Chapter-4
Azure Pricing and Support

Topic-1 Understanding Azure subscription options:

- There can be several Azure subscriptions for each tenant.
- The level of subscription is where the consumer receives usage-based billing.
- Additionally, it offers a logical division to make management simpler.
- A business can usually have a single tenant, and every department that uses cloud services can have a subscription for an Azure environment.
- There are several types of subscriptions out of which some are as follows:

Free Trial:
- For people and small organizations interested in learning more about and experimenting with Azure, the Free Azure Subscription is a great place to start.
- For a limited time, this kind of subscription offers a large range of free services, such as databases, storage, and virtual machines.
- While it does have some limitations, it offers an excellent opportunity to get hands-on experience with Azure at no cost.
- **Benefits and Limitations:**
    - → With no financial commitment, customers can explore and experiment with Azure services thanks to the Free Azure Subscription.
    - → There are restrictions on how resources can be used, therefore it's critical to keep an eye on utilization to prevent unforeseen fees.
    - → Restricted functionality and resource credits are included in the free subscription. In 2019, RightScale conducted a survey which revealed that 65% of firms were utilizing a complimentary Azure subscription.
- **Pros:**
    - → **No cost:** Azure Free Subscription allows users to explore and experiment with Azure services at no upfront cost.
    - → **Access to services:** Provides access to a wide range of Azure services and products to help users learn and build applications.
    - → **Budget control:** Users can set spending limits to control costs and avoid unexpected charges.
- **Cons:**
    - → **Limited resources:** Free subscription includes limited resources and has usage quotas that may restrict scalability.
    - → **Limited support:** Free subscription offers limited technical support options compared to other subscription types.
    - → **No SLA:** The Service Level Agreement does not apply to the Free subscription, meaning there is no guaranteed uptime.

Pay-As-You-Go:
- The most adaptable and popular kind of subscription is the Azure Pay-As-You-Go plan.
- It allows you to scale resources up or down in accordance with your demands and gives you access to all Azure services.
- This kind of subscription is perfect for companies of all sizes because it has no long-term obligations or upfront fees.
- **Features and Pricing:**
    - → Numerous capabilities are available with the Pay-As-You-Go Azure Subscription, including networking, storage, virtual machines, and AI services.

- → Pricing is determined by the real use of resources, giving flexibility and cost control.
- → There are no termination costs and organizations just pay for the services they use. Critical resources can be kept safe from unintentional deletions or modifications by using the "Resource Locks" function.
  - ▪ **Pros:**
    - → **Flexibility:** Pay-As-You-Go allows users to pay only for the resources they consume, with no long-term commitment.
    - → **Scalability:** Users can quickly scale up or down based on their needs, allowing optimal resource allocation.
    - → **Support options:** Pay-As-You-Go subscribers can access various support options depending on their needs.
  - ▪ **Cons:**
    - → **Cost management:** Without careful monitoring and management, costs can quickly add up, making it crucial to implement cost optimization strategies.
    - → **Pricing complexity:** Pay-As-You-Go pricing can be complex, with different pricing tiers and options for different services, potentially requiring careful planning to avoid unexpected expenses.
    - → **Limited discounts:** Pay-As-You-Go may not offer the same discounts or reserved capacity options, unlike other subscription types.

Enterprise Agreement:
  - ▪ It is designed for the Enterprise Agreement Azure Subscription is designed for large organizations with specific requirements and complex IT infrastructures.
  - ▪ It provides a discounted pricing model and additional features tailored to enterprise needs.
  - ▪ It offers extra features designed to meet the demands of enterprises, together with a subsidized pricing structure.
  - ▪ **Critical Benefits for Large Organizations:**
    - → The Enterprise Agreement Subscription offers predictable costs, volume discounts, and personalized support to meet the unique needs of large organizations.
    - → It provides flexible purchasing options and negotiation potential, such as the "Azure Monetary Commitment" feature that helps optimize budget allocation.
    - → Large organizations can streamline management and simplify reporting by consolidating services under a single agreement.
  - ▪ **Pros:**
    - → **Volume pricing:** Enterprise Agreement subscribers often benefit from volume pricing discounts, reducing costs for organizations with significant Azure usage.
    - → **Enhanced support:** Enterprise Agreement includes enhanced technical support options, providing faster response times and dedicated support resources.
    - → **Extended planning:** Enterprise Agreement allows longer-term planning and commitments with options for reserved instances, providing stability and predictability.
  - ▪ **Cons:**
    - → **Minimum commitment:** Enterprise Agreement requires a minimum upfront commitment, which may not be suitable for organizations with limited budgets or uncertain usage patterns.
    - → **Contractual obligations:** The Enterprise Agreement involves a contractual commitment, which may necessitate thorough review and negotiation before signing.
    - → **Complexity:** Managing an Enterprise Agreement involves handling multiple billing accounts, subscriptions, and users, which can increase administrative complexity.

Topic-2: Cost Management:

- Managing your cloud expenses is essential in Azure to avoid overspending and ensure you get the most value from your resources.
- **Cost Visibility and Insights:**
  - **Granular Cost Breakdowns:** Gain insights into your spending across various dimensions:
  - **Resource Type:** Analyze costs associated with virtual machines, storage, databases, network resources, and other Azure services.
  - **Service:** Identify cost drivers by drilling down into individual service usage (e.g., Azure VMs vs. Azure Cosmos DB).
  - **Location:** Understand how costs vary across different Azure regions (pricing can differ).
  - **Department/Project:** Allocate costs to specific departments or projects for improved financial accountability.
  - **Cost Trends and Monitoring:** Track your Azure spending over time to visualize trends and identify:
  - Potential areas for optimization (e.g., sudden spikes in usage).
  - Opportunities for proactive cost control measures.
- **Cost Optimization Recommendations:**
  - **Azure Advisor:** This integrated service analyzes your Azure resources and provides tailored recommendations for:
  - **Cost Savings:** Reduce your Azure spending through rightsizing, reservations, and other strategies.
  - **Security Best Practices:** Enhance the security posture of your Azure environment.
  - **Performance Improvements:** Optimize the performance of your Azure resources.
  - **Reliability Enhancements:** Improve the reliability and uptime of your Azure resources.
  - **Rightsizing Recommendations:** Azure Advisor identifies opportunities to optimize the size or tier of your virtual machines and storage based on actual usage patterns. You can potentially pay less by using a smaller VM size or a lower storage tier.
  - **Reserved Instances (RIs):** Azure Advisor can recommend purchasing RIs for predictable workloads. RIs offer significant discounts compared to pay-as-you-go pricing for consistently used resources.
  - **Spot Instances:** For workloads that can tolerate interruptions, Azure Advisor can suggest leveraging spot instances. These are unused Azure capacities offered at heavily discounted rates.
- **Cost Management Tools:**
  - **Azure Cost Management Service (Free):** This core service is your central hub for cost management activities. It provides:
    - → Cost analysis to understand your spending patterns.
    - → Budgeting tools to set spending limits and track progress.
    - → Recommendations for cost optimization opportunities.
  - **Billing Center:** This unified portal offers a comprehensive view of your Azure spending with:
    - → Detailed invoices for your Azure usage.
    - → Cost summaries to visualize your spending patterns.
    - → Various payment options to manage your Azure bill.

Topic-3: Pricing Models:

1. Pay-as-you-go:

- **Description:** The most flexible option. You are charged only for the resources you consume, billed hourly.
- **Ideal for:** Development/testing environments, unpredictable workloads, short-term projects.
- **Advantages:**
  - Cost-effective for sporadic use.
  - No upfront commitment required.
  - Easy to scale resources up or down as needed.
- **Disadvantages:**
  - Can be more expensive for consistent or predictable workloads compared to other models.
  - Requires careful monitoring to avoid unexpected charges.

2. Reserved Instances (RIs):
- **Description:** You purchase reserved instances for a specific Azure resource (VM, database, etc.) for a one- or three-year term at a significant discount compared to pay-as-you-go pricing.
- **Ideal for:** Predictable workloads, sustained resource usage.
- **Advantages:**
  - Significant cost savings compared to pay-as-you-go for consistent workloads.
  - Guaranteed resource availability during the reservation term.
- **Disadvantages:**
  - Requires upfront commitment for the reserved instance term.
  - Less flexibility compared to pay-as-you-go (resources cannot be easily switched to different usage patterns).

3. Spot Instances:
- **Description:** Utilize unused Azure capacity offered at heavily discounted rates (up to 90% savings compared to pay-as-you-go). However, these resources can be interrupted by Azure if needed.
- **Ideal for:** Fault-tolerant workloads, batch processing, non-critical tasks.
- **Advantages:**
  - Extremely cost-effective for workloads that can tolerate interruptions.
  - Can significantly reduce cloud costs.
- **Disadvantages:**
  - Resources can be interrupted by Azure at any time, potentially impacting workloads.
  - Less predictable availability compared to other models.

4. Azure Free Tier:
- **Description:** A free tier offering with a limited amount of free services and resources for a certain period. Ideal for experimenting with Azure services or for small, personal projects.
- **Ideal for:** Trying out Azure services, developing proofs of concept, small personal projects.
- **Advantages:**
  - Free to use for a limited time or resource quota.
  - Lowers barrier to entry for exploring Azure.
- **Disadvantages:**
  - Limited resources and services available in the free tier.
  - Not suitable for production workloads.

5. Azure Dev/Test:
- **Description:** Azure Dev/Test pricing allows you to benefit from discounted rates on certain Azure resources commonly used for development and testing purposes. These discounts apply to the standard pay-as-you-go pricing model, where you are billed hourly based on your resource consumption.

- **Ideal for:** Development and testing environments with fluctuating resource usage. Organizations of all sizes looking to optimize costs for Dev/Test workloads in Azure. Teams working under budget constraints for development and testing activities.
- **Advantages:**
  - **Cost Savings:** Provides discounted rates compared to standard pay-as-you-go pricing, specifically for development and testing resources like VMs, storage, and databases.
  - **Flexibility:** Maintains the flexibility of the pay-as-you-go model, allowing you to scale resources based on your needs.
  - **Reduced Barrier to Entry:** Lowers the cost of experimenting with Azure services for development and testing purposes.
  - **Option for Existing Agreements:** Leverages existing Enterprise Agreements (EA) or Microsoft Customer Agreements (MCA) for deeper discounts (Enterprise Dev/Test and Azure Plan for Dev/Test).
- **Disadvantages:**
  - **Monitoring Required:** Still requires monitoring of resource usage to avoid exceeding budgets, especially with the pay-as-you-go option.
  - **Limited Discounts (for pay-as-you-go):** Discounts might be less substantial compared to options requiring pre-existing agreements (Enterprise Dev/Test, Azure Plan for Dev/Test).
  - **Pre-existing Agreements Required (for deeper discounts):** Enterprise Dev/Test and Azure Plan for Dev/Test necessitate an existing agreement with Microsoft (EA or MCA).

Topic-4: Different Support Options available to Azure customers:

- **Basic:** Available to all Microsoft Azure accounts, this is the only free plan and does not have any active support from Azure, the user has access to community forums, self-help documentation, etc, and can raise as many support tickets as required.
  - The Basic Support Plan is an entry-level solution for organizations looking for basic support.
  - It is ideal for small businesses and startups who are new to Azure, since it provides access to critical services such as 24/7 tech support, Azure Service Health alerts, and basic documentation.
  - While it is inexpensive, it lacks direct developer communication, making it best suited for non-production environments or limited Azure installations.
  - The plan assures 99.9% service uptime and aims for an initial reaction time of one hour for major issues and four hours for serious concerns.
- **Developer:** Best suggested for **trial** and **non-production** environments.
  - This plan has active support from Azure in the form of access to support engineers via email during standard Business hours.
  - The response time from Microsoft for this plan is within **eight hours**.
  - The Developer Help Plan is ideal for developers and teams who want thorough help, and it expands on the capabilities of the Basic Support Plan.
  - It gives you access to the Azure Forums for community help and troubleshooting.
  - It's designed for development and testing and serves as a stepping stone to higher-tier support as your Azure usage increases.
  - The Developer Support Plan guarantees 99.9% availability and rapid replies, with a one-hour first reaction time for essential issues and a four-hour response time for major issues.

- **Standard:** Best suggested for **production** workload environments, this plan is an upgrade of the developer plan and provides support in the form of **24×7** access to support engineers via **email and phone**.
    - The response time from Microsoft for this plan is within **one hour**.
    - For companies operating Azure production workloads, the Standard Support Plan is the most cost-effective option.
    - It provides quick issue response and consultation for a strong Azure infrastructure.
    - It ensures dependability by guaranteeing 99.9% uptime.
    - Expect an initial response time of one hour for urgent concerns and eight hours for critical issues.
    - This plan finds a good mix between price and service, making it suitable for enterprises looking for consistent Azure support.
- **Professional Direct:** Absolutely necessary for **business-critical** environments, this plan also offers 24/7 technical support with one-hour response time but also includes operational support, training, and proactive guidance from a **ProDirect delivery manager.**
    - "Professional Direct Support, the pinnacle of Azure Support Plans, is designed for enterprises with critical applications and complex Azure setups."
    - It provides personalised, proactive help from Azure specialists who are familiar with your infrastructure.
    - This membership offers quick replies, direct access to Azure professionals around the clock, and complete help for difficult cases.
    - With a 99.95% service uptime guarantee, it provides a 15-minute first reaction time for severe issues and a 1-hour response time for major issues, making it suitable for enterprises who are intolerant of downtime and performance difficulties."
- If you have an enterprise agreement with Microsoft, you can purchase any of these plans **except** the Developer plan and the bill will be incorporated in the enterprise agreement.

Topic-5: Azure Pricing Calculator:

- It's simpler to plan and budget for your Azure usage when you can convert projected usage into an estimated cost with the aid of the Azure pricing calculator.
- The web-based application assists you in making well-informed decisions regarding your cloud spending, regardless of your size—small or large business owner.
- The calculator also shows you the estimated cost of your Azure use with your negotiated or discounted prices when you log in.
- The Azure Pricing Calculator is a tool provided by Microsoft that allows users to estimate the cost of using Azure services.
- It allows users to select the services they plan to use, specify the configuration and usage details, and then calculate the estimated cost based on the **current prices for those services.**
- The pricing calculator provides a detailed breakdown of the costs associated with each service, including the cost per hour or month.
- It also allows users to compare the costs of different services and configurations, and to estimate the total cost of running a specific workload on Azure.
- Users can also use the pricing calculator to estimate costs for different Azure regions, as prices can vary depending on the location of the data center where the services are hosted.
- Azure Pricing Calculator can assist you in estimating costs:
    - **Resource Selection:** You can choose the specific Azure services you plan to use, such as virtual machines, storage, databases, networking components, and other relevant services.
    - **Configuration Options:** For each service, the calculator allows you to specify configurations like:

- **VM size:** Select the size and type of virtual machines you need, considering factors like CPU cores, memory, and storage.
- **Storage type:** Choose the storage tier based on your access needs (e.g., standard HDD, premium SSD)
- **Region:** Specify the Azure region where you plan to deploy your resources, as pricing can vary slightly across different regions.
- **Usage duration:** Estimate the average hourly, daily, or monthly usage duration for your resources.
- **Cost Breakdown:** Based on your selections, the calculator provides an estimated cost breakdown, including:
- **Total estimated monthly cost:** This gives you a high-level overview of your potential monthly spending.
- **Per-service cost:** See how much each chosen service contributes to the overall cost.
- **Detailed cost components:** The calculator might break down costs further, showing individual charges for compute, storage, networking, and other relevant aspects.

Topic-6: Azure Deprecation Policies:

- Notification when a major update or removal of an Azure service or feature is planned.
- Gives customers enough time to switch to different applications or solutions before the service or feature is withdrawn.
- **Features:**
  - **Improved Functionality:** Deprecation often paves the way for newer, more feature-rich, and secure services. Users benefit from the advancements in technology and potentially improved performance or security.
  - **Potential Disruptions:** If a service you rely on is deprecated, it can cause disruptions if you're not prepared for migration. Functionality might be lost, or security vulnerabilities might arise if you continue using the deprecated service.
  - **Streamlined Resource Allocation:** Microsoft can focus resources on developing and supporting more popular services, potentially leading to overall service improvements across the Azure platform.
  - **Loss of Functionality (if not migrated):** Users who fail to migrate to alternative services before the retirement date will lose access to the functionalities offered by the deprecated service.
  - **Need for Proactive Management:** Users need to stay updated on Azure announcements and service lifecycles to avoid disruptions caused by unexpected deprecations.
  - **Migration Costs and Effort:** Transitioning to new services might involve additional costs for development, testing, and deployment, requiring careful planning and budgeting.
  - **Learning New Technologies:** Users might need to learn new APIs or functionalities of alternative services, potentially leading to an investment in training or retraining.
  - **Potential Downtime During Migration:** The migration process itself can lead to temporary downtime or disruptions while applications are transitioned to new services.

Topic-7: Total Cost of Ownership Calculator (TCO):

- It is a tool provided by Microsoft that helps users to estimate the costs of running their workloads on Azure, compared to running them on-premises or in another cloud platform.
- It allows users to compare the costs of different deployment options, including the costs for hardware, software, and support, as well as the costs for power, cooling, and other resources.

- The TCO Calculator for Azure can help users to understand the long-term costs of running their workloads on Azure, including the costs for operating and maintaining the services, as well as the costs for scaling and expanding the services as needed.
- It can also help users to identify areas where they can reduce costs and optimize their resource usage.
- Users can input information about their current infrastructure, usage, and expected growth and the TCO calculator will provide a comparison of costs between on-premises and Azure, including a breakdown of costs for computing, storage, and networking resources.
- The TCO calculator can be found on the Azure website, it's a useful tool for organizations that are considering migrating to Azure and want to compare the costs and benefits of running their workloads in the cloud.
- **Key factors that contribute to TCO in Azure:**
  - **Azure Service Costs:** This includes the pay-as-you-go hourly charges, reserved instance fees (if applicable), or costs associated with other pricing models like Azure Spot Instances.
  - **Software Licenses:** If your application requires additional software licenses beyond the base Azure services, these licensing costs factor into your TCO.
  - **Data Transfer:** Costs associated with transferring data into, out of, and across Azure regions can contribute to your TCO.
  - **Storage Costs:** The type and amount of storage used for your applications (e.g., standard HDD, premium SSD) will impact your overall TCO.
  - **Management and Operations:** This includes the cost of personnel managing your Azure environment, monitoring resource usage, and optimizing costs.
  - **Network Costs:** If your application requires specific network configurations or uses Azure VPN gateways, these network-related expenses contribute to TCO.
- **Understanding TCO Benefits You in Several Ways:**
  - **Cost Optimization:** By analyzing your TCO, you can identify areas for cost savings. This might involve optimizing resource usage, choosing more cost-effective pricing models, or leveraging features like auto-scaling to avoid unnecessary charges.
  - **Informed Budgeting:** A clear understanding of your TCO helps create realistic budget forecasts for your Azure deployments, ensuring your cloud spending aligns with your business goals.
  - **Comparison of On-Premises vs. Cloud:** When evaluating whether to migrate workloads to Azure, a TCO analysis can help compare the total cost of ownership between on-premises infrastructure and the cloud solution.
  - **Improved Resource Management:** By understanding TCO drivers, you can make data-driven decisions about resource allocation and identify opportunities for rightsizing resources to match your actual needs.

Topic-8: Cost Alerts:

Azure Cost Management offers three primary cost alert types to proactively manage your spending:
Budget Alerts:
- Triggered when spending reaches or exceeds a predefined threshold within a budget you set.
- Alerts can be configured to notify specific email addresses or integrate with workflows for further action.
- Budget alerts help you course-correct spending before exceeding your budget limitations.

Credit Alerts:
- Notify you when your Azure prepayment credit balance falls below a certain threshold.
- Prepayment credits can offer cost savings compared to pay-as-you-go pricing.

- Credit alerts ensure you have sufficient credit balance to avoid service disruptions due to depleted credit.

Department Spending Quota Alerts:
- Applicable to organizations with multiple departments using Azure.
- Allow you to set spending quotas for each department.
- Alerts notify designated personnel when a department nears or surpasses their allocated spending limit.
- Department spending quota alerts promote cost accountability within an organization.

Topic-9: Difference between Azure Cost Management and Azure Pricing Calculator:

Feature	Azure Cost Management	Azure Pricing Calculator
Purpose	Monitors and analyzes historical and ongoing costs	Estimates potential costs for future deployments
Data Source	Actual usage data from your Azure environment	User-defined configurations and estimated usage patterns
Cost Information	Provides insights into past and current spending	Estimates future costs based on selections
Cost Breakdown	Shows detailed cost breakdowns by resource, service, location, etc.	Provides a high-level overview of estimated costs
Budgeting	Allows setting budgets and receiving alerts for cost overruns	Not applicable
Cost Optimization	Helps identify areas for cost savings through cost analysis reports	Not applicable
Ideal Use Case	Analyzing past spending trends, identifying cost anomalies, managing existing deployments	Planning future deployments, comparing pricing models, estimating resource costs upfront
Example	Identifying underutilized resources that can be stopped to reduce costs	Estimating the monthly cost of running a virtual machine with specific configurations

Topic-10: Azure Advisor:

- Advisor is a virtual cloud assistant that assists you in optimizing your Azure deployments by following best practices.
- After analyzing your resource configuration and usage statistics, it makes recommendations on how to enhance the affordability, dependability, performance, and security of your Azure resources.
- Advisor allows you to:
  - Receive proactive, useful, and customized best practices advice.
  - Enhance the dependability, security, and performance of your resources while looking for ways to cut back on your total Azure expenditure.
  - Receive suggestions along with suggested courses of action.
  - The Advisor dashboard displays personalized recommendations for all your subscriptions.
- The recommendations are divided into five categories:
  - **Reliability**: To ensure and improve the continuity of your business-critical applications. For more information, see Advisor Reliability recommendations.

- **Security**: To detect threats and vulnerabilities that might lead to security breaches. For more information, see Advisor Security recommendations.
- **Performance**: To improve the speed of your applications. For more information, see Advisor Performance recommendations.
- **Cost**: To optimize and reduce your overall Azure spending. For more information, see Advisor Cost recommendations.
- **Operational Excellence**: To help you achieve process and workflow efficiency, resource manageability and deployment best practices. For more information, see Advisor Operational Excellence recommendations.
- The following services are recommended by the advisor:
Azure Synapse Analytics, Azure Farmbeats, Azure Stack ACI, Azure Public IP Addresses, Azure Synapse Analytics, API Management, Application Gateway, App Services, Availability Sets, Azure Cache, Azure Database for MySQL, Azure Database for PostgreSQL, ExpressRoute, Front Door, HDInsight Cluster, IoT Hub, Redis Cache Server, SQL Server, Storage Account, Traffic Manager Profile, Virtual Machine, Virtual Machine Scale Set, and Virtual Network Gateway.

Topic-11: Cost Allocation:

- **Cost allocation refers to the process of attributing and assigning costs to specific departments, teams, and projects within an organization.**
- Identify the most critical attributes to report against based on stakeholder needs.
- Consider the different reporting structures within the organization and how you'll handle change over time.
- Consider engineering practices that may introduce different types of cost that need to be analyzed independently.
- Establish and maintain a mapping of cloud and on-premises costs to each attribute and apply governance policies to ensure data is appropriately tagged in advance.
- Define a process for how to handle tagging gaps and misses.
- Cost allocation is the foundational element of cost accountability and enables organizations to gain visibility into the financial impact of their cloud solutions and related activities and initiatives.
- Cost allocation, as defined by the FinOps Foundation, is the set of practices to divide up a consolidated invoice. Or, to bill the people responsible for its various component parts.
- It's the process of assigning costs to different groups within an organization based on their consumption of resources and application of benefits.
- By providing visibility into costs to groups who are responsible for it, cost allocation helps organizations track and optimize their spending, improve budgeting and forecasting, and increase accountability and transparency.