



BUILDING A HIGHLY AVAILABLE, SCALABLE WEB APPLICATION PROJECT



CLOUD SPECIALIST
TRACK



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Group: CAI1_SWDD8_M2d

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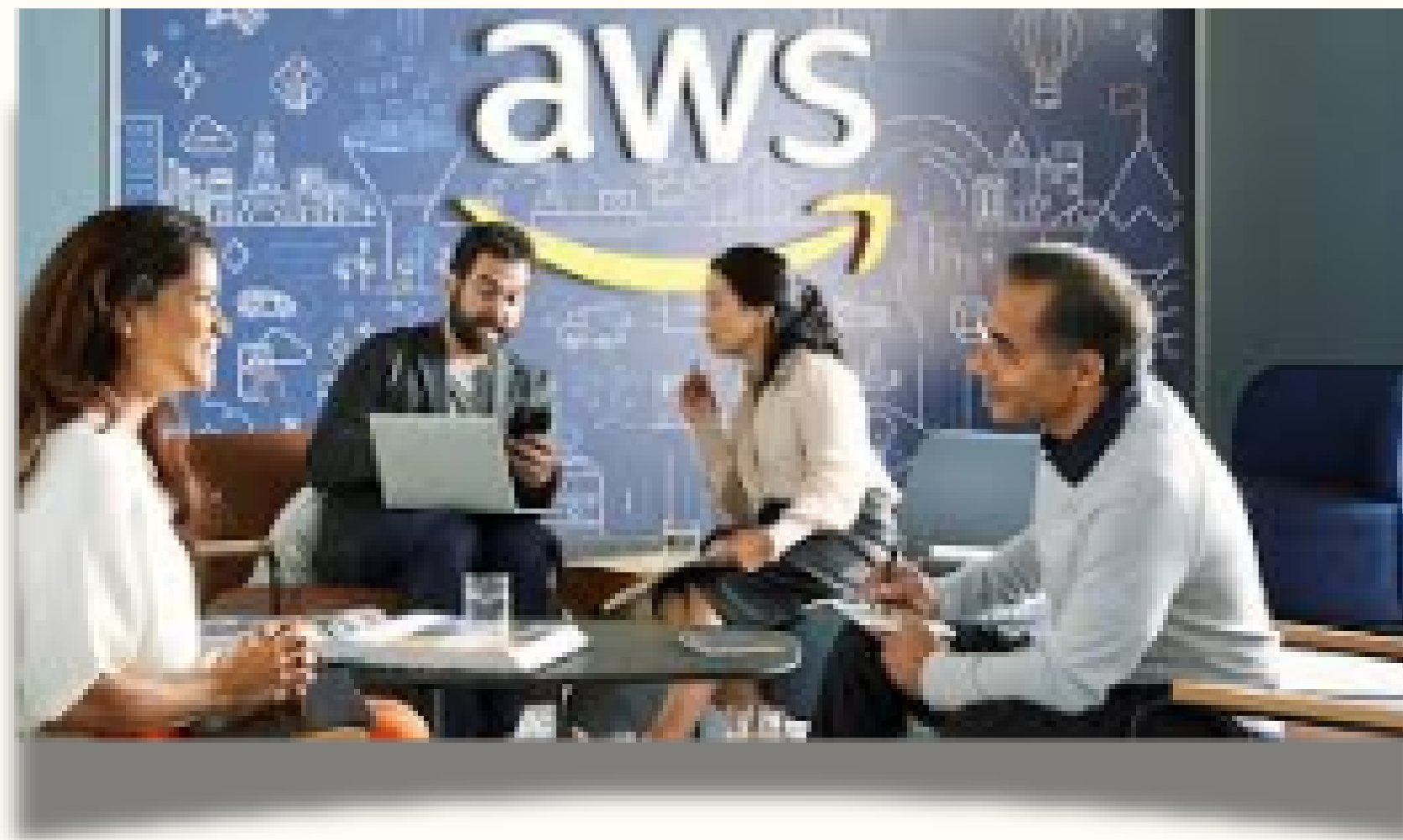
Introduction

*Architecture Diagram
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AWS Web
Services

*Samples of
Screen Projects*

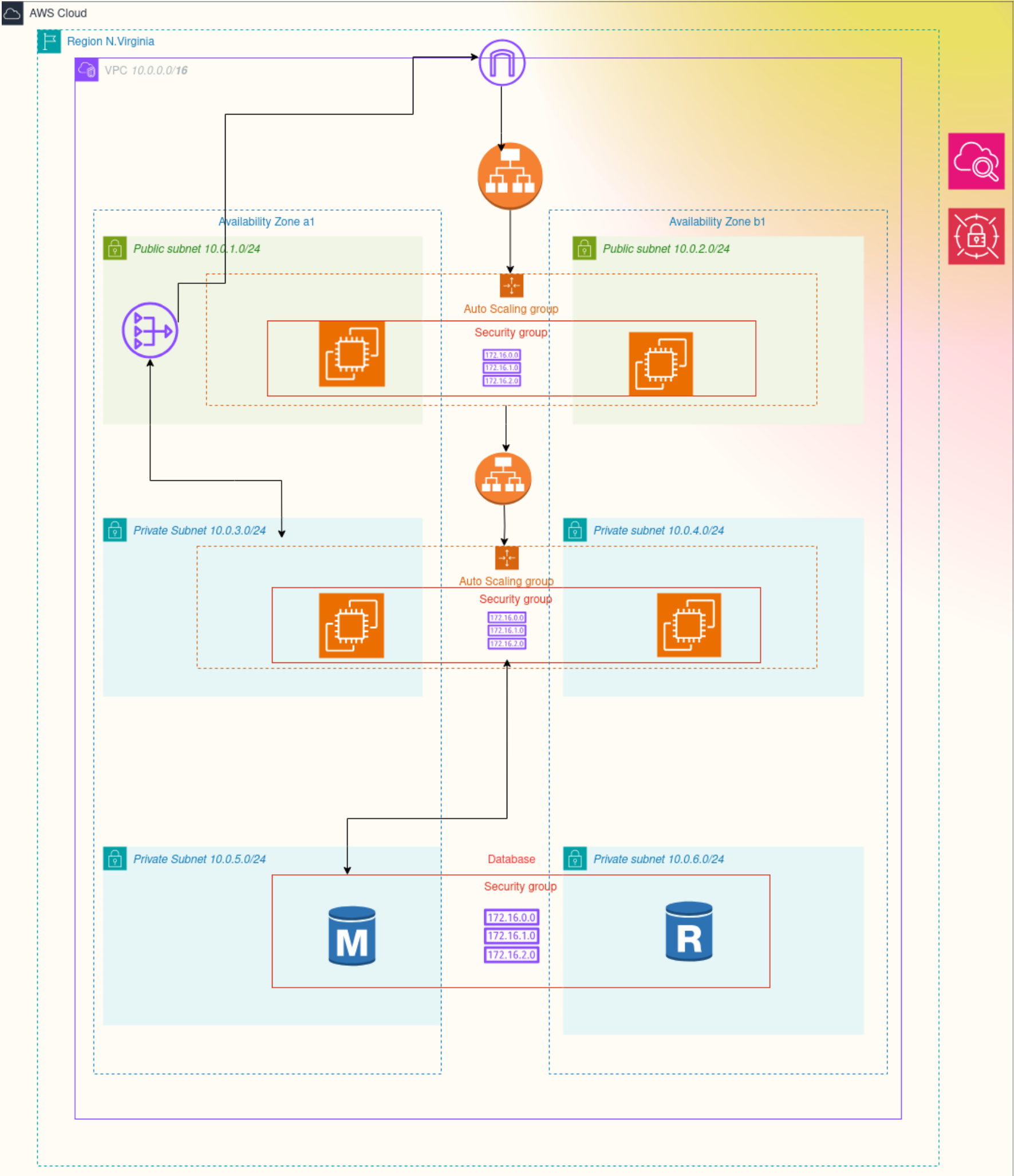
Conclusion



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
<div>Status: -</div> <div>Description:</div> <div>Config summary: 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)</div>				
Elastic Load Balancing	No group applied	US East (N. Virginia)	0.00 USD	40.85 USD
<div>Status: -</div> <div>Description:</div> <div>Config summary: Number of Application Load Balancers (2)</div>				

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
<div>Status: -</div> <div>Description:</div> <div>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)</div>				
Amazon Virtual Private Cloud (VPC)	No group applied	US East (N. Virginia)	0.00 USD	332.30 USD
<div>Status: -</div> <div>Description:</div> <div>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)</div>				
Amazon Simple Queue Service (SQS)	No group applied	US East (N. Virginia)	0.00 USD	4.50 USD
<div>Status: -</div> <div>Description:</div> <div>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)</div>				

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](#)

<https://calculator.aws/#/estimate>

1/2

Subnets

VPC

*EC2
Instance*

Application
Load Balancer

*Secret
Manager*

*Internet
Gateway*

Auto
Scaling

Security
Group

Amazon
Web
services

Route
Table

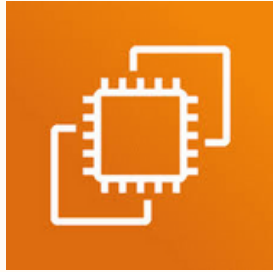
RDS

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



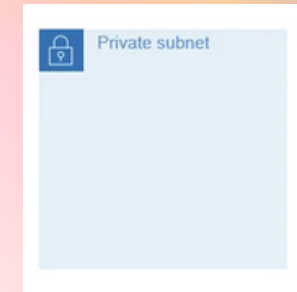
Virtual Private Cloud

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

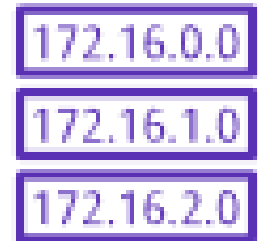
Relational Database Service a managed relational database service (e.g., MySQL, PostgreSQL).



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.



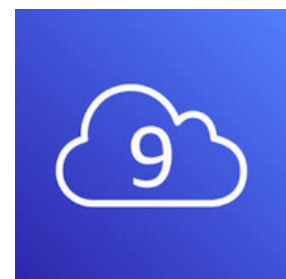
Secrets Manager

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

Virtual private cloud

Your VPCs

Subnets

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Security

Network ACLs

Security groups

DNS firewall

Rule groups

Domain lists

Network Firewall

Firewall

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"/>	-	vpc-0c76dc41f7dc62747	Available	172.31.0.0/16	-	dopt-038878b79f5377...	rtb-02e7209dbfe9bbf71	acl-0...
<input checked="" type="checkbox"/>	MyWebApp	vpc-0402607da6c027f78	Available	10.0.0.0/16	-	dopt-038878b79f5377...	rtb-094dbf0140bc2abd3	acl-0...

vpc-0402607da6c027f78 / MyWebApp

DetailsResource mapCIDRSTagsIntegrations

Details

VPC ID

vpc-0402607da6c027f78

Tenancy

Default

Default VPC

No

Network Address Usage metrics

Disabled

State

Available

DHCP option set

[dopt-038878b79f5377b8e](#)

IPv4 CIDR

10.0.0.0/16

Route 53 Resolver DNS Firewall rule groups

-

DNS hostnames

Enabled

Main route table

[rtb-094dbf0140bc2abd3](#)

IPv6 pool

-

Owner ID

676154506318

DNS resolution

Enabled

Main network ACL

[acl-062075b33b7efd9c0](#)

IPv6 CIDR (Network border group)

-

CloudShell

Feedback

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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	i-03854f11a8e127b7e	Running	t2.micro	2/2 checks passed	View alarms	us-east-1b	ec2-44-220-151-225.co...	44.220.151.225	-
<input type="checkbox"/>	aws-cloud9-cl...	i-02573e6b853eb71df	Running	t3.small	3/3 checks passed	View alarms	us-east-1a	ec2-52-87-162-76.com...	52.87.162.76	-
<input type="checkbox"/>	AppServer	i-0193d1762e8cc0c31	Running	t2.micro	2/2 checks passed	View alarms	us-east-1a	ec2-98-81-251-24.com...	98.81.251.24	-

i-03854f11a8e127b7e (Website)

DetailsStatus and alarmsMonitoringSecurityNetworkingStorageTags

Instance summary

Instance ID

i-03854f11a8e127b7e

IPv6 address

-

Hostname type

IP name: ip-10-0-2-225.ec2.internal

Answer private resource DNS name

-

Auto-assigned IP address

44.220.151.225 [Public IP]

IAM Role

LabRole

IMDSv2

Required

Public IPv4 address

44.220.151.225 | [open address](#)

Instance state

Running

Private IP DNS name (IPv4 only)

ip-10-0-2-225.ec2.internal

Instance type

t2.micro

VPC ID

vpc-0402607da6c027f78 (MyWebApp)

Subnet ID

subnet-03c482bc82844bf11 (PublicSubnet2)

Instance ARN

arn:aws:ec2:us-east-1:676154506318:instance/i-03854f11a8e127b7e

Private IPv4 addresses

10.0.2.225

Public IPv4 DNS

ec2-44-220-151-225.compute-1.amazonaws.com | [open address](#)

Elastic IP addresses

-

AWS Compute Optimizer finding

Opt-in to AWS Compute Optimizer for recommendations. | [Learn more](#)

Auto Scaling Group name

-

CloudShell

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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	rtb-05f16357376993277	2 subnets	-	No	vpc-0402607da6c027f78 MyWebApp	676154506318
<input type="checkbox"/> -	rtb-094dbf0140bc2abd3	-	-	Yes	vpc-0402607da6c027f78 MyWebApp	676154506318
<input type="checkbox"/> -	rtb-02e7209dbfe9bbf71	-	-	Yes	vpc-0c76dc41f7dc62747	676154506318
<input type="checkbox"/> PrivateRouteTable	rtb-0a8d91fc93caa0690	2 subnets	-	No	vpc-0402607da6c027f78 MyWebApp	676154506318
<input type="checkbox"/> RDS-Pvt-rt	rtb-0d857f179ce515114	5 subnets	-	No	vpc-0402607da6c027f78 MyWebApp	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"/> -	igw-04cdfa1c296947250	Attached	vpc-0c76dc41f7dc62747	676154506318
<input checked="" type="checkbox"/> IGW	igw-0686ab75f25ac2e4f	Attached	vpc-0402607da6c027f78 MyWebApp	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**