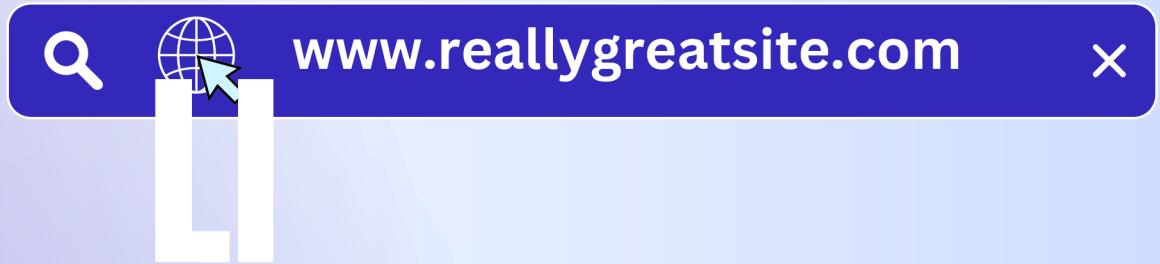




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BUILDING A HIGHLY AVAILABLE, SCALABLE WEB

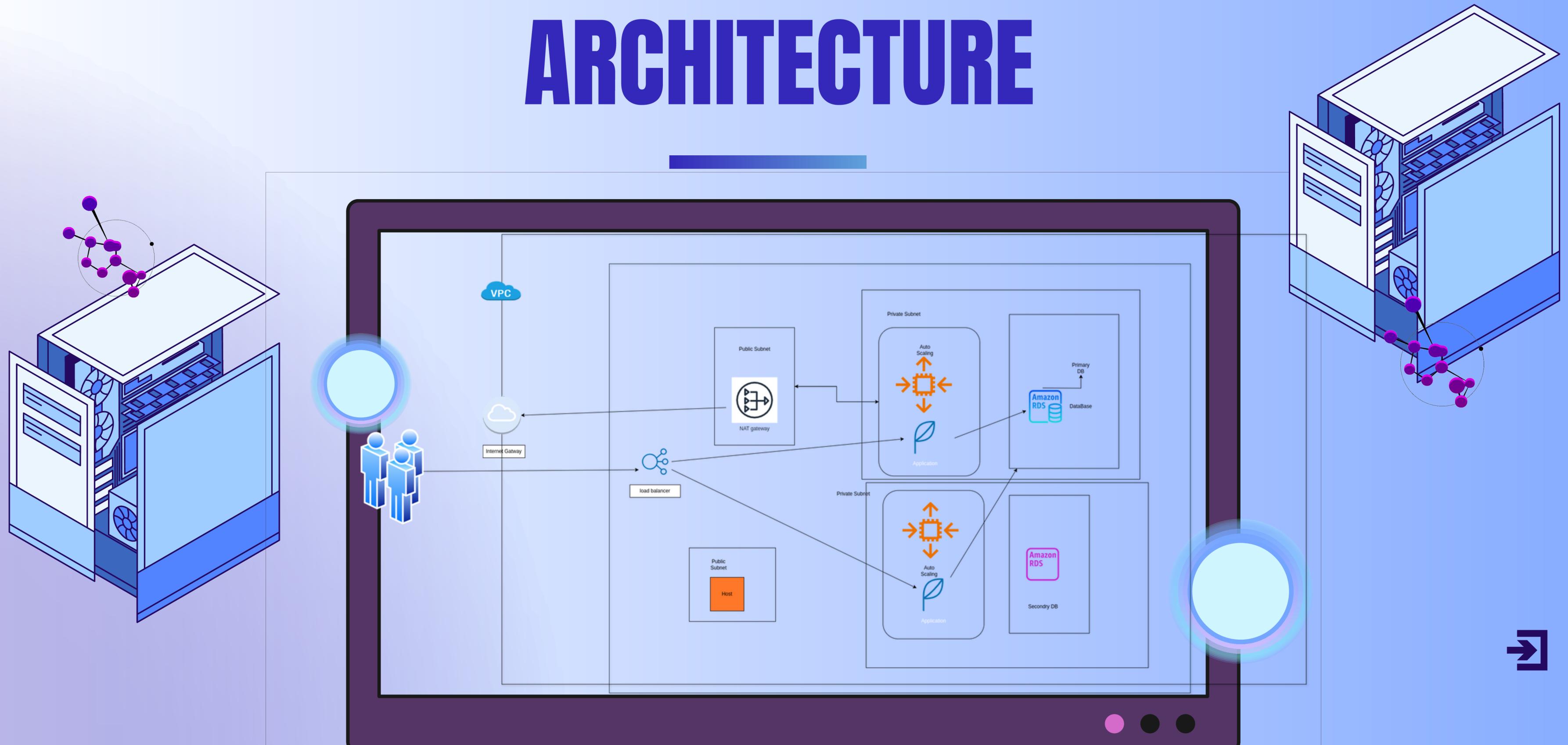
APPLICATION





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ARCHITECTURE





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STEPS

- 1.Creating Vpc
- 2.Creating EC2
- 3.testing the deployment
- 4.Creating RDS WITH secret key in secret manger
- 5.Creating Another EC2
6. Migarartion Data
- 7.Create Auto Scaling
- 8.Create Load Balancer

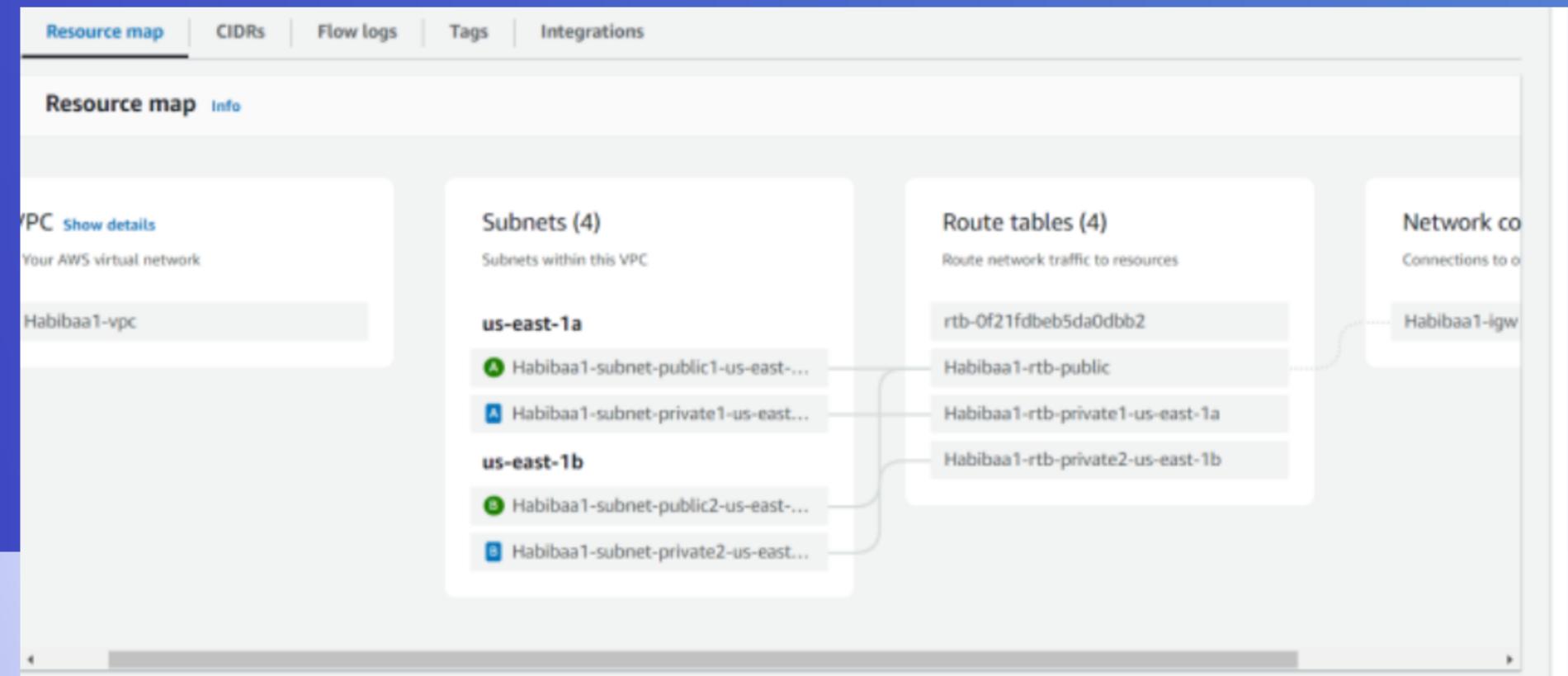


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CREATING VPC



Creating A VPC that has 2 availability zones to achieve availability





CREATING EC2

Creating the EC2 THAT HAS THE DATA LOCALLY INSIDE IT

Instances (1/5) [Info](#)

Last updated 2 minutes ago [Connect](#) [Instance state](#) [Actions](#) [Launch instances](#)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
Habibaawebserver	i-01b07082f19a37afb	Running	t2.micro	Initializing	View alarms	us-east-1a	ec2-18-232-180-113.co...	18.232.180.113
<input checked="" type="checkbox"/> HabibaaWeb1	i-0f553514227557234	Running	t2.micro	2/2 checks passed	View alarms	us-east-1a	ec2-44-223-66-178.co...	44.223.66.178
aws-cloud9-habiba-1-6beea4f2d4e549bba04acd872...	i-00637235406d8b05d	Running	t3.micro	3/3 checks passed	View alarms	us-east-1a	ec2-54-167-121-253.co...	54.167.121.253
	i-0d6c5c89ee584cd64d	Running	t2.micro	2/2 checks passed	View alarms	us-east-1a	-	-
	i-0aac36efa59ccda47	Running	t2.micro	2/2 checks passed	View alarms	us-east-1b	-	-

i-0f553514227557234 (HabibaaWeb1)

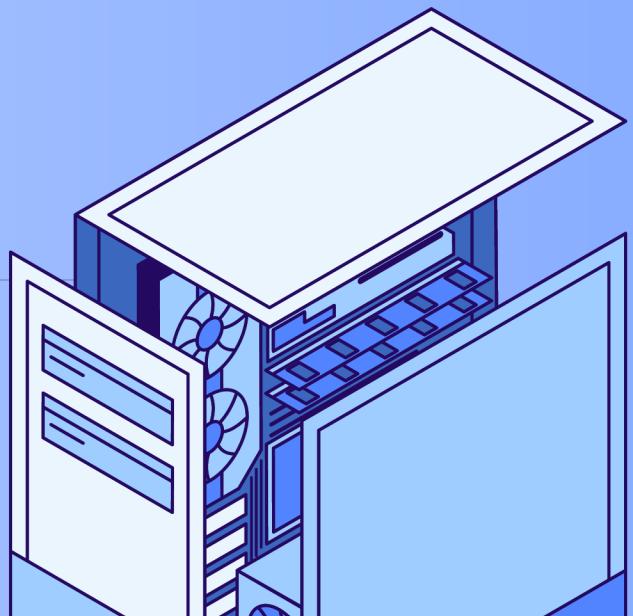
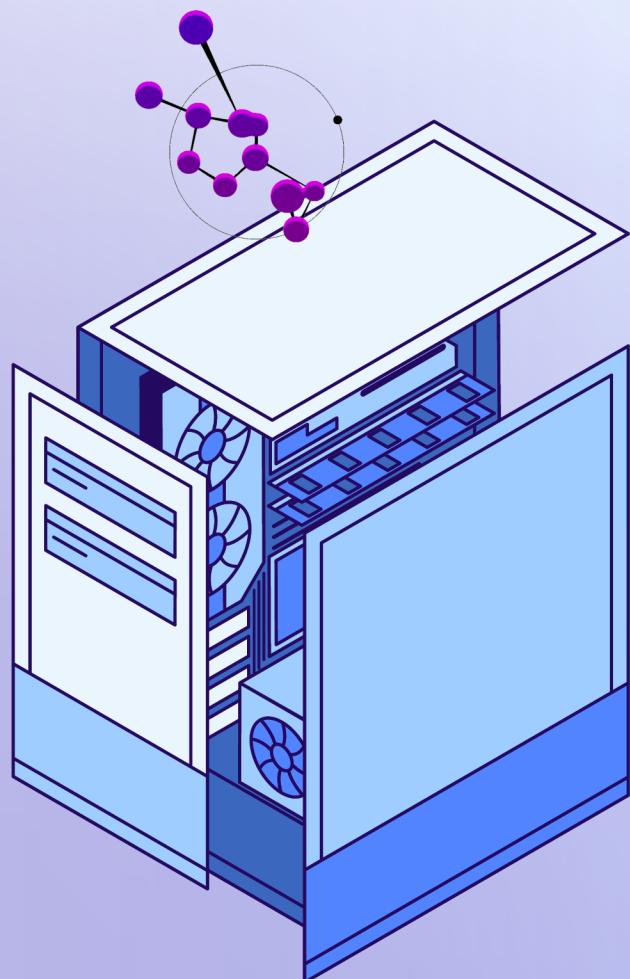
[Details](#) [Status and alarms](#) [Monitoring](#) [Security](#) [Networking](#) [Storage](#) [Tags](#)

Instance summary [Info](#)

Instance ID: [i-0f553514227557234 \(HabibaaWeb1\)](#)

Public IPv4 address: [44.223.66.178 | open address](#)

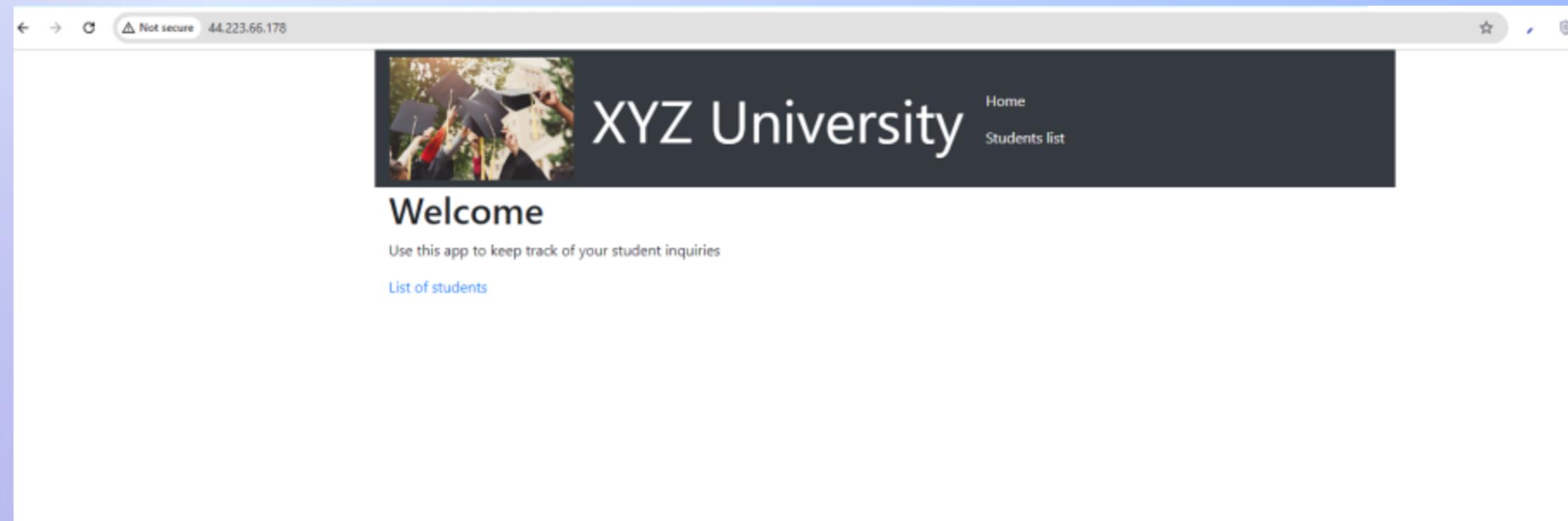
Private IPv4 addresses: [10.0.1.105](#)





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TESTING DEPLOYMENT





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CREATING RDS WITH A SECRET

Creating A secret for credentials in Secret key manger to the RDS

Secret value		Info	Close	Edit
Key/value	Plaintext			
Secret key	Secret value			
username	<input type="text"/> admin			
password	<input type="text"/> 3GaQr2W0z3E{t!u08myGdItt+6:y			
engine	<input type="text"/> mysql			
host	<input type="text"/> habibadatabase-1.c5u8wmg20ua4.us-east-1.rds.amazonaws.com			
port	<input type="text"/> 3306			
dbInstanceIdentifier	<input type="text"/> habibadatabase-1			





CREATING ANOTHER EC2

Creating another EC2 that is connected to the RDS and then have security group that is creating that is allowed to access RDS

Network settings [Info](#)

VPC - required [Info](#)
vpc-0194ed6f2aa35b37a (Habibaa1-vpc)
10.0.0.0/16

Subnet [Info](#)
subnet-009bb5b525e2e6525 Habibaa1-subnet-public1-us-east-1a
VPC: vpc-0194ed6f2aa35b37a Owner: 007403005255 Availability Zone: us-east-1a
Zone type: Availability Zone IP addresses available: 4088 CIDR: 10.0.0.0/20

Create new subnet [Info](#)

Auto-assign public IP [Info](#)
Enable

Additional charges apply when outside of [free tier allowance](#)

Firewall (security groups) [Info](#)
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group Select existing security group

Common security groups [Info](#)
Select security groups

HabibaSecurityGroup-ec2 sg-0c0c944edcea5e098 X
VPC: vpc-0194ed6f2aa35b37a

Compare security group rules [Info](#)

Security groups that you add or remove here will be added to or removed from all your network interfaces.

Advanced network configuration [Info](#)

Activate Windows
Go to Settings to activate Windows



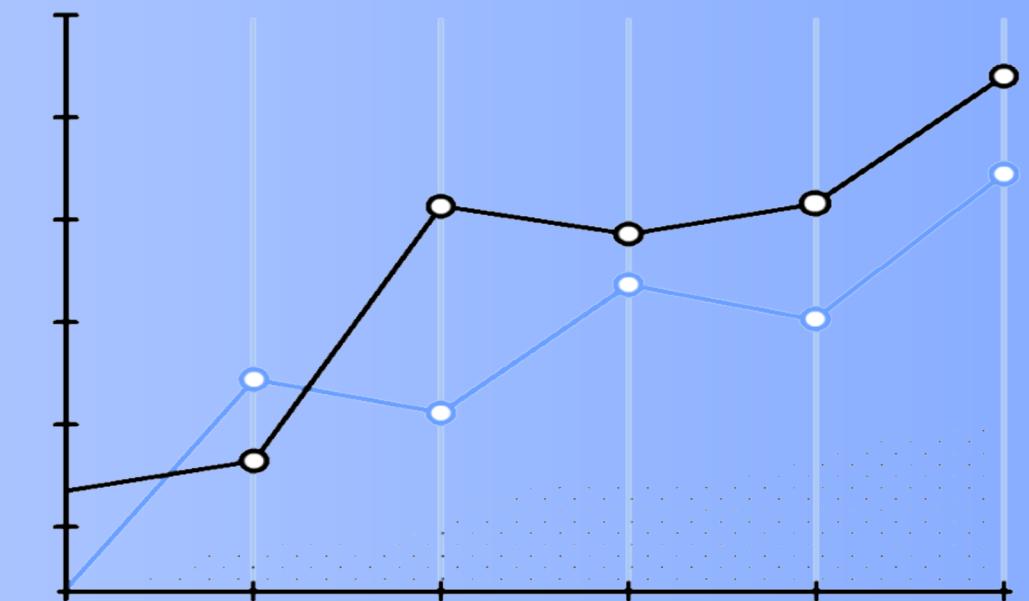
MIGRATING DATABASE

By connecting the EC2 that is connected to the RDS by command
`mysqldump -h <EC2instancePrivateip> -u nodeapp -p --databases STUDENTS > data.sql`

This command is used to create a backup of a MySQL database by exporting the structure and data of the STUDENTS database into a .sql file (data.sql)

`mysql -h <RDSEndpoint> -u nodeapp -p STUDENTS < data.sql`

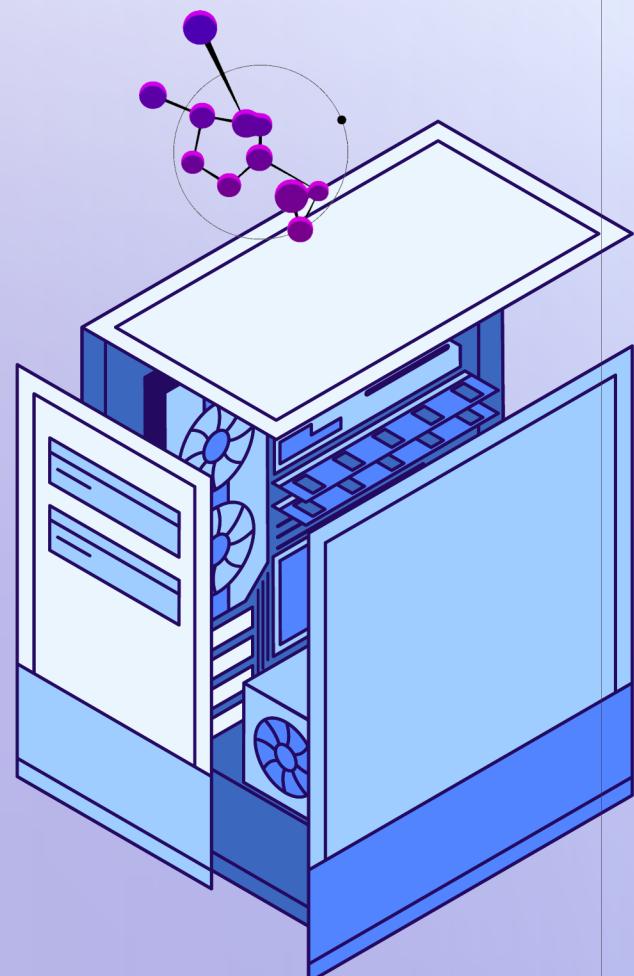
This command is used to restore a MySQL database using a previously created .sql file (data.sql), which contains SQL statements generated by mysqldump





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DATA





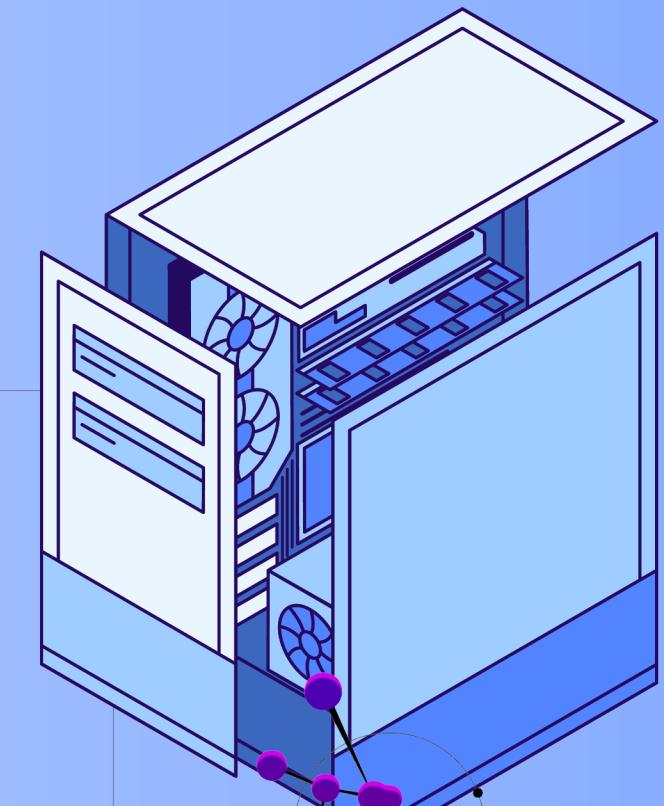
XYZ University

All students

Name	Address	City	State	Email	Phone
Habiba	Alexandria	Alexandria	Egypt	1@y.com	123456789
Habibaa Hossam	wabour el maya Bastour	Alexandria	الإسكندرية	Habibahossam.hh@gmail.com	12345454878
abc	abc	abc	abc	abc@y.com	1245545454

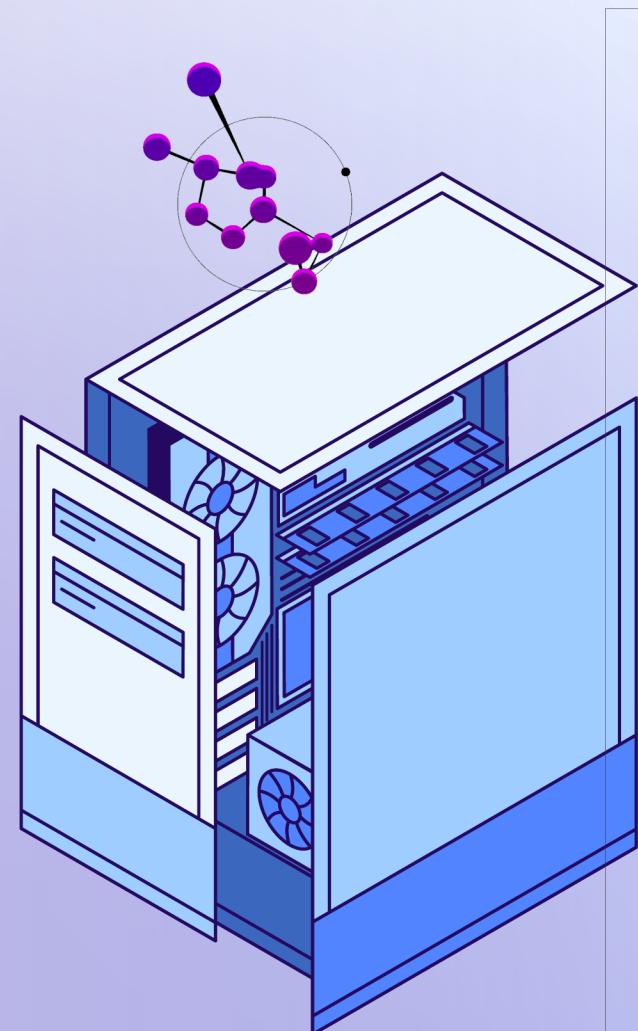
[Add a new student](#)

[edit](#) [edit](#) [edit](#)

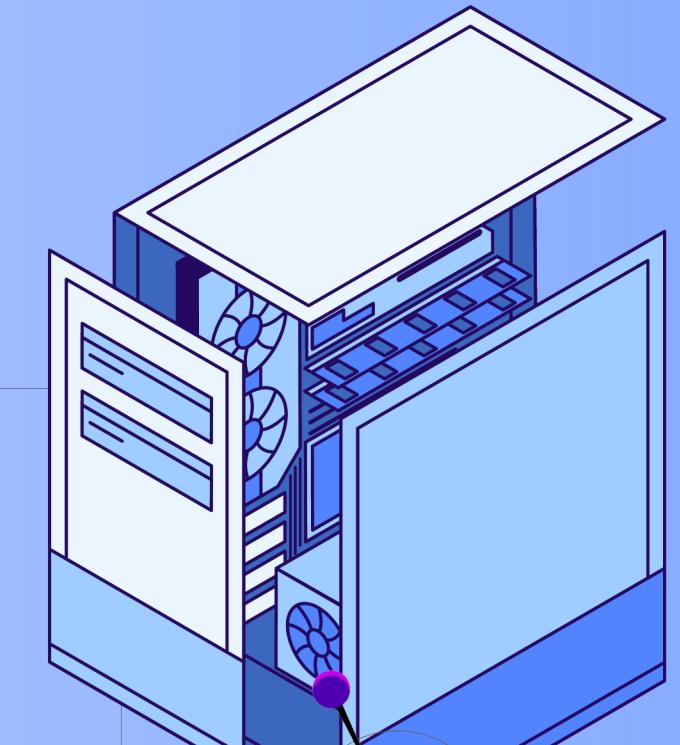




DATA INSIDE THE SECOND EC2



```
/*!40000 ALTER TABLE `students` DISABLE KEYS */;  
INSERT INTO `students` VALUES (1,'Habiba','Alexandria','Alexandria','Egypt','1@y.com','123456789'),  
'Habibaa Hossam','wabour el maya Bastour','Alexandria','الإسكندرية','Habibahossam.hh@gmail.com','1  
345454878'),(3,'abc','abc','abc','abc@y.com','1245545454');  
/*!40000 ALTER TABLE `students` ENABLE KEYS */;  
UNLOCK TABLES;  
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;
```





CREATING AN AUTOSCALING



making an image for The instance
then create a template for AutoScaling of
Launch template
then create the AutoScaling

The screenshot shows the AWS EC2 Auto Scaling groups page. At the top, there's a navigation bar with 'EC2 > Auto Scaling groups'. Below it is a search bar labeled 'Search your Auto Scaling groups'. A table lists one Auto Scaling group: 'webserverAutoScaling' (Launch template/configuration: 'webserverTemplate | Version Default', Instances: 2, Status: -, Desired capacity: 2, Min: 1, Max: 3, Availability Zones: 'us-east-1a, us-east-1b'). To the right of the table are buttons for 'Launch configurations', 'Launch templates', 'Actions', and a prominent orange 'Create Auto Scaling group' button.

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max	Availability Zones
webserverAutoScaling	webserverTemplate Version Default	2	-	2	1	3	us-east-1a, us-east-1b





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MAKE A TARGET GROUP

EC2 > Target groups > webserverTarget

webserverTarget

Actions ▾

Details
arn:aws:elasticloadbalancing:us-east-1:007403005255:targetgroup/webserverTarget/21b83754ceb58751

Target type Instance	Protocol : Port HTTP: 80	Protocol version HTTP1	VPC vpc-0194ed6f2aa35b37a
IP address type IPv4	Load balancer None associated		
2 Total targets	0 Healthy	0 Unhealthy	2 Unused
	0 Anomalous		0 Initial
			0 Draining

► Distribution of targets by Availability Zone (AZ)
Select values in this table to see corresponding filters applied to the Registered targets table below.

Targets | Monitoring | Health checks | Attributes | Tags

Registered targets (2) info
Target groups route requests to individual registered targets using the protocol and port number specified. Health checks are performed on all registered targets according to the target group's health check settings. Anomaly detection is automatically applied to HTTP/HTTPS target groups with at least 3 healthy targets.

Anomaly mitigation: Not applicable

Deregister | Register targets

Instance ID	Name	Port	Zone	Health status	Health status details	Launch...	Anomaly detection result
i-0be6cb3c8ea280d5		80	us-east-1a	Unused	Target group is not co...	September...	Normal
i-075c8b86996956d59		80	us-east-1b	Unused	Target group is not co...	September...	Normal

Activate Windows
Go to Settings to activate Windows.





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CREATING LOAD BALANCER

EC2 > Load balancers > habibaWebserver-lb

habibaWebserver-lb

Details

Load balancer type	Application	Status	Provisioning	VPC	vpc-0194ed6f2aa35b37a	Load balancer IP address type	IPv4
Scheme	Internet-facing	Hosted zone	Z355XD0TRQ7X7K	Availability Zones	subnet-009bb5b525e2e6525 us-east-1a (use1-az4) subnet-0c9a342794783102b us-east-1b (use1-az6)	Date created	September 21, 2024, 23:28 (UTC+03:00)
Load balancer ARN	arn:aws:elasticloadbalancing:us-east-1:007403005255:loadbalancer/app/habibaWebserver-lb/7351fde4a78ae50b	DNS name	habibaWebserver-lb-386462410.us-east-1.elb.amazonaws.com (A Record)				

Listeners and rules | Network mapping | Resource map - new | Security | Monitoring | Integrations | Attributes | Tags

Listeners and rules (1) info

A listener checks for connection requests on its configured protocol and port. Traffic received by the listener is routed according to the default action and any additional rules.

Protocol:Port	Default action	Rules	ARN	Security policy	Default SSL/TLS certificate	mTLS	Trust store	Trust
HTTP:80	Forward to target group	1 rule	ARN	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
	• webserverTarget (100%)							
	• Target group stickiness: Off							



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THANK YOU!

