

AZ-900 Azure Fundamental Exam Notes

Azure Support Plan Comparison									
Plan Name	Scope	Tech Support	Response Times	Architecture	Operations	Training	Proactive Guidance	Launch Support	
Developer	Non-Prod	Business Hours (email)	Sev C; < 8 bus hours	General Guidance					
Standard	Prod	24x7 (email & phone)	Sev A; < 1 hour	Based on best practice by ProDirect delivery manager	Onboarding services, service reviews, Azure Advisor consultations	Azure Engineering-led web seminars	ProDirect Delivery Manager		
Professional Direct	Business Critical								
Premier	Substantial Dependence			Customer specific architectural support (e.g. design reviews, perf tuning, config)	Technical account manager-led service reviews and reporting	Azure Engineering-led web seminars, on-demand training	ProDirect Delivery Manager Designated Technical Account Manager	Azure Event Management (available for additional fee)	

Pluralsight Image of Azure Support Plans

- AZ-900 Azure Fundamental Exam Notes. These notes will help you pass the AZ-900 Exam (exam for fundamentals of Azure cloud computing services). Exam measures:
 - 20–25% cloud concepts; 15–20% core Azure services; 10–15% core solutions and management tools; 10–15% general security and network security; 20–25% identity, governance, privacy, and compliance; 10–15% cost and service
 - Cloud computing: companies consume computing resources (virtual machine, storage, apps) as a utility like electricity instead of building/maintaining computing infrastructure in-house (<https://searchcloudcomputing.techtarget.com/definition/cloud-computing>). Computing resources and software over the Internet.

- Cloud providers giving cooling, power, tax saving, and pooled costs to customers; things more efficient and lower cost per unit when operating at larger scale: economies of scale
- Three types of cloud computing that are all supported by Microsoft Azure:
 - Infrastructure as a Service or IaaS where you handle apps, middleware, OS, routing, and data while the vendor handles virtualization, servers, storage, & networking. Azure versions include Azure Compute and Azure Storage. Commonly used for Test and development, storage and backups, high performance computing, and big data analysis. Physical security
 - Platform as a Service or PaaS where you handle apps and data. Meanwhile vendors handle OS, middleware, routing, virtualization, servers, storage, & networking. Azure versions include Azure Logic apps, Azure Functions, Azure Web Jobs, and Azure Automation. Common uses include analytic intelligence and business intelligence as well as development framework (get tools needed for app development over internet from 3rd party). Physical security, Identity/access management, network controls
 - Software as a Service or SaaS: You don't handle anything, and everything is handled by the vendor. Azure versions include SharePoint, OneDrive for Business, Microsoft Teams, and Power Platform. Common scenarios for this include access to sophisticated apps and mobilize your workforce easily. Organization can't install

and run software apps on PC or any computer. Physical security, Identity/access management, network controls

- Cap-Ex: cost over useful life of an asset, can't deduction from fiscal year, upfront cost for services and equipment, value of items reduce over time; Op-Ex: deducted same year they are made, doesn't necessarily have any upfront costs
- 4 Deployment modules for cloud computing:
 - Public: third party provider with hardware among multiple clients (lower capital costs and high reliability)
 - Private: hardware used by company owning hardware alone, most secure
 - Hybrid: combo of public and private
 - Community: Infrastructure shared between several organizations from a specific community with common concerns (Azure Government provides this: Azure Government has only Bring Your Own License or BYOL and Pay As You Go images of products; using same tech as global Azure; and Pipelines service is unavailable)
- Azure Data Centers: cost effective; ITPACs: pods of servers with own electricity and cooling; data center security and energy efficient since they are carbon neutral since 2012 & 100% renewable energy by 2025; Project Natick (underwater Scottish data center using water to cool off)

- Choose where data for most services (like service account) is stored: Region (usually 300+ miles apart, containing 1 or more datacenters networked in low latency networks, HA (high availability), has availability zones
 - Resources in Azure: VMs, storage accounts, web apps, databases, VNETs, etc.
- Resource Group: contains set of resources that share the same lifestyle; container for security boundaries & can export infrastructure as a code using Resource Manager Templates; can be in different regions
- Made in portal.azure.com, can delete (all resources gone), add tags
- Install Azure CLI -> 2 ways: download Windows/Mac/Linux and use az login; Azure Portal -> click Azure Cloud Shell (Cloud Shell times out after 20 mins inactivity)
 - Az group list, azresource list
- Infrastructure as a Code-Template: JSON, infrastructure and config, deployment: GitHub, Power and Azure CLI, Rest API
- Expert Resource: check resource/export template, download zip (can also add to library), deploy to other resource group

- Service Health: Service issues, planned maintenance, Health Security advisors, Resource Health, Rules management (create alert rule)
- Monitor: Activity log, Alerts, Metrics, Logs, Service Health, Workbooks
 - Insights: Apps, Virtual Machines, Networks (preview), Storage accounts
- Microsoft Azure app from Google Play or iOS -> Connects with Cloud Shell, alerts, Service Health
 - Start VMs, Microsoft Remote Desktop if you have it
- Advisor: optimize and reduce spending by idle and underused resources (option called Cost Management to provide cost optimization recommendations by identifying idle and underutilized resources)
 - Security- access config
 - Reliability
 - All recommendations
 - Advisor Alert

- Azure Core Products: VMs, containers, apps service, serverless computing -> Azure Computing (new resources, PaaS), pay for what you use, deliver exact units of resources when an app needs it
 - Azure Virtual Machines: IaaS, full operating system control, maintain and patch VM, making VM (type of image, size, availability options)
 - VM Scale Sets: multiple VMs with load balancing, scale out/in, spread across fault domains (domains that guarantee that VMs are deployed on hardware components which do not share a common power source and network switch) and update domains, only pay for underlying resources. Can install custom software, shutdown to save on cost manually or on schedule, hybrid cloud possible, lift-and-shift migration (site recovery, Azure Mitigate, ssh or RDP for Windows)
 - Containers: app in isolated package, has runtime and libraries, allows monolithic apps to split up into individual services
 - Same across different deployments (Azure Container Registry; Hosting Options for Containers: Local workstation, on-premises servers, VMs in Azure, Azure Container Instances (ACI), Azure Kubernetes Service (AKS), Azure App Service
 - AKS: Container management system in Azure, scale out container-based apps, monitoring and deploying containers, pods are groups of containers, nodes are virtual machines, can leverage VM Scale Sets, Azure Container Registry, Azure Monitor

■ Install container instances

- Azure App Service: like traditional web hosting, framework runtimes installed on servers, handles web servers for you, web apps, api, mobile app, containers, web jobs
 - Url: <https://<service name>.azurewebsites.net>
 - Basics, Docker, Monitoring, Tags, Review and create
- Serverless Compute: functions (run custom code started by triggers, polling trigger: continually checks an endpoint for messages that satisfy the criteria for creating a logic app instance & starting the workflow), logic apps (designer in portal started by triggers, large library of connectors), Azure Event Grid (connect data sources and event handlers)- size limit 1 MB in preview
 - Azure Logic Apps connector: component of Azure that helps your logic app access apps, services, and systems in the cloud or on premises by providing triggers, actions, or both
- Application Gateway (acts as web traffic load balancer that enables you to manage traffic to web apps)Features:
 - SSL Termination, Autoscaling (built-in feature of Cloud Services, Mobile Services, VMs, and Websites to perform well when demand changes), Session Affinity, HTTP Header Rewriting, Advanced Routing, Web App Firewall (WAF)

- ExpressRoute: pricing (unlimited or metered data-per GB outbound), Bandwidth (50 Mbps to 10 Gbps or 100 Gbps-ExpressRoute Direct), Redundancy, only way to replicate data over public internet and you can't use VPN to do this, connect on-premises environment to Azure data center over internet
- Vnet-> subsets for resources, DNS -> Default or Custom, Public IP address. Config DNS name label for ip, Vnet peering does not use a VPN gateway
- Windows Virtual Desktop: full desktop remotely like remote desktop services (or RDS), supported by PC, Mac, iOS, Android, HTML5
 - Windows Virtual Desktop: Azure AD, Multi-factor auth, support Server 2012 R2/2016/2019, 7 & 10 Enterprise
 - Azure CDD: Network of servers, cached data (less latency, traffic offload from source), typically static data but also dynamic
- CDN endpoint for content
- Dynamic Site Acceleration -> dynamic data, route optimization, TCP optimization
- Data Storage: flexible solutions to new/old problems, storage services for specific data types, Azure data storage problems
- Categories of Data include:

- Structured Data: Azure SQL Database, Azure Database for MySQL, Azure Database for PostgreSQL
 - Unstructured Data: Blob/File/Disk
 - Semi-structured: Cosmos DB
- SQL Server on VM -> full control, provision from Azure Marketplace (purchases that are deleted must be repurchased and provides 3rd party products and services that can be integrated with Microsoft Azure), Flexible pricing options, Automatic updates and Azure backup
- Azure SQL Database: PaaS, latest SQL server version, Flexible pricing model (Vcore, DTu's). (deploy with managed instance or database or Elastic Pool), autoscaling, Hub data must be an Azure SQL database when using Data Sync, Read Scale-Out is feature that sends read-only request to secondary replica of SQL database to load-balance requests
- Azure Database for MySQL: open-source tools, MySQL community edition, flexible pricing options, high-availability, dynamic scalability, encryption, automated patched and backup
- Azure SQL Managed Instance: SQL Server set, VM on own VNET
- Azure Database for PostgreSQL: Geometric data types, extensions for GIS, single server hyperscale (faster response time, 100 GB+), Geo-Replication (disaster recovery, in region), connection string,

auditing, dynamic data masking, Region Pairs: 2 Azure regions within same geographic region have relationship for disaster recovery purposes

- Enable IP address, for servers in firewall, data encryption
- Cosmos DB: global distribution, multi-modal, fast response times, backed by SSD storage, APIs: SQL API, Cassandra, MongoDB, Gremlin, Azure Table Storage
 - Data Explorer
- Azure Storage Account: Blob (unstructured), File, Disk (VM disks and page blob, table (NoSQL structured non-relational data), Queue (async for apps)
 - Authorization to Data: RBAC in Azure AD, Storage Account Keys, Shared Access Signatures (“SAS Token” for storage account, validity period)
- Programmatic Access to Storage Accounts: Rest API, SDKs, Powershell, Azure CLI, Azure Storage Explorers, AZ Copy
 - AzureFiles: supports SMB protocol (multiple VMs, file share with drive letter), good for mitigation scenarios, access with REST interface
 - Blob -> Binary Large OBject

- Block — text/binary
- Append — logs (append only)
- Page -> 8 TB, VM disks and databases, apps (Database)
 - Cost effective for large files
 - Hot Tier -> frequent
 - Cool Tier -> infrequent
 - Archive -> rare (hours, offtime)

Hot, Cool, and Archive available for all tiers.

- Snapshots, leases, soft delete, static website, CDN integration, Azure Search Integration
- Data Migration:
 - Azure Database Migration Service (DMS): to Azure from other regular/cloud platforms (process) -> Target, authentication
 - IoT: Devices and sensors, devices linked to each other/ internet -> alerts, insights, actions
 - Issues: no standards (IEEE working on); security

**Azure IoT: up to 10 IoT Hubs can be made, IoT Edge runtime reports health of IoT Edge modules, Mather: set of specific conditions that monitor the IoT device or sensor

- Azure IoT Central: managed app platform, built-in device profiles, industry-specific templates (set up url, app id, duplicate instance), free 7 days
- Azure IoT Hub: platform service, bi-directional communication, auto provisioning of device objects. SDKs, api, auth (X.509, shared access signatures), ability to process data from millions of sensors
- Azure Sphere: app platform, Foundation for IoT devices, component to IoT solutions, devices also use Azure Sphere Service
- Big Data Solutions
 - Azure HDInsight: open-source analytics tools, Apache Hadoop, cluster of compute nodes, on-demand scalability and auto scale, integration with Azure services for building analytics pipelines; easy, fast, and cost-effective to analyze streaming data using open source frameworks like Apache Hadoop
 - Features: Hadoop Distributed File System (DFS), MapReduce for batch processing, supports Apache Spark, familiar open source tools, supports newer development environments
 - Azure Databricks: Company outside Microsoft, Azure has hosted Databricks platform, based on Apache Spark platform, fully

managed Spark clusters, workspace for visualizing data, serverless option, notebooks, interactive dashboards, integration with other Azure services

- Azure Synapse Analytics: Formerly Azure SQL Data Warehouse (replicated table provides fastest query performance for small tables and materialized view is quicker to retrieve data than standard view), Storage component, Azure Synapse Analytics (SQL technologies, Spark analytics, pipelines for orchestration, serverless or provisioned options, Spark languages and T-SQL, ETL functionality, Integration with Azure services)
- See by Launch Synapse Studio for resource or Resource Groups (url is web.azuresynapse.net)

■ Data, Develop, Orchestrate, Monitor, Manage

- Azure Machine Learning: existing data to forecast future behaviors and outcomes and trends, model is trained using known data, makes predictions for unknown data, Machine Learning Studio (ml.azure.com)
- Notebooks, Automated ML (preview), Designer (preview), Dataset (created from multiple forms of data storage)
- Cognitive Services: prebuilt AI capabilities. Services include Vision (Process and catalog and generate captions for images, video indexer, optical character recognition for many languages as well as typed & handwritten text, Face API, Form Recognizer), Speech

(Speech to text and text to speech, Speaker recognition), Language (Language understanding API , Sentiment Analysis, Translator Service – 70+ languages), Web Search (Bing Web Search/Custom Search API/ Image Search/ Entity Search/News Search/ Video Search/ Visual Search/ Autosuggest/Spell Check/ Business Search API), and Decision (Anomaly API, Content Moderator, Personalizer)

- Azure Bot Service: virtual assistant to respond to question and uses natural language processing, Tools (Bot Framework SDK or Bot Framework Composer on Desktop app or Emulator that requires .NET Core SDK 3.1+), Deploy to app service or function app
- DevOps Solutions in Azure: host git repo, Collaboration Tools (Tracking of tasks and responsibilities, work broken into iterations), dev.azure.com
 - Azure DevOps Boards supports popular project management methods (Agile, Scrum, Basic, CMMI), link work items (pull requests, code commits, tests, builds, architectural diagrams). It is an integration solution for the deployment of code
- Azure DevOps Pipelines and GitHub Actions:
 - DevOps CI/CD — Continuous Integration, Continuous Deployment
 - DevOps Pipelines: build and release pipelines defined in YAML files and run tests during pipeline and create reports within pipeline, publish artifacts, publish ARM templates to create resources in

Azure, Code can be pulled From Azure Repos or external repo like GitHub (spinning blue = good running pipeline)

- GitHub Actions: like Azure DevOps Pipelines, YAML, build code on PC and Linux and Mac agents, GitHub actions run within workflows

- Azure DevTest Labs:

- Base images for VMs and images preconfigured, existing VMs in a pool, Auto-start and auto-stop of VMs, Constraints on resources that can be created by a developer (Size of VM, # of VMs)

- Use for developer desktops and test environments/sandbox, hands-on labs

- Microsoft Azure Security & Privacy Concepts:

- Authentication (prove who or what something is like user logging in with password or biometrics or prove someone part of staff) v. Authorization (correct level of resources like access to some files, can user make VM?, and access to what buildings)

**Authentication: username and password, multi-factor, sometimes captcha; Authorization: only after validation with RBAC and permissions

- Azure Active Directory: user and computer register, no group policies, no trust relationships, app management

- Active Directory Domain Services: User and computer register, group policies and trust and app/device management & deployment, Kerberos and NTLM support, schema management, Hierarchical directory service; PaaS
- Accounts: full time IT staff, full time users, contactors
- Azure AD Single Sign-On: key feature of Azure AD, put in 3rd party.
- Ask: Off site access, Multi factor access, Devices (restricted to some devices)
- Azure AD Conditional Access: signals to make decisions and conditions like if-then statements. Decisions based on ip location info, risk analysis, device info, and app being accessed. Can block access or grant access (might still enforce MFA or joined device, use **block user when fraud is reported** option)
- RBAC: assign roles and permissions to roles. 3 main built-in: owner, contributor (can't great access, but can make changes), reader (view, no changes). You have built-in or custom that can use built-in as template (use least privilege). Default Directory to create or invite user (lock to delete or read only — assign to resource group)
- Governance Tools: Security and technical requirements enforced
 - Azure Tags: key/value pairs for resources, organizations should have a tagging policy enforced by Azure policies (collection of rules -

- > policy definition assignment, parameters), Tags can be used (enforce security requirements, control costs, deploy software)
 - Initiatives: group of policies and assigned to scope like resource group with definition, assignment, and parameters
 - Built-in policies: Storage account with SKU sizes, allowed locations, resource types, Enforce tags, and Virtual Machine SKUs
- Dashboard -> Policy
 - Authoring: Assignments, Definitions (can sort by name, definition location, type, policies, etc.), Exemptions
 - Make initiative with new Initiative definition -> add policy definitions
- Azure Blueprints: orchestrate deployment of resource templates and artifacts, blueprints maintain relationship with deployed resources, Blueprints include Azure policy & initiatives as well as artifacts such as roles. Definition (resource groups defined and created, resource manager templates can be included to deploy resources, policy can be included, and roles can be assigned to resources that blueprints have created) and publishing (Home>Blueprints)
- Azure Advisor Security Assistance: Azure advisor integrates with Azure security center, Advisor security assistance that helps

prevent/detect/respond to threats, should be using tool every day, configuration is managed through security center

- Defense in depth: physical security, identity and access, perimeter, network and app, compute and data
- Network Security Groups (NSGs): NSGs filter traffic (allow or deny inbound & outbound traffic), NSGs contain rules (rules order based on a number from 100 to 4096 which are processed from 100 to 4096 in that order).
 - Attached to subnets or network cards, each NSG can be linked to multiple resources, stateful, includes things like name, priority, source or destination, protocol, direction, port range, action
 - Problems: can be complex and hard to maintain
- Solve with service tags, default security rules, and use application security groups
 - Application Security Groups: reference a group of resources, used as source/destination in network security groups, network security groups still required (consider N-Tier apps, DMZ, Automation)
 - Azure Firewalls and User Defined Roles: stateful firewall service, highly available, features include:

- Threat intelligence, outbound and inbound NAT support, integration with Azure Monitor, network traffic filtering rules, unrestricted scalability.
- DDoS Protection with always on monitoring with multi-layer protection, analytics, scale, and elasticity as well as protection against unplanned costs. Has basic (free, backed by an SLA, availability guaranteed and active monitoring, DDoS enabled by default) and standard (everything in basic, real time metric, post attack reports, access to DDoS experts during attack and security info, monthly fee, usage based)
- User Defined Routes: default system routes, system routes routing between subnet and internet, user defined routes to override defaults, traffic can be filtered through virtual appliance
- Security Options: Azure firewall, Network Security groups, forced tunneling, Azure DDoS Protection, Marketplace devices, Azure web app firewall
- Control internet traffic, Azure hosted SQL server, and router internet traffic are security scenarios
- Security and Reporting Tools: Azure Info Protection used to classify documents and emails with label to documents (labeled docs protected), AIP labels (auto, manually, recommended to users)
- Sides to AIP: Classification and Protection, 3 Security and Reporting Resources: Azure monitor (collect, analyze and act on

telemetry; Azure or on-premises; troubleshooting and performance monitoring; data collected by Azure monitor in the form of metrics and logs), Azure service health (notifies you of service status with report on incidents and planned maintenance and Azure health offers such as personalized dashboards & configurable alerts & guidance), Azure advanced threat protection (monitor user activity to identify suspicious events, works on-premises Active Directory forest, identifies domain dominance and lateral movements and compromised credentials and reconnaissance attacks); 443 or HTTPS must be open for telemetry data flow

- Azure Key Vault: Centralized storage of app secrets, logging to monitor how secrets used, centralized admin of secrets, uses FIPS 140–2 level 2 validated HSMs. Recommend separate vault for app or environment, regular backups, turn on logging and alerts, turn on soft delete/purge protection (Dashboard -> Key Vaults. Create key vault and access policy). Key, Secrets, Certificates, Access policies, firewalls and virtual networks
- Azure Security Center (Protect PaaS, Compliance, Assessment, Threat protection, Non-Azure services)
 - Azure Sentinel: cloud native security info event management (SIEM) and security orchestration automation response (SOAR) solution; single solution for collect date at cloud scale, detect previously undetected threats, and investigate threats with AI (Connect your security sources with data connectors, deep investigation and hunting, analyze your data using workbooks and

analytics, security automation/orchestration using playbooks
(Dashboard > Security Center)

- Azure Industry Compliance: ensure following laws of governing bodies; people and process monitor systems to detect and prevent violations; compliance monitoring can be complex; several tools to help us assess compliance posture
 - Selected Compliance Standards: HIPAA, PCI, GDPR, FedRAMP, ISO 27001
 - Azure Compliance: Global (more than 90 offerings), Industry (35+ offerings), Blueprints (deploy compliant environments), proof (access to 3rd party reports), Azure security center
 - Azure Service Trust Portal: Contents (details of Microsoft's implementation of controls and processes), Access (login as an authenticated user with a Microsoft cloud service account).
Servicetrust.microsoft.com -> white papers and azure blueprints and security assessments, Compliance Manager. Microsoft won't use info to target ads, if tenant deactivated then Trust data deleted within 24 hrs, and provides Security and Compliance Blueprints to help customers to build apps that comply with standards and regulations
- Group -> amount access and how close to compliance your system is. Privacy.microsoft.com for Microsoft Privacy Statement

- Azure Special Regions: US Gov (Virginia and Iowa – US govt. agencies; Level 5 DoD approval and certifications such as FedRAMP and DISA), China (China East and China north through partnership with 21Vianet), Germany (Germany central and Germany Northeast – T-System), must request access
- Trusted Cloud: Security, Privacy (Microsoft Privacy Statement/ Subscription Agreement or MOSA, Online Services Terms or OST), Compliance (Industry specific – Financial, Auto, Media, Energy)
- Understanding Azure Subscriptions: starts with making a new subscription, tying it to an account, and then deploying cloud resources you will consume. Azure.microsoft.com to sign up with Microsoft account. In portal, select new Subscriptions
- Management Groups: Activity Log, access control (IAM), Policies
- Planning and Management in costs:
 - Free- \$200 credit for 30 days, many services free for 12 months, 25+ free services forever
 - Pay as you go – Monthly
 - Student – \$100 credits for 12 months. No credit card required
 - Enterprise Agreement – purchase services and software under single agreement.

- Options for Azure purchases: Enterprise Agreement or EA (for large organizations, premiere support & dedicated Azure resources, annual spend commit, Customized and deeply discounted), Direct – from Microsoft (bill from Microsoft, self-manage or use partner for Azure usage management/deployment/provisioning), Indirect – Cloud Solution Provider or CSP (bill and support or usage and provisioning from CSP)

- Cost affected by Location, Service, Egress traffic, Resource Type

- Azure Zone – grouping of regions based on billing, data transfer cost

- Zone 1: US, Europe, Canada, UK, France, Switzerland

- Zone 2: East Asia, Southeast Asia, Japan, Australia, India Korea

- Zone 3: Brazil, South Africa, UAE

- DE Zone 1: Germany

- Pricing Calculators: Azure Pricing calculator, Total Cost of Ownership calculator or TCO (migration) – azure.microsoft.com/en-us/pricing/ (tco/calculator)

- Support Plans: Basic (free, 24x7 access to building and subscription, online self-help, support forums)

Go to Azure Portal -> Help Support

- Outside of Support Plan: MSDN Forum, Server Fault, Stack Overflow, Azure Support (@AzureSupport) on Twitter
- Azure Knowledge Center: common questions from experts, developers, and users
- Azure Services Level Agreements (SLAs): comes from ITIL. An SLA is a commitment between a service provider and its internal or external customers. Service provider gives to customers and standards to meet (azure.microsoft.com/en-us/support/legal/sla). Does not include Previews. SLA for each service
- Composite SLA — more than one service for app. Different levels of availability and connectivity (ex: app with Azure App Service web app on front end and Azure SQL Database on backend)
- Service Lifecycle:
 - o Azure Previews: feature previews for evaluation of beta or pre-release items. Public (for any customer for evaluation) or private (specific customers, Invite directly from product group). Public has PREVIEW label and click on “+Create a resource” or “All Services”. General Availability (GA) — preview becomes general product, believed to have been tested for reliability and absence of critical bugs
- Register for AZ-900 Exam: Microsoft account (always use same one), create certification profile if first time (enter name as it

appears on govt. ID). Provided by Pearson VUE or Certiport (students and instructors).

- o Select test center (arrive a bit early to give name and appointment date, Show ID, put personal items in locker) or online (proctor)

- o Select Language

- o Select Date and Time

- o Review, Confirm, and Pay

- Take It Online (system test a few days in advance, clean desk and room with no papers or electronics. Tell family and co-workers to not interrupt you since that is automatic failure. Have smartphone and piece of ID nearby, close apps and all unnecessary services, plug-in laptop or have full battery, check in 30 min before exam starts, begin when system checks done from Learning Dashboard)
- Exam Structure & Question Types:

- o Doesn't share exact number of questions (might differ from person to person), guidelines

- o AZ-900 Basics: 45 to 60 minutes (plan for 80 mins), 40 to 60 questions. About 1 min per question for fundamental exams. Short questions: more on the types of questions up next (can mark questions for later)

- o Generally: accept NDA, complete exam questions, provide comments and feedback (optional)
 - o Ten types of questions: Active screen, best answer, build list, case studies, drag and drop, hot area, multiple choice, repeated answer choices, short answer, labs
-
- Max score 1K, passing score 700. Passing get you badge and digital certificate. Badge on Social Media like LinkedIn. If fail: wait at least 24h before failing first time, 2nd: 14 days between 3rd, 4th, or 5th. No more than 5 times in 12-month period
 - User can unlock user's cloud account if account was locked out by the Smart Lockout: lock out bad actors using brute-force methods or guessing passwords (up to 10 failed attempts by default)
 - Azure MFA notifies you through phone/registered devices with notification
 - Azure firewall protects Azure Virtual Network Resources
 - Missteps that commonly occur in design/planning/implementation when migrating to the cloud: antipatterns
 - Patterns used by SQL Data Warehouse to distribute data: Hash, Round Robin, Replicate

- Defense in depth: strategy where you prevent unauthorized access with each layer providing protection so if one layer breached, subsequent layer in place to prevent further exposure
- DPA (Data Protection Addendum) — legal agreement between Azure customer and Microsoft for securing of a customer and personal data
- ISO — International Organization for Standardization
 - VNet can't use 224.0.0.0/4 (Multicast), 255.255.255.255/32 (Broadcast), 127.0.0.0/8 (Loopback), 169.254.0.0/16 (Link-local)
 - Hue: service consisting of web apps used to interact with and browse storage associated with an Apache Hadoop cluster
 - Azure virtual desktop: desktop and app virtualization (like EC2 for AWS)
 - Must delete previous Azure subscription before migrating an Azure Marketplace Virtual Machine from one Azure account to another.
 - Azure Marketplace doesn't warn you if you delete a purchase that is in use by one of your apps
 - Feature updates sent twice a year
 - Difference between a regular Azure VM and a Azure Spot Virtual Machine: no SLA for Azure VMs and they can be evicted at any time

- Preview banner is orange to distinguish it from other features
- Azure Key Vault stores certificates
- K-ISMS: certificate to ensure security and privacy of data in Korea
- Azure Hybrid Benefit: licensing benefit that reduces costs of running your workloads by letting you use your on-premises Software Assurance-enabled Windows Server and SQL Server licenses on Azure
- Rehydration: process of making archived Blob data online and reusable
- Command Line Interface uses bash or powershell
- Delete resource group: all resources in resource group deleted except for child and when the managedBy property is set, the managing resource is deleted before resource it manages. Try delete call every 15 mins when operation returns 408/428/5xx status
- Monitor/ensure app compliance with industry-specific compliance standards: Azure Monitor, Trust Center, Compliance Manager, Security Center
- Availability zone protects against datacenter failure
- Scalability: doesn't have to be automatic, elasticity automatically
- Azure Container Instance: Linux and Windows, Custom sizes, Hypervisor level security and fast start up as well as per-second billing; Azure Kubernetes Service: full container

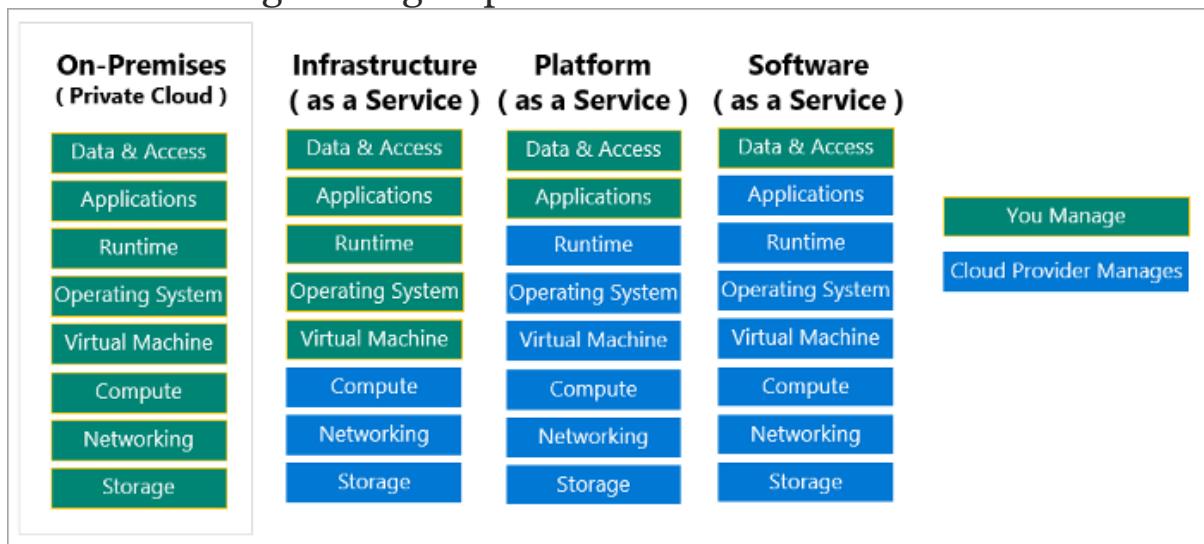
orchestration, automatic scaling; coordinated app upgrades, and service discovery across multiple containers

- Azure network security groups: provides diagnostics to track number of times a rule has been applied, flow logs don't work with storage accounts if the storage accounts have firewall enabled and network security groups can't be moved between regions
- Artifacts on Dreamsuites: policy assignment on Azure resources, ARM templates, role assignment, resource groups
- Virtual machine — Downtime, Cosmos DB — Read Error Rate, Azure Site Recovery — Failover Mins, Traffic Managers — Deployment Mins
- Dedicated Host: high availability with availability zones. Provisions physical hardware in a data center dedicated to one or more of your company's and no one else's virtual machines
- You shouldn't use MFA Server on premises to design a MFA for Azure deployment, use Azure MFA on the cloud
- Azure Archive Storage: data in an archive blob can't be copied to another archive blob, deleting or rehydrating an archive blob before 180 days might lead to early deletion fee, process of making archived Blob data online and reusable is known as rehydration
- Security layers of the defense in depth strategy: Data, Application, Compute, Network, Perimeter, Identity and access, Physical Security

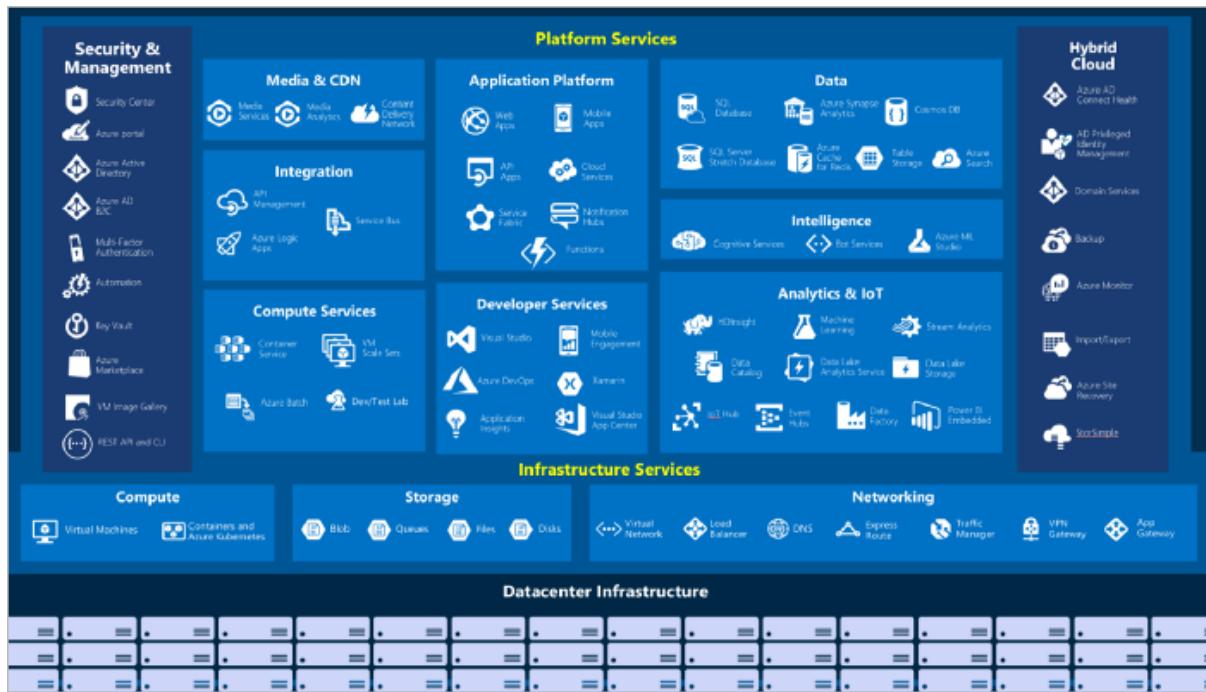
- Security Center – POLICY & COMPLIANCE: Regulatory compliance: export reports of compliance issues
- Blobfuse: a virtual file system driver that accesses the block blob data in the storage account through the Linux file system
- Azure Data Box: a service used to transfer on-premises data to Blob storage when large datasets or network constraints do not allow to upload data over the wire
- AzCopy: a command-line tool for Windows and Linux to copy data to and from Blob storage, across containers, or across storage accounts
- Azure Germany: separate instance of Azure service in German data centers, EU-based support staff for German customers
- Azure Reservations: size of Cosmos DB reservation required is dependent on compute capacity used by DB resources, utilization percentages of Azure Reservations can be viewed on Azure portal, Azure Reservations discounts not applicable for overlap the runtimes of two different SQL databases overlap
- Azure Resources: resources do not inherit resource group tags, some resources can exist outside of a resource group
- Compliance Score available only for on Office 365 assessment but assess more than Office 365, Compliance Manager has Microsoft Managed and Customer Managed Controls
- NIST standard and Azure compliance: Microsoft Antimalware, SQL database auditing writes database events

to an audit log in an Azure storage account, bastion host is the single point of entry that users can use to access the deployed resources

- Azure Functions “is 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” according to Microsoft Documents.
- Azure Virtual Desktop enables your team members to run Windows in the cloud, with access to the required applications for your company’s needs.
- Management groups facilitate the hierarchical ordering of Azure resources into collections, at a level of scope above subscriptions. Azure role-based access controls, to manage Azure subscriptions effectively. The resources and subscriptions assigned to a management group automatically inherit the conditions applied to the management group.



IaaS v PaaS v SaaS



IaaS and PaaS services

- Data transfers to the Azure data center are free and the free account allows you to use certain products for free and have others be pay-as-you-go. Cost of a virtual machines depends on the region. Cost of BLOB storage is also depended on region.
- If a service goes down for a breach in SLA for Microsoft, Microsoft will reimburse you by providing service credits to the customer. You can create a budget and get a notification if the costs are going beyond the budget using Azure Cost Management. Azure Active Directory pricing, you can create 50,000 objects as part of the free version.
- set of Virtual Machines in their Pay-as-you-go Azure subscription. After launching a set of VM's, they seem to be hitting a limit. They;
- ‘pay as you go’ cannot provision additional Virtual Machines. Which of the following can be done to allow the

company to provision more Virtual Machines? Raise a support ticket with Microsoft

- Microsoft Defender for Identity: prevents suspicious attacks and threats to resources with built-in sensors by monitoring organizational domain controllers with user activity views on every device.
- Manager Groups: containers for managing access across multiple Azure subscriptions
- Firewall is to protect your network infrastructure, it would not encrypt all network traffic sent to the internet.

Feature	DDoS Protection Basic	DDoS Protection Standard
Active traffic monitoring & always on detection	●	●
Automatic attack mitigations	●	●
Availability guarantee	○	●
Cost Protection	○	●
Mitigation policies tuned to customers application	○	●
Metrics & alerts	○	●
Mitigation reports	○	●
Mitigation flow logs	○	●
DDoS rapid response support		●

- Azure Advisor gives recommendations on how to reduce the cost of running Azure Virtual Machines. Does not decrease company's security score, but increase. Network Security Groups can't be used to encrypt all network traffic sent from Azure to the internet.
- Azure Activity Logs: see all operations on all resources
- Some Azure policies have inbuilt for tagging for resource groups

- Microsoft Trust Center: In-depth information about security, privacy, compliance offerings, policies, features, and practices across Microsoft cloud products. The Trust Center is a great resource for other people in your organization who might play a role in security, privacy, and compliance. These people include business managers, risk assessment and privacy officers, and legal compliance teams.
- Create alerts based on VM metrics with Azure monitor
- Locks prevent resources in a resource group from getting accidentally getting deleted
- Azure PowerShell works with PowerShell 5.1 on Windows. On other platforms like Linux, Azure PowerShell 6.2.4 and later versions are compatible. Microsoft recommends PowerShell 7.x and higher on all platforms.
- Azure Synapse — run queries across data, store petabytes of data
- Azure Logic apps provide platform for creating workflows
- Azure Resource Groups: group resources logically
- The Azure portal can be viewed on any browser and can be viewed on almost all operating systems. Ubuntu and others can also use Azure CLI and Azure Powershell.
- Low latency: cloud service that can be accessed quickly by users over the Internet.
- When can an organization decommission its private cloud infrastructure hosted in its data center? When all servers are on the public cloud

- Disaster Recovery: “A cloud service that can be restored in the event of a catastrophic loss.”
- When the virtual machine is stopped, you will still incur costs for the storage attached to the virtual machine.
- Azure CLI can use Powershell and Command Prompt
- It would help if you used network security groups to allow or deny traffic within subnets.

SCALE TARGETS FOR STANDARD STORAGE ACCOUNTS

Resource — Limit

Several storage accounts per region per subscription, including standard and premium storage accounts — 250

Maximum storage account capacity — 5 PiB 1

Maximum number of blob containers, blobs, file shares, tables, queues, entities, or messages per storage account — No limit

Maximum request rate¹ per storage account — 20,000 requests per second

Maximum ingress¹ per storage account (US, Europe regions) — 10 Gbps

Maximum ingress¹ per storage account (regions other than the US and Europe) — 5 Gbps if RA-GRS/GRS is enabled, 10 Gbps for LRS/ZRS²

Maximum egress for general-purpose v2 and Blob storage accounts (all regions) — 50 Gbps

Maximum egress for general-purpose v1 storage accounts (US regions) — 20 Gbps if RA-GRS/GRS is enabled, 30 Gbps for

LRS/ZRS²

Maximum egress for general-purpose v1 storage accounts (non-US regions) 10 Gbps if RA-GRS/GRS is enabled, 15 Gbps for LRS/ZRS²

Maximum number of virtual network rules per storage account - 200