



Cloud Computing



Definition

- What is cloud ?
 - Defining it through industry standard terms



Essential Characteristics

- On demand self service
 - Comparison of traditional environment and cloud environment
- Broad network access

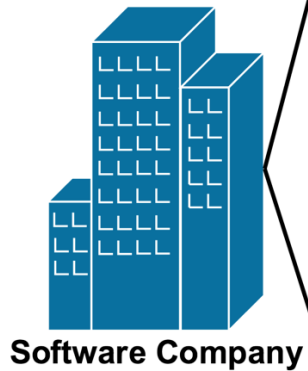


Essential Characteristics

- Resource pooling
- Rapid Elasticity

Common **Enterprise** Uses of Cloud Services

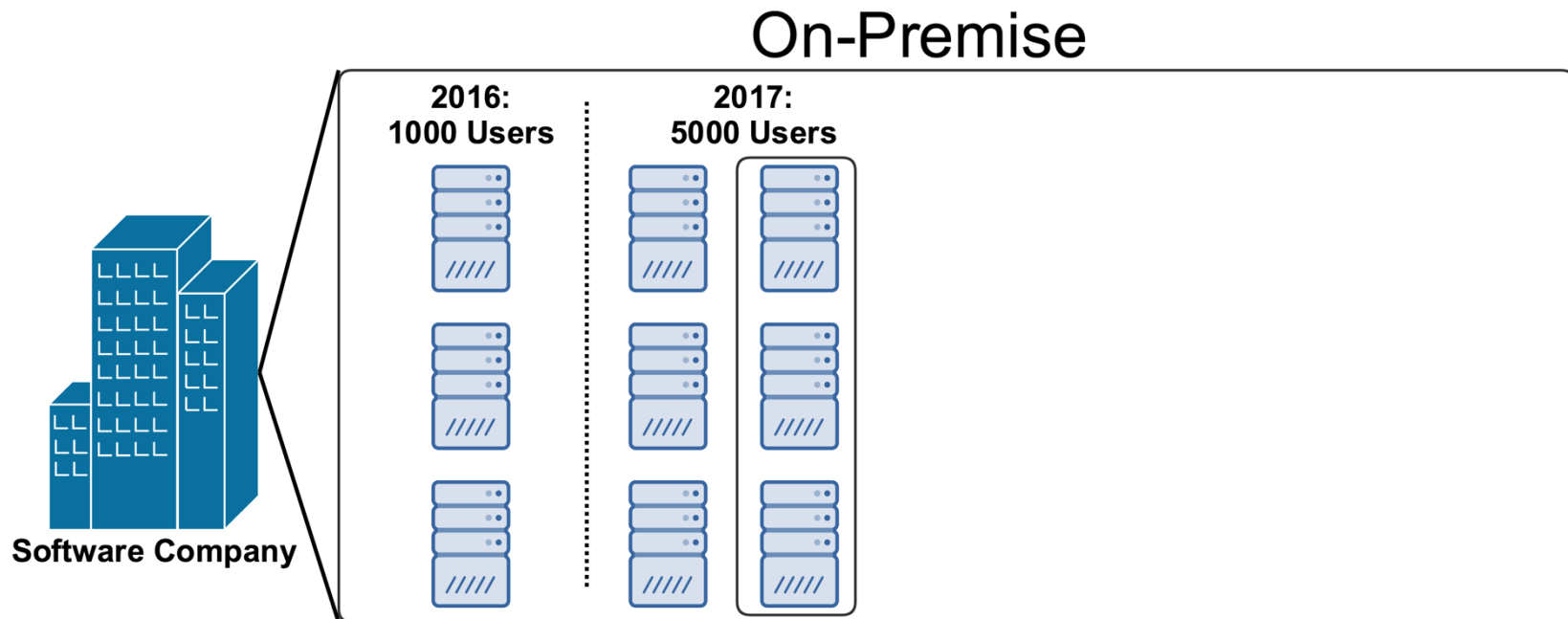
On-Premise



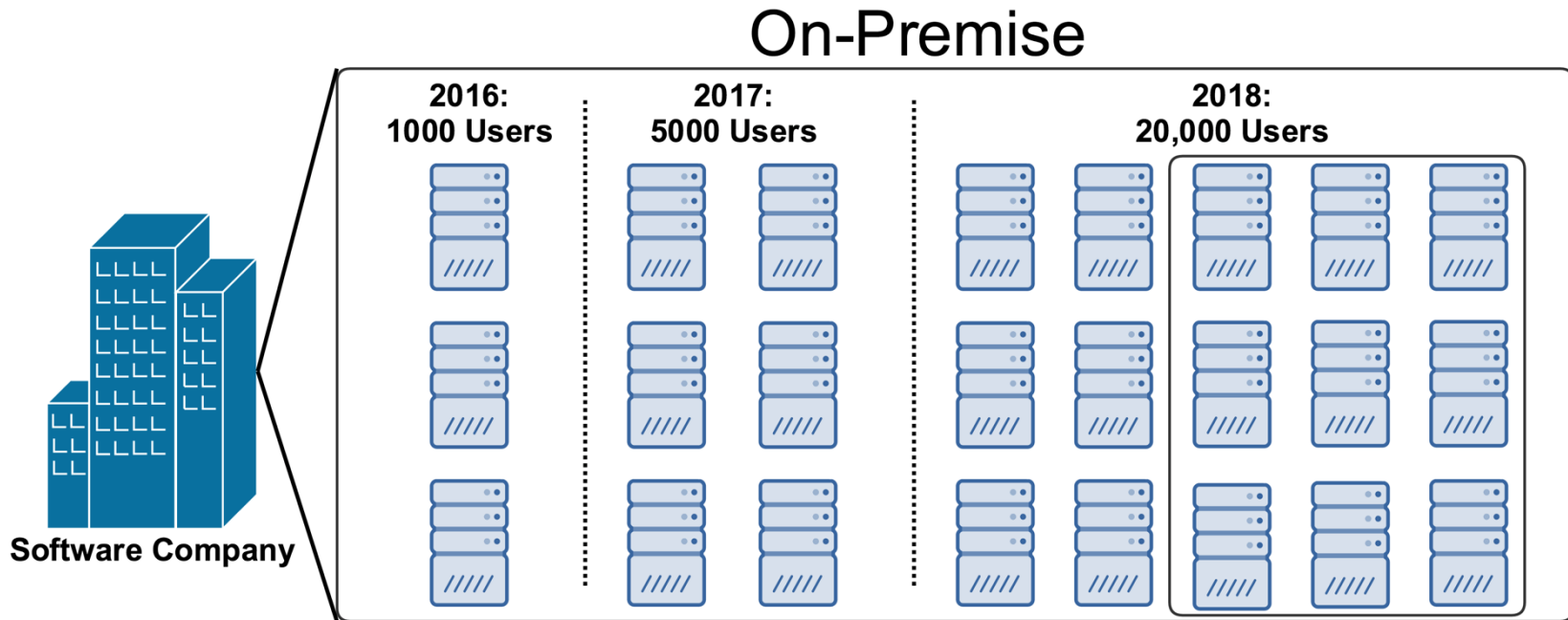
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Common **Enterprise** Uses of Cloud Services

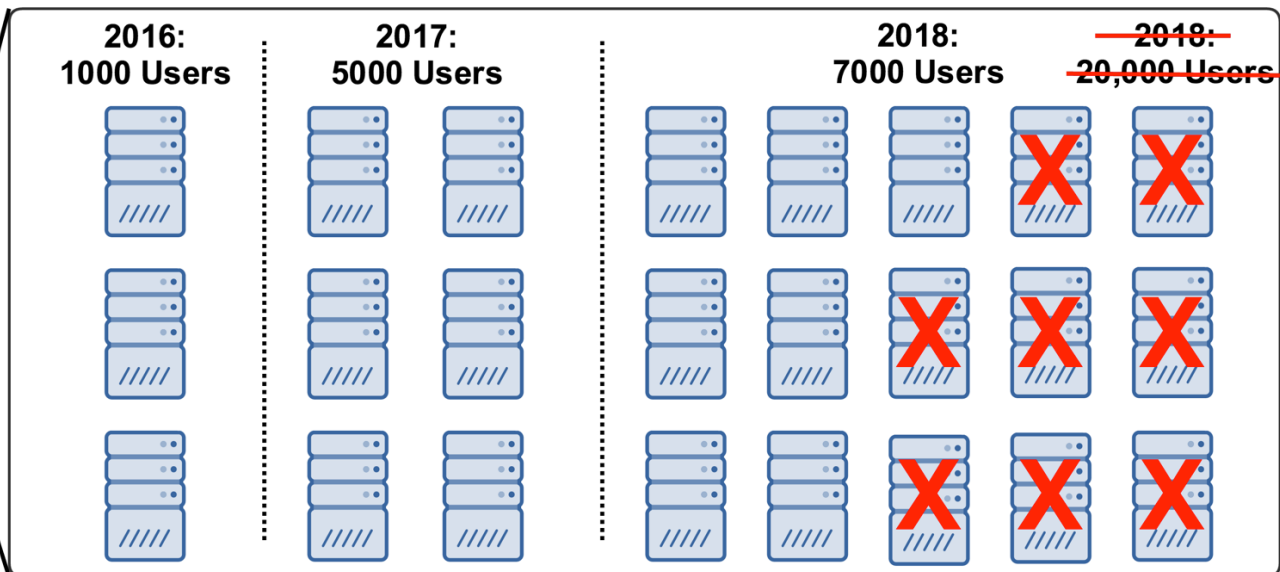
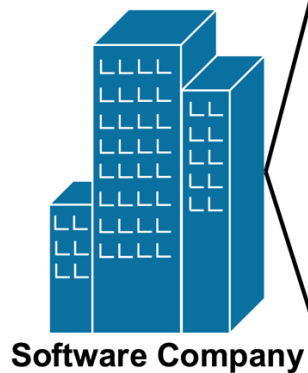


Common **Enterprise** Uses of Cloud Services

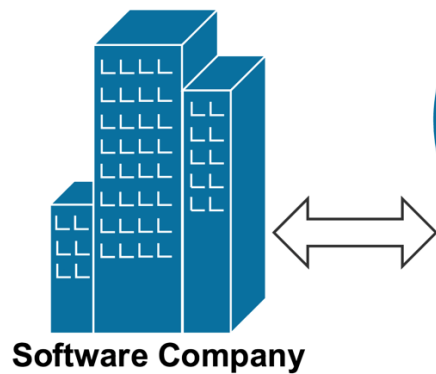


Common **Enterprise** Uses of Cloud Services

On-Premise



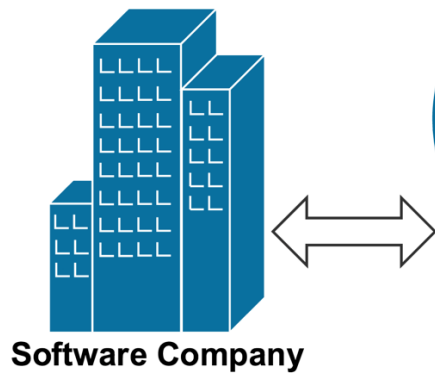
Common **Enterprise** Uses of Cloud Services



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Common **Enterprise** Uses of Cloud Services



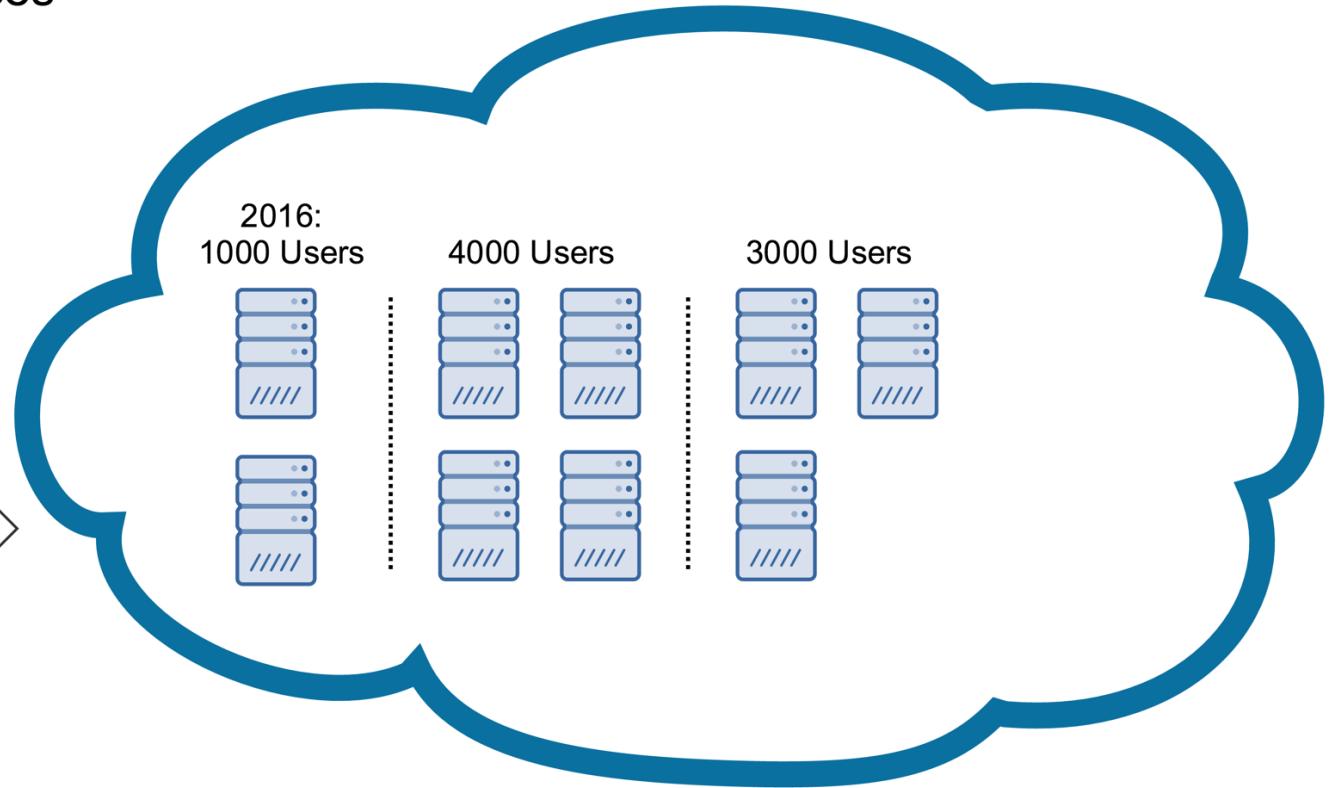
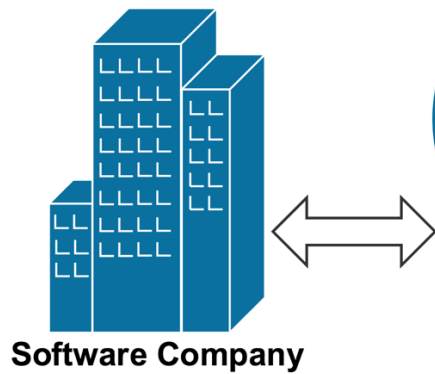
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4000 Users



Common **Enterprise** Uses of Cloud Services





Cloud Elasticity

- Peak hours
- Cloud size can be increased and decreased on-demand
- We say here clouds are auto scalable

Interview point : Earlier we used to take care of peak hours, now we go for elastic services

Why Cloud ?

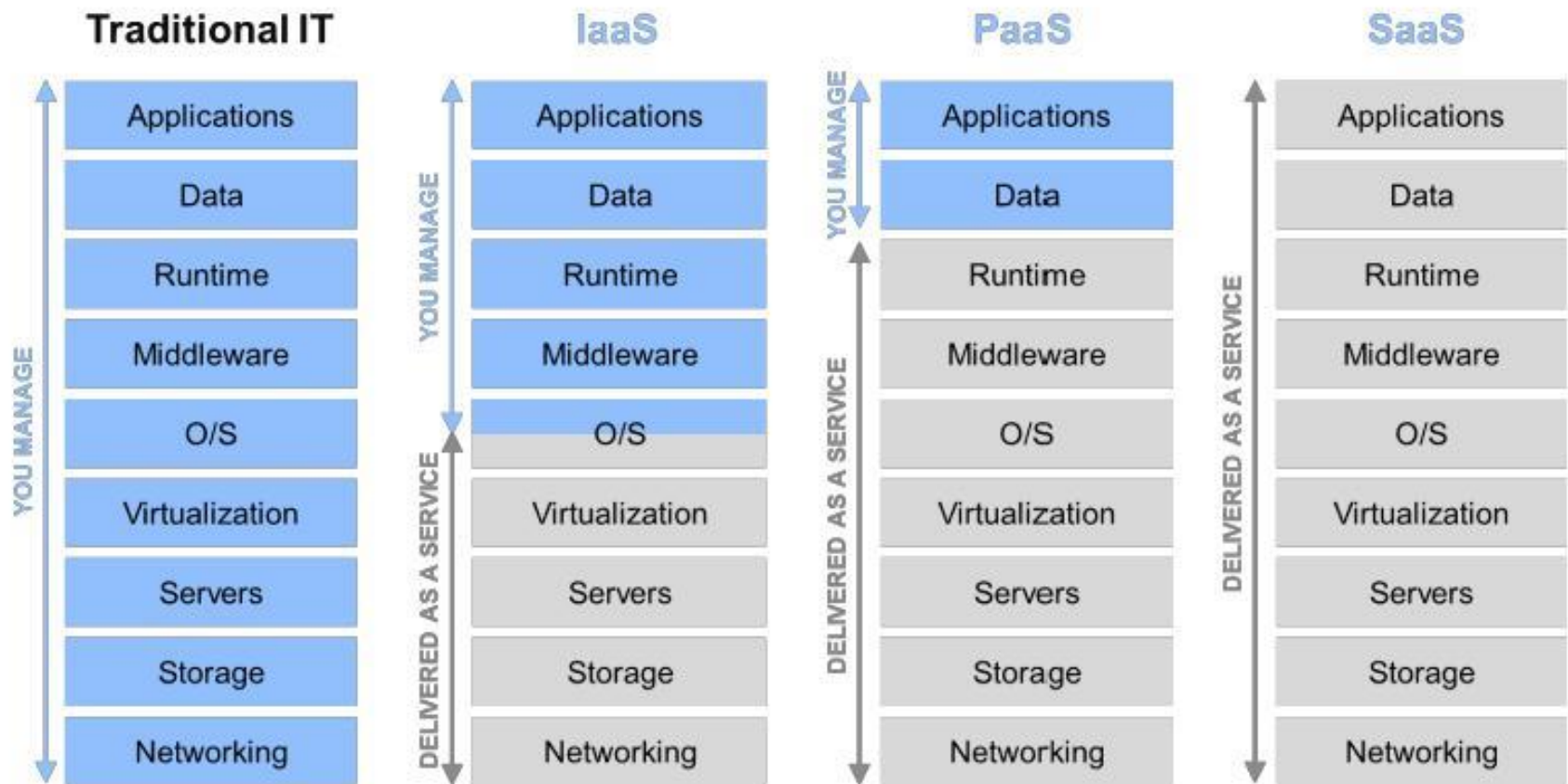
- Business media says 73% of the companies are going for cloud
- Understanding the TCO
- 80 – 20 rule
- Direct cost-comparisons between the Cloud and on-premise are difficult, calculations of in-house costs fail to take into account:
 - The direct costs that accompany running a server: power, floor space, storage, and IT operations to manage those resources.
 - The indirect costs of running a server: network and storage infrastructure and IT operations to manage the general infrastructure.
 - The overhead costs of owning a server: procurement and accounting personnel, not to mention a critical resource in short supply: IT management and its attention.



Four main areas in which Cloud Computing allows businesses to break from the past:

- Virtualization – The ability to increase computing efficiency
- Democratization of Computing – Bringing enterprise scale infrastructure to small and medium businesses
- Scalability and fast provisioning – Bringing web scale IT at a rapid pace
- Commoditization of infrastructure – Enabling IT to focus on the strategic aspects of its role

Service models or Cloud Stack



Source: Microsoft.



Deployment Models

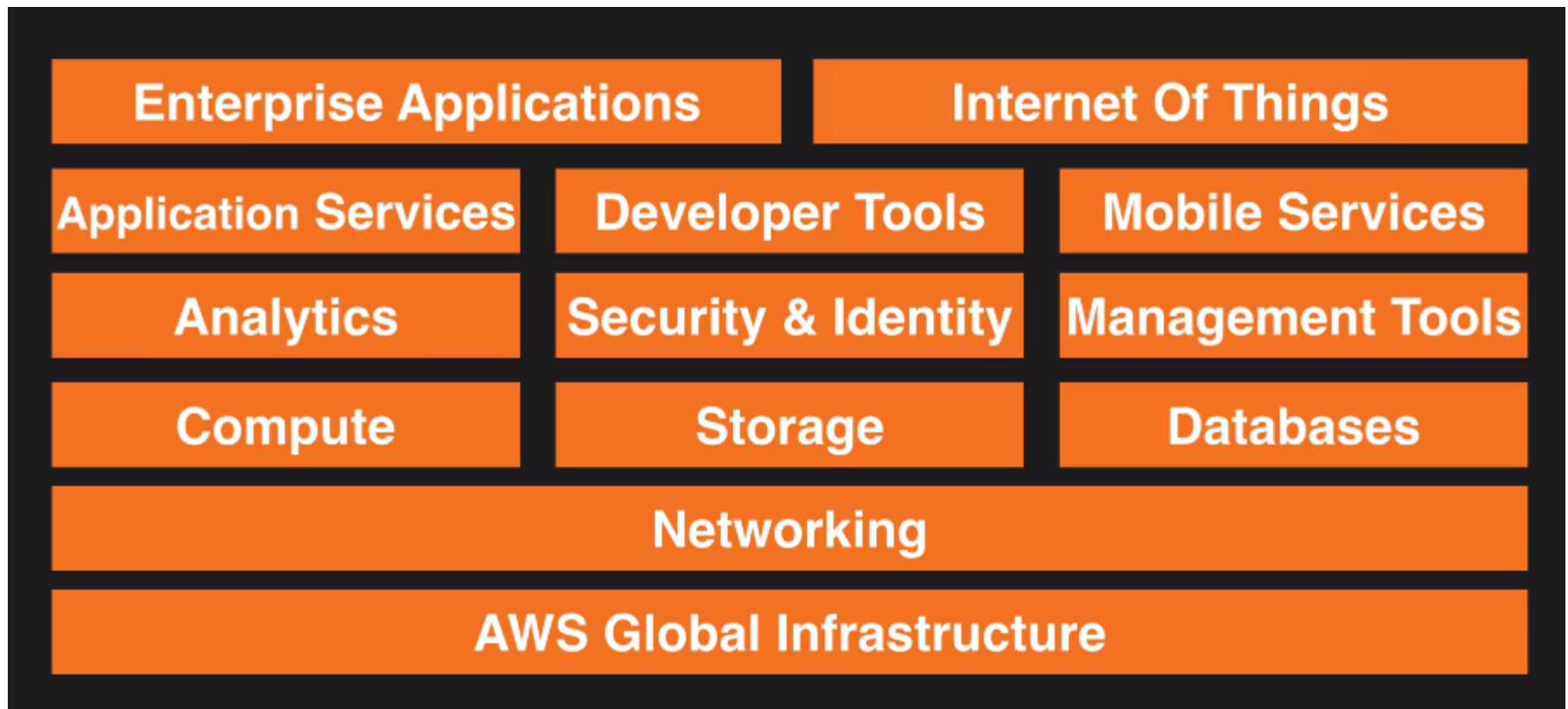
- Private Cloud
- Community Cloud
- Public Cloud
- Hybrid Cloud
 - Virtual private cloud
 - Cloud Burst



Why learn AWS ?

- Fastest growing cloud computing platform on the planet
- Largest public cloud computing platform on the planet
- More and more organizations are outsourcing their IT to AWS
- The AWS certifications are the most popular certifications right now
- The safest place to be in IT right now
- Gartner report

AWS Platform



S3 – Simple Storage Service

- S3 is object based storage i.e. it allows you to upload files
- Files can be from 1B to 5TB
- There is unlimited storage
- Files are stored in buckets
- Bucket names are unique globally
- Versioning
- Encryption



Amazon S3

S3

- S3 is simple key value store
 - Key (name of the object)
 - Value (data)
- Amazon guarantees 99.99% availability for S3
- Amazon guarantees 11 9's of durability for S3
- S3 provides Lifecycle management
- Secure data using ACL and Bucket policies



Amazon S3



S3 - Storage Tiers/Classes

- S3 (Standard) – 99.99% availability and 11 9's durability, stored redundantly across multiple devices in multiple facilities and is design to sustain loss of 2 facilities concurrently
- S3 IA (Infrequently accessed) – For data that is accessed less frequently , but requires rapid access when needed. Lower cost than S3, but requires a retrieval cost
- Reduced Redundancy Storage – Designed to provide 99.99% availability and 99.99% durability of objects over a year
- Glacier – Very cheap. Used for archival only. It takes 3-5 hours to retrieve from glaciers

S3 - Storage Tiers/Classes

	Standard	Standard - Infrequent Access	Reduced Redundancy Storage
Durability	99.999999999%	99.999999999%	99.99%
Availability	99.99%	99.9%	99.99%
Concurrent facility fault tolerance	2	2	1
SSL support	Yes	Yes	Yes
First byte latency	Milliseconds	Milliseconds	Milliseconds
Lifecycle Management Policies	Yes	Yes	Yes

Glaciers

- Glacier is extremely low cost storage for archival
- Amazon Glacier stores data for as little as \$0.01 per GB per month, and is optimized for data that is infrequently accessed and for retrieval times of 3-5 hours are suitable





Getting data on S3

- Upload to website
- Data Import/export
- Data pipeline

EC2 – Elastic Compute Cloud

- Backbone of AWS
- Provides resizable compute capability in cloud
- You pay for the capacity you use



Amazon EC2



Family	Speciality	Use case
D2	Dense Storage	Fileservers/Data Warehousing/Hadoop
R4	Memory Optimized	Memory Intensive Apps/DBs
M4	General Purpose	Application Servers
C4	Compute Optimized	CPU Intensive Apps/DBs
G2	Graphics Intensive	Video Encoding/ 3D Application Streaming
I2	High Speed Storage	NoSQL DBs, Data Warehousing etc
F1	Field Programmable Gate Array	Hardware acceleration for your code.
T2	Lowest Cost, General Purpose	Web Servers/Small DBs
P2	Graphics/General Purpose GPU	Machine Learning, Bit Coin Mining etc
X1	Memory Optimized	SAP HANA/Apache Spark etc

IAM – Identity and Access Management

- IAM allows you to manage users and their level of access to the AWS console
- Provides centralized control for your AWS account
- Granular permissions
- Identity federation
- Multifactor authentication
- Allows to set up password rotation policies





Volumes and Snapshots

- Volumes exist on EBS (Virtual HDD)
- Snapshots exists on S3
- You can take a snapshot of a volume, this will store that on S3
- Snapshots are point in time copies of volumes



EC2 labs

- Web server on EC2
- Bootstrapping
- Load Balancer
- AWS CLI
- Using roles to access S3
- Auto scaling



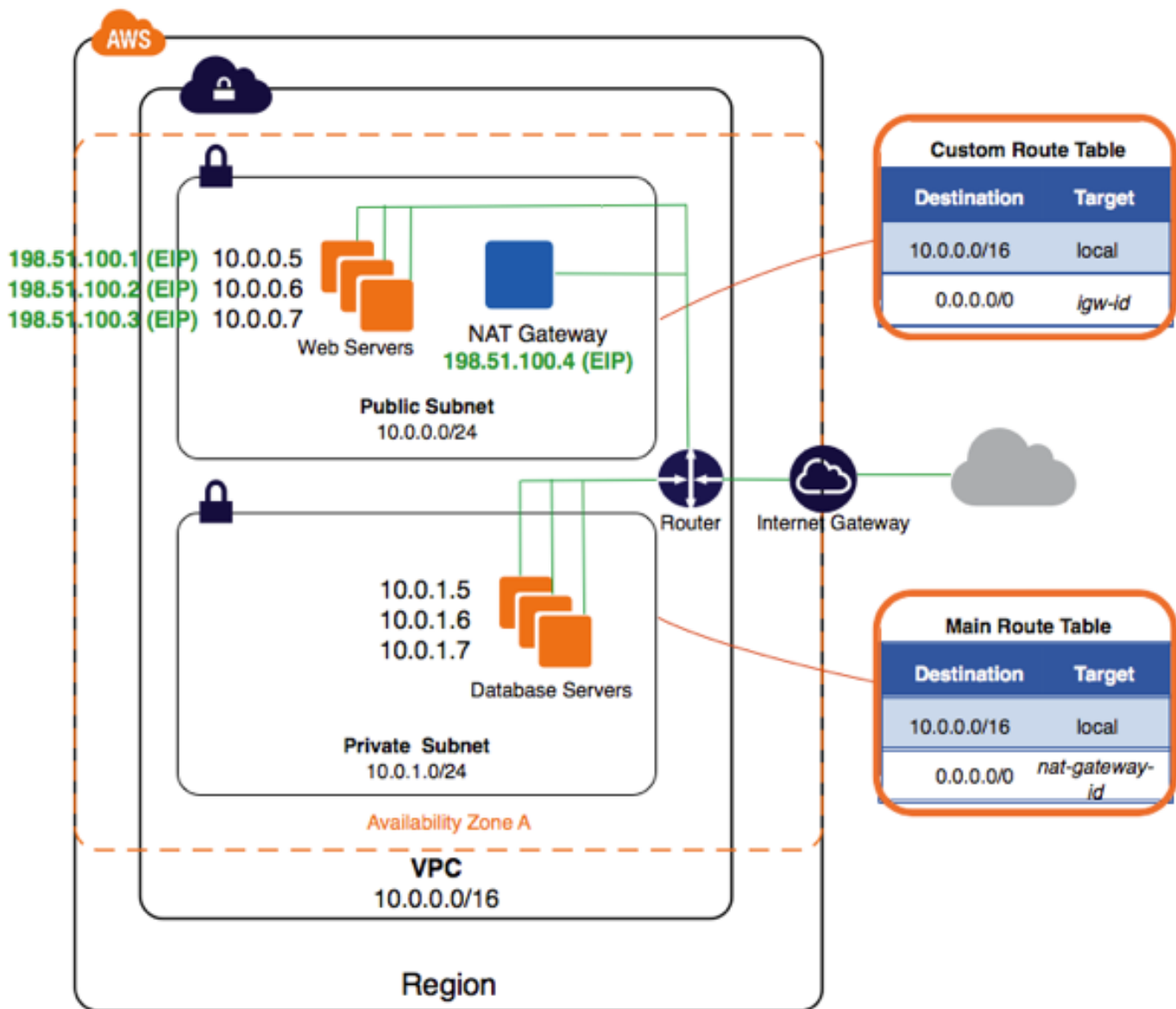
VPC

- Amazon Virtual Private cloud (VPC) lets you provision a logically isolated section of AWS cloud where you can launch AWS resources in a virtual network that you define
- You have complete control over virtual networking environment, including selection of your IP range, creation of subnet, configuration of route tables and network gateways
- Think of VPC as a logical datacentre in AWS



What can you do with a VPC

- Launch instances in a subnet of your choice
- Assign custom IP addresses
- Configure route tables between each subnet
- Create Internet Gateway and attach it to our VPC
- Much better security control over your AWS resources



Thank you

