

Lab 8: Estimating AWS Cloud Resource Costs Using AWS Pricing Calculator

Objectives:

1. To understand the concept of cloud cost estimation using official pricing calculators
2. To configure equivalent cloud resources on AWS and Azure for comparison
3. To estimate monthly costs for compute, storage, database, networking, and load balancing services
4. To analyze cost differences between AWS and Azure for similar infrastructure setups
5. To evaluate how service selection and configuration affect overall cloud expenditure
6. To develop practical skills in planning and budgeting cloud deployments

Tools and Platform Used

Tools and Methodology used:

1. AWS Pricing Calculator
2. Microsoft Azure Pricing Calculator
3. Estimating cloud infrastructure costs using pricing calculators
4. Comparing equivalent AWS and Azure services based on compute, storage, networking, and database requirements

Amazon Web Services (AWS):

Step 1: EC2 Instance Cost Estimation

1. Service Added: Amazon EC2
2. Configuration:
 - a. Instance Type: t4g.large
 - b. vCPU: 2
 - c. RAM: 8 GB
 - d. Operating System: Linux
 - e. Region: US East (N. Virginia)
 - f. Number of Instances: 1
 - g. Usage: 24x7 (100%)
 - h. Storage: 100 GB General Purpose SSD (EBS)

The screenshot shows the AWS Pricing Calculator interface. The top navigation bar includes 'Feedback', 'Language: English', 'Contact Sales', and 'Create an AWS Account'. The main page title is 'Create estimate: Configure Amazon EC2'. On the left, there's a sidebar with 'Step 1 Add service' and 'Step 2 Configure service'. The main content area has several sections: 'Description' (set to 'AWS System'), 'Choose a location type' (set to 'Region') with dropdowns for 'Region' (US East (N. Virginia)) and 'Choose a Region', 'EC2 specifications' (with 'Tenancy' set to 'Shared Instances', 'Operating system' set to 'Linux', and 'Workloads' with 'Constant usage' selected), and 'Number of instances' (set to 1). At the bottom, it shows 'Total Upfront cost: 0.00 USD' and 'Total Monthly cost: 49.06 USD'. Buttons for 'Show Details', 'Cancel', 'Save and view summary', and 'Save and add service' are available.

EC2 Instances (3)
Based on your inputs, this is the lowest-cost EC2 instance: **t4g.large**
Chosen instance: **t4g.large** | Family: **t4g** | 2vCPU | 8 GiB Memory
Search instance type:

Instance family	vCPUs	Memory (GiB)	Network performance
t4g	2	8 GiB	Any Network Performance

Show only current generation instances.

Instance name	vCPUs	Memory	Network Performance	Storage	On-Demand Hourly Cost	Current Generation	Potential Effective Hourly Cost Savings (%)
(<input checked="" type="radio"/>) t4g.large	2	8 GiB	Up to 5 Gigabit	EBS only	0.0672	Yes	0.0253 (62%)
(<input type="radio"/>) t4g.xlarge	4	16 GiB	Up to 5 Gigabit	EBS only	0.1344	Yes	0.0505 (62%)
(<input type="radio"/>) t4g.2xlarge	8	32 GiB	Up to 5 Gigabit	EBS only	0.2688	Yes	0.1010 (62%)

Step 2: RDS for SQL Server Cost Estimation

1. Service Added: Amazon RDS
2. Configuration:
 - a. Database Engine: SQL Server
 - b. Instance Class: db.m5.large (or AWS equivalent)
 - c. Region: US East (N. Virginia)
 - d. Storage: 100 GB General Purpose SSD
 - e. Deployment: Managed database service

The screenshot shows the AWS Pricing Calculator interface for creating an estimate. The top navigation bar includes 'AWS Pricing Calculator', 'Sandesh CSIT 28936', and 'Create estimate: Configure Amazon RDS Custom for SQL Server'. The left sidebar has 'Step 1' (Add service) and 'Step 2' (Configure service). The main area is titled 'Create estimate: Configure Amazon RDS Custom for SQL Server' with an 'Info' link. It contains fields for 'Description' (with placeholder 'Enter a description for your estimate') and 'Choose a location type' (with 'Info' link) and 'Choose a Region' (set to 'US East (N. Virginia)'). Below these, a section titled 'Select RDS Custom for SQL Server instances' shows a dropdown for 'Number of RDS Custom for SQL Server instances' (set to 1) and a search bar ('Q: db.m5.large'). A preview box displays the selected instance details: 'Selected Instance: db.m5.large', 'vCPU: 2', and 'Memory: 8 GiB'.

Step 3: Application Load Balancer (ALB) Estimation

1. Service Added: Elastic Load Balancing
2. Configuration:
 - a. Load Balancer Type: Application Load Balancer
 - b. Quantity: 1
 - c. Region: US East (N. Virginia)
 - d. Usage Parameters: Estimated traffic, processed bytes, and connections

The screenshot shows the AWS Pricing Calculator interface for creating an estimate. The top navigation bar includes 'AWS Pricing Calculator', 'Sandesh CSIT 28936', and 'Create estimate: Configure Elastic Load Balancing'. The left sidebar has 'Step 1' (Add service) and 'Step 2' (Configure service). The main area is titled 'Create estimate: Configure Elastic Load Balancing' with an 'Info' link. It contains fields for 'Description' (with placeholder 'Enter a description for your estimate') and 'Choose a location type' (with 'Info' link) and 'Choose a Region' (set to 'US East (N. Virginia)'). Below these, a section titled 'Elastic Load Balancing' shows a note 'Select Elastic Load Balancing Function Options that you want to estimate'. It includes four radio buttons: 'Application Load Balancer' (selected), 'Network Load Balancer', 'Gateway Load Balancer', and 'Classic Load Balancer'.

Step 4: Static Public IP (Elastic IP)

1. Service Added: Amazon VPC
2. Configuration:
 - a. Feature: Public IPv4 Address (Elastic IP)
 - b. Quantity: 1
 - c. Region: US East (N. Virginia)

The screenshot shows the AWS Pricing Calculator interface. In the top section, under 'Select VPC service(s) that you want to estimate', several options are listed, with 'Public IPv4 Address' being selected. Below this, under 'Public IPv4 Address feature', there is a field labeled 'Public IPv4 Address' containing '1'. A note states 'The calculations below exclude free tier discounts.' and 'Number of In-use public IPv4 addresses' is set to '1'.

Step 5: Storage Configuration

EC2 storage configured using EBS (100 GB SSD).

RDS storage configured independently (100 GB SSD).

Storage costs are included within EC2 and RDS pricing components.

Final AWS Cost Estimation

The screenshot shows the AWS Pricing Calculator results page. At the top, it displays 'Upfront cost: 0.00 USD', 'Monthly cost: 544.74 USD', and 'Total 12 months cost: 6,536.88 USD' (includes upfront cost). To the right, there's a 'Getting Started with AWS' section with 'Get started for free' and 'Contact Sales' buttons. Below this, the 'Sandesh CSIT 28936' resource group is listed with five items: Amazon EC2, Amazon RDS Custom, Elastic Load Balancing, and two entries for Amazon Virtual Private. Each item has a checkbox, a status column, and a detailed description of its usage.

Azure Virtual Machine:

Step 1: Virtual Machine (VM) service to estimate.

1. Selected Standard_B2ms (2 vCPU, 8 GB RAM), Linux, East US, 730 hours/month.

The screenshot shows the Azure Virtual Machines service configuration page. At the top, it displays "Sandesh's Linux" and the service summary: "Virtual Machines: Sandesh Khatiwada", "1 B2ms (2 Cores, 8 GB RAM) x 730 Hours (Pay as you go), Li...", "Upfront: \$0.00", and "Monthly: \$60.74". Below this are several filter and search fields:

- Region: East US
- Operating system: Linux
- Type: Ubuntu
- Tier: Standard
- Category: All
- Instance Series: All
- INSTANCE: B2ms: 2 Cores, 8 GB RAM, 16 GB Temporary storage, \$0.083/hour
- Virtual machines: 1 x 730 Hours

A message at the bottom encourages getting \$200 credit plus free monthly amounts of popular services for 12 months, including Virtual Machines.

Step 2: Load Balancer service.

1. Selected Standard tier, East US, 5 rules (to align with typical setup), usage set to cover typical/required processed data.

The screenshot shows the Azure Load Balancer service configuration page. At the top, it displays "Load Balancer: Azure Sandesh Load Balancer", "Standard Tier: 5 Rules, 1,000 GB Data Processed", "Upfront: \$0.00", and "Monthly: \$23.25". Below this are filter and search fields:

- Region: West US
- Tier: Standard

A section titled "Load Balancer rules" shows "5 Rules" and a cost of "\$18.25". A section titled "NAT rules" is also present. A message at the bottom encourages getting \$200 credit plus free monthly amounts of popular services for 12 months, including Azure Load Balancer, Standard.

Step 3: IP Addresses service.

1. Selected Standard (ARM) Static IP, East US, set to quantity 1, 730 hours/month.

The screenshot shows the Azure IP Addresses service configuration page. At the top, it says "Sandesh Khatiwada IP Address Azure" and has a "Give feedback" link. A note at the top indicates a \$200 credit plus free monthly amounts for 12 months, including Public IP Addresses, Basic (Classic). Below this, the "Region" is set to "East US" and the "Type" is "Standard (ARM)". A note states that common prices apply for load balanced or virtual machines. Under "Static IP Addresses", a quantity of 1 is selected for 730 hours, resulting in a cost of \$3.65. Under "Public IP Prefixes", 0 addresses are selected for 730 hours, resulting in a cost of \$0.00. At the bottom, the "Upfront cost" is \$0.00 and the "Monthly cost" is \$3.65.

Upfront cost	\$0.00
Monthly cost	\$3.65

Step 4: Managed Disk service.

1. Selected Premium SSD, P10 (128 GiB- the closest available to 100 GB)
2. East US, LRS (Locally Redundant Storage)
3. Quantity 1.

The screenshot shows the Azure Managed Disk service configuration page. At the top, it says "Sandesh Khatiwada Managed Disk" and has a "Give feedback" link. A note at the top indicates a \$200 credit plus free monthly amounts for 12 months, including Managed Disks, Standard HDD tier. Below this, the "Region" is set to "East US", the "Tier" is "Premium SSD", and the "Redundancy" is "LRS". A note specifies the disk size as P10: 128 GiB, 500 Provisioned IOPS, 100 Provisioned MB/s, \$19.710/mo. Under "Number of Disks", a quantity of 1 is selected at a cost of \$19.71 per month.

Step 5: SQL Database service.

1. Configured as Single Database, vCore purchasing model
2. General Purpose tier, 2 vCore, Gen5 hardware, 100 GB storage
3. East US.

Sandesh Azure SQL Database

Get \$200 credit plus free monthly amounts of popular services for 12 months—including Azure SQL Database. See free amounts 

Region:	Type:  	Purchase Model:  	Service Tier:  
East US	Single Database	vCore	General Purpose
Compute Tier:  	Hardware Type:  	Instance:  	Disaster Recovery:  
Provisioned	Standard-series (Gen 5)	2 vCore	Primary or Geo replica
Compute 			
Redundancy:  			
Locally Redundant			
 1		 730	Hours  
Databases			

Final Azure Cost Estimation:

A	B	C	D	E	F	G
1 Microsoft Azure Estimate						
2 Sandesh's Linux						
3 Service category	Service type	Custom name	Region	Description	Estimated monthly cost	Estimated upfront cost
Compute	Virtual Machines	Sandesh Khatiwada	East US	1 B2ms (2 Cores, 8 GB RAM) x 730 Hours (Pay as you go), Linux. (Pay as you go); 0 managed disks - S4; Inter Region transfer type, 5 GB outbound data transfer from East US to East Asia	\$60.74	\$0.00
Networking	Load Balancer	Azure Sandesh Load Balancer	East US	Standard Tier: 5 Rules, 1,000 GB Data Processed	\$23.25	\$0.00
Networking	IP Addresses	Sandesh Khatiwada IP Address Azure	East US	Standard (ARM, 1 Static IP Addresses X 730 Hours, 0 Public IP Prefixes X 730 Hours	\$3.65	\$0.00
Storage	Managed Disks	Sandesh Khatiwada Managed Disk	East US	Managed Disks, Premium SSD, LRS Redundancy, P10 Disk Type 1 Disks, Pay as you go	\$19.71	\$0.00
Databases	Azure SQL Database	Sandesh Azure SQL Database	East US	Single Database, vCore, General Purpose, Provisioned, Standard-series (Gen 5), Primary or Geo replica Disaster Recovery, Locally Redundant, 1 - 2 vCore Database(s) x 730 Hours, 100 GB Storage, SQL License (Pay as you go), RAGRS Backup Storage Redundancy, 0 GB Point-In-Time Restore, 0 x 5 GB Long Term Retention	\$383.14	\$0.00
Support					\$0.00	\$0.00
Licensing Program				Microsoft Customer Agreement (MCA)		
Billing Account						
Billing Profile						
Total					\$490.48	\$0.00

Conclusion

Component	AWS (Monthly)	Azure (Monthly)
VM/Compute	\$49.06	\$60.74
Load Balancer	\$31.03	\$23.25
Public IP	\$3.65	\$3.65
Storage (SSD)	included in VM line	\$19.71
Managed DB/SQL	\$461.00	\$383.14
TOTAL	\$544.74	\$490.48

Azure is cheaper than AWS for this scenario.

Azure provides an equivalent solution for about \$54 less per month for this setup. This demonstrates the importance of pricing calculators and careful resource selection when planning cloud deployments.