

AZ-900 Study Cram:

Cloud = Capacity

2 Types of Clouds:

- Public {Externally hosted, multi-tenant, Internet consumption based, many locations}
- Private

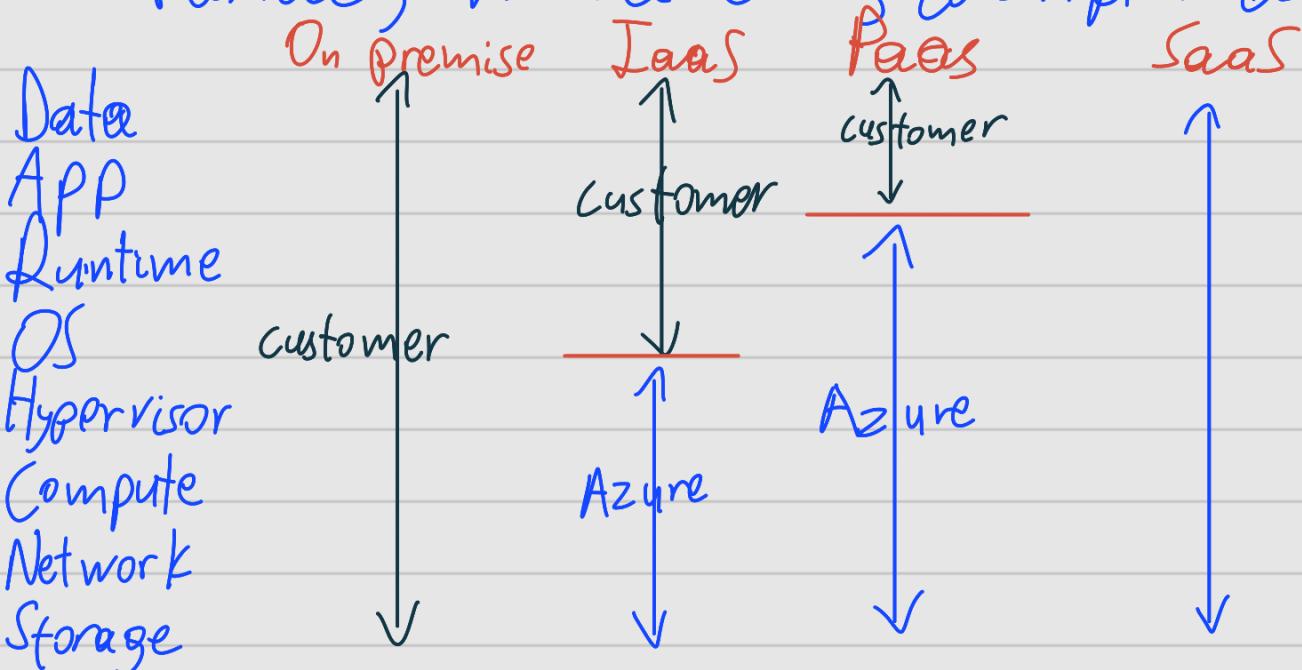
Hybrid Cloud: Public + Private

CapEx: Capital expenditure → Private Cloud

On premise, \$ up front, depreciation

OpEx: Operational expenditure → Public Cloud

\$ as you use, can easily change parameters, flexible, variable load, consumption based

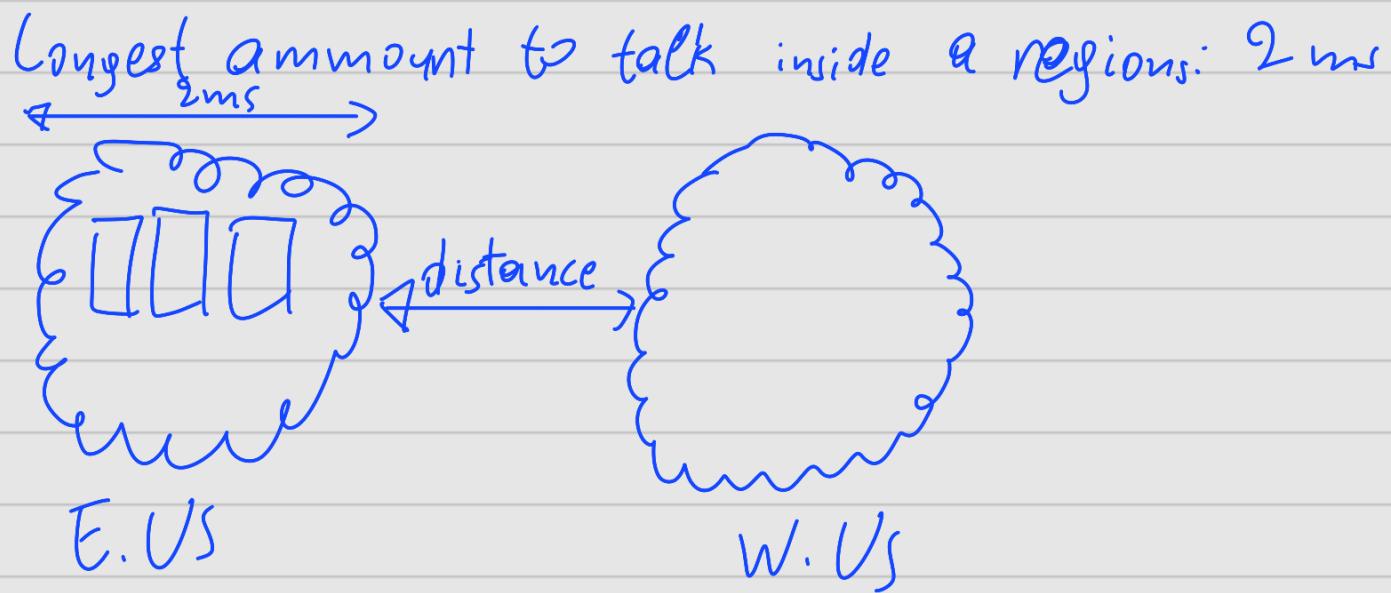


IaaS: Infrastructure as a Service → VM, VMSS (VM scale set)

PaaS: Platform as a Service → Azure Container Services, App Svcs, Functions, Azure Kubernetes, Logic Apps

SaaS: Software as a Service → Office 365

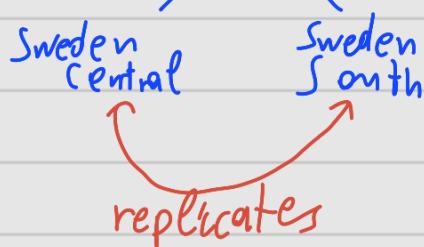
Regions:



Azure environments:

- (most common) commercial
 - ↳ "get-azenvironment"
 - US gov
 - CN cloud
- separate, isolated!

Azure pairings: replicates within the same region
i.e.: Sweden pairing



Updates are not rolled at the same time across regions

- Each Building:
- Power
 - Cooling
 - Network

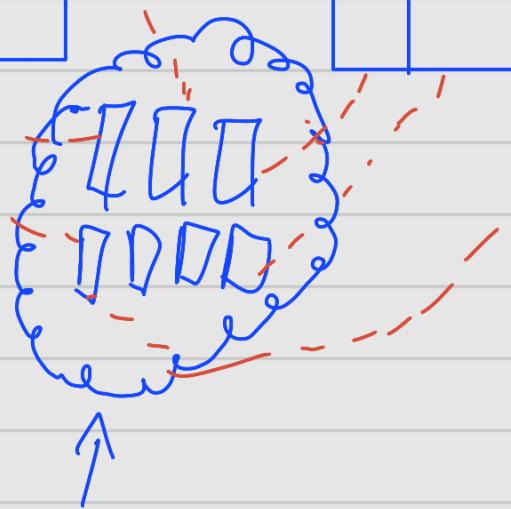
Multiple Buildings → Availability Zone

Subscription for region:

AZ1	AZ2	AZ3
-----	-----	-----

Other subscription

AZ1	AZ2	AZ3
-----	-----	-----



No consistency (My AZ1 is different from your AZ1)
Isolation

Zone Redundant: Spans the Availability Zone ↴

Can survive a
data center failing

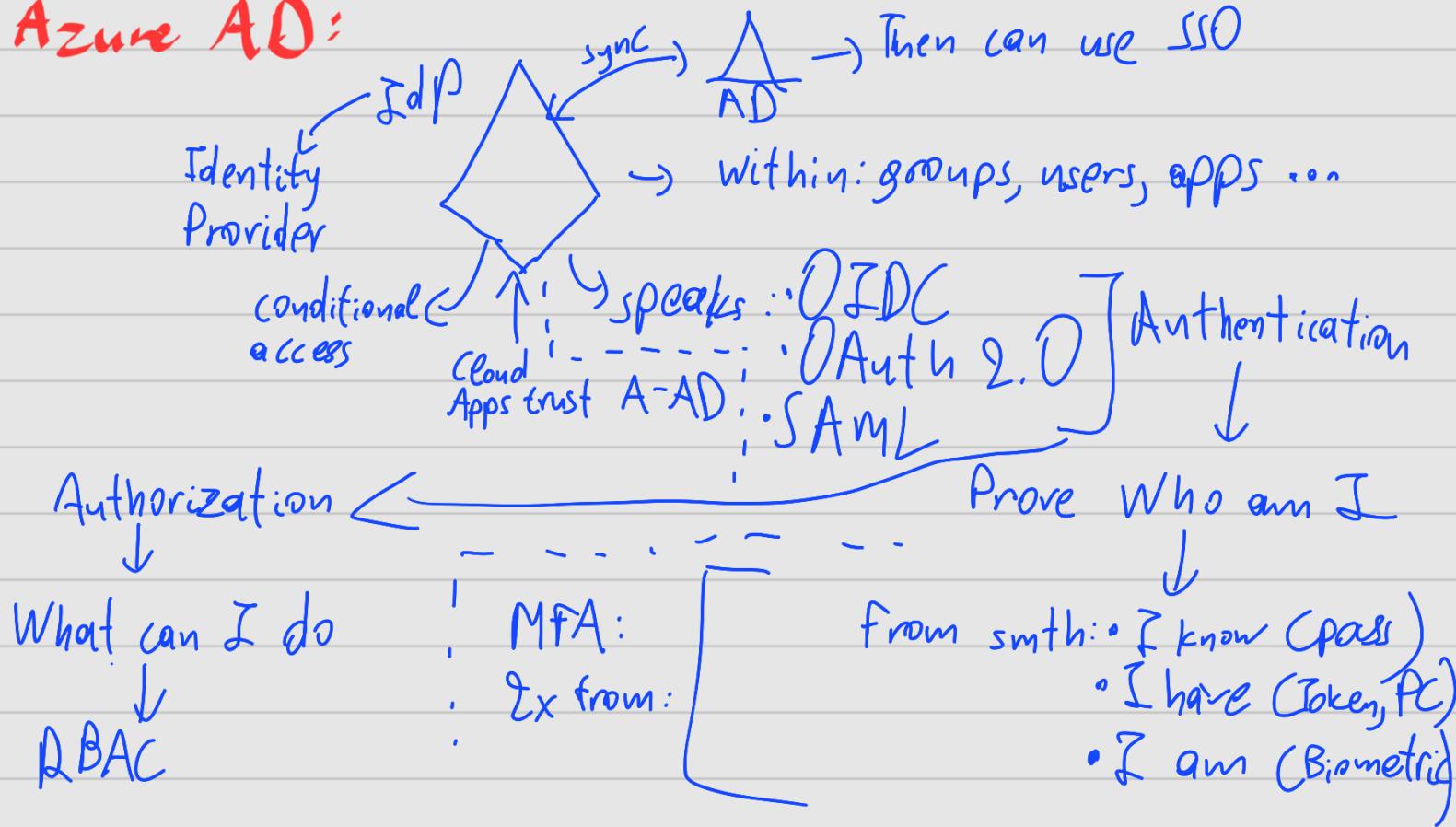
AZ1	AZ2	AZ3
Zone Redundant		

Zonal: In a specific zone → Need to create multiple instances for redundancy

AZ1	AZ2	AZ3
Zonal		

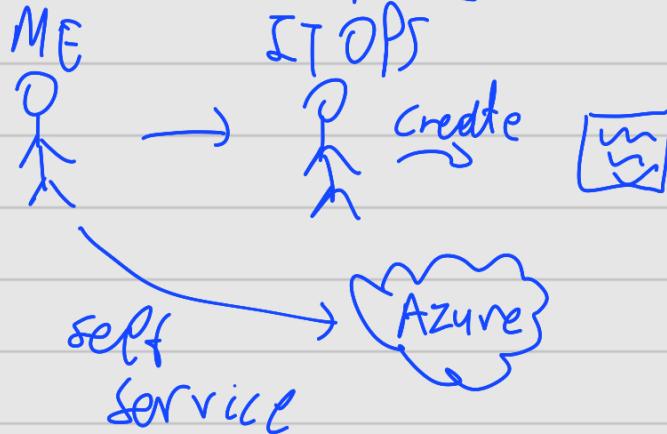
Availability Zone: Each Building
(physical construct)

Azure AD:



Governance.

The cloud is self service



Rbac: Role Based Access Controls (WHO?)
↳ Roles

some roles: • Owner

- Contributor
- Reader

RoleActions) → Identify → Scope ↴

↳ Role Assignment

Policy: → Guardrails (WHAT?)

→ i.e. limiting storage for some accounts

→ used for compliance too

→ can audit

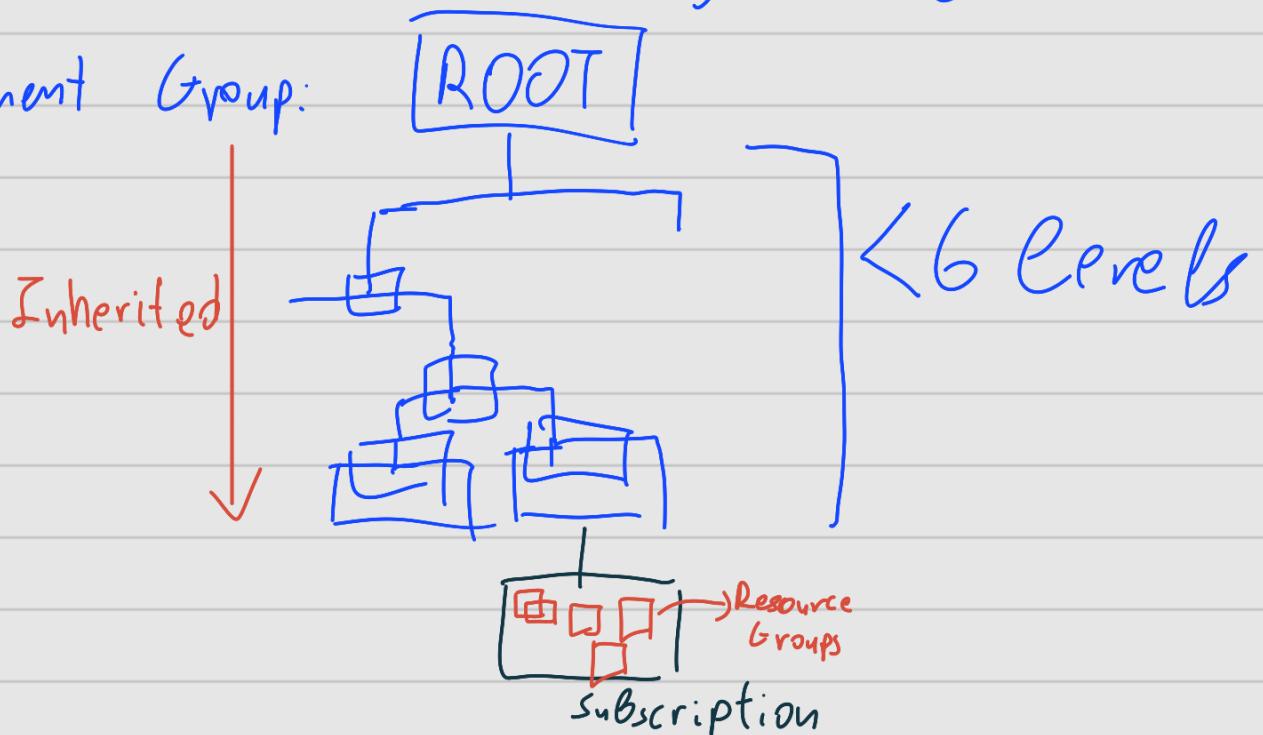
→ can control

→ can create/use initiative to apply many policy or check compliance state

Budget: \$ (HOW MUCH?)

Azure cloud trusts an AAD tenant. In each AAD tenant there are management groups

Management Group:



(can apply RBAC, policy, Budget to each one.)

Subscription: An agreement between customer and Azure

- Can apply RBAC, policy, Budget
- Can have many
- Usually each one for a purpose
- **Boundaries**

Resource Group: A set of resources

- Can apply RBAC, policy, Budget
- **not Boundary**
- **useful for common lifecycle**

Azure Resource Manager (ARM):

Azure: Resources provided by resource providers

Resource Types: i.e VMs, disks

• **Portal:** Azure Portal

- Bad for provisioning

• **Web shell:**

- Bash
- Powershell
- Online shell from portal

• **Mobile App:**

• **P/S AZ:**

- great for automation
- for example "az vm"

• **AZ (CLI):**

- can be run from cmd
- for example "az vm list --output table"

Great for scripting,
not for creating

- ARM JSON Templates:
 - provisioning
 - Declarative (have to only say the desired end state)
 - Can Be reused
 - More safe since it checks if a resource with the same name exists
 - DevOps friendly
 - ↳ since it is text use git for version control
 - collaboration
- BICEP is a user friendly way to create ARM JSON
- Terraform for cross platform

- Resource Locks:
- Apply at resources, groups etc
 - They can be:
 - Do not delete
 - Read-only
 - In order to modify the lock you basically have to be the owner of that resource

Tags: Metadata

- is key:Value
- Tags do not inherit
- can be applied for resources, resource groups etc
- can add any key and value
- can be restricted with policy

Blueprint:

- Can contain artifacts
- (can do many things)
- Is assigned at a subscription level
- Has lock Assignment

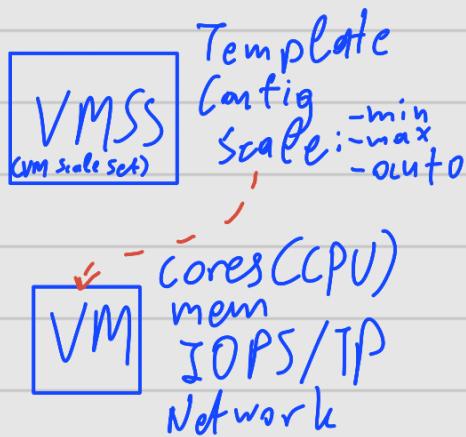
Blueprint
ARM Temp
RBA C
POLICY

Resource groups and Blueprints apply at Azure Resource Manager level (not at Data Plane of resources)
↳ only @ control plane

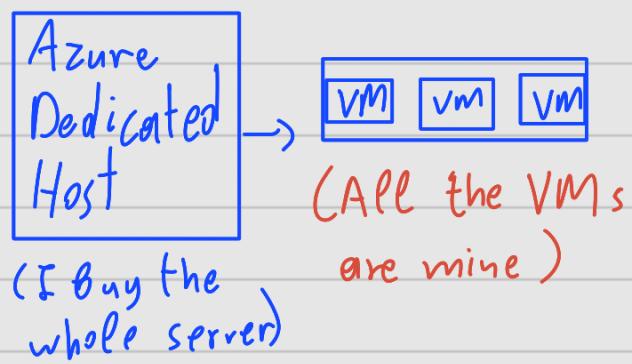
Cloud Adoption Framework:

- Strategy
- Plan
- Ready
- Migrate
- Innovate
- Govern
- Manage
- Organize

Types of resources:



SKUs
vCPU: Memory ratio
Special



Azure Batch → spins up resources

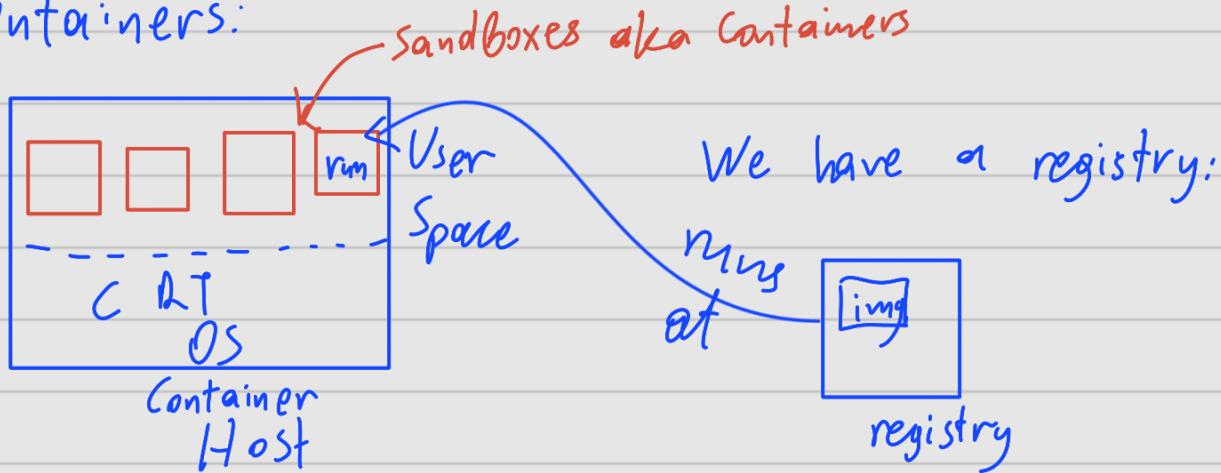
Isolated VM → VM so big it uses the entire Box

Different vCPU:Memory ratio for different purposes

I pick the SLV and then the size

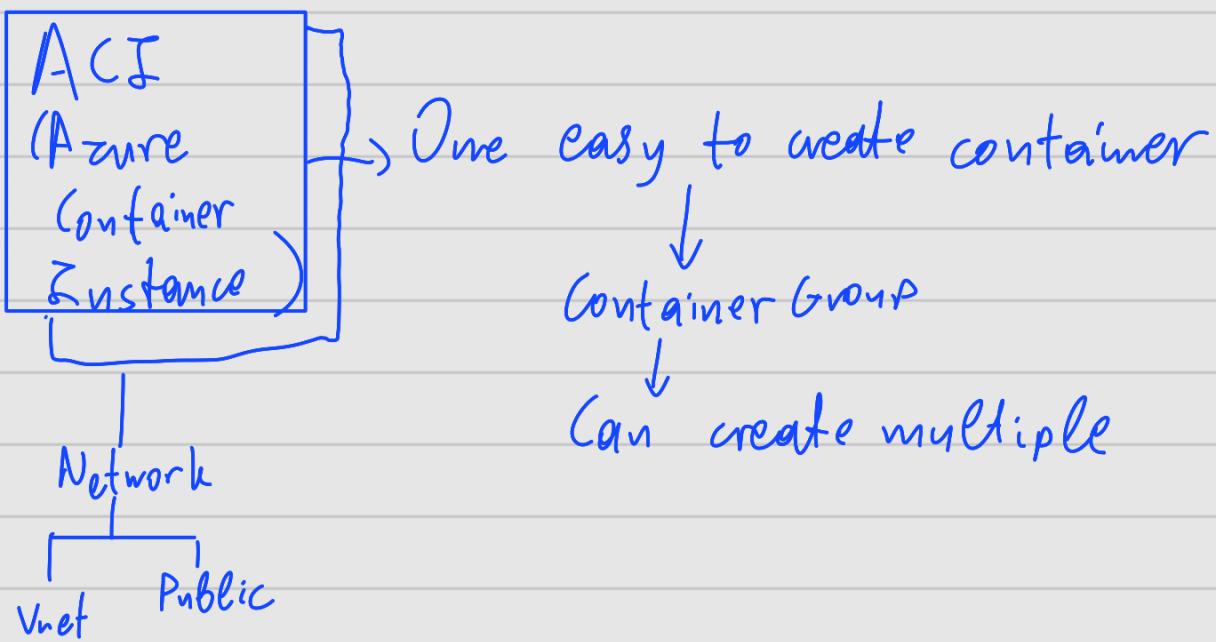
Can create multiple Azure Dedicated Hosts

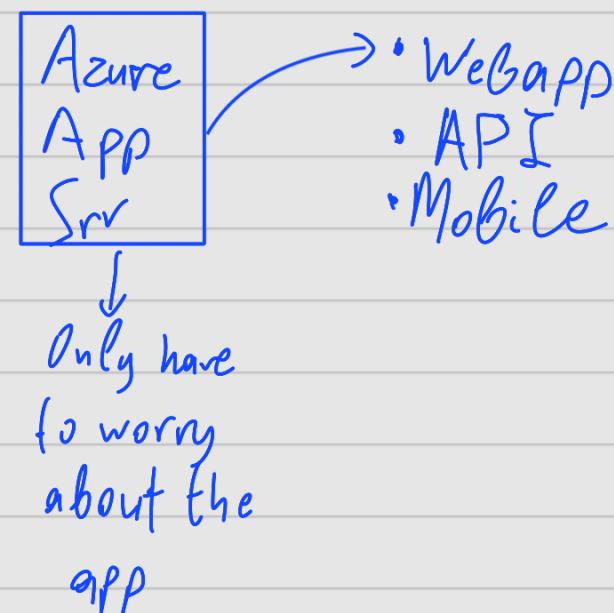
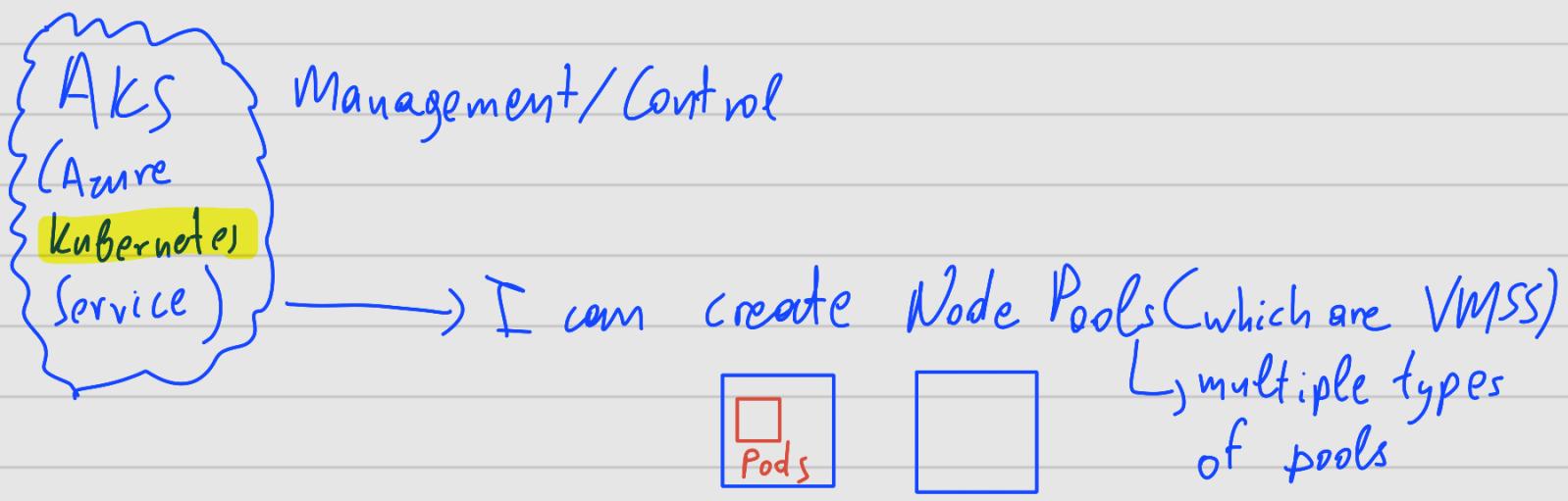
Containers:



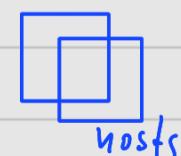
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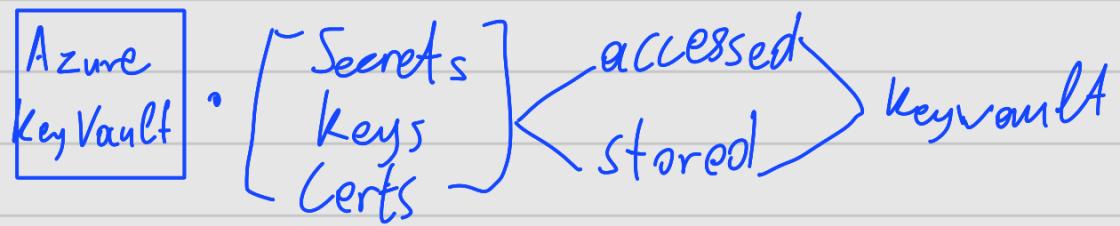
- instant
- shared runtime
- low overhead





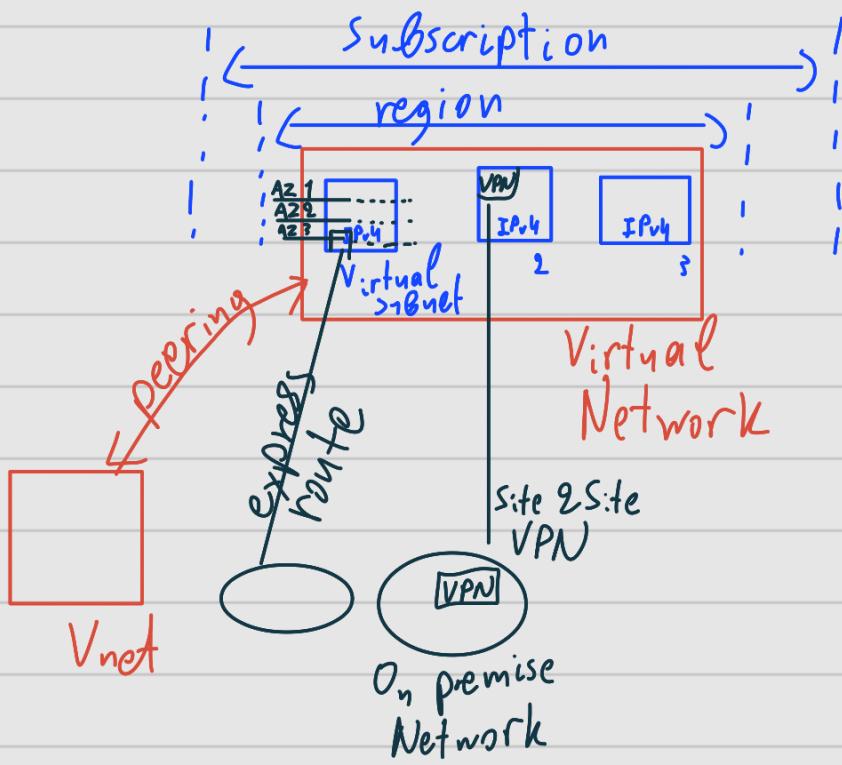
- Serverless:
- Don't pay for the VM
 - Pay for the work it does
 - Event Driven
 - Different Offerings
 - Uses **Azure Functions** (code)
 - Azure **Logic Apps** (no/low code)
 - ↳ pre-built connectors
 - Visual designer
 - Azure **Virtual Desktop**
 - ↳ Session
 - App
 - I get a bunch of VMs





- Policy, RBAC available

Networking:



- VNets do not span regions
- 1 or more IPv4 addresses
- Commonly used RFC 1918
Example: 10/8
172/16/12
192.168/16
- Make sure to add non conflicting IPv4 addresses
- Can have IPv6
- Span Availability Zones
- Address space loses 5 addresses:

- Gateway
- Host range
- DNS 1
- DNS 2
- Broadcast

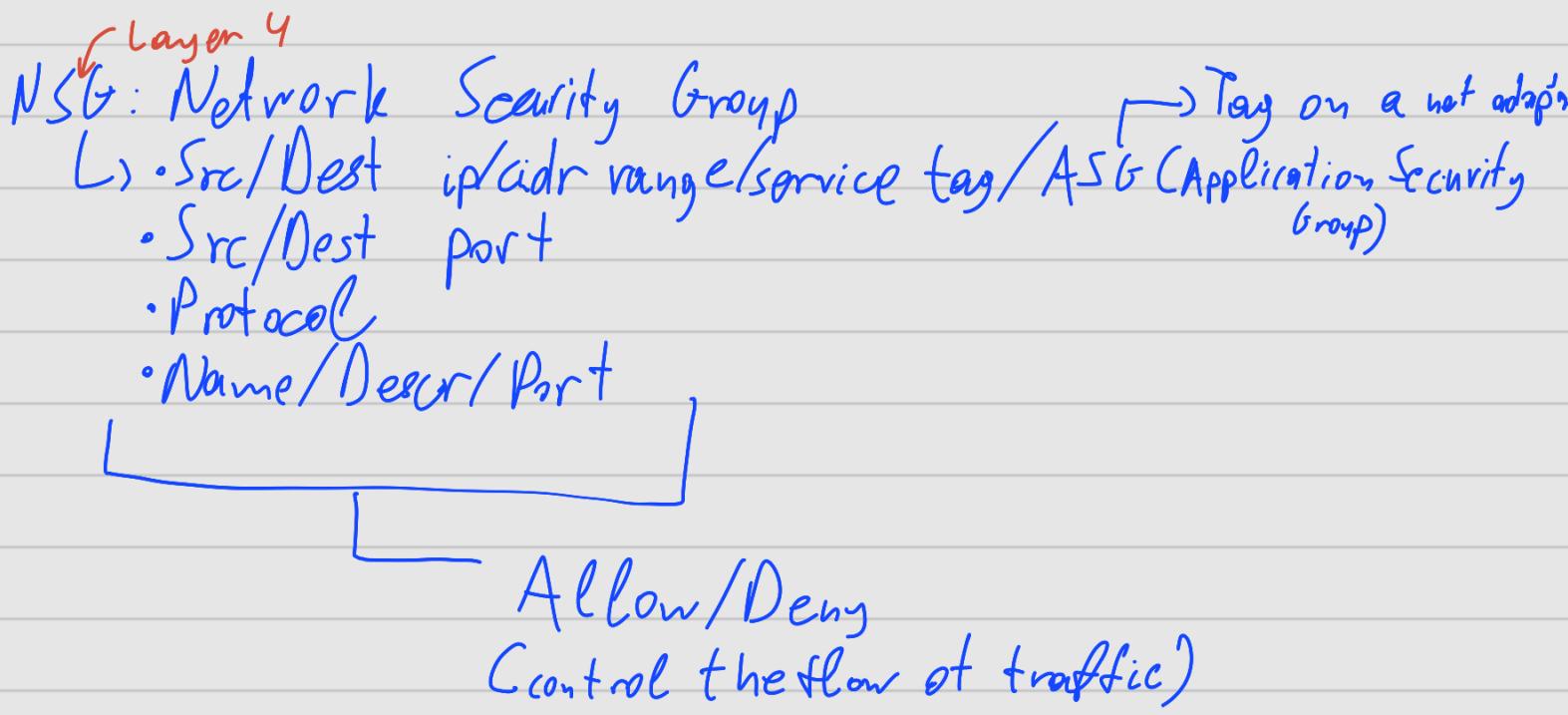
Over internet

VPN Types:

- Policy (1 connection, old)
- Route (n connections, Point 2 S)

Express Route:

- Private Connection
- Not over the internet

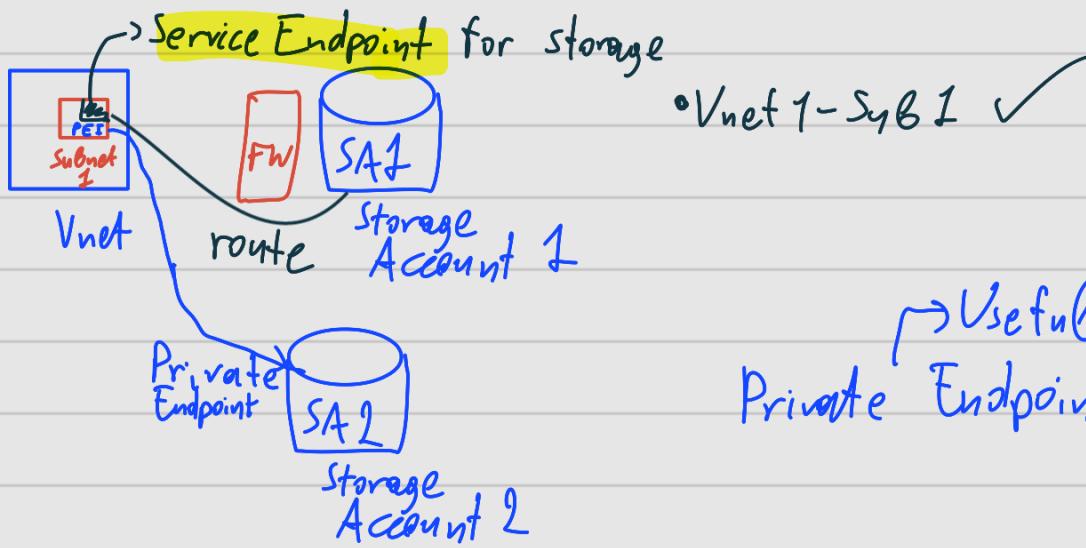


Azure Firewall:

- Network rules (Layer 4)
- Application Rules (Layer 7)
- can even do SSL dpi.
- Direct (1 IP to multiple VMs based on port)

UDR: User Defined Routes

- Used to add the firewall to the net
- Hops



→ Useful with FWs
Private Endpoint: An IP that points to a specific version of a service

For default for any public IP azure offers on basic DDoS protection

- ↳ Can buy a standard level of DDoS protection
 - ↳ can link to multiple vnets
 - ↳ reporting metrics

Storage:

Storage account: - Lives in a region
- Redundancy paired region

The diagram illustrates the redundancy of storage accounts. On the left, under the heading 'region', three storage accounts are shown in boxes labeled 'AZ1', '2', and '3'. The first account has two red 'S' icons, while the second and third have one red 'S' icon each. On the right, under the heading 'paired region', there is one large storage account box containing two red 'S' icons, representing replicated data.

I pick the resiliency:

- LRS: 3 copies always in the same cluster (data center)
- ZRS: 3 copies spread between the AZs in the region
- GRS: 3 copies in a cluster + 3 in the paired region
- GZRS: combination of GRS and ZRS (3 AZs + 3 in paired region with asynchronous replication)

- [RA-*]: Read from a pair

Varies with performance options:

- Standard has * LRS
- Premium has ZRS and may
have ZRS stored in containers

Types

- Blob

Block
Page
Append

+ can add ADLS gen2

Azure Data Lake Storage]
↳ Adds POSIX Style
↳ + hierarchical
↳ (like a trueFS)

Disk use a page-block

Disk types:- std HDD

- -\-\ SSD

You need
the S
variant
of the VM

{ - premium SSD

- Ultra Disk

↳ more customizable

+ can change settings
while working

Files:- can have SMB/NFS shares

- can use Azure File Sync (Sync storage

on-premises
with online)

Azure
File
Sync:



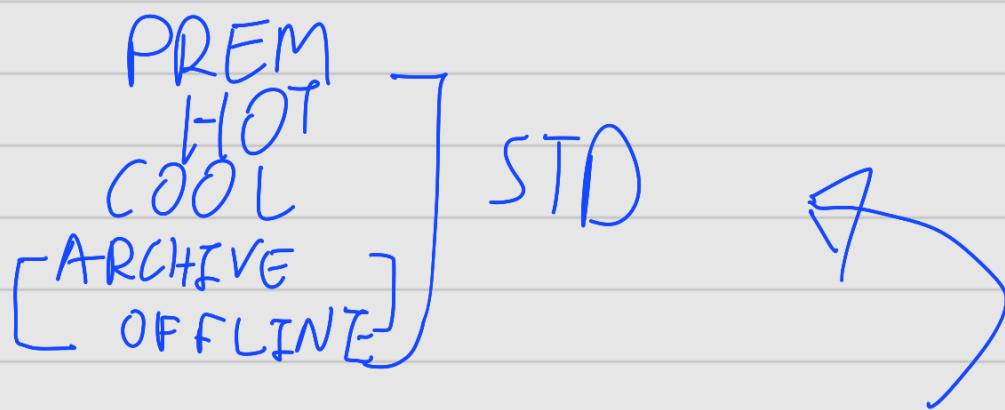
Queue:- FIFO

- for event driven processes

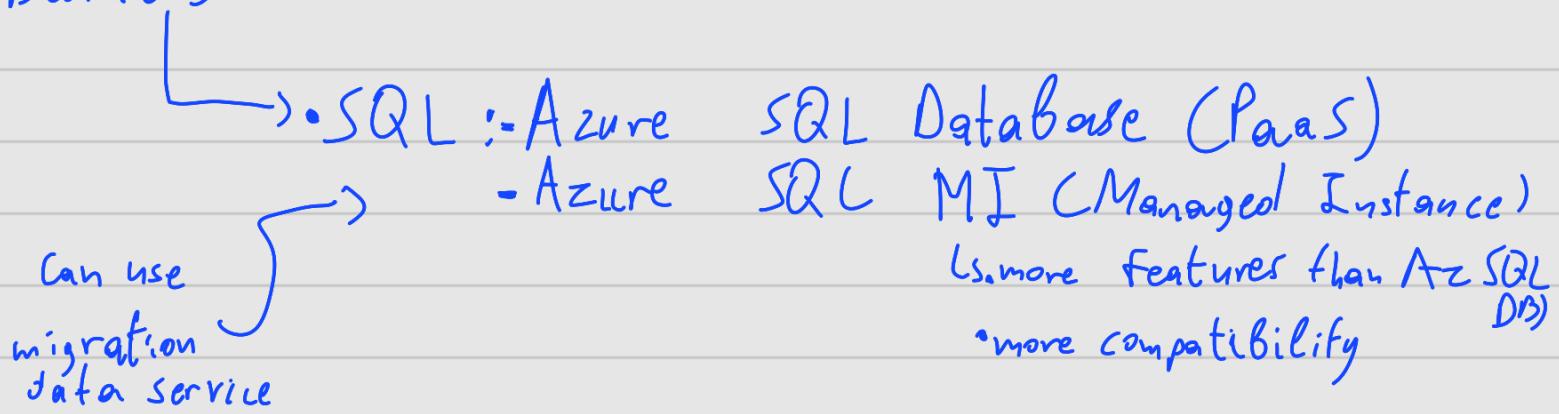
Tables: key: value

Premium doesn't have queues, tables,
block page and block append

Access Tiers exist :

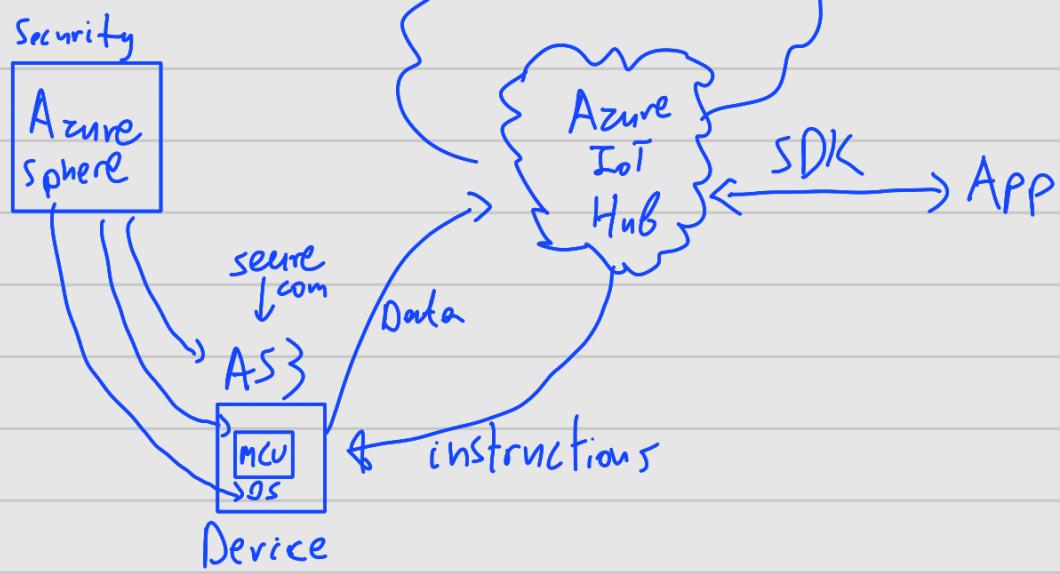


Lifecycle mgmt: Automate or to trash
Databases

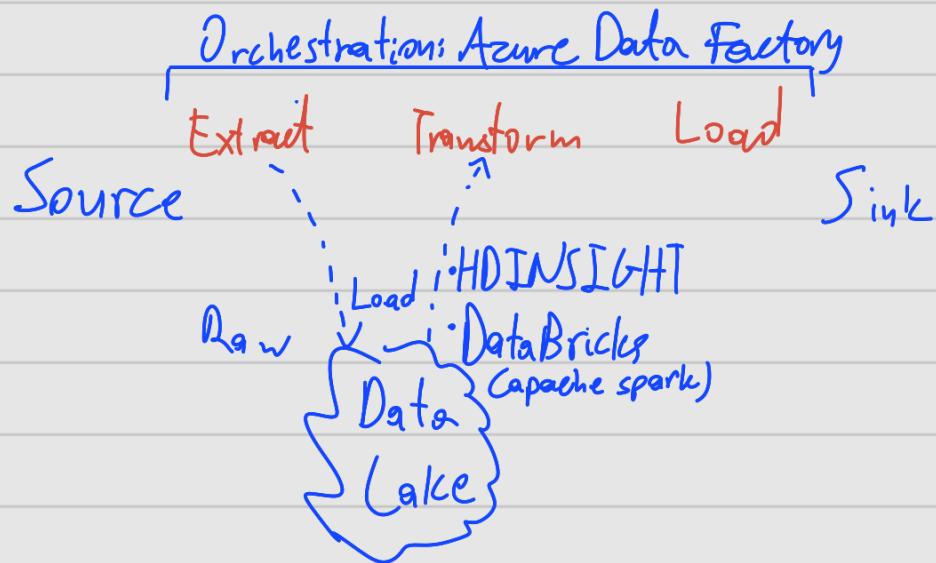


Azure marketplace : - can find VMs and resources, solutions

IoT Services:

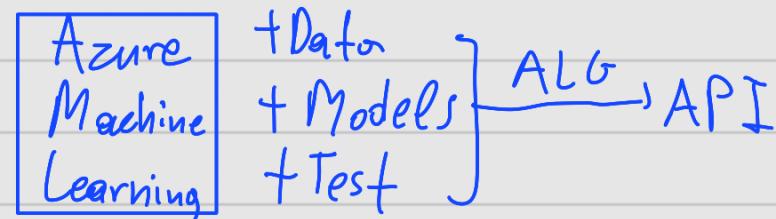


Data Service :



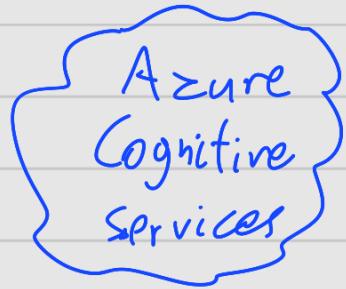
Azure Synapse Analytics

AI Services:



Platform
Predictions

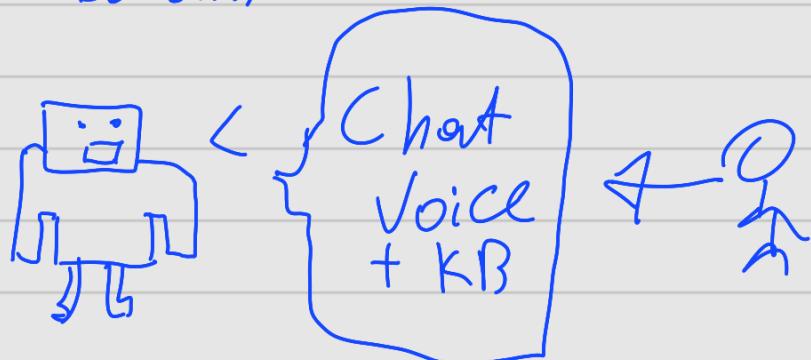
I input:



Pre-Built models

- Language
- Speech
- Vision
- Decision

Azure
Bot
Services



DevOps svcs:

- Azure DevOps
- Repos
- Boards
- Pipelines
- Artifacts
- Test plans

- Github

- Repos
- Actions
- CICD / ALL
- Projects

- Dev/Test Labs (testing environment)

Costs in Azure :

Azure Advisor

Azure
Spot
VMs

cheaper
eviction
vms

for cheaper
(stopped/resumed)

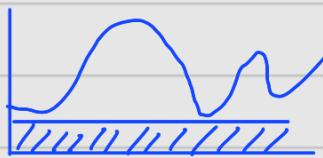
- Exist? → RG + Delete
- Running? → Deallocate
- How Many? → Autoscale
- Work doing?
- Storing Capacity
- Interactions



- TYPE ↗ move from IaaS to PaaS
- SKU ↗ Optimize
- TIER ↗ lifecycle mgmt
- LOCATION
- TAGS ↗ Owner

Licensing ↗ Hybrid Use Benefit (Use existing licenses on Azure)

Azure Reservations 1,3 Years



commitment to use

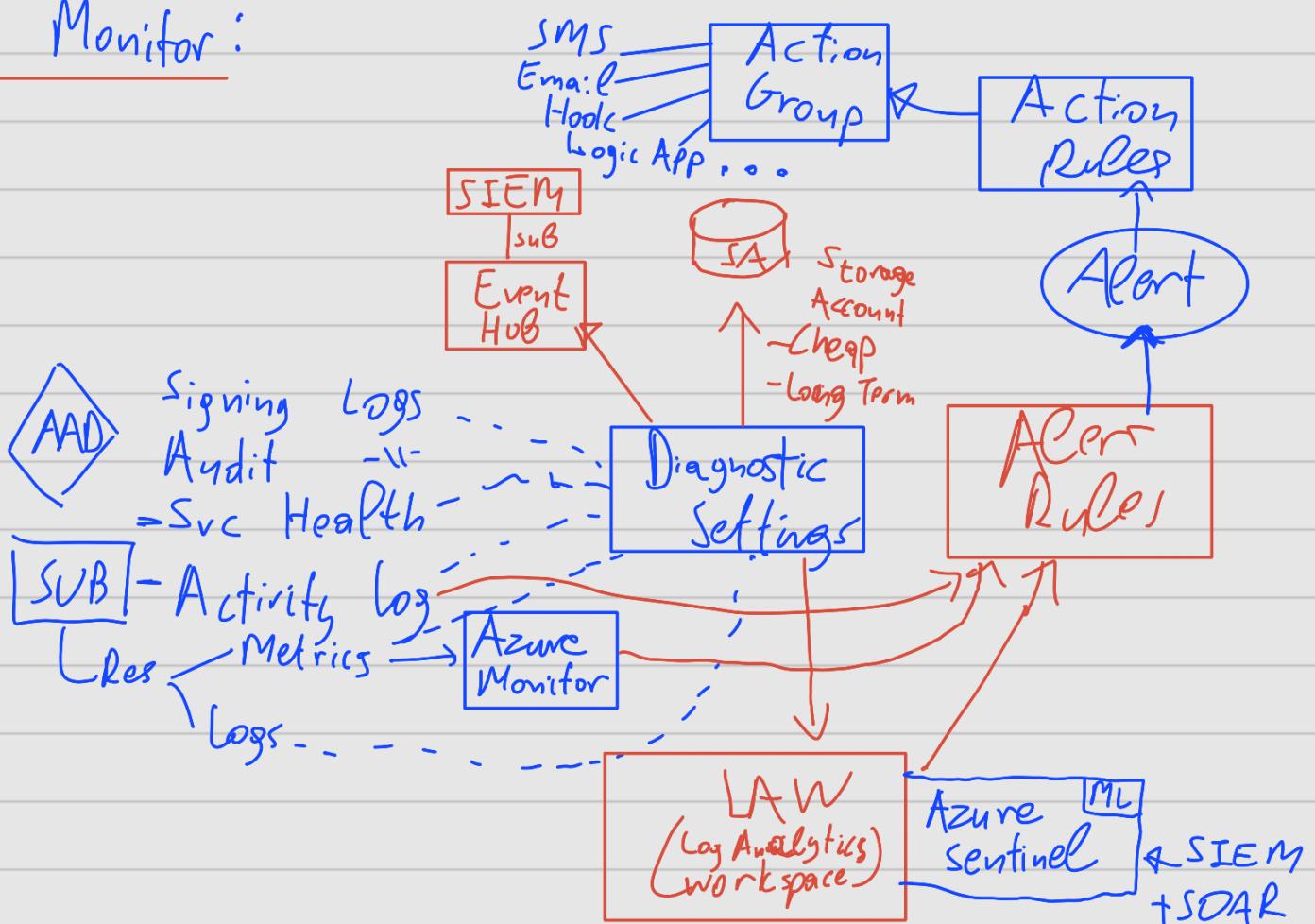
- Pricing ; Pricing Calc : - Give it details → price \$
- Has all the resources

[Note [D.*] : normal]
[D.*S] : premium]

- TCO calculator : - Give it on premise details →
On premise vs Azure \$

Azure Advisor: Guidance
Performance | cost | security
Operational | Reliability

Azure Monitor:



SLA: Service Level Agreement (99.9% avail → 10 min per week)

- 99.95 5 min/week
- 99.99 1.01 min/week

SLAs for VMs can change with regions:



(multiple AZs increase availability
- lesser with Availability sets)

SLAs varies also with disk:

prem	99.9
std ssd	99.5
hdd	95

General Availability



NO SLA
NO Support

Public Preview

Private Preview

Key Documents:

- Microsoft Privacy Document
- Online Services Terms
- DPA (Data Protection Addendum)

Azure ← Security
Privacy
Compliance] Offerings

Security:

- Data
- Application
- Compute
- Network
- Perimeter
- Identity/Access
- Physical

C] confidentiality
I] Integrity
A] Availability

Microsoft Defender for Cloud: - Score

- Adaptive Controls
- Tags in a lot of services
- Understanding the security posture