

AZ-900 (Cloud Basics)

Private cloud :

A private cloud consists of cloud computing resources used exclusively by one business or organization. The private cloud can be physically located at your organization or hosted by third party.

Advantages :

- 1) More flexibility - your organisation can customise its cloud environment to meet specific Business need.
 - 2) More control -
 - 3) More scalability - private clouds are often more scalable than on-premise infrastructure.
- > Hard ware must be purchased for setup & maintenance
4) Org is responsible for hardware maintenance & updates.

Azure Core Services

Caching : Caching is process of storing data locally so that future requests for that data can be accessed more quickly.
» Cache's primary purpose in any computing scenario is to speed things up.

> You shifting on-premise application to Azure. And you need to migrate files to cloud , we can use services

> Azure files

NOTES

> Azure Disk Storage

Both can be used to house the migrated windows file share data.

> Microsoft azure is best described as Public cloud.

⁹ Identity, governance, privacy, compliance

¹⁰ Azure Arc : Centralized governance and management for on-premises and multi-cloud computing resources.

¹¹ ¹² > Azure Government : It is cloud platform available to US federal, state, local & tribal gov. entities.

¹ ² > Azure Information Protection (AIP) : is cloud-based soln to help organizations classify and protect its documents & emails by applying label.
³ Can be used to embed a watermark into office Docs that contain SSN.

⁴ ⁵ ~~compliance~~ Service Trust portal : Central location for all published audit reports of Azure as well as risk assessments and security best practices.
⁶ Provide in depth information on what is required to meet different compliance requirements.

⁷ 11 SUNDAY

~~compliance~~ Azure Compliance manager

- It evaluates your azure environment and provides insight on how you can improve your compliance alignment
- NOTES
- > Get compliance score and report
 - > Recommendations
 - > Secure storage : Upload docs to prove compliance & store them securely

M	T	W	T	F	S	S	M	T	W	T	F	S	S
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31								

MONDAY
FEBRUARY 12 Wk 07 • 043-322

- Cost management 8 plans
SLA

10 Plans (Support plans)

- 1) Basic
- 2) Developer
- 3) Standard
- 4) Professional
- 5) Premier Direct

12 less

Support ↑

cost .

more

get
Tech account
manager

get even training

2,3
General
guidance

24/7 tech support

4) Arch.
Guidance

5)
Customer
specific guidance

Identity

• Microsoft Defender for Identity (Azure Threat Protection)

6 It identifies suspicious user activities and events.

7 It monitors & analyzes user activity, events & related information across your network.

NOTES

13

TUESDAY

Wk 07 • 044-321

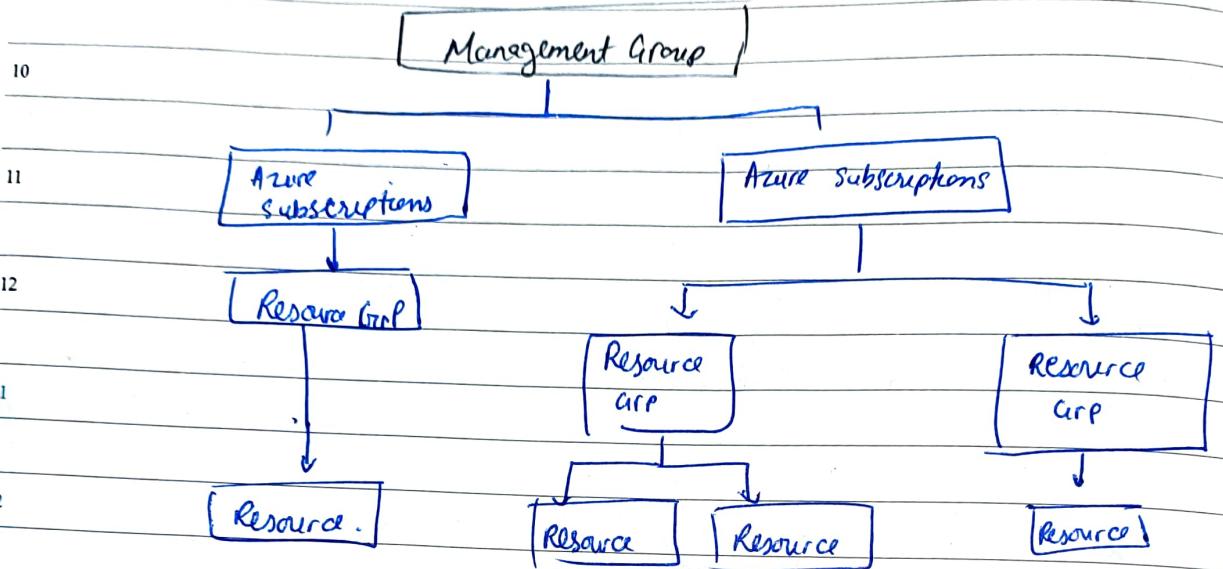
FEBRUARY

Part 2

FEBRUARY

M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7	8	9	10	11	12	13
12	13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28									

(Management Grp)



- Subscription = Billing + Access Control Boundaries
- Azure Subscription provides you with authentication & authorized access to Azure account.
- Compute = Memory + Processor
- ~~AI/ML~~
- > Azure ML & AI
 - Azure ML : cloud based to develop, and deploy ML model
 - Cognitive service : pre-defined models, quickly enable app to see, speak, understand & interpret user's need
 - Azure Bot service : develop intelligent, enterprise grade bots

NOTES

MARCH

M	T	W	T	F	S	S	M	T	W	T	F	S	S
1	2	3	4	5	6	7	8	9	10	11			
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31								

14
WEDNESDAY
FEBRUARY
Wk 07 • 045-320

~~Security~~ **Azure Sentinel**: cloud native security information and event management (SIEM) tool.
and security orchestration automated response (SOAR) soln.

Step 1 : Data collection

Step 2 : Aggregation & normalization

Step 3 : Analysis and threat detection

Step 4 : Things happen

Step 5 : Take action

→ any security breaches and threats are identified and you can investigate and take appropriate action

~~Security~~
Dedicated Hosts

Azure Dedicated Hosts is a full physical server that you get full control over.

- 7 > Hardware control
- > yours & yours alone
- > Maintenance (control over maintenance schedule)
- > Still get benefits of Azure global
- > OS of your choice
- > for strict compliance requirements

NOTES

15

THURSDAY
FEBRUARY

Wk 07 • 046-319

Summary

S	M	T	W	T	F	S
					4	5
1	2	3			6	7
12	13	14	15	16	17	18
26	27	28			19	20
					21	22
					23	24
						25

(Privacy compliance and trust)

Azure Compliance

- 10 1) Compliance Manager
~~2) services trust portal~~

11

Azure Privacy

- 1 1) Azure Information Protection (AIP)

cloud based soln to help organizations classify & protect its docs. Classify, label and protect data based on data sensitivity.

- 2 2) Guides

Use guides on Azure to respond & comply with GDPR privacy requests.

5

Azure trust

- 6 1) Trust center

7 Learn about Microsoft's effort on security, privacy, GDPR, data location, compliance etc.

- 2) Service trust portal

NOTES

2018

MARCH

M	T	W	T	F	S	S	M	T	W	T	F	S	S
1	2	3	4	5	6	7	8	9	10	11			
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31								

FRIDAY

FEBRUARY

16

Wk 07 • 047-318

~~security~~

Locks

- 1) A resource can have multiple locks
- 2) If lock is applied on resource grp, all resources get the lock.
- 3) Resource locks only affect your ability to make changes to resource within Azure but do not affect resource itself. for eg, a resource lock on VM still allow VM to operate but will prevent someone from restarting a VM. Similarly lock on Storage account only affects azure properties of account but we can modify data inside it

~~Security~~

Azure Activity log :-

- 5) It provides insight into subscription-level events that have occurred in Azure.
- 6) This include range of data, from Azure Resource Manager operational data to updates on service health events.
- 7) Events such as starting and stopping of VMs can be found here.

NOTES

17

SATURDAY
FEBRUARY

Wk 07 • 048-317

M	T	W	T	F	S	S	Mo	Tu	We	Th	F	S	S
					1	2	3	4	5	6	7	8	9
12	13	14	15	16	17	18	19	20	21	22	23	24	11
26	27	28											25

~~Containers~~

Containers : they fulfill the requirement to bundle an application with its dependencies and ensure portability.

10

Azure Kubernetes Service (AKS) vs Azure Container Instances.

11

- > Azure Container Instances are more suitable for running single container on demand.
- > AKS is more suitable for large-scale orchestration of multiple containers interacting with each other.

1

~~Availability & SLA~~

99.99% → Two or more instances deployed across two or more availability zones

99.95% → 2 or more instances deployed on same availability zones

99.9% → Single instance VM using premium SSD / ultra SSD plus OS

18 SUNDAY 99.5% → Single instance VM with standard SSD managed disks

NOTES

95% → Single instance VM with standard HDD magnetic Disk

MARCH

M	T	W	T	F	S	S	M	T	W	T	F	S	S
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31								

MONDAY

FEBRUARY

19

Wk 08 • 050-315

~~Subscription~~

- 9 ➤ When you want to increase your subscription limits
create a new support request
- 10 ➤ When you want to merge two subscriptions
Contact Microsoft Azure Support
- 11 ° no commands are present to do this subscription level tasks.

12

~~Basic~~

1 Agility : It is best defined as ability to rapidly test, develop and launch new application to drive growth

2

~~Monitoring tool~~

• Azure Service Health

4 Azure Service Health helps you keep track of Azure resources, both your specifically deployed resources and overall status of Azure. It has 3 different Azure services

5 1) Azure Status

6 It is global view of health of all Azure services across all Azure regions

7 2) Service Health

It focuses on Azure services & regions you're using.

3) Resource Health

tailored view of your actual resources. Using Azure Monitor, you can also configure alerts to notify you of availability changes to your cloud resources.

NOTES

20

TUESDAY
FEBRUARY

Wk 08 • 051-314

FEBRUARY

M	T	W	T	F	S	S	M	T	W	T	F	S	S
1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28

~~DevOps~~

Azure DevTest labs

10

- Basic images of VM
- Images pre-configured with rules
- Existing VM's in pool
- Auto-stop & auto-start of VM's
- Constraints on resources that can be created by developer

11

2

3

4

5

6

7

NOTES

2018

22

THURSDAY
FEBRUARY

Wk 08 • 053-312

FEBRUARY											
M	T	W	T	F	S	S	M	T	W	T	F
1	2	3	4	5	6	7	8	9	10	11	12
12	13	14	15	16	17	18	19	20	21	22	23
24	25										

~~Storage~~

Data Box

- > Is a physical migration service that helps transfer large amount of data in quick, inexpensive and reliable way.
- > max capacity of 80 Terabytes.
- > You receive a data box via carrier then you set it up using local web UI and connect to your network. Once you finished transferring data (either into or out of Azure), simply return Data Box.
- > offline way to upload data.

~~Storage~~

Storage account types

- 1) Standard - general - purpose v2 : Blob storage + Queue storage + Table storage & Azure files.
All redundancy options (LRS to GZRS)
- 2) Premium Block blobs : Block blobs (LRS, ZRS)
- 3) Premium file share : Azure files (LRS, ZRS)
- 4) Premium Page blobs : Page blobs only (LRS)

~~Storage~~

Azure files : Azure files offer fully managed file shares in cloud that are accessible via industry standard Server message block (SMB) or Network file system (NFS) protocol.

NOTES

Queue storage : Service to store large numbers of messages. Once stored, you can access the messages from anywhere in the world using HTTP and HTTPS.

- Queues are commonly used to create backlog of work to process asynchronously.
- Queue can be combined with compute service like Azure fn to take an action when message is received.

2018

MARCH						
M	T	W	T	F	S	S
1	2	3	4	5	6	7
12	13	14	15	16	17	18
26	27	28	29	30	31	1
19	20	21	22	23	24	25

FRIDAY
FEBRUARY 23
Wk 08 • 054-311

~~basic~~

Hybrid cloud

- > Provides more flexibility
- > Org determine where to run the applications
- > Org. control security, compliance or legal requirements.

11

~~basic~~

Multi-cloud

- > In multi-cloud you use multiple cloud providers, and manage resources & security in both environments.

~~basic (cost)~~

Total cost of ownership includes : Not only the cost of machine (hardware) and software, but also cost of hosting that machine including electricity, real state, Internet and salaries of employees needed to manage machine

5

6

~~physical info~~

~~Resource Group~~

- > actions in resource grp is applied to all resources in that grp.
- > if you delete resource grp, all resources will be deleted
- > if you grant or deny access to resource group, you've granted or denied access to all resources within resource grp

NOTES

24

SATURDAY
FEBRUARY

Wk 08 • 055-910

Azure account can have multiple administrators. Each subscription can have multiple account administrators

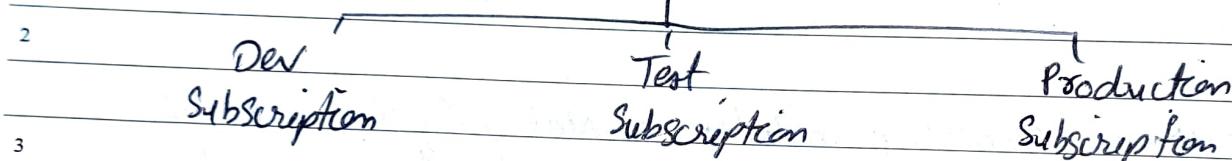
FEBRUARY												
M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7	8	9	10	11		
12	13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28									

~~physical info~~

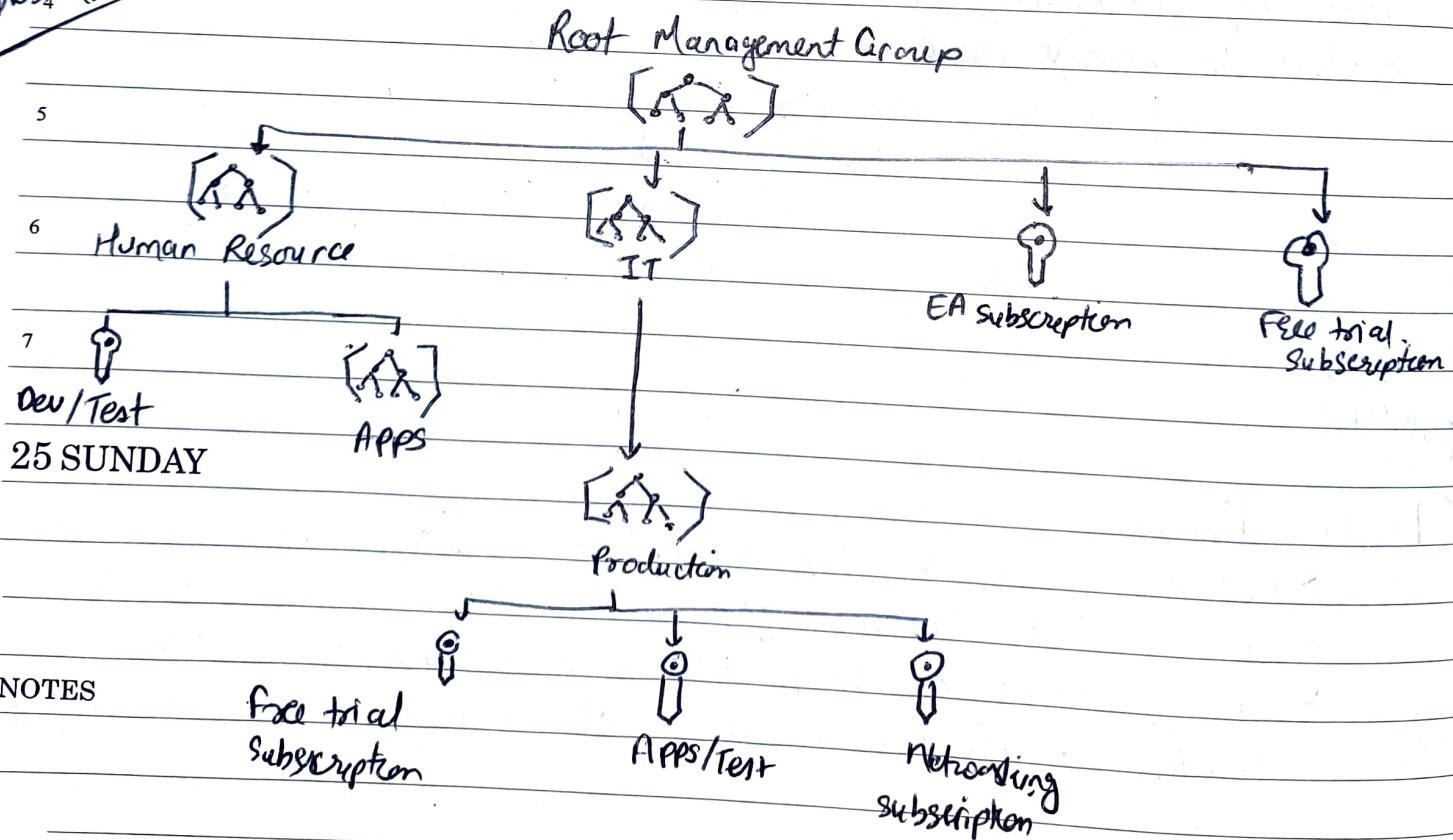
Subscription & account

- > Subscription : are unit of management, billing and scale.
- > Account : account can have multiple subscriptions, but at least one is must.
- 11. can use subscriptions to configure different billing models and apply different access-management policies
- 12. You can use Azure subscriptions to define boundaries around Azure products, services and resources.

Azure account



~~physical info~~



MARCH						
M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

MONDAY
FEBRUARY
26
Wk 09 • 057-308

~~Security~~ Public & private endpoints

10 ➤ Way to secure access to our Azure managed services specially PaaS.

11 By default when you create services like Azure Storage, Azure SQL etc these services are publicly exposed over public internet.

- 12 what to do to hide exposure
- 1) Service endpoint (good soln)
 - 2) private endpoint (better soln)
-
- ```

graph LR
 GP[general public] --> AS[Azure SQL]
 AS <--> PI[Public internet]

```

### • Service endpoints

privately connect VNet subnet to Azure PaaS service

- 4 • Direct connection from subnet to Azure PaaS service
- Connects over Microsoft's private backbone (not over public internet)
  - Can also restrict access to specific public IP address.

5 Limitations 1) No private on-premises access

- 6 2) Must allow on-premises access over public IP, hence PaaS public endpoint still exists

### • Private endpoints

- Private connection to specific instance of a service eg single storage account, SQL instance

7 ➤ Available over connected network via VPN or Express route.

allow hybrid / on-premises networks, peered virtual networks

- NOTES ➤ Can completely disable public access to connected service  
Public endpoint disabled

➤ next

27

TUESDAY  
FEBRUARY

Wk 09 • 058-307

FEBRUARY

| M  | T  | W  | T  | F  | S  | S  | M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 |    |    |    |    |    |    |    |    |    |    |    |

Q True or false : An azure storage account can have both a public endpoint & private endpoint at same time.

True

> public endpoint can be enabled, restricted to certain network or disabled.

> Multiple private networks can be created

> You can have both public & multiple private endpoints together as well.

1

~~Networking~~

## VNet (Public & Private )

3 VNet peering :- Connect 2+ VM or more

4 > connection is done on Microsoft private network and never pass public ~~domain~~ network.

5 > low-latency High bandwidth

6

7 Subnet : subnet is smaller network, which is part of your VNet. Use these for security & logical division of resources.

> Vnet is in single region & single subscriptions. Resources in vnet also should be in single region.

• all VM's in virtual network can communicate with other machines inside same VM irrespective of subnets they are in, they communicate via private IP addresses.

| MARCH |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|
| M     | T  | W  | T  | F  | S  | S  |
| 1     | 2  | 3  | 4  | 5  | 6  | 7  |
| 8     | 9  | 10 | 11 | 12 | 13 | 14 |
| 15    | 16 | 17 | 18 | 19 | 20 | 21 |
| 22    | 23 | 24 | 25 | 26 | 27 | 28 |
| 29    | 30 | 31 |    |    |    |    |

28  
WEDNESDAY  
FEBRUARY  
Wk 09 • 059-306

- Q Which of the following can access to Azure PaaS Service from resources in your VNet using Private endpoints?
- 1) firewall      2) Private link ✓

Private link enable access to Azure PaaS services from resources in your VNet using private endpoints. All data flows from VM to SQL database is isolated from internet and stays to microsoft backend.

## 2 Public end point

- > Public end points, which have a public IP address and can be accessed from anywhere in the world.
- > most services in Azure have a public endpoint by default.

## 3 Private endpoint

- > Private endpoints, which exist within a VN and have private IP address from within address space of that VN.

NOTES



## IMPORTANT NOTES

### Virtual Machines

1) Deleted VM will still incur charges.

When VM is deleted, its managed disk remains in Azure portal and can be used to create new VM. Until this disk is manually removed, you will incur charges for the disk.

2) VM's can't be auto-scaled, VM scale sets can.

VM scale sets can be auto-scaled to combat system performance.

If a VM needs to be resized, it must be stopped & done manually.

3) It is a compute resource.

Compute resource : Resources that perform some type of task that requires CPU cycles to perform the work.

4) Resources required to have a VM

1) Virtual network ✓

2) Storage account ✓

3) Public IP address

4) Network Interface Card (NIC) ✓

- NIC is hardware component without which computer can not be connected to a network.
- VM does not need public IP address. In fact, most Azure VMs are private and not accessible from the internet.

~~Identity~~~~Azure Active  
Directory~~

10 ~~Q Which Azure AD feature is used to provide access to resources based on organizational policies?~~

11 ~~Ans : Conditional access~~

~~Conditional Access is tool used by Azure active directory to~~

12 ~~allow (or deny) access to resources based on identity signals.~~  
~~Limits~~

1 ~~: Single user can belong to max 500 Azure AD tenants~~

~~: Single user can create max 200 directories.~~

2 ~~: You can add no more than 5000 managed domain names.~~

3 ~~•) Single - Sign On :- It is an authentication method that allows user to sign in using one set of credentials to login across applications . Single sign-on makes it easier to manage passwords and increase security capabilities~~

4 ~~- Azure AD licenses : Free , Office 365~~

~~Premium P1 , Premium P2 .~~

~~Compute~~

~~Azure Batch : It allows you to scale to thousands of VM for high performance computing and large-scale parallel jobs .~~

~~Network~~

NOTES

~~Azure VPN gateway : It consist of VN , a secure connection called a tunnel , and an on-premises network gateway .~~

| APRIL |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|
| S     | M  | T  | W  | T  | F  | S  |
| 9     | 10 | 11 | 12 | 13 | 14 | 15 |
| 23    | 24 | 25 | 26 | 27 | 28 | 29 |
| 30    | 1  | 2  | 3  | 4  | 5  | 6  |
|       |    |    |    | 7  | 8  | 9  |
|       |    |    |    | 16 | 17 | 18 |
|       |    |    |    | 19 | 20 | 21 |
|       |    |    |    | 22 |    |    |

## Networking

### 1) Application Gateway.

An app. gateway is used specifically for routing traffic based on parameters in traffic itself.

e.g.: you have web app, and one VM is charge of processing images, we can use Application gateway to route all requests for "image" URL's to specific VM.

Note: CDN does not route traffic

: A load balancer routes all traffic without looking at it.

### \* Cost of transferring data

- > Inbound data from on-premises to Azure is free
- > Outbound data from Azure to on-premises is not free
- > Data traffic betn Azure Services in same region is free.

## Network

### Express Route

- A point-to-point Ethernet connection is supported by ExpressRoute for connecting on-premises network to Azure
- 3 models that Express Route supports are :-
- 1) Cloud Exchange Connection
  - 2) Point-to-point ethernet connection
  - 3) Any-to-any connection

## Network

NOTES