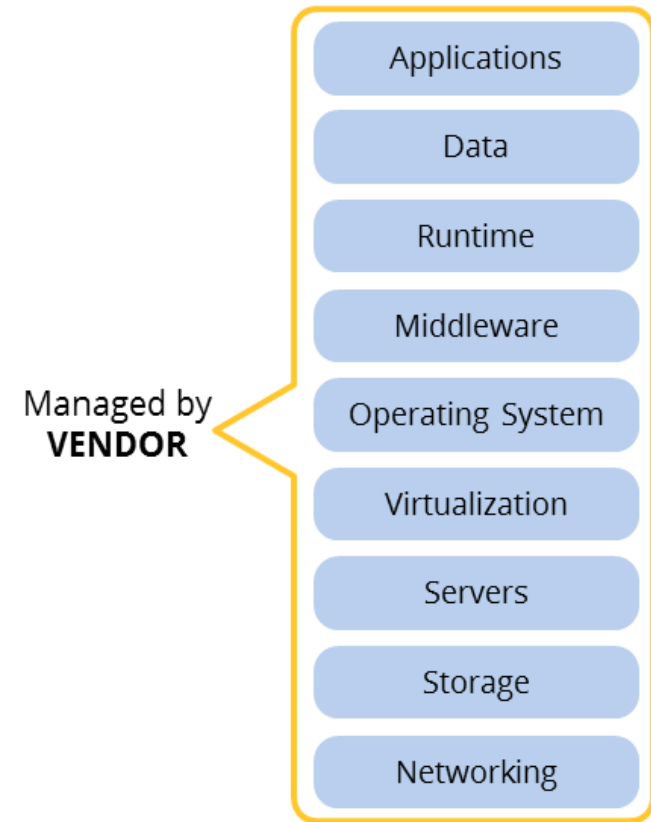
Software (as a Service)

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
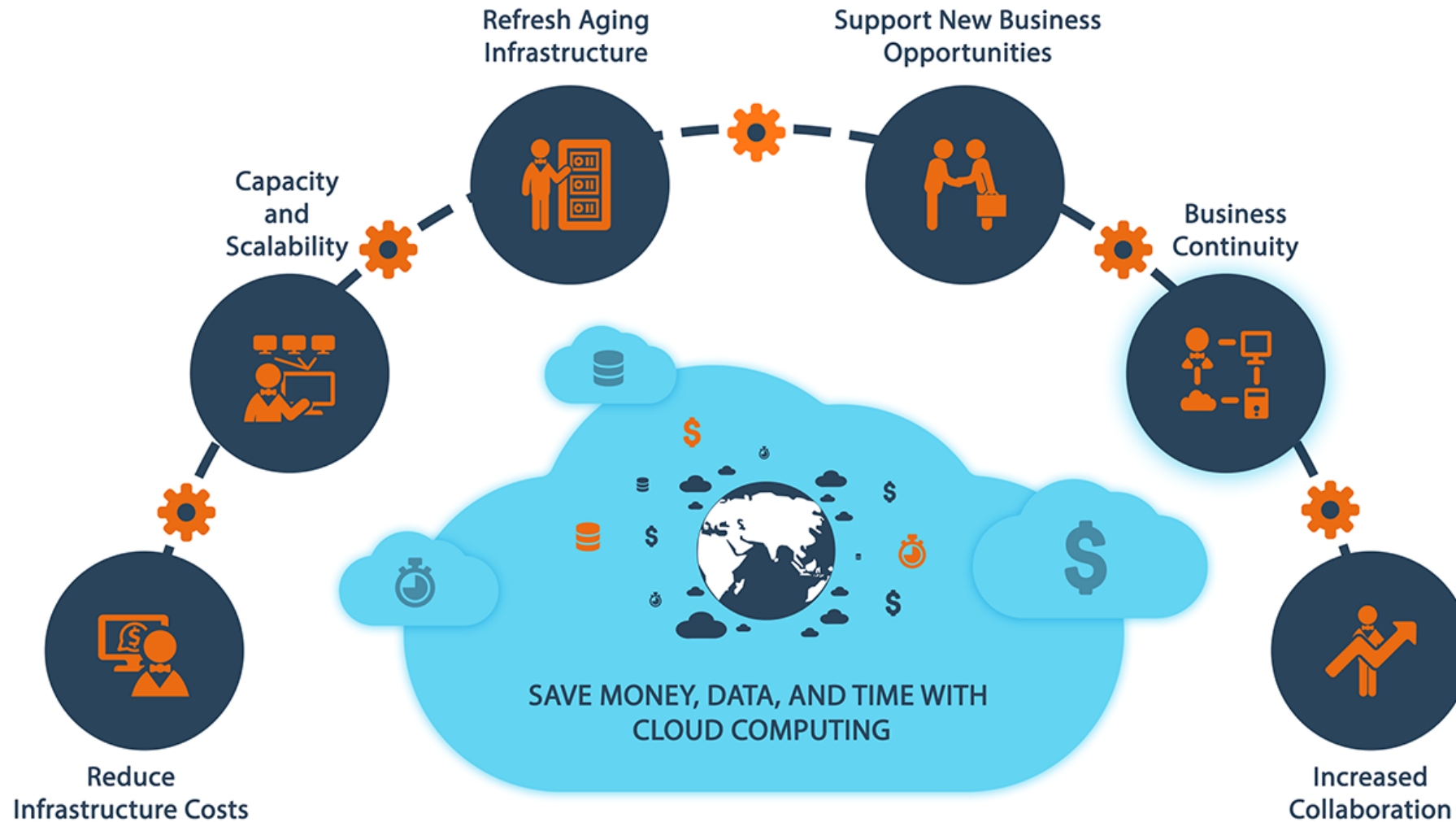
AWS Definition

▶ 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.

AMI

Storage

Snapshot

Instance

Volume
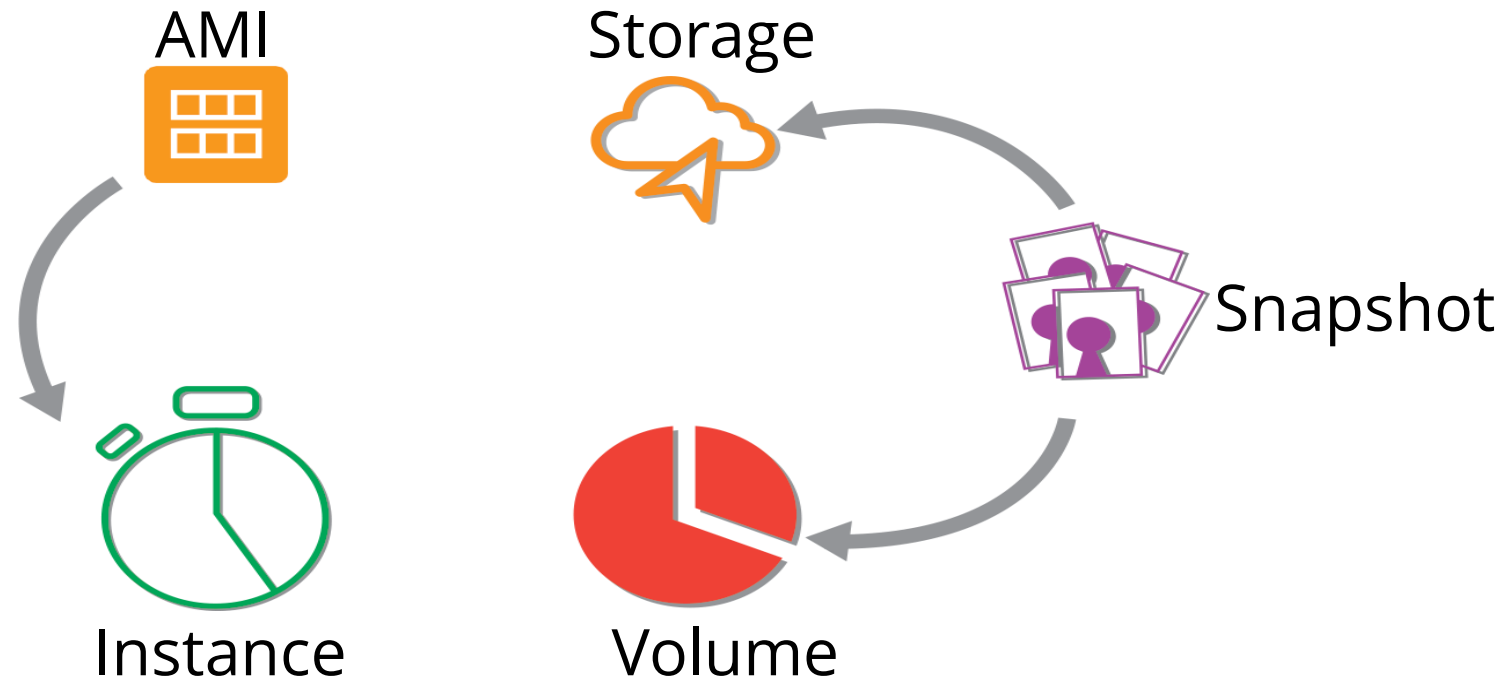
Amazon Web Services (AWS)

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
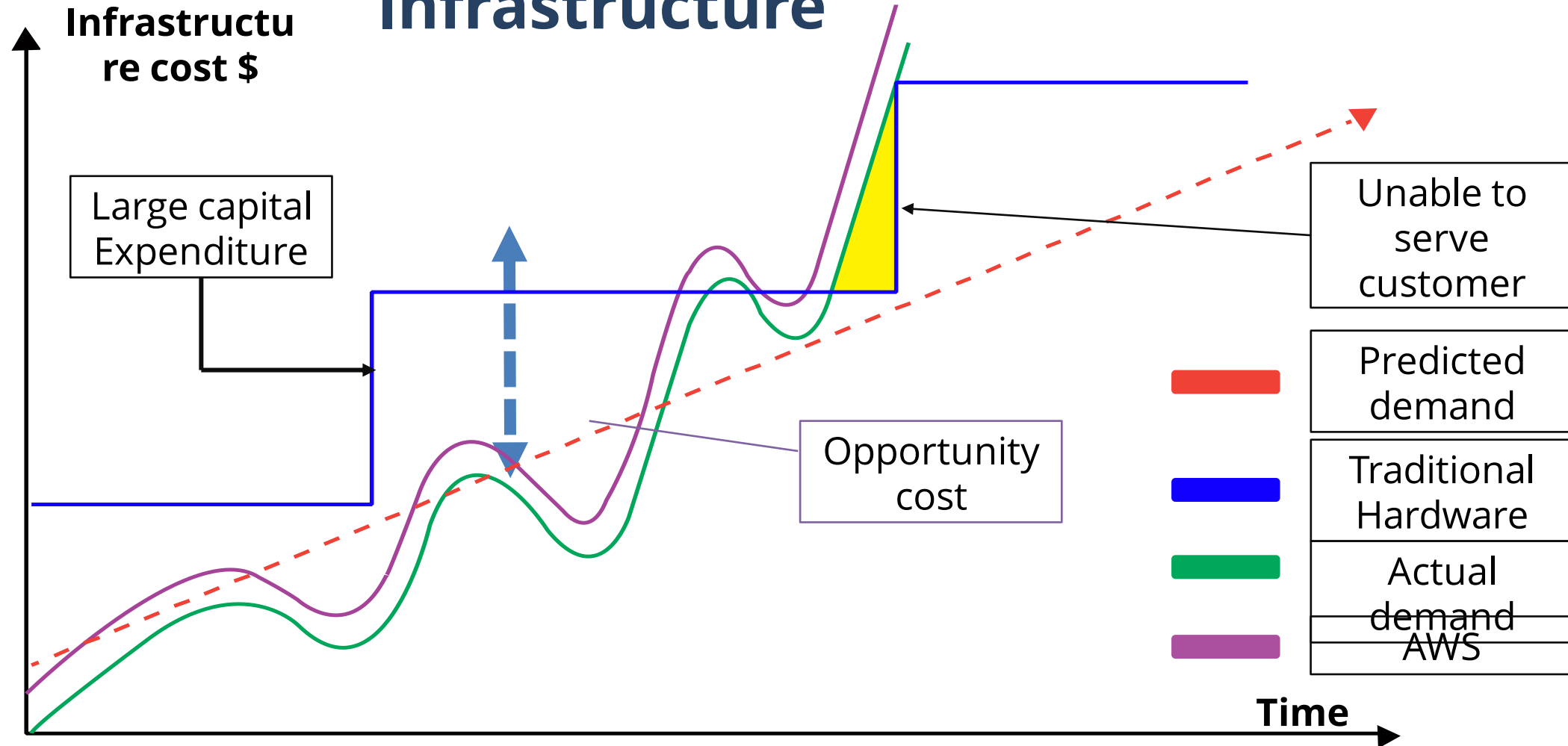
Why AWS

Easy to use

Flexible

Cost-Effective

Reliable

Scalable and high-performance

Secure

Why AWS (Contd.)

Elastic and Pay –per Use Infrastructure

Infrastructure cost $

Large capital Expenditure

Opportunity cost

Unable to serve customer

Predicted demand

Traditional Hardware

Actual demand

AWS

Time

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

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

Citrix joined the AWS Marketplace to simplify deployment, pricing, and packaging for its flagship Citrix NetScaler and CloudBridge products.
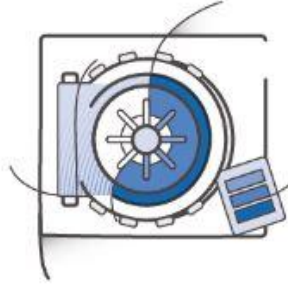
AWS has provided CSS with flexibility in both cost and service management.

AWS Cloud Solution
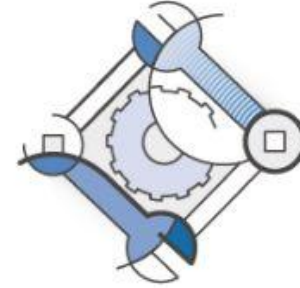

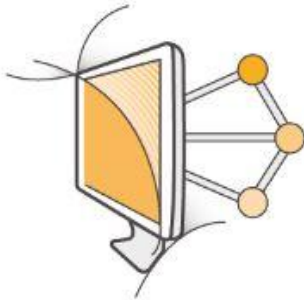Websites   Backup and Recovery   Archiving   Disaster Recovery   DevOps   Big Data
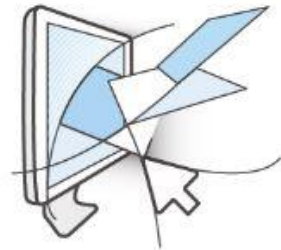
Financial Services   High Performance Computing   Digital Marketing   E-Commerce   Media and Entertainment   Mobile Services
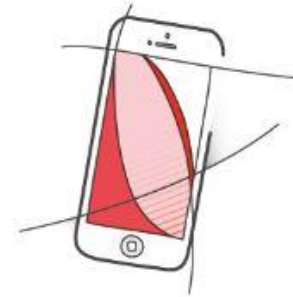
AWS Security

Amazon EC2 Security Group Firewall

Web Server

App Server

DB Server

EBS Volume

Only permits Web Layer access to App Layer

Only permits App Layer access to DB Layer

Port 80(HTTP) And 443(HTTPS) of Web Layer open to Internet

Only Port 22(SSH) of App layer open to only developers in corporate office network

All other traffic denied
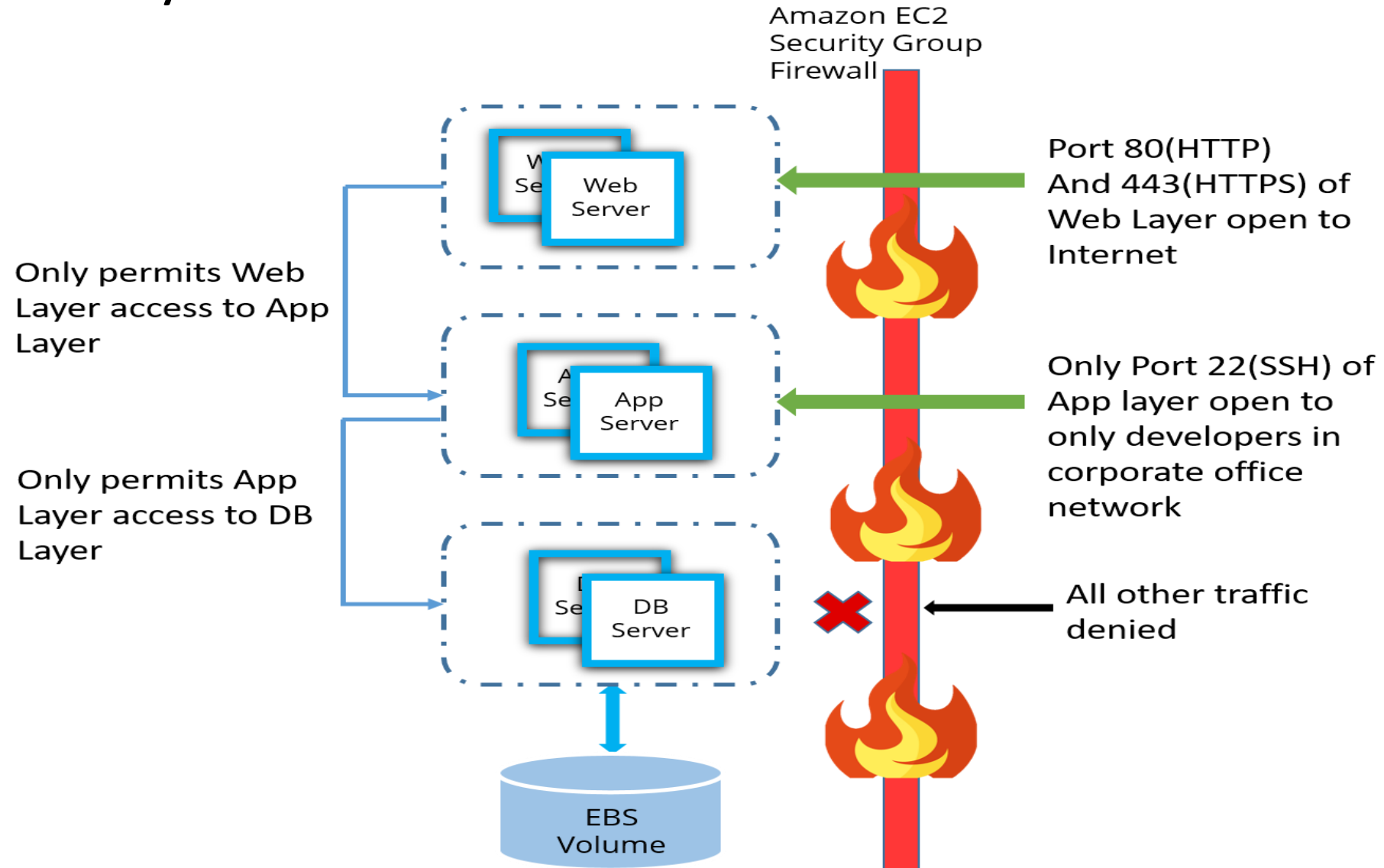
AWS Global Infrastructure

Getting Started with AWS

Create Aws Account

Enter payment Information

Sign up for Desired services

Retrieve private and public keys

Build and Deploy Application

Monitor and scale Application
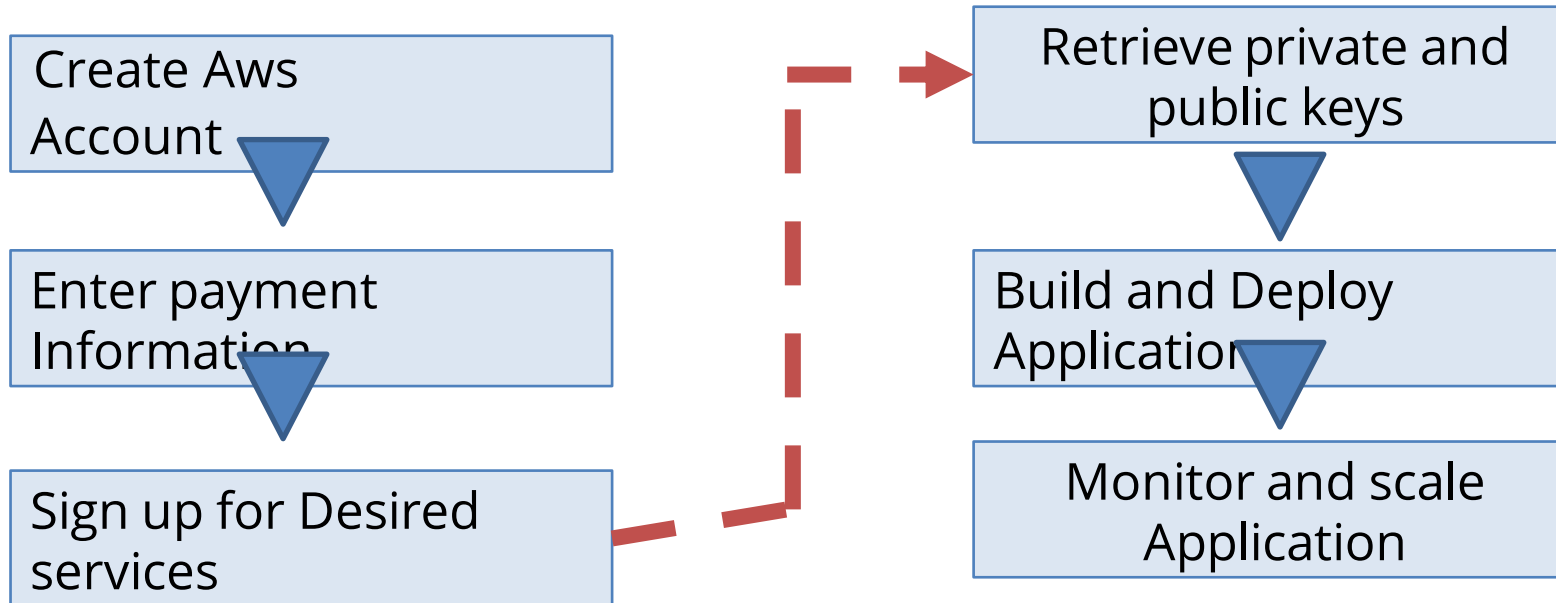
What Is Cloud Computing?

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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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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.
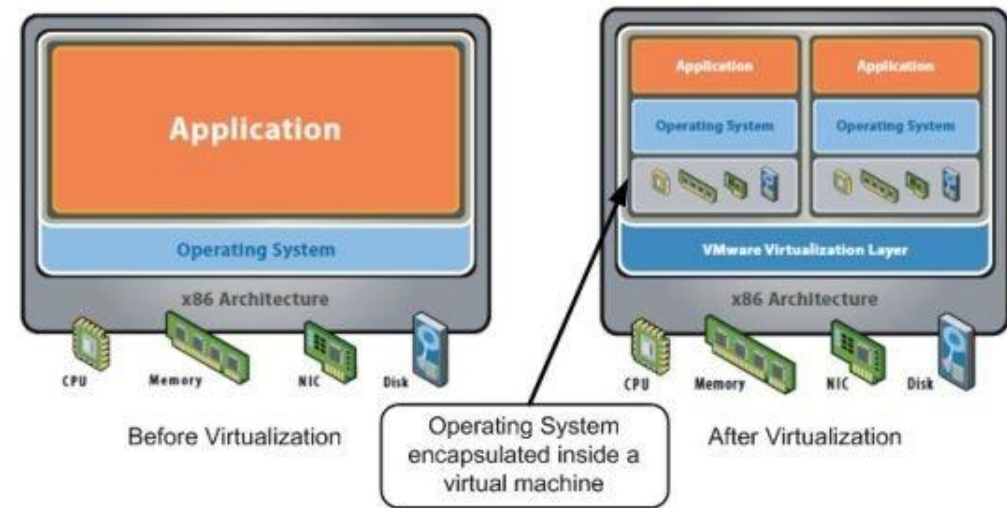
Cloud Basics

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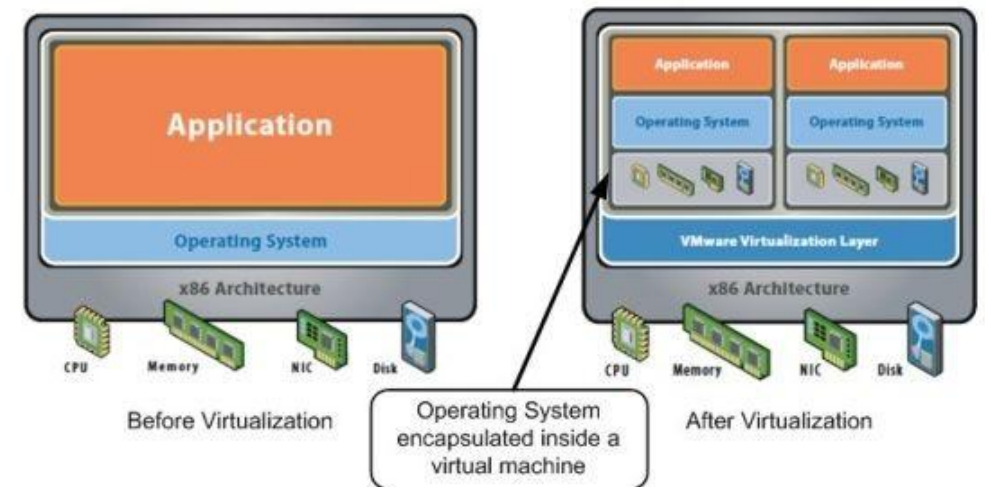
Virtual-* Allows for the Scale of Abstraction to Increase Over Time

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
Essential characteristics

3
Service models

4
Deployment models

Essential Characteristics

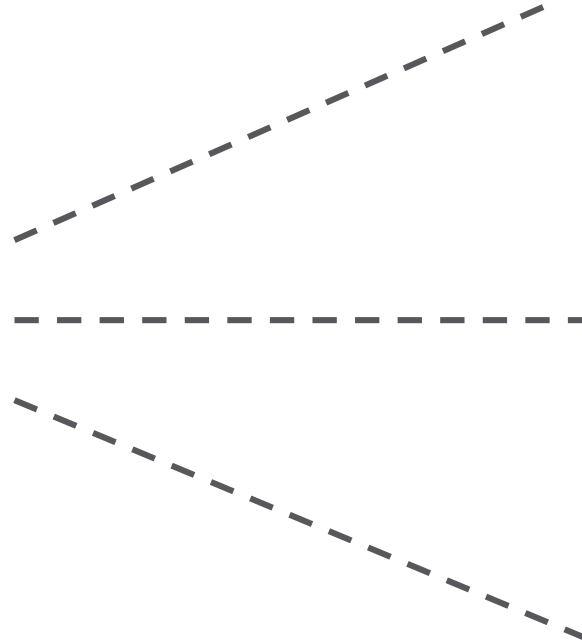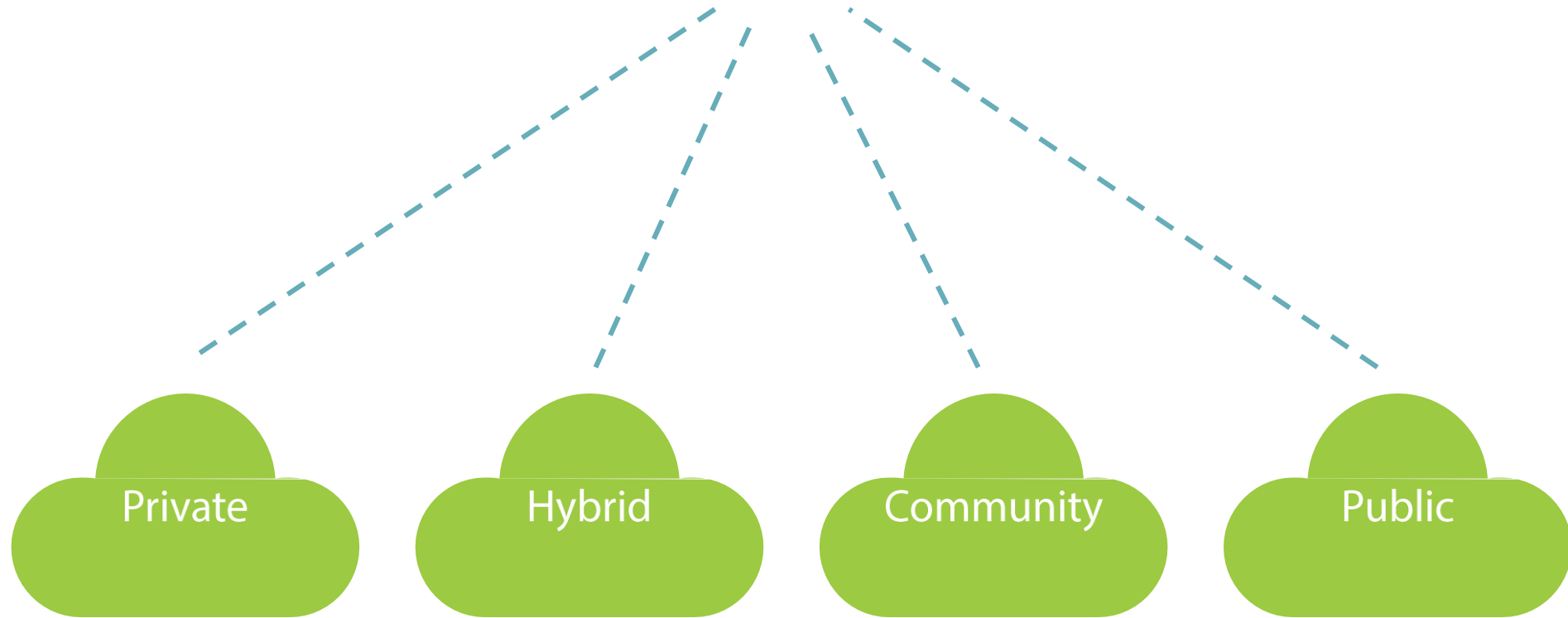|	
On-demand	Broad Network Access
Resource Pooling	Rapid Elasticity
Measured Service	

Key Dates in the History of Cloud Computing

AWS
July 2002

S3
March 2006

EC2
August 2006

Google App Engine
April 2008

Azure Beta
November 2009

Cloud Service Providers
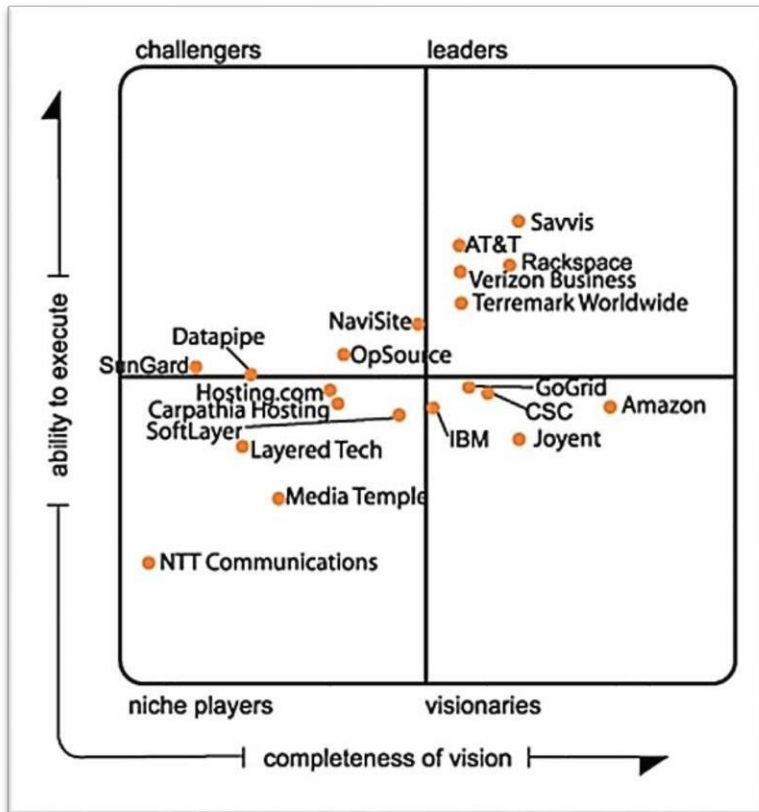
As of December 2010
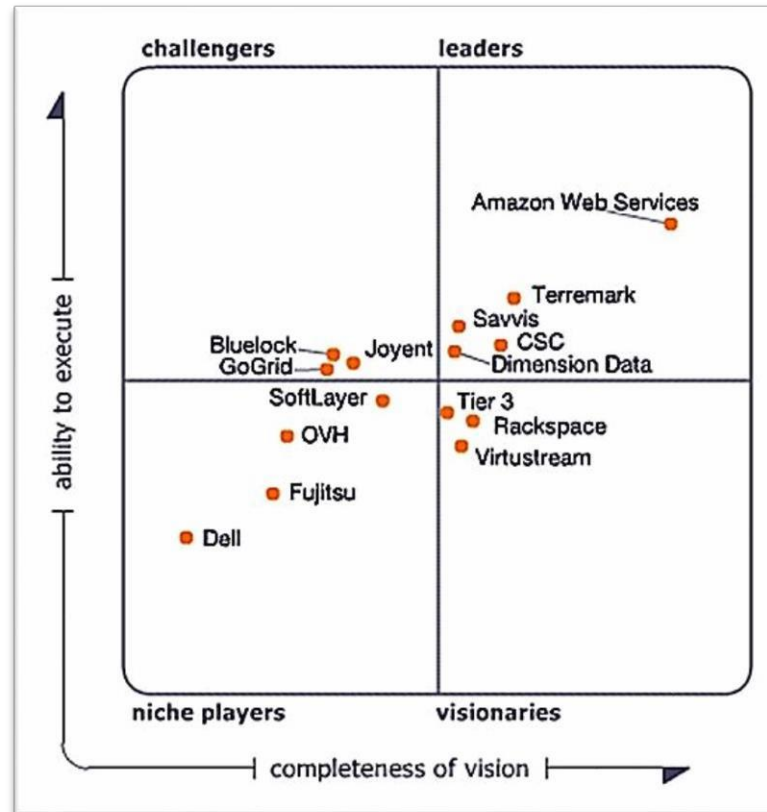
As of October 2012

As of August 2013

Cloud Service Providers

As of July 2014

Build and Operate → **Consume**

Summary

AWS Certifications

What Is Cloud Computing?

Build and Operate vs. Consume

Key Dates