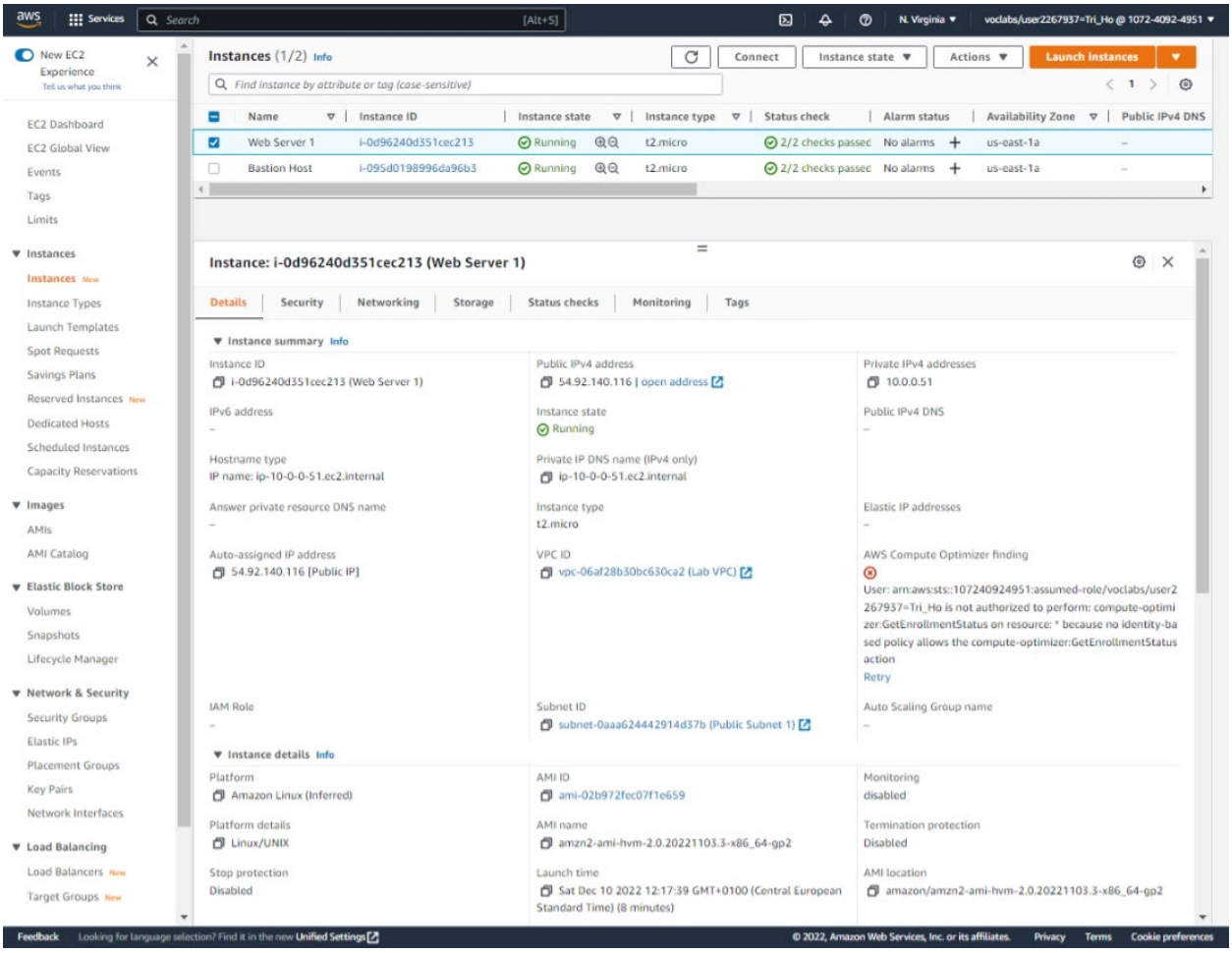
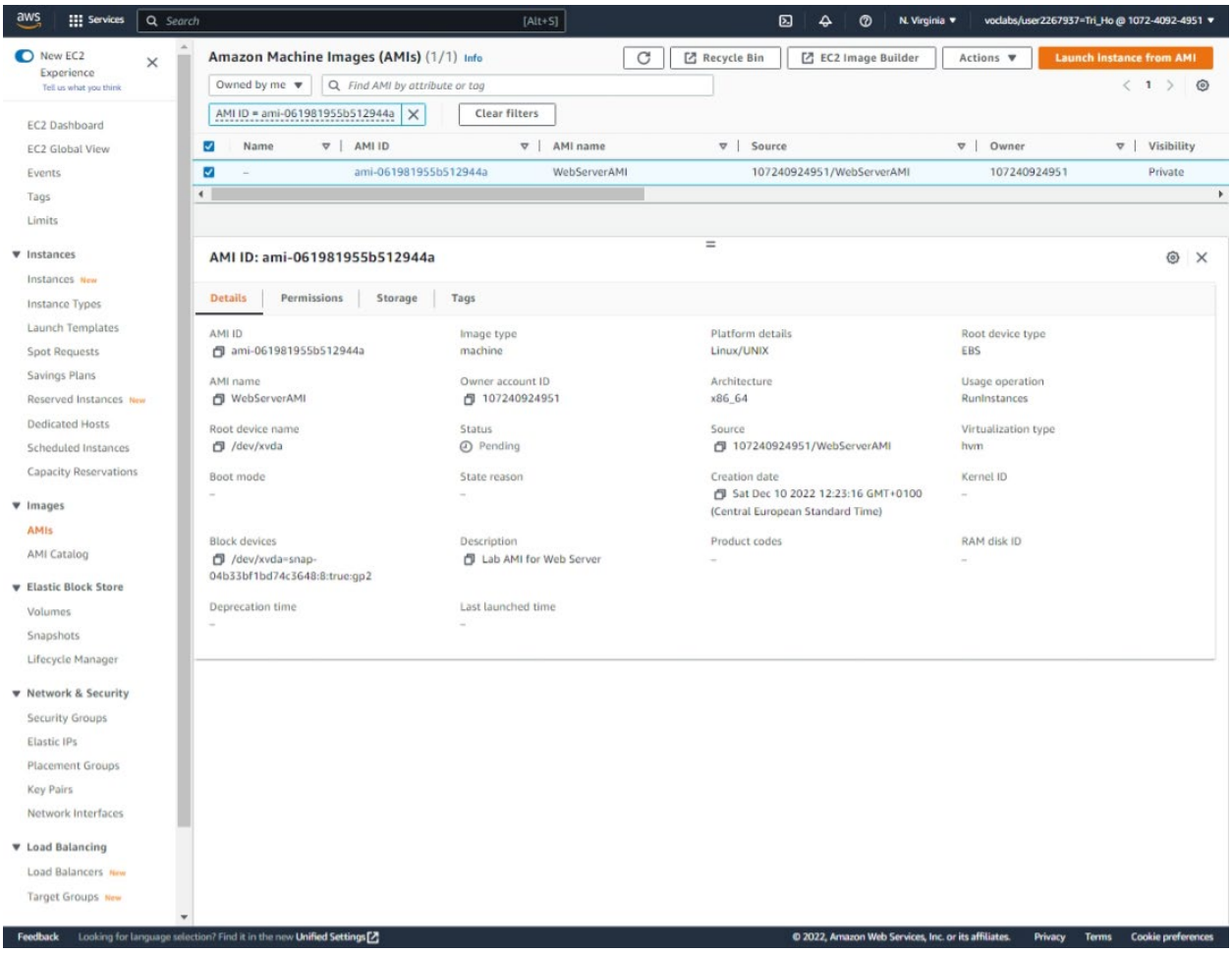
Scale and Load Balance Your Architecture

CMIT 326 7387 Cloud Technologies

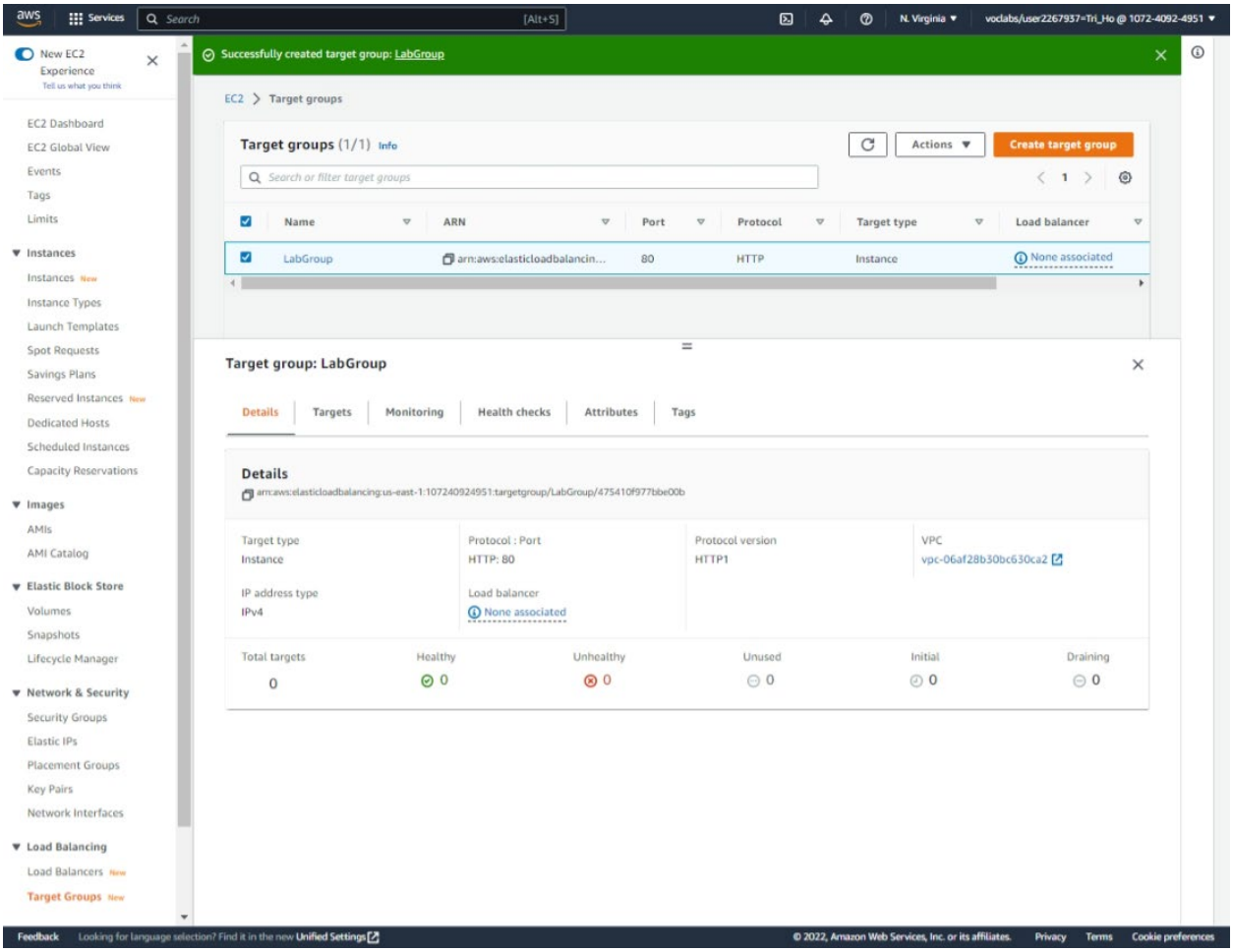
Professor

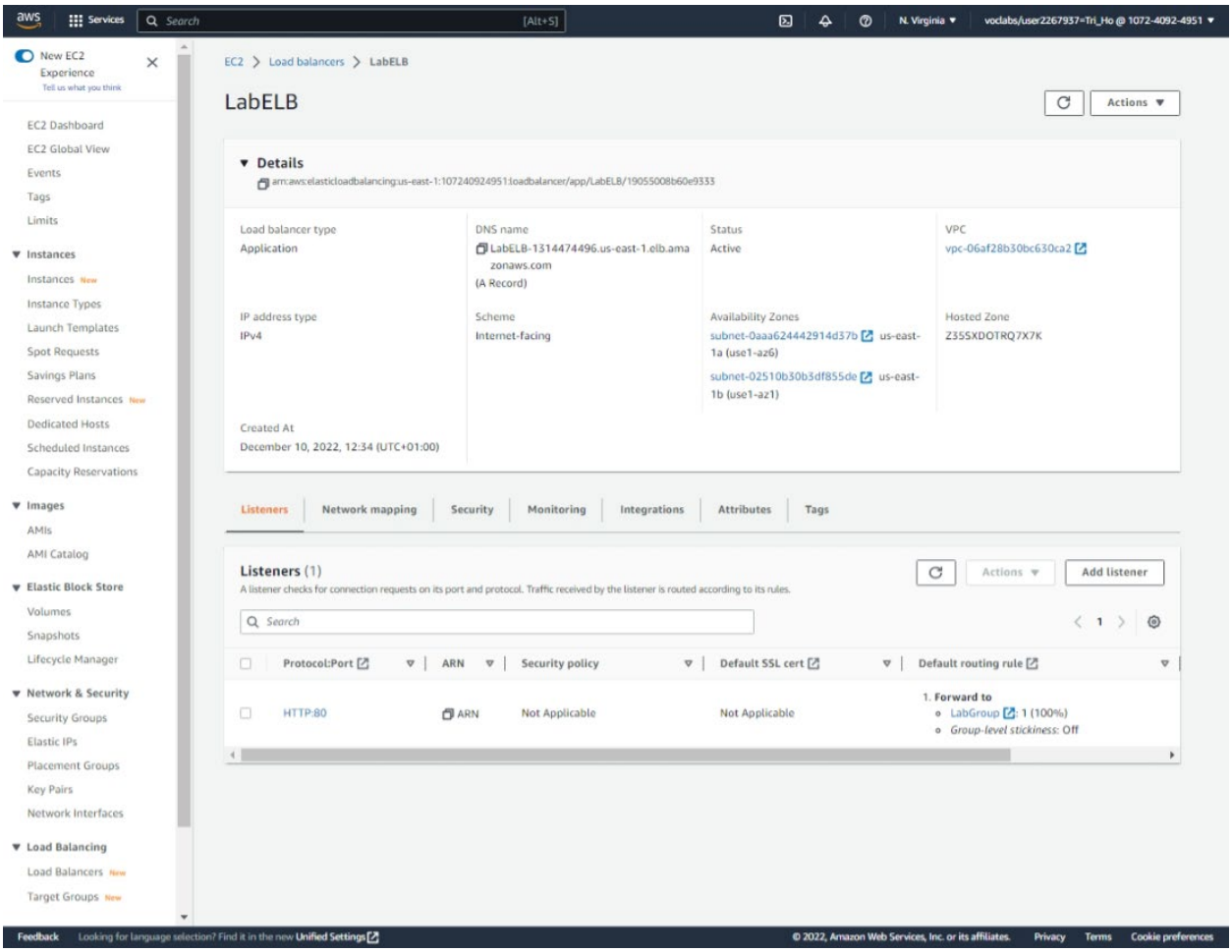
Task 1: Create an AMI for Auto Scaling

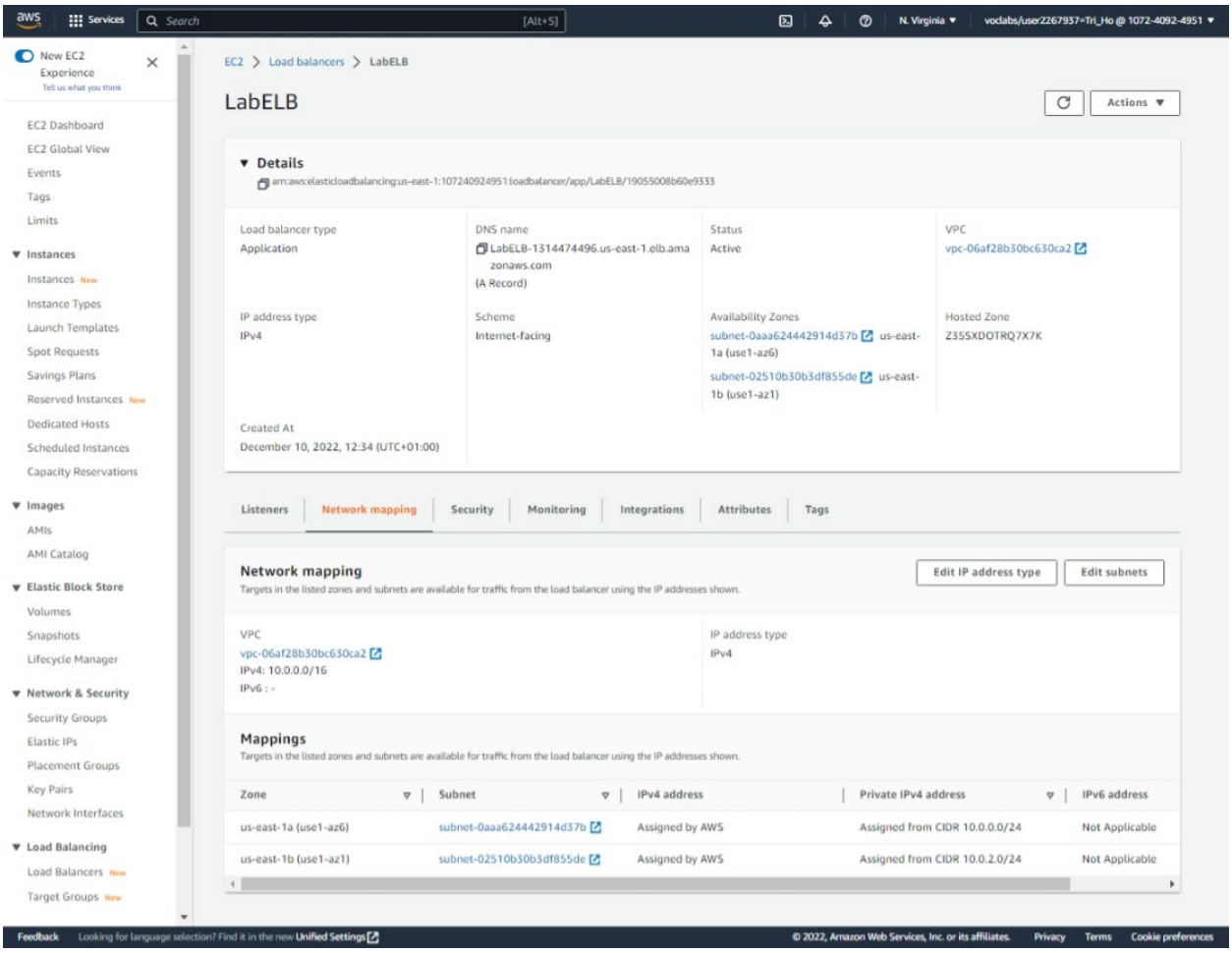


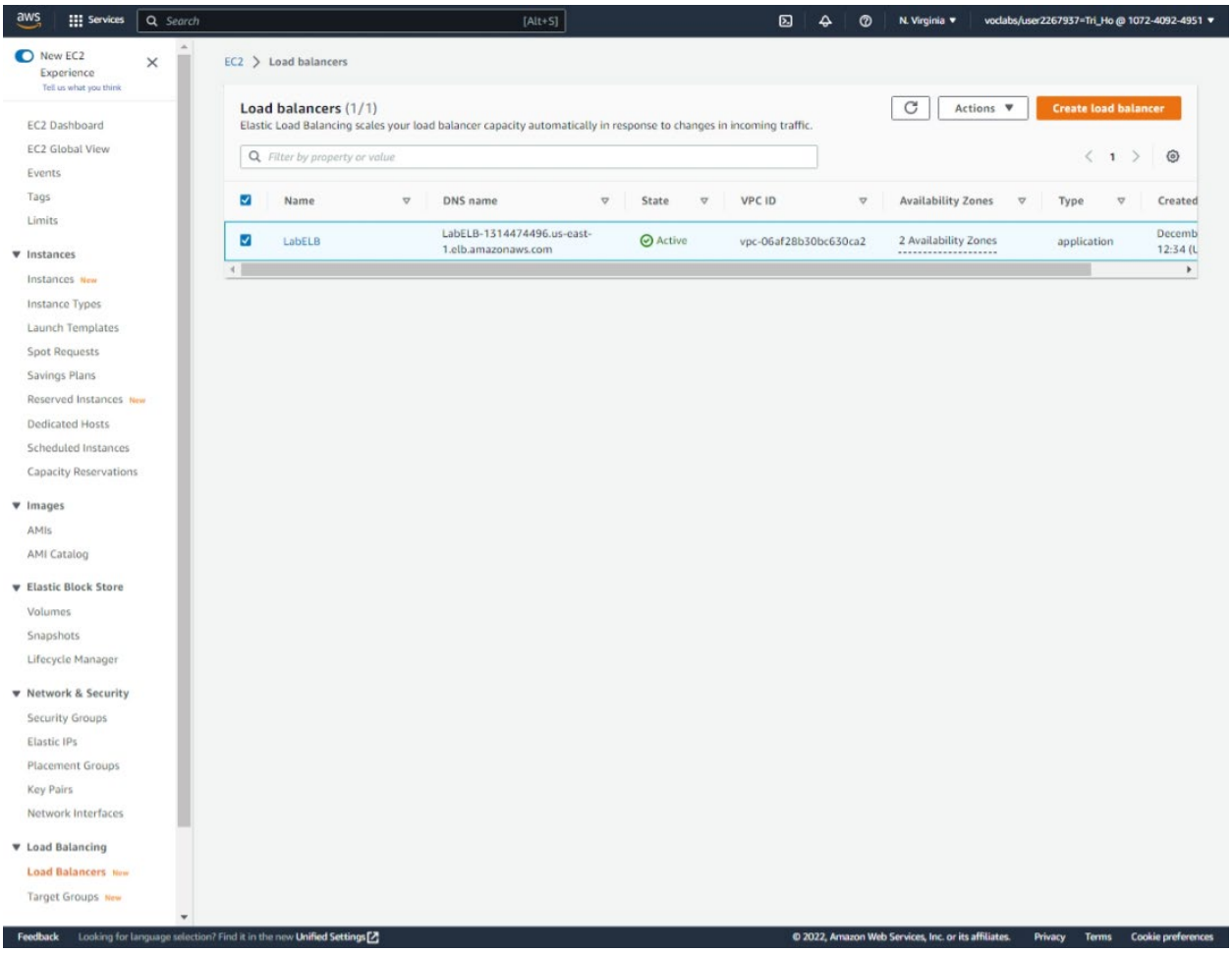

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
Load Balancing
Load Balancers New
Target Groups New
Amazon Machine Images (AMIs) (1/1) Info
Recycle Bin
EC2 Image Builder
Actions
Launch instance from AMI
Owned by me
Find AMI by attribute or tag
AMI ID = ami-061981955b512944a
Clear filters
Name
AMI ID
AMI name
Source
Owner
Visibility
ami-061981955b512944a
WebServerAMI
107240924951/WebServerAMI
107240924951
Private
AMI ID: ami-061981955b512944a
Details
Permissions
Storage
Tags
AMI ID
ami-061981955b512944a
Image type
machine
Platform details
Linux/UNIX
Root device type
EBS
AMI name
WebServerAMI
Owner account ID
107240924951
Architecture
x86_64
Usage operation
RunInstances
Root device name
/dev/xvda
Status
Pending
Source
107240924951/WebServerAMI
Virtualization type
hvm
Boot mode
State reason
Creation date
Sat Dec 10 2022 12:23:16 GMT+0100 (Central European Standard Time)
Kernel ID
Block devices
/dev/xvda=snap-04b33bf1bd74c3648:8:true:gp2
Description
Lab AMI for Web Server
Product codes
RAM disk ID
Deprecation time
Last launched time
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

Task 2: Create a Load Balancer

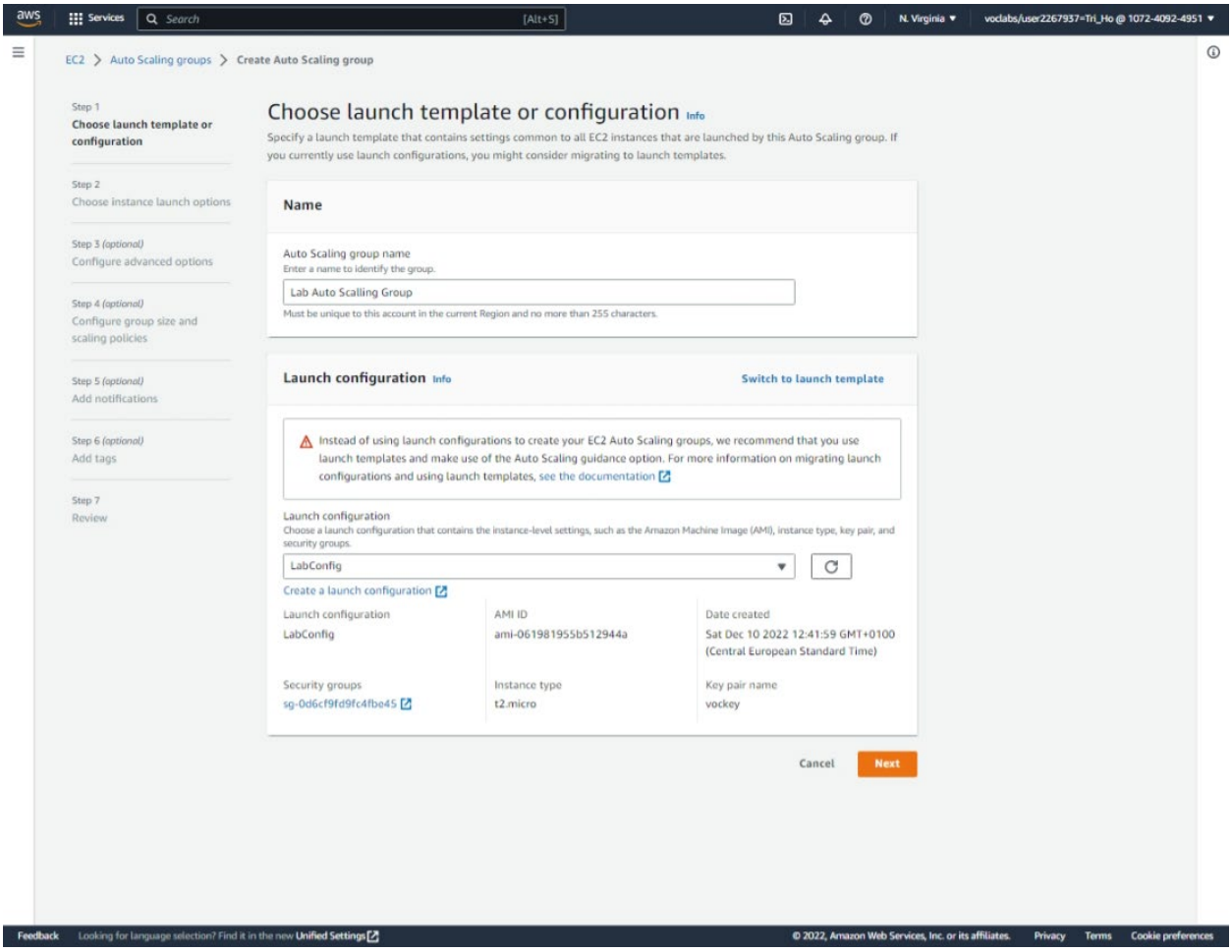


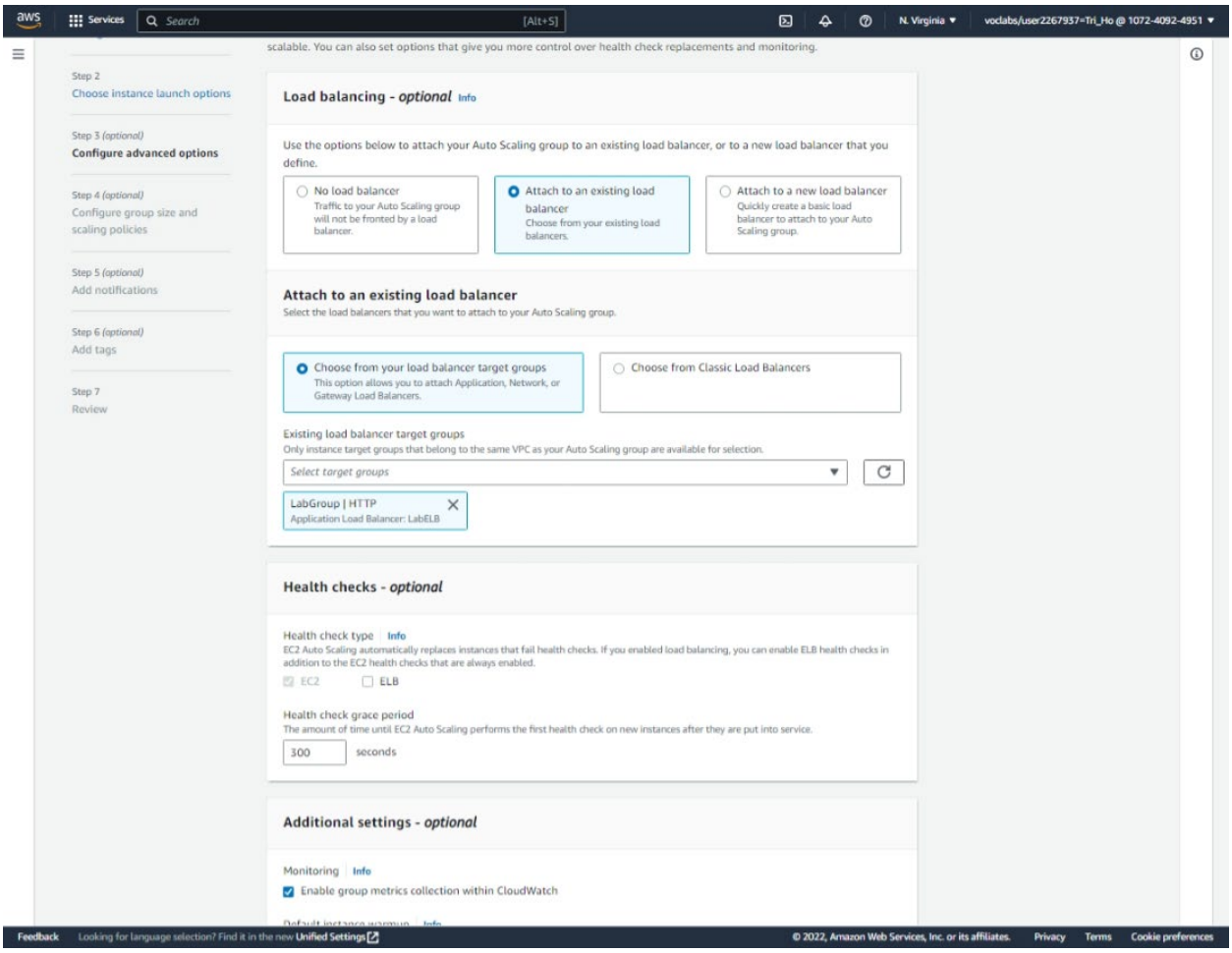

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
Load Balancing
Load Balancers New
Target Groups New
EC2 > Load balancers > LabELB
LabELB
Actions
Details
arn:aws:elasticloadbalancing:us-east-1:107240924951:loadbalancer/app/LabELB/19055008b60e9333
Load balancer type
Application
DNS name
LabELB-1314474496.us-east-1.elb.amazonaws.com
(A Record)
Status
Active
VPC
vpc-06af28b30bc630ca2
IP address type
IPv4
Scheme
Internet-facing
Availability Zones
subnet-0aaa624442914d37b us-east-1a (use1-az6)
subnet-02510b30b3df855de us-east-1b (use1-az1)
Hosted Zone
Z35SXDOTRQ7X7K
Created At
December 10, 2022, 12:34 (UTC+01:00)
Listeners
Network mapping
Security
Monitoring
Integrations
Attributes
Tags
Listeners (1)
A listener checks for connection requests on its port and protocol. Traffic received by the listener is routed according to its rules.
Actions
Add listener
Search
1
Protocol:Port
ARN
Security policy
Default SSL cert
Default routing rule
HTTP:80
ARN
Not Applicable
Not Applicable
1. Forward to
LabGroup: 1 (100%)
Group-level stickiness: Off
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

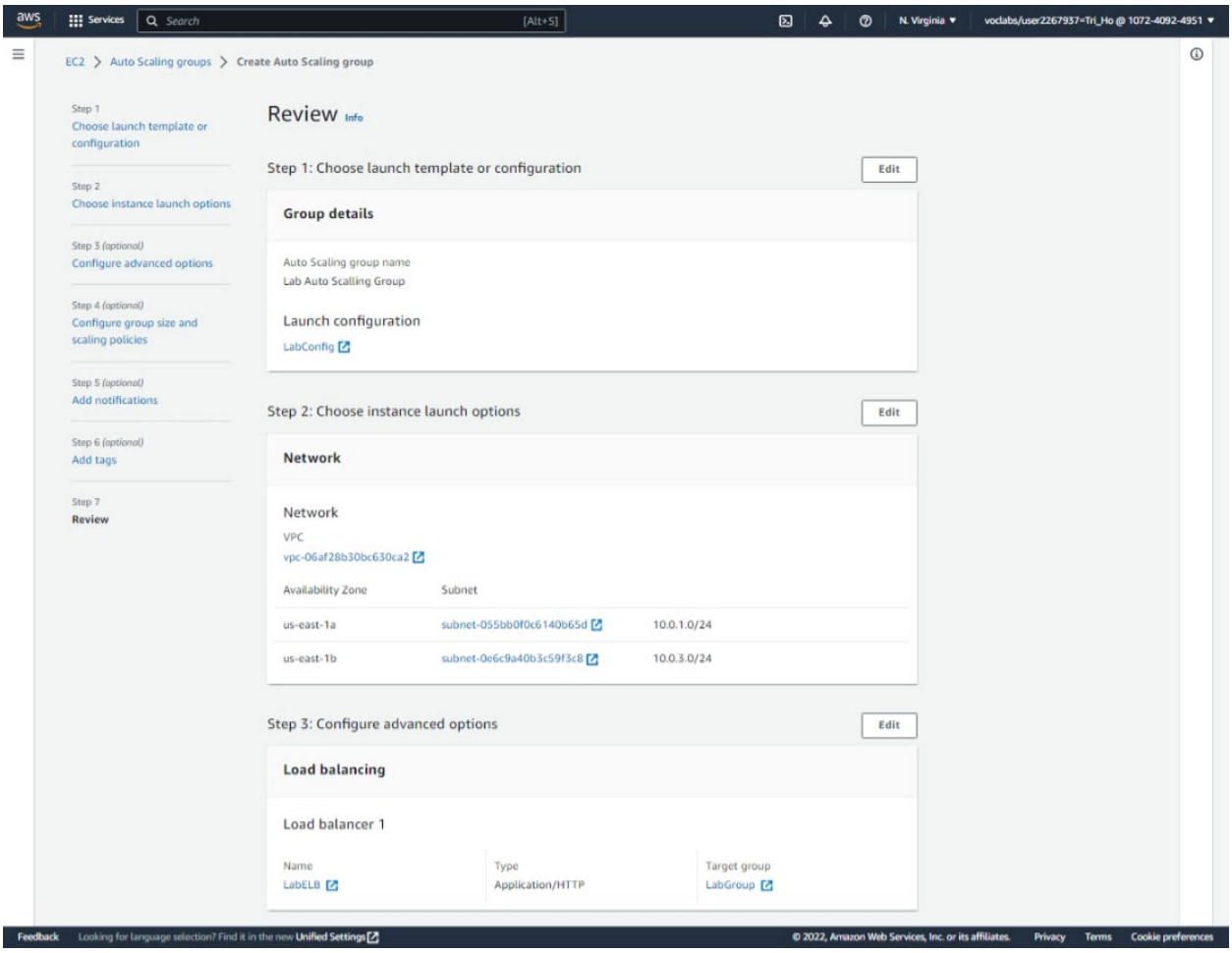

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
Load Balancing
Load Balancers
Target Groups
EC2 > Load balancers > LabELB
LabELB
Actions
Details
arn:aws:elasticloadbalancing:us-east-1:107240924951:loadbalancer/app/LabELB/19055008b60e9333
Load balancer type
Application
DNS name
LabELB-1314474496.us-east-1.elb.amazonaws.com
(A Record)
Status
Active
VPC
vpc-06af28b30bc630ca2
IP address type
IPv4
Scheme
Internet-facing
Availability Zones
subnet-0aaa624442914d37b us-east-1a (use1-az6)
subnet-02510b30b3df855de us-east-1b (use1-az1)
Hosted Zone
Z35SXDOTRQ7X7K
Created At
December 10, 2022, 12:34 (UTC+01:00)
Listeners
Network mapping
Security
Monitoring
Integrations
Attributes
Tags
Network mapping
Targets in the listed zones and subnets are available for traffic from the load balancer using the IP addresses shown.
Edit IP address type
Edit subnets
VPC
vpc-06af28b30bc630ca2
IPv4: 10.0.0.0/16
IPv6 : -
IP address type
IPv4
Mappings
Targets in the listed zones and subnets are available for traffic from the load balancer using the IP addresses shown.
Zone
Subnet
IPv4 address
Private IPv4 address
IPv6 address
us-east-1a (use1-az6)
subnet-0aaa624442914d37b
Assigned by AWS
Assigned from CIDR 10.0.0.0/24
Not Applicable
us-east-1b (use1-az1)
subnet-02510b30b3df855de
Assigned by AWS
Assigned from CIDR 10.0.2.0/24
Not Applicable
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

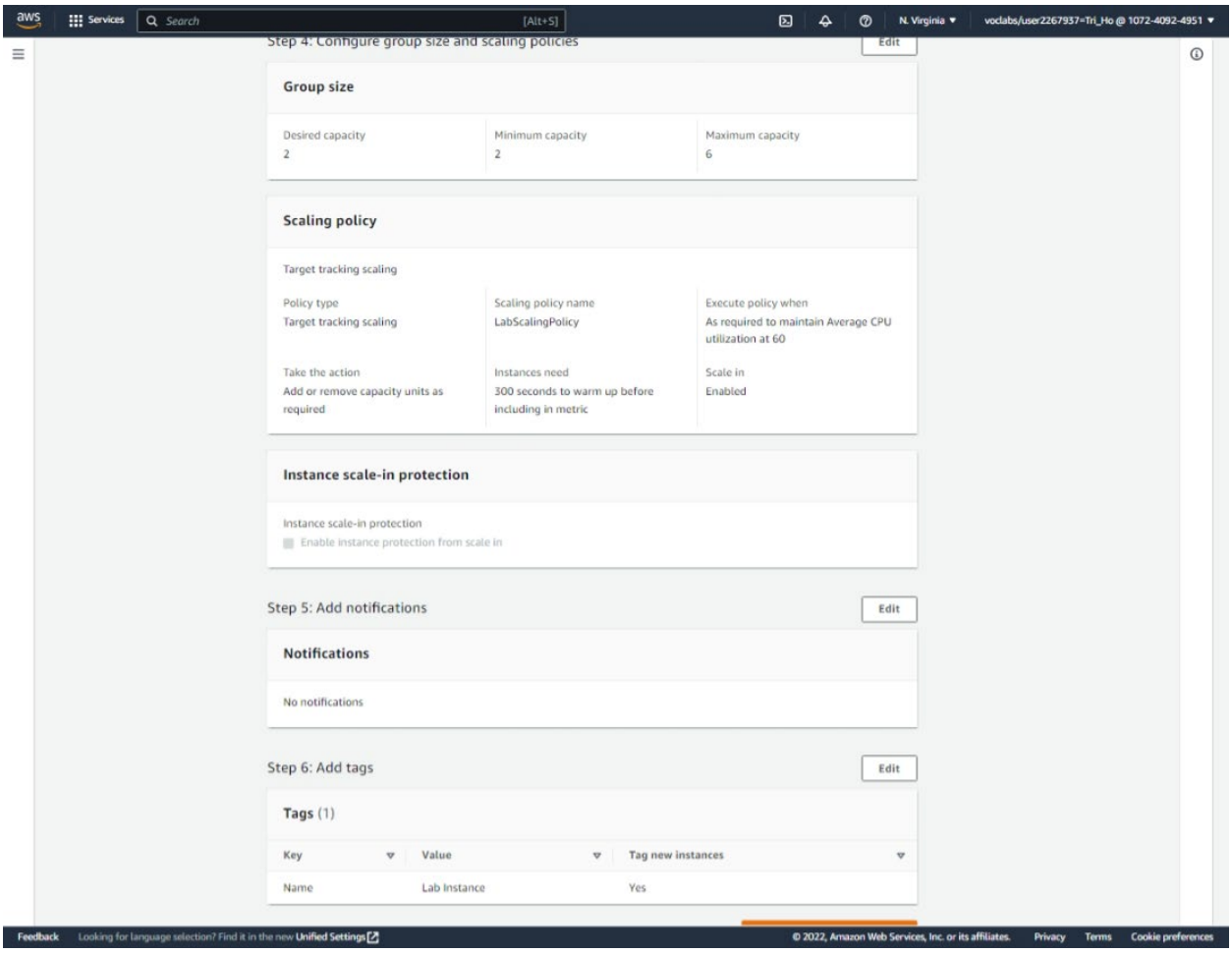

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
Load Balancing
Load Balancers New
Target Groups New
EC2 > Load balancers
Load balancers (1/1)
Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.
Actions
Create load balancer
Filter by property or value
1
Name
DNS name
State
VPC ID
Availability Zones
Type
Created
LabELB
LabELB-1314474496.us-east-1.elb.amazonaws.com
Active
vpc-06af28b30bc630ca2
2 Availability Zones
application
Decemb 12:34 (U
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

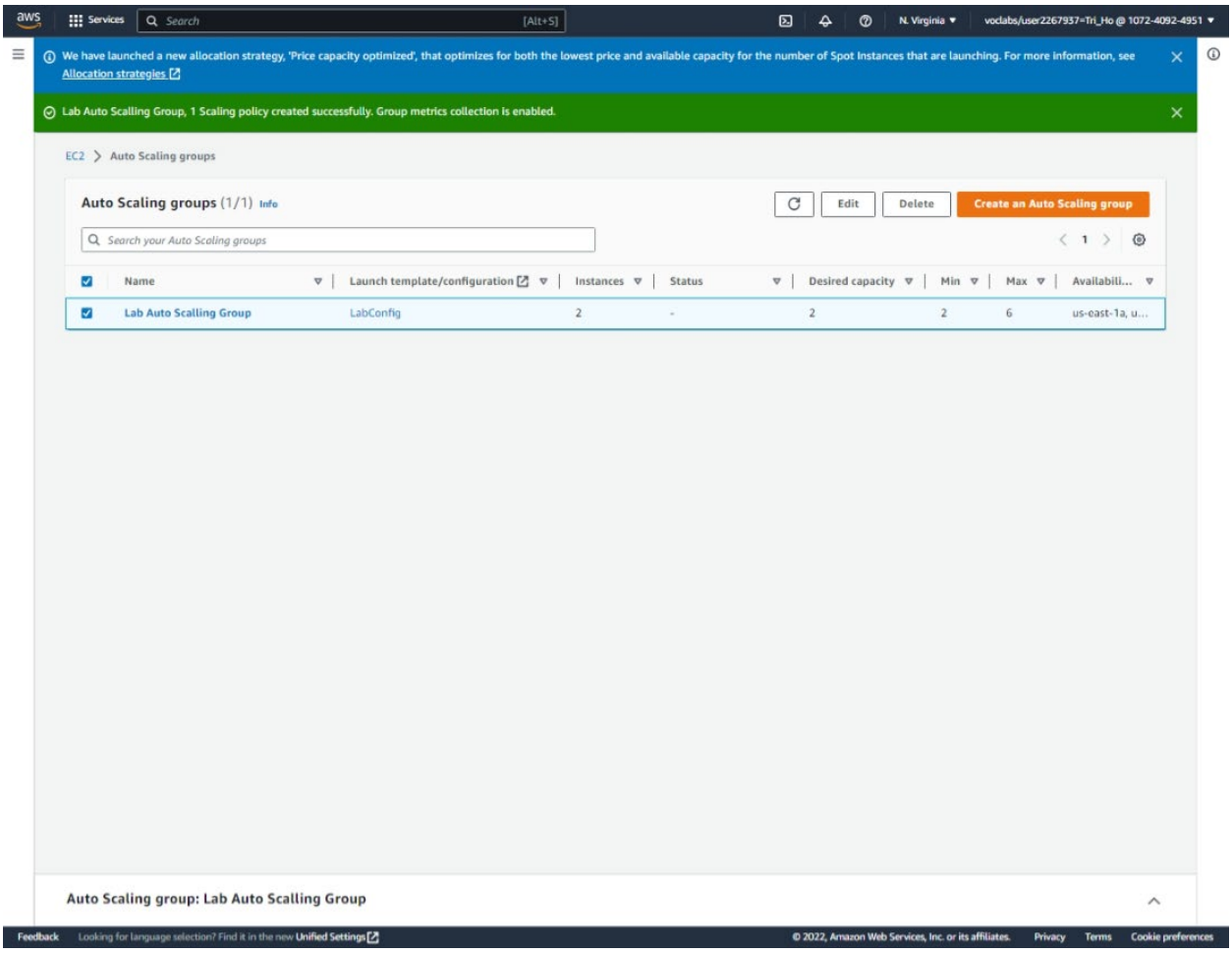
Task 3: Create a Launch Configuration and an Auto Scaling Group



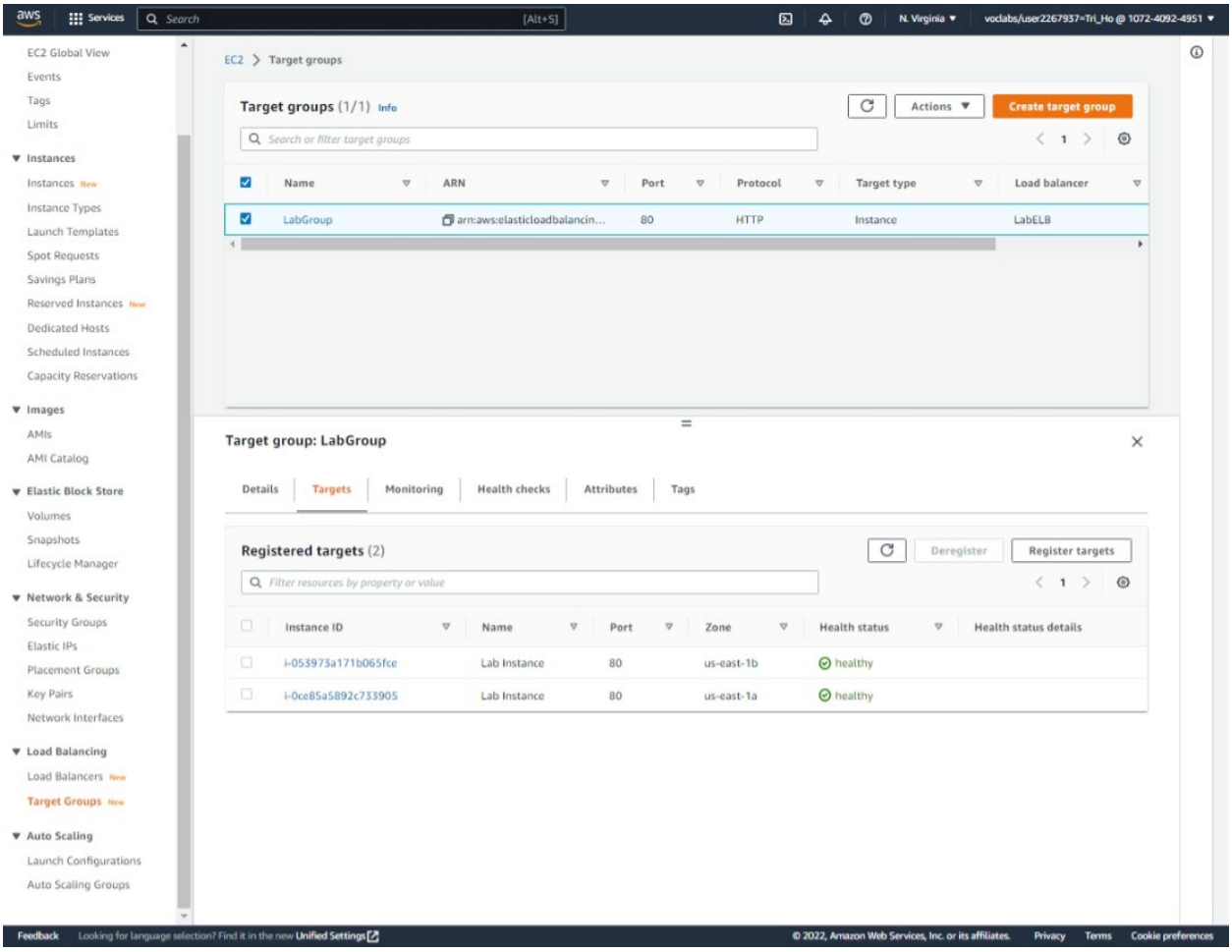

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
scalable. You can also set options that give you more control over health check replacements and monitoring.
Step 2
Choose instance launch options
Step 3 (optional)
Configure advanced options
Step 4 (optional)
Configure group size and scaling policies
Step 5 (optional)
Add notifications
Step 6 (optional)
Add tags
Step 7
Review
Load balancing - optional Info
Use the options below to attach your Auto Scaling group to an existing load balancer, or to a new load balancer that you define.
No load balancer
Traffic to your Auto Scaling group will not be fronted by a load balancer.
Attach to an existing load balancer
Choose from your existing load balancers.
Attach to a new load balancer
Quickly create a basic load balancer to attach to your Auto Scaling group.
Attach to an existing load balancer
Select the load balancers that you want to attach to your Auto Scaling group.
Choose from your load balancer target groups
This option allows you to attach Application, Network, or Gateway Load Balancers.
Choose from Classic Load Balancers
Existing load balancer target groups
Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection.
Select target groups
LabGroup | HTTP
Application Load Balancer: LabELB
Health checks - optional
Health check type Info
EC2 Auto Scaling automatically replaces instances that fail health checks. If you enabled load balancing, you can enable ELB health checks in addition to the EC2 health checks that are always enabled.
EC2
ELB
Health check grace period
The amount of time until EC2 Auto Scaling performs the first health check on new instances after they are put into service.
300
seconds
Additional settings - optional
Monitoring Info
Enable group metrics collection within CloudWatch
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

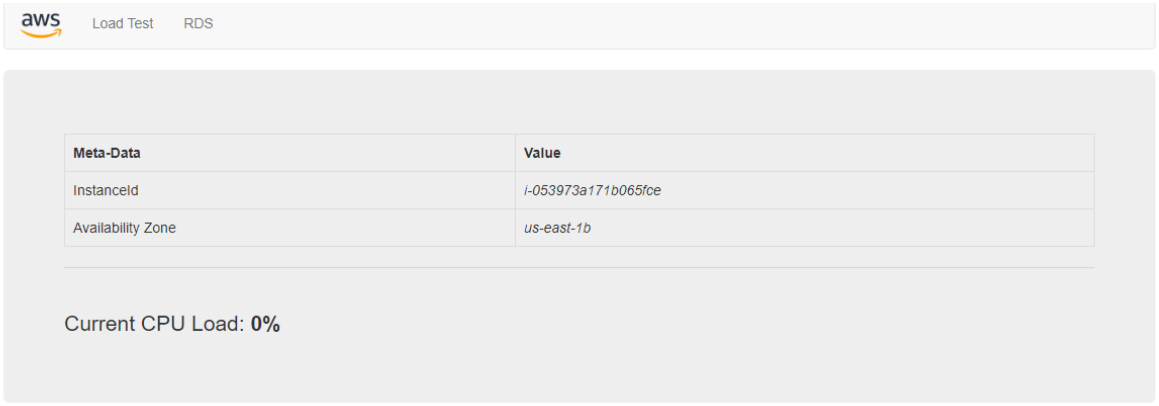

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
EC2 > Auto Scaling groups > Create Auto Scaling group
Step 1
Choose launch template or configuration
Step 2
Choose instance launch options
Step 3 (optional)
Configure advanced options
Step 4 (optional)
Configure group size and scaling policies
Step 5 (optional)
Add notifications
Step 6 (optional)
Add tags
Step 7
Review
Review Info
Step 1: Choose launch template or configuration
Edit
Group details
Auto Scaling group name
Lab Auto Scalling Group
Launch configuration
LabConfig
Step 2: Choose instance launch options
Edit
Network
Network
VPC
vpc-06af28b30bc630ca2
Availability Zone
Subnet
us-east-1a
subnet-055bb0f0c6140b65d
10.0.1.0/24
us-east-1b
subnet-0e6c9a40b3c59f3c8
10.0.3.0/24
Step 3: Configure advanced options
Edit
Load balancing
Load balancer 1
Name
LabELB
Type
Application/HTTP
Target group
LabGroup
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
Step 4: Configure group size and scaling policies
Edit
Group size
Desired capacity
2
Minimum capacity
2
Maximum capacity
6
Scaling policy
Target tracking scaling
Policy type
Target tracking scaling
Scaling policy name
LabScalingPolicy
Execute policy when
As required to maintain Average CPU utilization at 60
Take the action
Add or remove capacity units as required
Instances need
300 seconds to warm up before including in metric
Scale in
Enabled
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 (1)
Key
Value
Tag new instances
Name
Lab Instance
Yes
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

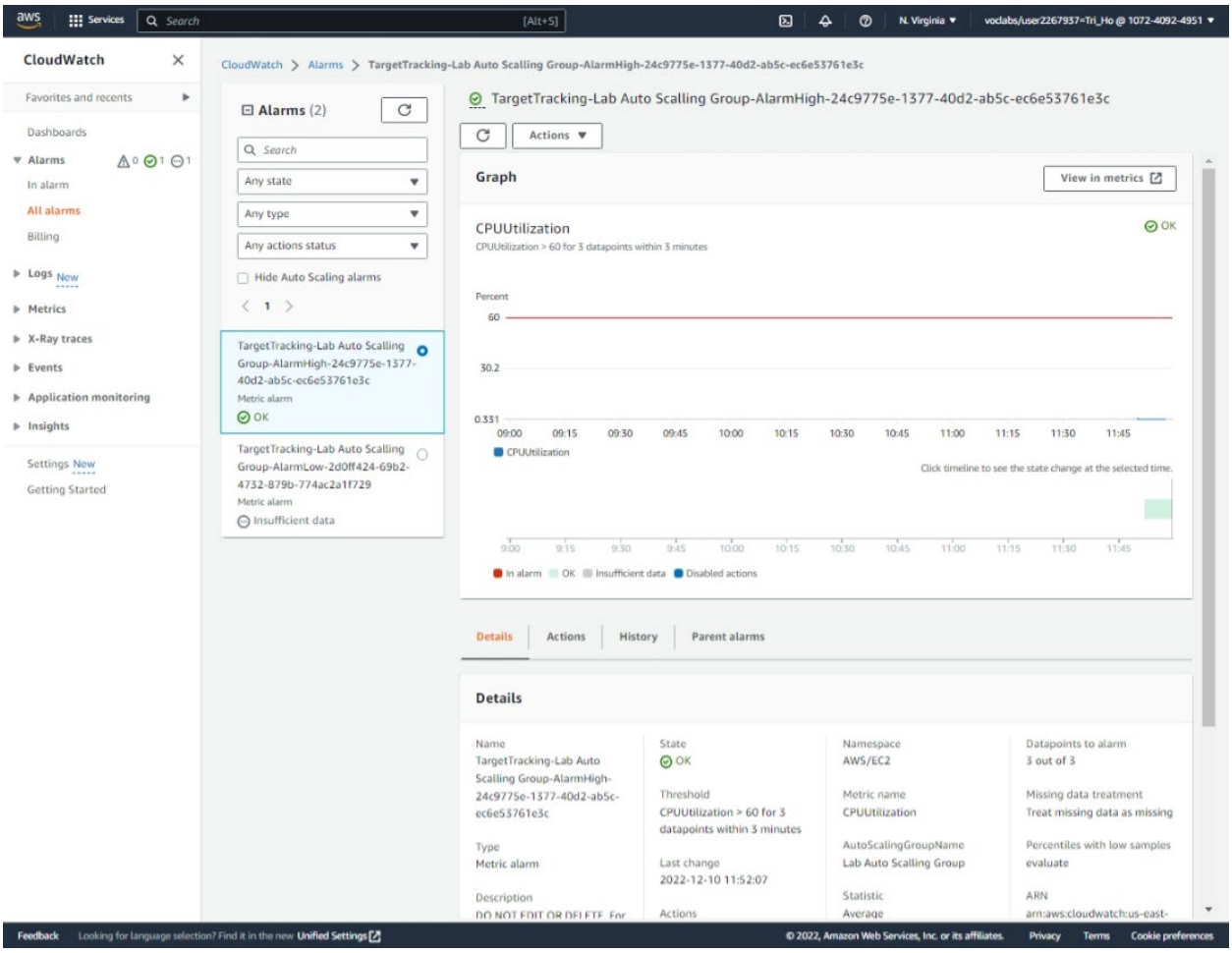

Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
We have launched a new allocation strategy, 'Price capacity optimized', that optimizes for both the lowest price and available capacity for the number of Spot Instances that are launching. For more information, see Allocation strategies
Lab Auto Scalling Group, 1 Scaling policy created successfully. Group metrics collection is enabled.
EC2 > Auto Scaling groups
Auto Scaling groups (1/1) Info
Edit
Delete
Create an Auto Scaling group
Search your Auto Scaling groups
Name
Launch template/configuration
Instances
Status
Desired capacity
Min
Max
Availabili...
Lab Auto Scalling Group
LabConfig
2
-
2
2
6
us-east-1a, u...
Auto Scaling group: Lab Auto Scalling Group
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

Task 4: Verify that Load Balancing is Working





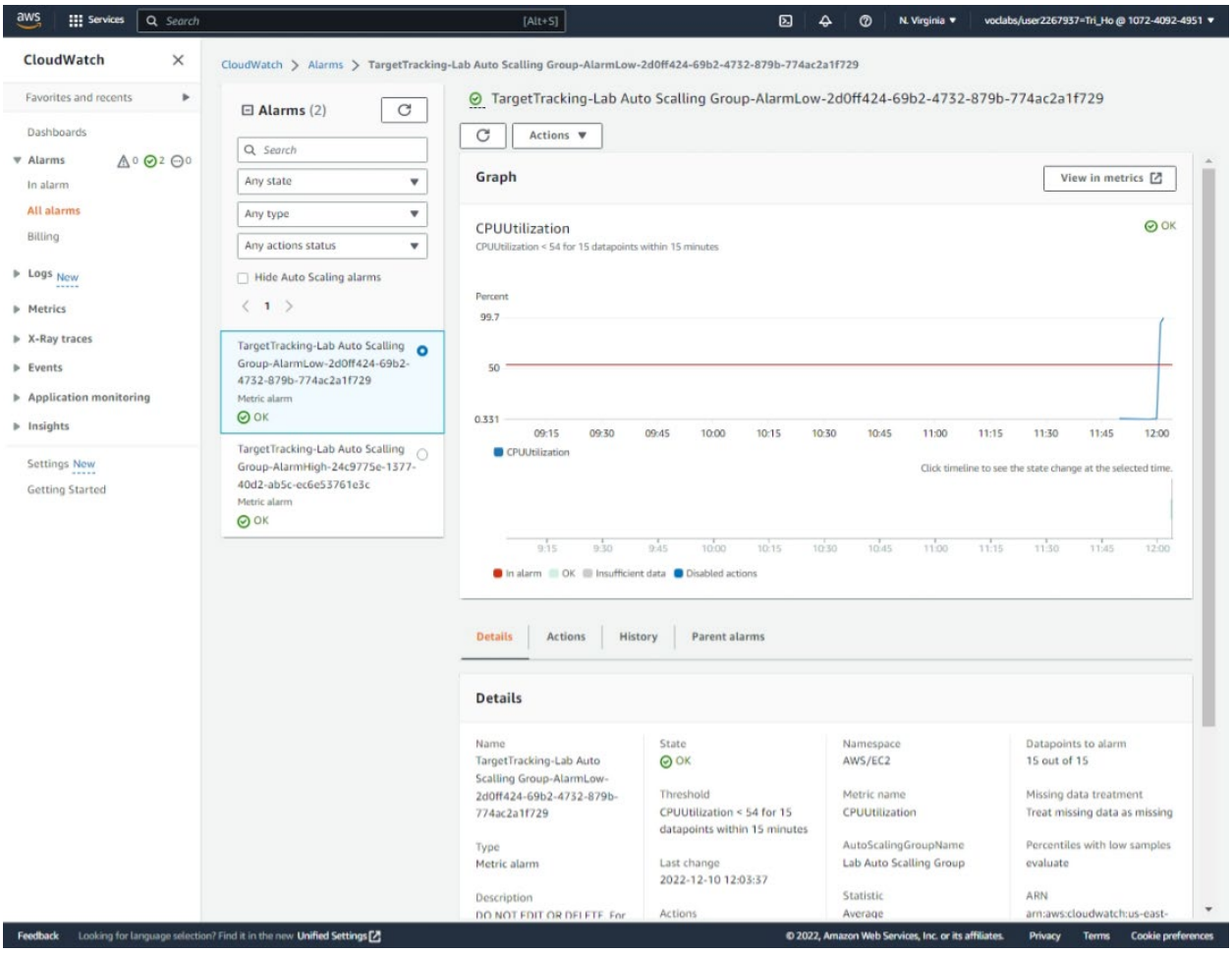
Task 5: Test Auto Scaling

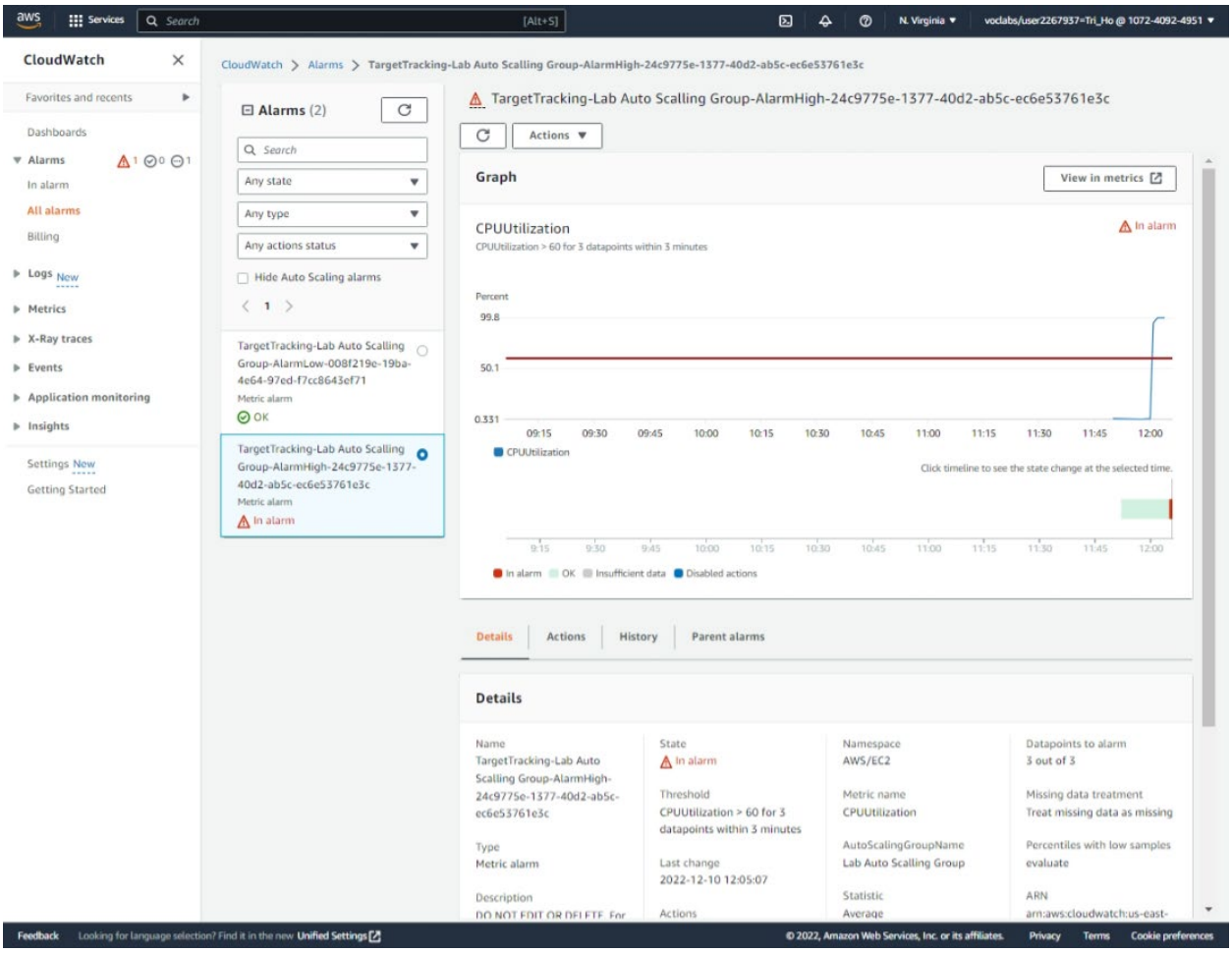


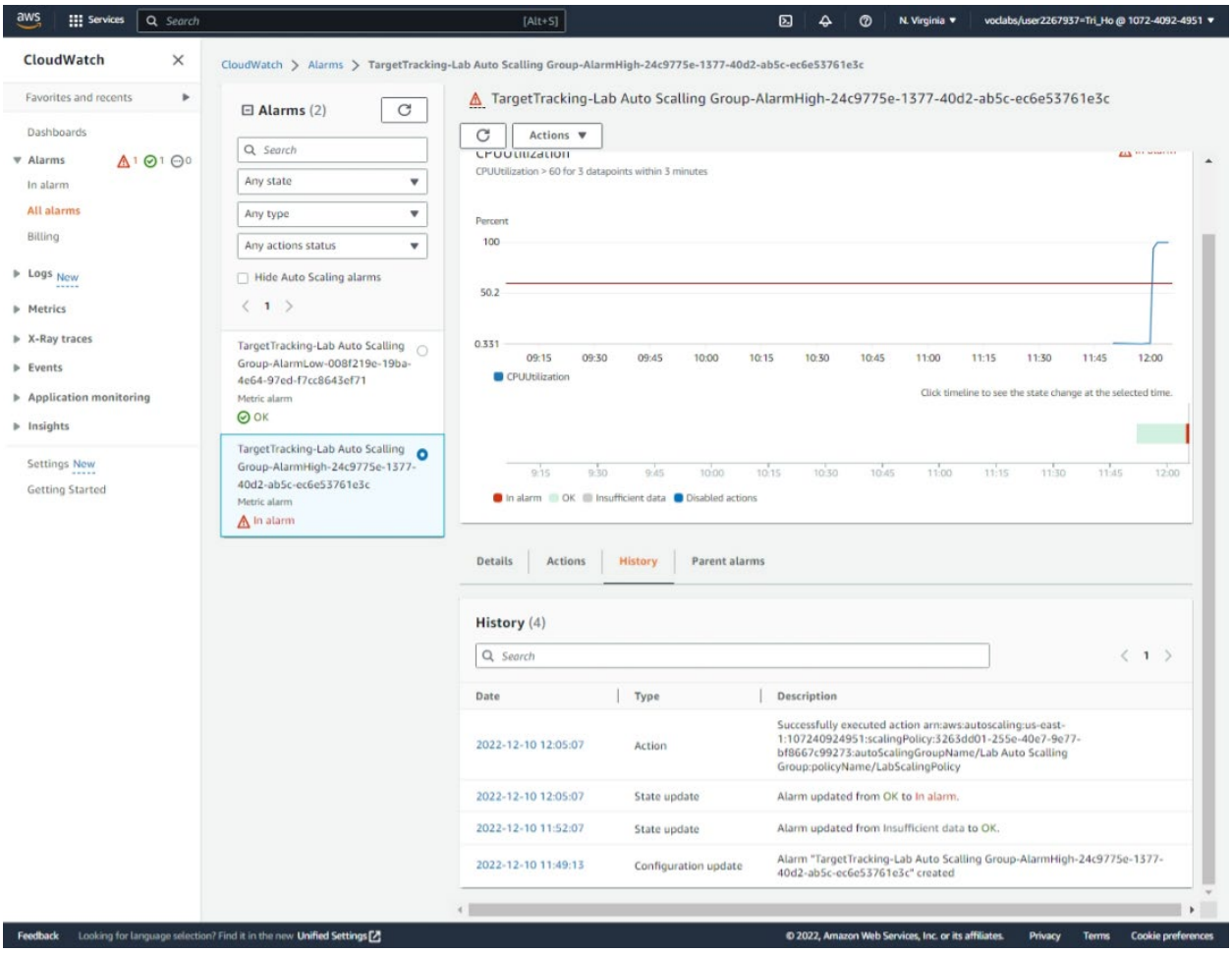
aws Load Test RDS

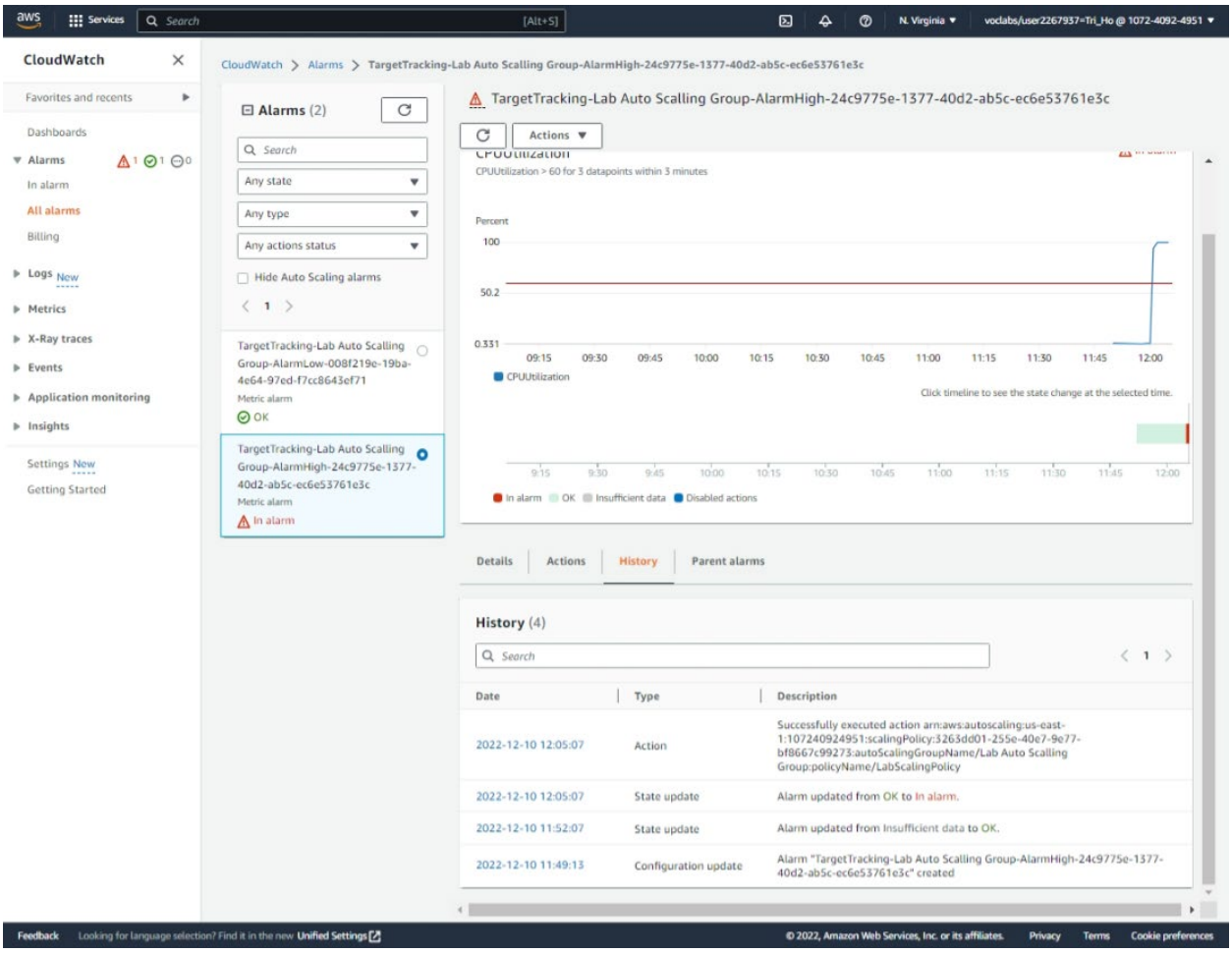
Generating CPU Load! (auto refresh in 5 seconds)

Current CPU Load: **100%**

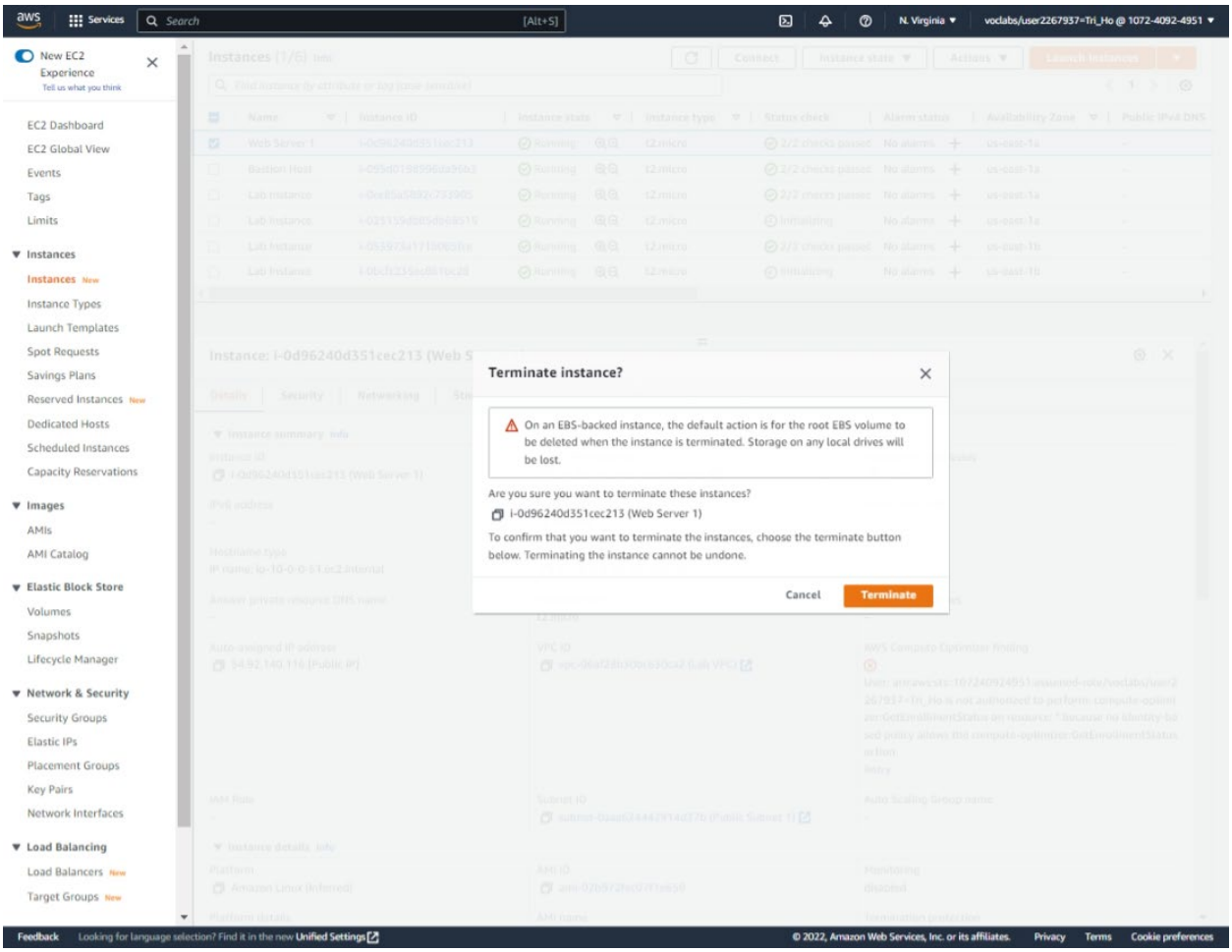

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
CloudWatch
Favorites and recents
Dashboards
Alarms 0 2 0
In alarm
All alarms
Billing
Logs New
Metrics
X-Ray traces
Events
Application monitoring
Insights
Settings New
Getting Started
CloudWatch > Alarms > TargetTracking-Lab Auto Scalling Group-AlarmLow-2d0ff424-69b2-4732-879b-774ac2a1f729
Alarms (2)
Search
Any state
Any type
Any actions status
Hide Auto Scaling alarms
1
TargetTracking-Lab Auto Scalling Group-AlarmLow-2d0ff424-69b2-4732-879b-774ac2a1f729
Metric alarm
OK
TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Metric alarm
OK
TargetTracking-Lab Auto Scalling Group-AlarmLow-2d0ff424-69b2-4732-879b-774ac2a1f729
Actions
Graph
View in metrics
CPUUtilization
CPUUtilization < 54 for 15 datapoints within 15 minutes
OK
Percent
99.7
50
0.331
09:15 09:30 09:45 10:00 10:15 10:30 10:45 11:00 11:15 11:30 11:45 12:00
CPUUtilization
Click timeline to see the state change at the selected time.
In alarm OK Insufficient data Disabled actions
Details
Actions
History
Parent alarms
Details
Name
TargetTracking-Lab Auto Scalling Group-AlarmLow-2d0ff424-69b2-4732-879b-774ac2a1f729
Type
Metric alarm
Description
State
OK
Threshold
CPUUtilization < 54 for 15 datapoints within 15 minutes
Last change
2022-12-10 12:03:37
Actions
Namespace
AWS/EC2
Metric name
CPUUtilization
AutoScalingGroupName
Lab Auto Scalling Group
Statistic
Average
Datapoints to alarm
15 out of 15
Missing data treatment
Treat missing data as missing
Percentiles with low samples
evaluate
ARN
arn:aws:cloudwatch:us-east-
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

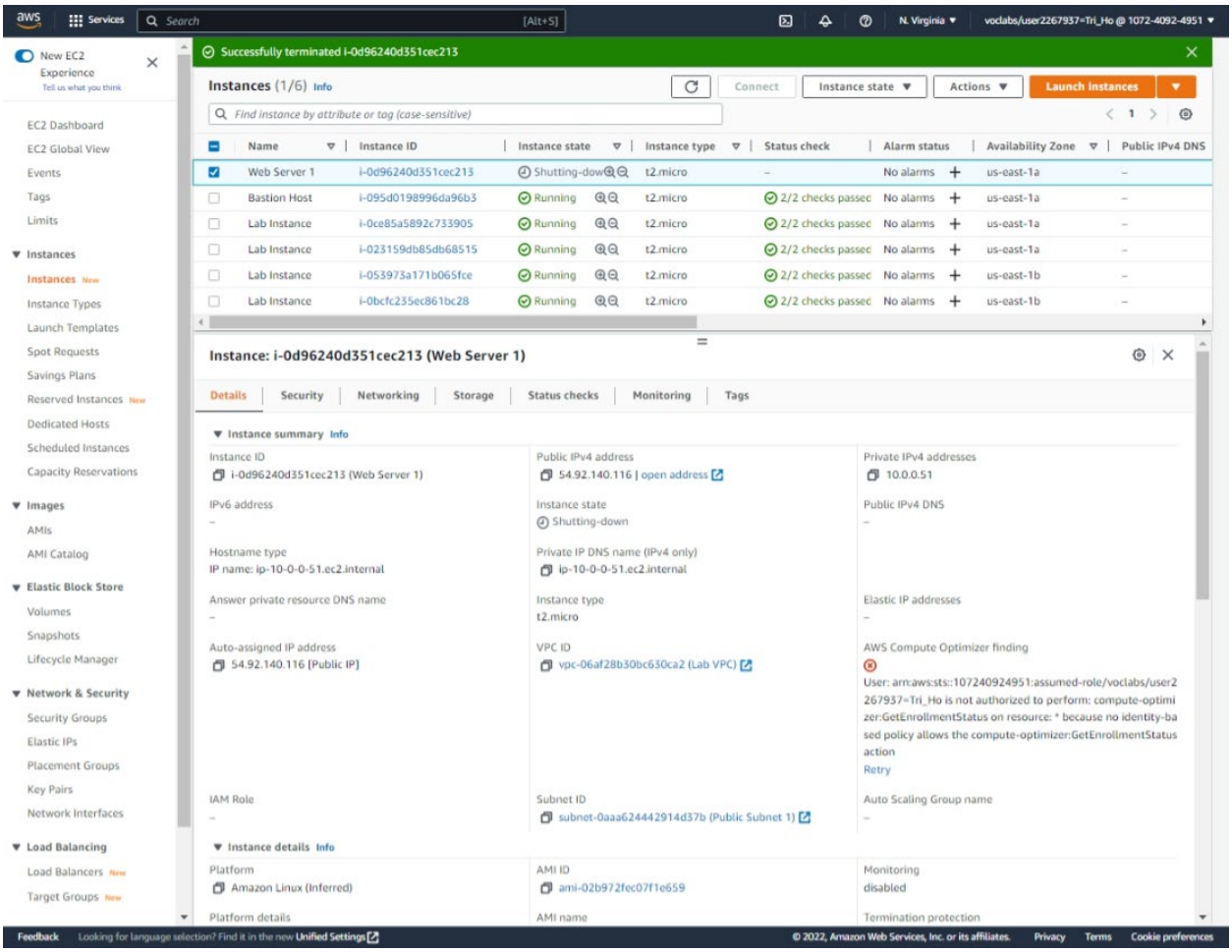

aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
CloudWatch
Favorites and recents
Dashboards
Alarms 1 0 1
In alarm
All alarms
Billing
Logs New
Metrics
X-Ray traces
Events
Application monitoring
Insights
Settings New
Getting Started
CloudWatch > Alarms > TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Alarms (2)
Search
Any state
Any type
Any actions status
Hide Auto Scaling alarms
1
TargetTracking-Lab Auto Scalling Group-AlarmLow-008f219e-19ba-4e64-97ed-f7cc8643ef71
Metric alarm
OK
TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Metric alarm
In alarm
TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Actions
Graph
View in metrics
CPUUtilization
CPUUtilization > 60 for 3 datapoints within 3 minutes
In alarm
Percent
99.8
50.1
0.331
09:15 09:30 09:45 10:00 10:15 10:30 10:45 11:00 11:15 11:30 11:45 12:00
CPUUtilization
Click timeline to see the state change at the selected time.
In alarm OK Insufficient data Disabled actions
Details
Actions
History
Parent alarms
Details
Name
TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Type
Metric alarm
Description
State
In alarm
Threshold
CPUUtilization > 60 for 3 datapoints within 3 minutes
Last change
2022-12-10 12:05:07
Actions
Namespace
AWS/EC2
Metric name
CPUUtilization
AutoScalingGroupName
Lab Auto Scalling Group
Statistic
Average
Datapoints to alarm
3 out of 3
Missing data treatment
Treat missing data as missing
Percentiles with low samples
evaluate
ARN
arn:aws:cloudwatch:us-east-
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2267937=Tri_Ho @ 1072-4092-4951
CloudWatch
Favorites and recents
Dashboards
Alarms 1 1 0
In alarm
All alarms
Billing
Logs New
Metrics
X-Ray traces
Events
Application monitoring
Insights
Settings New
Getting Started
CloudWatch > Alarms > TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Alarms (2)
Search
Any state
Any type
Any actions status
Hide Auto Scaling alarms
1
TargetTracking-Lab Auto Scalling Group-AlarmLow-008f219e-19ba-4e64-97ed-f7cc8643ef71
Metric alarm
OK
TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Metric alarm
In alarm
TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c
Actions
CPUUtilization
CPUUtilization > 60 for 3 datapoints within 3 minutes
Percent
100
50.2
0.331
09:15
09:30
09:45
10:00
10:15
10:30
10:45
11:00
11:15
11:30
11:45
12:00
CPUUtilization
Click timeline to see the state change at the selected time.
In alarm
OK
Insufficient data
Disabled actions
Details
Actions
History
Parent alarms
History (4)
Search
1
Date
Type
Description
2022-12-10 12:05:07
Action
Successfully executed action arn:aws:autoscaling:us-east-1:107240924951:scalingPolicy:3263dd01-255e-40e7-9e77-bf8667c99273:autoScalingGroupName/Lab Auto Scalling Group:policyName/LabScalingPolicy
2022-12-10 12:05:07
State update
Alarm updated from OK to In alarm.
2022-12-10 11:52:07
State update
Alarm updated from Insufficient data to OK.
2022-12-10 11:49:13
Configuration update
Alarm "TargetTracking-Lab Auto Scalling Group-AlarmHigh-24c9775e-1377-40d2-ab5c-ec6e53761e3c" created
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences



Task 6: Terminate Web Server 1


Terminate instance?
On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated. Storage on any local drives will be lost.
Are you sure you want to terminate these instances?
i-0d96240d351cec213 (Web Server 1)
To confirm that you want to terminate the instances, choose the terminate button below. Terminating the instance cannot be undone.
Cancel
Terminate



Lab Complete