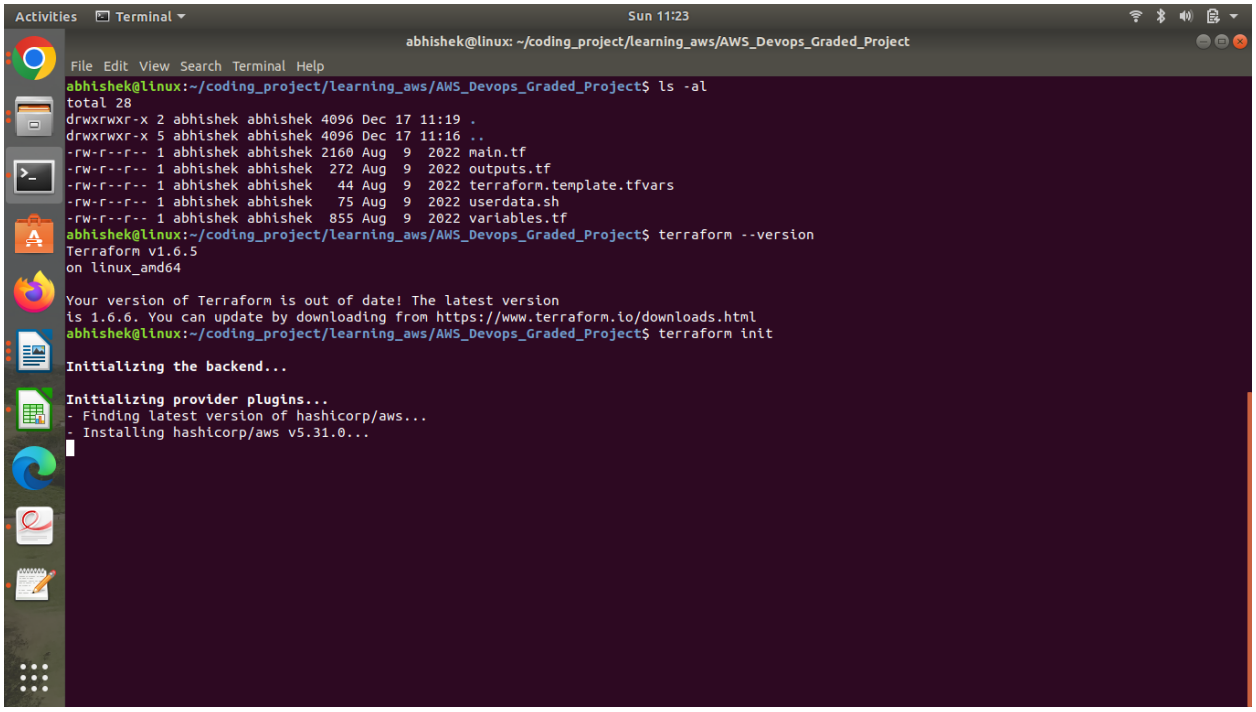
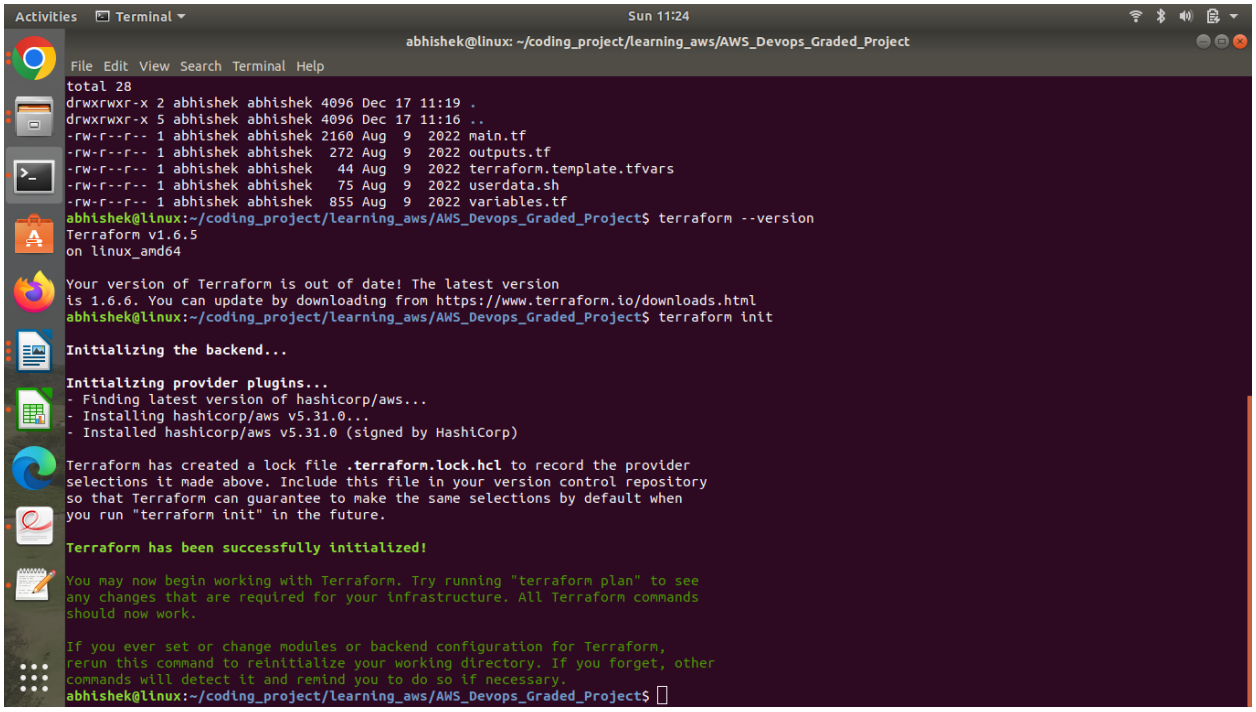
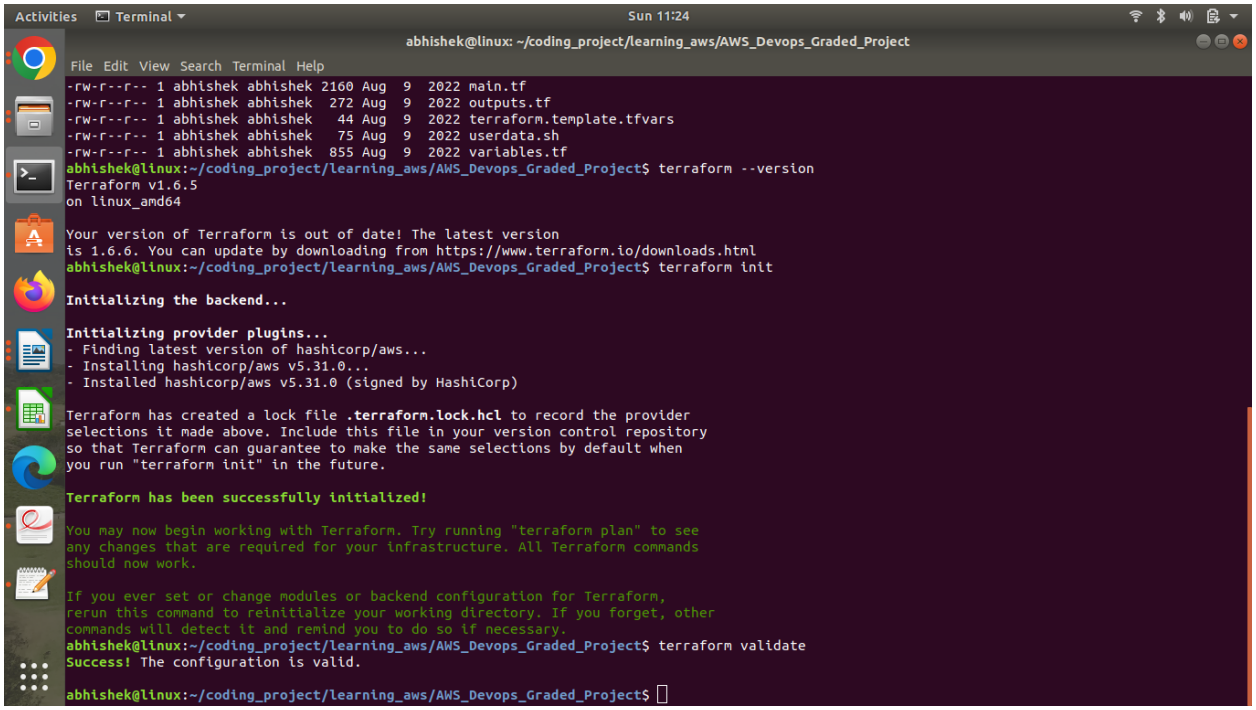
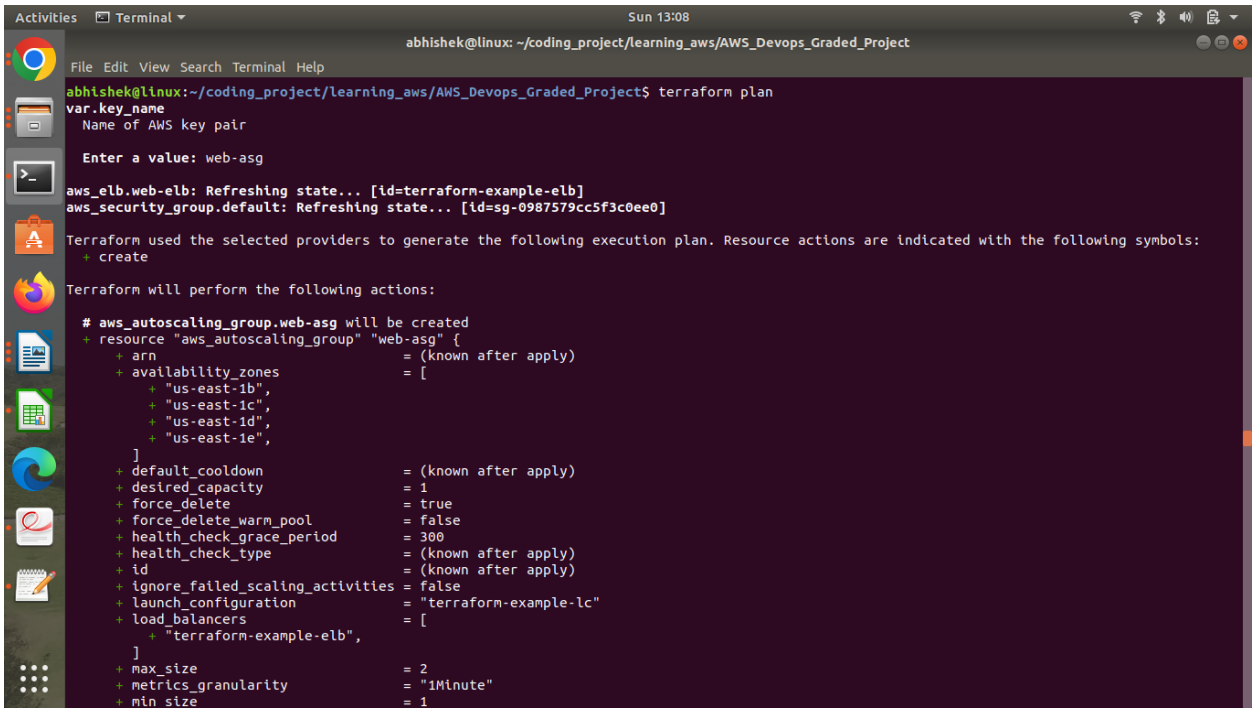
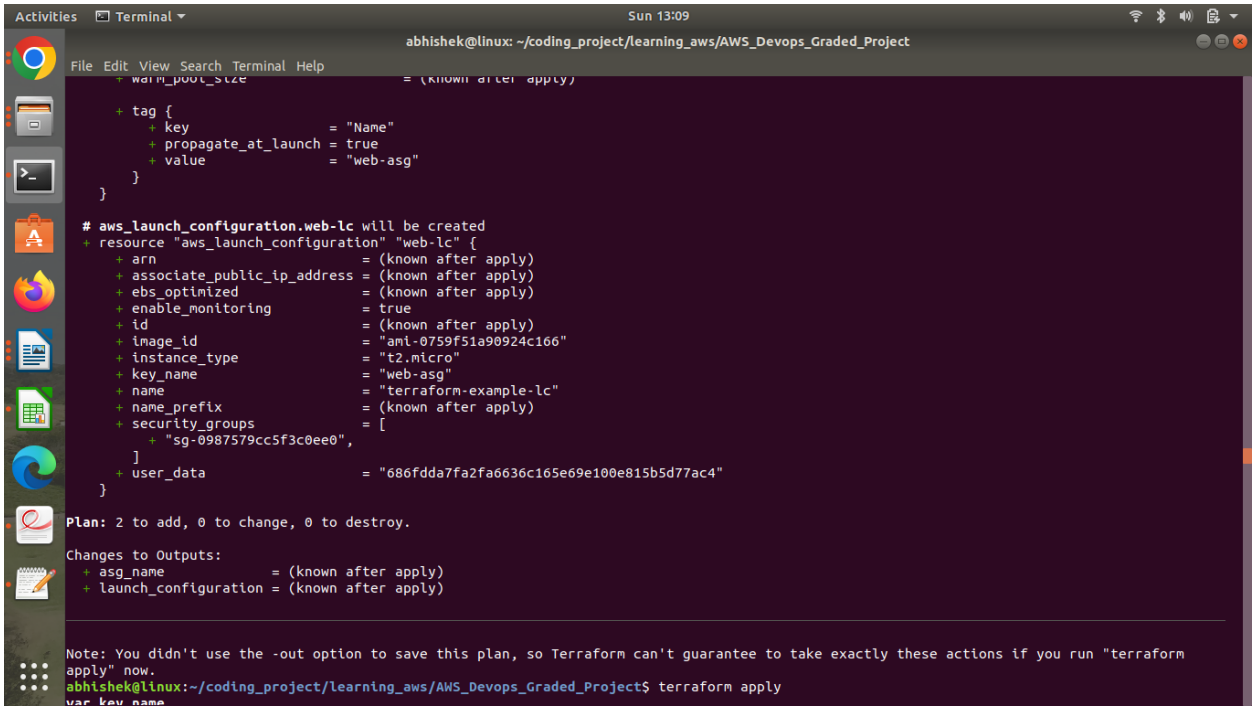
Problem Statement - Create an Autoscaling group using Terraform on AWS. The instances in the group should have Nginx installed on them. Parameters in the ASG can be set at your discretion and should be mentioned in the solution documentation.
Any variables in the script should be placed in a separate variables.tf file. The output of the script should be the DNS of the associated load balancer.

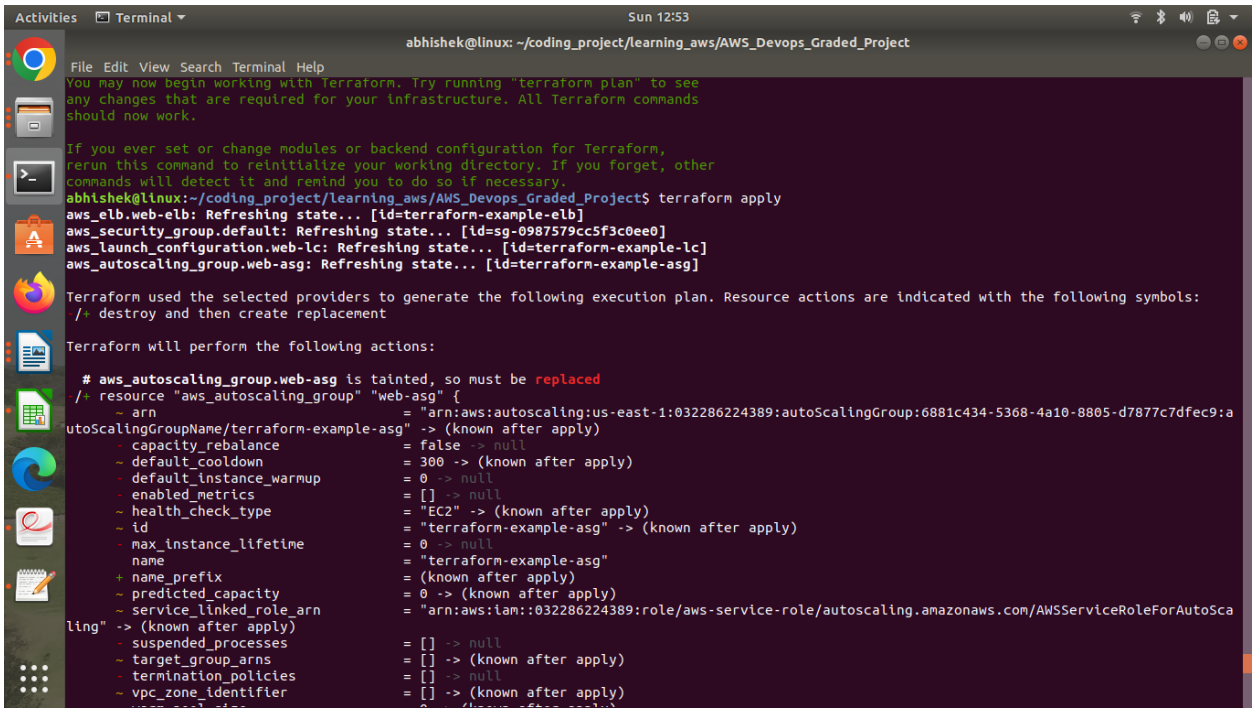


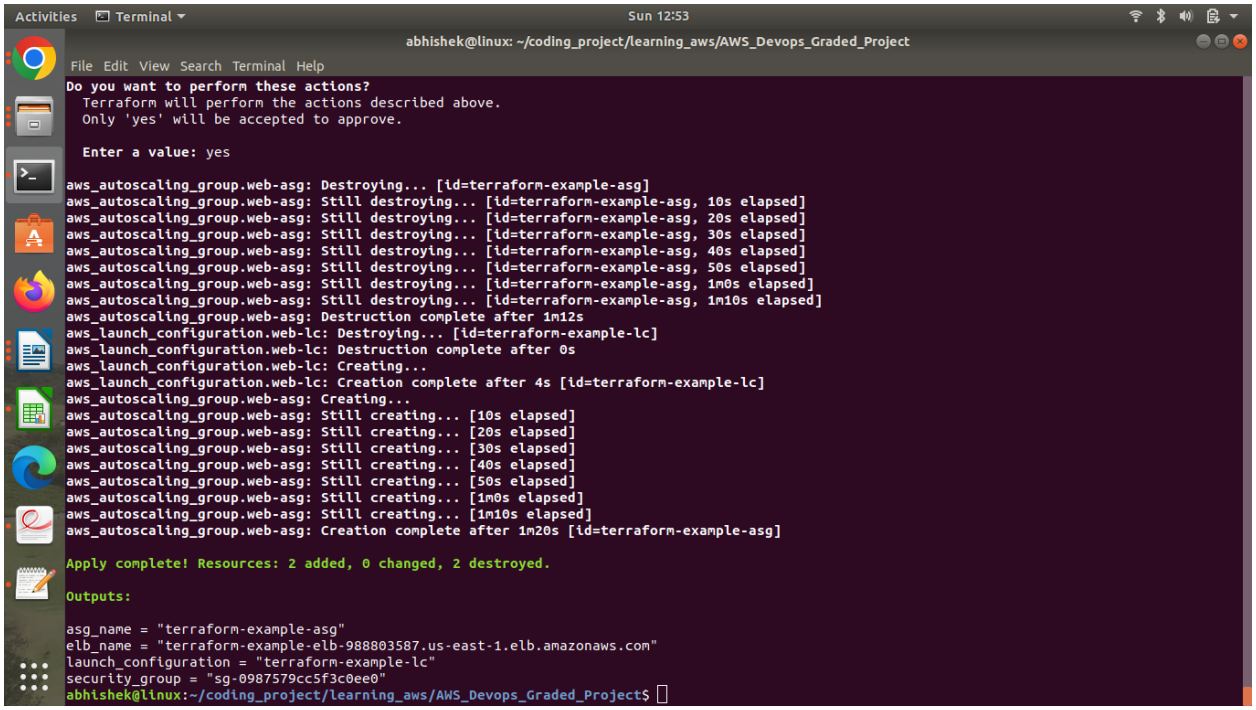


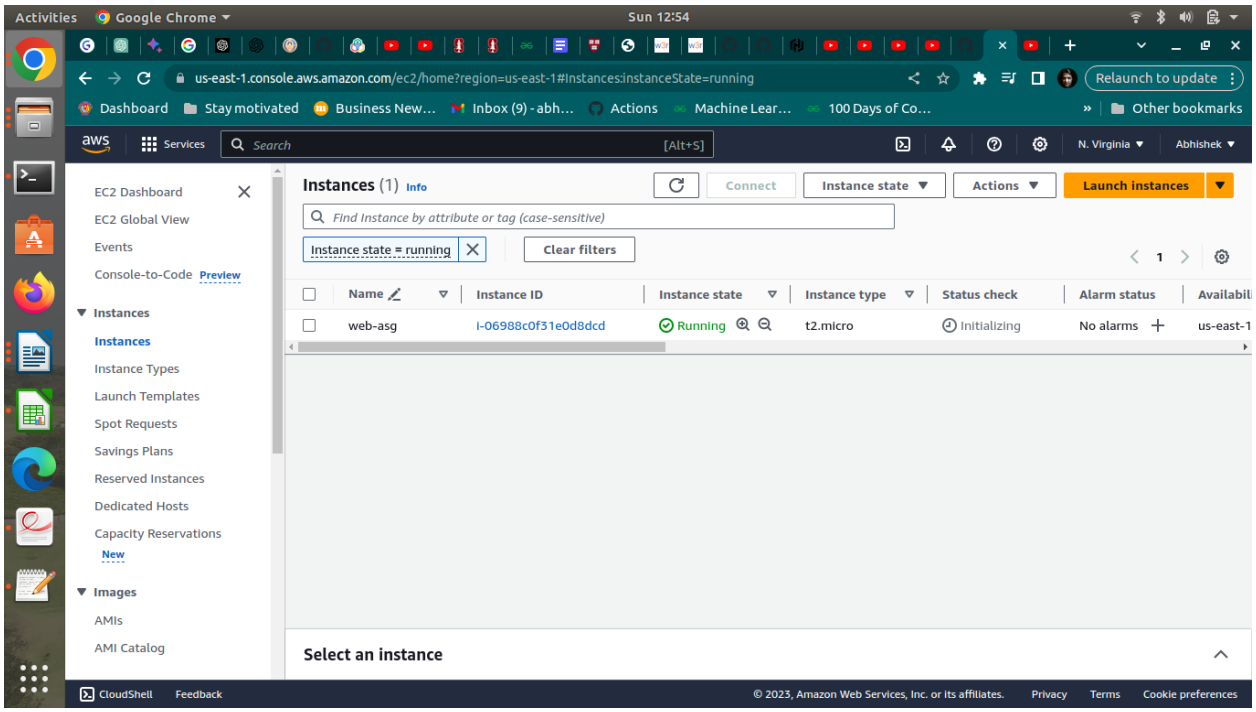

Activities
Terminal
Sun 11:24
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
-rw-r--r-- 1 abhishek abhishek 2160 Aug 9 2022 main.tf
-rw-r--r-- 1 abhishek abhishek 272 Aug 9 2022 outputs.tf
-rw-r--r-- 1 abhishek abhishek 44 Aug 9 2022 terraform.template.tfvars
-rw-r--r-- 1 abhishek abhishek 75 Aug 9 2022 userdata.sh
-rw-r--r-- 1 abhishek abhishek 855 Aug 9 2022 variables.tf
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform --version
Terraform v1.6.5
on linux_amd64
Your version of Terraform is out of date! The latest version
is 1.6.6. You can update by downloading from https://www.terraform.io/downloads.html
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform init
Initializing the backend...
Initializing provider plugins...
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v5.31.0...
- Installed hashicorp/aws v5.31.0 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.
Terraform has been successfully initialized!
You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.
If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform validate
Success! The configuration is valid.
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$


Activities
Terminal
Sun 13:08
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform plan
var.key_name
Name of AWS key pair
Enter a value: web-asg
aws_elb.web-elb: Refreshing state... [id=terraform-example-elb]
aws_security_group.default: Refreshing state... [id=sg-0987579cc5f3c0ee0]
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create
Terraform will perform the following actions:
# aws_autoscaling_group.web-asg will be created
+ resource "aws_autoscaling_group" "web-asg" {
+ arn = (known after apply)
+ availability_zones = [
+ "us-east-1b",
+ "us-east-1c",
+ "us-east-1d",
+ "us-east-1e",
]
+ default_cooldown = (known after apply)
+ desired_capacity = 1
+ force_delete = true
+ force_delete_warm_pool = false
+ health_check_grace_period = 300
+ health_check_type = (known after apply)
+ id = (known after apply)
+ ignore_failed_scaling_activities = false
+ launch_configuration = "terraform-example-lc"
+ load_balancers = [
+ "terraform-example-elb",
]
+ max_size = 2
+ metrics_granularity = "1Minute"
+ min_size = 1


Activities
Terminal
Sun 13:09
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
+ warm_pool_size = (known after apply)
+ tag {
+ key = "Name"
+ propagate_at_launch = true
+ value = "web-asg"
}
}
# aws_launch_configuration.web-lc will be created
+ resource "aws_launch_configuration" "web-lc" {
+ arn = (known after apply)
+ associate_public_ip_address = (known after apply)
+ ebs_optimized = (known after apply)
+ enable_monitoring = true
+ id = (known after apply)
+ image_id = "ami-0759f51a90924c166"
+ instance_type = "t2.micro"
+ key_name = "web-asg"
+ name = "terraform-example-lc"
+ name_prefix = (known after apply)
+ security_groups = [
+ "sg-0987579cc5f3c0ee0",
]
+ user_data = "686fdda7fa2fa6636c165e69e100e815b5d77ac4"
}
Plan: 2 to add, 0 to change, 0 to destroy.
Changes to Outputs:
+ asg_name = (known after apply)
+ launch_configuration = (known after apply)
Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions if you run "terraform apply" now.
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform apply
var.key_name


Activities
Terminal
Sun 12:53
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.
If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform apply
aws_elb.web-elb: Refreshing state... [id=terraform-example-elb]
aws_security_group.default: Refreshing state... [id=sg-0987579cc5f3c0ee0]
aws_launch_configuration.web-lc: Refreshing state... [id=terraform-example-lc]
aws_autoscaling_group.web-asg: Refreshing state... [id=terraform-example-asg]
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
-/+ destroy and then create replacement
Terraform will perform the following actions:
# aws_autoscaling_group.web-asg is tainted, so must be replaced
-/+ resource "aws_autoscaling_group" "web-asg" {
~ arn = "arn:aws:autoscaling:us-east-1:032286224389:autoScalingGroup:6881c434-5368-4a10-8805-d7877c7dfec9:autoScalingGroupName/terraform-example-asg" -> (known after apply)
- capacity_rebalance = false -> null
~ default_cooldown = 300 -> (known after apply)
- default_instance_warmup = 0 -> null
- enabled_metrics = [] -> null
~ health_check_type = "EC2" -> (known after apply)
~ id = "terraform-example-asg" -> (known after apply)
- max_instance_lifetime = 0 -> null
name = "terraform-example-asg"
+ name_prefix = (known after apply)
~ predicted_capacity = 0 -> (known after apply)
~ service_linked_role_arn = "arn:aws:iam::032286224389:role/aws-service-role/autoscaling.amazonaws.com/AWSServiceRoleForAutoScaling" -> (known after apply)
- suspended_processes = [] -> null
~ target_group_arns = [] -> (known after apply)
- termination_policies = [] -> null
~ vpc_zone_identifier = [] -> (known after apply)


Activities
Terminal
Sun 12:53
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.
Enter a value: yes
aws_autoscaling_group.web-asg: Destroying... [id=terraform-example-asg]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 10s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 20s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 30s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 40s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 50s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 1m0s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 1m10s elapsed]
aws_autoscaling_group.web-asg: Destruction complete after 1m12s
aws_launch_configuration.web-lc: Destroying... [id=terraform-example-lc]
aws_launch_configuration.web-lc: Destruction complete after 0s
aws_launch_configuration.web-lc: Creating...
aws_launch_configuration.web-lc: Creation complete after 4s [id=terraform-example-lc]
aws_autoscaling_group.web-asg: Creating...
aws_autoscaling_group.web-asg: Still creating... [10s elapsed]
aws_autoscaling_group.web-asg: Still creating... [20s elapsed]
aws_autoscaling_group.web-asg: Still creating... [30s elapsed]
aws_autoscaling_group.web-asg: Still creating... [40s elapsed]
aws_autoscaling_group.web-asg: Still creating... [50s elapsed]
aws_autoscaling_group.web-asg: Still creating... [1m0s elapsed]
aws_autoscaling_group.web-asg: Still creating... [1m10s elapsed]
aws_autoscaling_group.web-asg: Creation complete after 1m20s [id=terraform-example-asg]
Apply complete! Resources: 2 added, 0 changed, 2 destroyed.
Outputs:
asg_name = "terraform-example-asg"
elb_name = "terraform-example-elb-988803587.us-east-1.elb.amazonaws.com"
launch_configuration = "terraform-example-lc"
security_group = "sg-0987579cc5f3c0ee0"
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$


Activities
Google Chrome
Sun 12:54
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:instanceState=running
Relaunch to update
Dashboard
Stay motivated
Business New...
Inbox (9) - abh...
Actions
Machine Lear...
100 Days of Co...
Other bookmarks
aws
Services
Search
[Alt+S]
N. Virginia
Abhishek
EC2 Dashboard
EC2 Global View
Events
Console-to-Code Preview
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
AMIs
AMI Catalog
Instances (1) Info
Connect
Instance state
Actions
Launch instances
Find Instance by attribute or tag (case-sensitive)
Instance state = running
Clear filters
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
web-asg
i-06988c0f31e0d8dcd
Running
t2.micro
Initializing
No alarms
us-east-1
Select an instance
CloudShell
Feedback
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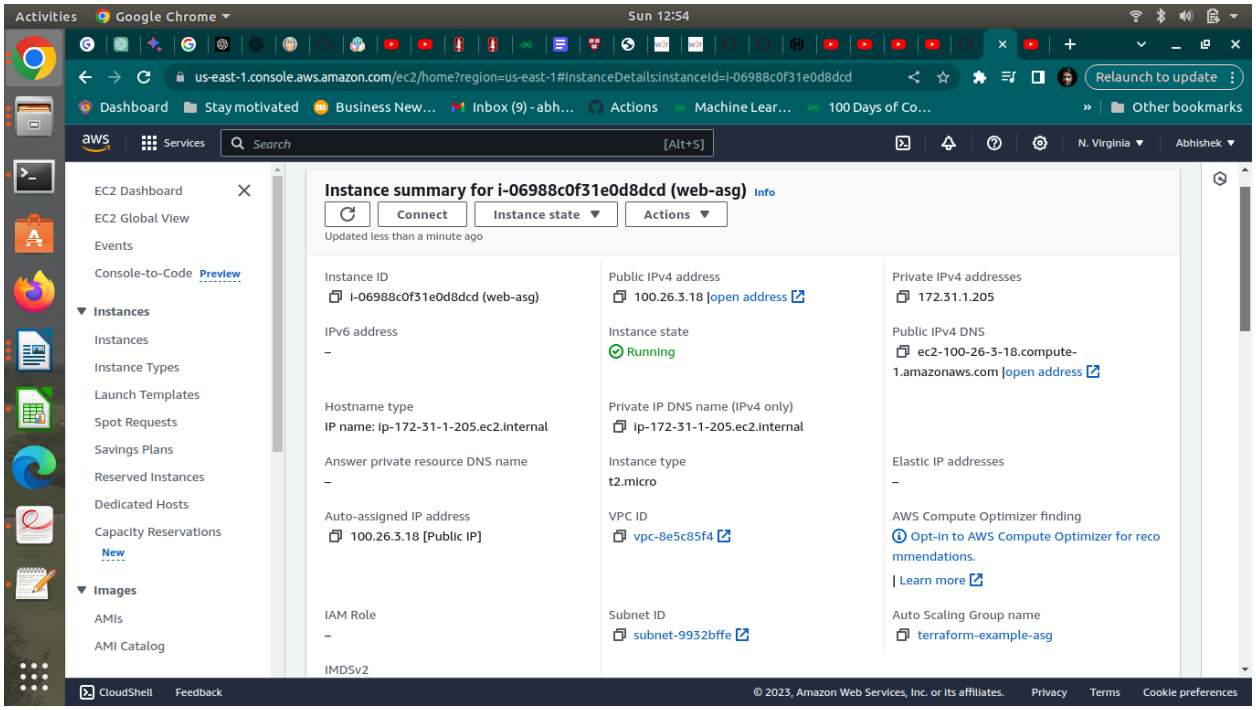
Activities
Google Chrome
Sun 12:54
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-06988c0f31e0d8dcd
Relaunch to update
Dashboard
Stay motivated
Business New…
Inbox (9) - abh…
Actions
Machine Lear…
100 Days of Co…
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
Abhishek
EC2 Dashboard
EC2 Global View
Events
Console-to-Code Preview
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
AMIs
AMI Catalog
Instance summary for i-06988c0f31e0d8dcd (web-asg) Info
Connect
Instance state
Actions
Updated less than a minute ago
Instance ID
i-06988c0f31e0d8dcd (web-asg)
Public IPv4 address
100.26.3.18 |open address
Private IPv4 addresses
172.31.1.205
IPv6 address
–
Instance state
Running
Public IPv4 DNS
ec2-100-26-3-18.compute-1.amazonaws.com |open address
Hostname type
IP name: ip-172-31-1-205.ec2.internal
Private IP DNS name (IPv4 only)
ip-172-31-1-205.ec2.internal
Answer private resource DNS name
–
Instance type
t2.micro
Elastic IP addresses
–
Auto-assigned IP address
100.26.3.18 [Public IP]
VPC ID
vpc-8e5c85f4
AWS Compute Optimizer finding
Opt-in to AWS Compute Optimizer for recommendations.
| Learn more
IAM Role
–
Subnet ID
subnet-9932bffe
Auto Scaling Group name
terraform-example-asg
IMDSv2
CloudShell
Feedback
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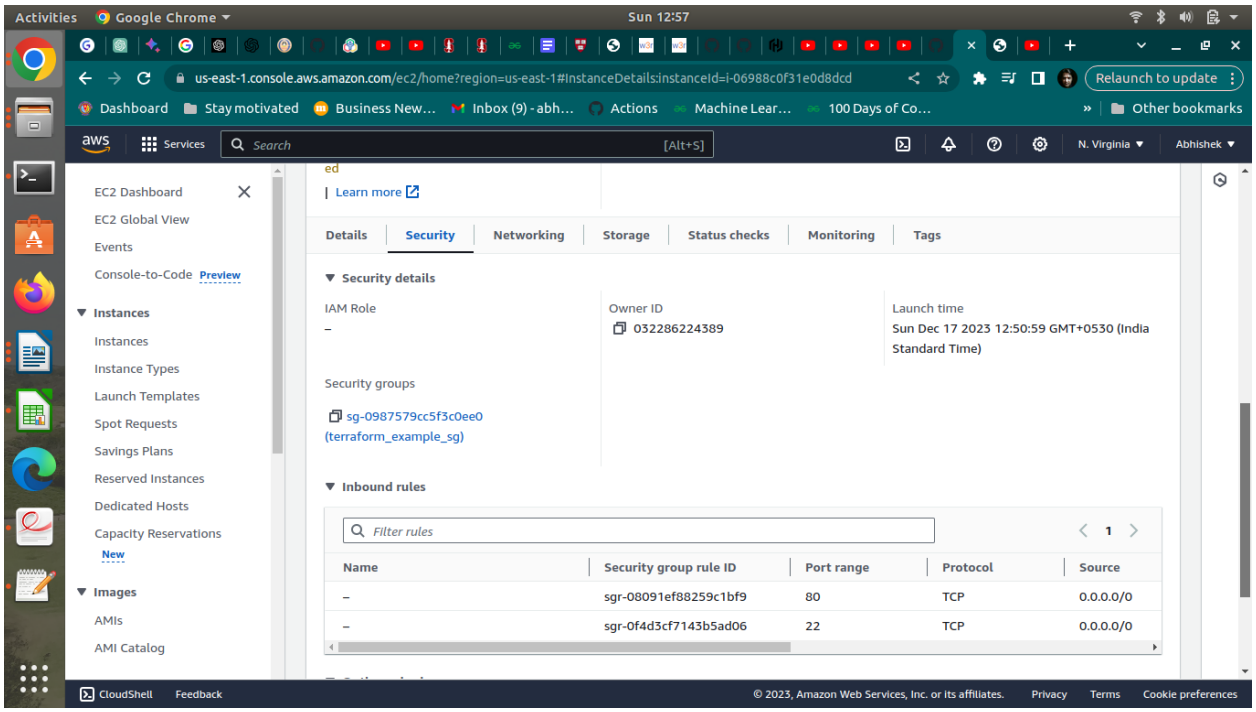
Activities
Google Chrome
Sun 12:57
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-06988c0f31e0d8dcd
Relaunch to update
Dashboard
Stay motivated
Business New…
Inbox (9) - abh…
Actions
Machine Lear…
100 Days of Co…
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
Abhishek
ed
| Learn more
Details
Security
Networking
Storage
Status checks
Monitoring
Tags
Security details
IAM Role
–
Owner ID
032286224389
Launch time
Sun Dec 17 2023 12:50:59 GMT+0530 (India Standard Time)
Security groups
sg-0987579cc5f3c0ee0 (terraform_example_sg)
Inbound rules
Filter rules
1
Name
Security group rule ID
Port range
Protocol
Source
–
sgr-08091ef88259c1bf9
80
TCP
0.0.0.0/0
–
sgr-0f4d3cf7143b5ad06
22
TCP
0.0.0.0/0
CloudShell
Feedback
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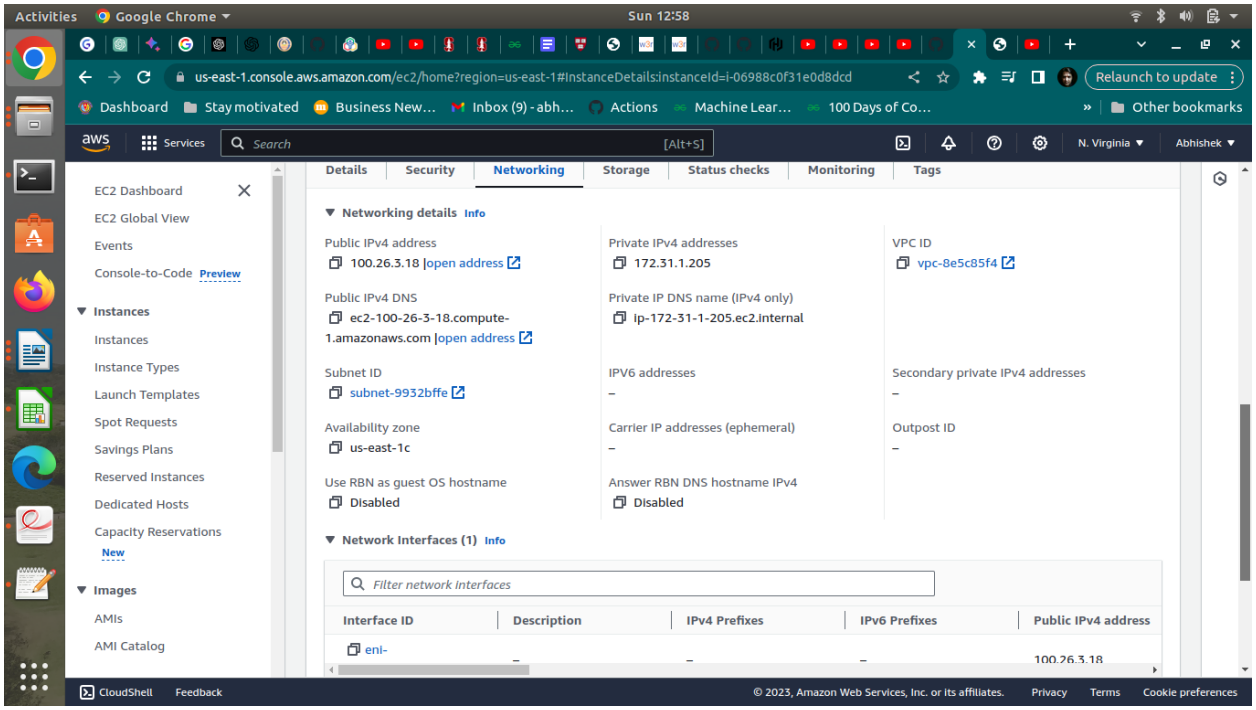
Activities
Google Chrome
Sun 12:58
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-06988c0f31e0d8dcd
Relaunch to update
Dashboard
Stay motivated
Business New...
Inbox (9) - abh...
Actions
Machine Lear...
100 Days of Co...
Other bookmarks
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Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
AMIs
AMI Catalog
Details
Security
Networking
Storage
Status checks
Monitoring
Tags
Networking details Info
Public IPv4 address
100.26.3.18 |open address
Private IPv4 addresses
172.31.1.205
VPC ID
vpc-8e5c85f4
Public IPv4 DNS
ec2-100-26-3-18.compute-1.amazonaws.com |open address
Private IP DNS name (IPv4 only)
ip-172-31-1-205.ec2.internal
Subnet ID
subnet-9932bffe
IPV6 addresses
–
Secondary private IPv4 addresses
–
Availability zone
us-east-1c
Carrier IP addresses (ephemeral)
–
Outpost ID
–
Use RBN as guest OS hostname
Disabled
Answer RBN DNS hostname IPv4
Disabled
Network Interfaces (1) Info
Filter network interfaces
Interface ID
Description
IPv4 Prefixes
IPv6 Prefixes
Public IPv4 address
eni-
100.26.3.18
CloudShell
Feedback
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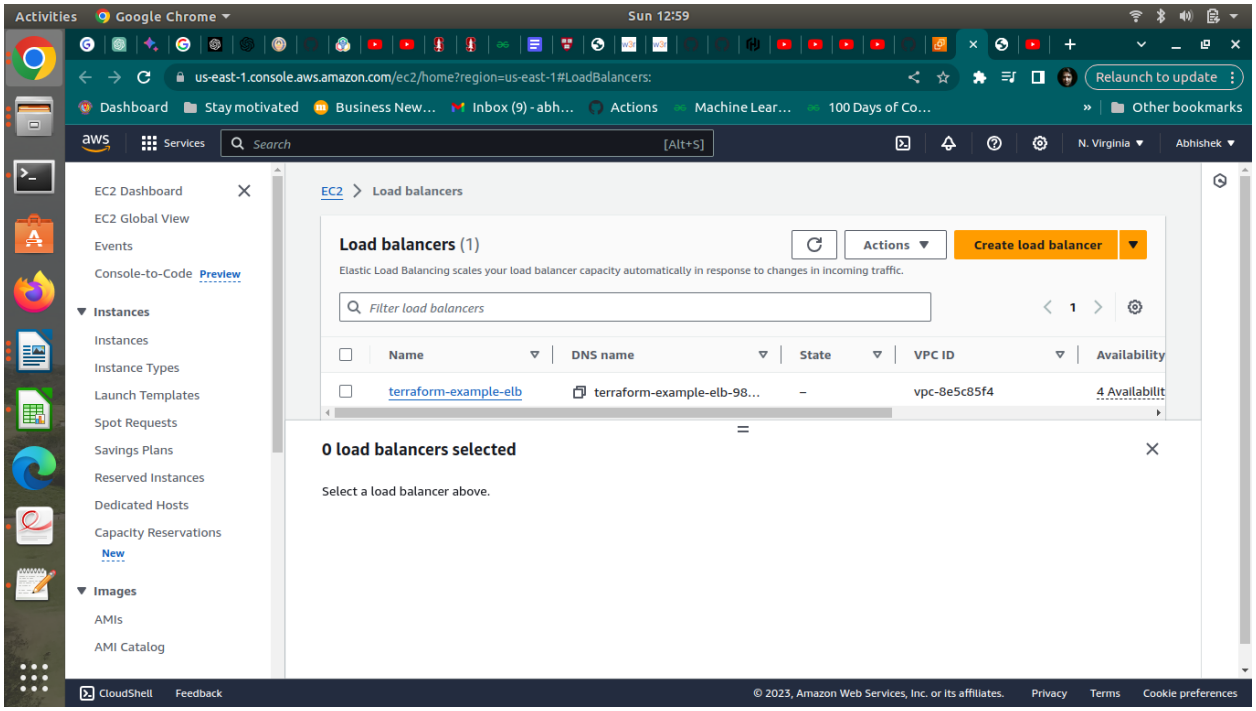
Activities
Google Chrome
Sun 12:59
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LoadBalancers:
Relaunch to update
Dashboard
Stay motivated
Business New...
Inbox (9) - abh...
Actions
Machine Lear...
100 Days of Co...
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
Abhishek
EC2 Dashboard
EC2 Global View
Events
Console-to-Code Preview
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
AMIs
AMI Catalog
EC2 > Load balancers
Load balancers (1)
Actions
Create load balancer
Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.
Filter load balancers
1
Name
DNS name
State
VPC ID
Availability
terraform-example-elb
terraform-example-elb-98...
–
vpc-8e5c85f4
4 Availabilit
0 load balancers selected
Select a load balancer above.
CloudShell
Feedback
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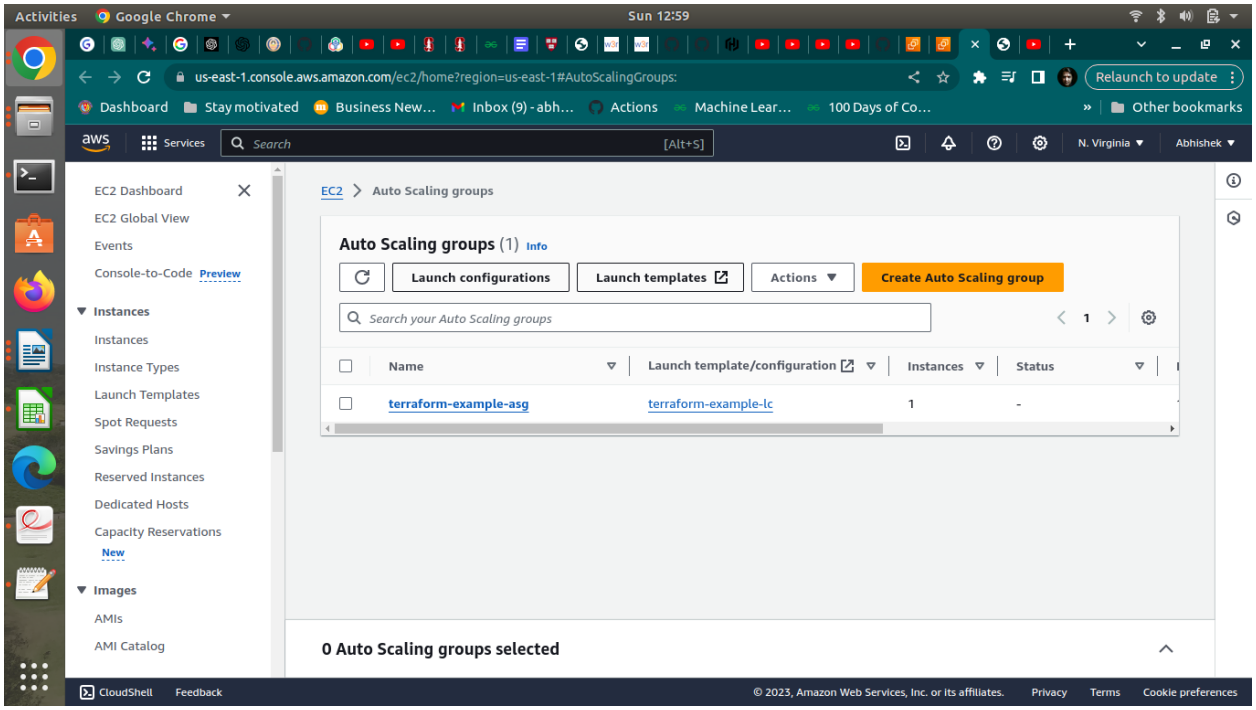
Privacy
Terms
Cookie preferences


Activities
Google Chrome
Sun 12:59
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AutoScalingGroups:
Relaunch to update
Dashboard
Stay motivated
Business New...
Inbox (9) - abh...
Actions
Machine Lear...
100 Days of Co...
Other bookmarks
aws
Services
Search
[Alt+S]
N. Virginia
Abhishek
EC2 Dashboard
EC2 Global View
Events
Console-to-Code Preview
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
AMIs
AMI Catalog
EC2
Auto Scaling groups
Auto Scaling groups (1) Info
Launch configurations
Launch templates
Actions
Create Auto Scaling group
Search your Auto Scaling groups
1
Name
Launch template/configuration
Instances
Status
terraform-example-asg
terraform-example-lc
1
-
0 Auto Scaling groups selected
CloudShell
Feedback
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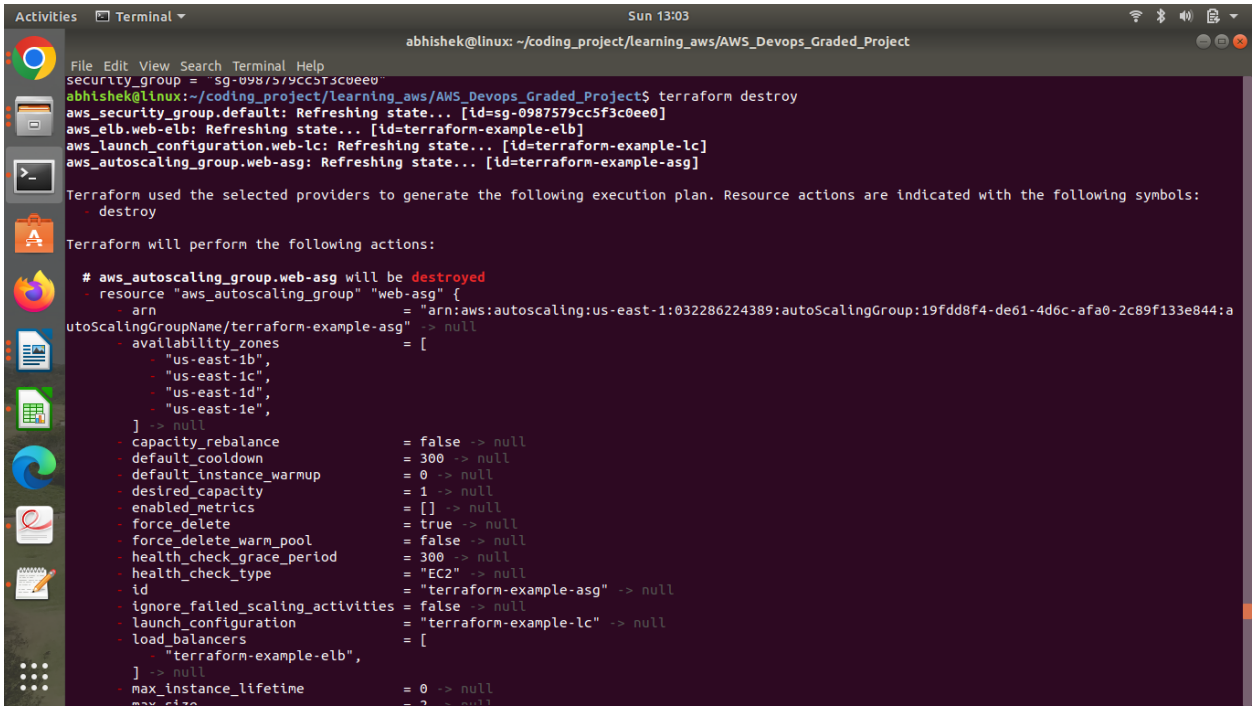
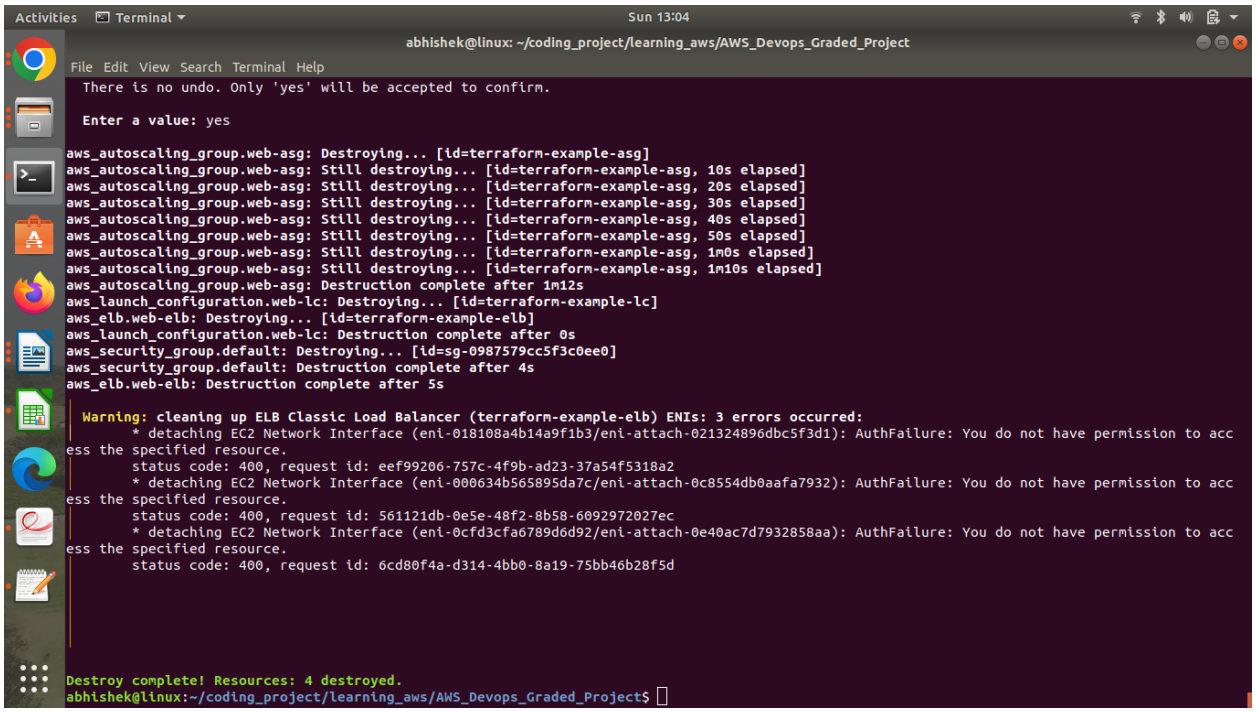

Activities
Terminal
Sun 13:03
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
security_group = "sg-0987579cc5f3c0ee0"
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$ terraform destroy
aws_security_group.default: Refreshing state... [id=sg-0987579cc5f3c0ee0]
aws_elb.web-elb: Refreshing state... [id=terraform-example-elb]
aws_launch_configuration.web-lc: Refreshing state... [id=terraform-example-lc]
aws_autoscaling_group.web-asg: Refreshing state... [id=terraform-example-asg]
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
- destroy
Terraform will perform the following actions:
# aws_autoscaling_group.web-asg will be destroyed
- resource "aws_autoscaling_group" "web-asg" {
- arn = "arn:aws:autoscaling:us-east-1:032286224389:autoScalingGroup:19fdd8f4-de61-4d6c-afa0-2c89f133e844:autoScalingGroupName/terraform-example-asg" -> null
- availability_zones = [
"us-east-1b",
"us-east-1c",
"us-east-1d",
"us-east-1e",
] -> null
- capacity_rebalance = false -> null
- default_cooldown = 300 -> null
- default_instance_warmup = 0 -> null
- desired_capacity = 1 -> null
- enabled_metrics = [] -> null
- force_delete = true -> null
- force_delete_warm_pool = false -> null
- health_check_grace_period = 300 -> null
- health_check_type = "EC2" -> null
- id = "terraform-example-asg" -> null
- ignore_failed_scaling_activities = false -> null
- launch_configuration = "terraform-example-lc" -> null
- load_balancers = [
"terraform-example-elb",
] -> null
- max_instance_lifetime = 0 -> null


Activities
Terminal
Sun 13:04
abhishek@linux: ~/coding_project/learning_aws/AWS_Devops_Graded_Project
File Edit View Search Terminal Help
There is no undo. Only 'yes' will be accepted to confirm.
Enter a value: yes
aws_autoscaling_group.web-asg: Destroying... [id=terraform-example-asg]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 10s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 20s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 30s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 40s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 50s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 1m0s elapsed]
aws_autoscaling_group.web-asg: Still destroying... [id=terraform-example-asg, 1m10s elapsed]
aws_autoscaling_group.web-asg: Destruction complete after 1m12s
aws_launch_configuration.web-lc: Destroying... [id=terraform-example-lc]
aws_elb.web-elb: Destroying... [id=terraform-example-elb]
aws_launch_configuration.web-lc: Destruction complete after 0s
aws_security_group.default: Destroying... [id=sg-0987579cc5f3c0ee0]
aws_security_group.default: Destruction complete after 4s
aws_elb.web-elb: Destruction complete after 5s
Warning: cleaning up ELB Classic Load Balancer (terraform-example-elb) ENIs: 3 errors occurred:
* detaching EC2 Network Interface (eni-018108a4b14a9f1b3/eni-attach-021324896dbc5f3d1): AuthFailure: You do not have permission to access the specified resource.
status code: 400, request id: eef99206-757c-4f9b-ad23-37a54f5318a2
* detaching EC2 Network Interface (eni-000634b565895da7c/eni-attach-0c8554db0aafa7932): AuthFailure: You do not have permission to access the specified resource.
status code: 400, request id: 561121db-0e5e-48f2-8b58-6092972027ec
* detaching EC2 Network Interface (eni-0cfd3cfa6789d6d92/eni-attach-0e40ac7d7932858aa): AuthFailure: You do not have permission to access the specified resource.
status code: 400, request id: 6cd80f4a-d314-4bb0-8a19-75bb46b28f5d
Destroy complete! Resources: 4 destroyed.
abhishek@linux:~/coding_project/learning_aws/AWS_Devops_Graded_Project$