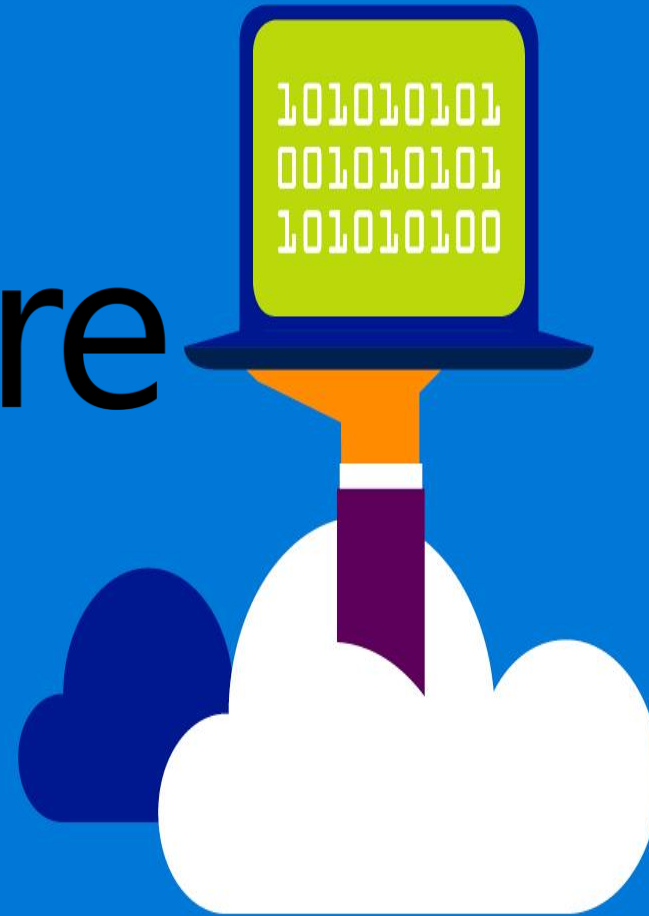


Microsoft Azure

PRESENTER – JITENDRA SINGH TOMAR



Today's Agenda

- ✓ Introduction to Cloud Computing
- ✓ Why Cloud Computing is a better option?
- ✓ How does Cloud Computing works?
- ✓ Services provided by Cloud.
- ✓ Cloud computing model – What's best?
- ✓ Cloud vendors in market.
- ✓ What is Microsoft Azure?
- ✓ Global foot print of Azure.



Introduction to Cloud Computing

- ✓ Cloud computing can be called a technology through which things like software, processing, and data storage are outsourced.
- ✓ There is only a need for an **internet connection**, an updated **web browser** and a compatible device for using a cloud computing service.
- ✓ Cloud computing makes computer system resources, especially storage and computing power, available on demand without direct active management by the user. [**By Wikipedia**]

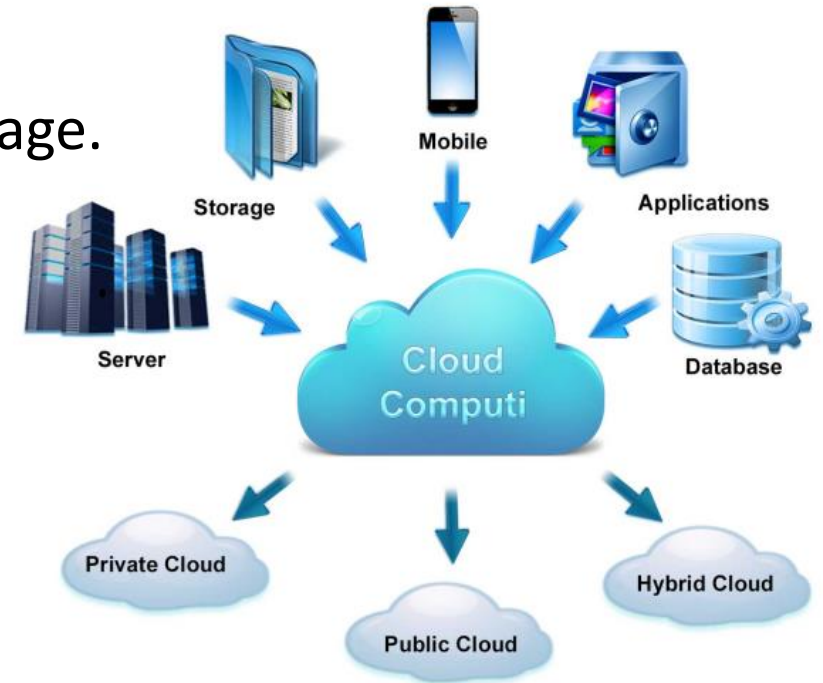
Cloud Computing

- ✓ 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. [By **NIST**]



Cloud Computing

- ✓ Central data center for providing services.
- ✓ On-demand, scalable, unlimited computation & storage.
- ✓ It's basically a data center.
- ✓ 4 characteristics of a Cloud:
 - Everything is a Service (backup, firewall, network...)
 - Elasticity in nature
 - HA – 99.99% SLA
 - Unlimited computation power.
- ✓ Any DC that provides above 4 chars is a cloud



High availability

Availability %	Downtime per year ^[note 1]	Downtime per month	Downtime per week	Downtime per day
55.5555555% ("nine fives")	162.33 days	13.53 days	74.92 hours	10.67 hours
90% ("one nine")	36.53 days	73.05 hours	16.80 hours	2.40 hours
95% ("one and a half nines")	18.26 days	36.53 hours	8.40 hours	1.20 hours
97%	10.96 days	21.92 hours	5.04 hours	43.20 minutes
98%	7.31 days	14.61 hours	3.36 hours	28.80 minutes
99% ("two nines")	3.65 days	7.31 hours	1.68 hours	14.40 minutes
99.5% ("two and a half nines")	1.83 days	3.65 hours	50.40 minutes	7.20 minutes
99.8%	17.53 hours	87.66 minutes	20.16 minutes	2.88 minutes
99.9% ("three nines")	8.77 hours	43.83 minutes	10.08 minutes	1.44 minutes
99.95% ("three and a half nines")	4.38 hours	21.92 minutes	5.04 minutes	43.20 seconds
99.99% ("four nines")	52.60 minutes	4.38 minutes	1.01 minutes	8.64 seconds
99.995% ("four and a half nines")	26.30 minutes	2.19 minutes	30.24 seconds	4.32 seconds
99.999% ("five nines")	5.26 minutes	26.30 seconds	6.05 seconds	864.00 milliseconds
99.9999% ("six nines")	31.56 seconds	2.63 seconds	604.80 milliseconds	86.40 milliseconds
99.99999% ("seven nines")	3.16 seconds	262.98 milliseconds	60.48 milliseconds	8.64 milliseconds
99.999999% ("eight nines")	315.58 milliseconds	26.30 milliseconds	6.05 milliseconds	864.00 microseconds
99.9999999% ("nine nines")	31.56 milliseconds	2.63 milliseconds	604.80 microseconds	86.40 microseconds

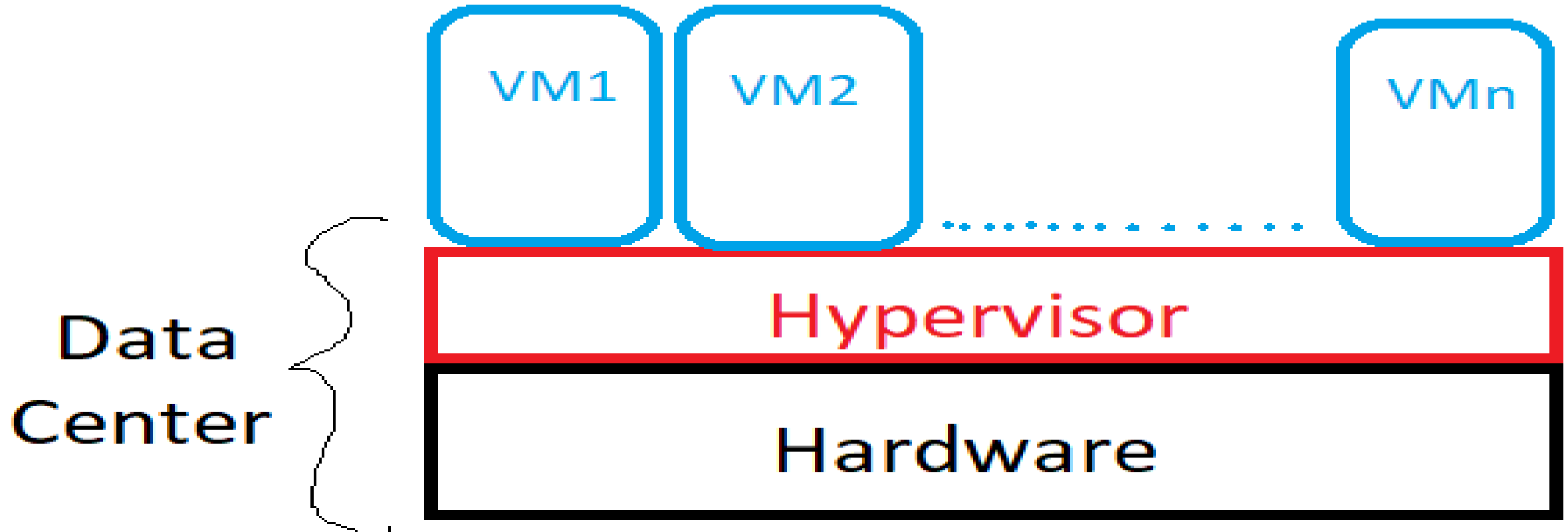
Generation-1/On-Premises DC

- ✓ Power supply
- ✓ Network devices
- ✓ Storage devices
- ✓ Server racks
- ✓ Space
- ✓ Scalable options
- ✓ Administrators for Servers, Networks, etc..

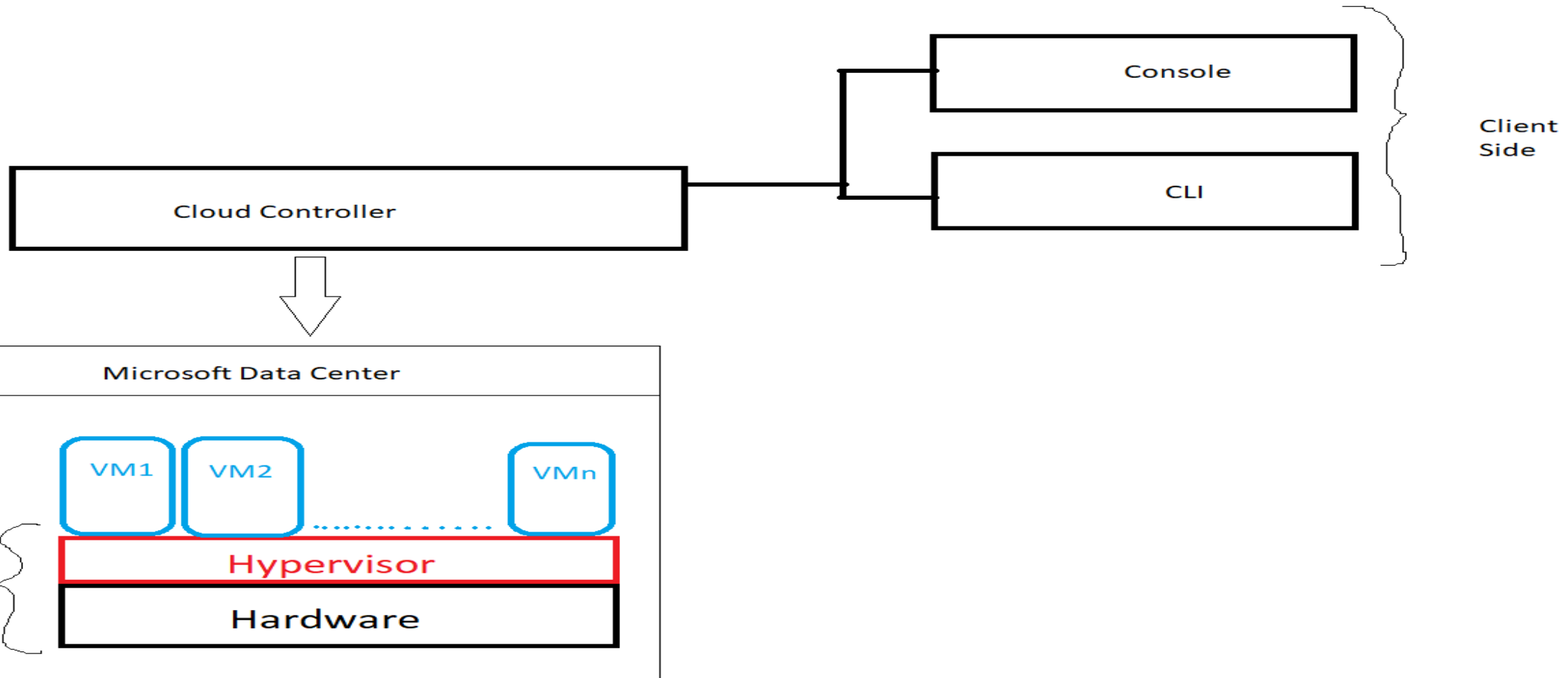
Generation-2/Virtualized DC

- ✓ Achieved using tool called “Hypervisor”.
- ✓ Advantages of using virtualization:
 - No maximum limit for a VM.
 - Centralized monitoring.
 - Software defined.
- ✓ There are different types of Virtualization”
 - Hardware virtualization
 - Network virtualization
 - Desktop virtualization
 - Storage virtualization

Generation-2/Virtualized DC



Generation 2 to cloud.



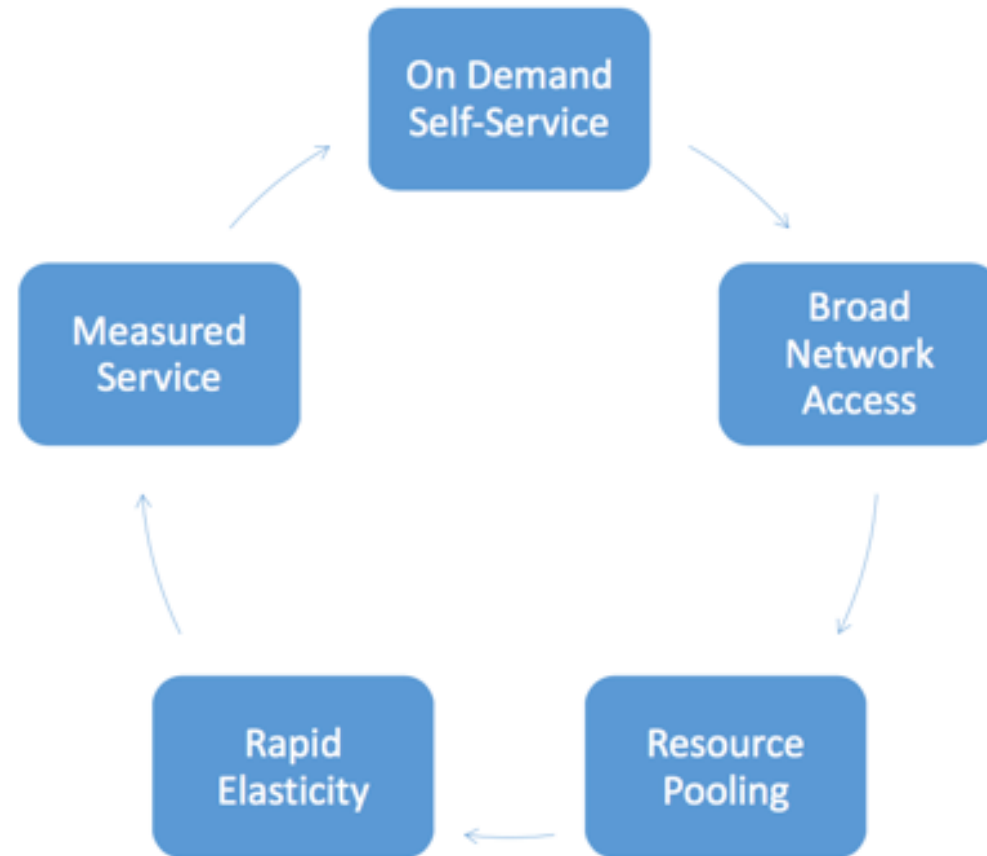
Why cloud computing is a better option?

- ✓ Highly scalable and flexible
- ✓ Low-cost solution
- ✓ Faster and secure
- ✓ Global Access
- ✓ Productive
- ✓ Hybrid
- ✓ Intelligent



Five Essential Characteristics of Cloud

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



Five Essential Characteristics of Cloud

1. **On-demand self-service**

- ✓ Resources are instantly available when needed.

2. **Broad network access**

- ✓ Access anytime or anywhere a connection to the Internet exists.

3. **Resource pooling**

- ✓ Data center resources are pooled together optimizing quality of service.

4. **Rapid elasticity**

- ✓ The ability to add or remove computing resources based on need.

5. **Measured service**

- ✓ The ability to measure resource usage and charge customers.

Services provided by Cloud

- ✓ Infrastructure as a Service (**IaaS**)
- ✓ Platform as a Service (**PaaS**)
- ✓ Software as a Service (**SaaS**)

Infrastructure as a Service (IaaS)

- ✓ IaaS is a fully self-service model that delivers infrastructure resources via virtualization technologies.
- ✓ IaaS comprises scalable computing, storage, and security capabilities accessed on an API or dashboard.
- ✓ Examples of IaaS
 - Amazon Web Services (AWS)
 - HP Cloud Services
 - Microsoft Windows Azure
 - Rackspace Cloud
 - IBM Smart Cloud
 - VMware
 - GoGrid

Platform as a Service (PaaS)

- ✓ PaaS provides a framework for developers to create their own applications. Essential, PaaS gives developers an online platform to create and manage software without worrying about maintaining everything else.
- ✓ Examples of PaaS
 - Amazon Web Services (AWS)
 - Microsoft Windows Azure
 - Google App
 - IBM SmartCloud Application services
 - Force.com

Software as a Service (SaaS)

- ✓ SAAS is the most common cloud deployment model. SaaS refers to applications delivered over the Internet that a third party manages.
- ✓ In easy words, the user doesn't have to worry about hosting, downloading, or updating any software. SaaS applications are typically accessed and ran via a Web browser, eliminating the need to download software onto a user's machines.
- ✓ Examples of SaaS
 - Salesforce CRM
 - Basecamp
 - Intuit QuickBooks
 - Constant Contact
 - NetSuite
 - Google Docs

Pizza as a Service



Business manages everything
(no cloud computing)

IAAS

PAAS

SAAS

Applications

Applications

Applications

Applications

Data

Data

Data

Data

Runtime

Runtime

Runtime

Runtime

Middleware

Middleware

Middleware

Middleware

Operating System

Operating System

Operating System

Operating System

Virtualization

Virtualization

Virtualization

Virtualization

Servers

Servers

Servers

Servers

Storage

Storage

Storage

Storage

Networking

Networking

Networking

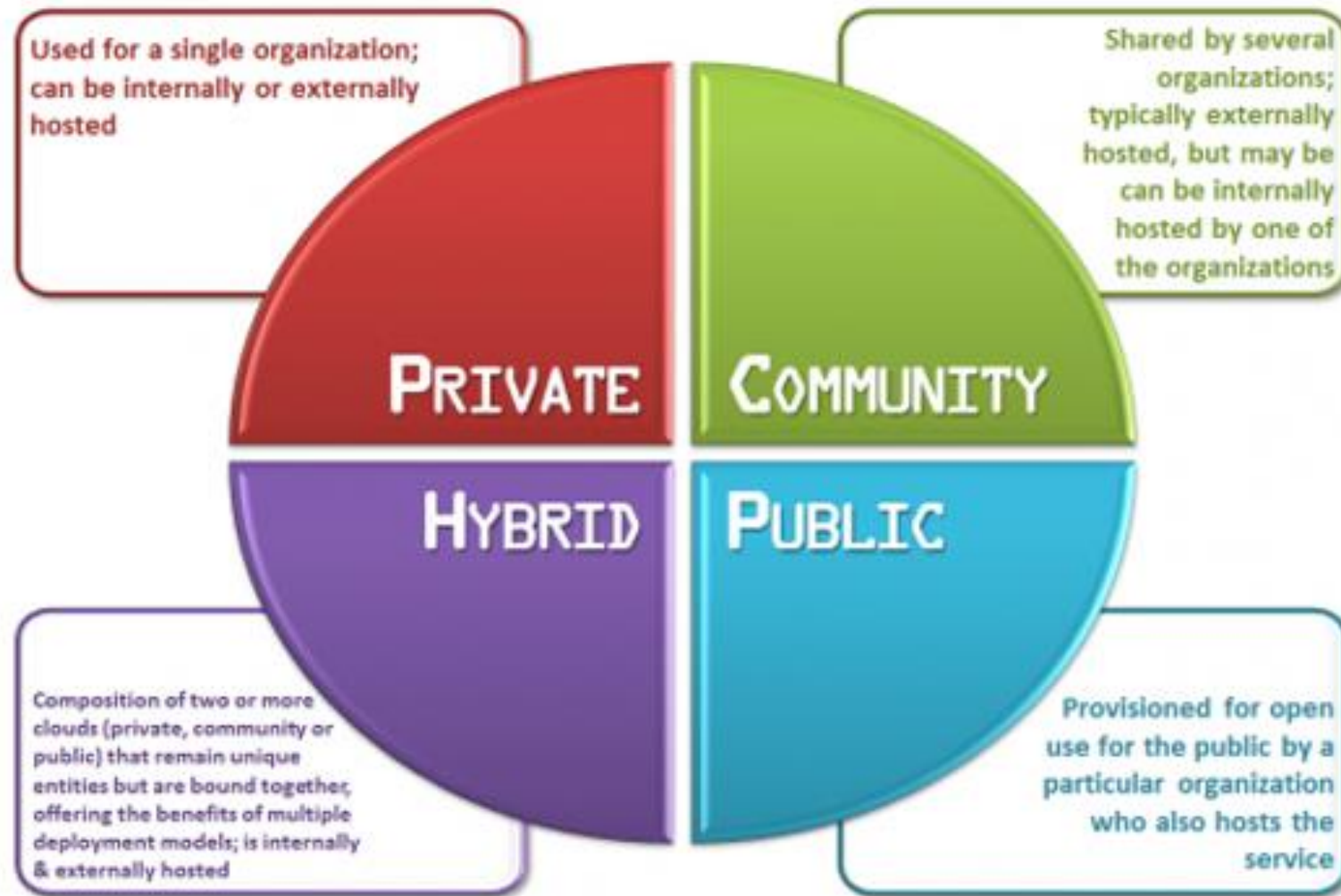
Networking

Key:

You manage

Vendor manages

Cloud Deployment Models



Cloud Deployment Models:

✓ **Public cloud**

- You use shared (isolated/without knowing others) resources.
- Secure in nature.

✓ **Private cloud**

- You OWN the resources & not sharing with others.
- More secure, More costly.

✓ **Hybrid cloud**

- Public cloud + Private cloud
- Could be used the scenario where security is bit of a concern.
- Private cloud will store: confidential info
- Public cloud will be used to share the info among limited people.

Benefits of Cloud computing

✓ **Cost**

- No h/w, s/w, on-prem data centers

✓ **Global scale**

- Elastic in nature (any time scale-in/out).

✓ **Performance**

- Reduced n/w latency.

✓ **Speed**

- Self-service, on-demand, flexibility.

✓ **Productivity**

- No racks & stacks, no h/w setup, no s/w patching.

✓ **Reliability**

- Data backup, easy & cheap DR, redundant.

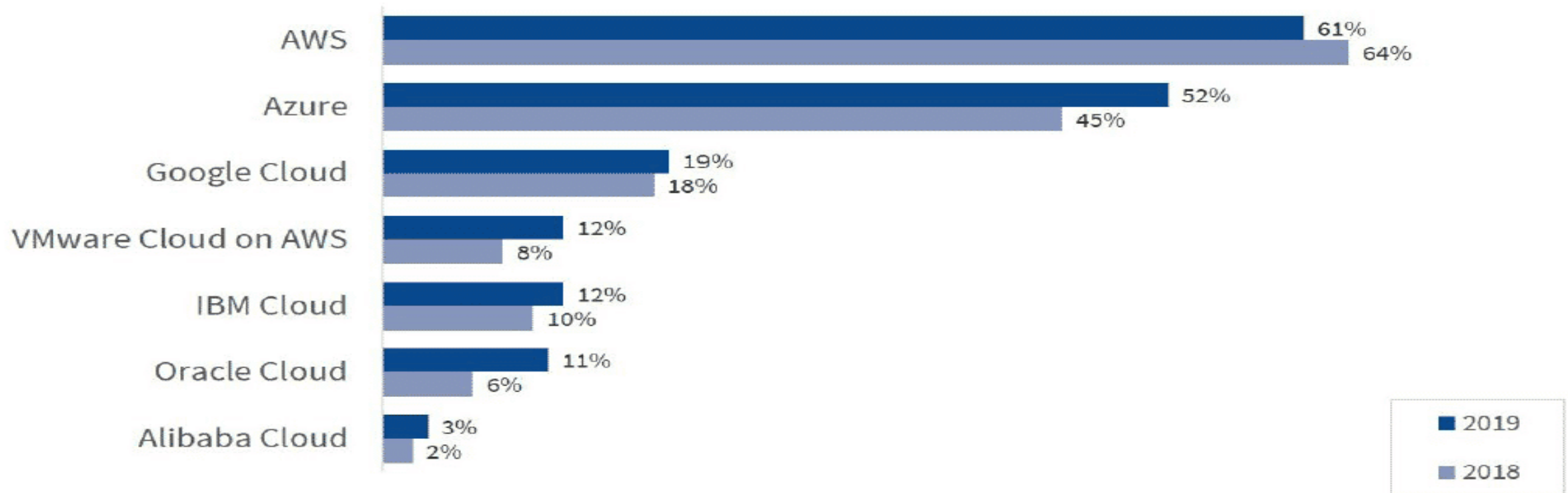
Why should I move to the cloud?

- ✓ A nearly limitless pool of raw compute, storage, and networking components.
- ✓ Speech recognition and other cognitive services that help make your application stand out from the crowd.
- ✓ Analytics services that enable you to make sense of telemetry data coming back from your software and devices.

Cloud Adoption - 2019

Public Cloud Adoption

% of All Respondents



Source: RightScale 2019 State of the Cloud Report from Flexera

Cloud vendors in market

- ✓ AWS
- ✓ Azure
- ✓ Google Cloud
- ✓ Alibaba
- ✓ IBM
- ✓ VMWare
- ✓ Rackspace
- ✓ Adobe



Google Cloud Platform

What is Microsoft Azure?

- ✓ Microsoft Azure is an ever-expanding set of cloud services to help your organization meet your business challenges.
- ✓ It's the freedom to build, manage, and deploy applications on a massive, global network using your favorite tools and frameworks.
- ✓ Microsoft Azure (formerly Windows Azure) is a cloud computing service created by Microsoft for building, testing, deploying, and managing applications and services through Microsoft-managed data centers.

Global footprint - Azure regions

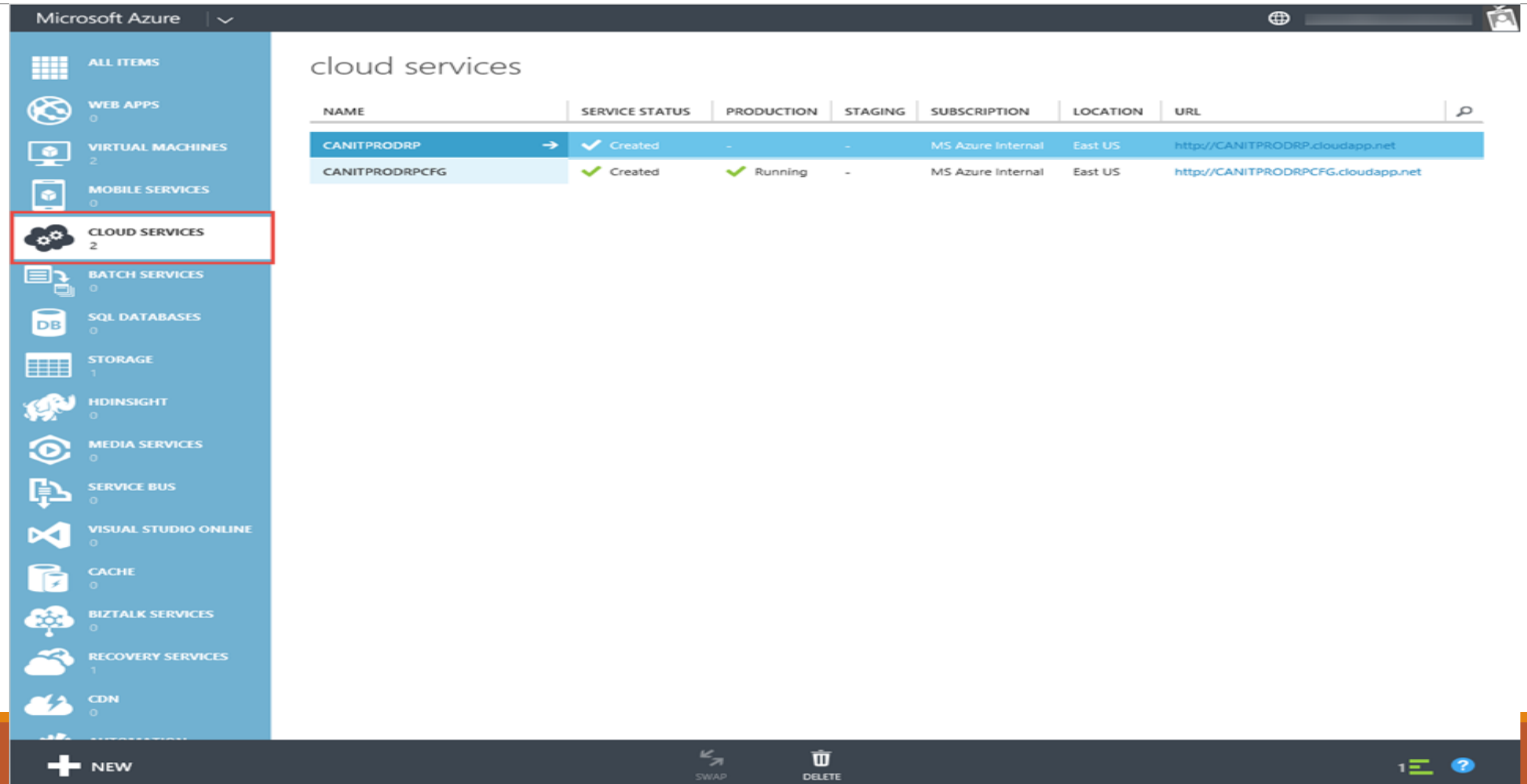


55 regions worldwide available in 140 countries

Accessing Azure

- ✓ GUI – New (ARM)
- ✓ GUI – Old (ASM)
- ✓ PowerShell
- ✓ Azure cloud shell
- ✓ REST API

Old Portal – Azure Service Manager (ASM)



The screenshot displays the Microsoft Azure portal interface. On the left, a sidebar lists various Azure services, with 'CLOUD SERVICES' (2) highlighted by a red box. The main content area, titled 'cloud services', shows a table with two entries:

NAME	SERVICE STATUS	PRODUCTION	STAGING	SUBSCRIPTION	LOCATION	URL
CANITPRODRP	✓ Created	-	-	MS Azure Internal	East US	http://CANITPRODRP.cloudapp.net
CANITPRODRPCFG	✓ Created	✓ Running	-	MS Azure Internal	East US	http://CANITPRODRPCFG.cloudapp.net

The bottom of the interface features a dark blue bar with a '+ NEW' button, 'SWAP' and 'DELETE' icons, and a notification area showing '1' items and a help icon.

New Portal – Azure Resource Manager (ARM)

The screenshot displays the Microsoft Azure portal interface. On the left is a dark navigation pane with the 'Microsoft Azure' logo at the top. Below the logo is a 'Home' button. The main navigation list includes: 'Create a resource' (with a green plus icon), 'Home' (with a house icon), 'Dashboard' (with a bar chart icon), 'All services' (with a list icon), a 'FAVORITES' section, 'All resources' (with a grid icon), 'Subscriptions' (with a key icon), 'Resource groups' (with a folder icon), 'App Services' (with a globe icon), 'Function Apps' (with a lightning bolt icon), and 'SQL databases' (with a SQL icon). The main content area has a search bar at the top with the placeholder text 'Search resources, services, and docs'. Below the search bar is the 'Azure services' section, which includes a 'See all (+100)' link and four service tiles: 'Virtual machines' (with a monitor icon), 'Storage accounts' (with a storage icon), 'App Services' (with a globe icon), and 'SQL databases' (with a SQL icon). Further down is the 'Make the most out of Azure' section, featuring two promotional tiles. The first tile, titled 'Learn Azure with free online courses by Microsoft', includes a 'Microsoft Learn' link with an external link icon. The second tile, titled 'Monitor your apps and infrastructure', includes an 'Azure Monitor' link with an external link icon.

Microsoft Azure

Home

Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Subscriptions

Resource groups

App Services

Function Apps

SQL databases

Search resources, services, and docs

Azure services [See all \(+100\) >](#)

Virtual machines

Storage accounts

App Services

SQL databases

Make the most out of Azure

Learn Azure with free online courses by Microsoft

[Microsoft Learn](#)

Monitor your apps and infrastructure

[Azure Monitor](#)

Accessing azure (Cloud Shell)

```
PowerShell ▾ | 🔌 ? ⚙️ 📄 📁 {}  
Your cloud drive has been created in:  
  
Subscription Id: ccdfec5c-5f39-453d-a0bc-fd9686281f9c  
Resource group: cloud-shell-storage-centralindia  
Storage account: csgccdfec5c5f39x453dxa0b  
File share:      cs-rpainfra0011-outlook-com-10032000397174ee  
  
Initializing your account for Cloud Shell...-  
Requesting a Cloud Shell.Succeeded.  
Connecting terminal...  
  
Welcome to Azure Cloud Shell  
  
Type "az" to use Azure CLI 2.0  
Type "help" to learn about Cloud Shell  
  
MOTD: Discover installed Azure modules: Get-Module Az* -ListAvailable  
  
VERBOSE: Authenticating to Azure ...  
VERBOSE: Building your Azure drive ...  
Azure:/  
PS Azure:\> 
```

Accessing azure (PowerShell)

```
PS C:\scripts> Get-AzSubscription | fl
```

```
Id : [REDACTED]
Name : MSDN Platforms
State : Enabled
SubscriptionId : [REDACTED]
TenantId : [REDACTED]
CurrentStorageAccountName :
ExtendedProperties : {[Account, jeetu.singh5591@hotmail.com], [Tenants, [REDACTED]],
[Environment, AzureCloud]}
CurrentStorageAccount :
```


Azure services

[Overview](#) [Solutions](#) [Products](#) ^ [Documentation](#) [Pricing](#) [Training](#) [Marketplace](#) v [More](#) v



[Portal](#)

[Free account](#) >

⚡ Featured

[AI + Machine Learning](#)

[Analytics](#)

[Blockchain](#)

[Compute](#)

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[Databases](#)

[Developer Tools](#)

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[Migration](#)

[Mixed Reality](#)

[Mobile](#)

[Networking](#)

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Featured

Explore some of the most popular Azure products

[Virtual Machines](#)

Provision Windows and Linux virtual machines in seconds

[Windows Virtual Desktop](#)

The best virtual desktop experience, delivered on Azure

[Azure SQL Database](#)

Managed, intelligent SQL in the cloud

[App Service](#)

Quickly create powerful cloud apps for web and mobile



Free services (for 12 months)

▪ Linux Virtual Machines (750Hrs)	▪ Windows Virtual Machines (750Hrs)
▪ Managed Disks (64 GB x 2)	▪ Blob Storage (5 GB)
▪ File Storage (5 GB)	▪ SQL Database (250 GB)
▪ Azure Cosmos DB (5 GB)	▪ Bandwidth (Data Transfer) (15 GB)
▪ Computer Vision (AI + MACHINE LEARNING/5,000 transactions)	▪ Personalizer (AI + MACHINE LEARNING / 50,000 transactions)
▪ Translator Text (AI + MACHINE LEARNING / 2,000,000 characters)	▪ Anomaly Detector (AI + MACHINE LEARNING / 20,000 transactions)
▪ Form Recognizer (AI + MACHINE LEARNING / 500 pages)	▪ QnA Maker (AI + MACHINE LEARNING / 3 days)























Products that are always free

- App Service (10)
- Functions (1,000,000 requests per month)
- Event Grid (INTEGRATION, 100,000)
- Azure Kubernetes Service (AKS)
- DevTest Labs
- Active Directory B2C (50,000, authentications per month)

Azure Subscriptions

- ✓ Free Trial
- ✓ Pay-As-You-Go
- ✓ 12-Months-Plan (Prepaid)
- ✓ Developer Support (MSDN)
- ✓ Professional Direct Support
- ✓ Standard Support
- ✓ Enterprise

What can be deployed to Azure?

GENERAL (15)		
 All resources	★	
 Management groups	★	
 Resource groups	★	
 Reservations	★	
 Help + support	★	
 Templates	PREVIEW ★	
 What's new	★	
 Shared dashboards	★	
COMPUTE (23)		
 Virtual machines	★	
 Virtual machine scale sets	★	
 Function Apps	★	
		
Compute		 Ubuntu Server 18.04 VM Learn more
Networking		
Storage		 Web App Quickstart tutorial
Web		
Mobile		
Containers		 SQL Database Quickstart tutorial
Databases		
Analytics		 Serverless Function App Quickstart tutorial
AI + Machine Learning		
Internet of Things		 Cosmos DB Quickstart tutorial
Integration		
Security		 Kubernetes Service Quickstart tutorial
Identity		
Developer Tools		 DevOps Project Quickstart tutorial
Management Tools		
Software as a Service (SaaS)		
Blockchain		 Storage Account Quickstart tutorial

Requirements to run an environment

- ✓ Similar to an on-premises data center, Azure also have some requirements to run an environment.
- ✓ Few of them are as follows:
 - VNet
 - Storage
 - Specific port rules (3389,22)
 - Resource Group
 - DNS
 - Etc..

SLA for azure resources

✓ **Virtual Machines**

- 99.9% SLA for Single instance
- 99.99% SLA for VMs deployed in same Azure region. (AS)

✓ **Storage Durability**

- Read: 99.9% (LRS, ZRS, GRS)
- Write: 99.9% (LRS, ZRS, GRS) ,RA-GRS : 99.99%

✓ **App service**

- 99.95% for customer subscription, No SLA is provided for Apps under either the Free or Shared tiers.

✓ **Azure Active Directory**

- 99.9% availability of the Azure Active Directory Basic and Premium services

Migrate on-premises machines to Azure

- ✓ Supported setup:
 - VMware VMs.
 - Physical servers.
 - Hyper-V VMs.



Azure calculator



Virtual Machines

REGION:

West US



OPERATING SYSTEM:

Windows



TYPE:

(OS Only)



TIER:

Standard



INSTANCE:

D2 v3: 2 vCPU(s), 8 GB RAM, 50 GB Temporary storage, US\$ 0.21/hour



Billing Option

Save up to 72% on pay-as-you-go prices with 1-year or 3-year Reserved Virtual Machine Instances. Reserved Instances are great for applications with steady-state usage and applications that require reserved capacity. [Learn more about Reserved VM Instances pricing.](#)

- ☒ Pay as you go
- ☐ 1 year reserved (~18% savings)
- ☐ 3 year reserved (~32% savings)

Azure calculator

<input type="text" value="1"/>	×	<input type="text" value="730"/>	=	US\$ 152.57
Virtual machines		Hours		Per month

 Virtual Machines are billed per-second. [Learn more about Virtual Machines pricing.](#)

Managed OS Disks

TIER:

Standard HDD

DISK SIZE:

S4: 32 GiB, US\$ 1.54/month



ADD SNAPSHOT

<input type="text" value="0"/>	×	US\$ 1.54	=	US\$ 0.00
Disks		Per month		

Storage transactions

<input type="text" value="100000"/>	×	US\$ 0.00	=	US\$ 50.00
Transaction units (10,000 transactions)		Per unit		

Sub-total **US\$ 202.57**

Azure Updates

December 2019

30 Dec [Service-aided subnet configuration for managed instance in Azure SQL Database is now available](#)

■■■ NOW AVAILABLE

To address customer security and manageability requirements, managed instance, a deployment capability of Azure SQL Database, is transitioning from a manual to service-aided subnet configuration.

Azure SQL Database

Managed Instance

26 Dec [Azure Migrate now supports assessment of physical servers](#)

■■■ IN PREVIEW

TARGET AVAILABILITY: Q4 2019

Support to assess physical servers is now available in Azure preview, in addition to existing support for VMware and Hyper-V servers. The appliance for physical servers can be installed on an existing Windows server. This feature can be used to assess virtual machines where there is no access to the hypervisor, as well as virtual machines on any cloud. For more details, refer to the [documentation](#)

Azure Status

Refresh every

2 minutes

✓ Good ⓘ Information ⚠ Warning ✖ Critical

	Americas	Europe	Asia Pacific	Middle East and Africa			Azure Government			Azure China		
PRODUCTS AND SERVICES	*NON-REGIONAL	EAST US	EAST US 2	CENTRAL US	NORTH CENTRAL US	SOUTH CENTRAL US	WEST CENTRAL US	WEST US	WEST US 2	CANADA EAST	CANADA CENTRAL	BRAZIL SOUTH
COMPUTE												
Azure VMware Solution by CloudSimple		✓						✓				
Virtual Machines		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SAP HANA on Azure Large Instances		✓						✓	✓			
Windows Virtual Desktop	✓											
Virtual Machine Scale Sets		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Azure Functions		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Service Fabric		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Batch		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cloud Services		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Azure Spring Cloud		✓							✓			

Useful Links

- **FastTrack updates:** <https://azure.microsoft.com/en-in/updates/fasttrack-for-azure/>
- **Updates:** <https://azure.microsoft.com/en-in/blog/topics/updates/>
- **Status:** <https://azure.microsoft.com/en-us/status/>
- **Pricing calculator:** <https://azure.microsoft.com/en-in/pricing/calculator/>
- **EDX:** <https://www.edx.org/learn/azure>
- **YouTube Azure Friday:**
<https://www.youtube.com/playlist?list=PLLasX02E8BPDT2Z2pdCHNCkENpcQWy5n6>
- **Azure Friday:** <https://channel9.msdn.com/Shows/Azure-Friday>



That's all Folks!