Azure Fundamentals

Flash cards

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Microsoft Azure Fundamentals:

#1 Describe cloud concepts (3 modules):

- 1.1 Describe cloud computing
- 1.2 Describe the benefits of using cloud services
- 1.3 Describe cloud service types

#2 Describe Azure architecture and services (4 modules):

- 2.1 Describe the core architectural components of Azure
- 2.2 Describe Azure compute and networking services
- 2.3 Describe Azure storage services
- 2.4 Describe Azure identity, access, and security

#3 Describe Azure management and governance (4 modules)

- 3.1 Describe cost management in Azure
- 3.2 Describe features and tools in Azure for governance and compliance
- 3.3 Describe features and tools for managing and deploying Azure resources
- 3.4 Describe monitoring tools in Azure

Microsoft Azure Fundamentals:

Describe cloud concepts

Next module:

#1.1 Describe cloud computing

Q.1

Describe the shared responsibility model

A.1

You'll always be responsible for:

1. Info & data stored in the cloud
2. Devices allowed to connect to cloud (cell phones, computers)
3. The accounts and identities of the people, services, and devices within your organization

The cloud provider is always responsible for:

1. Physical datacenter
2. Physical network
3. Physical hosts

Your service model will determine responsibility for:

1. Operating systems
2. Network controls
3. Applications
4. Identity and infrastructure

Q.2

Define the cloud based models

A.2

- Private Cloud
- Public Cloud
- Hybrid Cloud
- Multi-Cloud

Q.3

Describe the Consumption-based model and its benefits

A.3

Cloud computing falls under OpEx because cloud computing operates on a consumption-based model

Benefits include:

- No upfront costs.
- No need to purchase and manage costly infrastructure that users might not use to its fullest potential.
- The ability to pay for more resources when they're needed.
- The ability to stop paying for resources that are no longer needed.

Microsoft Azure Fundamentals:

Describe cloud concepts

Next module:

#1.2 Describe the benefits of using cloud services

Q.4

Describe the Benefits of high availability and scalability in the cloud

A.4

- High availability: ensuring maximum availability, regardless of disruptions or events that may occur.
- Scalability: ability to adjust resources to meet demand. Another benefit of scalability is that you aren't overpaying for services. Because the cloud is a consumption-based model, you only pay for what you use

Q.5

Describe the Benefits of reliability and predictability in the cloud

A.5

- Reliability: ability of a system to recover from failures and continue to function. if aregion has a catastrophic event, others are still running.
- Predictability:
  - Performance predictability focuses on predicting the resources needed to deliver via Autoscaling, load balancing, & high availability
  - Cost predictability- With the cloud, you can track your resource use in real time, monitor resources to ensure that you’re using them in the most efficient way,

Q.6

Describe the Benefits of security and governance in the cloud

A.6

- help ensure that all your deployed resources meet corporate standards and government regulatory requirements.
- If you want maximum control of security, IaaS provides you with physical resources but lets you manage the o/s and installed software, including patches and maintenance.
- If you want patches and maintenance taken care of automatically, PaaS or SaaS deployments may be the best cloud strategies for you.

Q.7

Describe the Benefits of manageability in the cloud

A.7

- Automatically scale resource deployment based on need.
- Deploy resources based on a preconfigured template, removing the need for manual config.
- Monitor the health of resources and automatically replace failing resources.
- Receive automatic alerts based on configured metrics, so you're aware of performance in real time.
- Managed:
  - through a web portal, a CLI, an API or using PowerShell

Microsoft Azure Fundamentals:

Describe cloud concepts

Next module:

#1.3 Describe cloud service types

Q.8

Describe IaaS

A.8

- IaaS - the MOST flexible category of cloud services
- Max amount of control for your cloud resources
- Cloud provider responsible for maintaining the HW, Network connectivity and Physical security
- You are responsible for everything else:
  - OS, config, maintenance,
  - Network, config,
  - DB and storage config
- essentially renting the HW in a cloud datacenter
- advantage = rapid deployment of new compute devices (Lift & Shift; Test and Dev)

Q.9

Describe PaaS

A.9

- PaaS - middle ground; managed hosting environment
- Cloud provider is responsible for maintaining the physical infrastructure, physical security, connection to internet, OS, middleware, dev tools and B.I. services
- You are responsible for:
  - ~~OS, config, maintenance,~~
  - Network, config,
  - DB and storage config
  - Network and app security
  - Directory infrastructure
- Well suited to provide a complete DEV environment w/o maintaining all the infrastructure.
- Example: **Azure App Services** provides a managed hosting environment where devs can upload web applications, w/o having to worry about the physical hardware and software requirements.

Q.10

Describe SaaS

A.10

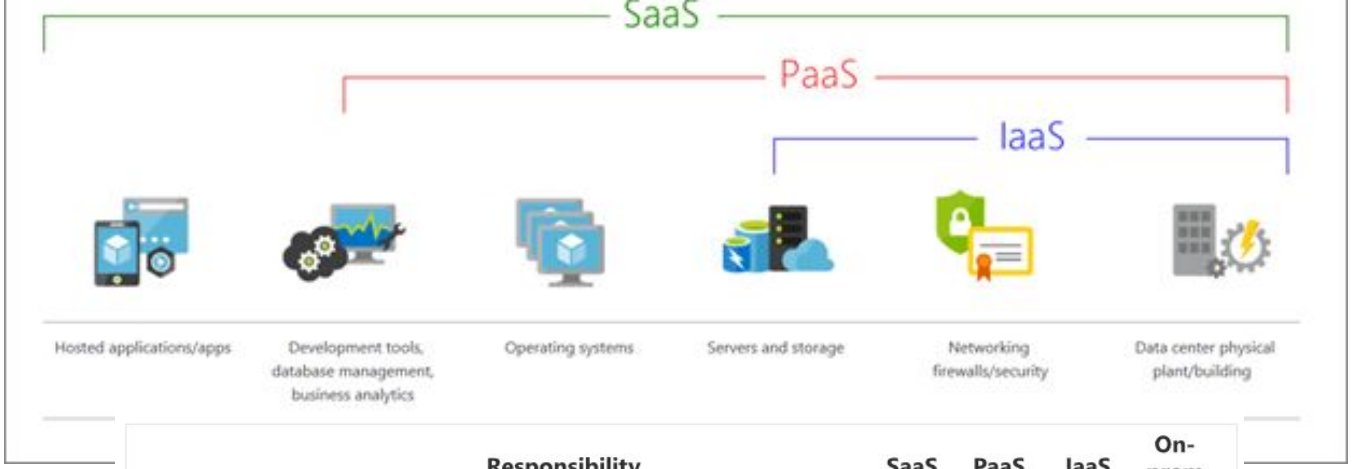
- SaaS - most complete cloud service model
- Cloud provider has the most responsibility: maintaining the physical infrastructure, security of the datacenters, power, network connectivity, and application dev and patching
- You are responsible for:
  - Data you put in
  - Devices allowed
  - User access
- Examples: Email, financial software, messaging applications, and connectivity software, M365 online

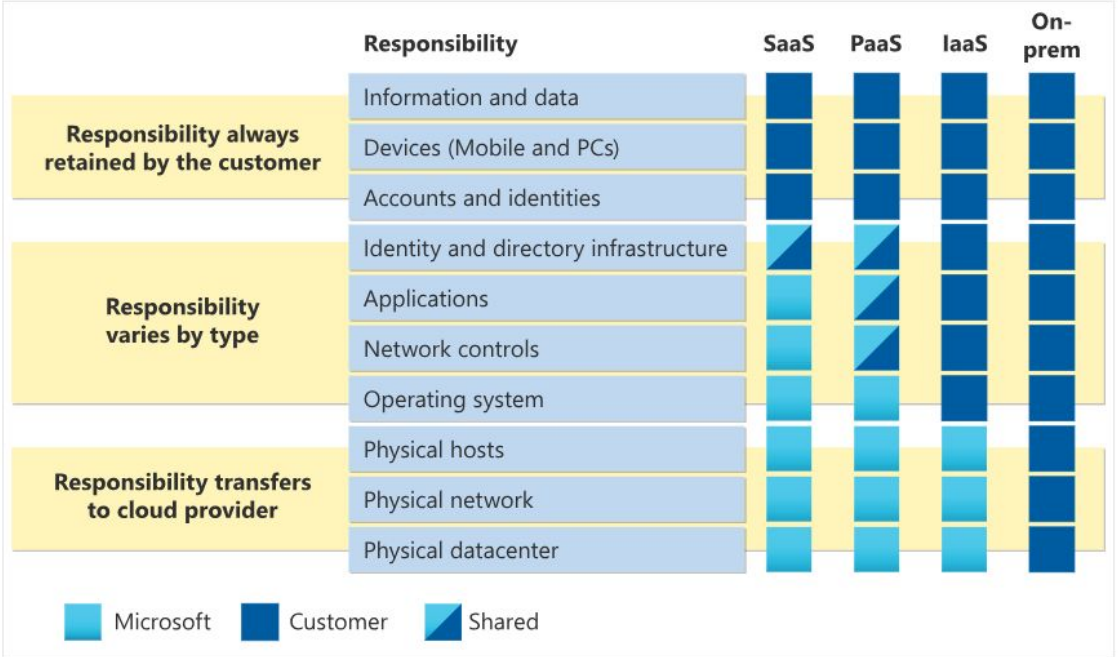
Q.10
b

What is Serverless Computing?

A.10b

- Like PaaS
- Enables devs to build applications faster by eliminating the need for them to manage infrastructure.
- cloud service provider provisions, scales, and manages the infrastructure required to run the code
- Serverless = infrastructure mgmt is invisible to the devs
- highly scalable and event-driven, only using resources when a specific function or trigger occurs.
- Important: servers are still running the code.


SaaS
PaaS
IaaS
Hosted applications/apps
Development tools, database management, business analytics
Operating systems
Servers and storage
Networking firewalls/security
Data center physical plant/building


Responsibility
SaaS
PaaS
IaaS
On-prem
Responsibility always retained by the customer
Information and data
Devices (Mobile and PCs)
Accounts and identities
Responsibility varies by type
Identity and directory infrastructure
Applications
Network controls
Operating system
Responsibility transfers to cloud provider
Physical hosts
Physical network
Physical datacenter
Microsoft
Customer
Shared

Microsoft Azure Fundamentals:

Describe Azure architecture and services

Next module:

#2.1 Describe the core architectural components of Azure

Q.11

Describe Azure physical infrastructure

A.11

1. Datacenters
    a. Grouped into Azure REGIONS or Azure AVAILABILITY ZONES
2. Resources
3. Subscriptions

Q.12

What is difference between:

- Azure Region
- Availability Zone
- Region Pair
- Sovereign Region

A.12

1. **Azure Region** - a geographical area that has dcs networked together with a low latency network (some services do not require you to select a region: Azure Active Directory, Traffic Mgr, DNS)
2. **Availability Zone** - physically separate dcs within a REGION; min of 3 separate availability zones are present in all availability zone-enabled regions for redundancy
3. **Region Pair** - paired with another region within the same geography > 300 miles apart; Most are paired in 2 directions; Planned Azure updates are rolled out to paired regions one region at a time to minimize downtime and risk
4. **Sovereign Region** - instances of Azure that are isolated from the main instance of Azure.

Q.13

Describe Azure management infrastructure

A.13

1. Resources
2. Resource Groups
3. Subscriptions
4. Accounts

Q.14

What is an Azure Resource vs. Resource Group?

A.14

1. Resources
    a. Resource is a basic building block of Azure. Anything you create, provision, deploy, etc. is a resource. Virtual Machines (VMs), virtual networks, databases, cognitive services, etc. are all considered resources within Azure
2. Resource Groups
    a. Resource groups are simply groupings of resources

** When you create a resource, you're ***required*** to place it into a resource group. Resource group can contain many resources, a ***single resource can only be in one resource group at a time. Resource Groups cannot be nested.***

Q.15

Why would someone want to to create multiple Azure subscriptions?

A.15

Might want to create additional subscriptions for resource or billing management purposes

- For example, you may want to create additional subscriptions to separate **Environments** (development and testing, security, or to isolate data for compliance reasons), **Org Structures,** or **Billing**

Q.16

Why would someone want to to create a Management group?

What is diff b/n groups and subscriptions?

A.16

1. Resources are gathered into resource groups, resource groups are gathered into subscriptions
2. Organize subscriptions into containers called **management groups** and apply **governance conditions** to the management groups.
3. Management groups:
   - provide a level of scope ***above subscriptions***
   - give you enterprise-grade mgmt at a large scale, irregardless of subscriptions you have.
   - **can be nested.**
   - 10,000 can be supported in a single directory
   - Can support up to 6 levels of depth
   - Can support only ONE parent

Microsoft Azure Fundamentals:

Describe Azure architecture and services

Next module:

#2.2 Describe Azure compute and networking services

Q.17

What is a VM?

A.17

1. VMs provide infrastructure as a service (IaaS) in the form of a virtualized server and can be used in many ways.
2. VMs are an ideal choice when you need:
   a. **Total control over the operating system** (OS).
   b. The ability to run **custom software**.
   c. To use **custom hosting configurations.**

Q.18

What allows you to create and manage a group of identical load-balanced VMs?

A.18

Virtual machine scale sets

Scale sets allow you to:

- **centrally manage**, **configure**, and **update** a large number of VMs in minutes.
- automatically increase or decrease in response to demand, or you can set it to scale based on a defined schedule.
- automatically deploy a **load balancer** to make sure that your resources are being used efficiently

Q.19

Describe Azure Containers

A.19

Containers are a virtualization environment.

- can run multiple containers on a single physical or virtual host.
- Unlike virtual machines, you **don't manage the operating system for a container.**
- containers are a **lighter weight**, **more agile** method vs. VMs
- Azure Container Instances are a platform as a service **(PaaS)** offering.

Q.20

What are Azure Functions?

A.20

- Azure Functions is an event-driven, serverless compute option, that does NOT require VMS or containers
- only concerned about the code running your service and not about the underlying platform or infrastructure.
- commonly used when you need to perform work in response to an event (often via a REST request), timer, or message from another Azure service, and when that work can be completed quickly, within seconds or less.
- scale automatically based on variable demand;
- charged for the CPU time used while your function runs.
- can be either **stateless** (the default), where they behave as if they're restarted every time, or **stateful** (called Durable Functions)

Q.21

What is the Azure App Service?

A.21

- enables you to build and host web apps, background jobs, mobile back-ends, and RESTful APIs in the programming language of your choice ***without managing infrastructure;***
- automatic scaling and high availability;
- supports Windows and Linux;
- enables automated deployments from GitHub, Azure DevOps, or any Git repo to support a continuous deployment model.
- HTTP-based service for hosting web applications, REST APIs, and mobile back ends.

Q.22

Describe Azure Virtual networking

A.22

Azure virtual networks provide the following key networking capabilities:

- Isolation and segmentation
- Internet communications
- Communicate between Azure resources
- Communicate with on-premises resources
- Route network traffic
- Filter network traffic
- Connect virtual networks

supports both public and private endpoints to enable communication between external or internal resources with other internal resources.

Q.23

How to communicate securely between Azure resources?

A.23

1. **Virtual Networks**
   - Connect not only VMs but other Azure resources, such as the **App Service Environment for Power Apps, Azure Kubernetes Service** and **Azure VM Scale Sets**

2. **Service Endpoints**
   - such as Azure SQL databases and storage accounts.

Q.24

What options are available to communicate with on-premises resources?

A.24

1. **Point-to-site VPN**
   - from a computer outside your organization back into your corporate network
2. **Site to site VPN**
   - Over the internet to link your on-premises VPN device or gateway, to the Azure VPN gateway in a virtual network
3. **Azure Express Route**
   - provides a dedicated private connectivity to Azure that doesn't travel over the internet.
   - ExpressRoute is useful for environments where you **need greater bandwidth and even higher levels of security**

Q.25

How to determine which type of VPN Gateway to setup?

A.25

Primary distinction is **how they determine which traffic needs encryption.**

In Azure, regardless of the VPN type, the method of authentication employed is a **pre-shared key.**

1. **Policy-based VPN**
    - from a computer outside your organization back into your corporate network
2. **Route-based gateway:**
    - links your **on-premises device or gateway,** to the Azure VPN gateway in a virtual network (IPSec)

Q.26

When should you use a route-based VPN gateway?

A.26

Use a route-based VPN gateway if you need any of the following types of connectivity:

1. **Connections between virtual networks**
2. **Point-to-site connections**
3. **Multi-site connections**
4. **Coexistence with an Azure ExpressRoute gateway** (as a secure failover path to ensure there's always a connection to the virtual networks)

Q.27

What are the features / benefits of ExpressRoute?

A.27

1. Connectivity to Microsoft cloud services a**cross all regions in the geopolitical region.**
2. Global connectivity to Microsoft services **across all regions with the ExpressRoute Global Reach.**
3. **Dynamic routing** between your network and Microsoft via **Border Gateway Protocol (BGP).**
4. **Built-in redundancy** in every peering location for higher reliability.

➢ ***data does NOT travel over the public internet,*** so it's not exposed to the potential risks associated with internet communications. **ExpressRoute is a private connection** from your on-premises infrastructure to your Azure infrastructure.

Q.28

What connectivity does Express Route enable to other MS cloud services?

A.28

ExpressRoute enables direct access to the following services in all regions:

1. **Microsoft Office 365**
2. **Microsoft Dynamics 365**
3. **Azure compute services,** such as Azure Virtual Machines
4. **Azure cloud services,** such as Azure Cosmos DB and Azure Storage

Q.29

What are the four models that ExpressRoute connectivity supports?

A.29

ExpressRoute supports four models that you can use to connect your on-premises network to the Microsoft cloud:

1. **CloudExchange colocation**
2. **Point-to-point Ethernet connection**
3. **Any-to-any connection** (to integrate your WAN)
4. **Directly from ExpressRoute sites**

Q.30

What are the benefits of Azure DNS?

A.30

Azure DNS leverages the scope and scale of Microsoft Azure to provide:

1. Reliability and performance
2. Security (based on Azure Resource Mgr)
3. Ease of Use
4. Customizable virtual networks
5. Alias records

Microsoft Azure Fundamentals:

Describe Azure architecture and services

Next module:

#2.3 Describe Azure storage services

Q.31

What are the different storage account types available in Azure?

A.31

A storage account provides a unique namespace for your Azure Storage data that's accessible from anywhere in the world over HTTP or HTTPS.

1. Locally redundant storage (LRS)
2. Geo-redundant storage (GRS)
3. Read-access geo-redundant storage (RA-GRS)
4. Zone-redundant storage (ZRS)
5. Geo-zone-redundant storage (GZRS)
6. Read-access geo-zone-redundant storage (RA-GZRS)

Q.32

What are the different SERVICES supported in each storage account type?

A.32

Type	Supported services	Redundancy Options
Standard general-purpose v2	Blob Storage (including Data Lake Storage), Queue Storage, Table Storage, and Azure Files	LRS, GRS, RA-GRS, ZRS, GZRS, RA-GZRS
Premium block blobs	Blob Storage (including Data Lake Storage)	LRS, ZRS
Premium file shares	Azure Files	LRS, ZRS
Premium page blobs	Page blobs only	LRS

Q.33a

Describe Azure Storage Services

A.33a

1. **Azure Blobs**: A massively scalable object store for UNSTRUCTURED text and binary data.
2. **Azure Files:** Managed file shares for cloud or on-premises deployments.
3. **Azure Queues:** A messaging store for reliable messaging between application components.
4. **Azure Disks:** Block-level storage volumes for Azure VMs.
5. **Azure Tables:** NoSQL table option for structured, non-relational data.

Q.33b

What are some advantages of Blob Storage Services

A.33b

Azure Blobs: A massively scalable object store for UNSTRUCTURED text and binary data.

- Does **NOT require developers to think about or manage disks.** Data is uploaded as blobs, and Azure takes care of the physical storage needs.
- Users or client applications can **access** blobs via URLs, the Azure Storage REST API, Azure PowerShell, Azure CLI, or an Azure Storage client library

Q.34

Describe Azure Storage TIERS

A.34 ALL Access tiers can be set at the blob level.

1. **Hot** access tier:
   a. Optimized for storing data that is **accessed frequently**
   b. Example: images for your **website**
   c. **Highest** level of durability, retrieval latency, throughput characteristics, retrieval SLA, storage costs
2. **Cool**:
   a. for infrequently accessed data, **stored for at least 30 days**
   b. Example: **invoices** for your customers
   c. Can tolerate slightly lower availability, but still require high durability, retrieval latency and throughput characteristics
   d. **Lower SLA, lower storage costs**
3. **Cold**: stored for at least 90 days.
4. **Archive** access tier: rarely accessed and stored for at least 180 days, with flexible latency requirements (for example, long-term backups). Archive access is NOT available to be set up at the account level. HIGHEST costs to rehydrate and access data

Q.35

Describe Azure Queues

A.35

1. Azure Queue storage is a service for **storing large numbers of messages.**
2. Once stored, you can access the messages from anywhere in the world via authenticated calls using HTTP or HTTPS

Q.36

Describe Azure Disks

A.36

1. Azure Disk storage, or Azure managed disks, are **block-level storage volumes** *managed by Azure* **for use with Azure VMs.**
2. Conceptually, they're the same as a physical disk, but they're **virtualized**
3. offering **greater resiliency and availability t**han a physical disk.
4. With managed disks, all you have to do is provision the disk, and Azure will take care of the rest.

Q.37

Describe Azure Tables

A.37

1. Azure Table storage stores large amounts of **STRUCTURED** data.
2. Azure tables are a **NoSQL datastore**
3. accepts authenticated calls from **inside and outside the Azure cloud.**
4. enables you to use Azure tables to build your hybrid or multi-cloud solution and **have your data always available.**
5. Azure tables are ideal for **storing structured, non-relational data.**

Q.38

What is Azure Migrate?

A.38

Azure Migrate is a **SERVICE** that helps you migrate from an on-premises environment to the cloud.

1. **Unified migration platform**
2. **Range of tools**
3. **Assessment and migration**

Q.39

What is Azure Data Box?

A.39

Azure Data Box is a **physical** migration service that helps transfer large amounts of data in a quick, inexpensive, and reliable way.

Q.40

What is Az Copy?

A.40

- AzCopy is a **command-line utility** that you can use to copy blobs or files to or from your storage account.
- Allows you to upload files, download files, copy files between storage accounts, and even synchronize files.
- AzCopy can be configured to work with other cloud providers to help move files back and forth between clouds.
- Synchronizing blobs or files with AzCopy is one-direction synchronization.

Q.41

What can you do with Azure File Sync?

A.41

- Use any protocol that's available on Windows Server to access your data locally, including SMB, NFS, and FTPS.
- Have caches as you need across the world.
- Replace a failed local server by installing Azure File Sync on a new server in the same datacenter.
- Configure cloud tiering so the most frequently accessed files are replicated locally, while infrequently accessed files are kept in the cloud until requested.

Microsoft Azure Fundamentals:

Describe Azure architecture and services

Next module:

#2.4 Describe Azure identity, access, and security

Q.42

Compare Single Sign-on with Multi Factor Authentication

A.42

- Single sign-on (SSO) enables a user to sign in one time and use that credential to access multiple resources and applications from different providers.
- With SSO, you need to remember only one ID and one password
- Multifactor authentication is the process of prompting a user for an extra form (or factor) of identification during the sign-in process

Q.43

Describe Azure external identities

A.43

- **Business to business (B2B)** - users are represented in your directory, typically as guest users.
- **B2B direct connect -** mutual, two-way trust with another Azure AD organization; users are not in your directory.
- **Azure AD business to customer (B2C)**

Can easily enable collaboration across organizational boundaries by using the Azure AD B2B feature

Q.44

When is it useful to use Conditional Access?

A.44

Conditional Access is useful when you need to:

- **Require multifactor authentication (MFA)** to access an application depending on the requester's role, location, or network.
- Require access to services only through **approved client applications.**
- Require users to access your application **only from managed devices.**
- **Block access from untrusted sources**, such as access from unknown or unexpected locations.

Q.45

What is Azure Role-based access control (RBAC)?

A.45

- **set of access permissions** that relate to that role
- **receive all the associated access permissions.**
- **hierarchical**, in that when you grant access at a parent scope, those permissions are inherited by all child scopes.
- **enforced on any action that's initiated against an Azure resource that passes through Azure Resource Manager.**
- Azure RBAC does **NOT enforce access permissions at the application or data level.**

Q.46

What is a zero trust model?

A.46

Instead of assuming that a device is safe because it’s within the corporate network, Zero trust requires everyone to authenticate.

- **Verify explicitly**
- **Use least privilege access**
- **Assume breach**

Q.47

What are the layers of defense in depth?

A.47

Each layer provides protection so that if one layer is breached, a subsequent layer is already in place:

1. **Physical security** -1st line of defense to protect computing hardware in the datacenter.
2. **Identity and access** - controls access to infrastructure and change control.
3. **Perimeter** - uses distributed denial of service (DDoS) protection to filter large-scale attacks before they can cause a denial of service for users.
4. **Network** - layer limits communication between resources through segmentation and access controls.
5. **Compute** - layer secures access to virtual machines.
6. **Application** - layer helps ensure that applications are secure and free of security vulnerabilities.
7. **Data -** layer controls access to business and customer data that you need to protect.

Q.48

What is Microsoft Defender for Cloud?

A.48

Microsoft Defender for Cloud is a monitoring tool that:

1. **Continuously Assesse**s / monitors your cloud, on-prem, hybrid, and multi-cloud envs
2. Provides tools to **Secure** / Harden resources, track security and protect against cyber attacks and streamline security management
3. **Defends** and Detects threats across:
   a. Azure PaaS Services
   b. Azure data Services
   c. Networks

Microsoft Azure Fundamentals:

Describe Azure management and governance

Next module:

#3.1 Describe cost mgmt in Azure

Q.49

What factors can affect costs in Azure?

A.49

OpEx costs can be impacted by:

- Resource type
- Consumption
- Maintenance (use resource groups)
- Geography (eg. cost of power, network traffic, etc)
- Subscription type
- Azure Marketplace (for purchasing services from 3rd party vendors)

When you provision an Azure resource, Azure creates metered instances for that resource.

The meters track the resources' usage and generate a usage record that is used to calculate your bill.

Q.50

Compare Pricing and Total Cost of Ownership calculators

A.50

- Pricing Calc is designed to ***estimate*** the cost for **provisioning** resources in Azure.
- TCO calc is designed to help you **compare costs** for running an on-prem vs. an Azure Cloud infrastructure. (eg. enter current infra config such as servers, dbs, storage and outbound traffic; then compare the anticipated costs of current env vs. Azure env.) **(3 steps: Define your workloads, Adjust Assumptions, View report)**

Q.51

Describe Microsoft Cost Management tool

A.51

- Provides ability to quickly check Azure resource **costs**, **create alerts** (budget alerts, credit alerts dept spending quota alerts), and **budget spending limits** (by billing cycle, region, resource, cost based or usage based, etc)
- Can be used to **automate mgmt of resources**
- Identifies **spending trends**;
- Identifies accumulated costs over time to **estimate future cost trends against budget**

Q.52

What are the purpose of tags?

A.52

1. **Resource management:** tags enable you to locate and act on resources that are associated with specific workloads, environments, business units, and owners.
2. **Cost management and optimization:** Tags enable you to group resources so that you can report on costs, allocate internal cost centers, track budgets, and forecast estimated cost.
3. **Operations management:** Tags enable you to group resources according to how critical their availability is to your business. This grouping helps you formulate service-level agreements (SLAs).
4. **Security Tags** enable you to classify data by its security level, such as public or confidential.
5. **Governance and regulatory compliance**
6. **Workload optimization and automation** Tags can help you visualize all of the resources that participate in complex deployments.

Q.53

How do you manage resource tags?

A.53

1. A resource tag consists of a **name** and a **value**.
2. add, modify, or delete resource tags through **Windows PowerShell,** the **Azure CLI, Azure Resource Manager templates,** the **REST API,** or the **Azure portal.**
3. can use **Azure Policy** to enforce tagging rules and conventions.

Microsoft Azure Fundamentals:

Describe Azure management and governance

Next module:

#3.2 Describe features and tools in Azure for governance and compliance

Q.54

Describe the purpose of Microsoft Purview.

A.54

Microsoft Purview has robust, **unified data governance solutions to:**

1. **Protect sensitive data**
2. Identify data **risks**
3. Get started with **regulatory compliance.**

Q.55

How does Microsoft Purview help manage your on-premises, multicloud, and software as a service data?

A.55

- **Creates** an **up-to-date map of your entire data estate** (includes data classification and end-to-end lineage)
- **Identifies where sensitive data** is stored
- **Creates a secure environment** for data consumers to find valuable data.
- **Generates insights** about how your data is stored and used.
- **Manages access** to the data in your estate securely and at scale.

Q.56

Describe the purpose of Azure Policy.

A.56

Azure Policy defines “**initiatives**” or a a group of related policies that:

- create, assign, and manage **policies that control or audit your resources (including VMs).**
- enforce different rules across your resource configurations so that those **configurations stay compliant with corporate standards.**

Q.57

How does Azure Policy define policies?

A.57

Azure Policy enables you to **define both individual policies and groups of related policies,** known as **initiatives.**

- **Evaluate and highlight resources that are not compliant with the policies you've created**
- you can flag resources as an **exception** from the Policy

Q.58

What are some examples of Azure Policy initiative definitions?

A.58

The initiative definition contains over 100 policy definitions to help track compliance state for a larger goal, and includes monitoring for:

1. **unencrypted SQL Databases and servers** in Security Center.
2. **OS vulnerabilities** in Security Center
3. **Servers with missing Endpoint Protection** in Security Center

Q.60

Describe the purpose of resource locks.

A.60

1. Resource lock prevents resources from being accidentally deleted or changed
2. Can be applied to individual resources, resource groups, or an entire subscription
3. Are inherited

Q.61

What are the 2 types of resource locks.

A.61

1. Prevents users from deleting
2. Prevents users from changing or deleting (similar to ReadOnly)

** Resource locks apply regardless of RBAC permissions **

** To modify a locked resource, you must first remove the lock.**

Q.62

Describe the purpose of the Service Trust portal.

A.62

The Microsoft Service Trust Portal is a portal that provides access to various content, tools, and other resources about Microsoft **security, privacy, and compliance practices.**

Microsoft Azure Fundamentals:

Describe Azure management and governance

Next module:

#3.3 Describe features and tools for managing and deploying Azure resources

Q.63

Describe Azure portal

A.63

Azure portal is a web-based, unified console that provides an alternative to command-line tools.

Manages your Azure subscription by using a graphical user interface to:

1. **Build, manage, and monitor** everything from simple web apps to complex cloud deployments
2. **Create custom dashboards** for an organized view of resources
3. **Configure accessibility options** for an optimal experience

Q.64

Describe Azure Cloud Shell, including Azure CLI and Azure PowerShell

A.64

Azure Cloud Shell is a browser-based shell tool that allows you to **create, configure, and manage** Azure resources using a shell.

Azure Cloud Shell supports both:

- Azure PowerShell (for DevOps to run cmdlets and PowerShell commands)
- Azure Command Line Interface (CLI), a Bash shell using Bash commands

Q.65

Describe the purpose of Azure Arc

A.65

Arc lets you extend your Azure compliance and monitoring to your hybrid and multi-cloud configurations by providing a centralized, unified way to:

1. Manage your entire environment together by projecting your existing non-Azure resources into ARM.
2. Manage multi-cloud and hybrid virtual machines, Kubernetes clusters, and databases as if they are running in Azure.
3. Use familiar Azure services and management capabilities, regardless of where they live.
4. **Continue using traditional ITOps** while **introducing DevOps** practices to support new cloud and native patterns in your environment.
5. **Configure custom locations as an abstraction layer** on top of Azure Arc-enabled Kubernetes clusters and cluster extensions.

Q.66

What resources can you manage with Azure Arc

A.66

Currently, Azure Arc allows you to manage the following resource types **hosted outside of Azure:**

1. **Servers**
2. **Kubernetes clusters**
3. **Azure data services**
4. **SQL Server**
5. **Virtual machines (preview)**

Q.67

Describe Azure Resource Manager (ARM)

A.67

ARM is the deployment and management service for Azure (uses REST API)

It provides a management layer that enables you to **create, update, and delete resources** in your Azure account

When a user sends a request from any of the Azure tools, APIs, or SDKs, ARM receives the request.

Q.68

What are the benefits of using Azure Resource Manager (ARM)?

A.68

1. Manage your infrastructure through **declarative templates** rather than scripts.
2. Deploy, manage, and monitor all the resources for your solution **as a group**, rather than handling the resources individually.
3. Re-deploy your solution and have confidence your resources are **deployed in a consistent state**.
4. Define the **dependencies between resources**, so they're deployed in the correct order.
5. **Apply access control to all services** because RBAC is natively integrated into the management platform.
6. **Apply tags to resources** to logically organize all the resources in your subscription.
7. **Clarify billing** by viewing costs for a group of resources that share the same tag.

Q.69

Describe Azure ARM templates

A.69

ARM templates:

- Describe the resources you want to use in a declarative JSON format
- Deployment code is verified before run
- creates resources in parallel

Define the desired state and configuration of each resource in the ARM template, and the template does the rest.

Templates can even execute PowerShell and Bash scripts before or after the resource has been set up.

Q.70

What are the benefits of using ARM Templates?

A.70

1. **Declarative syntax** (where you declare what you want to deploy but don't need to write the actual programming commands and sequence to deploy the resources)
2. **Repeatable results**
3. **Orchestration** (simplifies deployment of interdependent resources, so they're created in the correct order)
4. **Modular files**
5. **Extensibility** (can add PowerShell or Bash scripts to templates or stored in an external source and referenced in the template)

Microsoft Azure Fundamentals:

Describe Azure management and governance

Next module:

#3.4 Describe monitoring tools in Azure

Q.71

Describe the purpose of Azure Advisor

A.71

Azure Advisor **evaluates** your Azure resources and **makes recommendations** to help improve:

1. **Reliability -** continuity of biz critical applications
2. **Security**
3. **Performance** - speed of applications
4. **Operational excellence -** achieve process and workflow efficiency, resource manageability, and deployment best practices.
5. **Costs**

Q.72

Describe Azure Service Health

A.72

Azure service health combines 3 services:

1. **Azure Status** - informs of service outages and offers global view of health of all Azure services - good ref for incidents
2. **Service Health** - focuses on the services and regions being used.
3. **Resource Health** - focuses on individual cloud resource health (eg. a specific VM instance)

Q.73

Describe Azure Monitor, including Azure Log Analytics, Azure Monitor Alerts, and Application Insights

A.73

Azure Monitor is a **PLATFORM** for collecting data, analyzing, visualizing the info and acting on resources.

- **Azure Log Analytics** - writes and runs log queries
- **Azure Monitor Alerts**
  - alerts (and can be configured to correct action) when it detects a threshold being crossed.
  - rules based on metrics provide near real time alerts based on numeric values.
  - Rules based on logs allow for complex logic across data from multiple sources.
  - **Application Insights** are a feature that monitors **web applications**

Q.74

What are 2 ways to configure Application Insights?

A.74

- **install an SDK in your application,**
- **use the Application Insights agent.** The Application Insights agent is supported in C#.NET, VB.NET, Java, JavaScript, Node.js, and Python.

Q.75

What can you use Application Insights to monitor?

A.75

- **Request rates, response times, and failure rates**
- **Dependency rates, response times, and failure rates,** to show whether external services are slowing down performance
- **Page views and load performance reported by users' browsers**
- **AJAX calls from web pages,** including rates, response times, and failure rates
- **User and session counts**
- **Performance counters from Windows or Linux server machines,** such as CPU, memory, and network usage

Q.76

What are actions groups and which Azure services use them?

A.76

An Action Group is a collection of notification and action preferences that you associate with one or multiple alerts

Azure Monitor, Service Health, and Azure Advisor all use actions groups to notify you when an alert has been triggered.

General Questions
- not aligned with specific modules

Q.77

List the most commonly used categories of Azure Services

A.77

1. Compute
2. Web
3. Internet of Things (IoT)
4. Big data
5. AI
6. DevOps
7. Networking
8. Storage
9. Mobile
10. Databases

Q.78

List the Azure COMPUTE Services

A.78

1. Azure Virtual Machines
2. Azure Virtual Machine Scale Sets
3. Azure Kubernetes Service
4. Azure Service Fabric
5. Azure Batch
6. Azure Container Instances
7. Azure Functions

Q.79

List the Azure NETWORKING Services

A.79

1. Azure Virtual Network
2. Azure Load Balancer
3. Azure Application Gateway
4. Azure VPN Gateway
5. Azure DNS
6. Azure Content Delivery Network
7. Azure DDoS Protection
8. Azure Traffic Manager
9. Azure ExpressRoute
10. Azure Network Watcher
11. Azure Firewall
12. Azure Virtual WAN

Q.80

List the Azure STORAGE Services

A.80

1. Azure Blob storage
2. Azure File storage
3. Azure Queue storage
4. Azure Table storage

Q.81

List the features of Azure MOBILE Services

A.81

1. Corporate sign-in
2. Offline data synchronization.
3. Connectivity to on-premises data and resources
4. Broadcasting push notifications.
5. Autoscaling to match business needs.

Q.82

What are the common characteristics of Azure STORAGE Services

A.82

1. **Durable** and highly available with redundancy and replication.
2. **Secure** through automatic encryption and role-based access control.
3. **Scalable** with virtually unlimited storage.
4. **Managed**, handling maintenance and any critical problems for you.
5. **Accessible** from anywhere in the world over HTTP or HTTPS.

Q.83

What are the types of Azure DATABASE Services?

A.83

1. Azure Cosmos DB
2. Azure SQL Database
3. Azure Database for MySQL
4. Azure Database for PostgreSQL
5. SQL Server on Azure Virtual Machines
6. Azure Synapse Analytics
7. Azure Database Migration Service
8. Azure Cache for Redis
9. Azure Database for MariaDB

Q.84

What are the types of Azure WEB HOSTING Services?

A.84

1. **Azure App Service:** Quickly create powerful cloud web-based apps.
2. **Azure Notification Hubs:** Send push notifications to any platform from any back end.
3. **Azure API Management:** Publish APIs to devs, partners, and ees securely and at scale.
4. **Azure Cognitive Search:** Deploy this fully managed search as a service.
5. **Web Apps feature of Azure App Service:** Create and deploy mission-critical web apps at scale.
6. **Azure SignalR Service:** Add real-time web functionalities easily.

Q.85

What are the types of Azure IoT Support Services?

A.85

1. IoT Central
   - IoT SaaS
2. Azure IoT Hub
   - Messaging hub
3. IoT Edge
   - Data analysis models to be pushed to IoT devices

Q.86

What are the types of Azure Services that support BIG DATA ?

A.86

1. Azure Synapse Analytics
   - Uses cloud based enterprise data warehouse
   - takes advantage of massively parallel processing to run complex queries quickly across petabytes of data.
2. Azure HDInsight
   - Process massive amounts of data w/ managed clusters of Hadoop clusters in the cloud.
3. Azure Databricks
   - Apache Spark-based analytics service used to integrate other big data services in Azure

Q.87

What are the common AI and machine learning service types in Azure ?

A.87

1. Azure Machine Learning Service:
   - Cloud-based environment you can use to develop, train, test, deploy, manage, and track machine learning models. It can auto-generate a model and auto-tune it for you. It will let you start training on your local machine, and then scale out to the cloud.
2. Azure Machine Learning Studio:
   - Collaborative visual workspace where you can build, test, and deploy machine learning solutions by using prebuilt machine learning algorithms and data-handling modules.

Q.88

What are the cognitive services in Azure ?

A.88

1. **Vision:**
   - Uses image-processing algorithms to smartly identify, caption, index, and moderate pictures and videos.
2. **Speech:**
   - Convert spoken audio into text, use voice for verification, or add speaker recognition to your app.
3. **Knowledge mapping:**
   - Map complex information and data to solve tasks such as intelligent recommendations and semantic search.
4. **Bing Search:**
   - Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news with a single API call.
5. **Natural Language processing:**
   - Allow your apps to process natural language with pre-built scripts, evaluate sentiment, and learn how to recognize what users want.

Q.89

What are the DevOps services in Azure ?

A.89

1. **Azure DevOps**
   - Use development collaboration tools such as high-performance pipelines, free private Git repositories, configurable Kanban boards, and extensive automated and cloud-based load testing. Formerly known as Visual Studio Team Services.
   -
2. **Azure DevTest Labs**
   - Quickly create on-demand Windows and Linux environments to test or demo applications directly from deployment pipelines