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Prerequisites

Labs1c1 have to be done and the context for Administrative user have to activated on Command Line Session.

Labs6c1 have to be done, because you learn how to: Deploy Network Infrastructure, Securize instances, deploy applications using Docker, create a functional ALB and NLB. The only exception is that you have to delete the instances A and B of previous lab.

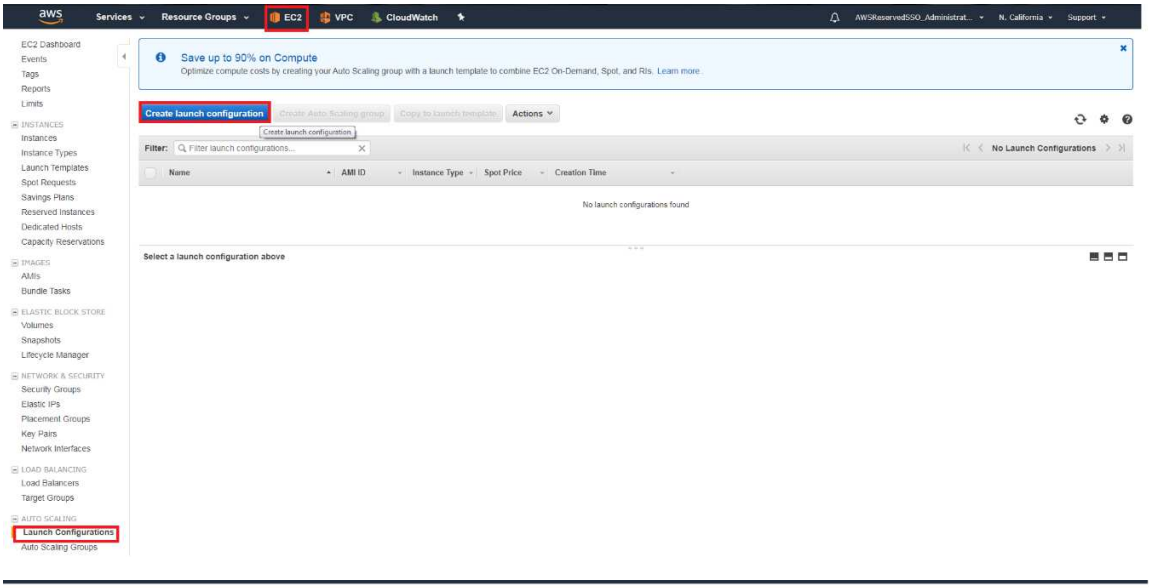
Lab 6B: Multi-tier Web App with Autoscaling

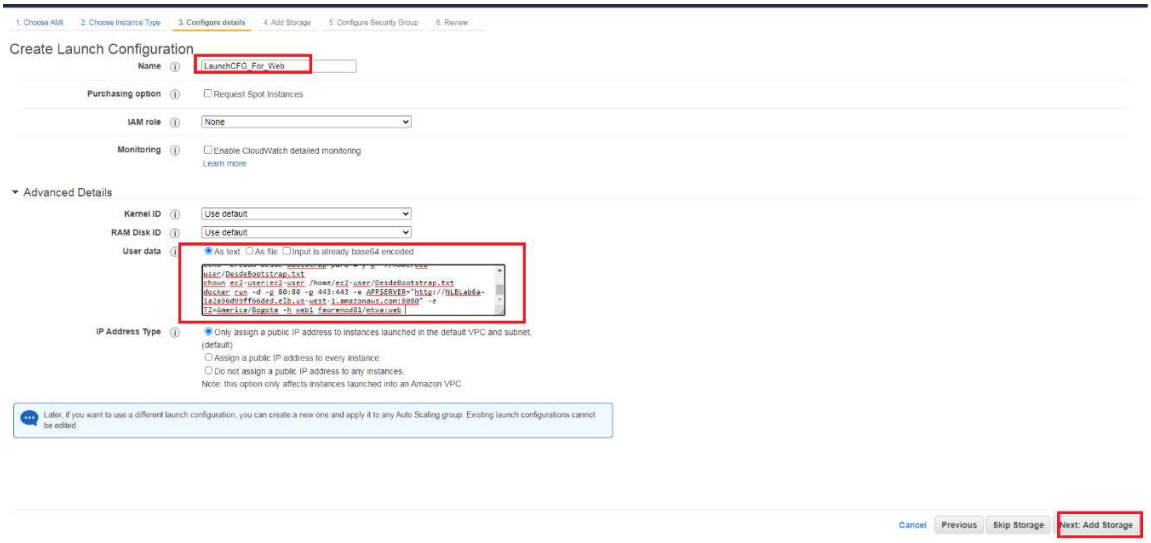
Create VPC, Subnet, IGW, NAT, Routing Table, Keys, Sec Groups (Labs4c1) VPC Peering (Labs4c2), Instances on App Layer (Labs5c1), ALB, NLB and their target groups (Labs6c1).

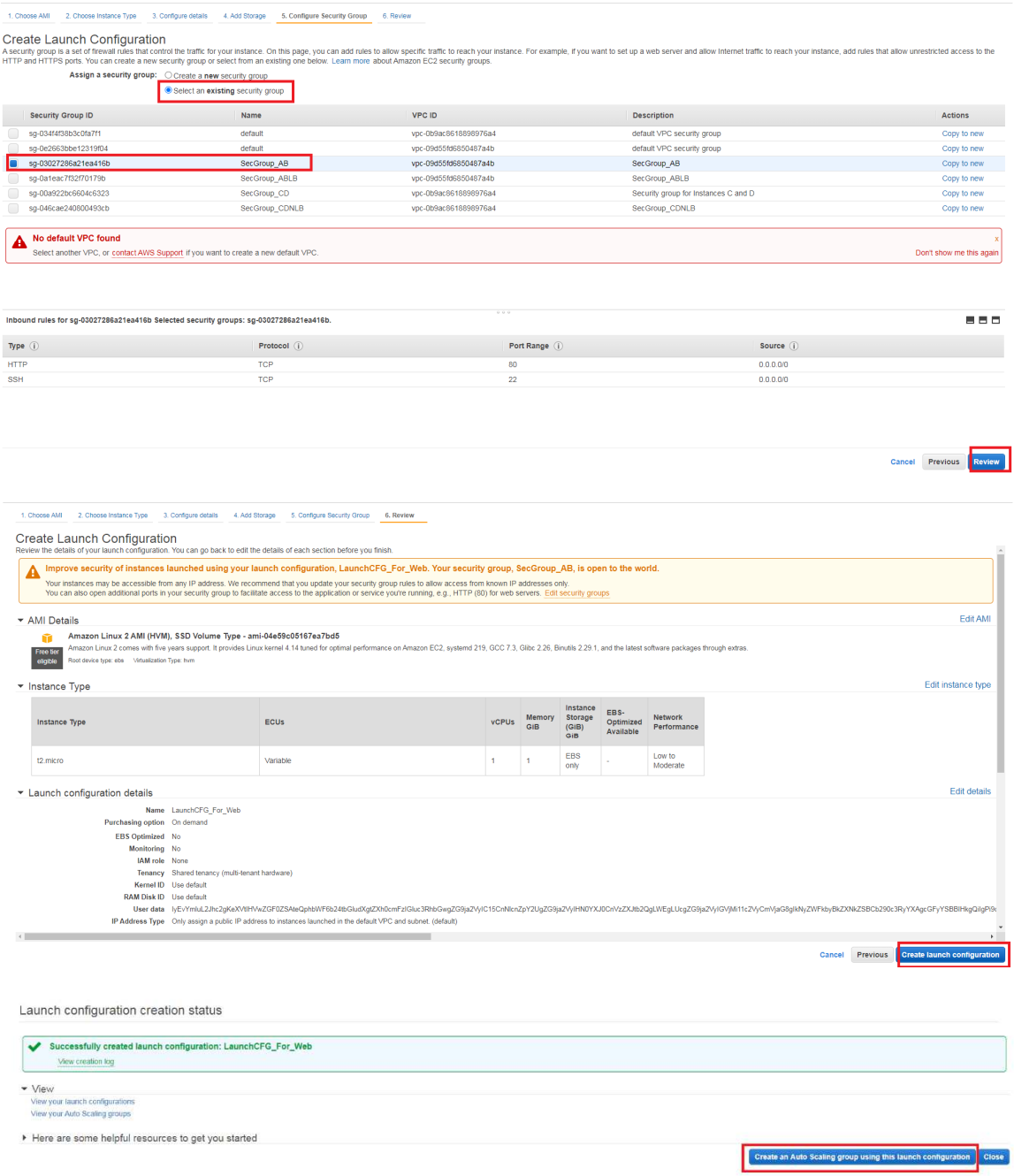
Review with the browser from Lab s6c1 as initial status. Delete Instances A and B to force that work Autoscaling Group

Lab 6B using Web Management Console

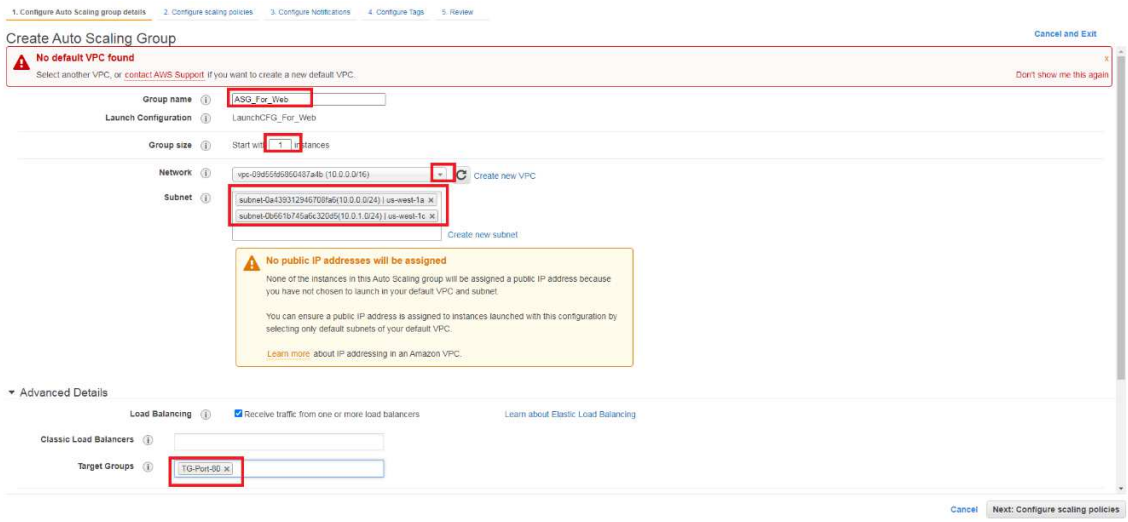
Create Launch Configuration, Autoscaling Group and internal configurations

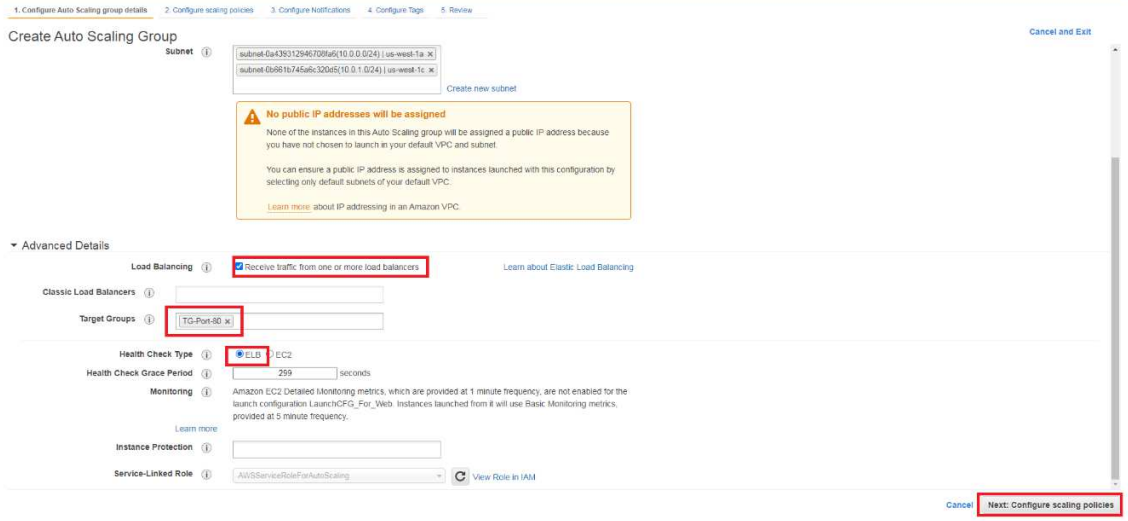






This is a shortcut to create a Auto Scaling Group from a Launch configuration:


1. Configure Auto Scaling group details
2. Configure scaling policies
3. Configure Notifications
4. Configure Tags
5. Review
Create Auto Scaling Group
Cancel and Exit
No default VPC found
Select another VPC, or contact AWS Support if you want to create a new default VPC.
Don't show me this again
Group name
ASG_For_Web
Launch Configuration
LaunchCFG_For_Web
Group size
Start with 1 instances
Network
Create new VPC
Subnet
subnet-0a4393129467 08fa6(10.0.0.0/24) | us-west-1a
subnet-0b661b745a6c320d5(10.0.1.0/24) | us-west-1c
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.
Advanced Details
Load Balancing
Receive traffic from one or more load balancers
Learn about Elastic Load Balancing
Classic Load Balancers
Target Groups
TG-Port-80
Cancel
Next: Configure scaling policies


1. Configure Auto Scaling group details
2. Configure scaling policies
3. Configure Notifications
4. Configure Tags
5. Review
Create Auto Scaling Group
Cancel and Exit
Subnet
subnet-0a4393129467 08fa6(10.0.0.0/24) | us-west-1a
subnet-0b661b745a6c320d5(10.0.1.0/24) | us-west-1c
Create new subnet
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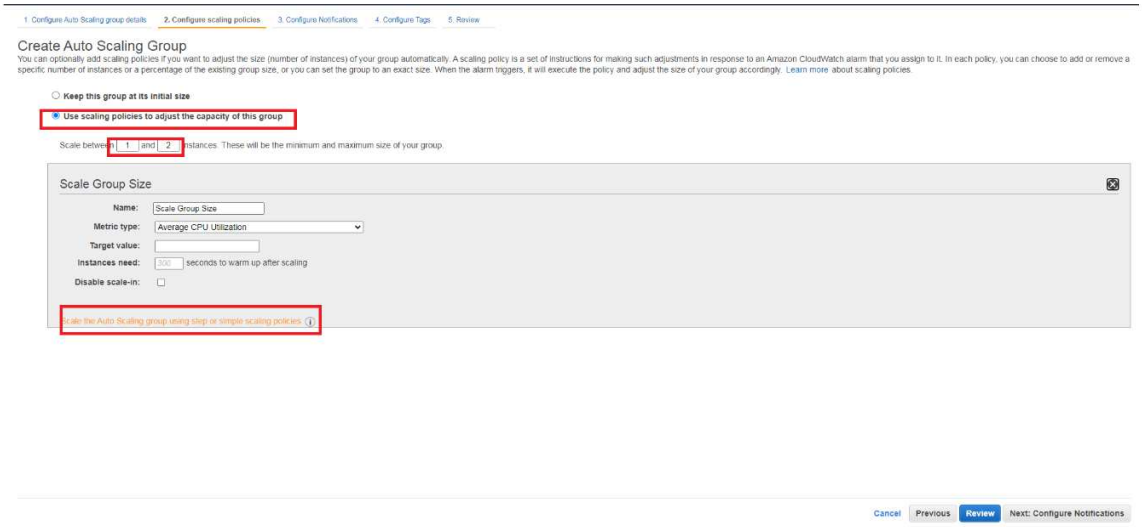
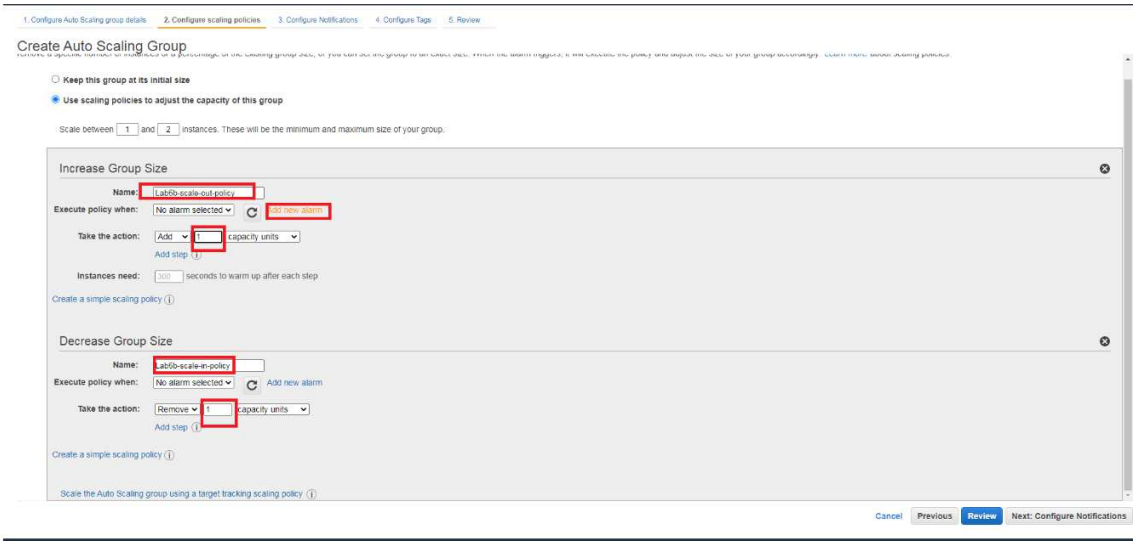
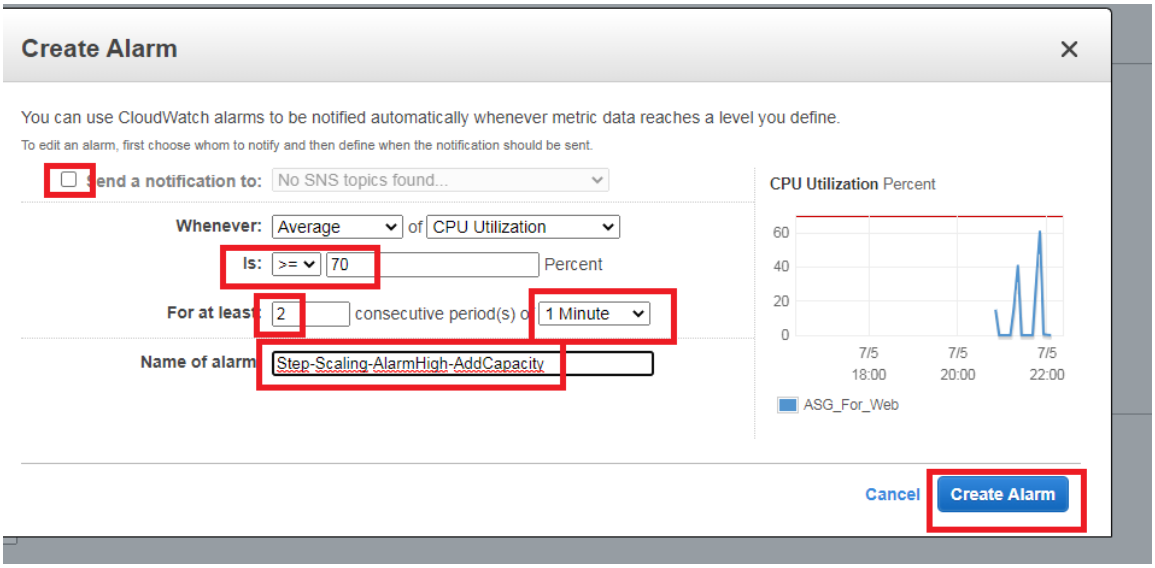
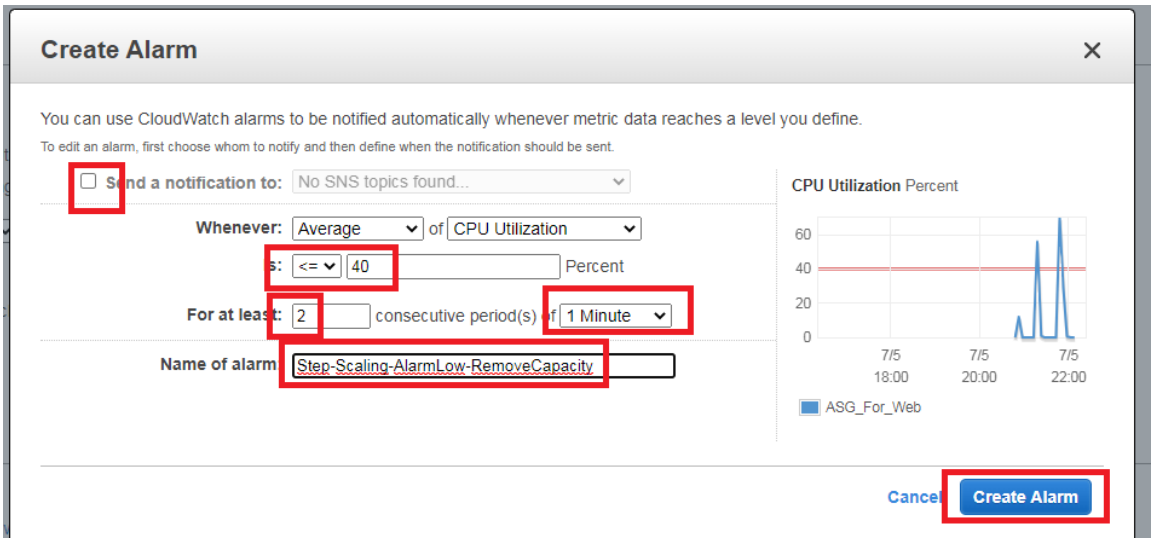
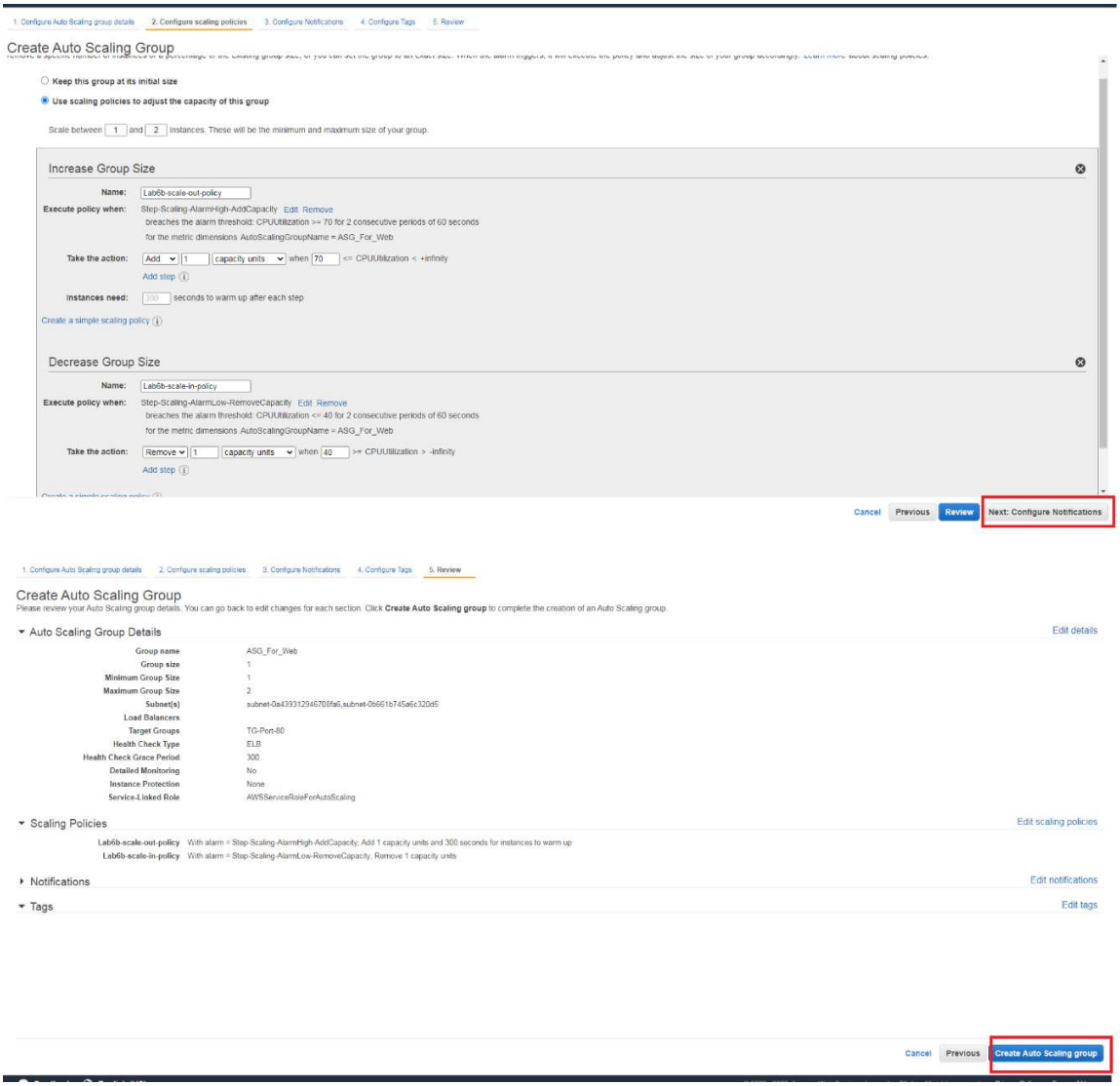
Learn more about IP addressing in an Amazon VPC.
Advanced Details
Load Balancing
Receive traffic from one or more load balancers
Learn about Elastic Load Balancing
Classic Load Balancers
Target Groups
TG-Port-80
Health Check Type
ELB
EC2
Health Check Grace Period
299
seconds
Monitoring
Amazon EC2 Detailed Monitoring metrics, which are provided at 1 minute frequency, are not enabled for the launch configuration LaunchCFG_For_Web. Instances launched from it will use Basic Monitoring metrics, provided at 5 minute frequency.
Learn more
Instance Protection
Service-Linked Role
AWSServiceRoleForAutoScaling
View Role in IAM
Cancel
Next: Configure scaling policies


1. Configure Auto Scaling group details
2. Configure scaling policies
3. Configure Notifications
4. Configure Tags
5. Review
Create Auto Scaling Group
You can optionally add scaling policies if you want to adjust the size (number of instances) of your group automatically. A scaling policy is a set of instructions for making such adjustments in response to an Amazon CloudWatch alarm that you assign to it. In each policy, you can choose to add or remove a specific number of instances or a percentage of the existing group size, or you can set the group to an exact size. When the alarm triggers, it will execute the policy and adjust the size of your group accordingly. Learn more about scaling policies.
Keep this group at its initial size
Use scaling policies to adjust the capacity of this group
Scale between 1 and 2 instances. These will be the minimum and maximum size of your group.
Scale Group Size
Name:
Scale Group Size
Metric type:
Average CPU Utilization
Target value:
Instances need:
300
seconds to warm up after scaling
Disable scale-in:
Create the Auto Scaling group using step or simple scaling policies
Cancel
Previous
Review
Next: Configure Notifications

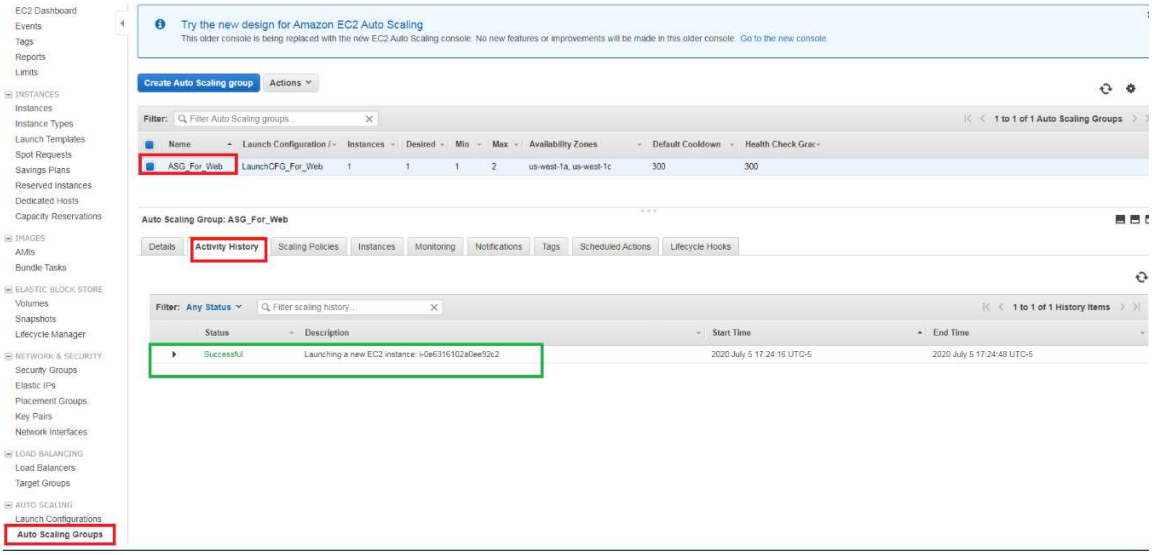

1. Configure Auto Scaling group details
2. Configure scaling policies
3. Configure Notifications
4. Configure Tags
5. Review
Create Auto Scaling Group
Keep this group at its initial size
Use scaling policies to adjust the capacity of this group
Scale between 1 and 2 instances. These will be the minimum and maximum size of your group.
Increase Group Size
Name: Lab6b-scale-out-policy
Execute policy when: No alarm selected
Add new alarm
Take the action: Add 1 capacity units
Add step
Instances need: 300 seconds to warm up after each step
Create a simple scaling policy
Decrease Group Size
Name: Lab6b-scale-in-policy
Execute policy when: No alarm selected
Add new alarm
Take the action: Remove 1 capacity units
Add step
Create a simple scaling policy
Scale the Auto Scaling group using a target tracking scaling policy
Cancel
Previous
Review
Next: Configure Notifications

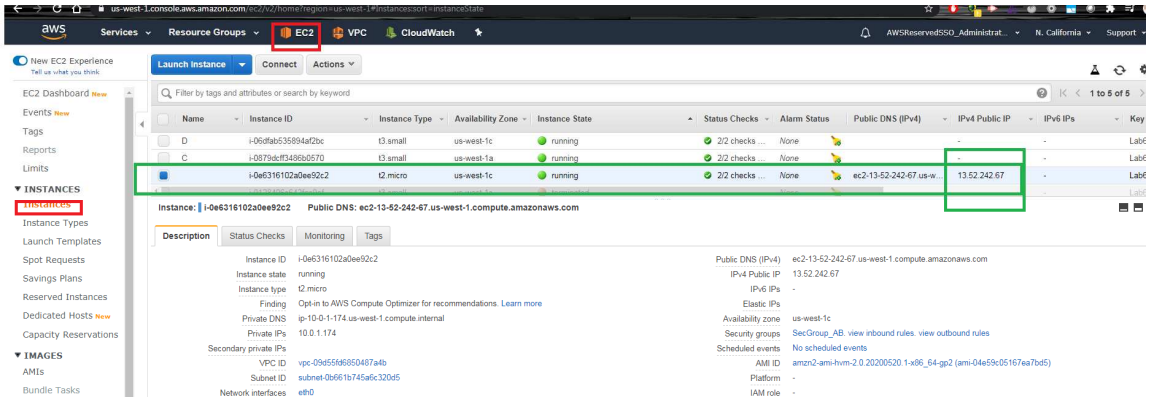

Create Alarm
You can use CloudWatch alarms to be notified automatically whenever metric data reaches a level you define.
To edit an alarm, first choose whom to notify and then define when the notification should be sent.
Send a notification to:
No SNS topics found...
Whenever:
Average
of
CPU Utilization
Is:
>=
70
Percent
For at least:
2
consecutive period(s) of
1 Minute
Name of alarm:
Step-Scaling-AlarmHigh-AddCapacity
CPU Utilization Percent
60
40
20
0
7/5
18:00
7/5
20:00
7/5
22:00
ASG_For_Web
Cancel
Create Alarm


Create Alarm
You can use CloudWatch alarms to be notified automatically whenever metric data reaches a level you define.
To edit an alarm, first choose whom to notify and then define when the notification should be sent.
Send a notification to:
No SNS topics found...
Whenever:
Average
of
CPU Utilization
Is:
<=
40
Percent
For at least:
2
consecutive period(s) of
1 Minute
Name of alarm:
Step-Scaling-AlarmLow-RemoveCapacity
CPU Utilization Percent
60
40
20
0
7/5
18:00
7/5
20:00
7/5
22:00
ASG_For_Web
Cancel
Create Alarm



Finally, you can check that a new instance is created:





Go to “Forcing Policy Status” section

Lab 6B using Command Line (Windows)

Create Launch Configuration, Autoscaling Group, Simple Scaling Policy with Cloudwatch as trigger

```
rem Se tiene que crear un Launch Template
rem Se crea ua configuracion para la capa Web
aws autoscaling create-launch-configuration --launch-configuration-
name LaunchCFG_For_Web --image-id %AMI% --instance-type %instance_type% --
security-groups %SecGroup_AB_Id% --key-name Lab6a --user-
data file://bootstrapAB.txt >tmpFile
rem Se tiene que crear un AutoScaling Group para un LB
aws autoscaling create-auto-scaling-group --auto-scaling-group-
name ASG_For_Web --launch-configuration-name LaunchCFG_For_Web --vpc-zone-
identifier %pbsn1_Id%,%pbsn2_Id% --target-group-arns %TG80_ARN% --max-
size 5 --min-size 1 --desired-capacity 1
```

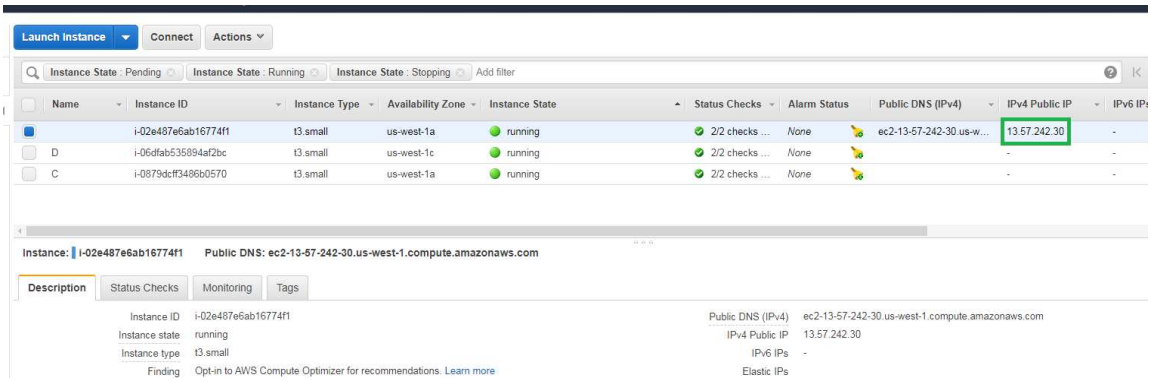
```
rem Se crea un escalamiento simple en crecimiento y decreciendo. https://doc
s.aws.amazon.com/autoscaling/ec2/userguide/as-scaling-simple-
step.html#simple-scaling-policies-aws-cli
aws autoscaling put-scaling-policy --policy-name Lab6b-scale-out-policy --
auto-scaling-group-name ASG_For_Web --scaling-adjustment 50 --adjustment-
type PercentChangeInCapacity|jq ".PolicyARN" >tmpFile
set /p ASG_Scaleout_Policy= <tmpFile
aws autoscaling put-scaling-policy --policy-name Lab6b-scale-in-policy --
auto-scaling-group-name ASG_For_Web --scaling-adjustment -1 --adjustment-
type ChangeInCapacity --cooldown 180 |jq ".PolicyARN" >tmpFile
set /p ASG_Scalein_Policy= <tmpFile
aws cloudwatch put-metric-alarm --alarm-name Step-Scaling-AlarmHigh-
AddCapacity  --metric-name CPUUtilization --namespace AWS/EC2 --
statistic Average  --period 120 --evaluation-periods 1 --threshold 70 --
comparison-operator GreaterThanOrEqualToThreshold --
dimensions "Name=AutoScalingGroupName,Value=ASG_For_Web" --alarm-
actions %ASG_Scaleout_Policy%
aws cloudwatch put-metric-alarm --alarm-name Step-Scaling-AlarmLow-
RemoveCapacity --metric-name CPUUtilization --namespace AWS/EC2 --
statistic Average --period 120 --evaluation-periods 1 --threshold 40 --
comparison-operator LessThanOrEqualToThreshold --
dimensions "Name=AutoScalingGroupName,Value=ASG_For_Web" --alarm-
actions %ASG_Scalein_Policy%
```

```
C:\Code\bsg-saa-c02\AWS_SAA\Code\s6c1\CLI>aws autoscaling create-launch-configuration --launch-configuration-name LaunchCFG_For_Web --image-id %AMI% --instance-
type %instance_type% --security-groups %SecGroup_AB_Id% --key-name Lab6a --user-data file://bootstrapAB.txt >tmpFile

C:\Code\bsg-saa-c02\AWS_SAA\Code\s6c1\CLI>aws autoscaling create-auto-scaling-group --auto-scaling-group-name ASG_For_Web --launch-configuration-name LaunchCFG_
For_Web --vpc-zone-identifier %pbsn1_Id%,%pbsn2_Id% --target-group-arns %TG80_ARN% --max-size 5 --min-size 1 --desired-capacity 1


C:\Code\bsg-saa-c02\AWS_SAA\Code\s6c1\CLI>aws autoscaling put-scaling-policy --policy-name ASG_For_Web-policy --auto-scaling-group-name ASG_For_Web --scaling-ad
justment 30 --adjustment-type PercentChangeInCapacity --min-adjustment-magnitude 2
{
    "PolicyARN": "arn:aws:autoscaling:us-west-1:455469987488:scalingPolicy:9df4ce76-f8dd-435a-9768-215b404d49a9:autoScalingGroupName/ASG_For_Web:policyName/ASG_
For_Web-policy",
    "Alarms": []
}


C:\Code\bsg-saa-c02\AWS_SAA\Code\s6c1\CLI>aws autoscaling put-scaling-policy --policy-name ASG_For_Web_ScaleIn-policy --auto-scaling-group-name ASG_For_Web --sc
aling-adjustment -1 --adjustment-type ChangeInCapacity --cooldown 180
{
    "PolicyARN": "arn:aws:autoscaling:us-west-1:455469987488:scalingPolicy:1d8a89ea-9239-4c5b-bcc9-da58f02c0190:autoScalingGroupName/ASG_For_Web:policyName/ASG_
For_Web_ScaleIn-policy",
    "Alarms": []
}
```

Go to “Forcing Policy Status” section

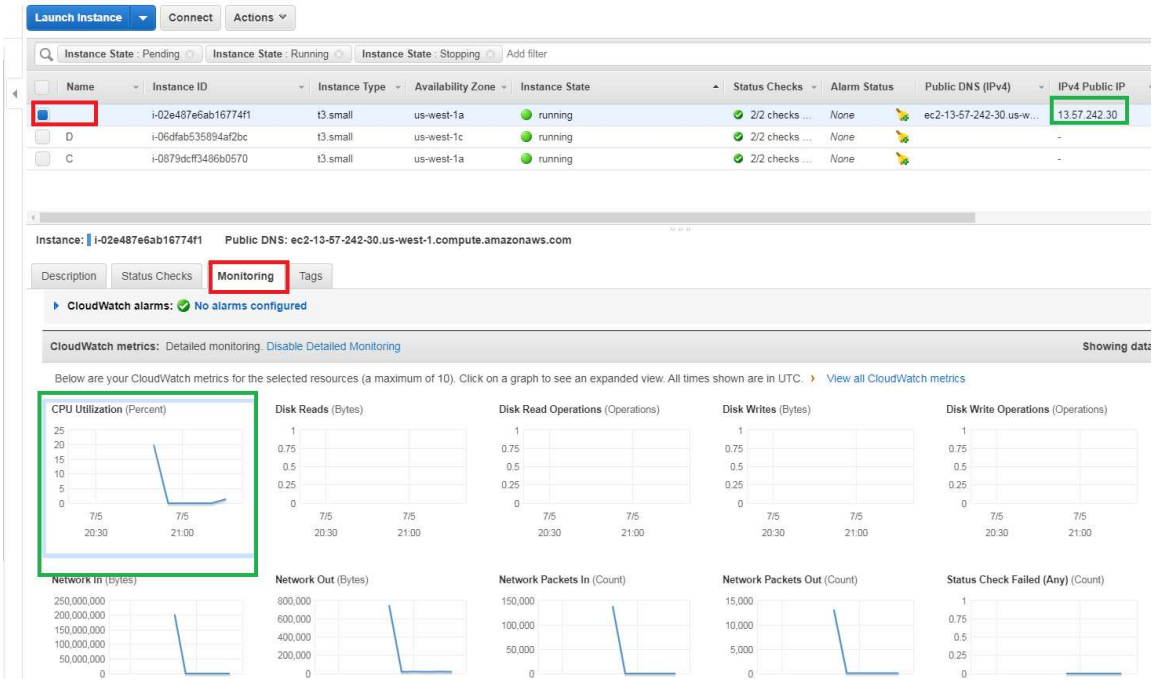
Forcing Policy Status

Given the new IP, goes to Putty and run the following commands:

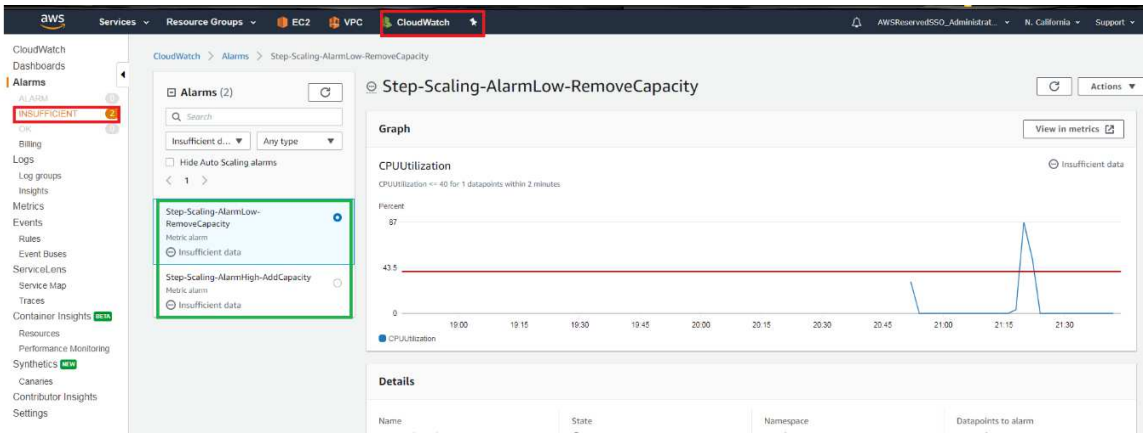



```
putty -i "Lab6a.ppk" ec2-user@13.57.242.30
putty -i "Lab6a.ppk" ec2-user@13.57.242.30
sudo amazon-linux-extras install epel -y
sudo yum install stress -y
rem Definir la cantidad de CPUs a cargar, esto depende del tipo de instancia
 a realizar la prueba. t3.small tiene 2 cpus
stress --cpu 2 --timeout 360
```

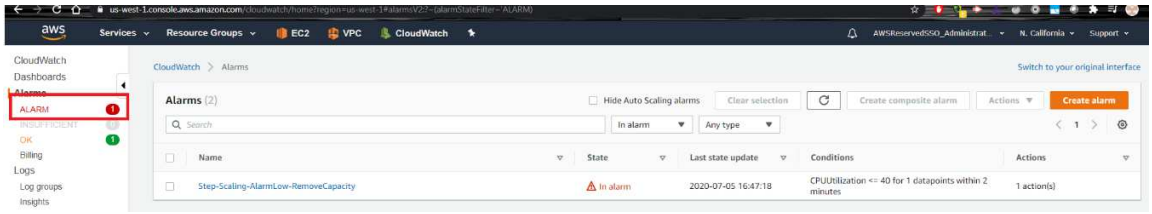
You can check its status on Monitoring on the same instance page.

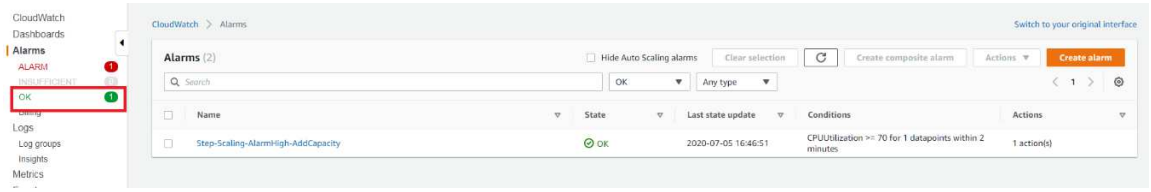


And you check the status of the alarmas on Cloudwatch. At starting, there are “insufficient data” status upto have a complete period.

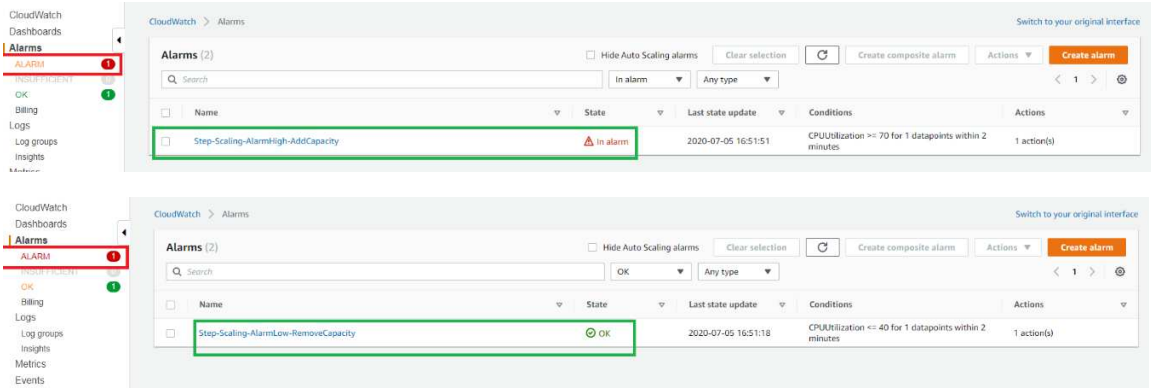


Later,

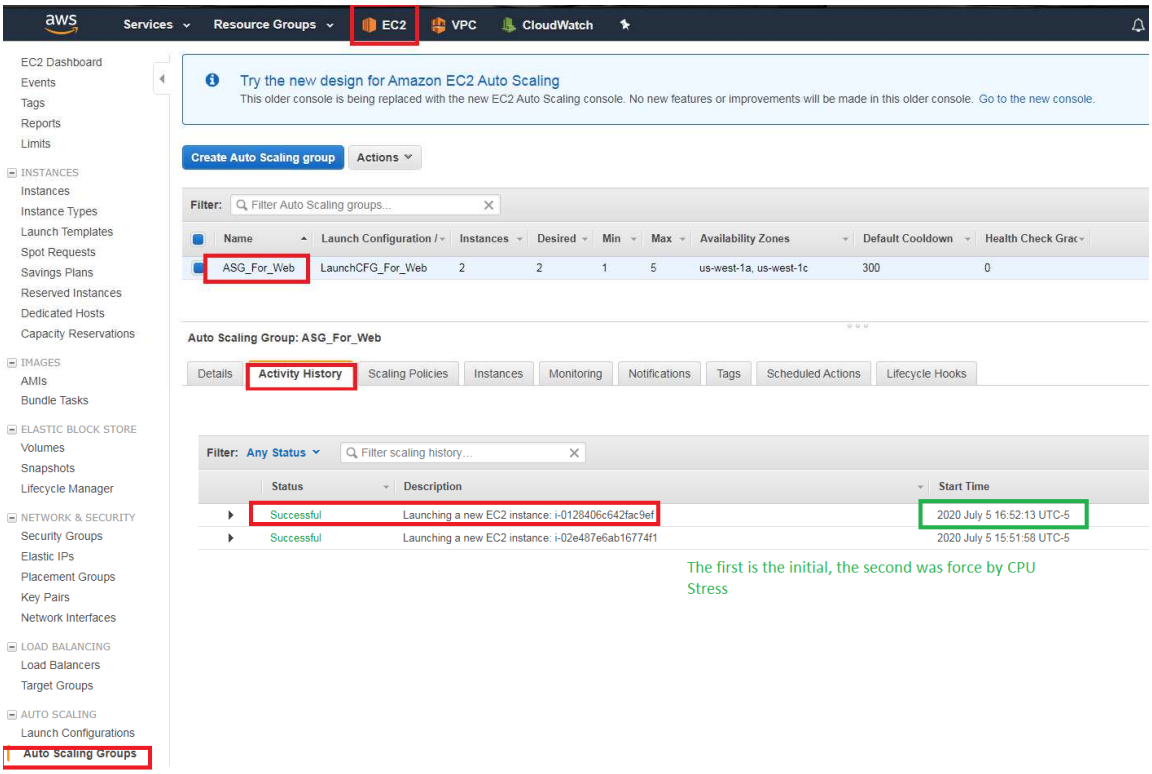




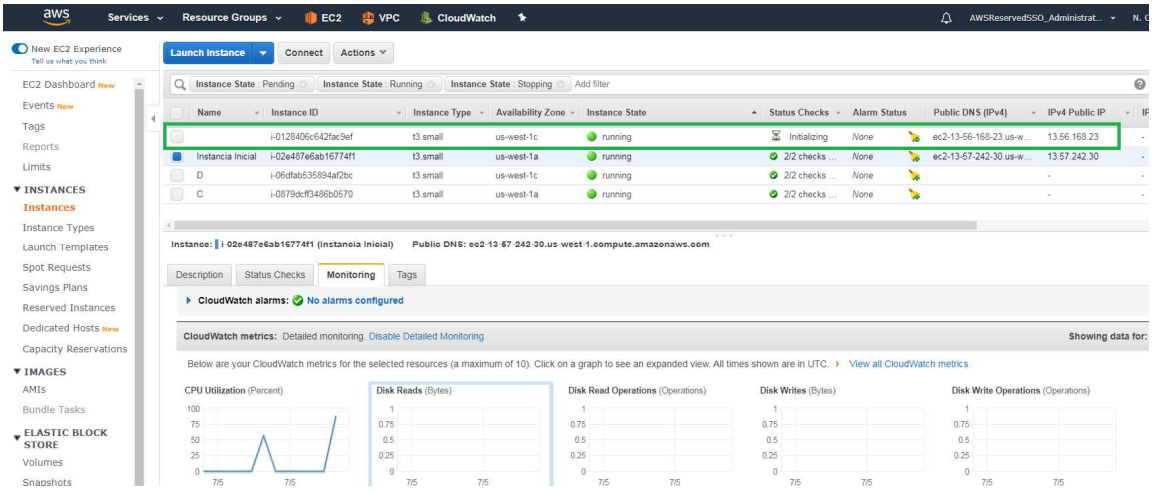
When it detects the CPU stress, the alarms change its statues.



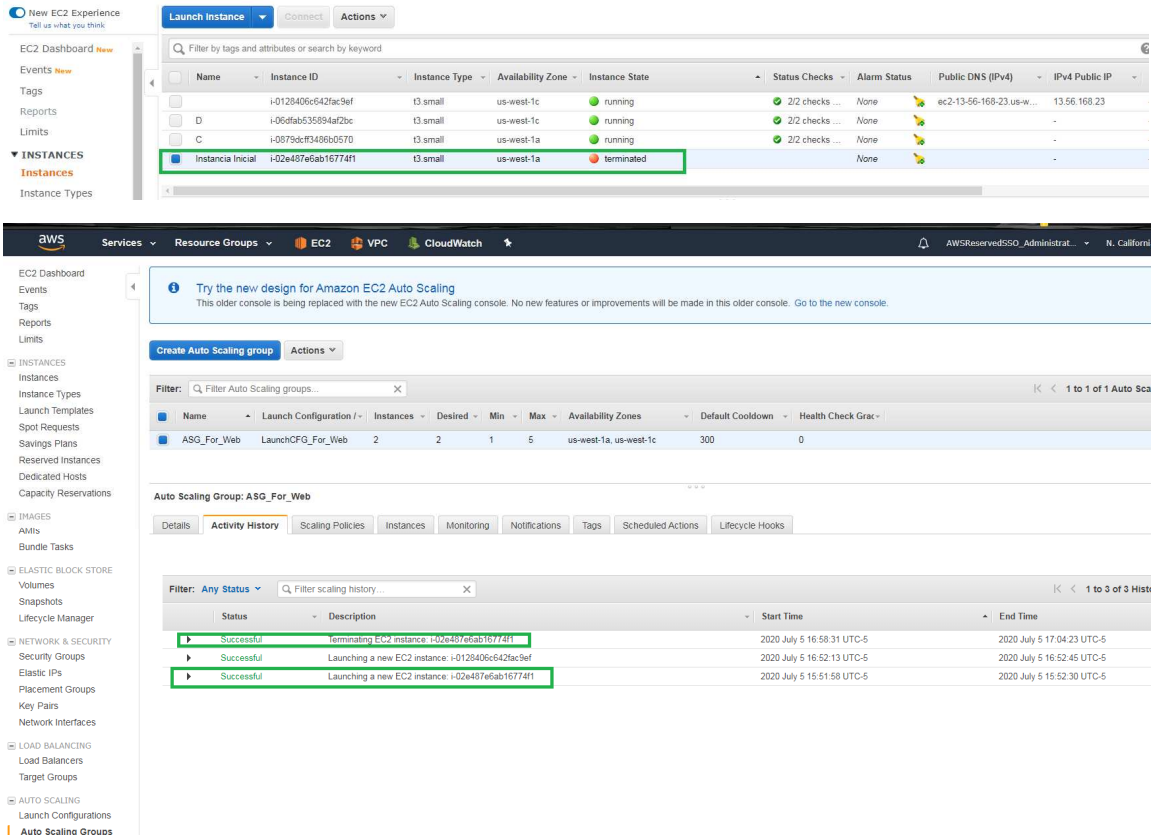
And you can see the activity of Autoscaling group history,



Even on the instance page, you see the new instance



On the other way, to scale-in you have to wait until it happened, and the default policy is to delete the older.



Clean Resources

`VPC: Peering Connections`

EC2: Instances
EC2: Load LoadBalancers
EC2: TargetGroups
VPC: NAT gateway
VPC: EIP
EC2: Keypair
EC2: Security Group
VPC: VPC