

Module 2: Cloud Economics and Billing

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A. Learning Outcomes (LOs) and Topics

- Topics:
 - + Fundamentals of pricing
 - + Total cost of Ownership
 - + AWS Organizations
 - + AWS Billing and Cost Management
 - + Technical Support
- Learning Outcomes:
 - + Explain the AWS pricing philosophy
 - + Recognize fundamental pricing characteristics
 - + Indicate the elements of total cost of ownership
 - + Discuss the results of the AWS Pricing Calculator.
 - + Identify how to set up an organizational structure that simplifies billing and account visibility to review cost data.
 - + Identify the functionality in the AWS Billing Dashboard
 - + Describe how to use AWS Bills, AWS Cost Explorer, AWS Budgets, and AWS Cost and Usage Reports.
 - + Identify the various AWS technical support plans and features.

B. Fundamentals of Pricing

- There are three fundamental drives of cost with AWS:
 - + Compute:
 - * Charged per hour/second
 - * Varies by instance type.
 - + Storage: Charged typically per GB
 - + Data Transfer:
 - * Outbound is aggregated and charged
 - * Inbound has no charge (with some exceptions)
 - * Charged typically per GB
- How to pay for the AWS?
 - + Pay for what to use
 - + Pay less when you reserve
 - + Pay less when you use more and as AWS grows
- "Pay for what you use": pay only for the services that you consume, with no large upfront expenses.
- "Pay less by using more":
 - + **Savings** as usage increases
 - + **Tiered pricing** for services like Amazon Simple Storage Service (Amazon S3), Amazon Elastic Block Store (Amazon EBS), or Amazon Elastic File System (Amazon EFS) => The more you use, the less you pay GB.
 - + Multiple storage services deliver **lower** storage costs based on needs
- "Pay even less as AWS grows": As AWS grows
 - + AWS focuses on lowering cost of doing business.
 - + This practice results in AWS passing savings from economies of scale to you.
 - + Since 2006, AWS has **lowered pricing 75** times (as of Sep 2019)
 - + Future higher-performing resources replace current resources for no extra charge.
- Custom pricing:
 - + Meet varying needs through custom pricing
 - + Available for high-volume projects with unique requirements.
- AWS Free Tier: Enables to gain free hands-on experience with the AWS platform, products, and services. Free for 1 year for new customers:
 - + Sign up for an AWS account
 - + Learn with 10-minute tutorials
 - + Start building with AWS
- Services with no charge: Amazon VPC, Elastic Beanstalk, Auto Scaling, AWS CloudFormation, AWS Identity and Access Management (IAM)

C. Total Cost of Ownership

- On-premises versus AWS Cloud

| <i>Traditional Infrastructure</i> | <i>AWS Cloud</i> |
|--|---|
| <ul style="list-style-type: none"> - Equipment - Resources and administration - Contracts - Cost | <ul style="list-style-type: none"> - No upfront expense-pay for what you use - Improve time to market and agility - Scale up and down - Self-service infrastructure |

- **Total Cost of Ownership (TCO)** is the financial estimate to help identify direct and indirect costs of a system.

- Benefits of TCO:

- + To compare the costs of running an **entire infrastructure environment or specific workload** on-premises versus on AWS.
- + To budget and **build the business case** for moving to the cloud.

- AWS Pricing Calculator:

- + Estimate monthly costs
- + Identify opportunities to reduce monthly costs
- + Model your solutions before building them
- + Explore price points and calculators behind your estimate
- + Find the available instance types and contract terms that meet your needs.
- + Name your estimate and create name groups of services.

- Reading an estimate

- Additional benefit considerations:

| <i>Hard benefits</i> | <i>Soft benefits</i> |
|---|---|
| <ul style="list-style-type: none"> - Reduce spending on compute, storage, networking, security - Reductions in hardware and software purchases (capex). - Reductions in operational costs, backup, and disaster recovery - Reduction in operations personnel. | <ul style="list-style-type: none"> - Reuse of service and applications that enable you to define (and redefine solutions) by using the same cloud service. - Increased developer productivity - Improved customer satisfaction. - Agile business processes that can quickly respond to new and emerging opportunities - Increased in global reach. |

D. AWS Organizations: is a free account management service that enables you to consolidate multiple AWS accounts into an organizational tree which each represents the department or team.

- Key features and benefits:

- + Policy-based account management
- + Group based account management
- + Application programming interfaces (APIs) that automate account management
- + Consolidated billing

- Security with AWS Organizations:

- + Control access with AWS Identity and Access Management (IAM)
- + IAM policies enable you to allow or deny access to AWS services for users, groups, and roles.
- + Service control policies (SCPs) enable you to allow or deny access to AWS services for individuals or group accounts in an organizational unit (OU).

- Organizations setup:

- + Step 1: Create organization
- + Step 2: Create organization units
- + Step 3: Create service control policies
- + Step 4: Test restrictions

- Accessing AWS Organizations:

- + AWS Management Console
- + AWS Command Line Interface (AWS CLI) tools
- + Software development kits (SDKs)
- + HTTPS Query application programming interfaces (API)

E. AWS Billing and Cost Management:

- Tools: AWS Budgets, AWS Cost and Usage Report, AWS Cost Explorer

F. Technical Support Models

- Provide unique combination of tools and expertise: AWS Support and AWS Support Plans
- Support is provided for:
 - + Experimenting with AWS
 - + Production use of AWS
 - + Business-critical use of AWS
- AWS Support:
 - + Proactive guidance: Technical Account Manager (TAM)
 - + Best practices: AWS Trusted Advisor
 - + Account Assistance: AWS Support Concierge
- Support plans: AWS Support offers four support plans:
 - + **Basic Support:** Resource Center access, Service Health Dashboard, product FAQs, discussion forums, and support for health checks.
 - + **Developer Support:** Support for early development on AWS.
 - + **Business Support:** Customers that run production workloads
 - + **Enterprise Support:** Customers that run business and mission-critical workloads.