



# BUILDING A HIGHLY AVAILABLE, SCALABLE WEB APPLICATION PROJECT



CLOUD SPECIALIST  
TRACK



# OUR Team :-

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**Group: CAI1\_SWDD8\_M2d**

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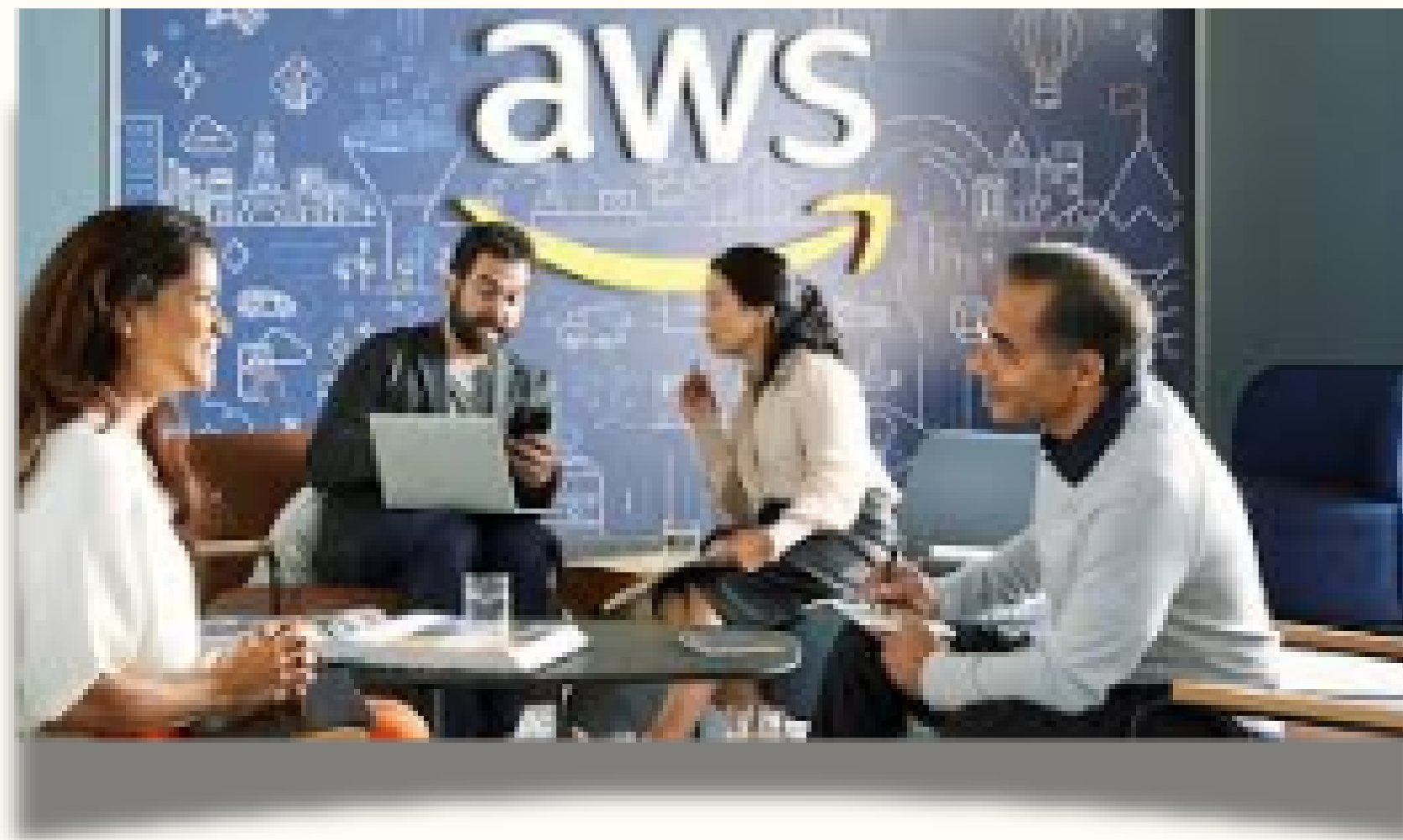
*Introduction*

*Architecture Diagram  
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AWS Web  
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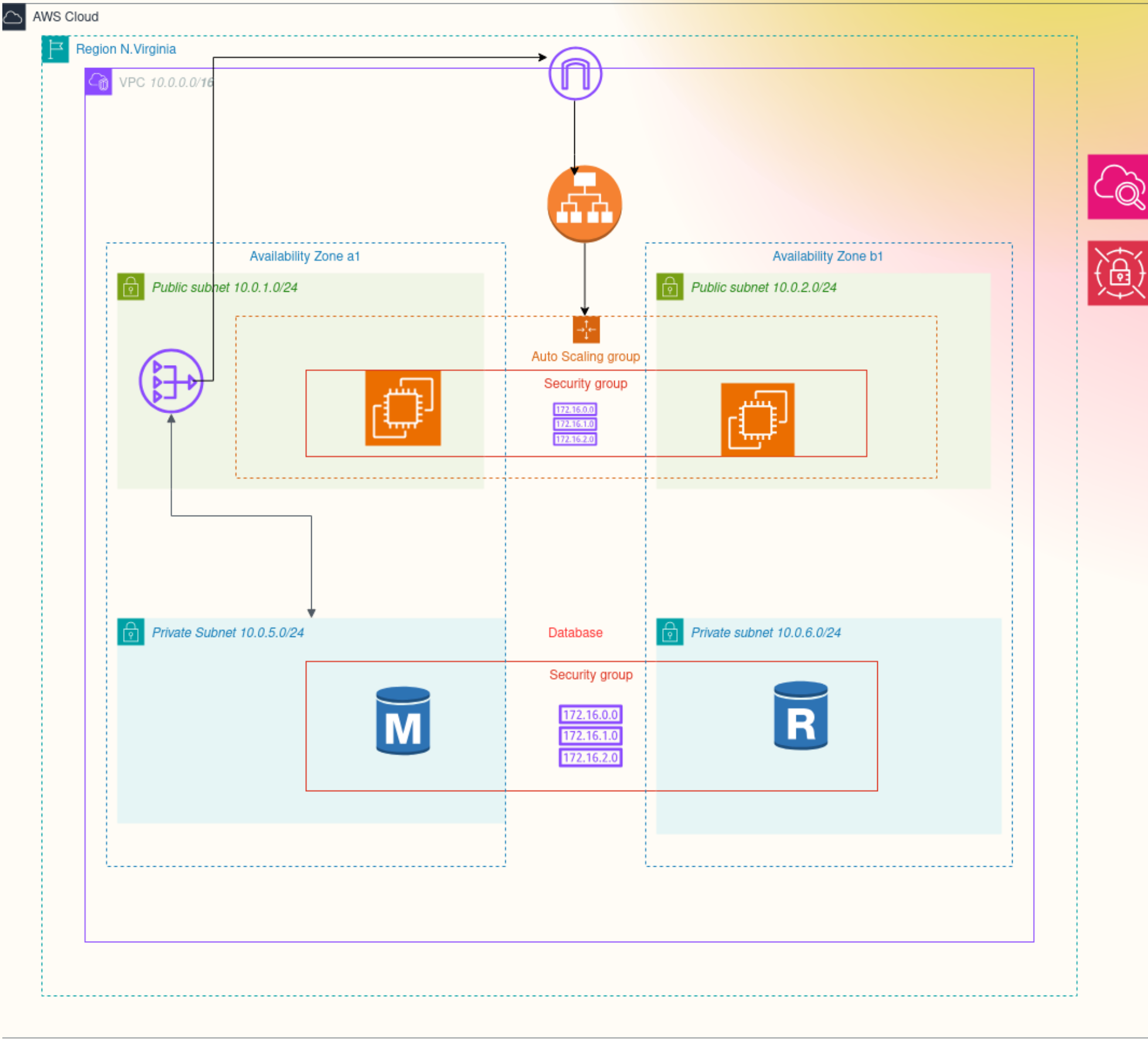
*Conclusion*



# INTRODUCTION

IN THIS PROJECT, WE DESIGNED AND BUILT A SCALABLE, SECURE, AND HIGHLY AVAILABLE 3-TIER WEB APPLICATION ARCHITECTURE USING AWS SERVICES. THE SOLUTION IS DESIGNED TO ENSURE EFFICIENT TRAFFIC MANAGEMENT, ROBUST SECURITY, AND SEAMLESS DATABASE INTERACTION, WHILE LEVERAGING AWS'S BEST PRACTICES. MY DESIGN INCORPORATES SERVICES LIKE EC2 INSTANCES FOR COMPUTE POWER, APPLICATION LOAD BALANCER FOR DISTRIBUTING TRAFFIC, AND RDS FOR DATABASE MANAGEMENT, ALL DISTRIBUTED ACROSS MULTIPLE AVAILABILITY ZONES FOR REDUNDANCY AND ANOTHER SERVICES WE WILL KNOW ABOUT IT

# ARCHITECTURE DIAGRAM





# Estimate Costs

10/17/24, 12:14 AM

My Estimate - AWS Pricing Calculator

Contact your AWS representative: [Contact Sales](#)



Export date: 10/17/2024

Language: English

Estimate URL: <https://calculator.aws/#/estimate?id=a860323bb70440c33698dde8a5afe64f4bac574f>

## Estimate summary

Upfront cost	Monthly cost	Total 12 months cost
196.22 USD	1,163.11 USD	14,153.54 USD
		Includes upfront cost

## Detailed Estimate

Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	No group applied	US East (N. Virginia)	196.22 USD	85.05 USD
<b>Status:</b> - <b>Description:</b> <b>Config summary:</b> Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 4), Advance EC2 instance (t3a.small), Pricing strategy ( 1yr Partial Upfront), Enable monitoring (enabled), EBS Storage amount (40 GB), DT Inbound: Internet (50 GB per month), DT Outbound: Internet (50 GB per month), DT Intra-Region: (0 TB per month)				
Elastic Load Balancing	No group applied	US East (N. Virginia)	0.00 USD	40.85 USD
<b>Status:</b> - <b>Description:</b> <b>Config summary:</b> Number of Application Load Balancers (2)				

10/17/24, 12:14 AM

My Estimate - AWS Pricing Calculator

Amazon RDS Custom for SQL Server	No group applied	US East (N. Virginia)	0.00 USD	700.41 USD
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**Status:** -

**Description:**

**Config summary:** Storage for each RDS Custom for SQL Server instance (General Purpose SSD (gp2)), Storage amount (1000 GB), Instance type (db.m5.xlarge), Number of RDS Custom for SQL Server instances (1), Utilization (On-Demand only) (730 Hours/Month), Database edition (Web), Deployment option (Single-AZ), License (AWS-provided), Pricing strategy (Reserved 1yr No Upfront), Additional backup storage (1000 GB)

Amazon Virtual Private Cloud (VPC)	No group applied	US East (N. Virginia)	0.00 USD	332.30 USD
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**Status:** -

**Description:**

**Config summary:** Working days per month (22) Number of NAT Gateways (1) Number of In-use public IPv4 addresses (2), Number of Idle public IPv4 addresses (1)

Amazon Simple Queue Service (SQS)	No group applied	US East (N. Virginia)	0.00 USD	4.50 USD
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**Status:** -

**Description:**

**Config summary:** DT Inbound: Internet (50 GB per month), DT Outbound: Internet (50 GB per month), Standard queue requests (1 million per month), Data transfer cost (4.5)

## Acknowledgement

AWS Pricing Calculator provides only an estimate of your AWS fees and doesn't include any taxes that might apply. Your actual fees depend on a variety of factors, including your actual usage of AWS services. [Learn more](#)

Subnets

VPC

*EC2  
Instance*

Application  
Load Balancer

*Secret  
Manager*

*Internet  
Gateway*

Auto  
Scaling

Security  
Group

Amazon  
Web  
services

Route  
Table

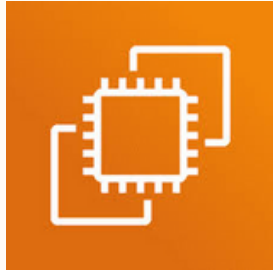
RDS

*Cloud9*

*Cloud  
Watch*

AWS (Amazon Web Services) is a cloud computing platform that provides a wide range of services, including compute power, storage, databases, networking, and security, enabling users to build and deploy scalable applications. AWS helps organizations avoid upfront infrastructure costs, scale quickly, and only pay for the resources they use.

# OUR SERVICES



## Elastic Compute Cloud

Virtual servers that run your application



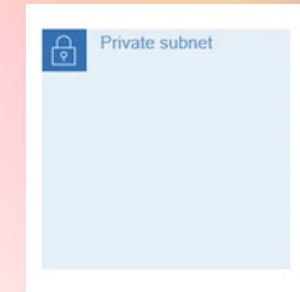
## Virtual Private Cloud

A VPC is a virtual network that isolates your resources.



## Public Subnet

A subnet that allows access to the internet through an Internet gateway



## Private Subnet

A subnet that is not directly accessible from the internet.



## Application Load Balancer

handles traffic distribution.



## Security Groups

Virtual firewalls that control inbound and outbound traffic for AWS resources.



## Amazon RDS

Relational Database Service a managed relational database service (e.g., MySQL, PostgreSQL).

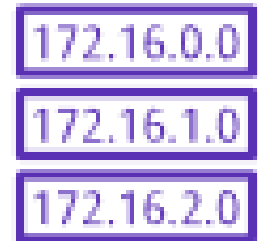


## Auto Scaling Group

A group that automatically adjusts the number of EC2 instances based on demand.



# OUR SERVICES



## Route Table

A set of rules within a VPC that determines how traffic is routed through the subnets and connected networks.



## Internet Gateway

A gateway that provides internet access to your public resources.



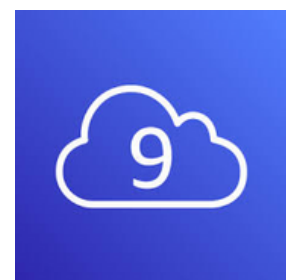
## Secrets Manager

A service that helps you protect access to your applications, services, and IT resources without hardcoding sensitive information, like database credentials, API keys, and other secrets



## Amazon CloudWatch

A monitoring and management service for AWS resources and applications.



AWS Cloud9 is an online Integrated Development Environment (IDE) provided by Amazon Web Services (AWS) that allows developers to write, run, and debug code directly in a web browser.

aws

Services

Search

[Alt+S]

VPC dashboard

EC2 Global View

Filter by VPC

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Your VPCs (1/2)

Info

Last updated less than a minute ago

Actions

Create VPC

Search

	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set	Main route table	Main
<input type="checkbox"/>	-	<a href="#">vpc-0c76dc41f7dc62747</a>	Available	172.31.0.0/16	-	<a href="#">dopt-038878b79f5377...</a>	<a href="#">rtb-02e7209dbfe9bbf71</a>	<a href="#">acl-0...</a>
<input checked="" type="checkbox"/>	MyWebApp	<a href="#">vpc-0402607da6c027f78</a>	Available	10.0.0.0/16	-	<a href="#">dopt-038878b79f5377...</a>	<a href="#">rtb-094dbf0140bc2abd3</a>	<a href="#">acl-0...</a>

vpc-0402607da6c027f78 / MyWebApp

DetailsResource mapCIDRSTagsIntegrations

Details

VPC ID	State	DNS hostnames	DNS resolution
vpc-0402607da6c027f78	Available	Enabled	Enabled
Tenancy	DHCP option set	Main route table	Main network ACL
Default	<a href="#">dopt-038878b79f5377b8e</a>	<a href="#">rtb-094dbf0140bc2abd3</a>	<a href="#">acl-062075b33b7efd9c0</a>
Default VPC	IPv4 CIDR	IPv6 pool	IPv6 CIDR (Network border group)
No	10.0.0.0/16	-	-
Network Address Usage metrics	Route 53 Resolver DNS Firewall rule groups	Owner ID	
Disabled	-	676154506318	

CloudShell

Feedback

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Services

Search

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Instances dashboard

EC2 Global View

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Snapshots

Lifecycle Manager

Network & Security

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Load Balancing

Instances (1/4)

Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch Instances

Find Instance by attribute or tag (case-sensitive)

All states

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
<input checked="" type="checkbox"/>	Website	<a href="#">i-03854f11a8e127b7e</a>	Running	t2.micro	2/2 checks passed	<a href="#">View alarms</a>	us-east-1b	<a href="#">ec2-44-220-151-225.co...</a>	44.220.151.225	-
<input type="checkbox"/>	aws-cloud9-cl...	<a href="#">i-02573e6b853eb71df</a>	Running	t3.small	3/3 checks passed	<a href="#">View alarms</a>	us-east-1a	<a href="#">ec2-52-87-162-76.com...</a>	52.87.162.76	-
<input type="checkbox"/>	AppServer	<a href="#">i-0193d1762e8cc0c31</a>	Running	t2.micro	2/2 checks passed	<a href="#">View alarms</a>	us-east-1a	<a href="#">ec2-98-81-251-24.com...</a>	98.81.251.24	-

i-03854f11a8e127b7e (Website)

DetailsStatus and alarmsMonitoringSecurityNetworkingStorageTags

Instance summary

Instance ID	Public IPv4 address	Private IPv4 addresses
i-03854f11a8e127b7e	44.220.151.225   <a href="#">open address</a>	10.0.2.225
IPv6 address	Instance state	Public IPv4 DNS
-	Running	ec2-44-220-151-225.compute-1.amazonaws.com   <a href="#">open address</a>
Hostname type	Private IP DNS name (IPv4 only)	Elastic IP addresses
IP name: ip-10-0-2-225.ec2.internal	ip-10-0-2-225.ec2.internal	-
Answer private resource DNS name	Instance type	AWS Compute Optimizer finding
-	t2.micro	Opt-in to AWS Compute Optimizer for recommendations.   <a href="#">Learn more</a>
Auto-assigned IP address	VPC ID	Auto Scaling Group name
44.220.151.225 [Public IP]	vpc-0402607da6c027f78 (MyWebApp)	-
IAM Role	Subnet ID	
LabRole	subnet-03c482bc82844bf11 (PublicSubnet2)	
IMDSv2	Instance ARN	
Required	arn:aws:ec2:us-east-1:676154506318:instance/i-03854f11a8e127b7e	
Platform	AMI ID	Monitoring

CloudShell

Feedback

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Route tables (1/5)

Find resources by attribute or tag

Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC	Owner ID
<input checked="" type="checkbox"/> PublicRouteTable	<a href="#">rtb-05f16357376993277</a>	2 subnets	-	No	<a href="#">vpc-0402607da6c027f78   MyWebApp</a>	676154506318
<input type="checkbox"/> -	<a href="#">rtb-094dbf0140bc2abd3</a>	-	-	Yes	<a href="#">vpc-0402607da6c027f78   MyWebApp</a>	676154506318
<input type="checkbox"/> -	<a href="#">rtb-02e7209dbfe9bbf71</a>	-	-	Yes	<a href="#">vpc-0c76dc41f7dc62747</a>	676154506318
<input type="checkbox"/> PrivateRouteTable	<a href="#">rtb-0a8d91fc93caa0690</a>	2 subnets	-	No	<a href="#">vpc-0402607da6c027f78   MyWebApp</a>	676154506318
<input type="checkbox"/> RDS-Pvt-rt	<a href="#">rtb-0d857f179ce515114</a>	5 subnets	-	No	<a href="#">vpc-0402607da6c027f78   MyWebApp</a>	676154506318

rtb-05f16357376993277 / PublicRouteTable

Details

Routes

Subnet associations

Edge associations

Route propagation

Tags

Details

Route table ID

rtb-05f16357376993277

Main

No

Explicit subnet associations

2 subnets

Edge associations

-

VPC

[vpc-0402607da6c027f78 | MyWebApp](#)

Owner ID

676154506318

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Internet gateways (1/2)

Search

Name	Internet gateway ID	State	VPC ID	Owner
<input type="checkbox"/> -	<a href="#">igw-04cdfa1c296947250</a>	Attached	<a href="#">vpc-0c76dc41f7dc62747</a>	676154506318
<input checked="" type="checkbox"/> IGW	<a href="#">igw-0686ab75f25ac2e4f</a>	Attached	<a href="#">vpc-0402607da6c027f78   MyWebApp</a>	676154506318

igw-0686ab75f25ac2e4f / IGW

Details

Tags

Details

Internet gateway ID

igw-0686ab75f25ac2e4f

State

Attached

VPC ID

[vpc-0402607da6c027f78 | MyWebApp](#)

Owner

676154506318

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# CONCLUSION

- THIS ARCHITECTURE ENSURES A RELIABLE, COST-EFFECTIVE SOLUTION CAPABLE OF SCALING TO MEET USER DEMAND, WHILE MAINTAINING SECURITY AND OPERATIONAL EFFICIENCY.





**THANK  
YOU**