

## **Document Overview**

The various steps followed to perform the exercise assigned by Soltius for “The challenge - Cloud engineer” on AWS.

Amazon Web Services (AWS) provides a platform that is ideally suited for building fault-tolerant software systems.

The AWS platform is unique because it enables you to build fault-tolerant systems that operate with a minimal amount of human interaction.

## **AWS Architecture Design for Fault tolerant and Highly available application.**

Amazon Web Services provides services and infrastructure to build reliable, fault-tolerant, and highly available systems in the cloud. These qualities have been designed into our services both by handling such aspects without any special action.

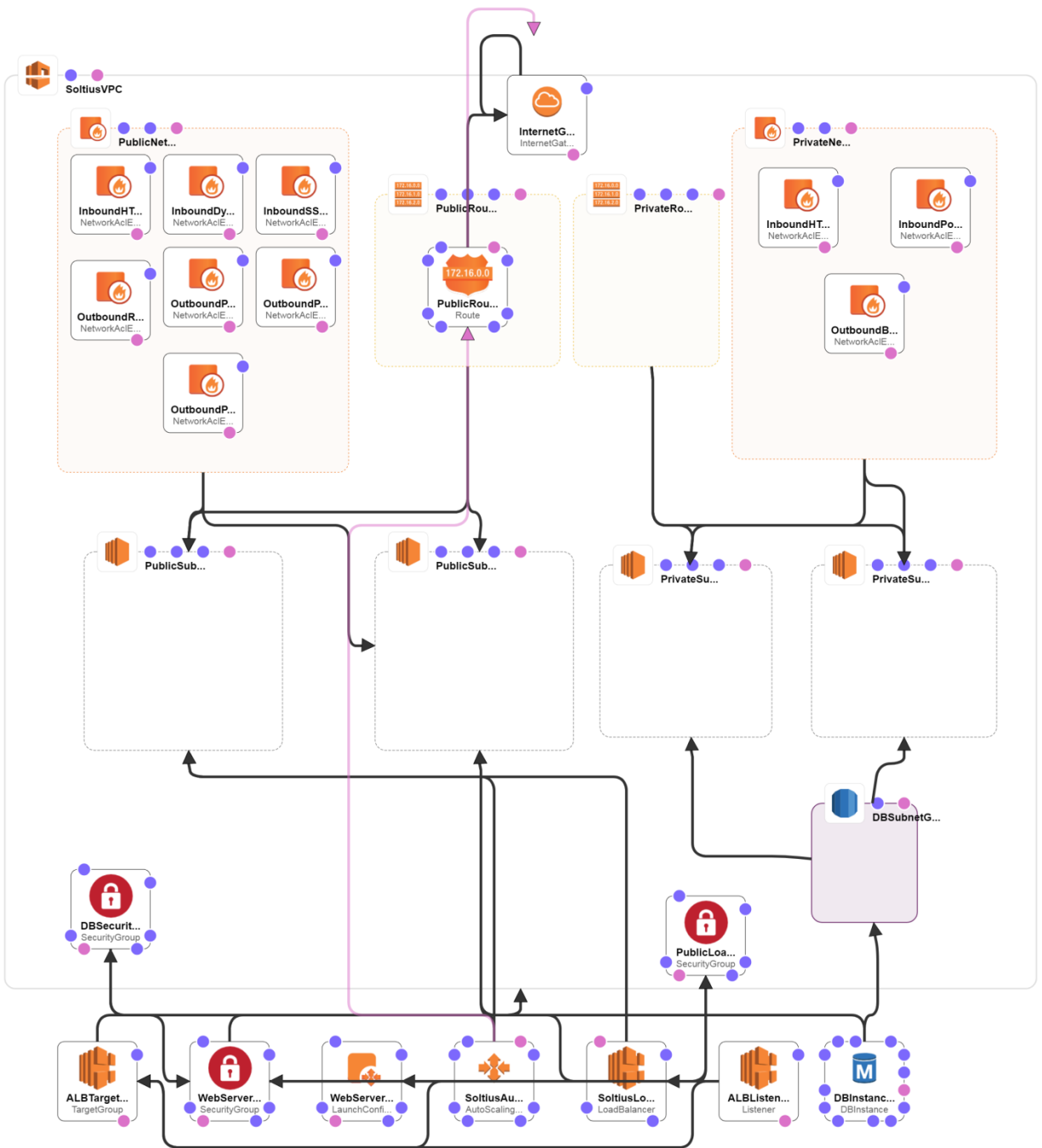
Amazon EC2 provides infrastructure building blocks that, by themselves, may not be fault-tolerant. Hard drives may fail, power supplies may fail, and racks may fail. It is important to use combinations of the features presented in this document to achieve fault tolerance and high availability.

### **Fault Tolerance and High Availability of Amazon Web Services.**

Most of the higher-level services, such as Amazon SimpleDB, Amazon Auto-Scaling, and Amazon Elastic Load Balancing (ELB), were used to address this exercise, built with fault tolerance and high availability.

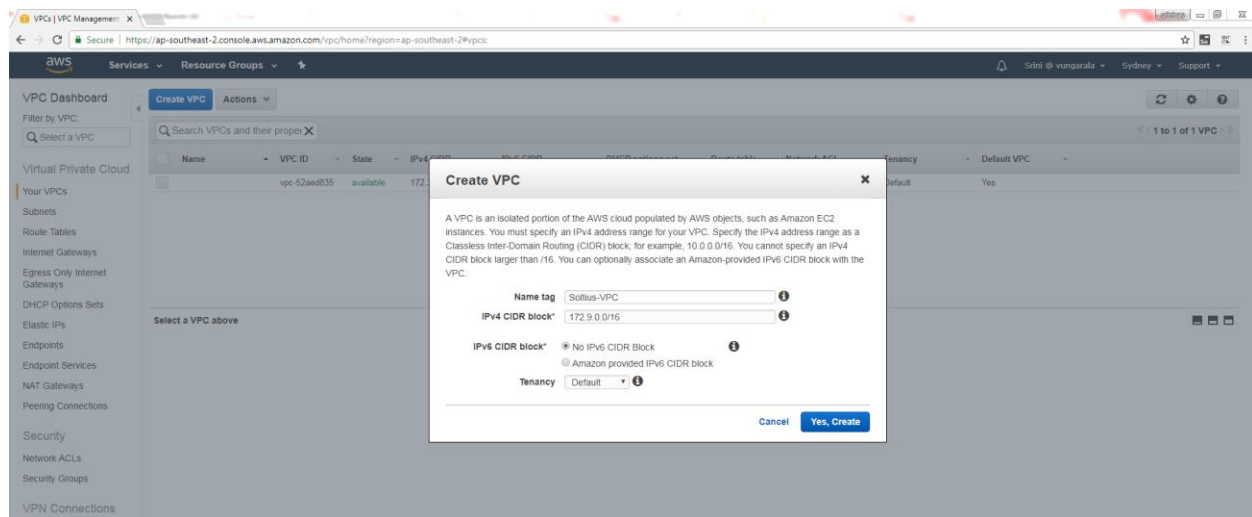
Services that provide basic infrastructure, such as Amazon Elastic Compute Cloud (EC2) and Amazon Elastic Block Store (EBS), provide specific features, such as availability zones, elastic IP addresses, and snapshots, that a fault-tolerant and highly available system must take advantage of and use correctly. Just moving a system into the cloud doesn't make it fault-tolerant or highly available.

The following design and AWS Service used to address "The challenge - Cloud engineer".



Below are the captured screenshots for the steps followed to create a New project for Soltius assigned exercise for Cloud engineer from Console.

## Creating of the New VPC – Soltius-VPS



## Create VPC

A VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You must specify an IPv4 address range for your VPC. Specify the IPv4 address range as a Classless Inter-Domain Routing (CIDR) block; for example, 10.0.0.0/16. You cannot specify an IPv4 CIDR block larger than /16. You can optionally associate an Amazon-provided IPv6 CIDR block with the VPC.

Name tag

Soltius-VPC

IPv4 CIDR block\*

172.9.0.0/16

IPv6 CIDR block\*

No IPv6 CIDR Block

Amazon provided IPv6 CIDR block

Tenancy

Default

Cancel

Yes, Create

## Creating of Subnets

### Public Subnet1 on Zone A

The screenshot shows the 'Create subnet' page in the AWS Management Console. The 'Name tag' is 'Pub-Sub1-Sollius'. The 'VPC' is 'vpc-0ce888fa263fe03b4'. The 'VPC CIDRs' table shows '172.9.0.0/16' with status 'associated'. The 'Availability Zone' is 'ap-southeast-2a'. The 'IPv4 CIDR block' is '172.9.1.0/24'. The page includes a 'Cancel' button and a 'Create' button.

Subnets > Create subnet

### Create subnet

Specify your subnet's IP address block in CIDR format, for example, 10.0.0.0/24. IPv4 block sizes must be between a /16 netmask and /28 netmask, and can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag: Pub-Sub1-Sollius ⓘ

VPC: vpc-0ce888fa263fe03b4 ⓘ

VPC CIDRs	CIDR	Status	Status Reason
	172.9.0.0/16	associated	

Availability Zone: ap-southeast-2a ⓘ

IPv4 CIDR block\*: 172.9.1.0/24 ⓘ

\* Required

Cancel Create

### Public Subnet2 on Zone A

The screenshot shows the 'Create subnet' page in the AWS Management Console. The 'Name tag' is 'Pub-Sub2-Sollius'. The 'VPC' is 'vpc-0ce888fa263fe03b4'. The 'VPC CIDRs' table shows '172.9.0.0/16' with status 'associated'. The 'Availability Zone' is 'ap-southeast-2b'. The 'IPv4 CIDR block' is '172.9.2.0/24'. The page includes a 'Cancel' button and a 'Create' button.

Subnets > Create subnet

### Create subnet

Specify your subnet's IP address block in CIDR format, for example, 10.0.0.0/24. IPv4 block sizes must be between a /16 netmask and /28 netmask, and can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag: Pub-Sub2-Sollius ⓘ

VPC: vpc-0ce888fa263fe03b4 ⓘ

VPC CIDRs	CIDR	Status	Status Reason
	172.9.0.0/16	associated	

Availability Zone: ap-southeast-2b ⓘ

IPv4 CIDR block\*: 172.9.2.0/24 ⓘ

\* Required

Cancel Create

### Subsequently Created Private Subnets on Zone A & B

The screenshot shows the 'Subnets' page in the AWS Management Console. It displays a table of subnets with columns: Name, Name, Subnet ID, State, VPC, IPv4 CIDR, Available IPv4, IPv6 CIDR, Availability Zone, and Route table. The table lists five subnets: Pvt-Sub2-Sollius, Pvt-Sub1-Sollius, Pub-Sub2-Sollius, and Pub-Sub1-Sollius, all in 'available' state and associated with VPC 'vpc-0ce888fa263fe03b4'.

Subnets | VPC Manager

Filter by VPC: Select a VPC

Virtual Private Cloud

Your VPCs

Subnets

Route Tables

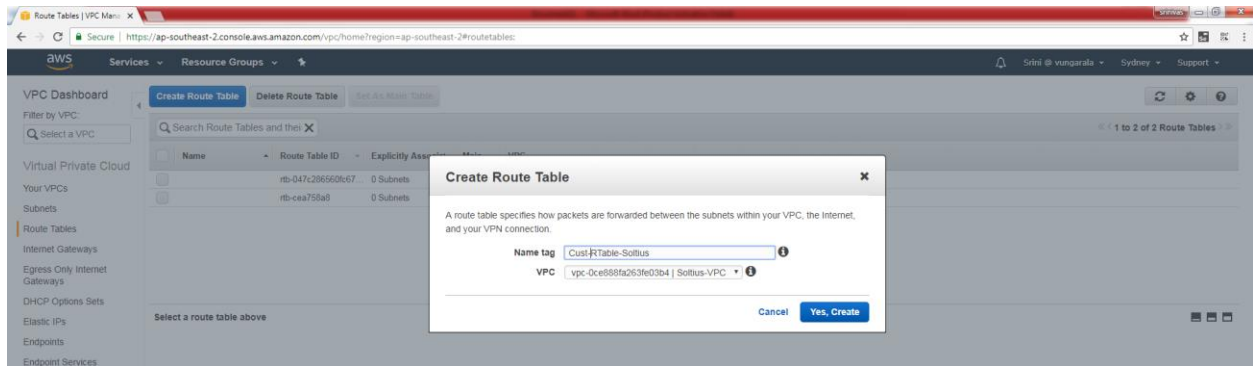
Internet Gateways

Egress Only Internet Gateways

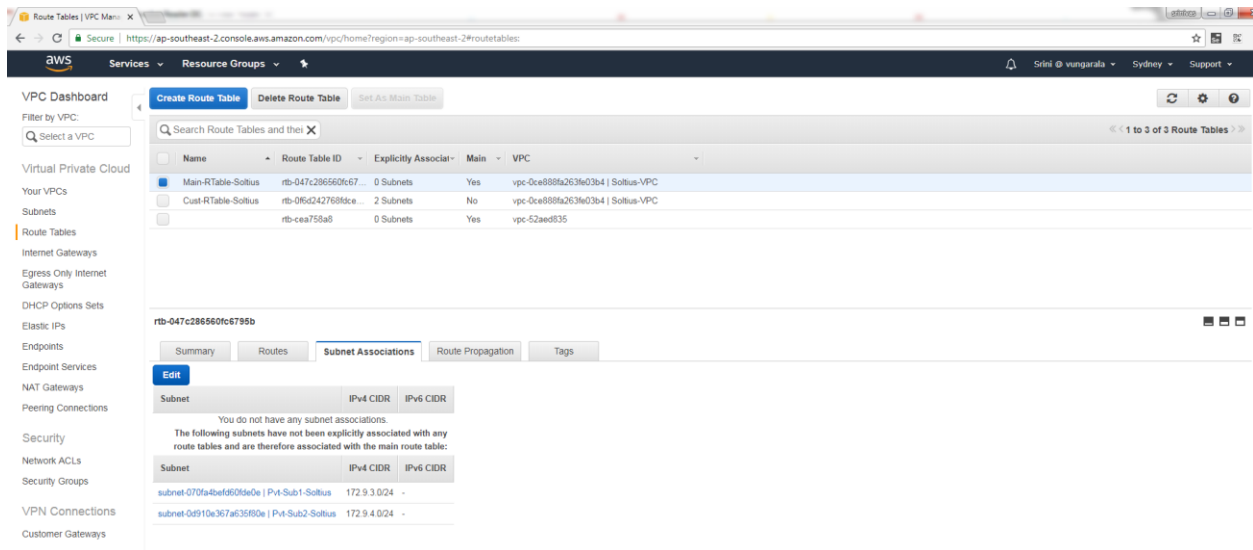
DHCP Options Sets

Elastic IPs

Name	Name	Subnet ID	State	VPC	IPv4 CIDR	Available IPv4	IPv6 CIDR	Availability Zone	Route table
Pvt-Sub2-Sollius	Pvt-Sub2-S...	subnet-0d910e367a63590e	available	vpc-0ce888fa263fe03b4	172.9.4.0/24	251	-	ap-southeast-2b	rtb-047c296560k6795b
Pvt-Sub1-Sollius	Pvt-Sub1-S...	subnet-0709a4bef950f9e0e	available	vpc-0ce888fa263fe03b4	172.9.3.0/24	251	-	ap-southeast-2a	rtb-047c296560k6795b
Pub-Sub2-Sollius	Pub-Sub2-...	subnet-0c28a7e9d2d2cf92	available	vpc-0ce888fa263fe03b4	172.9.2.0/24	251	-	ap-southeast-2b	rtb-047c296560k6795b
Pub-Sub1-Sollius	Pub-Sub1-...	subnet-0e63998c2305487ea	available	vpc-0ce888fa263fe03b4	172.9.1.0/24	251	-	ap-southeast-2a	rtb-047c296560k6795b



## Public Subnet Associations with Custom Route Table



Route Tables | VPC Manager

Secure | https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#routetables:

aws Services Resource Groups

### VPC Dashboard

Filter by VPC:

Select a VPC

### Virtual Private Cloud

- Your VPCs
- Subnets
- Route Tables**
- Internet Gateways
- Egress Only Internet Gateways
- DHCP Options Sets
- Elastic IPs
- Endpoints
- Endpoint Services
- NAT Gateways
- Peering Connections

### Security

- Network ACLs
- Security Groups

### VPN Connections

- Customer Gateways
- Virtual Private Gateways
- VPN Connections

Create Route Table Delete Route Table Set As Main Table

Search Route Tables and their

	Name	Route Table ID	Explicitly Associated	Main	VPC
<input type="checkbox"/>	Main-RTable-Soltius	rtb-047c286560fc67...	0 Subnets	Yes	vpc-0ce888fa263fe03b4   Soltius-VPC
<input checked="" type="checkbox"/>	Cust-RTable-Soltius	rtb-0f6d242768fdce...	2 Subnets	No	vpc-0ce888fa263fe03b4   Soltius-VPC
<input type="checkbox"/>		rtb-cea758a8	0 Subnets	Yes	vpc-52aed835

**rtb-0f6d242768fdce258 | Cust-RTable-Soltius**

Summary Routes **Subnet Associations** Route Propagation Tags

Edit

Subnet	IPv4 CIDR	IPv6 CIDR
subnet-0e83998c2305487ea   Pub-Sub1-Soltius	172.9.1.0/24	-
subnet-0b28a7e9d2d2cfa92   Pub-Sub2-Soltius	172.9.2.0/24	-

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Subnet	IPv4 CIDR	IPv6 CIDR
subnet-070fa4bafd60fde0e   Pvt-Sub1-Soltius	172.9.3.0/24	-
subnet-0d910e367a635f80e   Pvt-Sub2-Soltius	172.9.4.0/24	-

## Creation of Internet Gateway:IGW-Soltius

Create internet gateway

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Name tag

\* Required

Cancel Create

## IGW Attachment with VPC

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#igws:sort=internetGatewayId>

Services ▾ Resource Groups ▾ ⭐

Create internet gateway Actions ▾

Filter by tags and attributes or search by keyword

<input type="checkbox"/>	Name ▾	Name ▾	ID ▾	State	VPC ▾
<input checked="" type="checkbox"/>	IGW-Soltius	IGW-Soltius	igw-06f64f358c15...	attached	vpc-0ce888fa263f...
<input type="checkbox"/>			igw-d4ecbbb0	attached	vpc-52aed835

Internet gateway: igw-06f64f358c158caf8

Description Tags

ID igw-06f64f358c158caf8 Attached VPC ID vpc-0ce888fa263fe03b4 | Soltius-VPC  
State attached

## Assigning IGW to Custom Route Table

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#routetables:>

Services ▾ Resource Groups ▾ ⭐

Create Route Table Delete Route Table Set As Main Table

Search Route Tables and their associated subnets X

<input type="checkbox"/>	Name ▾	Route Table ID ▾	Explicitly Associated ▾	Main ▾	VPC ▾
<input type="checkbox"/>	Main-RTTable-Soltius	rtb-047c286560fc67...	0 Subnets	Yes	vpc-0ce888fa263fe03b4   Soltius-VPC
<input checked="" type="checkbox"/>	Cust-RTTable-Soltius	rtb-0f6d242768fdce...	2 Subnets	No	vpc-0ce888fa263fe03b4   Soltius-VPC
<input type="checkbox"/>		rtb-cea758a8	0 Subnets	Yes	vpc-52aed835

rtb-0f6d242768fdce258 | Cust-RTTable-Soltius

Summary Routes Subnet Associations Route Propagation Tags

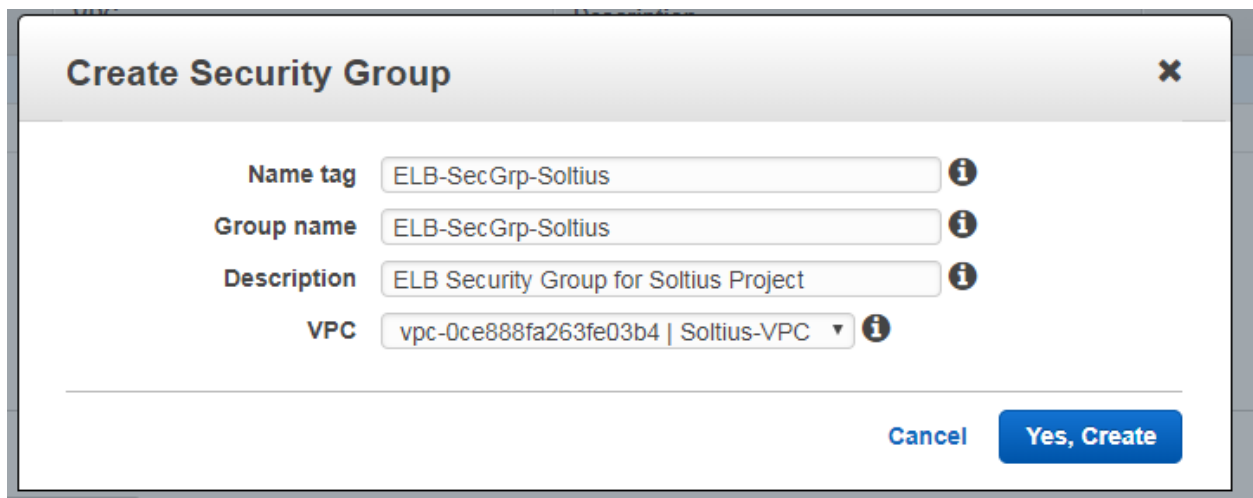
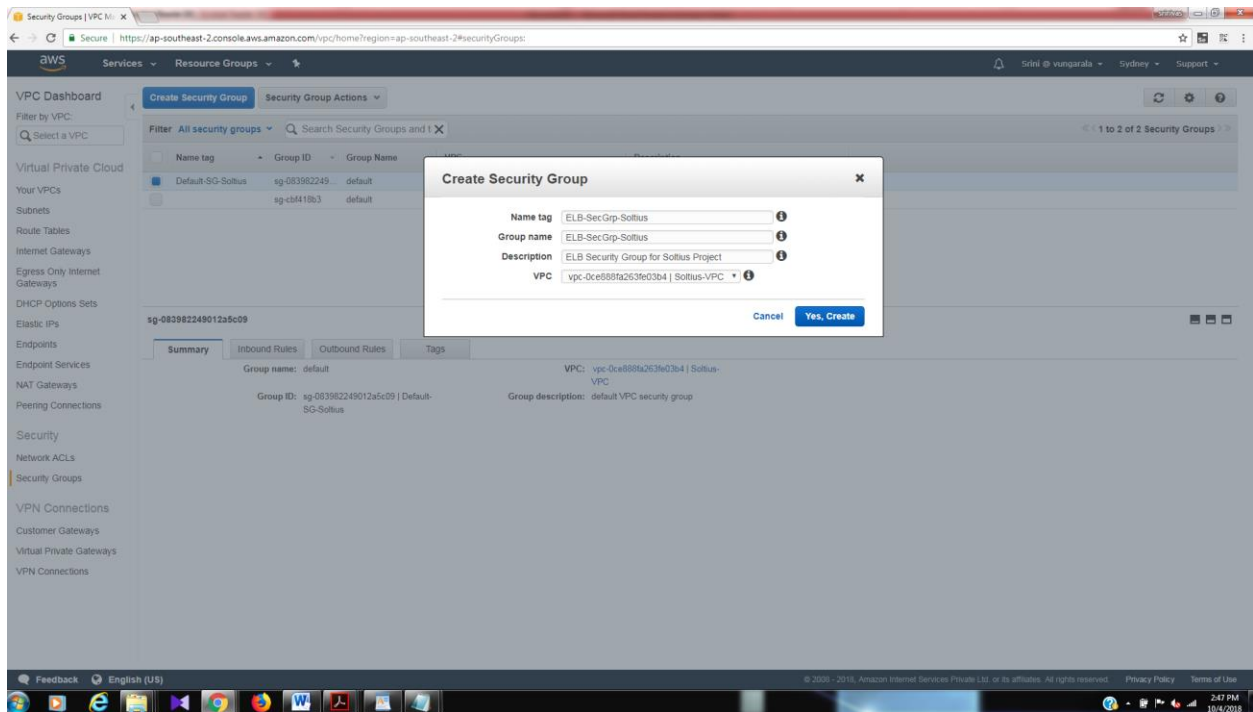
Edit

View: All rules ▾

Destination	Target	Status	Propagated
172.9.0.0/16	local	Active	No
0.0.0.0/0	igw-06f64f358c158caf8	Active	No



## Creation of Security Groups for ELB, Webserver and DB Server.



## Subsequently Created Security Groups for Webserver and Database

es

Resource Groups

☆

Create Security Group

Security Group Actions

Filter

All security groups

Search Security Groups and t

<input type="checkbox"/>	Name tag	Group ID	Group Name	VPC	Description
<input checked="" type="checkbox"/>	DB-SecGrp-Soltius	sg-04eb634e...	DB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	Data Base Security Group for Soltius Project
<input type="checkbox"/>	ELB-SecGrp-Soltius	sg-0c2e861f3...	ELB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	ELB Security Group for Soltius Project
<input type="checkbox"/>	Webserver-SecGrp-Solt	sg-09fb78518...	Webserver-SecGrp-S...	vpc-0ce888fa263fe03b4   Soltius-VPC	Webserver Security Group for Soltius Project
<input type="checkbox"/>	Default-SG-Soltius	sg-083982249...	default	vpc-0ce888fa263fe03b4   Soltius-VPC	default VPC security group
<input type="checkbox"/>		sg-cbf418b3	default	vpc-52aed835	default VPC security group

## Elastic Load Balancer Inbound Rules.

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#securityGroups:>

vices ▾ Resource Groups ▾ ⭐					
Create Security Group		Security Group Actions ▾			
Filter All security groups ▾ 🔍 Search Security Groups and t ✕					
<input type="checkbox"/>	Name tag ▾	Group ID ▾	Group Name ▲	VPC ▾	
<input type="checkbox"/>	DB-SecGrp-Soltius	sg-04eb634e6...	DB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	
<input checked="" type="checkbox"/>	ELB-SecGrp-Soltius	sg-0c2e861f3...	ELB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	
<input type="checkbox"/>	Webserver-SecGrp-Solt	sg-09fb78518...	Webserver-SecGrp-S...	vpc-0ce888fa263fe03b4   Soltius-VPC	
<input type="checkbox"/>	Default-SG-Soltius	sg-083982249...	default	vpc-0ce888fa263fe03b4   Soltius-VPC	
<input type="checkbox"/>		sg-cbf418b3	default	vpc-52aed835	

**sg-0c2e861f30a2b89e0 | ELB-SecGrp-Soltius**

Summary Inbound Rules Outbound Rules Tags

Edit ✓ Save Successful

Type	Protocol	Port Range	Source	Description
HTTP (80)	TCP (6)	80	0.0.0.0/0	
HTTP (80)	TCP (6)	80	:::0	
HTTPS (443)	TCP (6)	443	0.0.0.0/0	
HTTPS (443)	TCP (6)	443	:::0	

## ELB Outbound Rule:

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#securityGroups>

Services ▾ Resource Groups ▾ ⌕

Create Security Group Security Group Actions ▾

Filter All security groups ▾ 🔍 Search Security Groups and t X

<input type="checkbox"/>	Name tag ▾	Group ID ▾	Group Name ▴	VPC ▾	Description
<input type="checkbox"/>	DB-SecGrp-Soltius	sg-04eb634e6...	DB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	Data Base Security Group for Soltius Project
<input checked="" type="checkbox"/>	ELB-SecGrp-Soltius	sg-0c2e861f3...	ELB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	ELB Security Group for Soltius Project
<input type="checkbox"/>	Webserver-SecGrp-Solt	sg-09fb78518...	Webserver-SecGrp-S...	vpc-0ce888fa263fe03b4   Soltius-VPC	Webserver Security Group for Soltius Project
<input type="checkbox"/>	Default-SG-Soltius	sg-083982249...	default	vpc-0ce888fa263fe03b4   Soltius-VPC	default VPC security group
<input type="checkbox"/>		sg-cbf418b3	default	vpc-52aed835	default VPC security group

sg-0c2e861f30a2b89e0 | ELB-SecGrp-Soltius

Summary Inbound Rules Outbound Rules Tags

Cancel Save

Type	Protocol	Port Range	Destination	Description	Remove
ALL Traffic ▾	ALL ▾	ALL	sg-09fb785180af06a02 ⓘ	Outbound rule to Webserver	✕

Add another rule

## Nested Webserver Inbound Rules Association from ELB Security Group

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#securityGroups>

Services ▾ Resource Groups ▾ ⌕

Create Security Group Security Group Actions ▾

Filter All security groups ▾ 🔍 Search Security Groups and t X

<input type="checkbox"/>	Name tag ▾	Group ID ▾	Group Name ▴	VPC ▾	Description
<input type="checkbox"/>	DB-SecGrp-Soltius	sg-04eb634e6...	DB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	Data Base Security Group for Soltius Project
<input type="checkbox"/>	ELB-SecGrp-Soltius	sg-0c2e861f3...	ELB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-VPC	ELB Security Group for Soltius Project
<input checked="" type="checkbox"/>	Webserver-SecGrp-Solt	sg-09fb78518...	Webserver-SecGrp-S...	vpc-0ce888fa263fe03b4   Soltius-VPC	Webserver Security Group for Soltius Project
<input type="checkbox"/>	Default-SG-Soltius	sg-083982249...	default	vpc-0ce888fa263fe03b4   Soltius-VPC	default VPC security group
<input type="checkbox"/>		sg-cbf418b3	default	vpc-52aed835	default VPC security group

sg-09fb785180af06a02 | Webserver-SecGrp-Soltius

Summary Inbound Rules Outbound Rules Tags

Cancel Save

Type	Protocol	Port Range	Source	Description	Remove
HTTP (80) ▾	TCP (6) ▾	80	sg-0c2e861f30a2b89e0	Inbound rule associated from ELBsecurity Group	✕
HTTPS (443) ▾	TCP (6) ▾	443	sg-0c2e861f30a2b89e0 ⓘ	Inbound rule associated from	✕

Add another rule

Nested Database Inbound Rules Nested from Webserver Security group.

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#securityGroups:>

Services ▾Resource Groups ▾★

Create Security GroupSecurity Group Actions ▾

Filter All security groups ▾

<input type="checkbox"/>	Name tag	Group ID	Group Name	VPC
<input checked="" type="checkbox"/>	DB-SecGrp-Soltius	sg-04eb634e6...	DB-SecGrp-Soltius	vpc-0ce888fa263fe03b4   Soltius-
<input type="checkbox"/>	Default-SG-Soltius	sg-083982249...	default	vpc-0ce888fa263fe03b4   Soltius-
<input type="checkbox"/>	Webserver-SecGrp-Solt	sg-09fb78518...	Webserver-SecGrp-S...	vpc-0ce888fa263fe03b4   Soltius-

sg-04eb634e62bfc684b | DB-SecGrp-Soltius

SummaryInbound RulesOutbound RulesTags

Edit

Type	Protocol	Port Range	Source	Description
MySQL/Aurora (3306)	TCP (6)	3306	sg-09fb785180af06a02	Inbound Webserver Se...

The Outbound rules kept as default for all the Security groups

Custom Network Access Control List (NACL) Created for our Project configured with Inbound/Outbound rules and Subnet Assciations.

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#acis:>

Services ▾Resource Groups ▾★

Create Network ACLDelete

<input type="checkbox"/>	Name	Network ACL ID	Associated With	Default	VPC
<input type="checkbox"/>		acl-983c2eff	3 Subnets	Yes	vpc-52aed835
<input type="checkbox"/>	Default-NACL-Soltius	acl-04e2ae9dba4d67...	2 Subnets	Yes	vpc-0ce888fa263fe03b4   Soltius-VF
<input checked="" type="checkbox"/>	Custom-NACL-Soltius	acl-09e0445fd291c475c	2 Subnets	No	vpc-0ce888fa263fe03b4   Soltius-VF

acl-09e0445fd291c475c | Custom-NACL-Soltius

SummaryInbound RulesOutbound RulesSubnet AssociationsTags

Allows inbound traffic. Because network ACLs are stateless, you must create inbound and outbound rules.

Edit

View: All rules ▾

Rule #	Type	Protocol	Port Range	Source	Allow / Deny
100	ALL Traffic	ALL	ALL	0.0.0.0/0	ALLOW
*	ALL Traffic	ALL	ALL	0.0.0.0/0	DENY

## Public Subnets Associated with Custom NACL

<https://ap-southeast-2.console.aws.amazon.com/vpc/home?region=ap-southeast-2#acls>

Services ▾ Resource Groups ▾ ⌕

Create Network ACL Delete

Search Network ACLs and the X

<input type="checkbox"/>	Name	Network ACL ID	Associated With	Default	VPC
<input type="checkbox"/>		acl-983c2eff	3 Subnets	Yes	vpc-52aed835
<input type="checkbox"/>	Default-NACL-Soltius	acl-04e2ae9dba4d67...	2 Subnets	Yes	vpc-0ce888fa263fe03b4   Soltius-VPC
<input checked="" type="checkbox"/>	Custom-NACL-Soltius	acl-09e0445fd291c475c	2 Subnets	No	vpc-0ce888fa263fe03b4   Soltius-VPC

**acl-09e0445fd291c475c | Custom-NACL-Soltius**

Summary Inbound Rules Outbound Rules **Subnet Associations** Tags

Edit

Subnet	IPv4 CIDR	IPv6 CIDR
<a href="#">subnet-0e83998c2305487ea   Pub-Sub1-Soltius</a>	172.9.1.0/24	-
<a href="#">subnet-0b28a7e9d2d2cfa92   Pub-Sub2-Soltius</a>	172.9.2.0/24	-

## Launching EC2 Instance using Ubuntu AMI

<https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#Home>

Services ▾ Resource Groups ▾ ⌕

Sriini @ vungarala ▾ Sydney ▾

**Resources**

You are using the following Amazon EC2 resources in the Asia Pacific (Sydney) region:

0 Running Instances	0 Elastic IPs
0 Dedicated Hosts	0 Snapshots
0 Volumes	0 Load Balancers
1 Key Pairs	5 Security Groups
0 Placement Groups	

Learn more about the latest in AWS Compute from AWS re:Invent 2017 by viewing the [EC2 Videos](#).

**Create Instance**

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

[Launch Instance](#)

Note: Your instances will launch in the Asia Pacific (Sydney) region

**Account Attributes**

Supported Platforms

VPC

Default VPC

vpc-52aed835

Resource ID length management

Console experiments

**Additional Information**

Getting Started Guide

Documentation

All EC2 Resources

Forums

Pricing

Contact Us

https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#Instances:

Services ▾Resource Groups ▾★

Launch Instance ▾ConnectActions ▾

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IPs	Key Name	Monitoring
	i-058731956f22312f6	t2.micro	ap-southeast-2a	running	Initializing	None		13.239.6.8	-	soltius-proj	disable

Instance: i-058731956f22312f6Public IP: 13.239.6.8

DescriptionStatus ChecksMonitoringTags

Instance ID

i-058731956f22312f6

Instance state

running

Instance type

t2.micro

Elastic IPs

Availability zone

ap-southeast-2a

Security groups

Webserver-SecGrp-Soltius [view inbound rules](#) [view outbound rules](#)

Scheduled events

No scheduled events

AMI ID

ubuntu/images/hvm-ssd/ubuntu-bionic-18.04-amd64-server-20180912 (ami-07a3bd4944eb120a0)

Platform

-

IAM role

-

Key pair name

soltius-proj

Owner

702199414918

Launch time

October 4, 2018 at 4:29:52 PM UTC+13 (less than one hour)

Termination protection

False

Lifecycle

normal

Monitoring

basic

Alarm status

None

Kernel ID

-

RAM disk ID

-

Placement group

-

Virtualization

hvm

Public DNS (IPv4)

-

IPv4 Public IP

13.239.6.8

IPv6 IPs

-

Private DNS

ip-172-9-1-240.ap-southeast-2.compute.internal

Private IPs

172.9.1.240

Secondary private IPs

VPC ID

vpc-0ce888fa263fe03b4

Subnet ID

subnet-0e83998c2305487ea

Network interfaces

eth0

Source/dest. check

True

T2/T3 Unlimited

Disabled

EBS-optimized

False

Root device type

ebs

Root device

/dev/sda1

Block devices

/dev/sda1

Elastic GPU

-

Elastic GPU type

-

Elastic GPU status

-

https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#Instances:

Services ▾Resource Groups ▾★

Launch Instance ▾ConnectActions ▾

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type
	i-058731956f22312f6	t2.micro

Instance: i-058731956f22312f6Public IP: 13.239.6.8

DescriptionStatus ChecksMonitoringTags

Instance ID

i-058731956f22312f6

Instance state

running

Instance type

t2.micro

Elastic IPs

Availability zone

ap-southeast-2a

Security groups

Webserver-SecGrp-Soltius

Scheduled events

No scheduled events

AMI ID

ubuntu/images/hvm-ssd/ubuntu-bionic-18.04-amd64-server-20180912 (ami-07a3bd4944eb120a0)

Platform

-

IAM role

-

Key pair name

soltius-proj

Owner

702199414918

Launch time

October 4, 2018 at 4:29:52 PM UTC+13 (less than one hour)

Termination protection

False

Lifecycle

normal

Monitoring

basic

Alarm status

None

Kernel ID

-

Elastic GPU status

-

Connect To Your Instance

I would like to connect with

☒ A standalone SSH client ⓘ

☐ A Java SSH Client directly from my browser (Java required) ⓘ

To access your instance:

1. Open an SSH client. (find out how to [connect using PuTTY](#))

2. Locate your private key file (soltius-proj.pem). The wizard automatically detects the key you used to launch the instance.

3. Your key must not be publicly viewable for SSH to work. Use this command if needed:  

```
chmod 400 soltius-proj.pem
```

4. Connect to your instance using its Public IP:  
  
13.239.6.8

Example:

```
ssh -i "soltius-proj.pem" ubuntu@13.239.6.8
```

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

If you need any assistance connecting to your instance, please see our [connection documentation](#).

Close

Ubuntu config

```
#!/bin/bash
```

```
sudo apt-get update
```

```
sudo apt-get install php apache2
```

```
sudo apt-get install libapache2-mod-php
```

```
sudo apt-get install php-mysqli
```

```
sudo apachectl restart (echo "ServerName localhost" | sudo tee /etc/apache2/conf-  
available/servername.conf    sudo service apache2 reload)
```

```
sudo service httpd start
```

```
sudo chkconfig httpd on
```

```
sudo apt-get install mysql-client
```

```
mysql -u root -p
```

<Enter you mysql root password>

```
mysql> create database mydb; (don't forget semicolon)
```

```
mysql> show databases;
```

```
mysql> exit
```

Creation of RDS MYSQL

← → ↻ Secure | https://ap-southeast-2.console.aws.amazon.com/rds/home?region=ap-southeast-2#launch-dbinstance:ct=dashboard;s3-import=false

aws Services Resource Groups

Step 1  
**Select engine**


Step 2  
Specify DB details


Step 3  
Configure advanced settings


RDS > Create database


## Select engine


### Engine options


☐ Amazon Aurora  


☒ MySQL  


☐ MariaDB  


☐ PostgreSQL  


☐ Oracle  


☐ Microsoft SQL Server  


### MySQL

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 16 TiB.
- Instances offer up to 32 vCPUs and 244 GiB Memory.
- Supports automated backup and point-in-time recovery.
- Supports cross-region read replicas.

☒ Only enable options eligible for RDS Free Usage Tier [Info](#)

Cancel **Next**

## Creation and Assigning of Subnet Group

utheast-2.console.aws.amazon.com/rds/home?region=ap-southeast-2#subnet-group:ids=sol-db-secgrp

Resource Groups

RDS > Subnet groups > sol-db-secgrp

### sol-db-secgrp

#### Subnet group details

VPC ID  
Soltius-VPC (vpc-0ce88fa263fe03b4)

ARN  
arn:aws:rds:ap-southeast-2:702199414918:subgrp:sol-db-secgrp

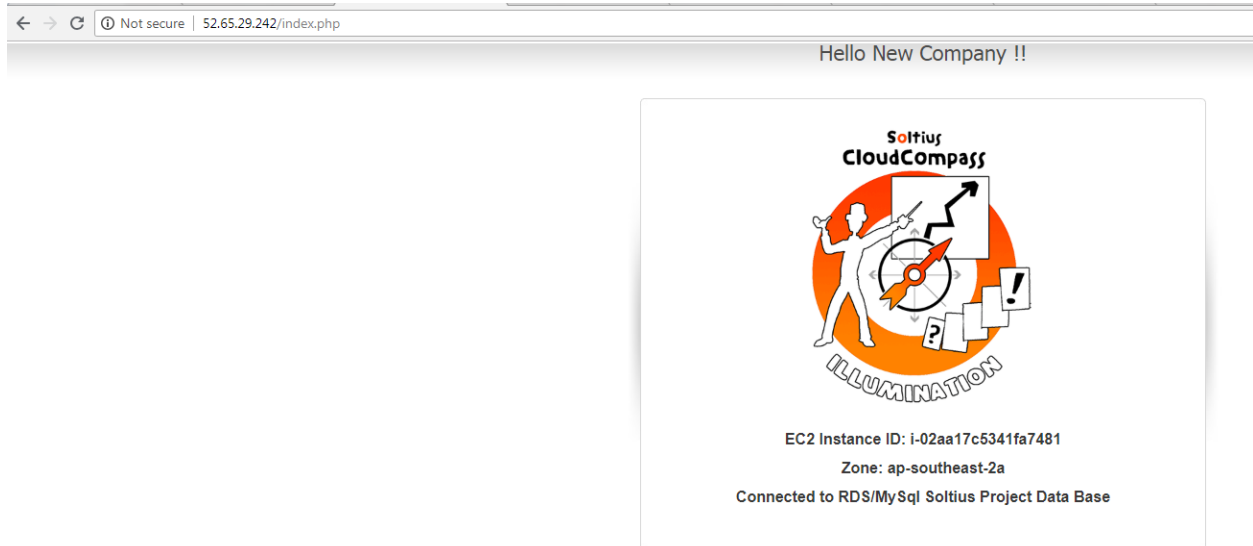
Description  
Soltius MySQL Security Group

#### Subnets (2)

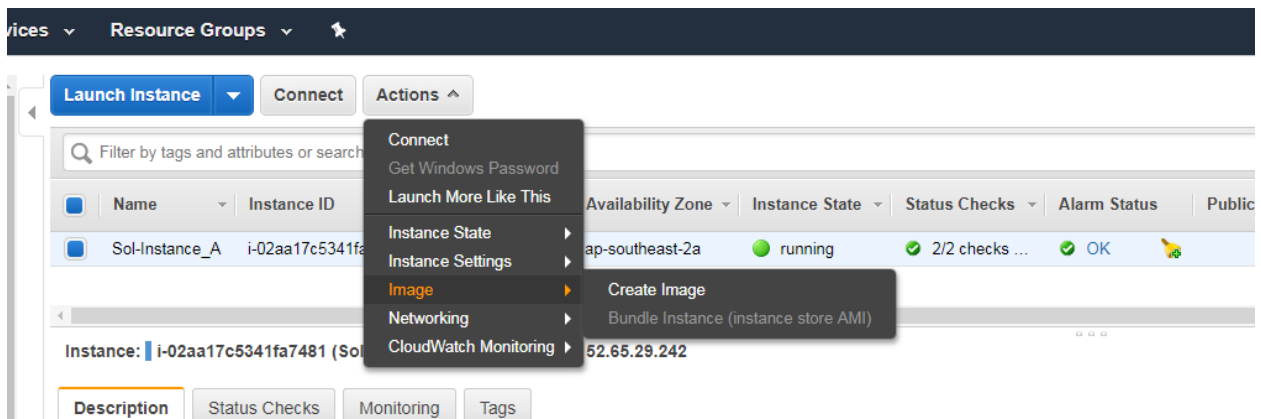
Availability zone	Subnet ID	CIDR block
ap-southeast-2b	subnet-0d910e367a635f80e	172.9.4.0/24
ap-southeast-2a	subnet-070fa4befd60fde0e	172.9.3.0/24



## WebPage Display for Mysql DB Connectivity from PublicIP of the EC2 Instance



## Creation of the AMI from the configured Instance



Ami (AMI-Soltius-Project) Created.

https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#images:sort=name

servicesResource Groups

LaunchActions

Owned by meFilter by tags and attributes or search by keyword

	Name	AMI Name	AMI ID	Source	Owner	Visibility	Status	Creation Date	Platform
	AMI-Soltius-Project	AMI-Soltius-Proj	ami-079d267f270520c1c	702199414918/...	702199414918	Private	available	October 5, 2018 at 2:31:55 A...	Other Linux

Image: ami-079d267f270520c1c

DetailsPermissionsTags

AMI IDami-079d267f270520c1cOwner702199414918

AMINameAMI-Soltius-ProjectSource702199414918/AMI-Soltius-Proj

## Creation of Classic ELB in Public Subnets

←Securehttps://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#CreateELBWizard

awsServicesResource GroupsSrinivungaralaSydney

1. Define Load Balancer2. Assign Security Groups3. Configure Security Settings4. Configure Health Check5. Add EC2 Instances6. Add Tags7. Review

Step 1: Define Load Balancer

Basic Configuration

This wizard will walk you through setting up a new load balancer. Begin by giving your new load balancer a unique name so that you can identify it from other load balancers you might create. You will also need to configure ports and protocols for your load balancer. Traffic from your client from any load balancer port to any port on your EC2 instances. By default, we've configured your load balancer with a standard web server on port 80.

Load Balancer name:

ELB-Soltius-Project

Create LB inside:

vpc-0ce888fa263fe03b4 (172.9.0.0/16) | Soltius-VPC

Create an internal load balancer:

☐ (what's this?)

Enable advanced VPC configuration:

☒

Listener Configuration:

Load Balancer Protocol	Load Balancer Port	Instance Protocol	Instance Port
HTTP	80	HTTP	80

Add

Select Subnets

You will need to select a Subnet for each Availability Zone where you wish traffic to be routed by your load balancer. If you have instances in only one Availability Zone, please select at least two Subnets in different Availability Zones to provide higher availability for your load balancer.

VPC vpc-0ce888fa263fe03b4 (172.9.0.0/16) | Soltius-VPC

Available subnets

Actions	Availability Zone	Subnet ID	Subnet CIDR	Name
+	ap-southeast-2a	subnet-070fa4bef6f05e0e	172.9.3.0/24	Priv-Sub1-Soltius
+	ap-southeast-2b	subnet-0e5f10e367a635f80e	172.9.4.0/24	Priv-Sub2-Soltius

Selected subnets

Actions	Availability Zone	Subnet ID	Subnet CIDR	Name
-	ap-southeast-2a	subnet-0e03999c2305487ea	172.9.1.0/24	Pub-Sub1-Soltius
-	ap-southeast-2b	subnet-0b28a7e9d242cfa92	172.9.2.0/24	Pub-Sub2-Soltius

Create target group

Port

80

Target type

instance

VPC

vpc-0ce888fa263fe03b4 (172.9.0.0/16) | Solt

Health check settings

Protocol

HTTP

Path

/

Advanced health check settings

Port

☒ traffic port
 ☐ override

Healthy threshold

5

Unhealthy threshold

2

Timeout

5

seconds

Interval

30

seconds

Success codes

200

Cancel

Create

## Assigning Security Group ELB-SecGrp-Soltius

Secure

https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#CreateELBWizard:

aws

Services

Resource Groups

1. Define Load Balancer

2. Assign Security Groups

3. Configure Security Settings

4. Configure Health Check

5. Add EC2 Instances

6. Add Tags

7. Review

Step 2: Assign Security Groups

You have selected the option of having your Elastic Load Balancer inside of a VPC, which allows you to assign security groups to your load balancer. Please select the security groups to assign to this load balancer.

Assign a security group:

☐ Create a new security group
 ☒ Select an existing security group

Security Group ID	Name	Description
<input type="checkbox"/> sg-04eb634e62bfc684b	DB-SecGrp-Soltius	Data Base Security Group for Soltius Project
<input type="checkbox"/> sg-083982249012a5c09	default	default VPC security group
<input checked="" type="checkbox"/> sg-0c2e861f30a2b89e0	ELB-SecGrp-Soltius	ELB Security Group for Soltius Project
<input type="checkbox"/> sg-09fb785180af06a02	Webserver-SecGrp-Soltius	Webserver Security Group for Soltius Project

ELB Created Successfully.

https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#LoadBalancers:sort=loadBalancerName

Services ▾ Resource Groups ▾ ⌕

Create Load Balancer Actions ▾

Filter by tags and attributes or search by keyword

Name	DNS name	State	VPC ID	Availability Zones	Type	Created At	Monitor
ELB-Soltius-Project	ELB-Soltius-Project-738652...		vpc-0ce888fa263fe03b4	ap-southeast-2b, ap-southeast-2a	classic	October 6, 2018 at 2:53:22 A...	

Load balancer: ELB-Soltius-Project

Description Instances Health Check Listeners Monitoring Tags Migration

**Basic Configuration**

Name:	ELB-Soltius-Project	Creation time:	October 6, 2018 at 2:53:22 AM UTC+13
DNS name:	ELB-Soltius-Project-73865242.ap-southeast-2.elb.amazonaws.com (A Record)	Hosted zone:	Z1GM3OXH4ZPM65
Type:	Classic (Migrate Now)	Status:	1 of 2 instances in service
Scheme:	internet-facing	VPC:	vpc-0ce888fa263fe03b4
Availability Zones:	subnet-0b28a7e9d2d2cfa92 - ap-southeast-2b, subnet-0e63998c2305487ea - ap-southeast-2a		

**Port Configuration**

Port Configuration: 80 (HTTP) forwarding to 80 (HTTP)  
Stickiness: LBCookieStickinessPolicy, expirationPeriod=120

Edit stickiness

Creating Launch Configuration for Auto scaling and utilizing the newly created AMI (AMI-Soltius-Project)

https://ap-southeast-2.console.aws.amazon.com/ec2/autoscaling/home?region=ap-southeast-2#LaunchConfigurations:

Services ▾ Resource Groups ▾ ⌕

**Launch Templates have arrived!**  
The EC2 Auto Scaling console now has full support for launch templates. Launch templates can be updated and versioned, and include support

Create launch configuration Create Auto Scaling group Copy to launch template Actions ▾

Filter: Filter launch configurations... X

Name	AMI ID	Instance Type	Spot Price	Creation Time
------	--------	---------------	------------	---------------

No launch configurations found

Launch configuration creation status

Successfully created launch configuration: LConf-Soltius-Project  
View creation log

View  
View your launch configurations  
View your Auto Scaling groups

Here are some helpful resources to get you started

Create an Auto Scaling group using this launch configuration

## Creating Auto Scaling Group in Private subnets.

← → ↻

Secure | https://ap-southeast-2.console.aws.amazon.com/ec2/autoscaling/home?region=ap-southeast-2#CreateAutoScalingGroup:source

aws Services ▾ Resource Groups ▾ ⌵

1. Configure Auto Scaling group details 2. Configure scaling policies 3. Configure Notifications 4. Configure Tags 5. Review

### Create Auto Scaling Group

Launch Configuration ⓘ

LConf-Soltius-Project

Group name ⓘ

AScaling-Soltius-Project

Group size ⓘ

Start with  instances

Network ⓘ

vpc-0ce888fa263fe03b4 (172.9.0.0/16) | Soltius-VPC


Create new VPC

Subnet ⓘ

subnet-070fa4befd60fde0e(172.9.3.0/24) | Pvt-Sub1-Soltius | ap-southeast-2a ✕

subnet-0d910e367a635f80e(172.9.4.0/24) | Pvt-Sub2-Soltius | ap-southeast-2b ✕

Create new subnet

 **No public IP addresses will be assigned**

None of the instances in this Auto Scaling group will be assigned a public IP address because you have not chosen to launch in your default VPC and subnet.

You can ensure a public IP address is assigned to instances launched with this configuration by selecting only default subnets of your default VPC.

[Learn more](#) about IP addressing in an Amazon VPC.

← → ↻ Secure | https://ap-southeast-2.console.aws.amazon.com/ec2/autoscaling/home?region=ap-southeast-2#CreateAutoScalingGroup:source=lc-launch-configuration-name=LConf-Sol

aws Services ▾ Resource Groups ▾ ★

1. Configure Auto Scaling group details 2. Configure scaling policies 3. Configure Notifications 4. Configure Tags 5. Review

## Create Auto Scaling Group

Please review your Auto Scaling group details. You can go back to edit changes for each section. Click **Create Auto Scaling group** to complete the creation of an Auto Scaling group.

▼ Auto Scaling Group Details

Group name	AScaling-Soltius-Project
Group size	2
Minimum Group Size	2
Maximum Group Size	2
Subnet(s)	subnet-0d910e367a635f80e,subnet-070fa4befd60fde0e
Load Balancers	ELB-Soltius-Proj
Target Groups	TG-Soltius-Proj
Health Check Type	EC2
Health Check Grace Period	300
Detailed Monitoring	Yes
Instance Protection	None
Service-Linked Role	AWSServiceRoleForAutoScaling

▼ Scaling Policies

Scale Group Size Maintain metric type Average CPU Utilization at target value 60, with 150 seconds for instances to warm up.

▼ Notifications

soltius (srinivas.vungarala@gmail.com) launch, terminate, fail to launch, fail to terminate

▼ Tags

## The Instances Launched successfully using Auto scaling

https://ap-southeast-2.console.aws.amazon.com/ec2/autoscaling/home?region=ap-southeast-2#AutoScalingGroup:AScaling-Soltius-Projectview=instances

Services ▾ Resource Groups ▾ ★ Srin @ vungarala ▾ Sydney ▾

Launch Templates have arrived!  
The EC2 Auto Scaling console now has full support for launch templates. Launch templates can be updated and versioned, and include support for the latest features of Amazon EC2. Create an Auto Scaling group to get started or [Learn more](#).

Create Auto Scaling group Actions ▾

Filter: Filter Auto Scaling groups... 1 to 1 of 1 Auto Scaling Gro

Name	Launch Configuration	Instances	Desired	Min	Max	Availability Zones	Default Cooldown	Health Check Grace
AScaling-Sol...	LConf-Soltius-Project	2	2	2	2	ap-southeast-2b, ap-southea...	300	300

Auto Scaling Group: AScaling-Soltius-Project

Details Activity History Scaling Policies **Instances** Monitoring Notifications Tags Scheduled Actions Lifecycle Hooks

Actions ▾

Filter: Any Health Status ▾ Any Lifecycle State ▾ Filter instances... 1 to 2 of 2 Instance:

Instance ID	Lifecycle	Launch Configuration Name	Availability Zone	Health Status	Protected from
i-02757ad76c55686fc	InService	LConf-Soltius-Project	ap-southeast-2a	Healthy	
i-09234d92fd3ee34f3	InService	LConf-Soltius-Project	ap-southeast-2b	Healthy	

## The ELB Updated with the instances attached and Healthy

https://ap-southeast-2.console.aws.amazon.com/ec2/v2/home?region=ap-southeast-2#LoadBalancers:sort=loadBalancerName

services ▾ Resource Groups ▾

Create Load Balancer Actions ▾

Filter by tags and attributes or search by keyword

Name	DNS name	State	VPC ID	Availability Zones	Type	Created At	Monitoring
ELB-Soltius-Proj	ELB-Soltius-Proj-186495047...		vpc-0ce888fa263fe03b4	ap-southeast-2b, ap-so...	classic	October 5, 2018 at 1:47:27 A...	

Load balancer: ELB-Soltius-Proj

Description Instances Health Check Listeners Monitoring Tags Migration

Connection Draining: Enabled, 200 seconds (Edit)

Edit Instances

Instance ID	Name	Availability Zone	Status	Actions
i-09234d92fd3ee34f3		ap-southeast-2b	InService ⓘ	Remove from Load Balancer
i-02757ad76c55686fc		ap-southeast-2a	InService ⓘ	Remove from Load Balancer

Edit Availability Zones


Availability Zone	Subnet ID	Subnet CIDR	Instance Count	Healthy?	Actions
ap-southeast-2b	subnet-0b28a7e9d2d2cfa92	172.9.2.0/24	1	Yes	Remove from Load Balancer
ap-southeast-2a	subnet-0e83998c2305487ea	172.9.1.0/24	1	Yes	Remove from Load Balancer

Application successfully accessed from Load Balancer

Zone:ap-southeast-2a

← → ↻ ⓘ Not secure | elb-soltius-project-713008364.ap-southeast-2.elb.amazonaws.com

Hello New Company !!



EC2 Instance ID: i-02757ad76c55686fc  
 Zone: ap-southeast-2a  
 Connected to RDS/MySQL Soltius Project Data Base

Zone:ap-southeast-2b



EC2 Instance ID: i-09234d92fd3ee34f3

Zone: ap-southeast-2b

Connected to RDS/MySql Soltius Project Data Base

## RDS Stopped



EC2 Instance ID: i-02757ad76c55686fc

Zone: ap-southeast-2a

Failed to connect to RDS/MySQL: No route to host



Integration and Configuration of Datadog for AWS

https://app.datadoghq.com/account/settings

Welcome, Srinivas!Get startedYou are 67% done setting up. You have 14 days left in your trial.

IntegrationsAPIsAgentEmbeds

Search for an integration...

All

Installed

Amazon API Gateway

Amazon API Gateway

Installed

Amazon Auto Scaling

Amazon Auto Scaling

Installed

Amazon CloudFront

Amazon CloudFront

Installed

Amazon CloudSearch

Amazon CloudSearch

Installed

Amazon EC2

Amazon EC2

Installed

Amazon ELB

Amazon ELB

Installed

Amazon RDS

Amazon RDS

Installed

Amazon Route 53

Amazon Route53

Installed

Amazon SES

Amazon SES

Installed

Amazon SNS

Amazon SNS

Installed

Amazon Web Services

Amazon Web Services

Installed

https://app.datadoghq.com/dash/host/6271838307?live=true&from\_ts=1538693408604&to\_ts=1538697008604&page=0&is\_auto=false&tile\_size=m

Welcome, Srinivas!Get startedYou are 67% done setting up. You have 14 days left in your trial.Upgrade

☆ ELB-Soltius-Project-713008364.ap-southeast-2.elb.amazonaws.com

hosts:ELB-Soltius-Project-713008364.ap-southeast-2.elb.amazonaws.com

Show1hThe Past Hour

ELB: Latency

ELB: Request count (per minute)

ELB: Healthy and UnHealthy Hosts

ELB: Backend 2xx

ELB: Backend 3xx

ELB: Backend 4xx

ELB: Backend 5xx

ELB: 4xx and 5xx

ELB: Surge Queue Length

Welcome, Srinivas!Get startedYou are 67% done setting up.

6 Hosts up / 6 total

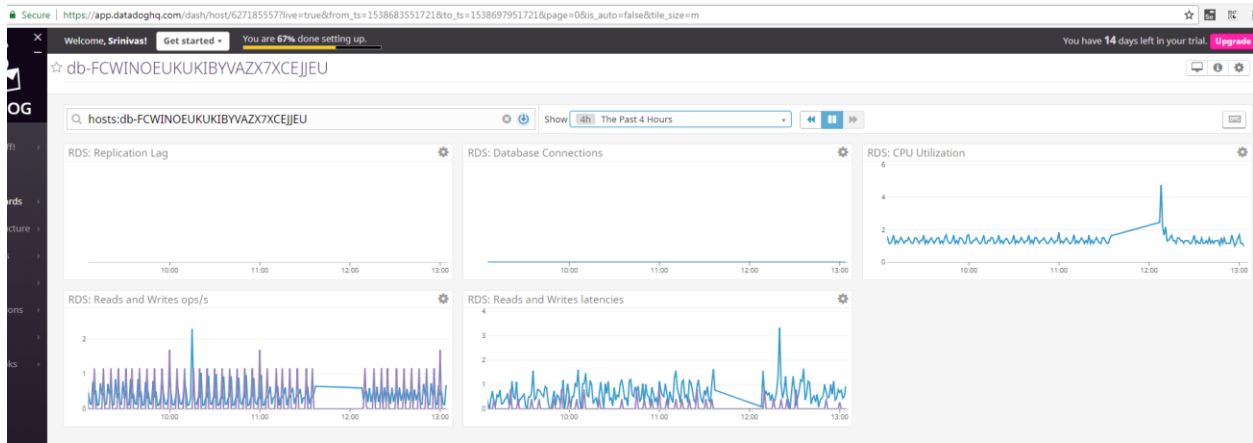
soltiusGroup by tags:Showing all 4 matching entries.

Hostname	Status	CPU i	IOWait	Load 15	Apps
i-09234d92fd3ee34f3	UP				aws
ELB-Soltius-Project-713008364.ap-southeast-2.elb.amazonaws.com	UP				elb
db-FCWINOEUKUKIBYVAZX7XCEJEU	UP				rds
i-02757ad76c55686fc	UP				aws

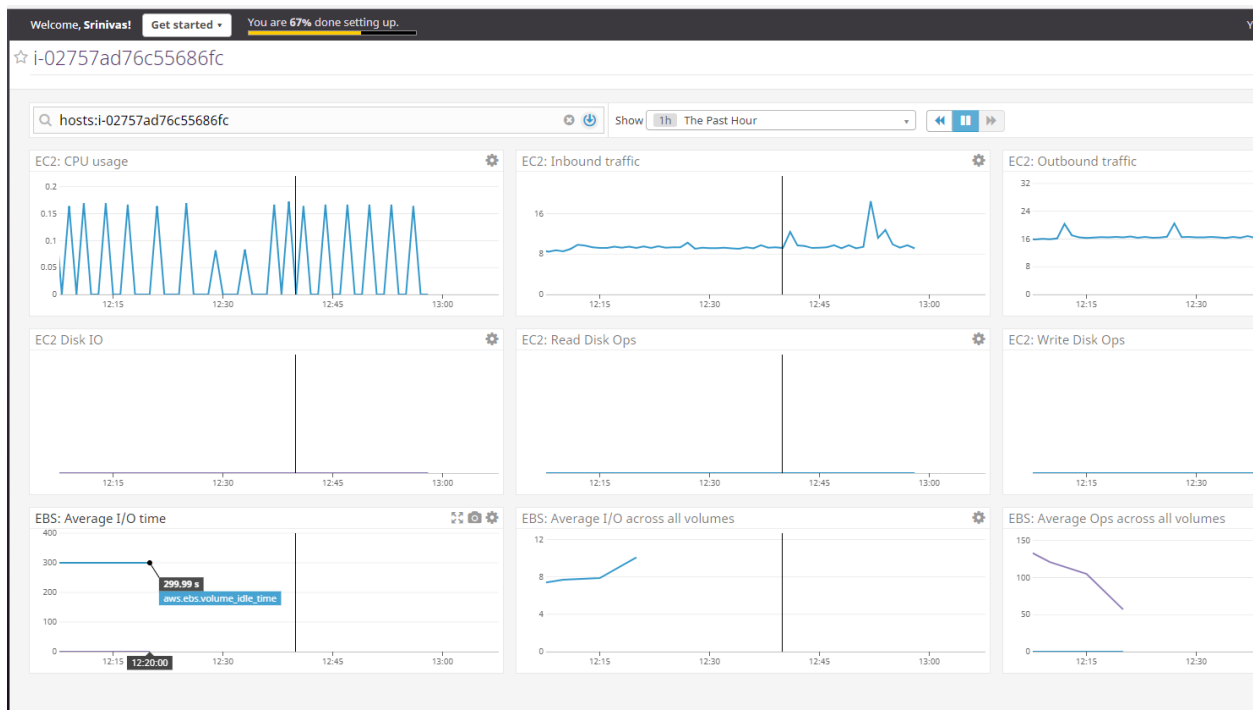
(Click any row for details)

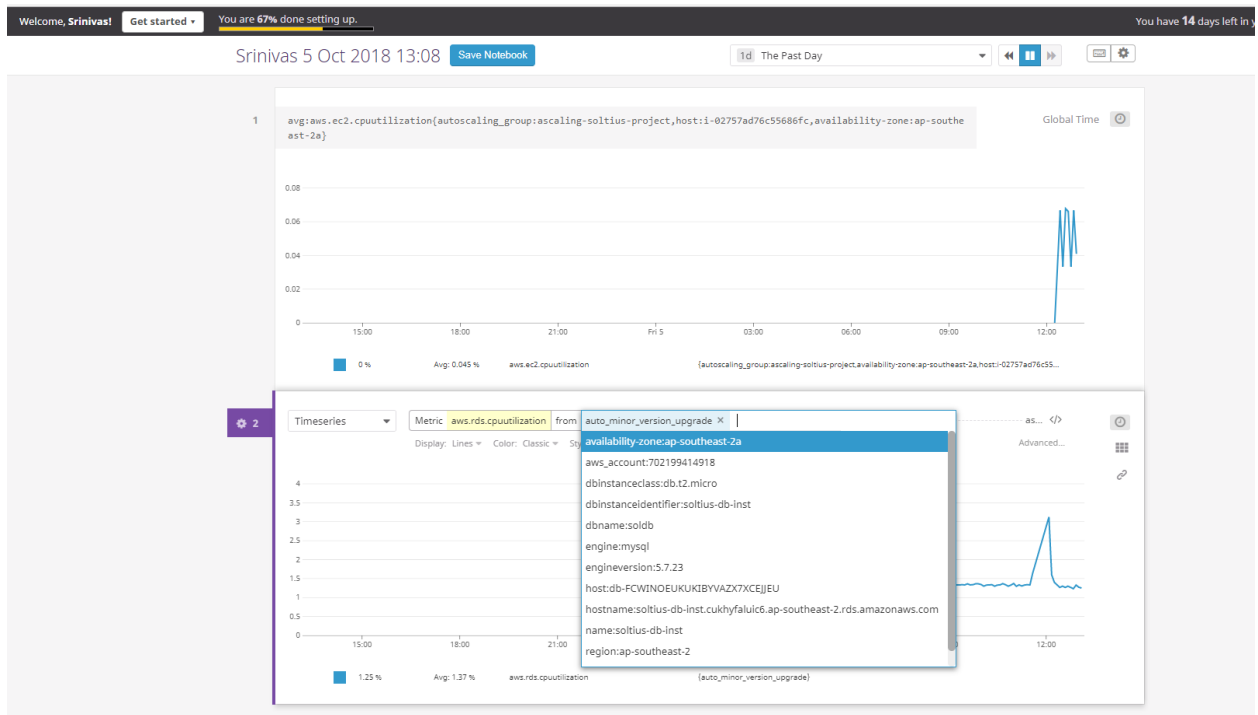
JSON API permalink →

## RDS Activity



## EC2

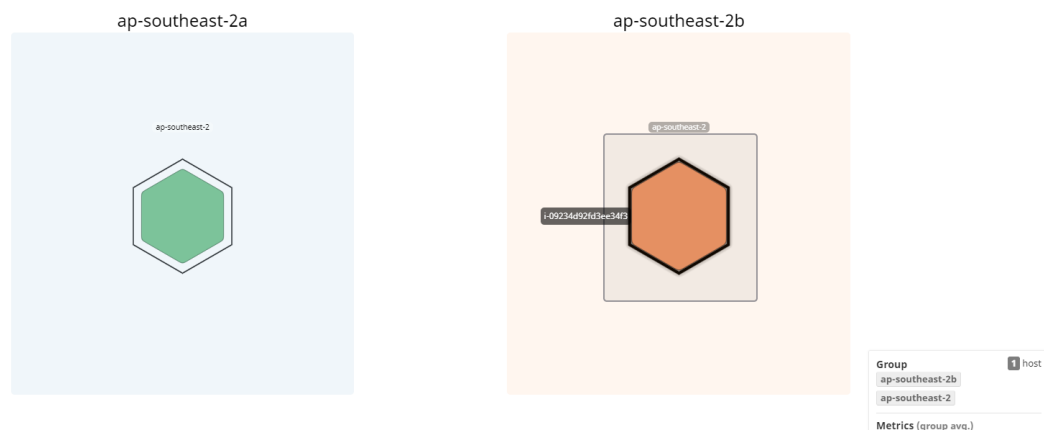


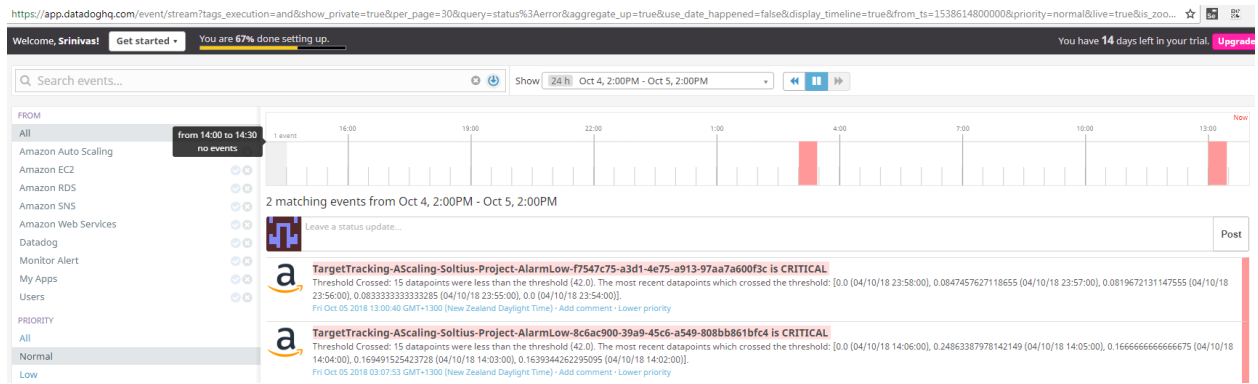


https://app.datadoghq.com/infrastructure/map?filterby=avg%3Aaws.ec2.cputilization.maximum&sizeby=avg%3Aanometric&groupby=availability-zone%2Cregion&filter=autoscaling\_group%3Ascaling-soltius-project&nameby=name&nometrichosts=false&tv...

Welcome, Srinivas! Get started You are 67% done setting up. You have 14 days left in your trial. Upgrade

Hosts autoscaling\_group:scaling-soltius-project availability-zone region Fill by: aws.ec2.cputilization.maximum avg Size by:





End of the Exercise Cloud-Engineer