

Implantando um Application Load Balancer (ALB) na AWS com EC2

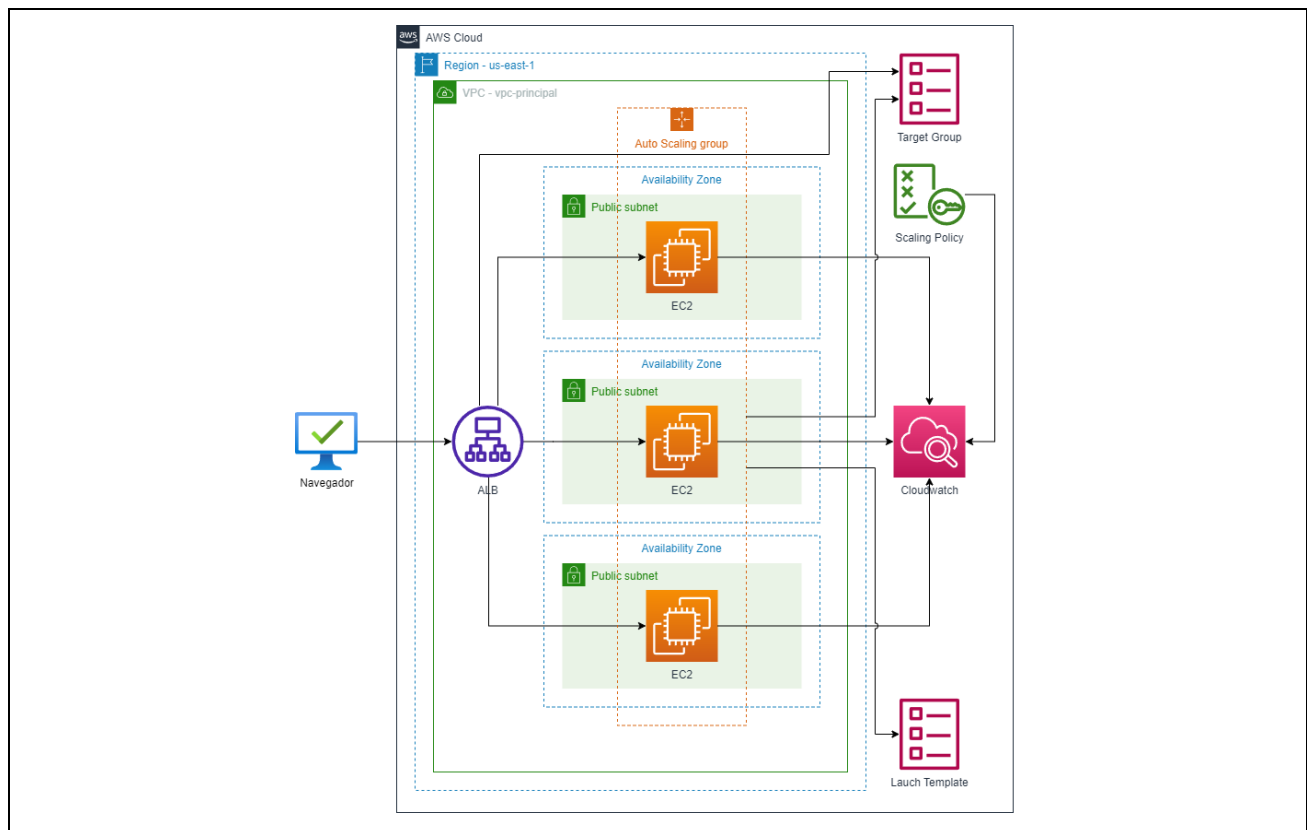


Prof. Thomás da Costa - <https://thomasdacosta.com.br>

Objetivo:

Implantar um Application Load Balancer na AWS direcionando o tráfego para as instâncias EC2 que possuem o servidor Apache HTTP instalado. Neste tutorial, iremos demonstrar como criar o ALB, Auto Scaling Group, Target Group e Launch Template.

Desenho da Solução:



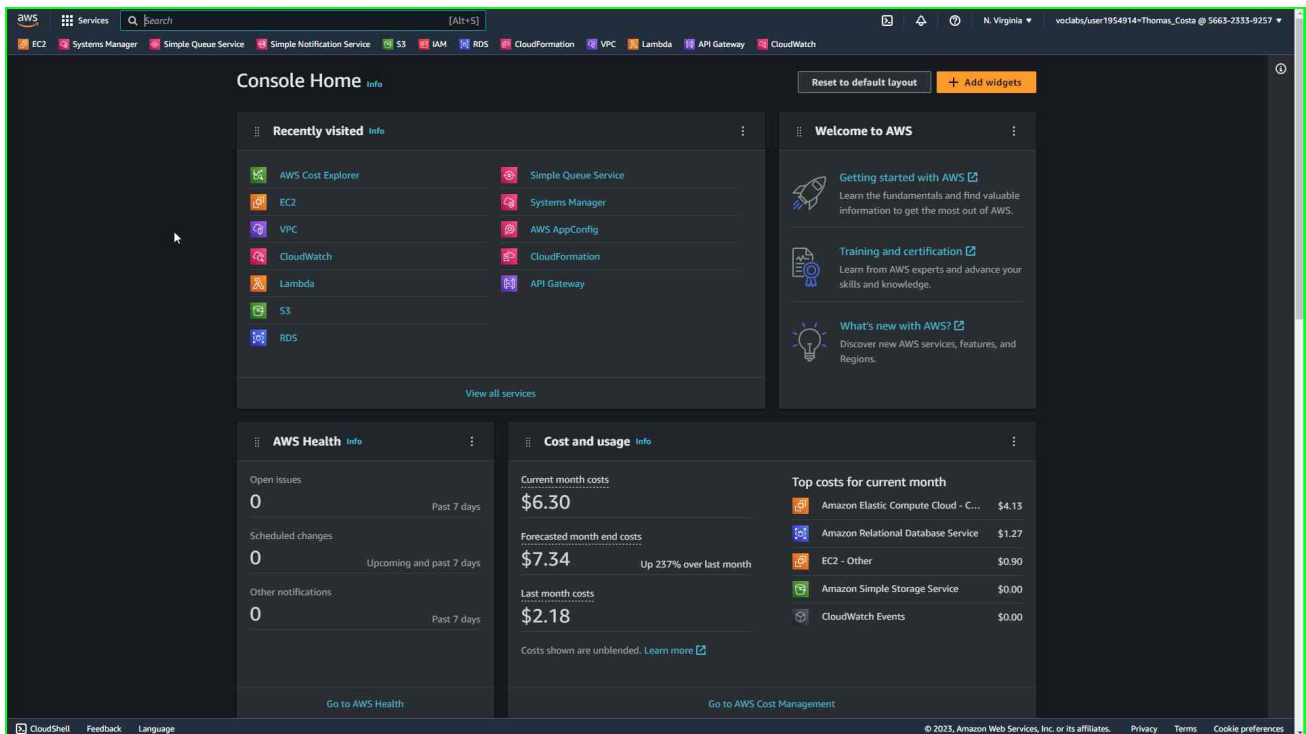
Premissas:

- ☐ Possuir um **Security Group** com **acesso de entrada** para a **porta HTTP 80** para todos os endereços chamado **SG-webserver**;
- ☐ Possuir uma **IAM Role** chamada **LabRole** com as permissões e **Policy** necessárias para a execução dos recursos;
- ☐ Conhecer previamente o **CloudWatch Logs** e seu funcionamento.

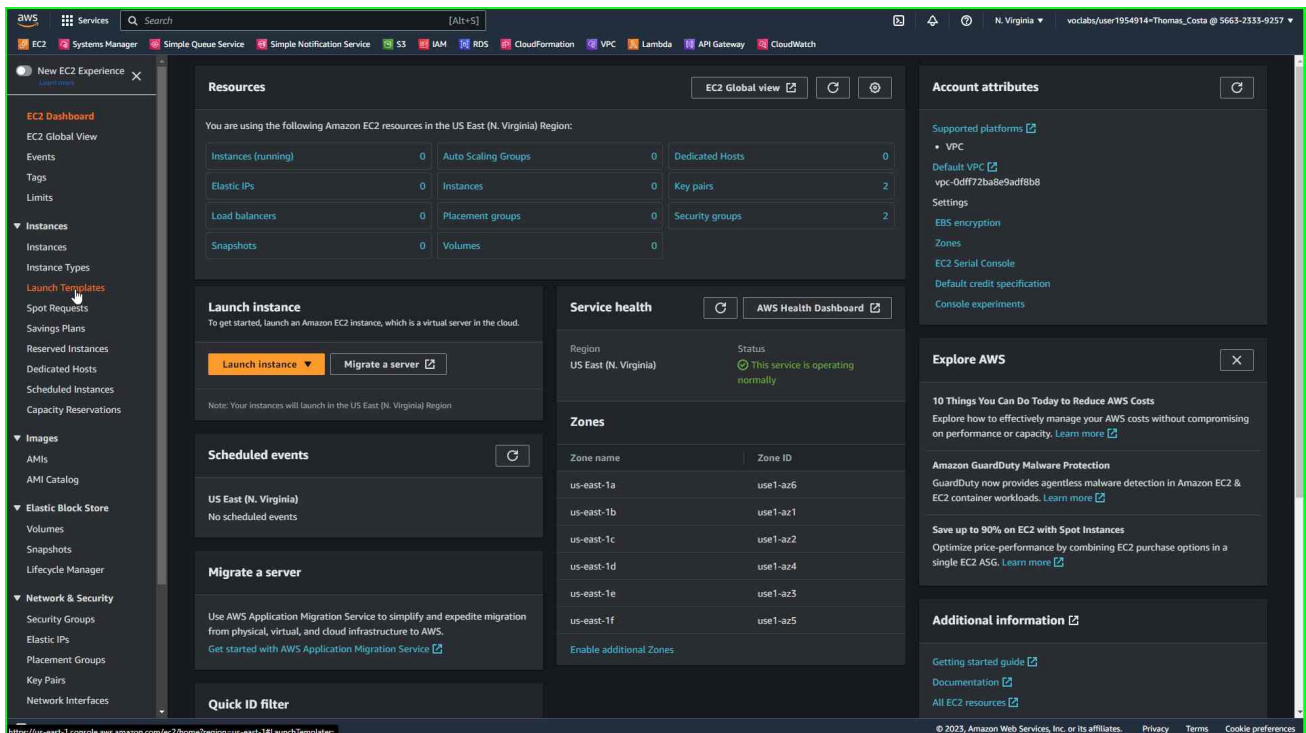
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Parte 1 – Criando o Launch Template

Na tela principal, pesquisar a opção EC2:

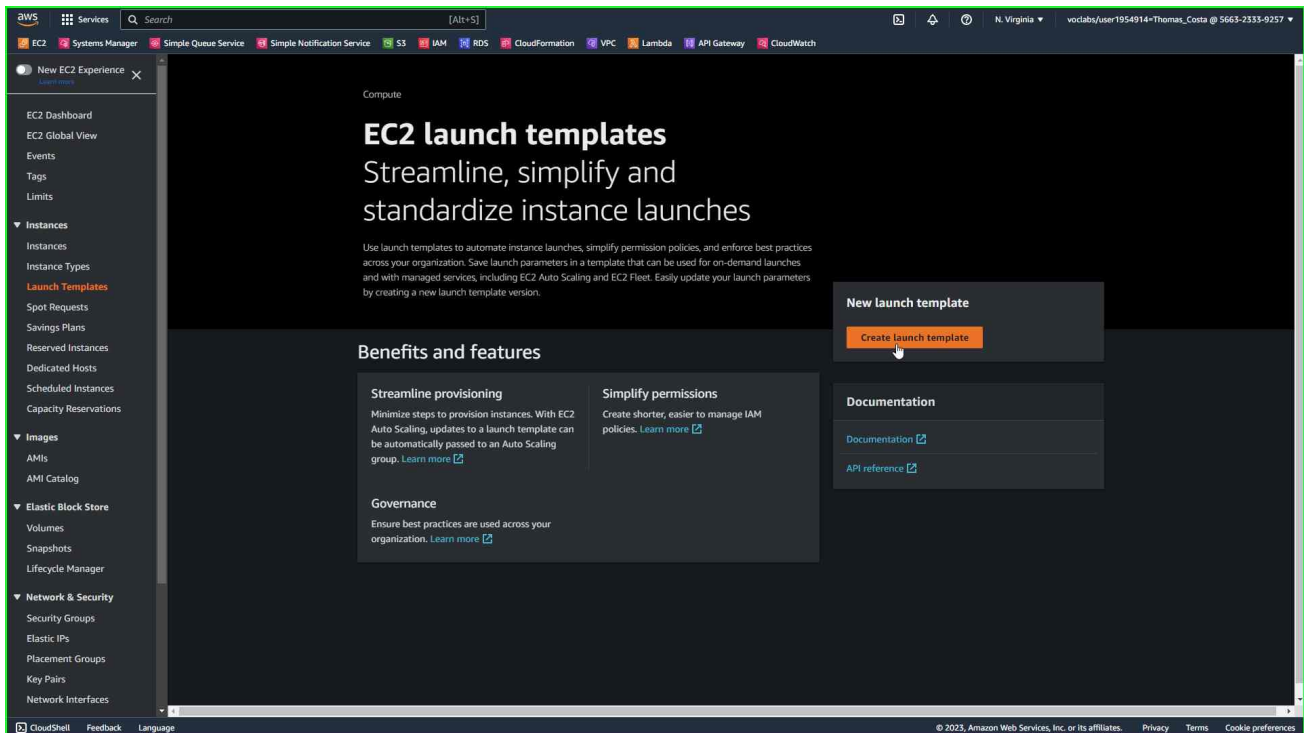


Selecione a opção Launch Templates:

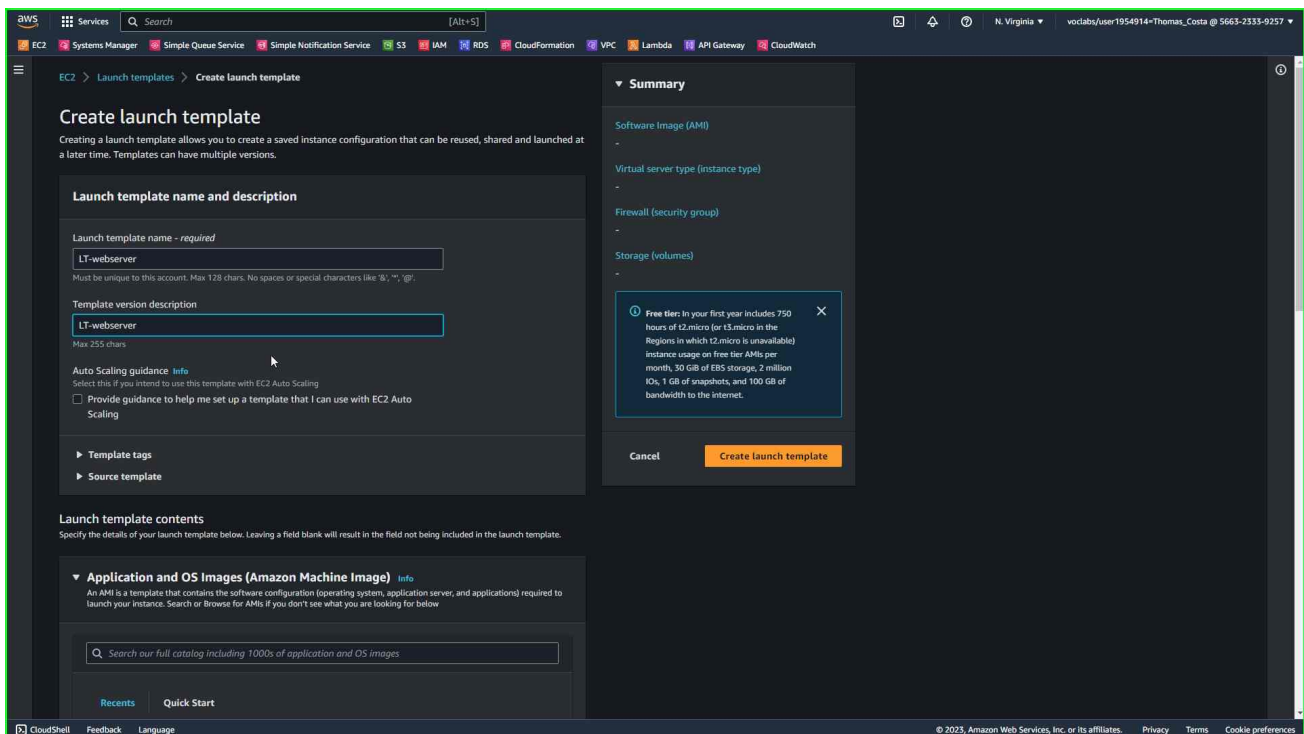


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Selecione o botão Create launch template:

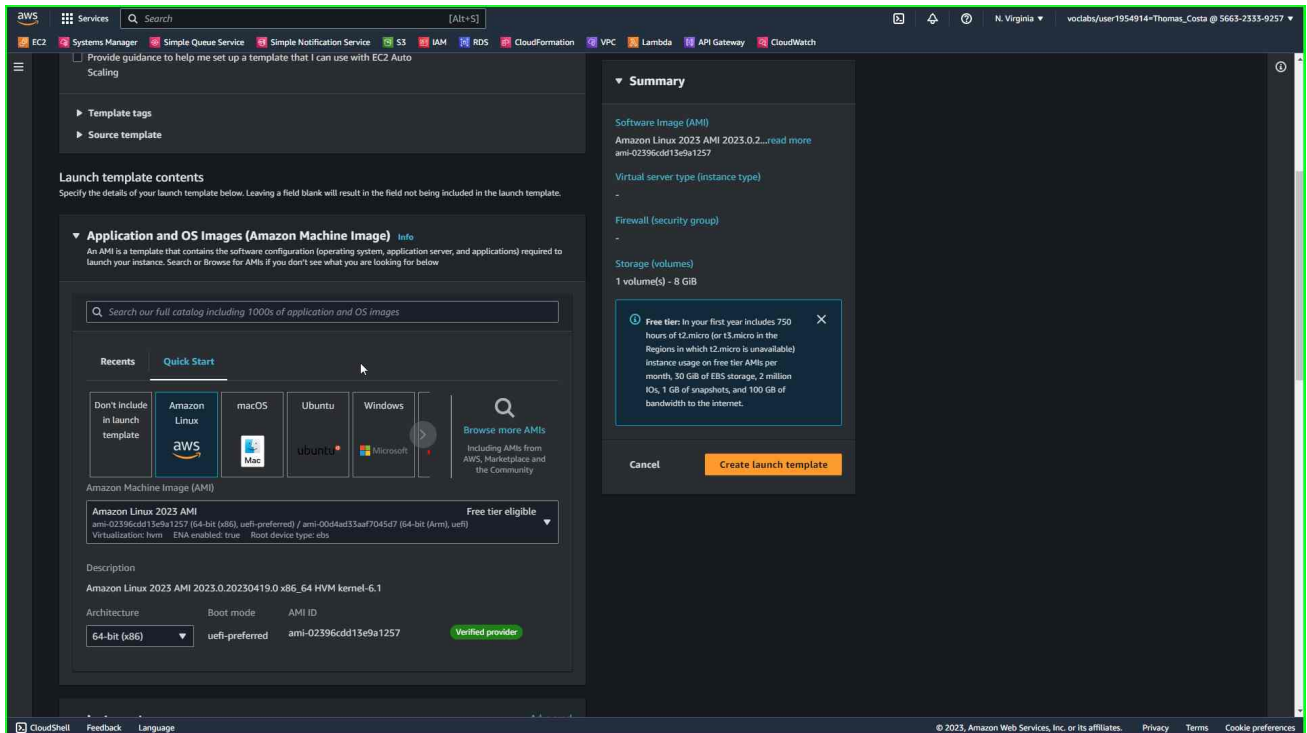


Incluir o nome do template, No nosso caso LT-webserver:

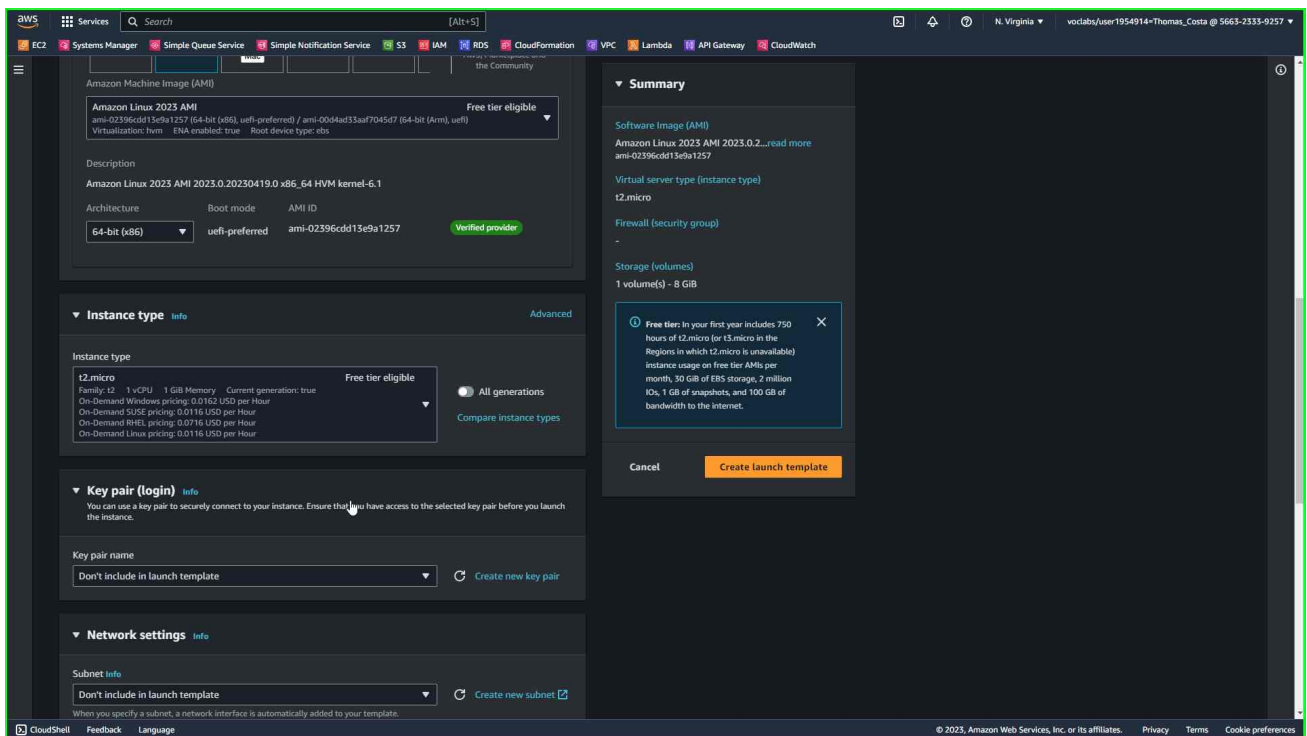


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Selecionar a imagem do Amazon Linux:

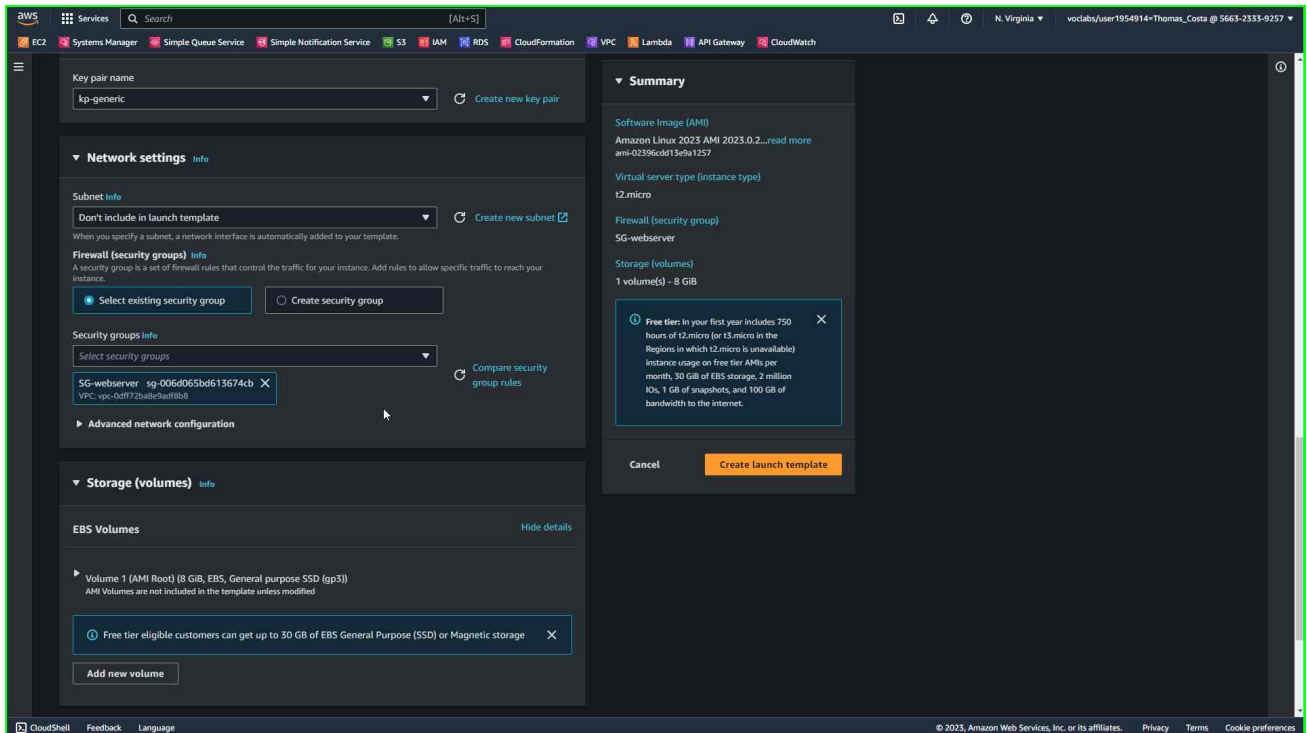


Escolher a instância do t2.micro:



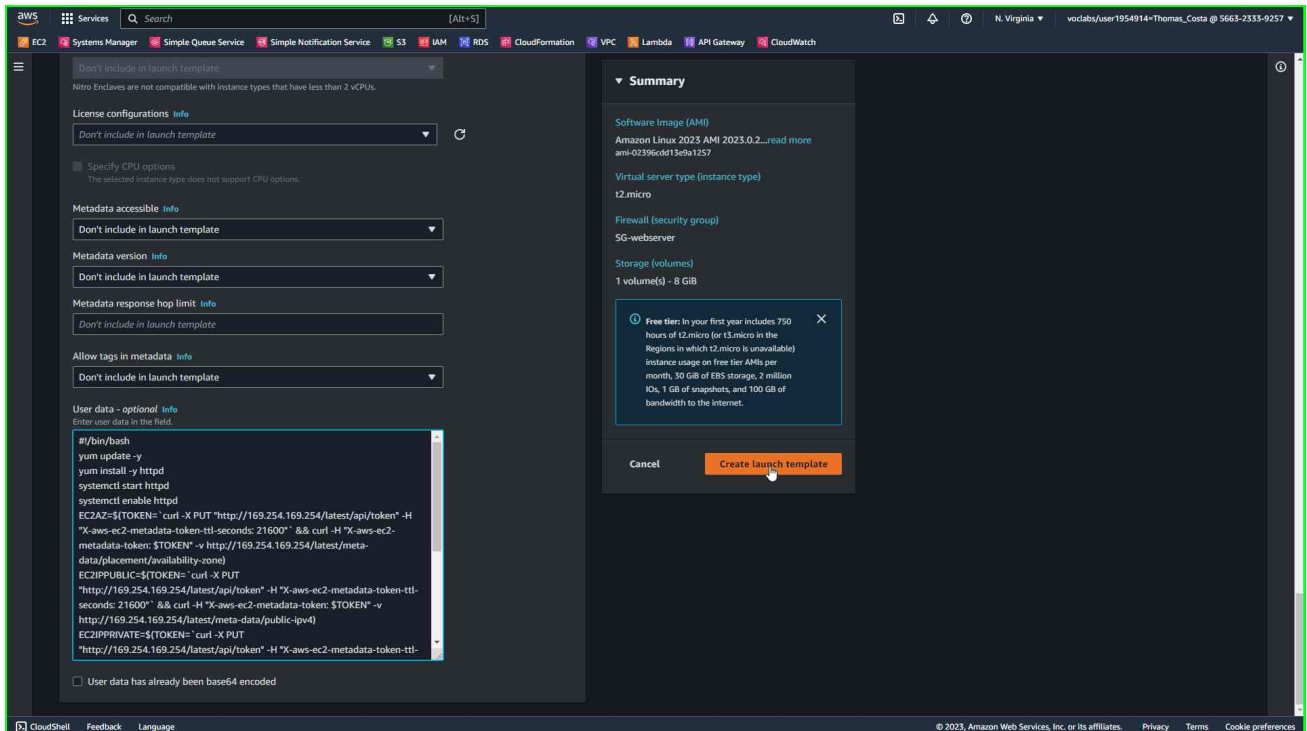
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Selecionar o **Security Group** chamado **SG-webserver**:



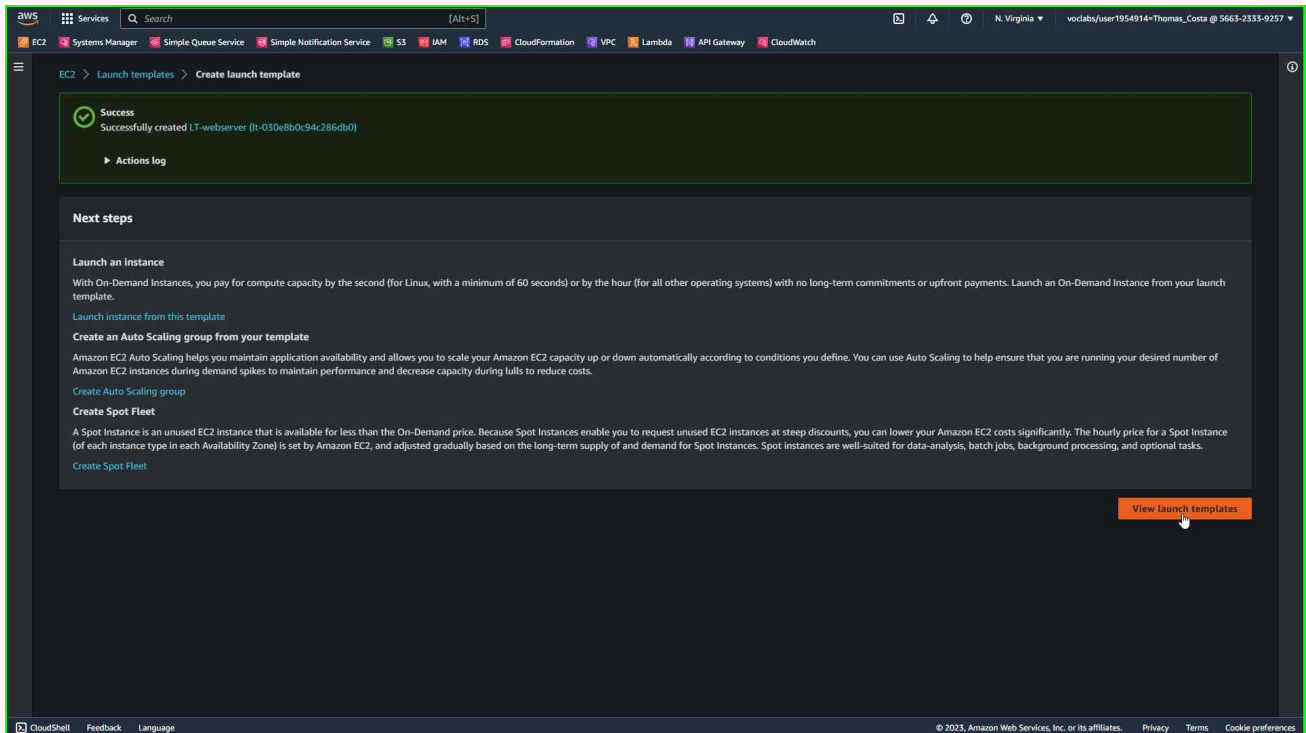
Incluir o script de inicialização no **User data** e clicar no botão **Create launch template**.

O script se encontra no final desse documento:

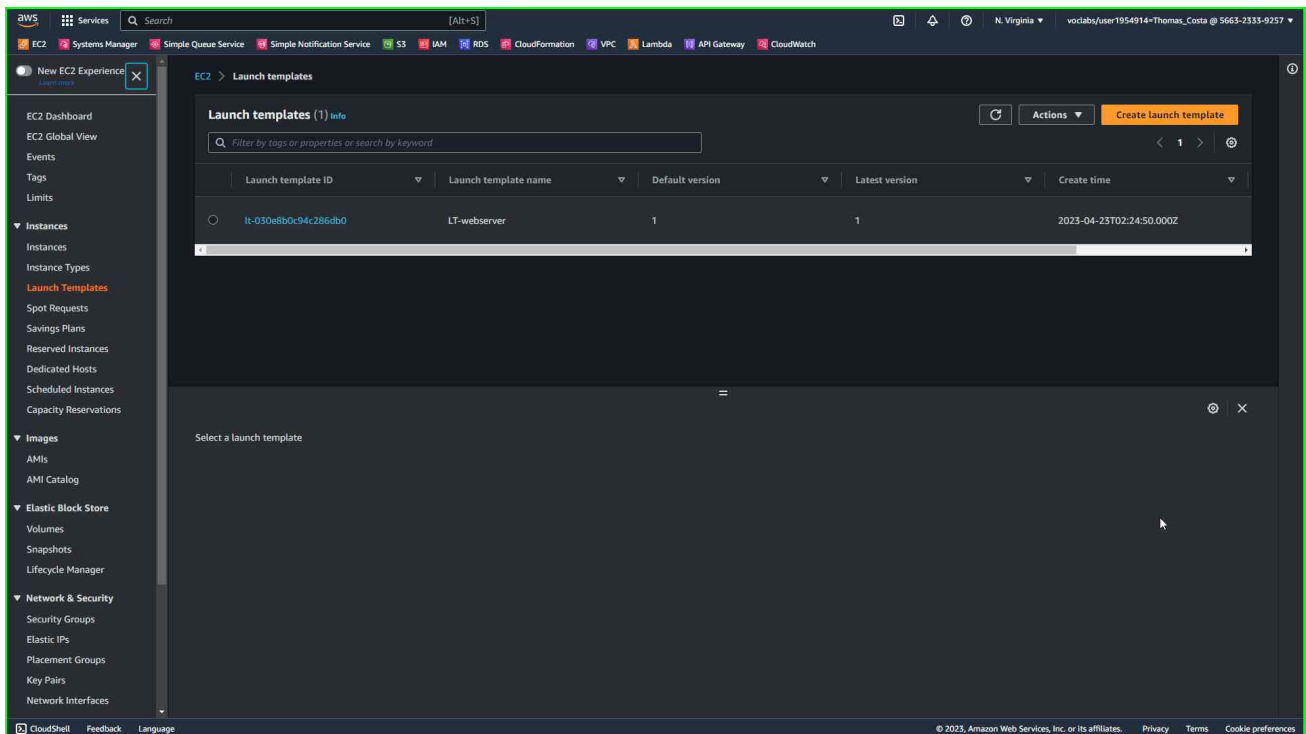


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Launch Template criado com sucesso:



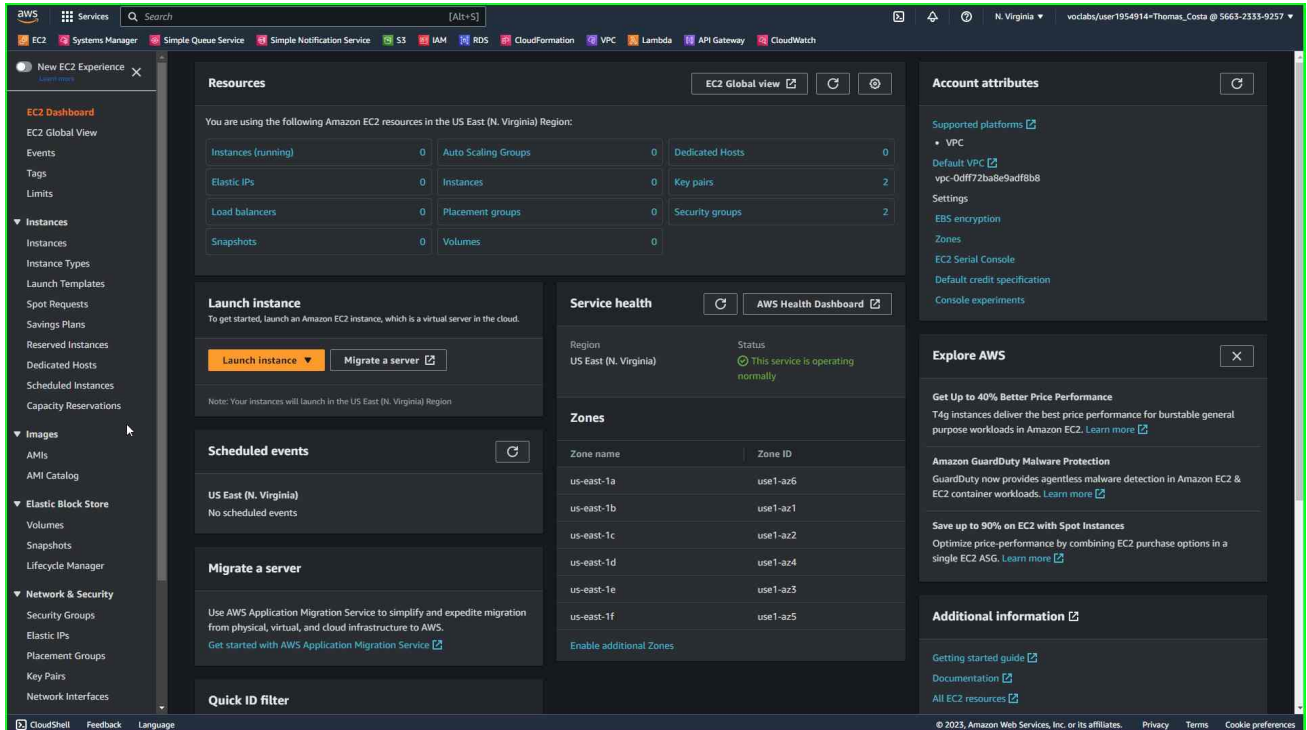
Entre na tela inicial do Launch templates e temos o template criado:



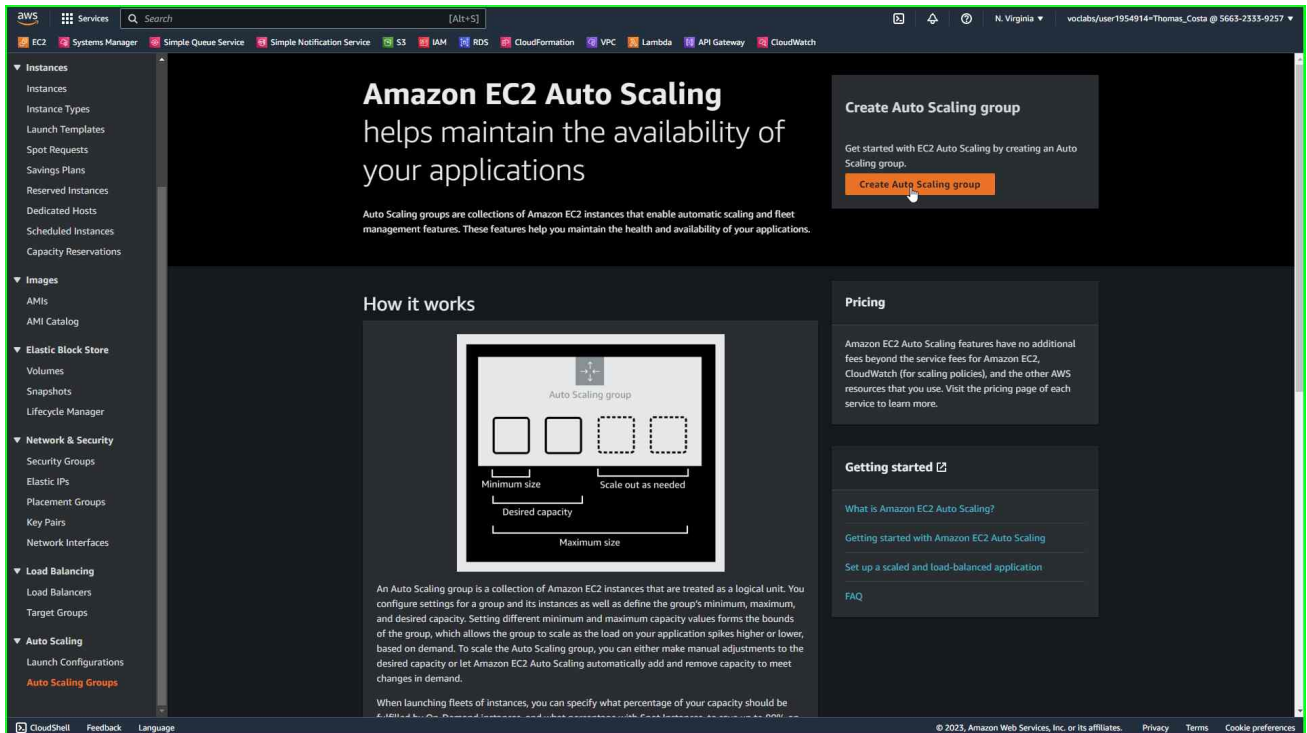
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Parte 2 – Criando o EC2 Auto Scaling Group (ASG)

Selecione a opção Auto Scaling Groups:

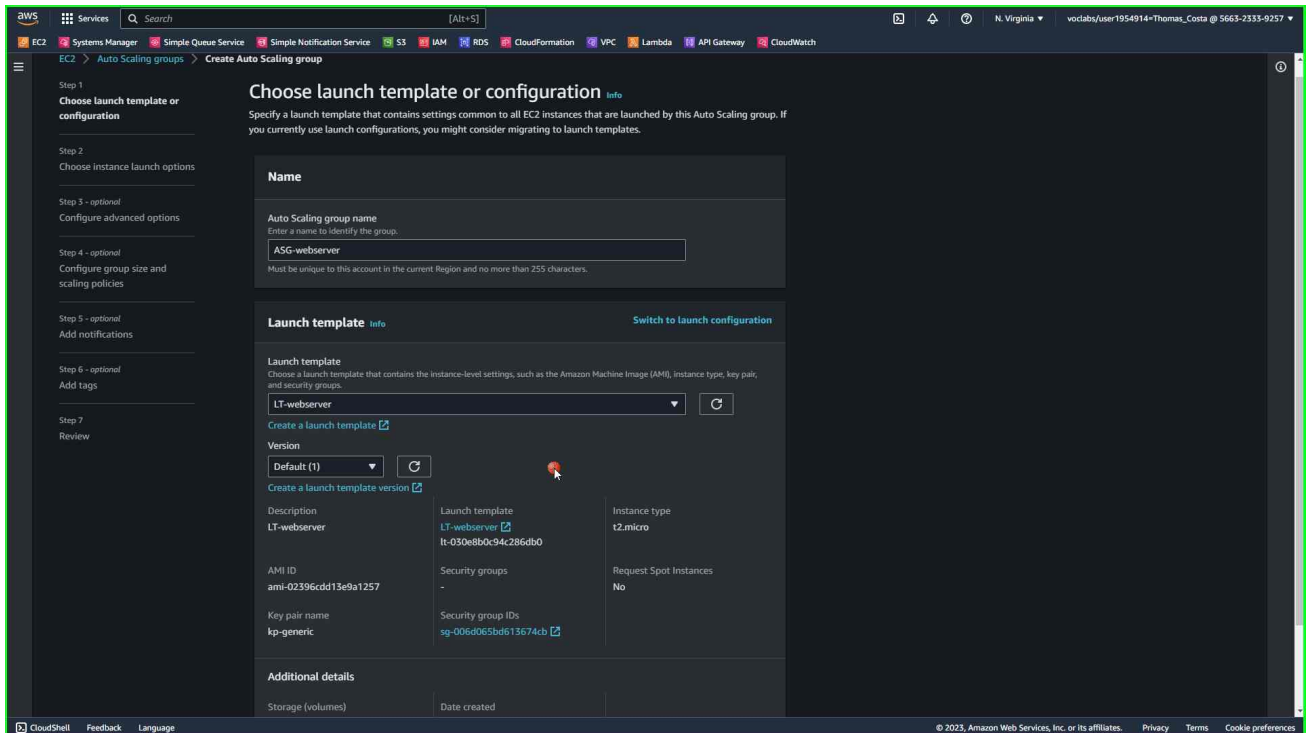


Clique no botão Create Auto Scaling group:

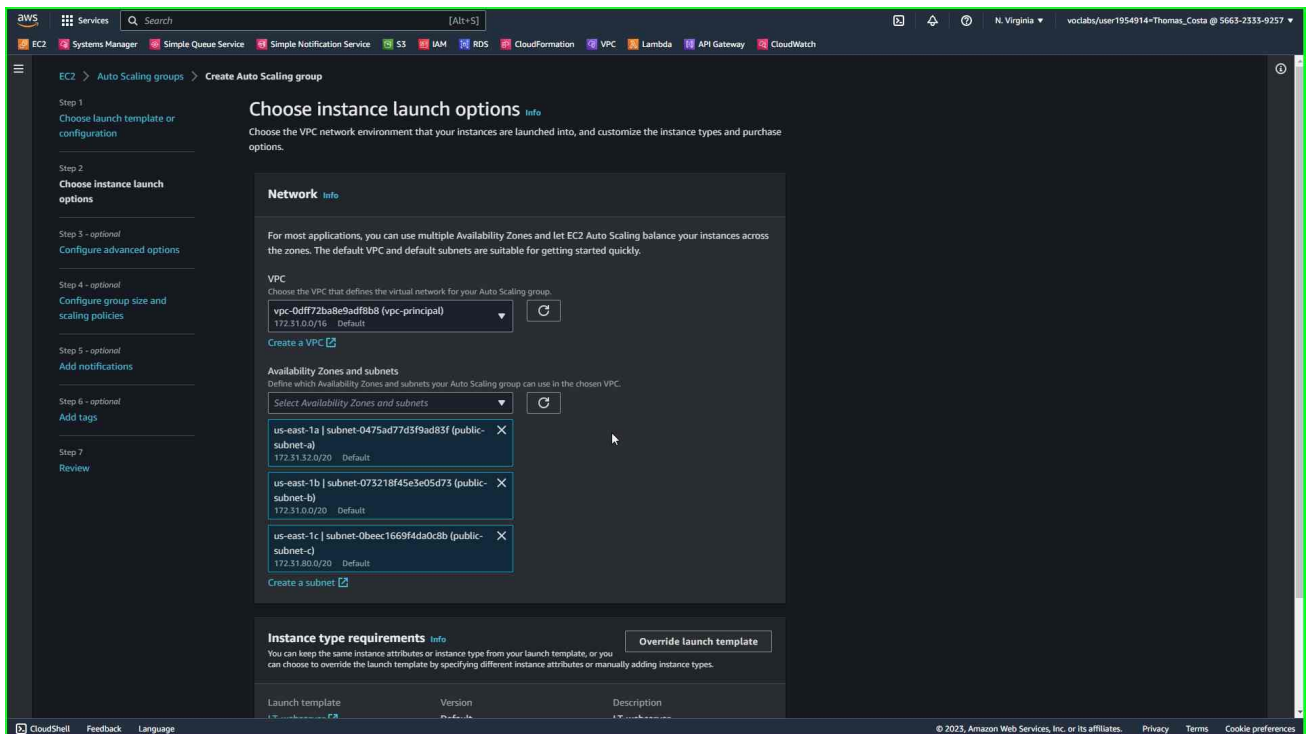


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Inclua o nome do ASG. No nosso exemplo chama-se **ASG-webserver**:

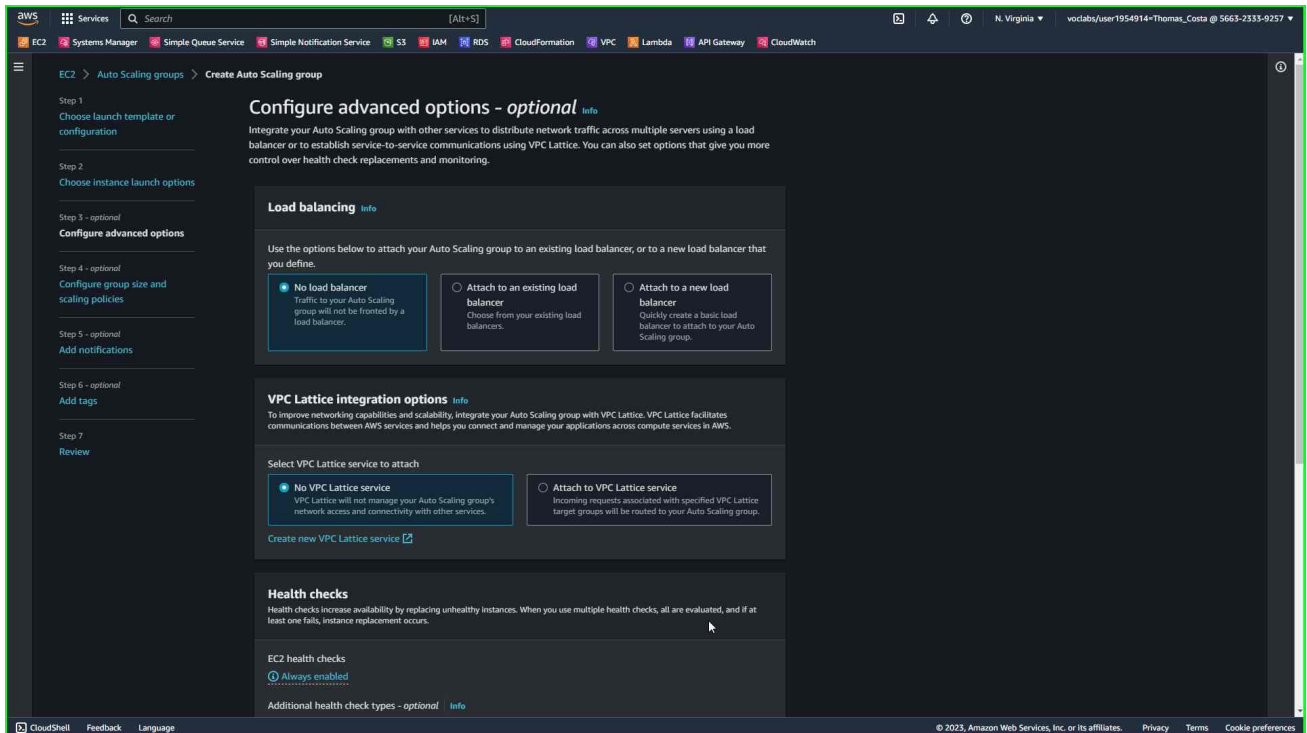


Selecione no mínimo 3 AZ para o ASG:

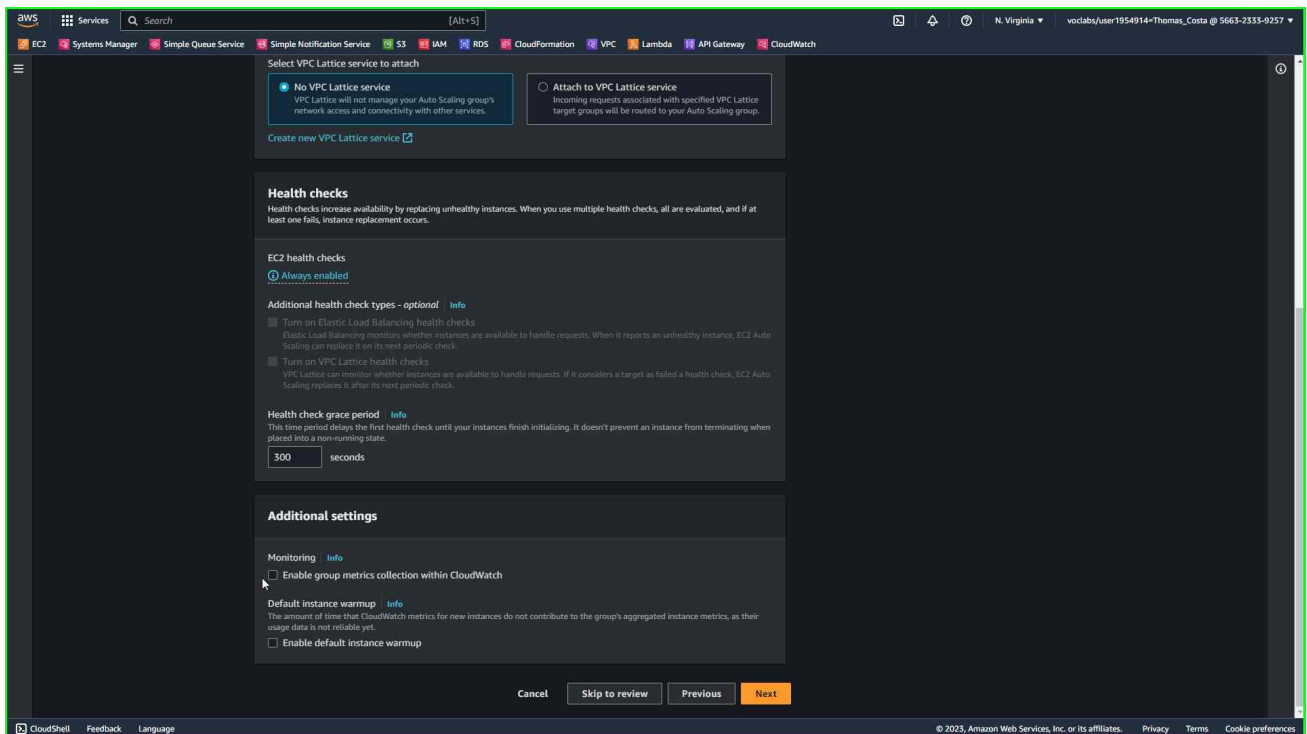


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Selecione a opção No load balancer:



Selecione a opção Enable group metrics collection within CloudWatch:



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Inclua os seguintes valores para os servidores: Desired Capacity e Minimum Capacity é igual a 2
Maximum Capacity é igual a 4:

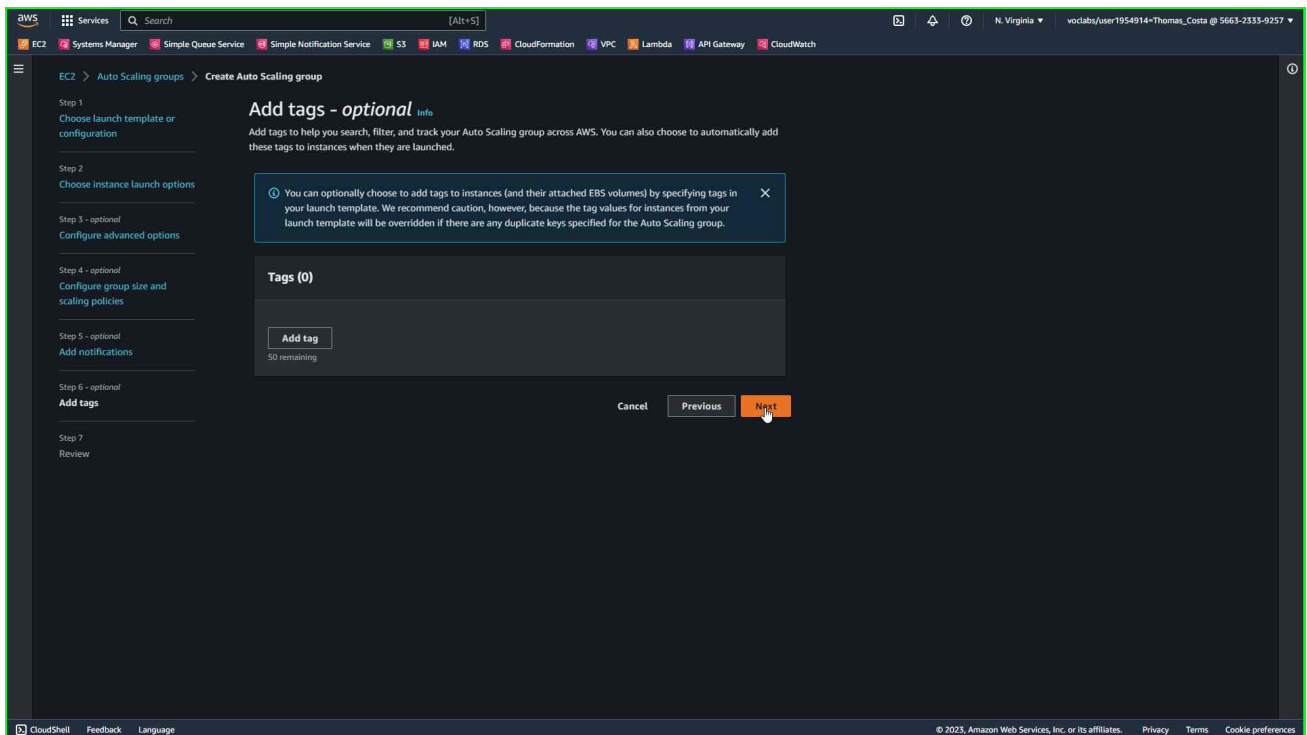
The screenshot shows the 'Create Auto Scaling group' wizard in the AWS Management Console, specifically Step 4: 'Configure group size and scaling policies - optional'. The left sidebar lists the steps: Step 1 (Choose launch template or configuration), Step 2 (Choose instance launch options), Step 3 (optional: Configure advanced options), Step 4 (optional: Configure group size and scaling policies), Step 5 (optional: Add notifications), Step 6 (optional: Add tags), and Step 7 (optional: Review). The main content area is divided into three sections: 'Group size - optional', 'Scaling policies - optional', and 'Instance scale-in protection - optional'. In the 'Group size' section, 'Desired capacity' is set to 2, 'Minimum capacity' is set to 2, and 'Maximum capacity' is set to 4. In the 'Scaling policies' section, the 'Target tracking scaling policy' is selected, and the 'None' option is chosen. In the 'Instance scale-in protection' section, the 'Enable instance scale-in protection' checkbox is checked. The bottom of the console shows the AWS logo, 'CloudShell', 'Feedback', 'Language', and copyright information for 2023.

Na próxima tela não tem ação somente clique em Next:

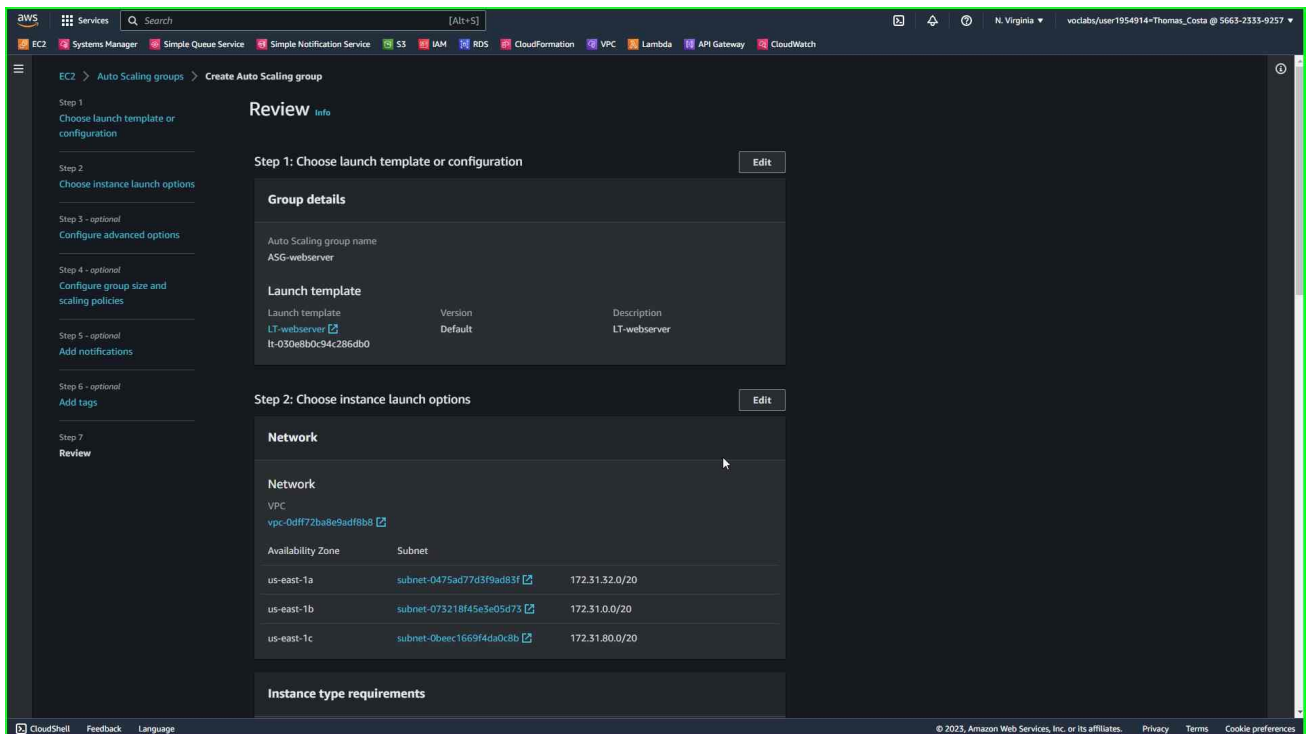
The screenshot shows the 'Create Auto Scaling group' wizard in the AWS Management Console, specifically Step 5: 'Add notifications - optional'. The left sidebar lists the steps: Step 1 (Choose launch template or configuration), Step 2 (Choose instance launch options), Step 3 (optional: Configure advanced options), Step 4 (optional: Configure group size and scaling policies), Step 5 (optional: Add notifications), Step 6 (optional: Add tags), and Step 7 (optional: Review). The main content area has a heading 'Add notifications - optional' and a subheading 'Send notifications to SNS topics whenever Amazon EC2 Auto Scaling launches or terminates the EC2 instances in your Auto Scaling group.' Below this is an 'Add notification' button. At the bottom of the main content area are four buttons: 'Cancel', 'Skip to review', 'Previous', and 'Next'. The 'Next' button is highlighted in orange and has a mouse cursor over it. The bottom of the console shows the AWS logo, 'CloudShell', 'Feedback', 'Language', and copyright information for 2023.

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Na próxima tela não tem ação somente clique em Next:



Faça o Review da criação do ASG:



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Confirme a criação:

Group size

Desired capacity	Minimum capacity	Maximum capacity
2	2	4

Scaling policy

No scaling policy

Instance scale-in protection

Instance scale-in protection

☐ Enable instance protection from scale in

Step 5: Add notifications [Edit](#)

Notifications

No notifications

Step 6: Add tags [Edit](#)

Tags (0)

Key	Value	Tag new instances
No tags		

[Cancel](#) [Previous](#) [Create Auto Scaling group](#)

Com ASG criado com sucesso, selecione para ver suas propriedades:

Auto Scaling groups (1) [Info](#)

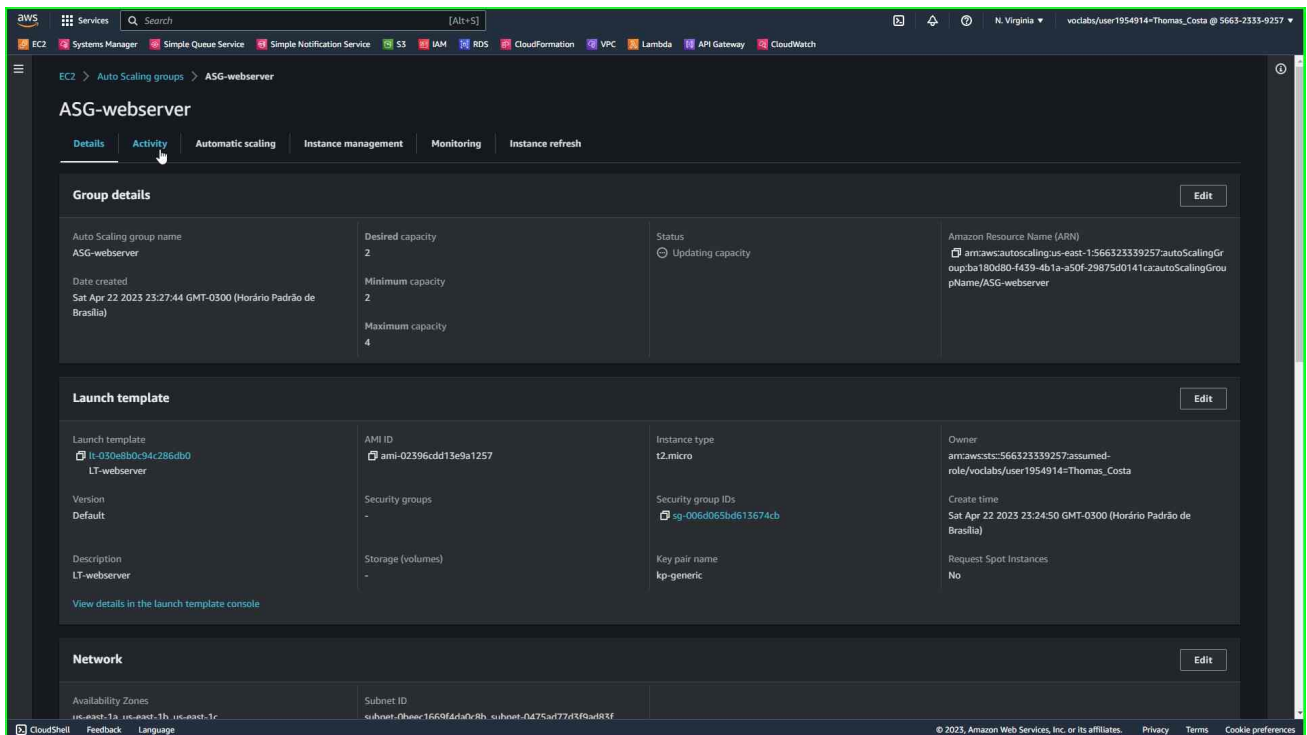
[Refresh](#) [Edit](#) [Delete](#) [Create an Auto Scaling group](#)

<input type="checkbox"/>	Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max	Availability Zones
<input type="checkbox"/>	ASG-webserver	LT-webserver Version Default	0	Updating capacity...	2	2	4	us-east-1a, us-east-1b, us-east-1c

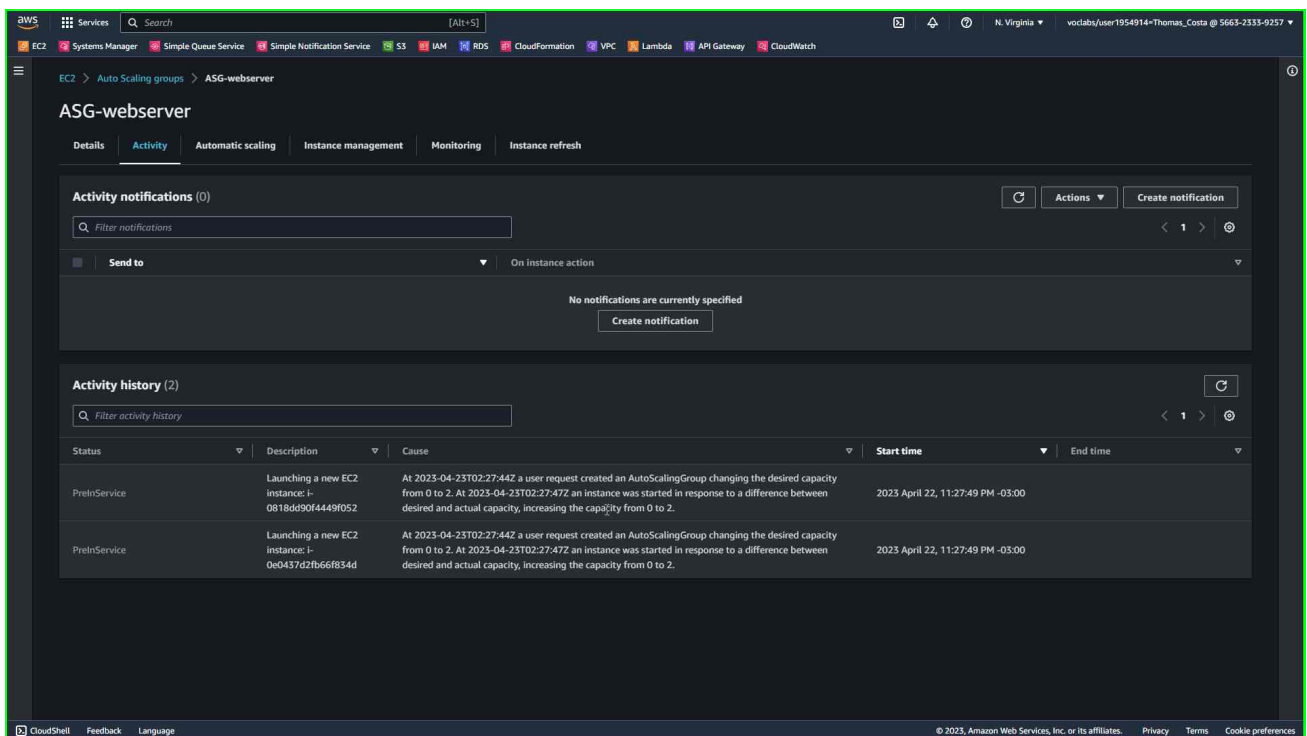
0 Auto Scaling groups selected

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Selezione a aba **Activity**:

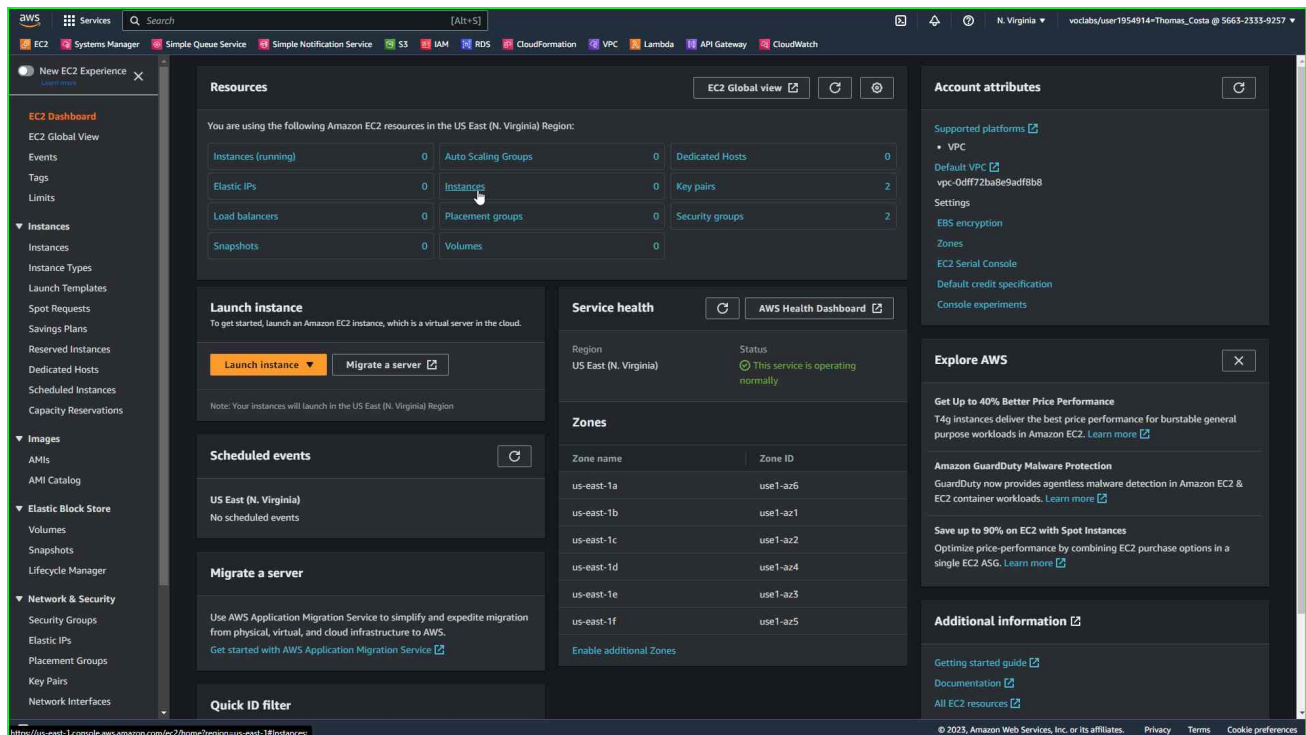


Em **Activity History** podemos ver que a criação dos EC2 foi disparada:

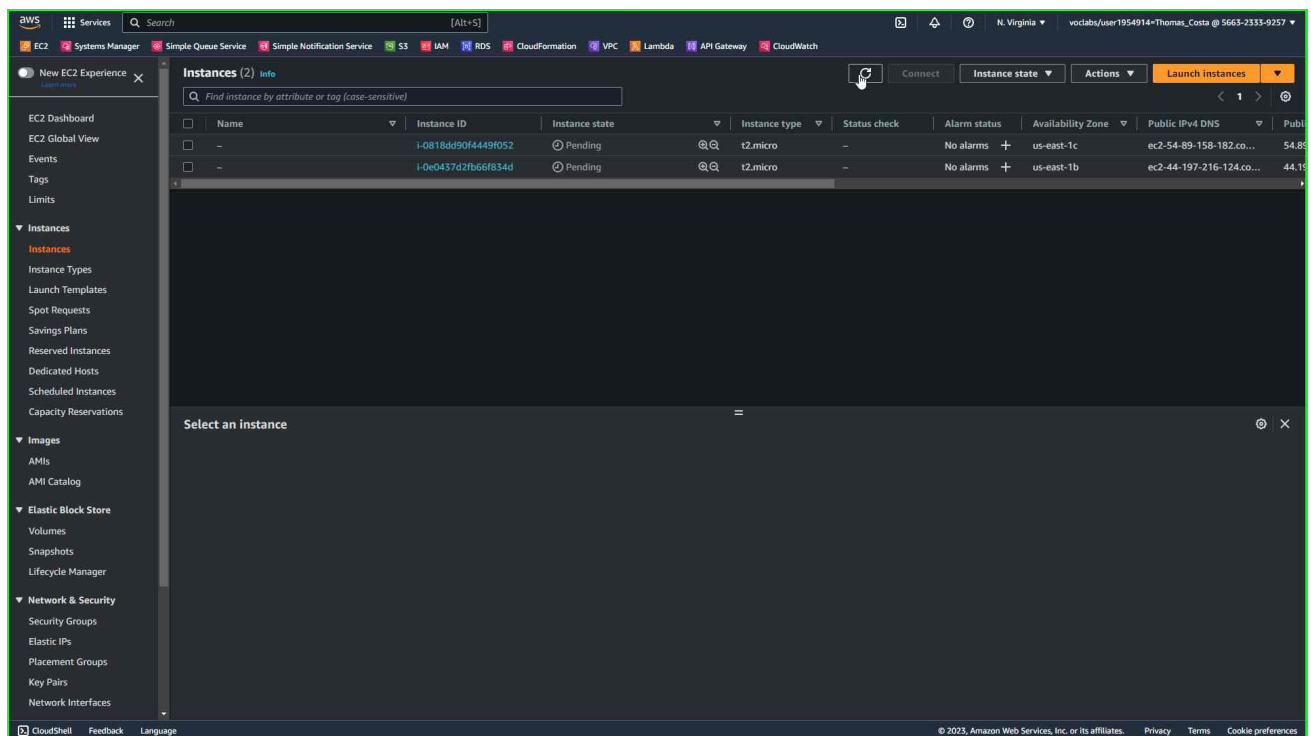


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Voltando para a tela principal do EC2 selecionando a opção Instances:

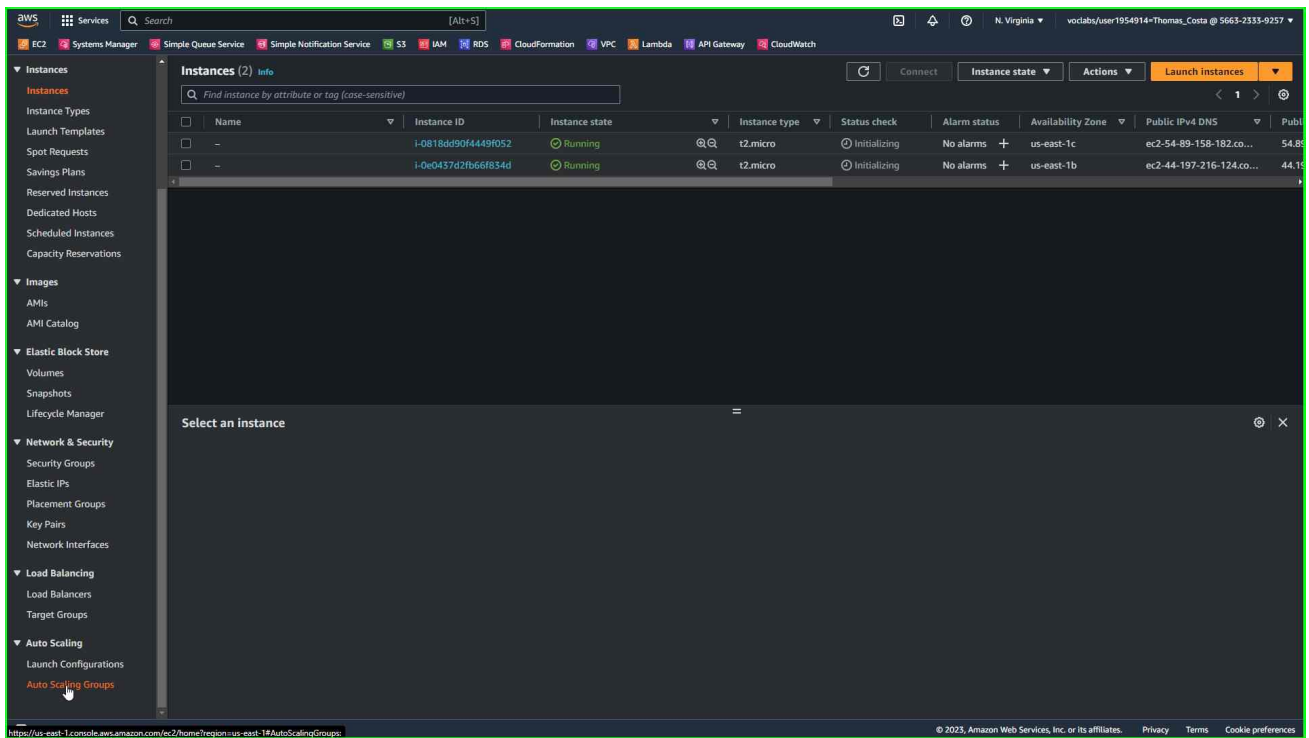


Duas instâncias estão sendo criadas de acordo com os parâmetros do ASG:

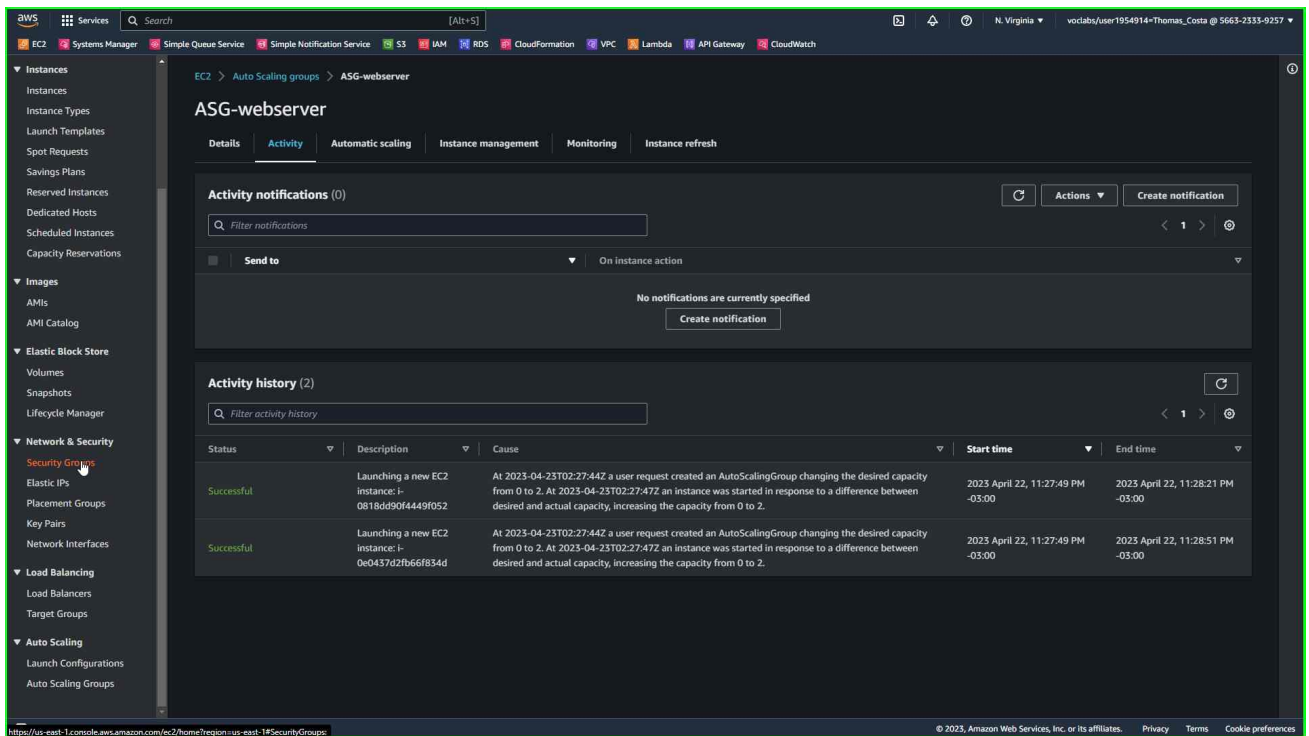


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Instâncias criadas com sucesso:

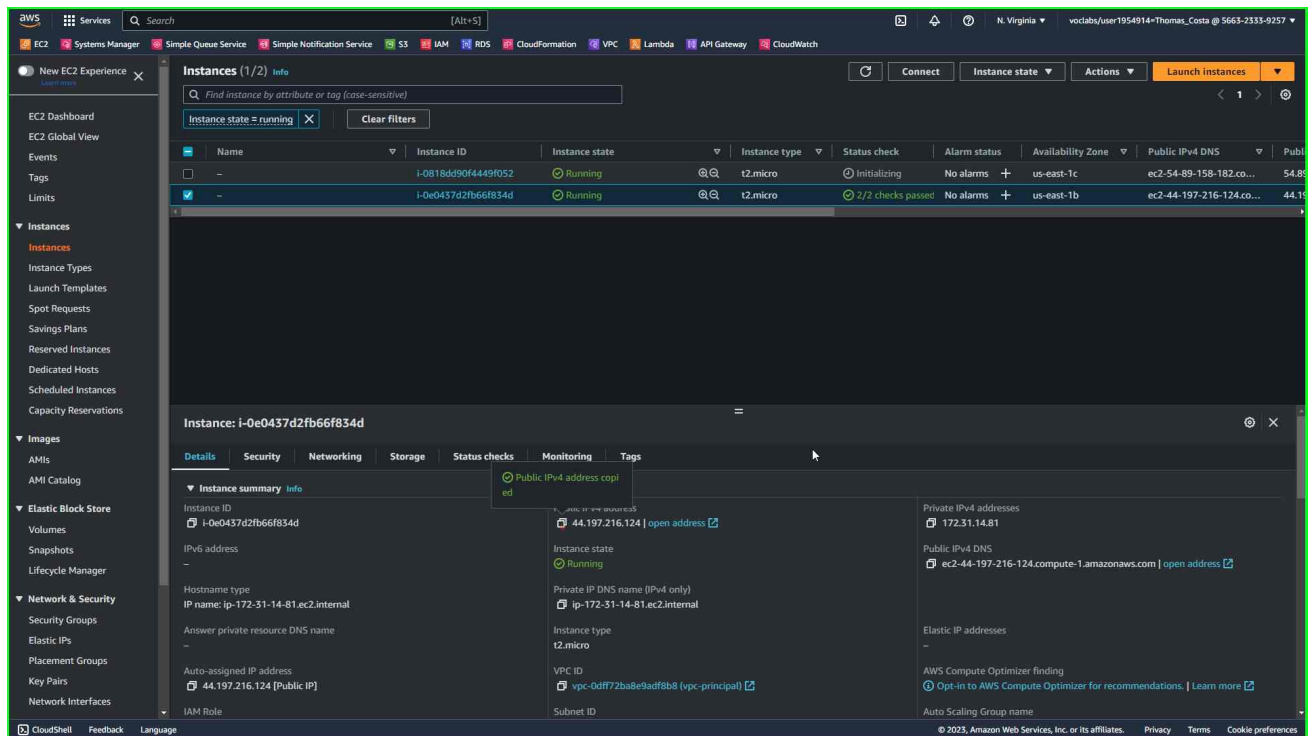


Em Activity History do ASG foi notificado que as duas instâncias foram criadas:

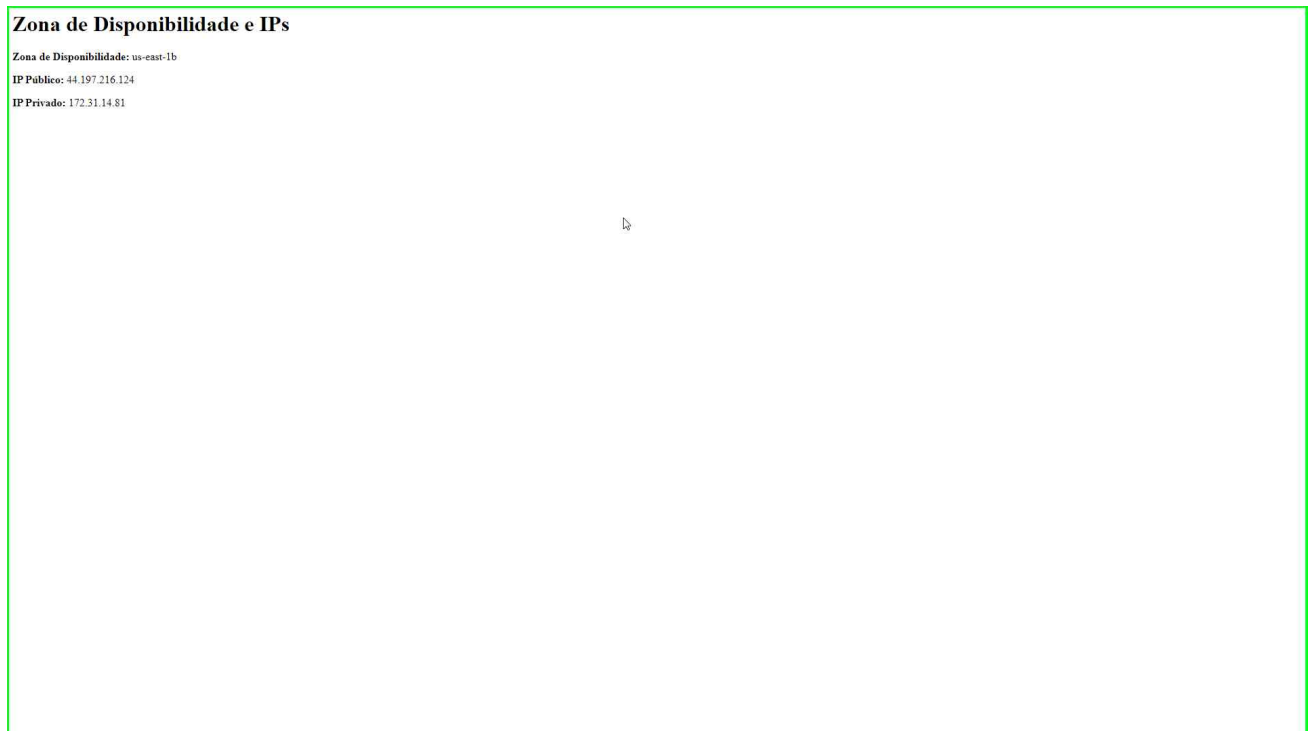


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Selecione o endereço público de uma das instâncias para acessar o servidor Apache HTTP:

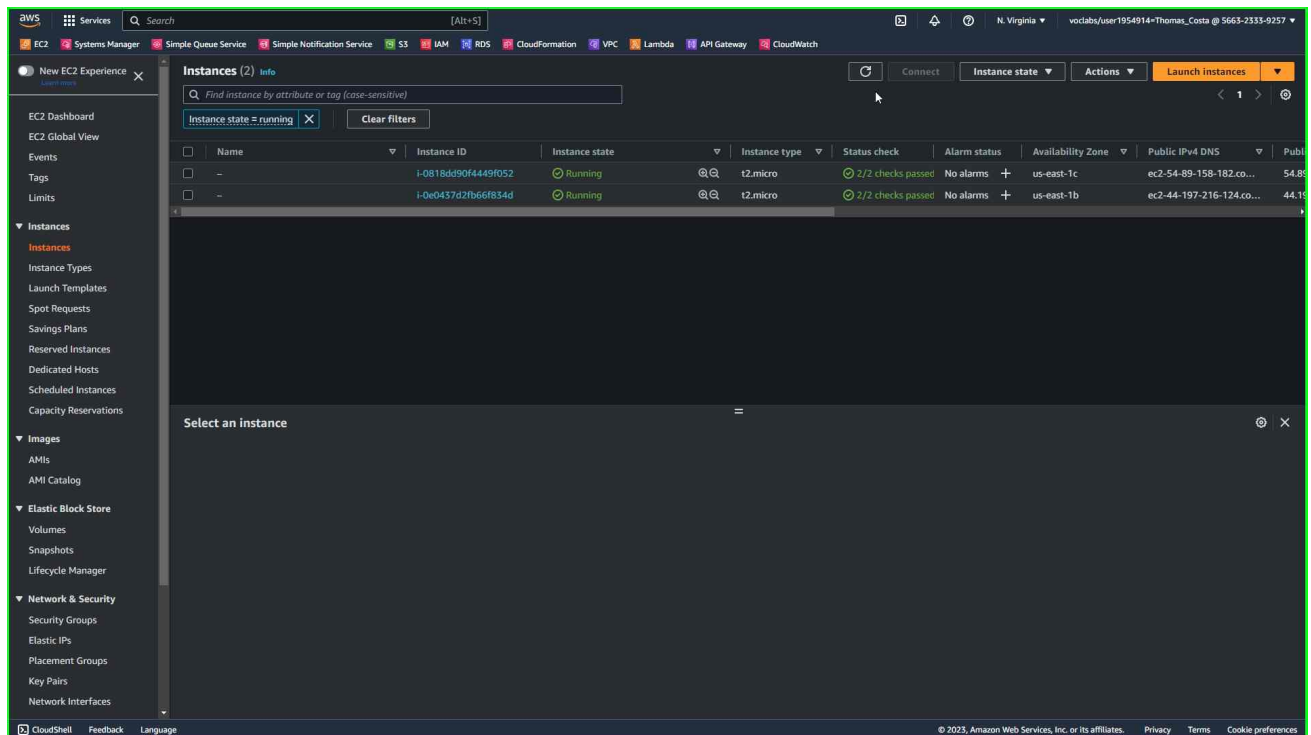


Resposta do servidor Apache HTTP no navegador:



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Instâncias criadas com sucesso e Status check em ordem:



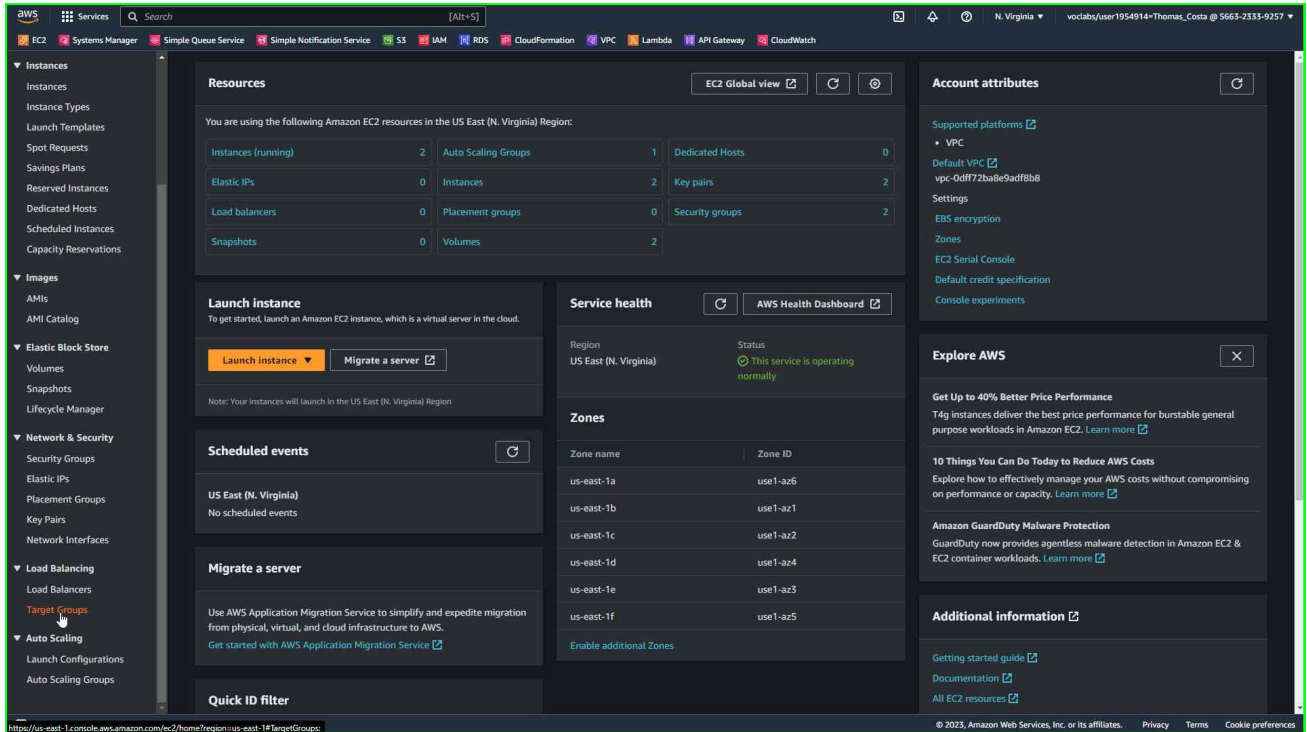
The screenshot displays the AWS Management Console's 'Instances' page. Two EC2 instances are listed, both in a 'Running' state with successful status checks. The left sidebar shows the navigation menu with categories like EC2 Dashboard, Images, Elastic Block Store, and Network & Security. The main content area includes a search bar, filters, and a table of instances.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 address
-	i-0818d90f4449f052	Running	t2.micro	2/2 checks passed	No alarms	us-east-1c	ec2-54-89-158-182.co...	54.89.158.182
-	i-0e0437d2fb66f834d	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-44-197-216-124.co...	44.197.216.124

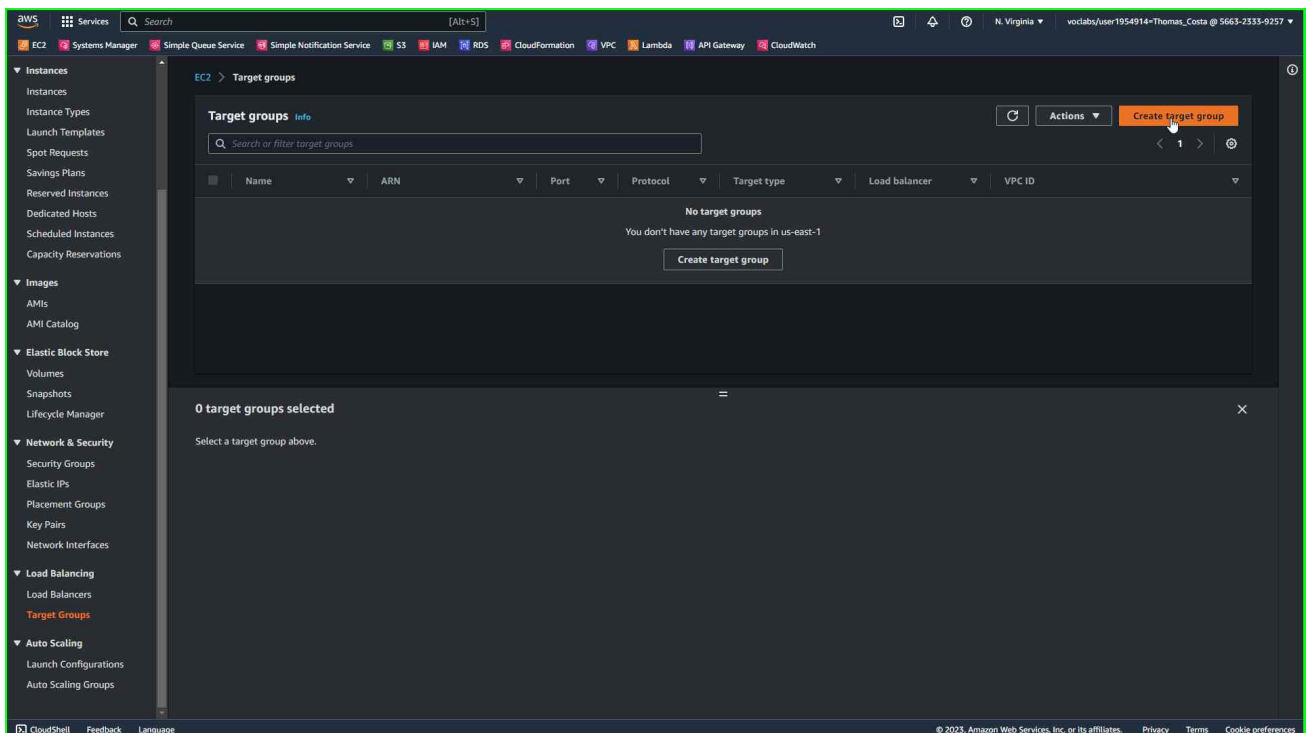
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Parte 3 – Criando o Target Group

Selecionar a opção Target Groups:

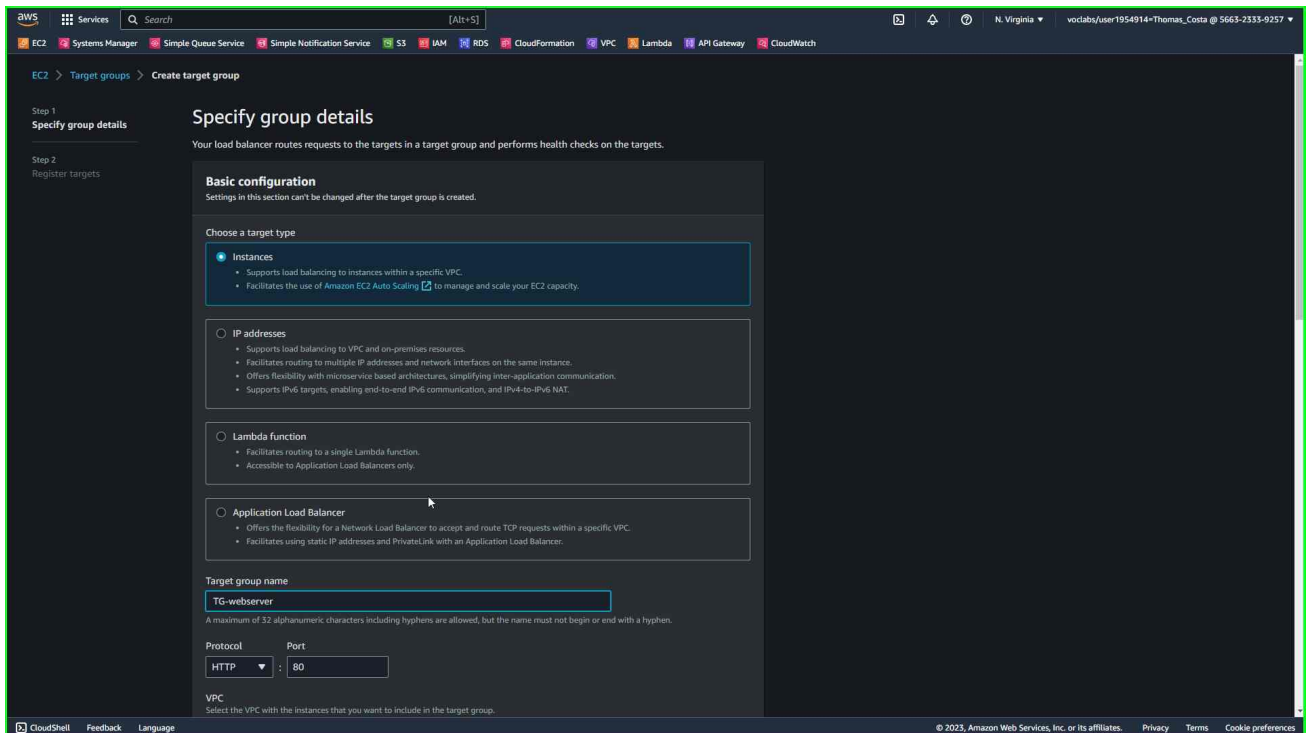


Na tela principal, clicar no botão Create target group:

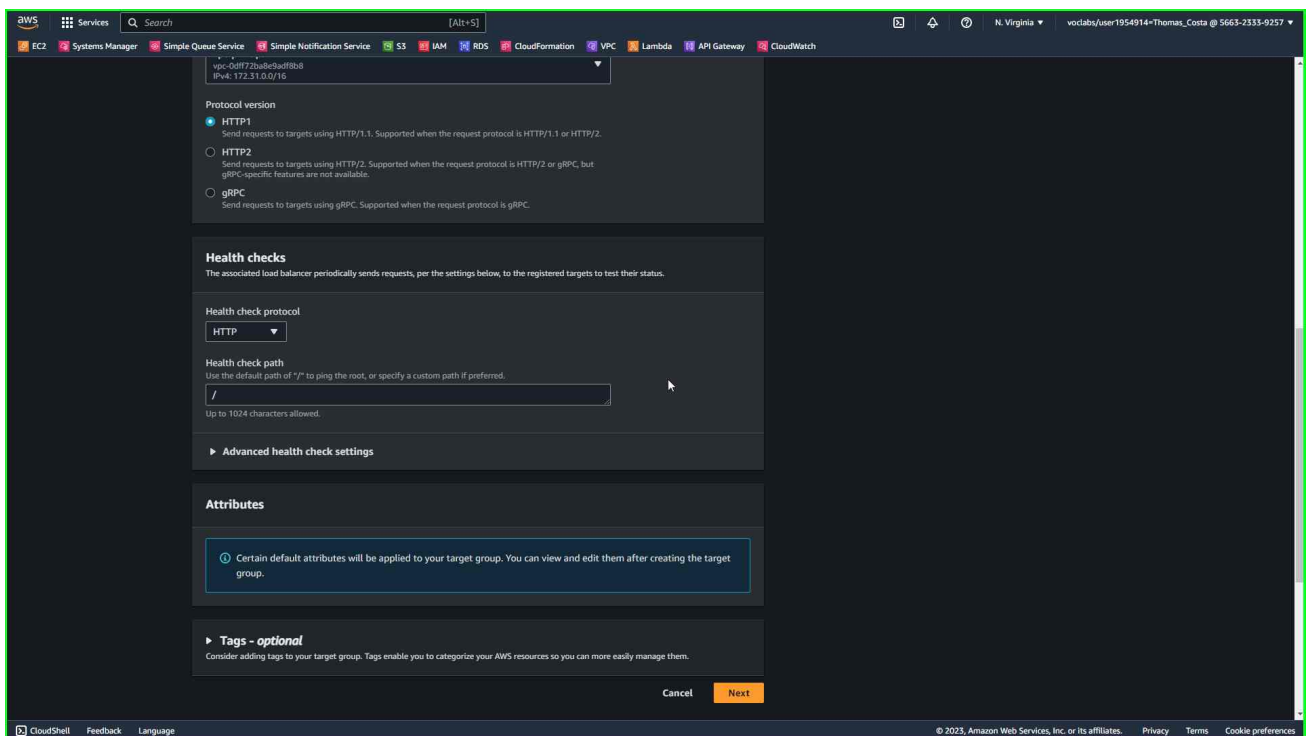


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Colocar o nome do Target group de **TG-webserver**:

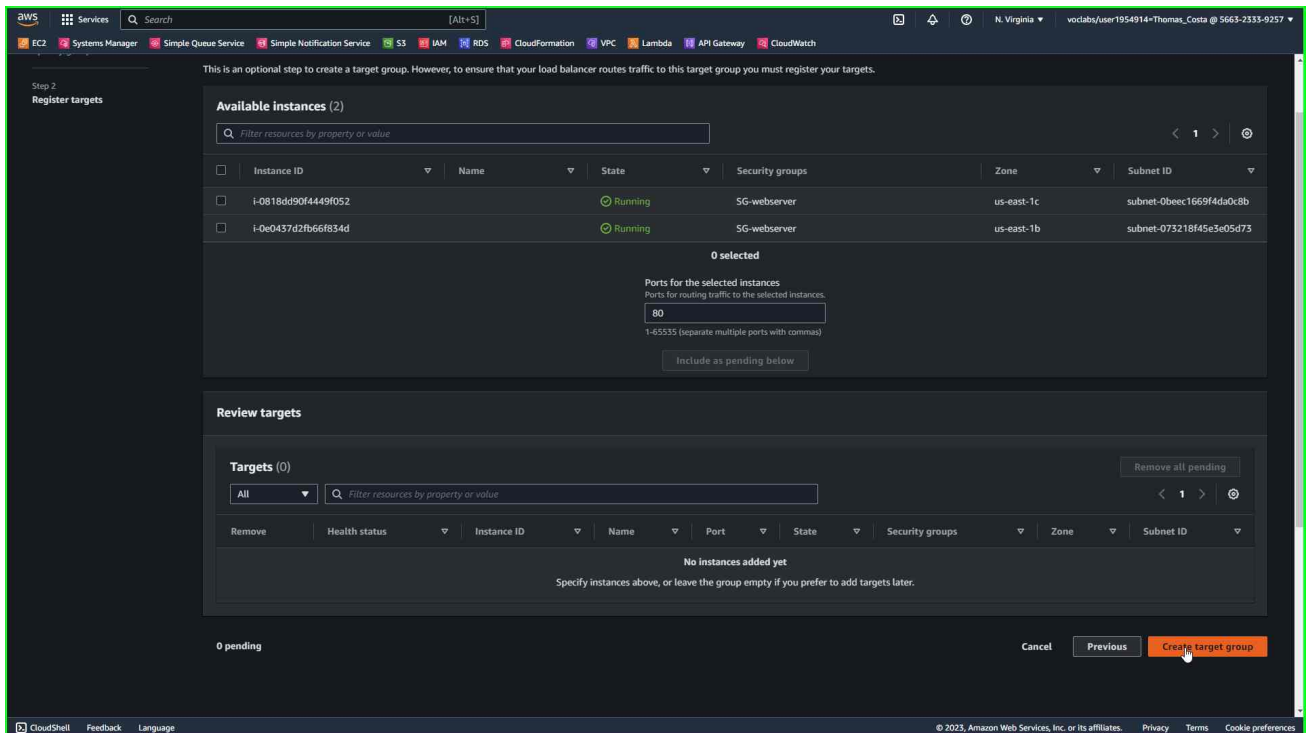


Selecionar as opções conforme imagem abaixo:

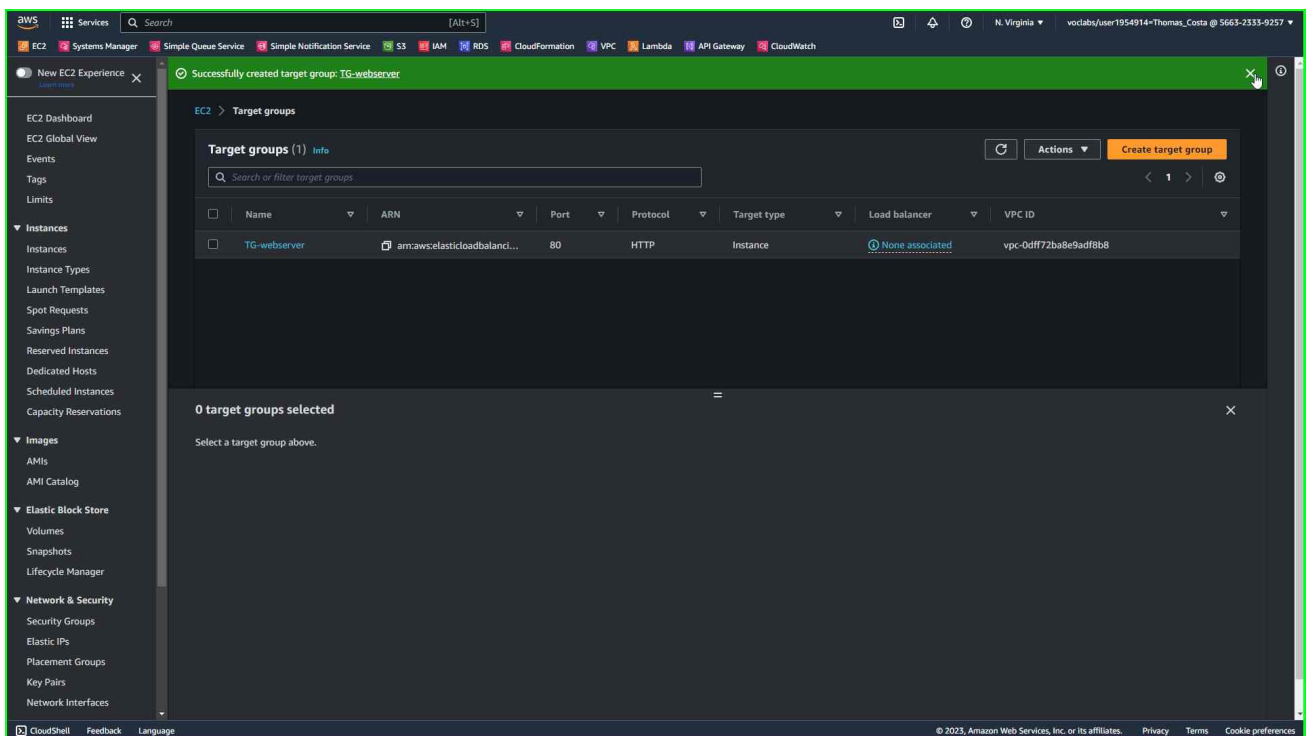


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Nesta tela clique somente em **Create target group**:

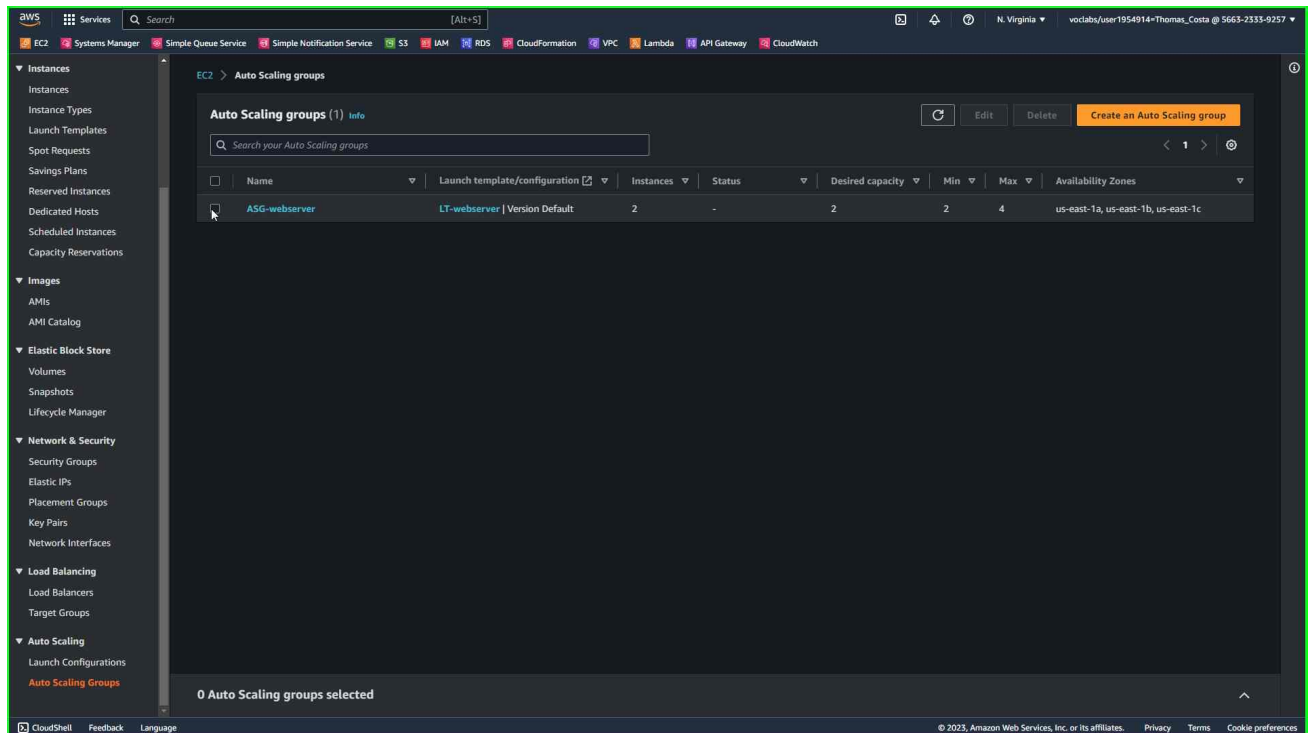


Target group foi criado com sucesso:



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Vamos voltar para a tela do Auto Scaling groups selecionar o ASG-webserver:



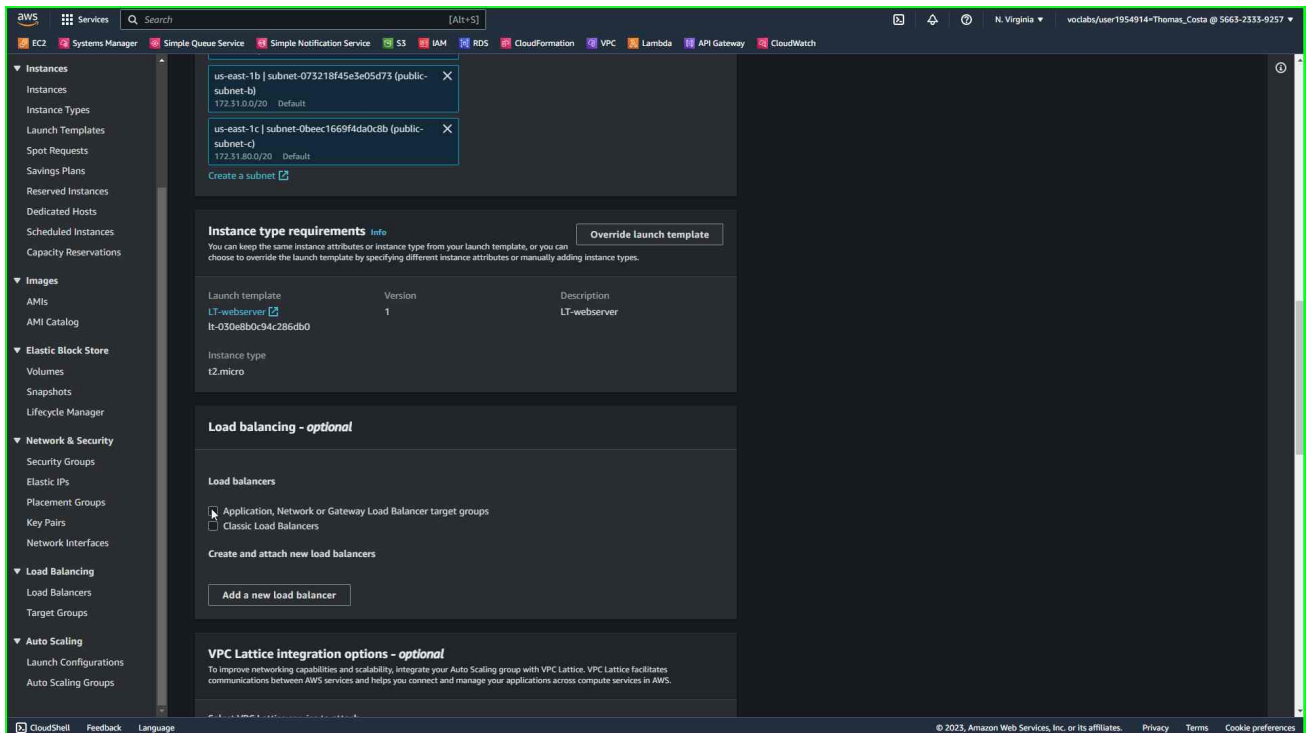
The screenshot displays the AWS Management Console interface for the 'Auto Scaling groups' page. The left-hand navigation pane shows the 'Auto Scaling' section expanded, with 'Auto Scaling Groups' highlighted. The main content area shows a list of Auto Scaling groups. One group, 'ASG-webserver', is selected and highlighted in blue. The table below lists the details of this group.

	Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max	Availability Zones
<input checked="" type="checkbox"/>	ASG-webserver	LT-webserver Version Default	2	-	2	2	4	us-east-1a, us-east-1b, us-east-1c

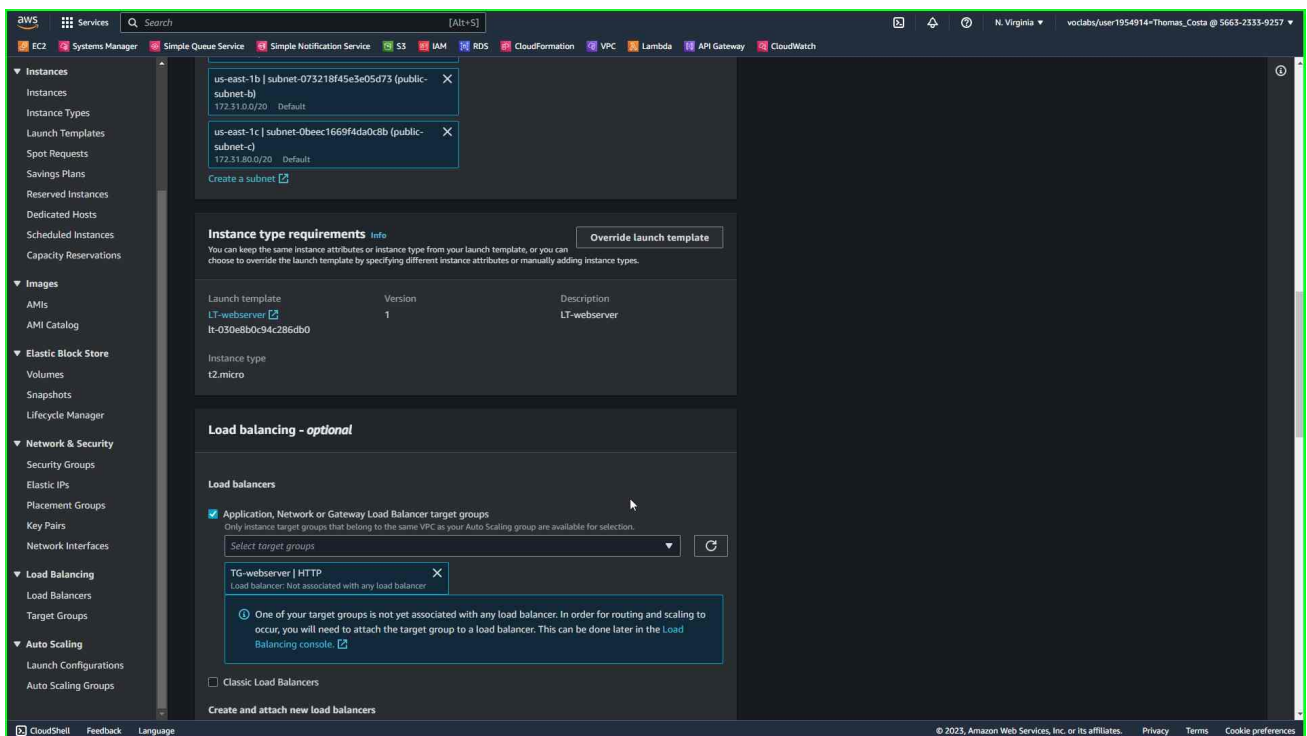
At the bottom of the console, a status bar indicates '0 Auto Scaling groups selected'.

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Selecionar a opção **Application, Network or Gateway Load Balancer target groups**:

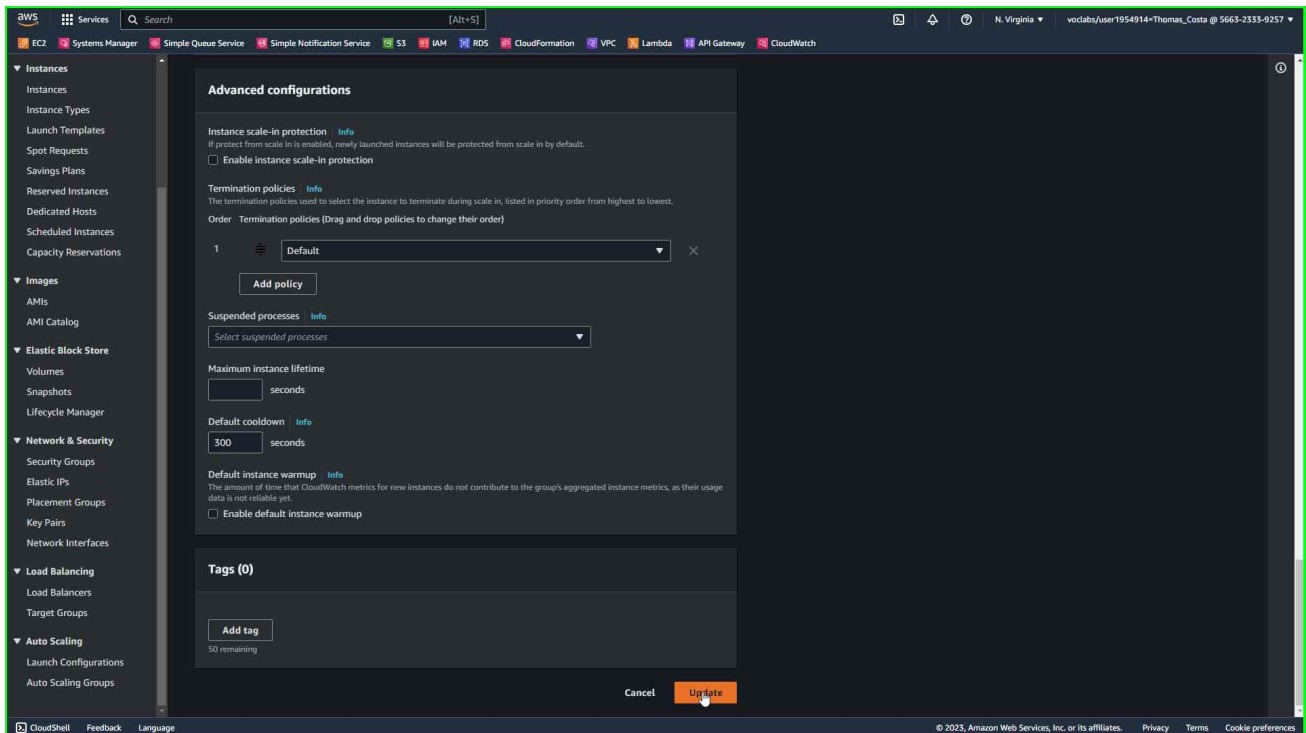


Selecionar o Target group **TG-webserver**:

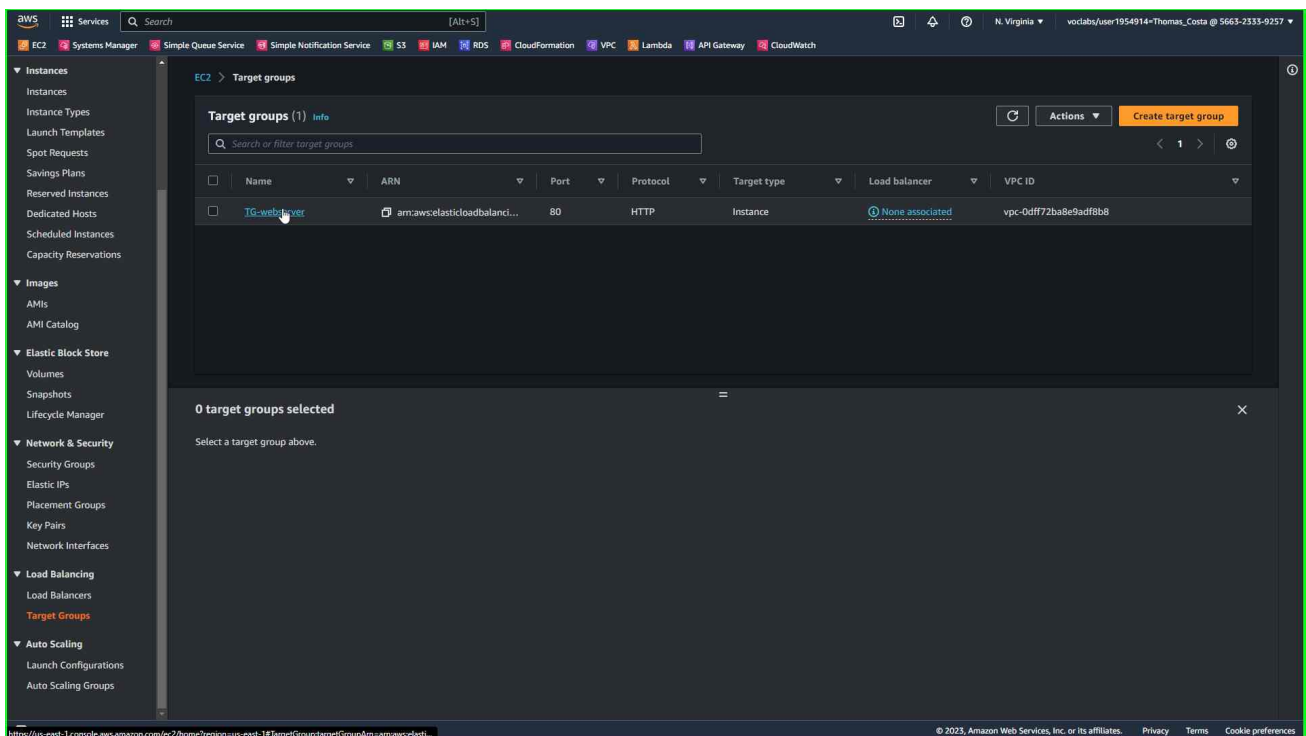


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Clique em **Update**:

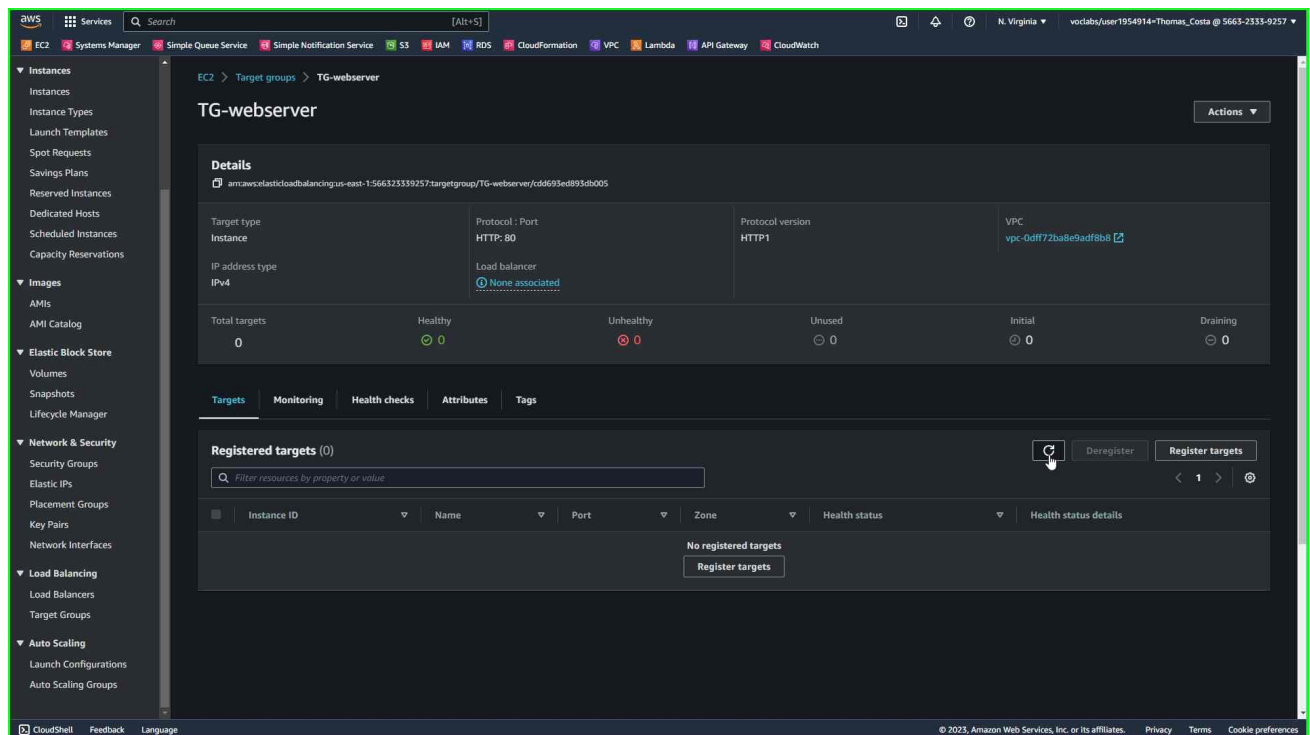


Volte a tela do **Target groups** e selecione o **TG-webserver**:

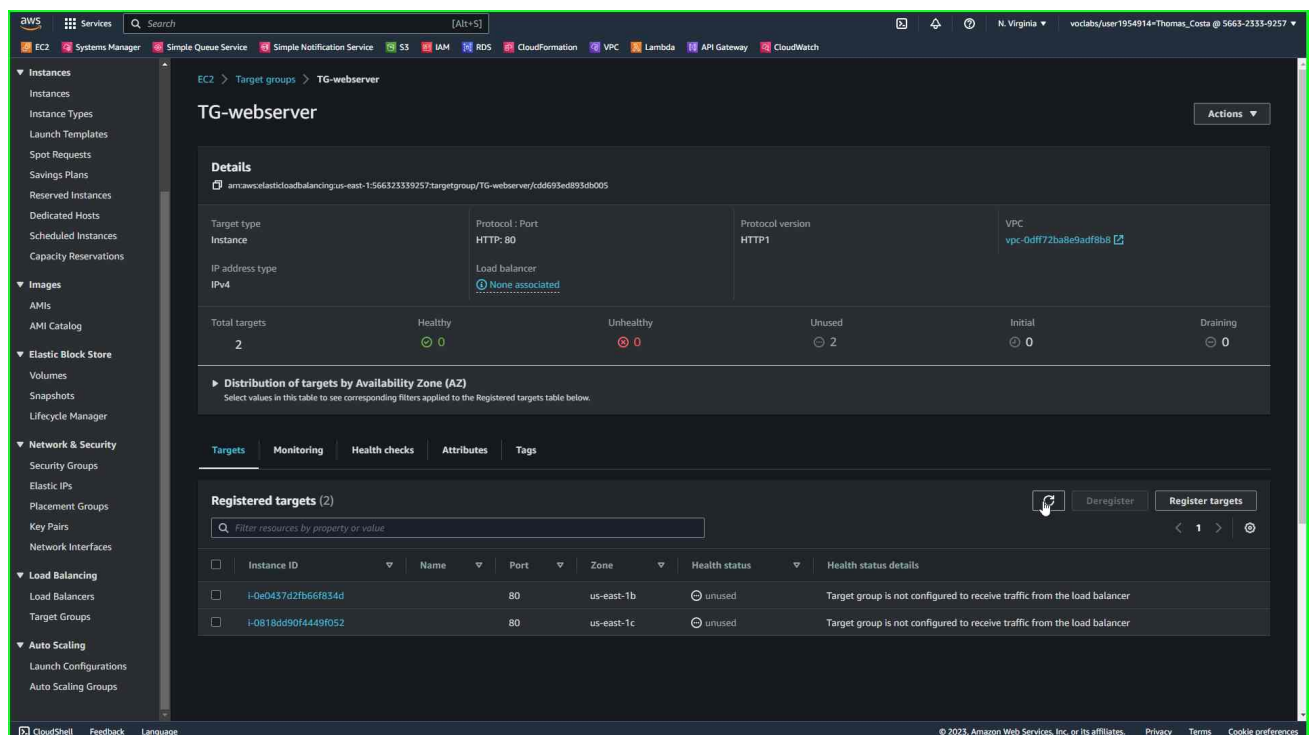


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Clique no botão mostrado na imagem abaixo:



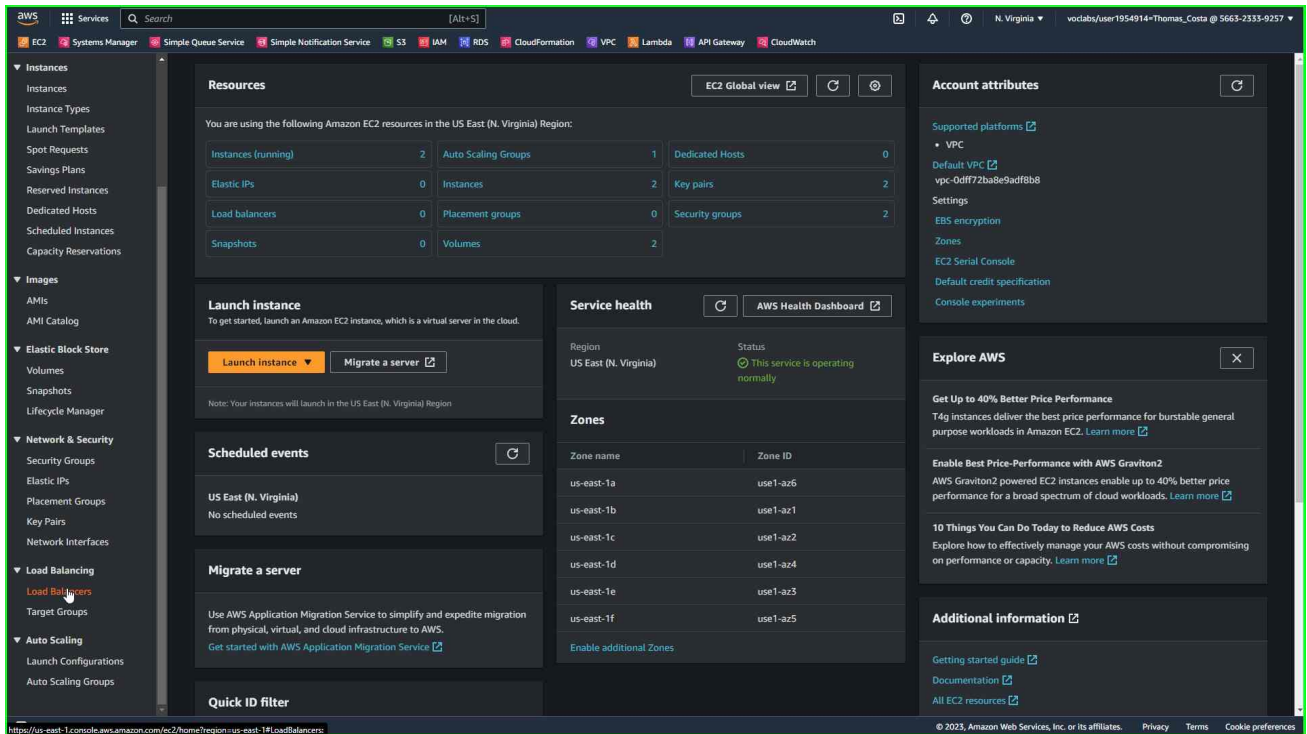
As instâncias EC2 estão atribuídas corretamente para o Target group mas com **Health Status** em **unused**:



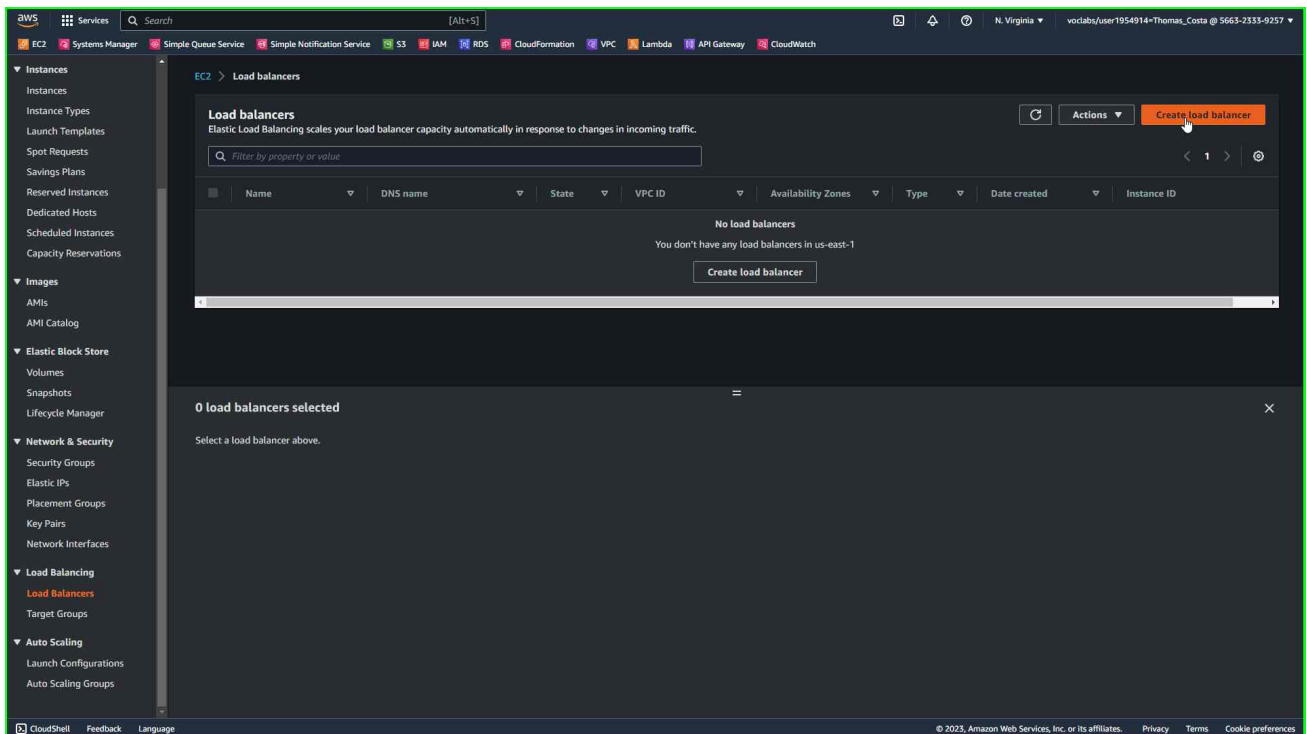
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Parte 4 – Criando o Application Load Balancer (ALB)

Na tela principal do EC2, selecionar a opção Load Balancers:

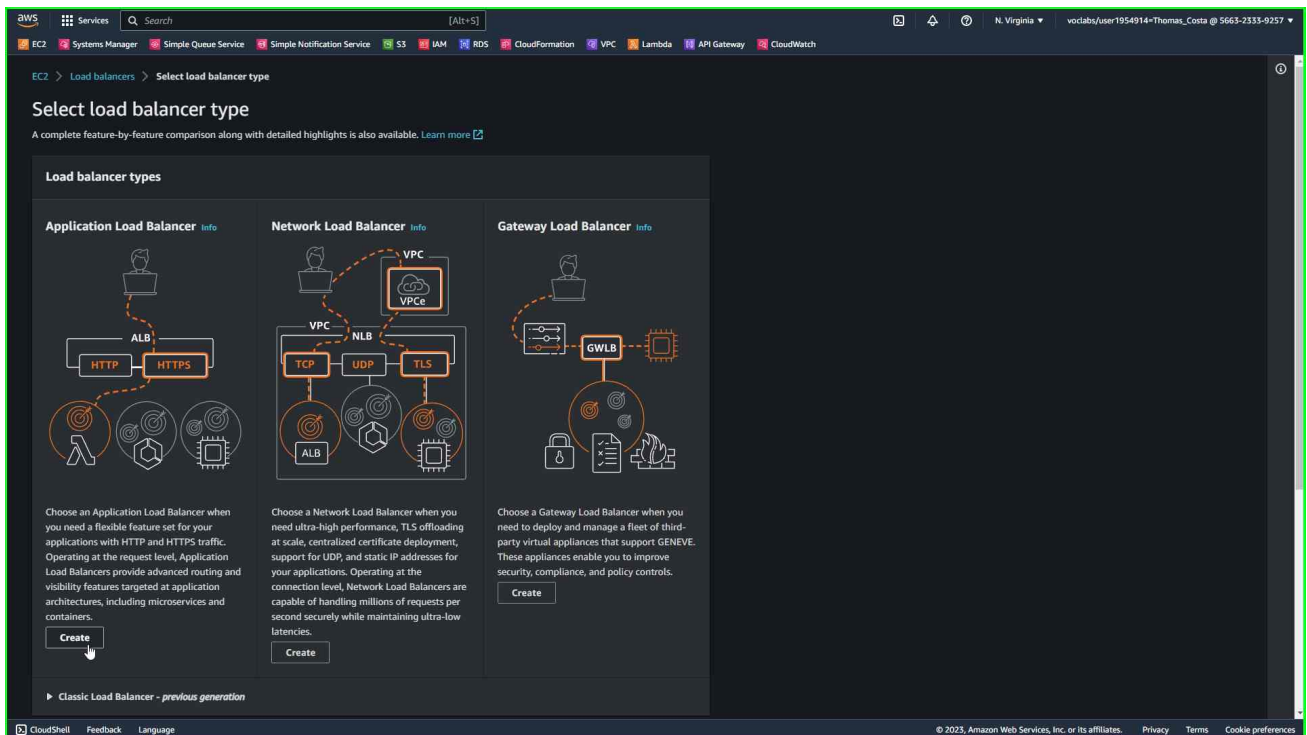


Clique no botão Create load balancer:

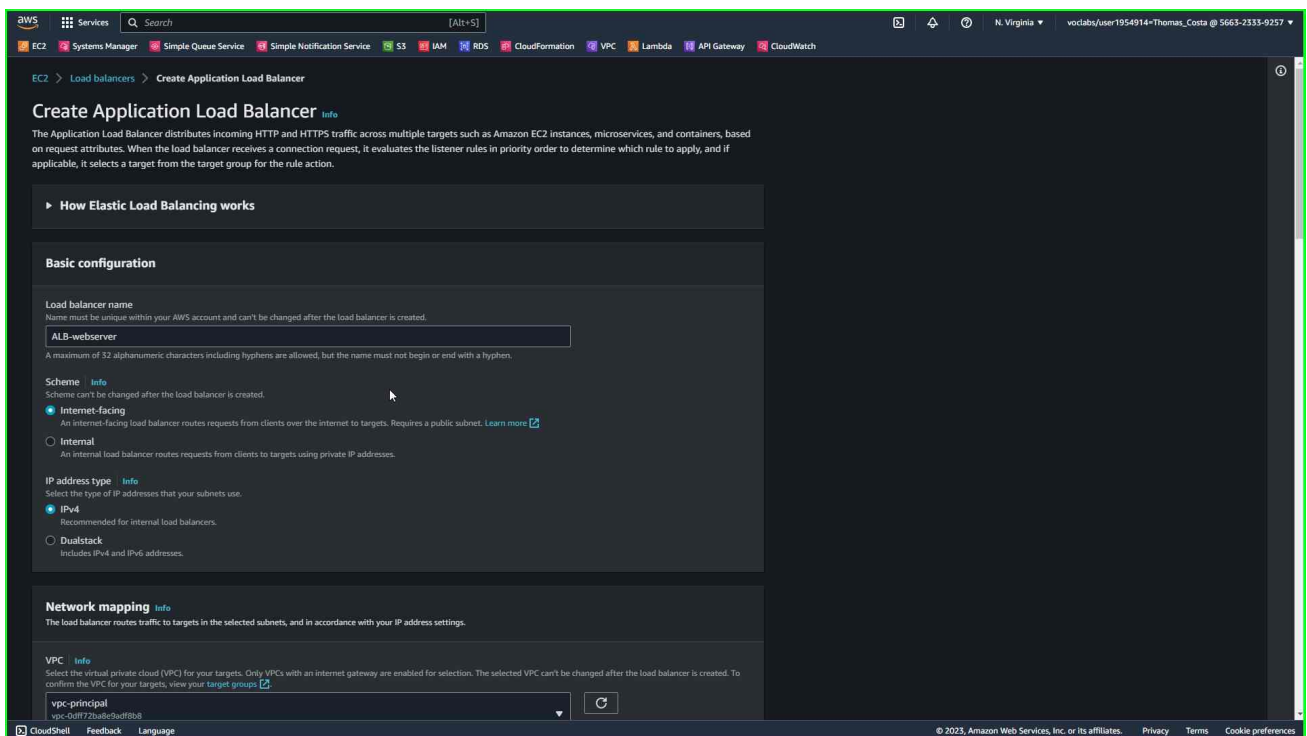


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Clique no botão **Create** do item **Application Load Balancer**:

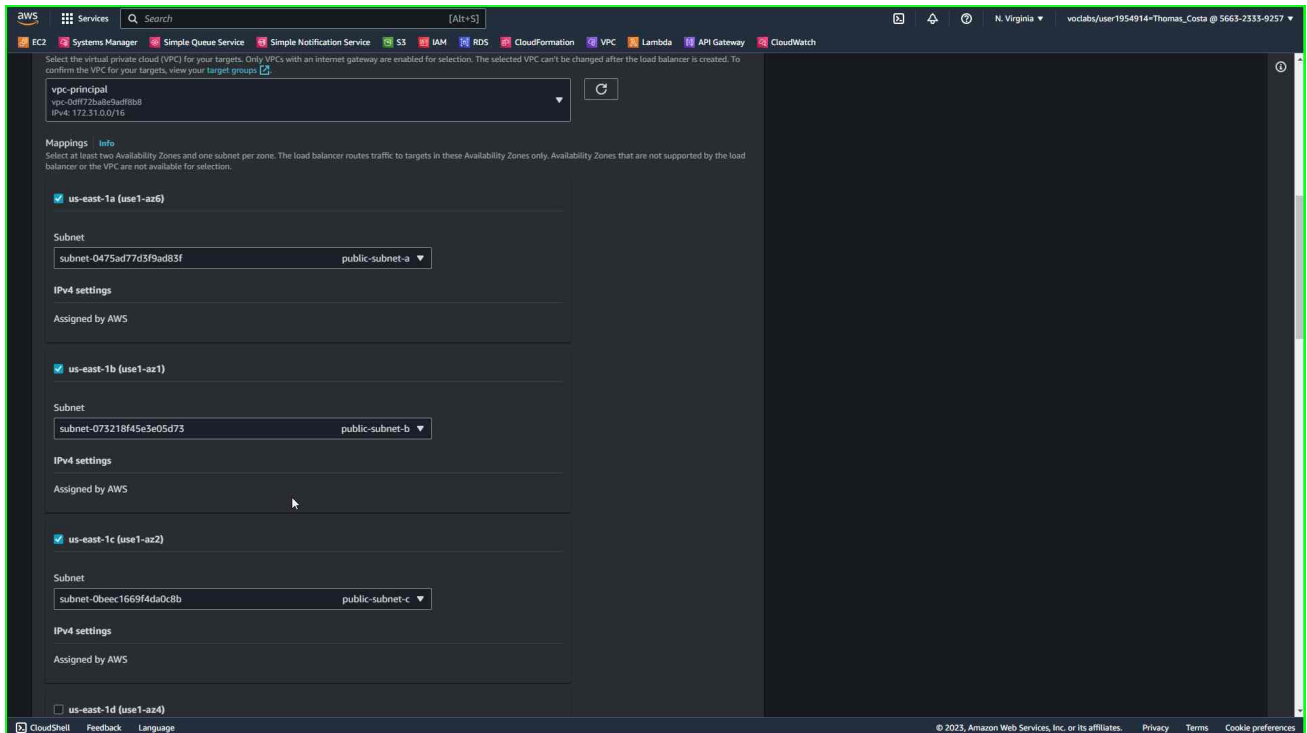


Coloque o nome do ALB de **ALB-webserver**:

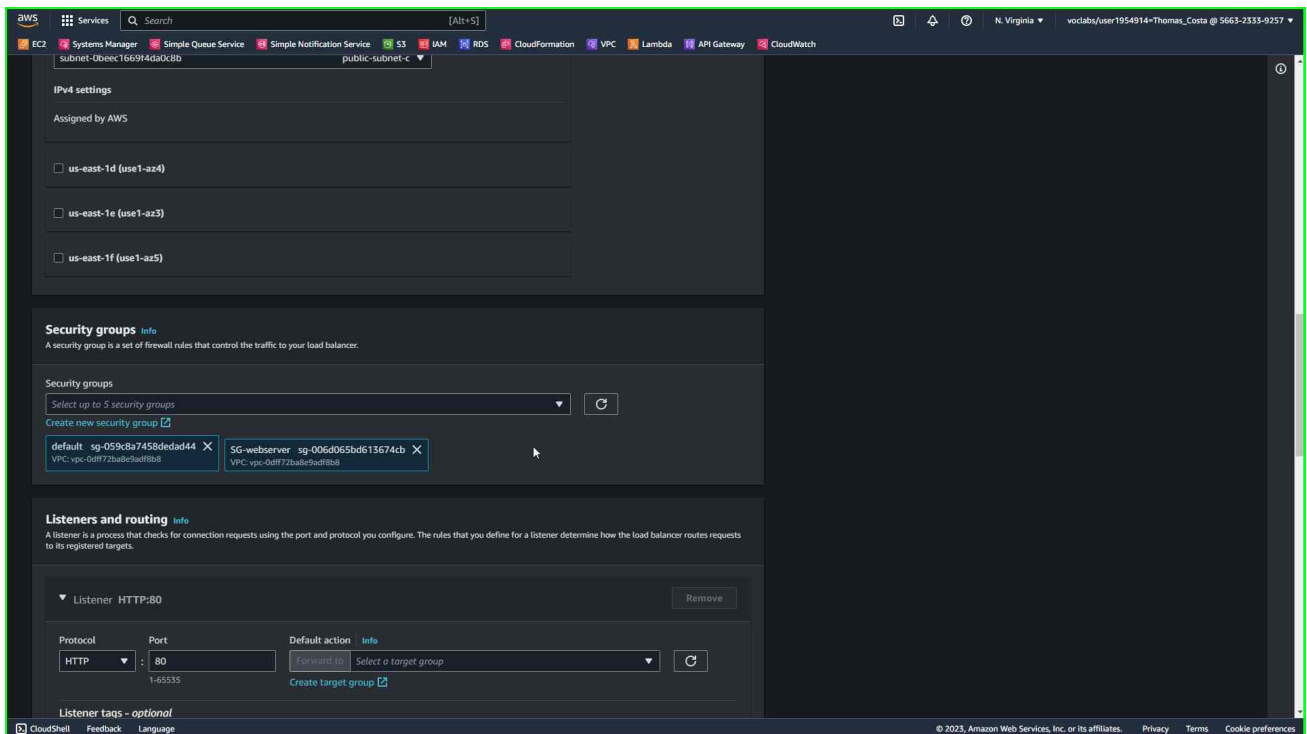


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Selecione 3 AZ conforme imagem abaixo:

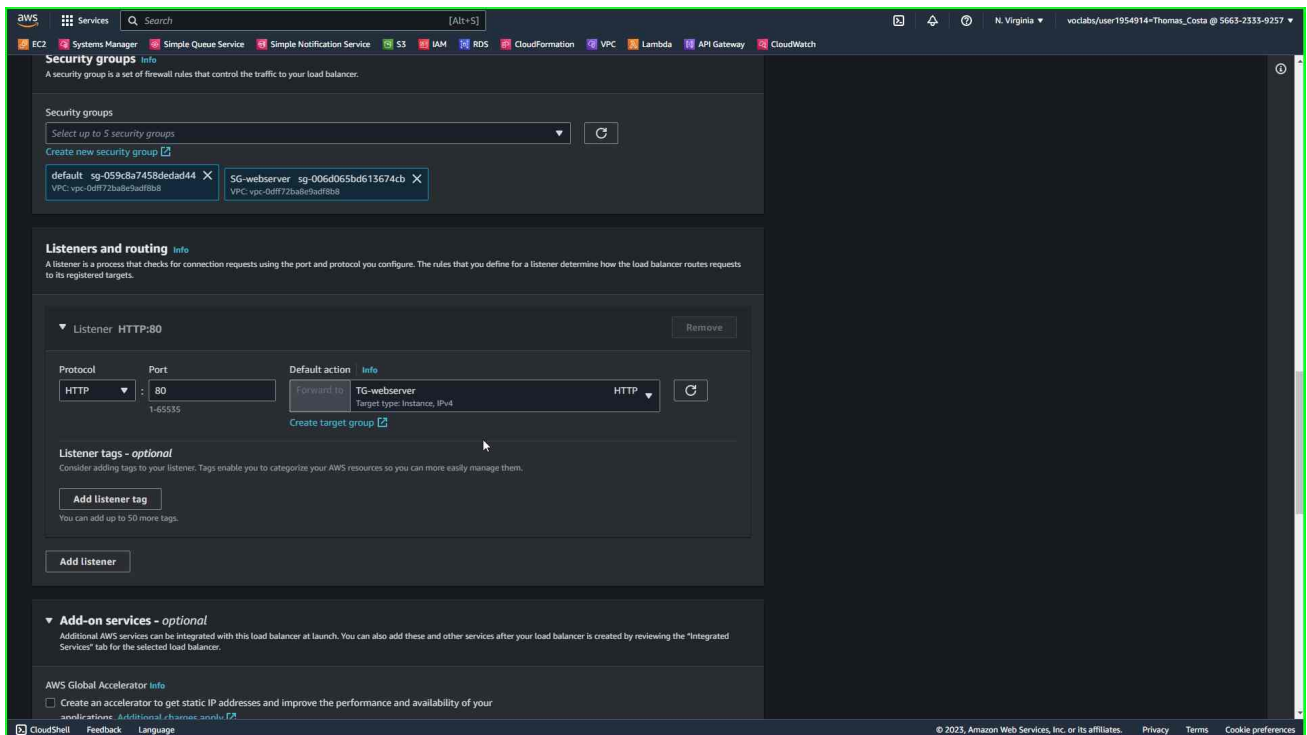


Selecione o Security Group **SG-webserver**:

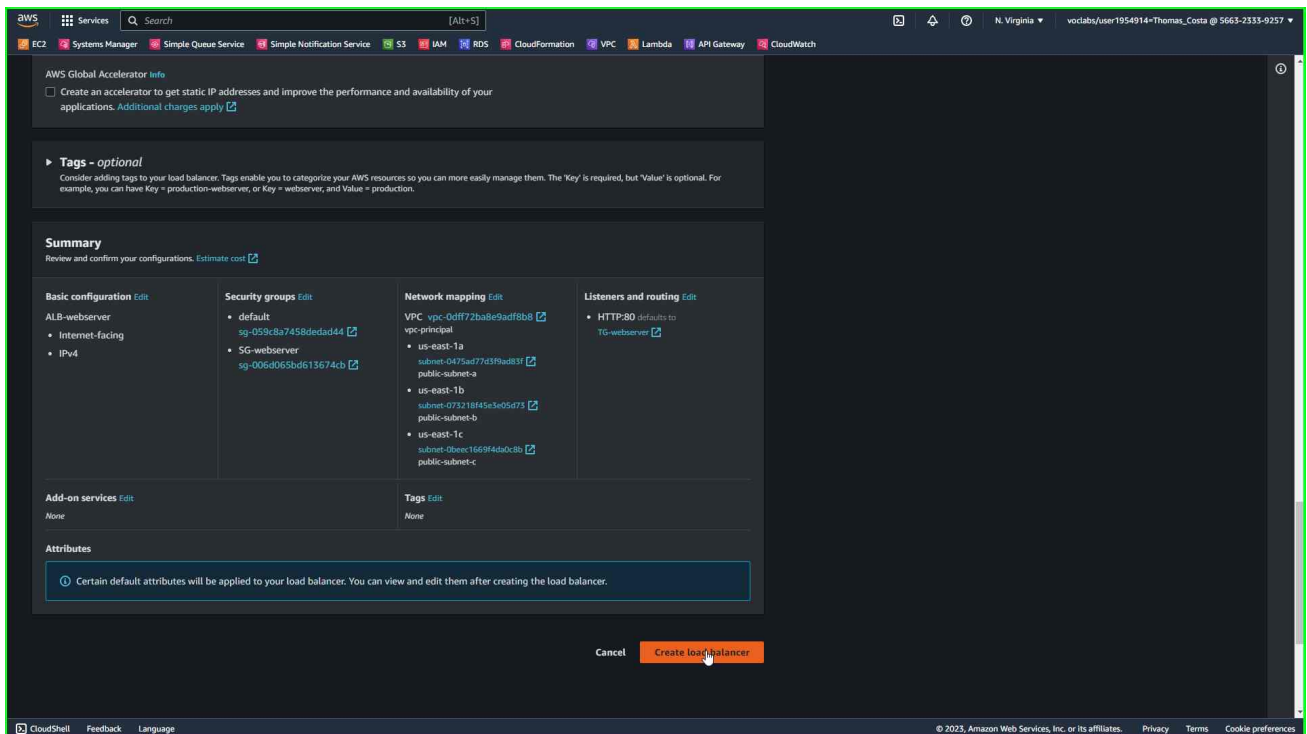


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Selecione o Target group **TG-webserver**:

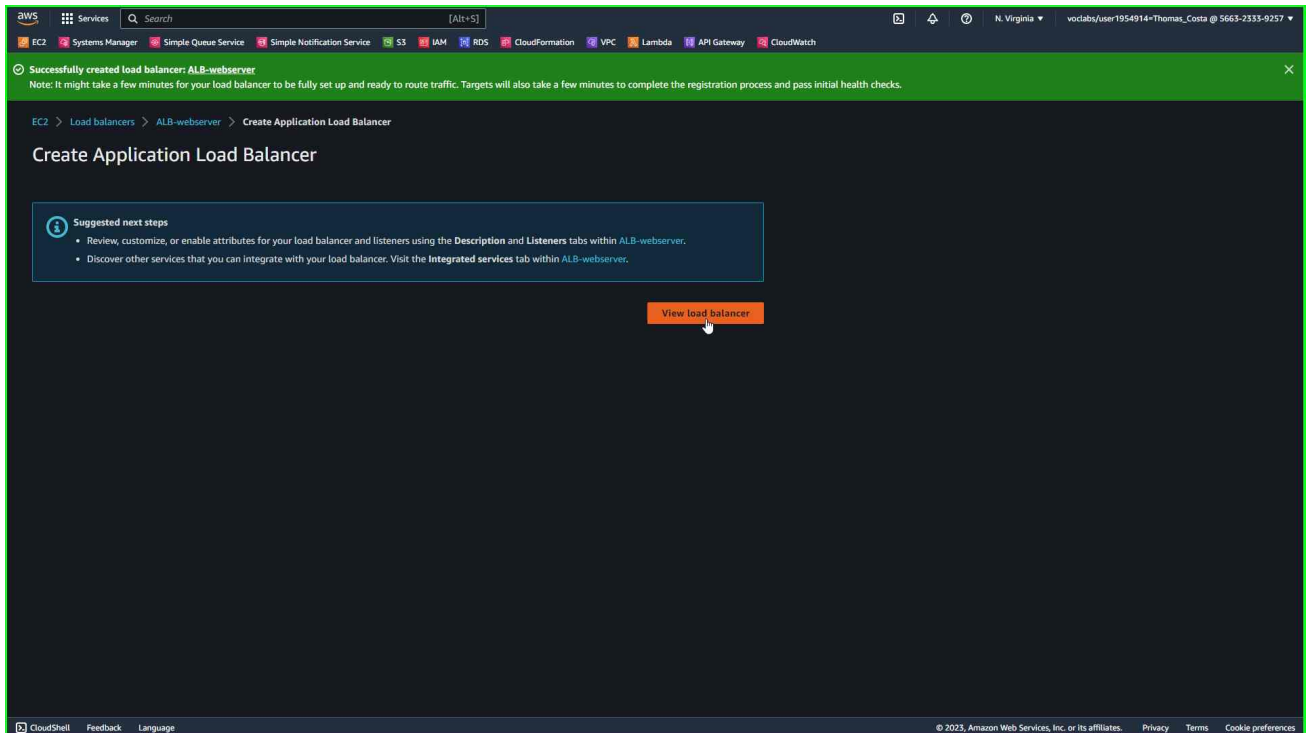


Clique no botão **Create load balancer**:

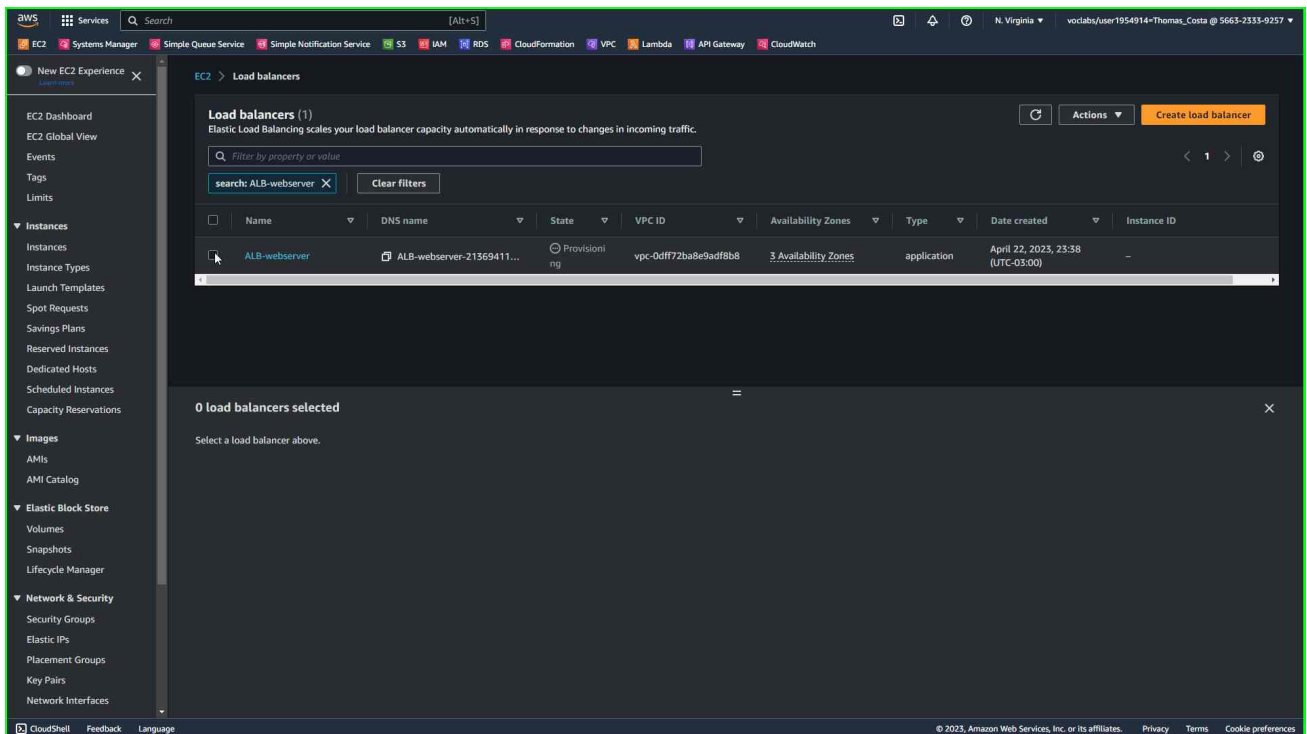


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ALB criado com sucesso:

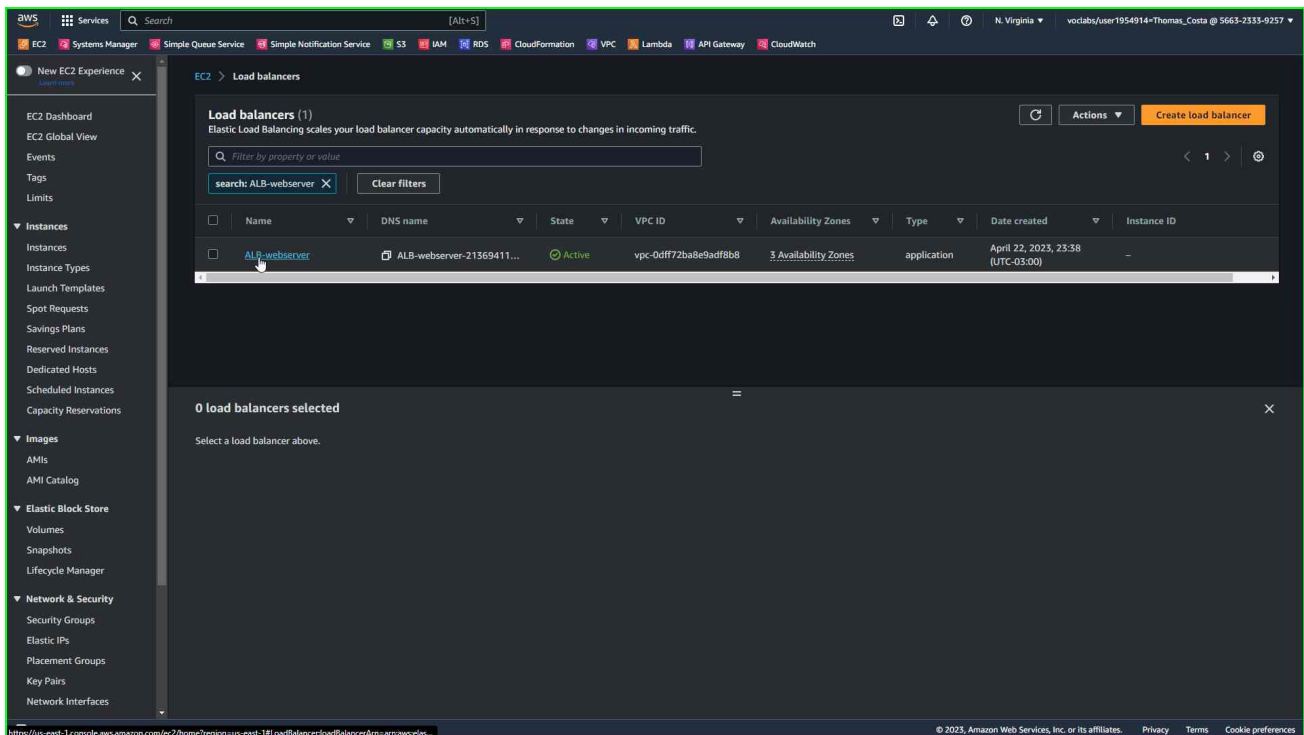


Aguardar o balanceador sair do status **Provisioning**:

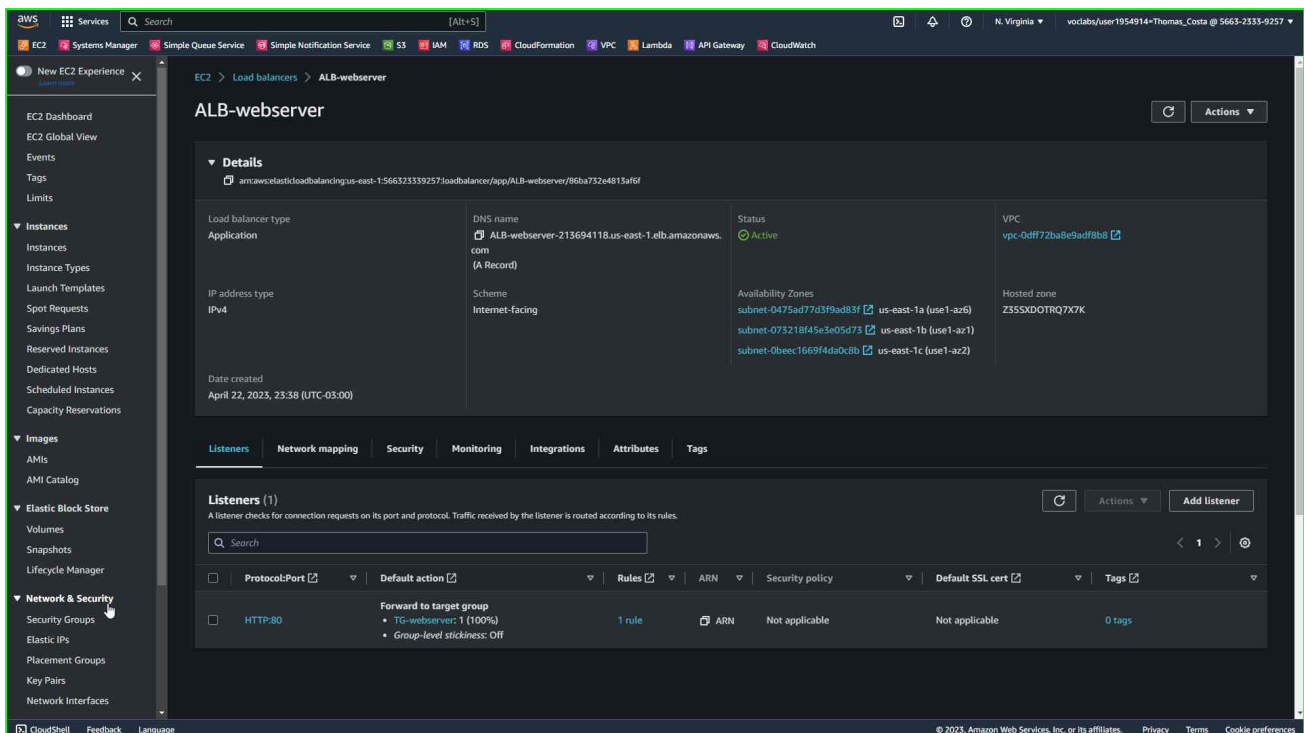


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Status do ALB em **Active**, pronto para ser utilizado:

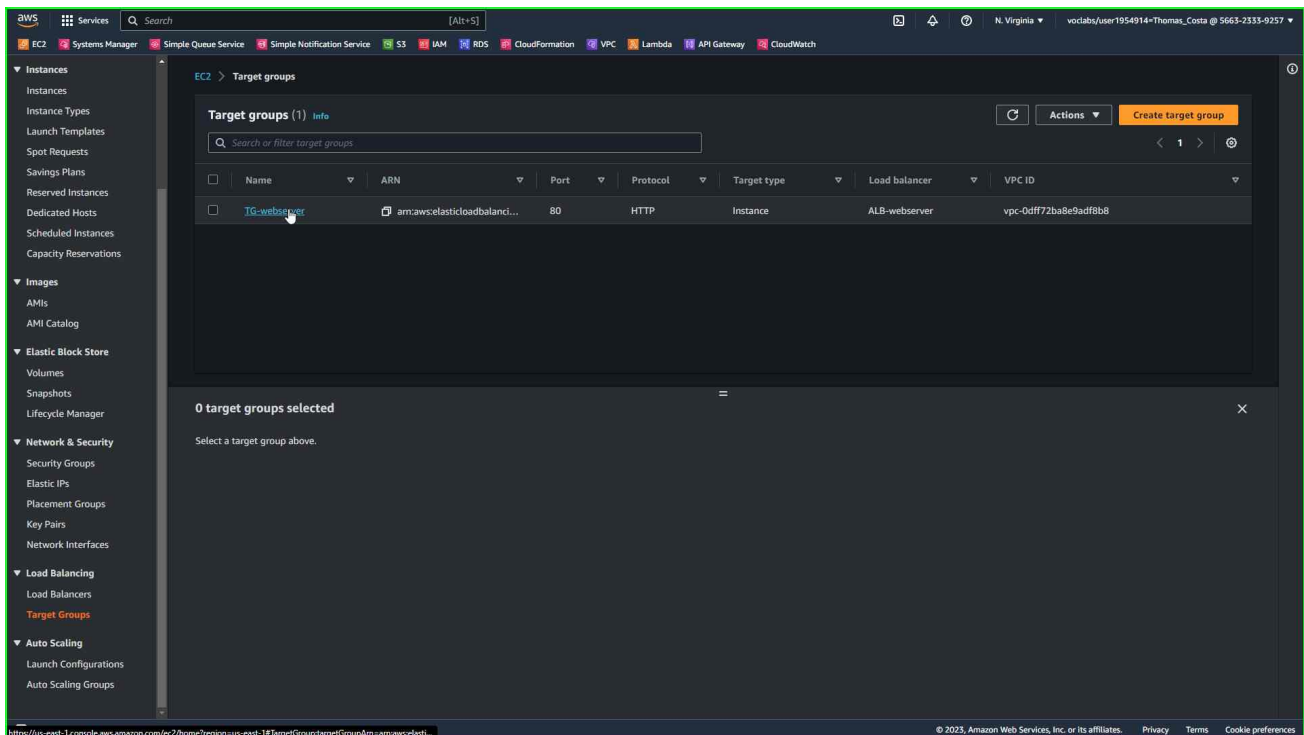


Selecione o ALB para ver as suas propriedades:

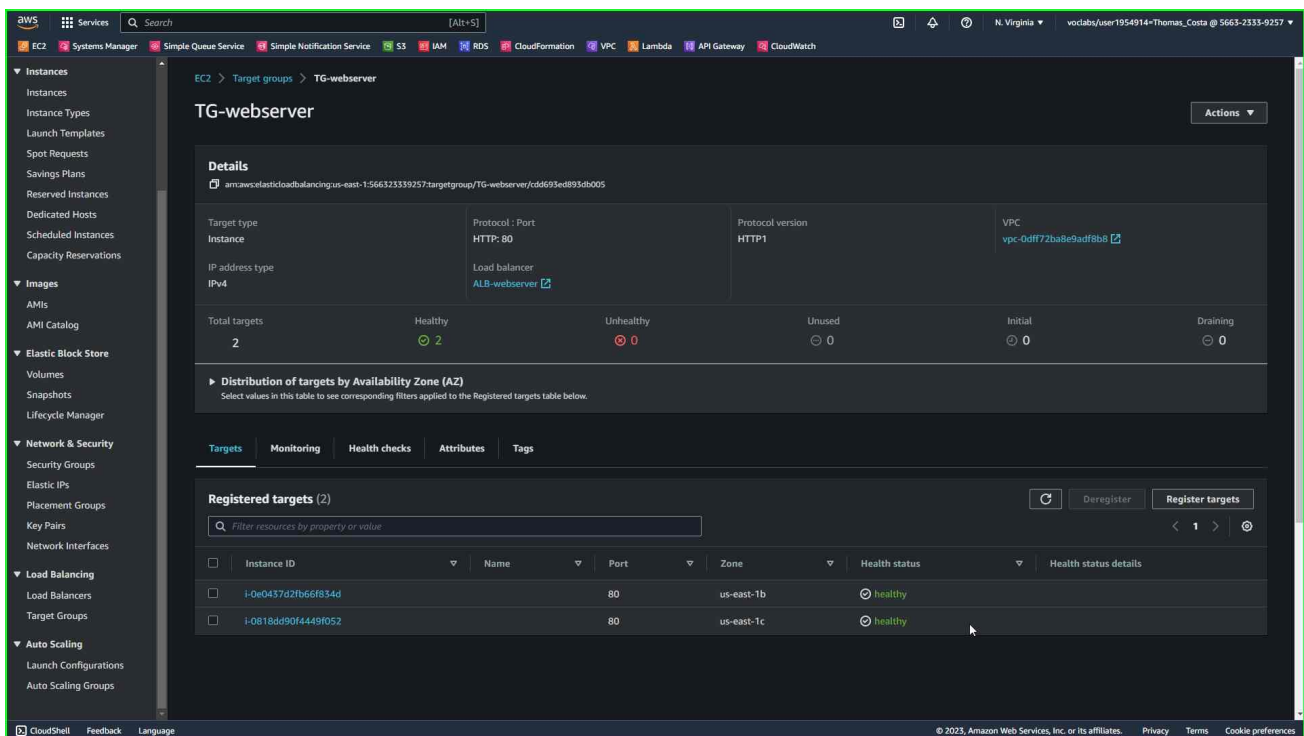


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Voltar a tela com a lista de Target groups e selecionar o que criamos nos itens anteriores:

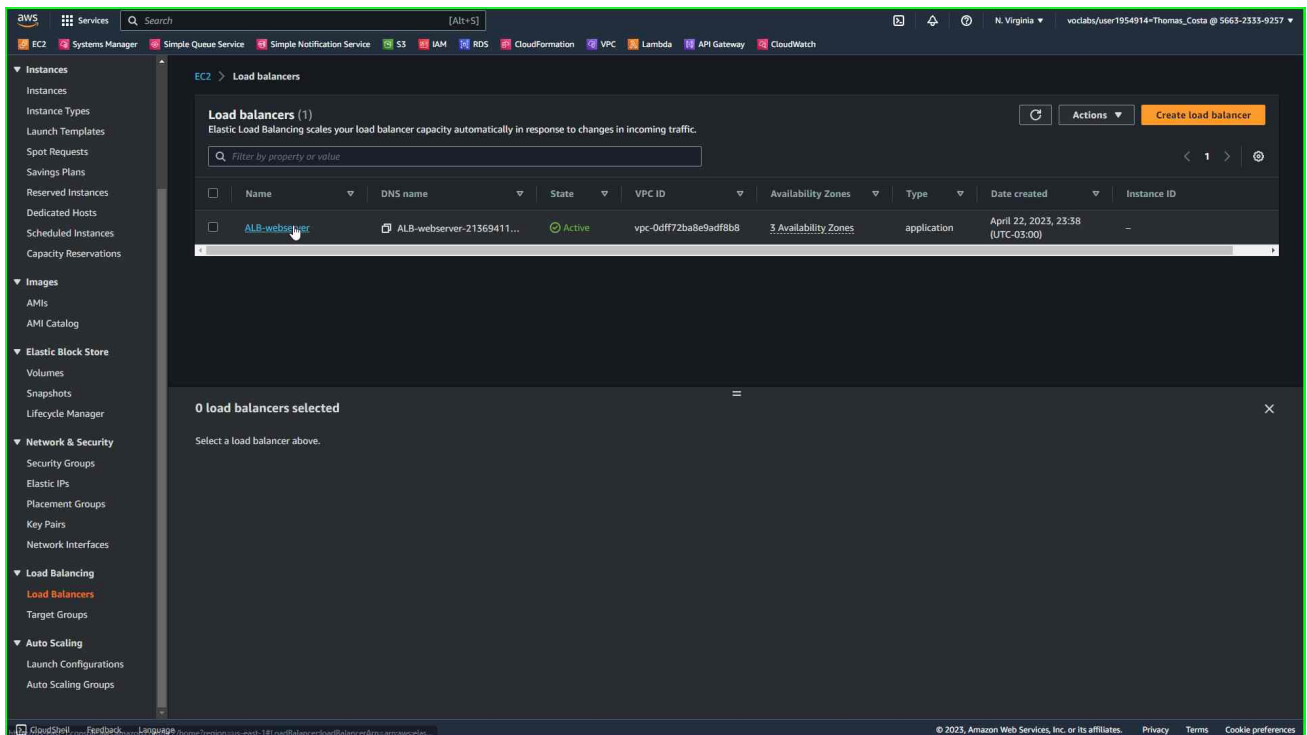


Balanceador reconhece as instâncias através do Target group conforme podemos ver o Health Status em healthy:

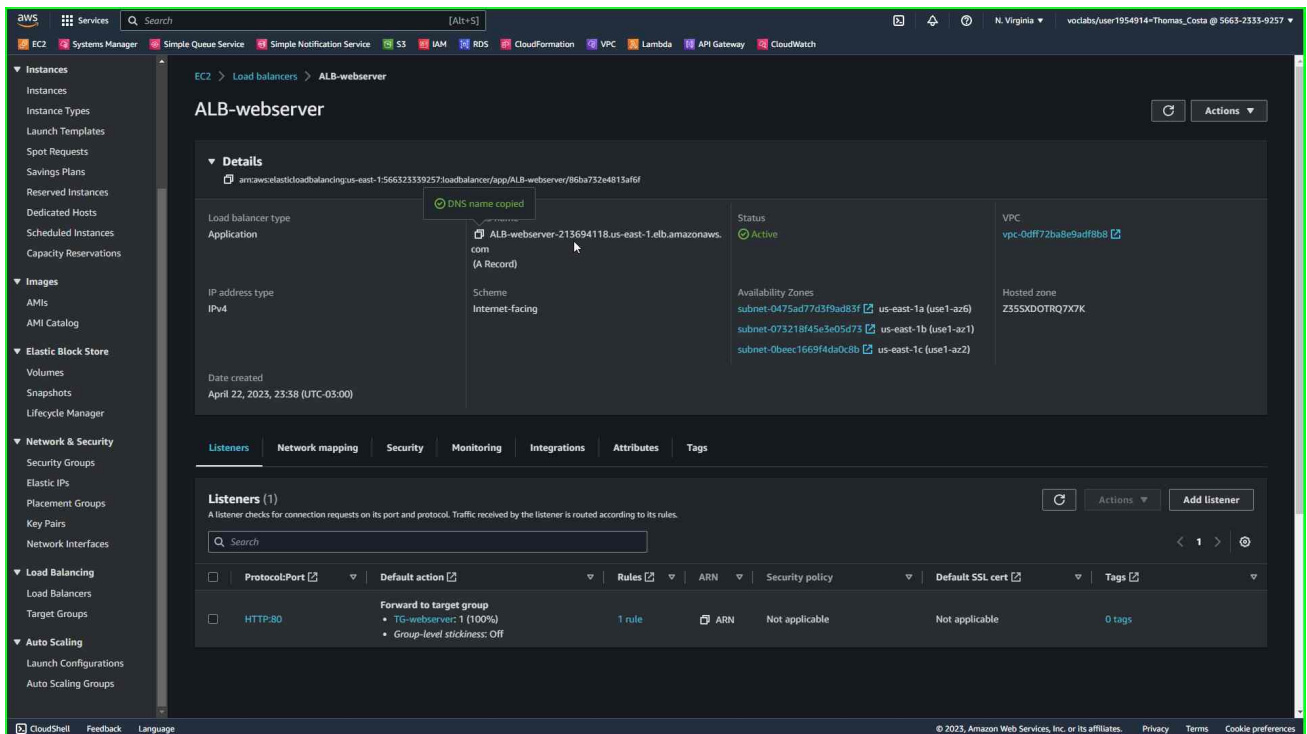


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Selecione novamente o balanceador:



Copie o endereço público do balanceador para testar no navegador:



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Balanceador funcionando e acessando os EC2. Podemos verificar que a cada requisição a solicitação é enviada para uma instância:

Zona de Disponibilidade e IPs

Zona de Disponibilidade: us-east-1b

IP Público: 44.197.216.124

IP Privado: 172.31.14.81



Implantando um Application Load Balancer (ALB) na AWS com EC2

Scripts do User Data

```
#!/bin/bash

sudo yum update -y

sudo yum install -y httpd

sudo systemctl start httpd

sudo systemctl enable httpd

EC2AZ=$(TOKEN=`curl -X PUT "http://169.254.169.254/latest/api/token" -H "X-aws-ec2-metadata-token-ttl-seconds: 21600"` && curl -H "X-aws-ec2-metadata-token: $TOKEN" -v
http://169.254.169.254/latest/meta-data/placement/availability-zone)

EC2IPPUBLIC=$(TOKEN=`curl -X PUT "http://169.254.169.254/latest/api/token" -H "X-aws-ec2-metadata-token-ttl-seconds: 21600"` && curl -H "X-aws-ec2-metadata-token: $TOKEN" -v
http://169.254.169.254/latest/meta-data/public-ipv4)

EC2IPPRIVATE=$(TOKEN=`curl -X PUT "http://169.254.169.254/latest/api/token" -H "X-aws-ec2-metadata-token-ttl-seconds: 21600"` && curl -H "X-aws-ec2-metadata-token: $TOKEN" -v
http://169.254.169.254/latest/meta-data/local-ipv4)

echo '<html><head><title>Minha Página EC2</title></head><body><h1>Zona de Disponibilidade e
IPs</h1><p><b>Zona de Disponibilidade:</b> AZID</p><p><b>IP Público:</b> IPPUBLIC</p><p><b>IP
Privado:</b> IPPRIVATE</p></body></html>' > /var/www/html/index.txt

sudo sed "s/AZID/$EC2AZ/" /var/www/html/index.txt > /var/www/html/index1.txt

sudo sed "s/IPPUBLIC/$EC2IPPUBLIC/" /var/www/html/index1.txt > /var/www/html/index2.txt

sudo sed "s/IPPRIVATE/$EC2IPPRIVATE/" /var/www/html/index2.txt > /var/www/html/index.html
```