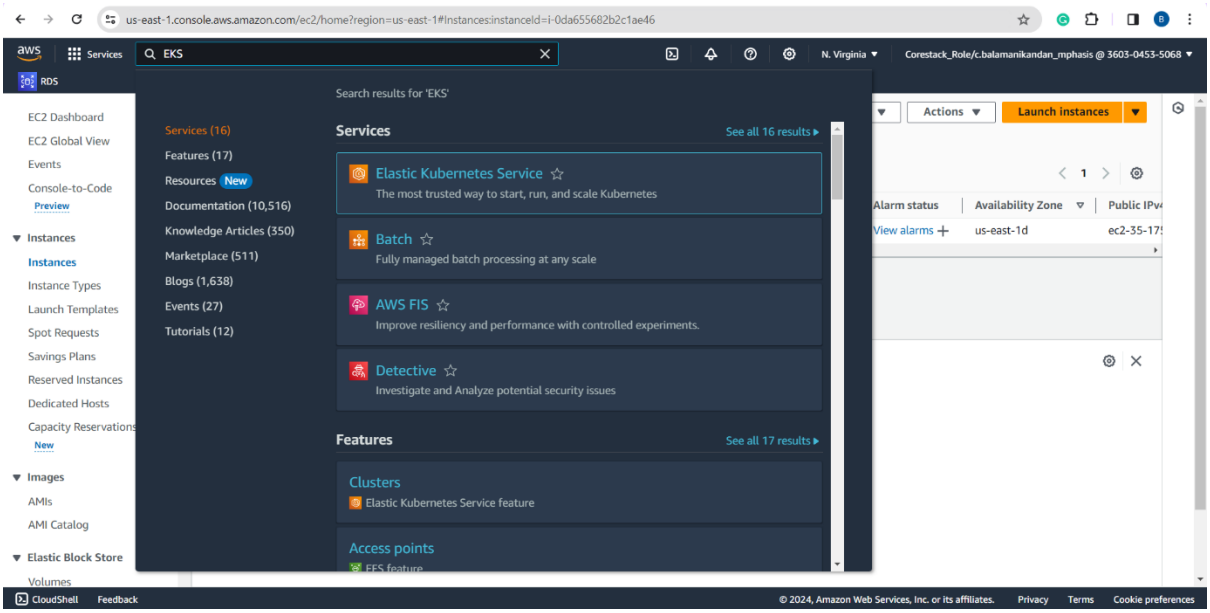
Install Kubernetes on cloud

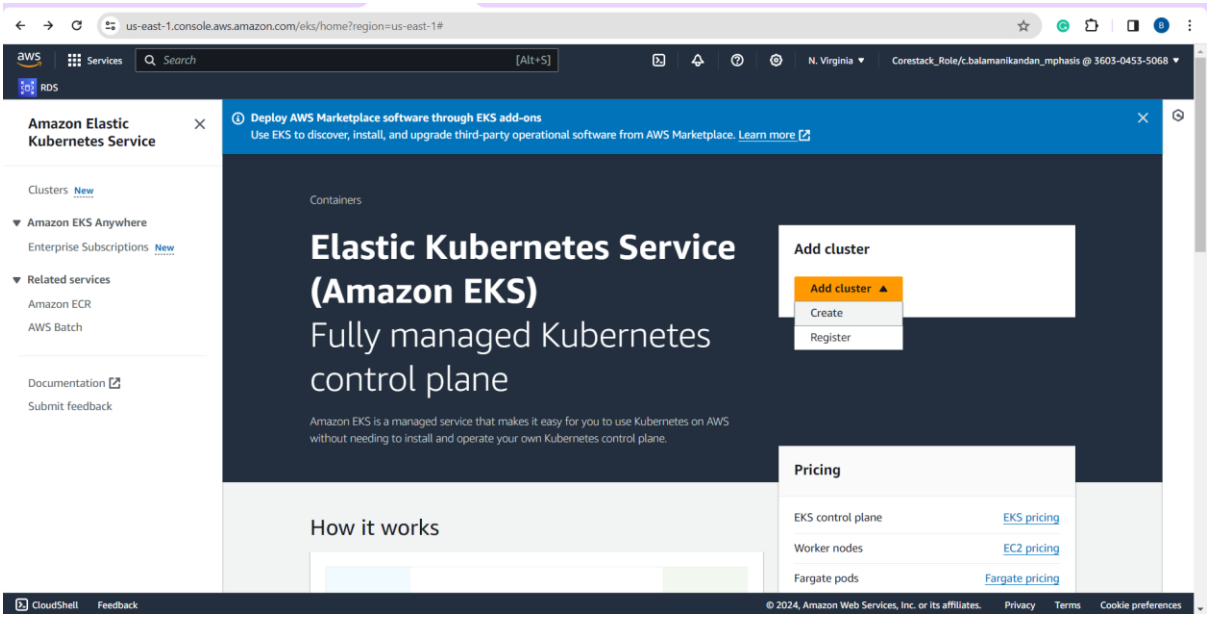
Phase 5 Practice Project Set 4

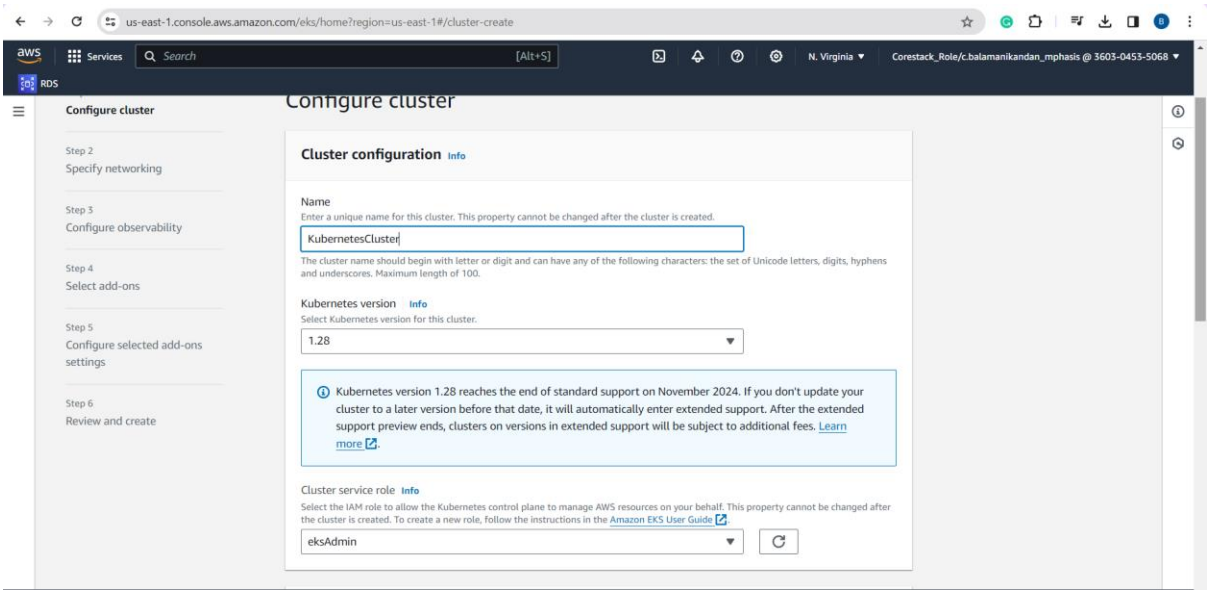
Name: C Balamanikandan

Creating an AWS EKS cluster

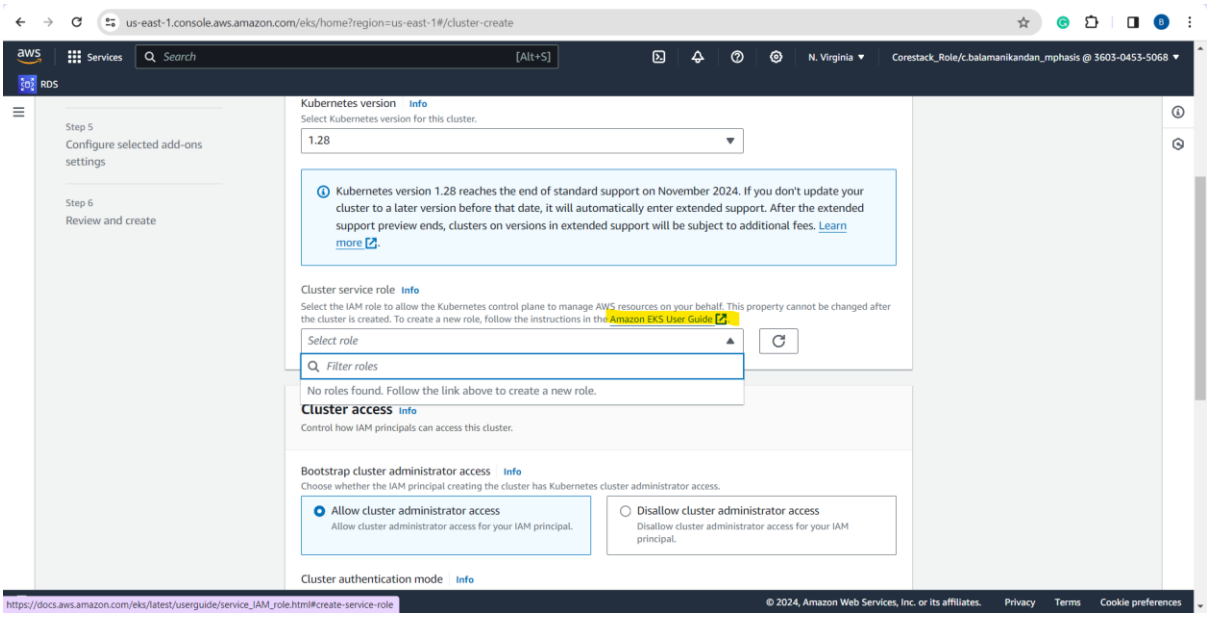
- **Connect to AWS console and navigate to EKS service to create an EKS cluster.**

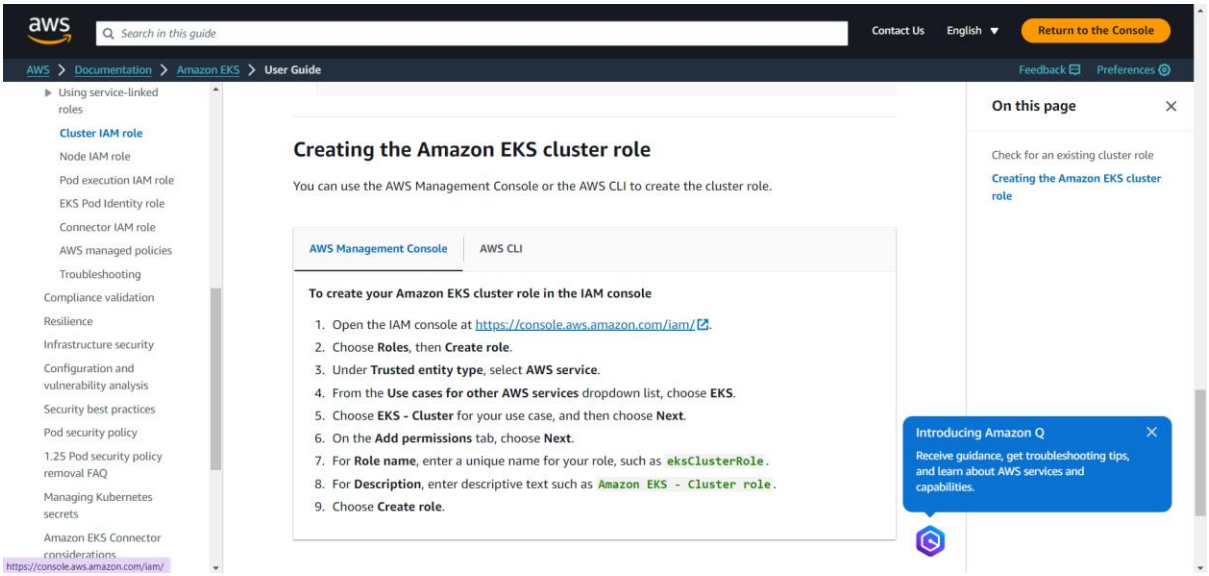






To Create Role:




Search in this guide
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AWS > Documentation > Amazon EKS > User Guide
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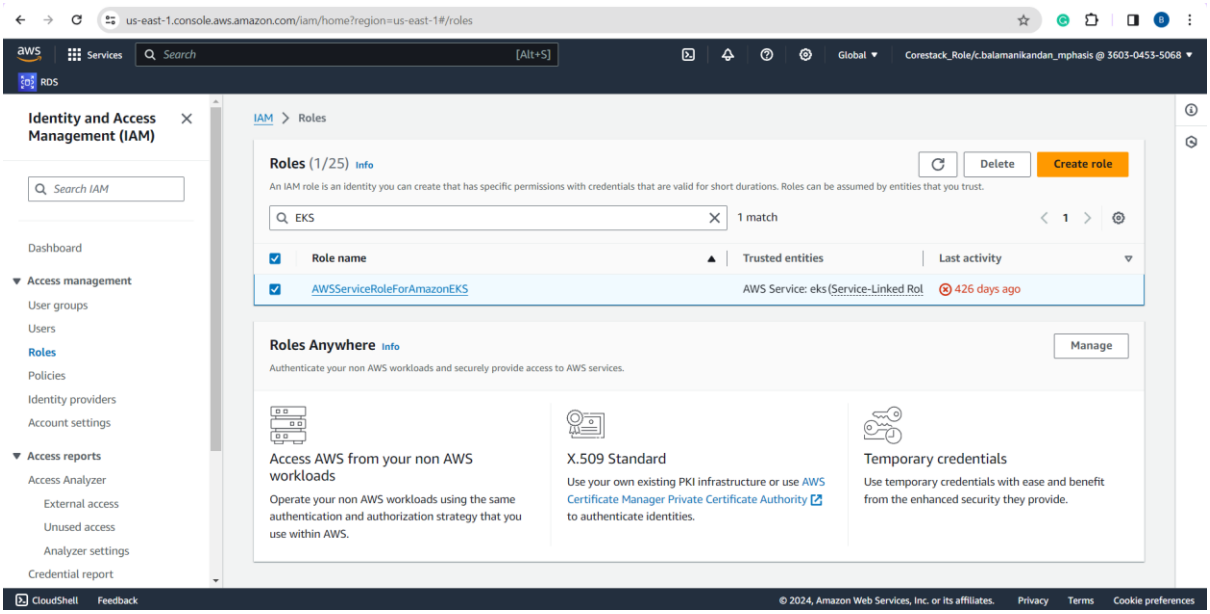
Using service-linked roles
Cluster IAM role
Node IAM role
Pod execution IAM role
EKS Pod Identity role
Connector IAM role
AWS managed policies
Troubleshooting
Compliance validation
Resilience
Infrastructure security
Configuration and vulnerability analysis
Security best practices
Pod security policy
1.25 Pod security policy removal FAQ
Managing Kubernetes secrets
Amazon EKS Connector considerations
https://console.aws.amazon.com/iam/
Creating the Amazon EKS cluster role
You can use the AWS Management Console or the AWS CLI to create the cluster role.
AWS Management Console
AWS CLI
To create your Amazon EKS cluster role in the IAM console
1. Open the IAM console at https://console.aws.amazon.com/iam/.
2. Choose Roles, then Create role.
3. Under Trusted entity type, select AWS service.
4. From the Use cases for other AWS services dropdown list, choose EKS.
5. Choose EKS - Cluster for your use case, and then choose Next.
6. On the Add permissions tab, choose Next.
7. For Role name, enter a unique name for your role, such as eksClusterRole.
8. For Description, enter descriptive text such as Amazon EKS - Cluster role.
9. Choose Create role.
On this page
Check for an existing cluster role
Creating the Amazon EKS cluster role
Introducing Amazon Q
Receive guidance, get troubleshooting tips, and learn about AWS services and capabilities.


us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles
Services
Search
[Alt+S]
Global
Corestack_Role/c.balamanikandan_mphasis @ 3603-0453-5068
RDS
Identity and Access Management (IAM)
Search IAM
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Access reports
Access Analyzer
External access
Unused access
Analyzer settings
Credential report
IAM > Roles
Roles (1/25) Info
An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.
Delete
Create role
EKS
1 match
Role name
Trusted entities
Last activity
AWSServiceRoleForAmazonEKS
AWS Service: eks (Service-Linked Rol
426 days ago
Roles Anywhere Info
Authenticate your non AWS workloads and securely provide access to AWS services.
Manage
Access AWS from your non AWS workloads
Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.
X.509 Standard
Use your own existing PKI infrastructure or use AWS Certificate Manager Private Certificate Authority to authenticate identities.
Temporary credentials
Use temporary credentials with ease and benefit from the enhanced security they provide.
CloudShell
Feedback
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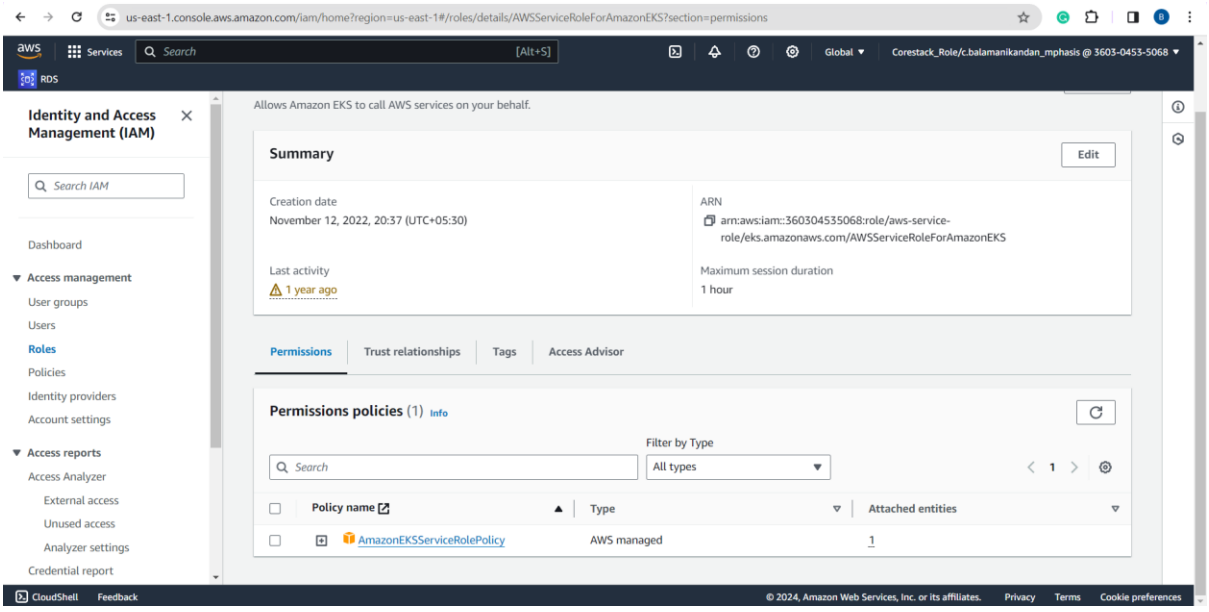
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles/details/AWSServiceRoleForAmazonEKS?section=permissions
Services
Search
[Alt+S]
Global
Corestack_Role/c.balamanikandan_mphasis @ 3603-0453-5068
RDS
Identity and Access Management (IAM)
Search IAM
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User groups
Users
Roles
Policies
Identity providers
Account settings
Access reports
Access Analyzer
External access
Unused access
Analyzer settings
Credential report
Allows Amazon EKS to call AWS services on your behalf.
Summary
Edit
Creation date
November 12, 2022, 20:37 (UTC+05:30)
ARN
arn:aws:iam::360304535068:role/aws-service-role/eks.amazonaws.com/AWSServiceRoleForAmazonEKS
Last activity
1 year ago
Maximum session duration
1 hour
Permissions
Trust relationships
Tags
Access Advisor
Permissions policies (1) Info
Filter by Type
Search
All types
Policy name
Type
Attached entities
AmazonEKSServiceRolePolicy
AWS managed
1
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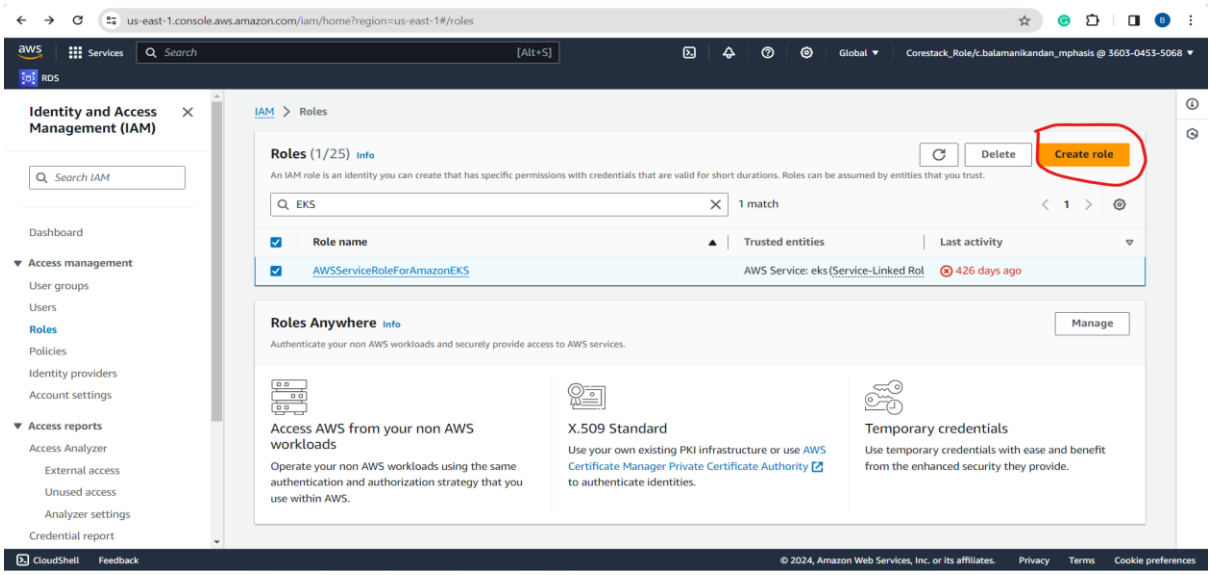
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles
Identity and Access Management (IAM)
IAM > Roles
Roles (1/25) Info
An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.
Delete
Create role
EKS
1 match
Role name
Trusted entities
Last activity
AWSServiceRoleForAmazonEKS
AWS Service: eks (Service-Linked Rol
426 days ago
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Identity providers
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Access Analyzer
External access
Unused access
Analyzer settings
Credential report
CloudShell
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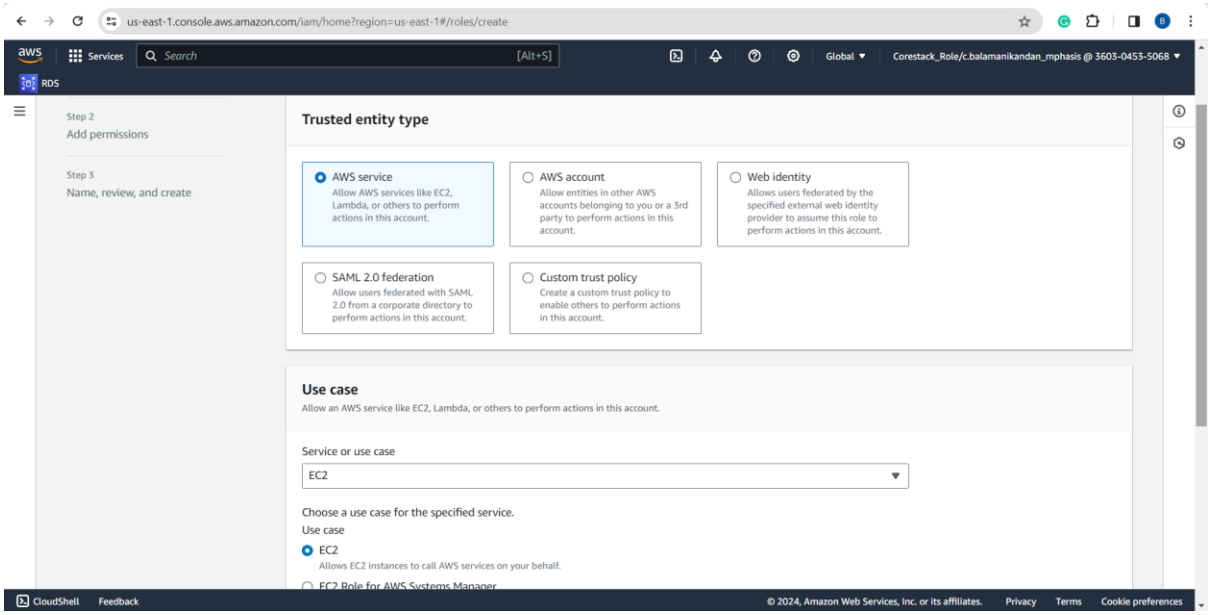
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles/create
Step 2
Add permissions
Step 3
Name, review, and create
Trusted entity type
AWS service
Allow AWS services like EC2, Lambda, or others to perform actions in this account.
AWS account
Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
Web identity
Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
SAML 2.0 federation
Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
Custom trust policy
Create a custom trust policy to enable others to perform actions in this account.
Use case
Allow an AWS service like EC2, Lambda, or others to perform actions in this account.
Service or use case
EC2
Choose a use case for the specified service.
Use case
EC2
Allows EC2 instances to call AWS services on your behalf.
EC2 Role for AWS Systems Manager
CloudShell
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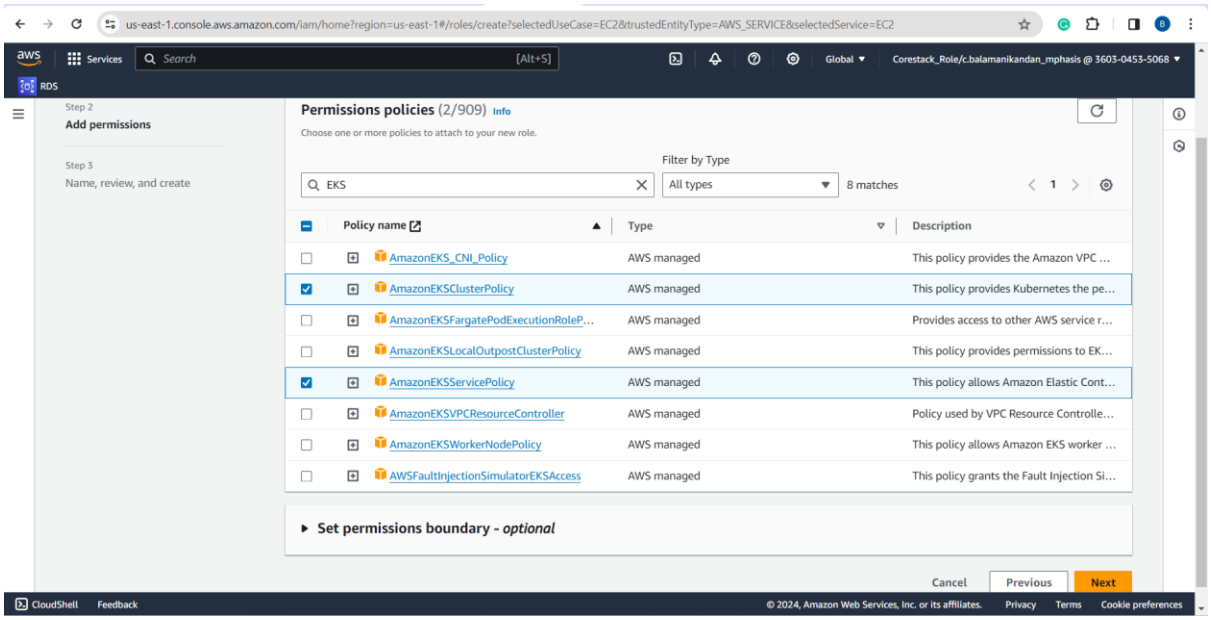
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles/create?selectedUseCase=EC2&trustedEntityType=AWS_SERVICE&selectedService=EC2
Step 2
Add permissions
Step 3
Name, review, and create
Permissions policies (2/909) Info
Choose one or more policies to attach to your new role.
Filter by Type
EKS
All types
8 matches
Policy name
Type
Description
AmazonEKS_CNI_Policy
AWS managed
This policy provides the Amazon VPC ...
AmazonEKSClusterPolicy
AWS managed
This policy provides Kubernetes the pe...
AmazonEKSFargatePodExecutionRoleP...
AWS managed
Provides access to other AWS service r...
AmazonEKSLocalOutpostClusterPolicy
AWS managed
This policy provides permissions to EK...
AmazonEKSServicePolicy
AWS managed
This policy allows Amazon Elastic Cont...
AmazonEKSVPCResourceController
AWS managed
Policy used by VPC Resource Controlle...
AmazonEKSWorkerNodePolicy
AWS managed
This policy allows Amazon EKS worker ...
AWSFaultInjectionSimulatorEKSAccess
AWS managed
This policy grants the Fault Injection Si...
Set permissions boundary - optional
Cancel
Previous
Next
CloudShell
Feedback
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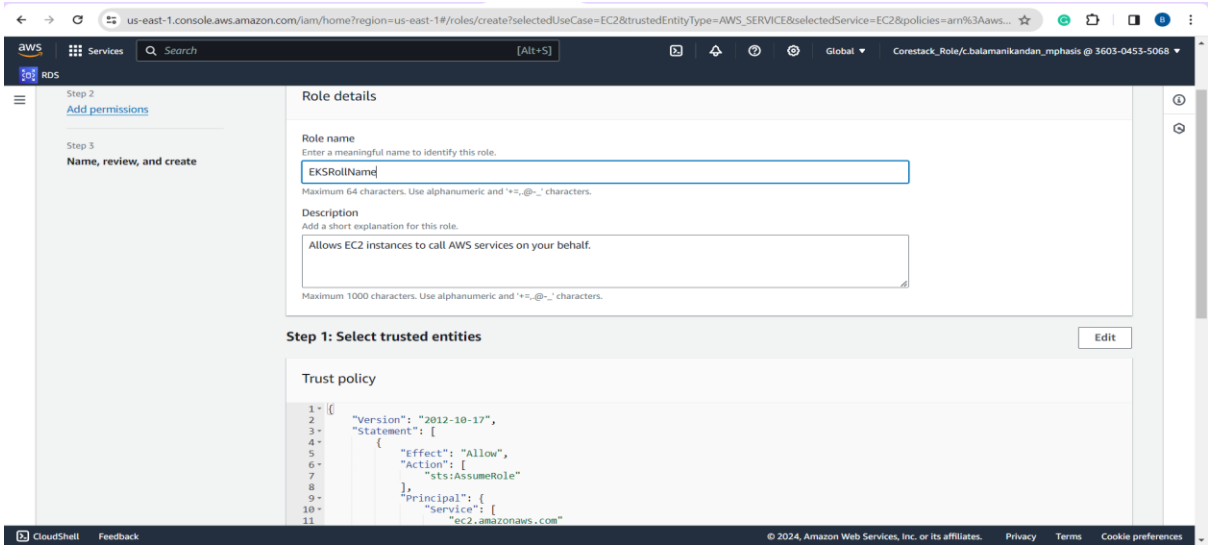
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles/create?selectedUseCase=EC2&trustedEntityType=AWS_SERVICE&selectedService=EC2&policies=arn%3Aaws...
Services
Search
[Alt+S]
Global
Corestack_Role/c.balamanikandan_mphasis @ 3603-0453-5068
RDS
Step 2
Add permissions
Step 3
Name, review, and create
Role details
Role name
Enter a meaningful name to identify this role.
EKSRollName
Maximum 64 characters. Use alphanumeric and '+=,.@-_' characters.
Description
Add a short explanation for this role.
Allows EC2 instances to call AWS services on your behalf.
Maximum 1000 characters. Use alphanumeric and '+=,.@-_' characters.
Step 1: Select trusted entities
Edit
Trust policy
{
"Version": "2012-10-17",
"Statement": [
{
"Effect": "Allow",
"Action": [
"sts:AssumeRole"
],
"Principal": {
"Service": [
"ec2.amazonaws.com"
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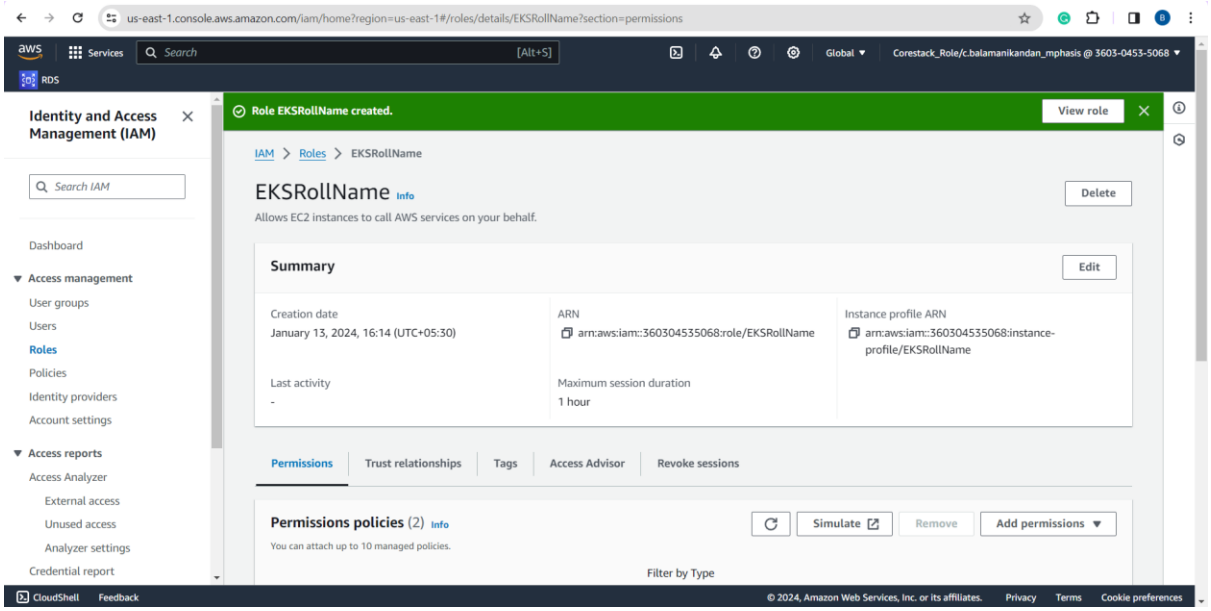
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles/details/EKSRollName?section=permissions
Identity and Access Management (IAM)
Search IAM
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Roles
Policies
Identity providers
Account settings
Access reports
Access Analyzer
External access
Unused access
Analyzer settings
Credential report
Role EKSRollName created.
View role
IAM > Roles > EKSRollName
EKSRollName Info
Allows EC2 instances to call AWS services on your behalf.
Delete
Summary
Edit
Creation date
January 13, 2024, 16:14 (UTC+05:30)
ARN
arn:aws:iam::360304535068:role/EKSRollName
Instance profile ARN
arn:aws:iam::360304535068:instance-profile/EKSRollName
Last activity
-
Maximum session duration
1 hour
Permissions
Trust relationships
Tags
Access Advisor
Revoke sessions
Permissions policies (2) Info
You can attach up to 10 managed policies.
Simulate
Remove
Add permissions
Filter by Type
CloudShell
Feedback
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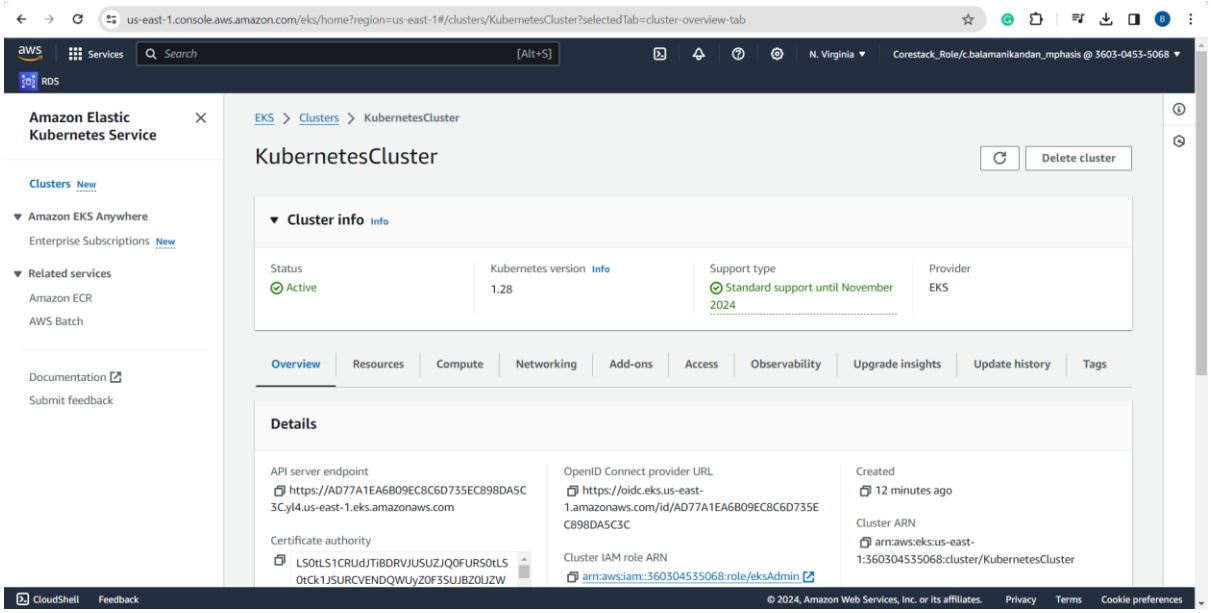
us-east-1.console.aws.amazon.com/eks/home?region=us-east-1#/clusters/KubernetesCluster?selectedTab=cluster-overview-tab
N. Virginia
Amazon Elastic Kubernetes Service
Clusters New
Amazon EKS Anywhere
Enterprise Subscriptions New
Related services
Amazon ECR
AWS Batch
Documentation
Submit feedback
EKS > Clusters > KubernetesCluster
KubernetesCluster
Delete cluster
Cluster info Info
Status
Active
Kubernetes version Info
1.28
Support type
Standard support until November 2024
Provider
EKS
Overview
Resources
Compute
Networking
Add-ons
Access
Observability
Upgrade insights
Update history
Tags
Details
API server endpoint
https://AD77A1EA6B09EC8C6D735EC898DA5C3C.yl4.us-east-1.eks.amazonaws.com
Certificate authority
LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSURCVENDQWUyZ0F3SUJBZ0lUZW
OpenID Connect provider URL
https://oidc.eks.us-east-1.amazonaws.com/id/AD77A1EA6B09EC8C6D735EC898DA5C3C
Cluster IAM role ARN
arn:aws:iam::360304535068:role/eksAdmin
Created
12 minutes ago
Cluster ARN
arn:aws:eks:us-east-1:360304535068:cluster/KubernetesCluster
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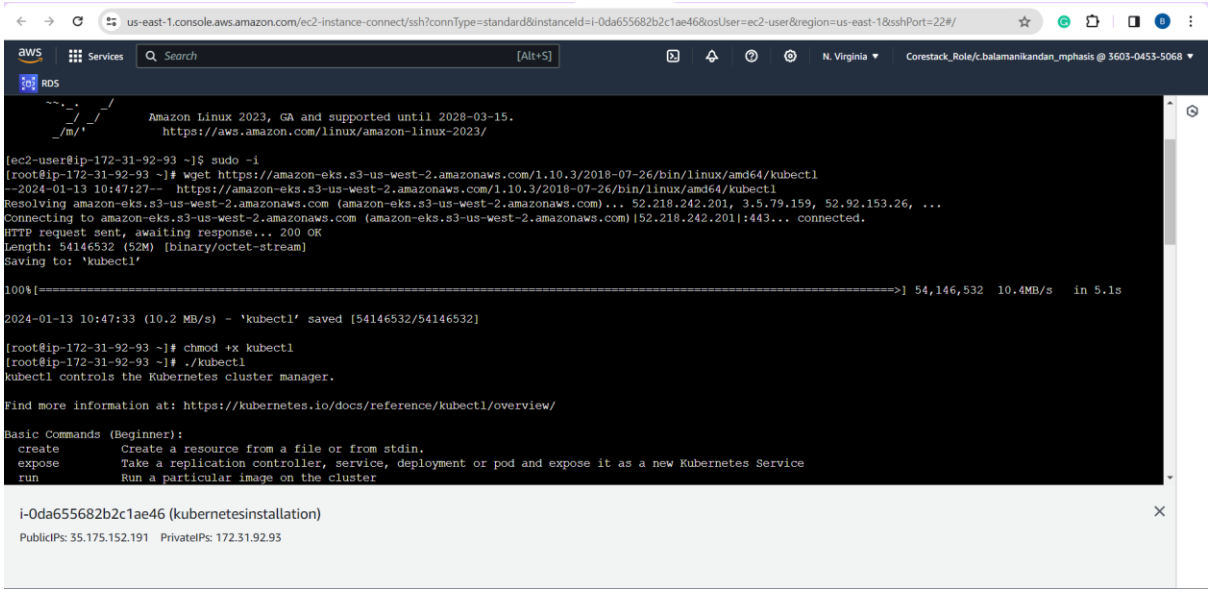
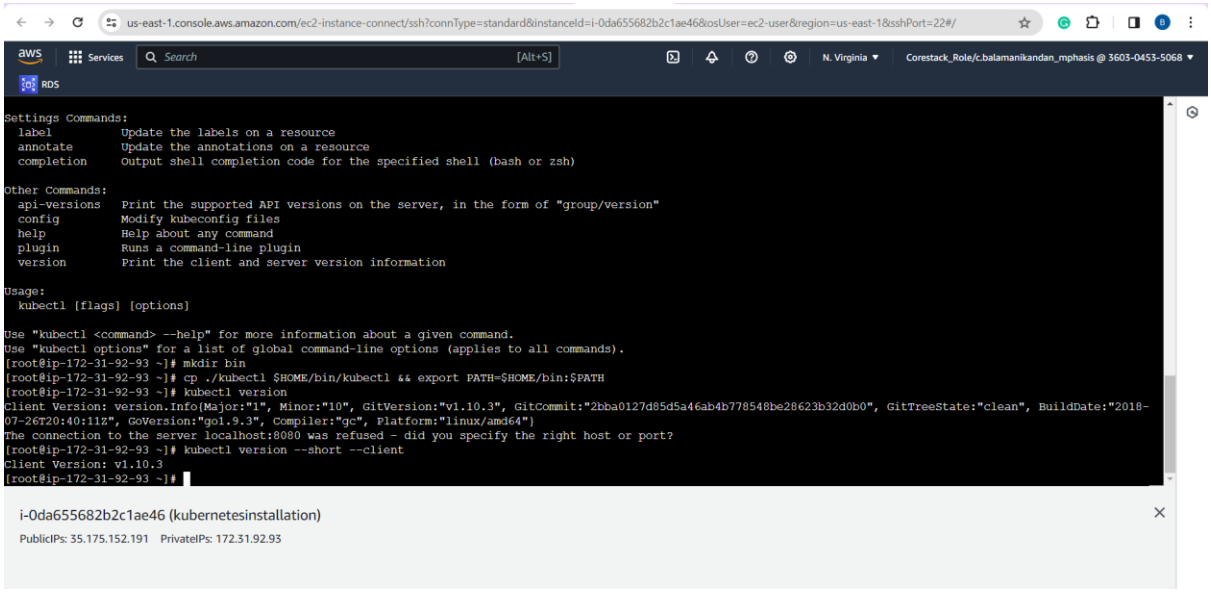
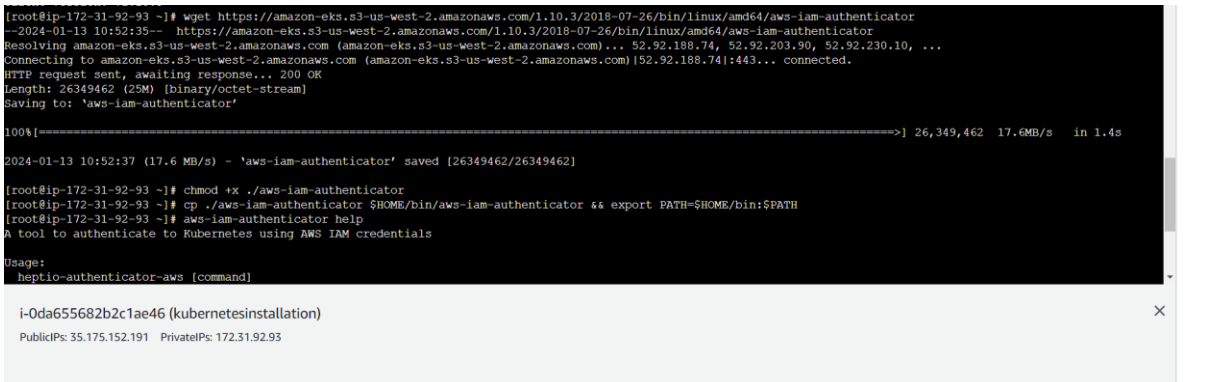
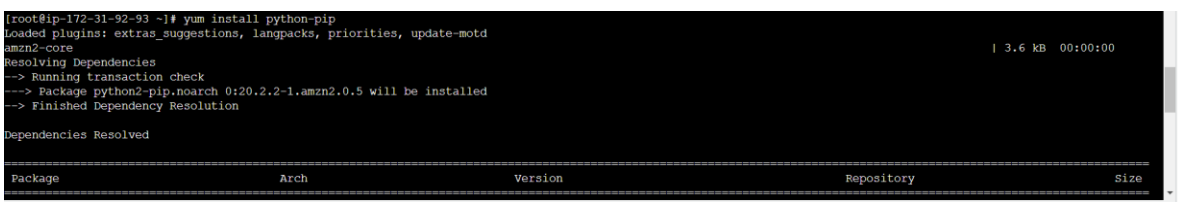

us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0da655682b2c1ae46&osUser=ec2-user&region=us-east-1&sshPort=22#/
Services
Search
[Alt+S]
N. Virginia
Corestack_Role/c.balamanikandan_mphasis @ 3603-0453-5068
RDS
Amazon Linux 2023, GA and supported until 2028-03-15.
https://aws.amazon.com/linux/amazon-linux-2023/
[ec2-user@ip-172-31-92-93 ~]$ sudo -i
[root@ip-172-31-92-93 ~]# wget https://amazon-eks.s3-us-west-2.amazonaws.com/1.10.3/2018-07-26/bin/linux/amd64/kubectl
--2024-01-13 10:47:27-- https://amazon-eks.s3-us-west-2.amazonaws.com/1.10.3/2018-07-26/bin/linux/amd64/kubectl
Resolving amazon-eks.s3-us-west-2.amazonaws.com (amazon-eks.s3-us-west-2.amazonaws.com)... 52.218.242.201, 3.5.79.159, 52.92.153.26, ...
Connecting to amazon-eks.s3-us-west-2.amazonaws.com (amazon-eks.s3-us-west-2.amazonaws.com)|52.218.242.201|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 54146532 (52M) [binary/octet-stream]
Saving to: 'kubectl'
100%[=>] 54,146,532 10.4MB/s in 5.1s
2024-01-13 10:47:33 (10.2 MB/s) - 'kubectl' saved [54146532/54146532]
[root@ip-172-31-92-93 ~]# chmod +x kubectl
[root@ip-172-31-92-93 ~]# ./kubectl
kubectl controls the Kubernetes cluster manager.
Find more information at: https://kubernetes.io/docs/reference/kubectl/overview/
Basic Commands (Beginner):
create Create a resource from a file or from stdin.
expose Take a replication controller, service, deployment or pod and expose it as a new Kubernetes Service
run Run a particular image on the cluster
i-0da655682b2c1ae46 (kubernetesinstallation)
PublicIPs: 35.175.152.191 PrivateIPs: 172.31.92.93


us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0da655682b2c1ae46&osUser=ec2-user&region=us-east-1&sshPort=22#/
Services
Search
[Alt+S]
N. Virginia
Corestack_Role/c.balamanikandan_mphasis @ 3603-0453-5068
RDS
Settings Commands:
label Update the labels on a resource
annotate Update the annotations on a resource
completion Output shell completion code for the specified shell (bash or zsh)
Other Commands:
api-versions Print the supported API versions on the server, in the form of "group/version"
config Modify kubeconfig files
help Help about any command
plugin Runs a command-line plugin
version Print the client and server version information
Usage:
kubectl [flags] [options]
Use "kubectl <command> --help" for more information about a given command.
Use "kubectl options" for a list of global command-line options (applies to all commands).
[root@ip-172-31-92-93 ~]# mkdir bin
[root@ip-172-31-92-93 ~]# cp ./kubectl $HOME/bin/kubectl && export PATH=$HOME/bin:$PATH
[root@ip-172-31-92-93 ~]# kubectl version
Client Version: version.Info{Major:"1", Minor:"10", GitVersion:"v1.10.3", GitCommit:"2bba0127d85d5a46ab4b778548be28623b32d0b0", GitTreeState:"clean", BuildDate:"2018-07-26T20:40:11Z", GoVersion:"go1.9.3", Compiler:"gc", Platform:"linux/amd64"}
The connection to the server localhost:8080 was refused - did you specify the right host or port?
[root@ip-172-31-92-93 ~]# kubectl version --short --client
Client Version: v1.10.3
[root@ip-172-31-92-93 ~]#
i-0da655682b2c1ae46 (kubernetesinstallation)
PublicIPs: 35.175.152.191 PrivateIPs: 172.31.92.93

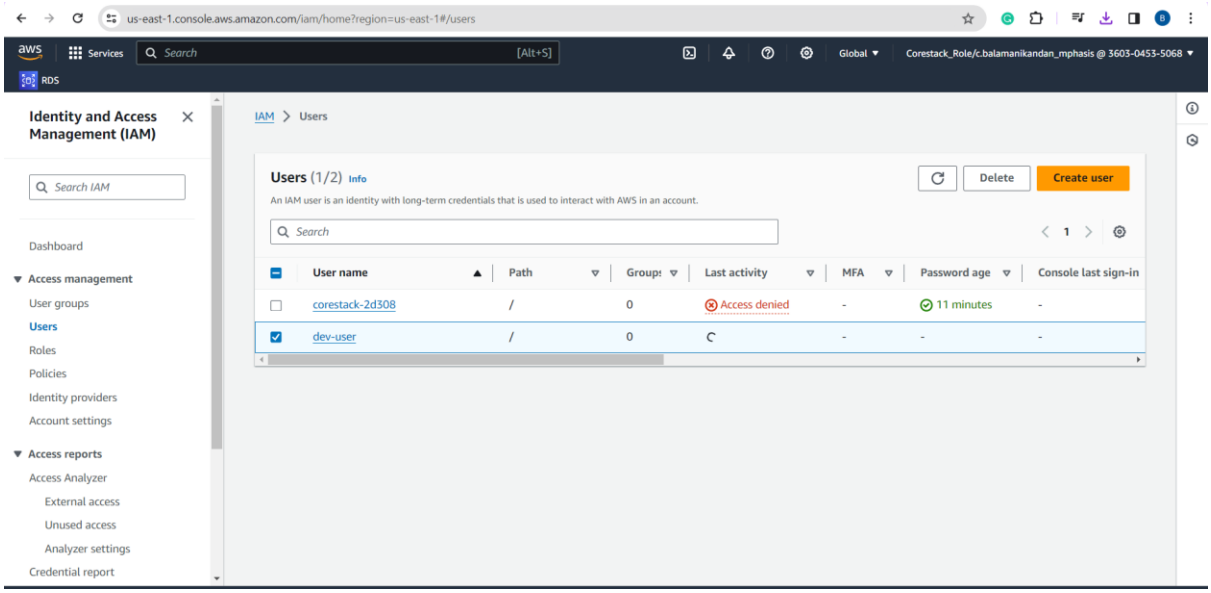

[root@ip-172-31-92-93 ~]# wget https://amazon-eks.s3-us-west-2.amazonaws.com/1.10.3/2018-07-26/bin/linux/amd64/aws-iam-authenticator
--2024-01-13 10:52:35-- https://amazon-eks.s3-us-west-2.amazonaws.com/1.10.3/2018-07-26/bin/linux/amd64/aws-iam-authenticator
Resolving amazon-eks.s3-us-west-2.amazonaws.com (amazon-eks.s3-us-west-2.amazonaws.com)... 52.92.188.74, 52.92.203.90, 52.92.230.10, ...
Connecting to amazon-eks.s3-us-west-2.amazonaws.com (amazon-eks.s3-us-west-2.amazonaws.com)|52.92.188.74|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 26349462 (25M) [binary/octet-stream]
Saving to: 'aws-iam-authenticator'
100%[=>] 26,349,462 17.6MB/s in 1.4s
2024-01-13 10:52:37 (17.6 MB/s) - 'aws-iam-authenticator' saved [26349462/26349462]
[root@ip-172-31-92-93 ~]# chmod +x ./aws-iam-authenticator
[root@ip-172-31-92-93 ~]# cp ./aws-iam-authenticator $HOME/bin/aws-iam-authenticator && export PATH=$HOME/bin:$PATH
[root@ip-172-31-92-93 ~]# aws-iam-authenticator help
A tool to authenticate to Kubernetes using AWS IAM credentials
Usage:
heptio-authenticator-aws [command]
i-0da655682b2c1ae46 (kubernetesinstallation)
PublicIPs: 35.175.152.191 PrivateIPs: 172.31.92.93

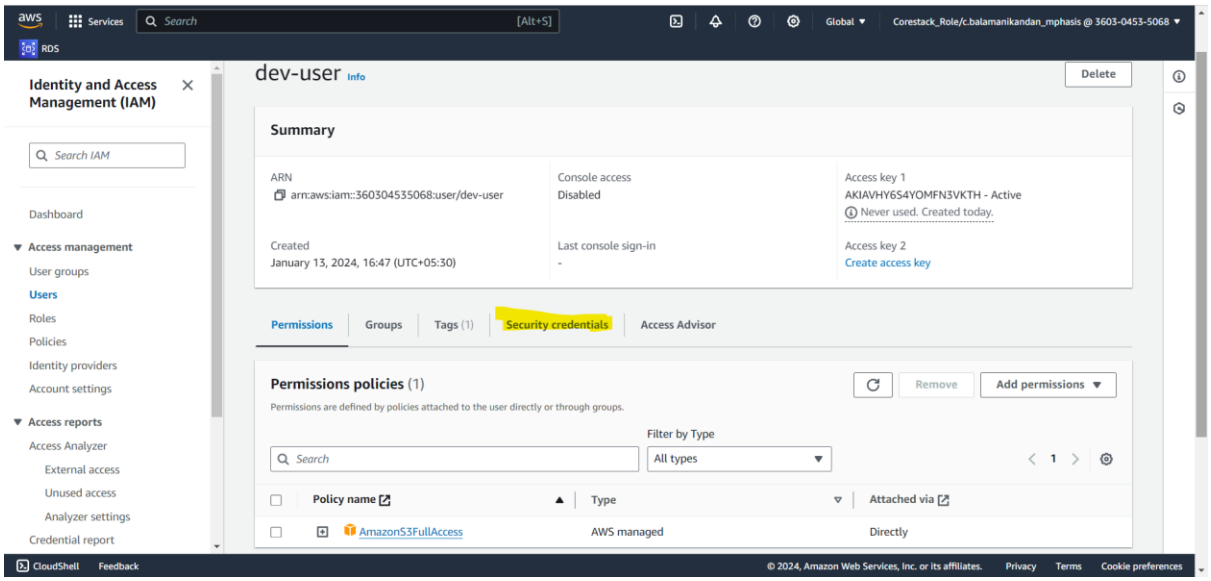

[root@ip-172-31-92-93 ~]# yum install python-pip
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core | 3.6 kB 00:00:00
Resolving Dependencies
--> Running transaction check
---> Package python2-pip.noarch 0:20.2.2-1.amzn2.0.5 will be installed
--> Finished Dependency Resolution
Dependencies Resolved
Package Arch Version Repository Size

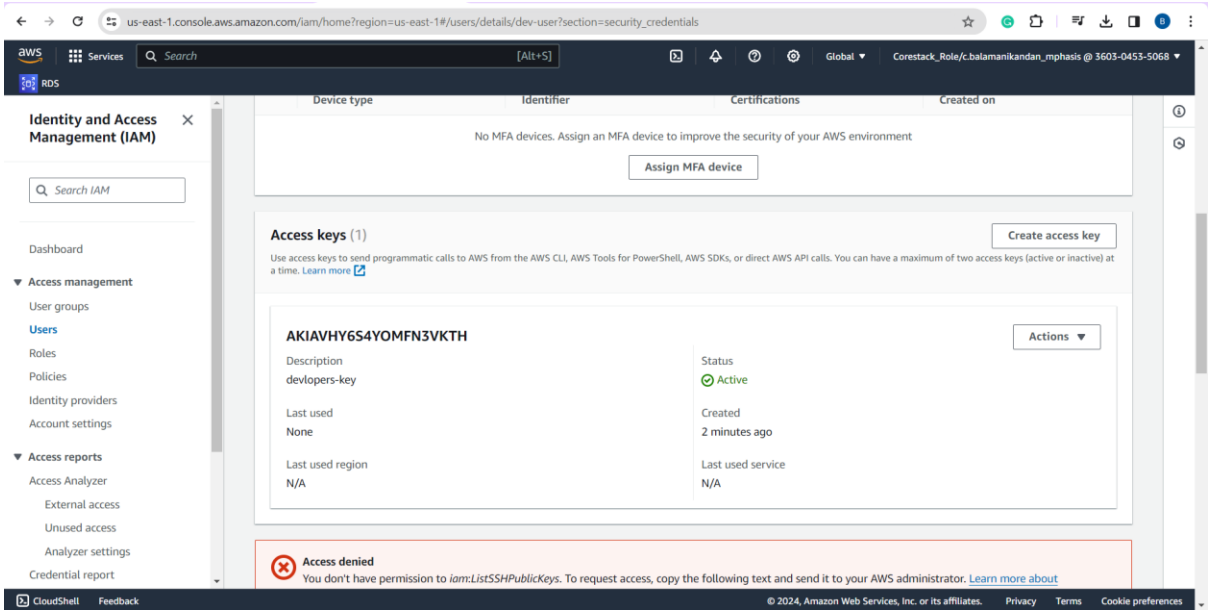
```
[root@ip-172-31-92-93 ~]# pip install awscli
DEPRECATION: Python 2.7 reached the end of its life on January 1st, 2020. Please upgrade your Python as Python 2.7 is no longer maintained. pip 21.0 will drop support
 for Python 2.7 in January 2021. More details about Python 2 support in pip can be found at https://pip.pypa.io/en/latest/development/release-process/#python-2-suppor
t
WARNING: Running pip install with root privileges is generally not a good idea. Try `pip install --user` instead.
Requirement already satisfied: awscli in /usr/lib/python2.7/site-packages (1.18.147)
Requirement already satisfied: botocore==1.18.6 in /usr/lib/python2.7/site-packages (from awscli) (1.18.6)
Requirement already satisfied: docutils<0.16,>=0.10 in /usr/lib/python2.7/site-packages (from awscli) (0.12)
Requirement already satisfied: s3transfer<0.4.0,>=0.3.0 in /usr/lib/python2.7/site-packages (from awscli) (0.3.3)
Requirement already satisfied: PyYAML<5.4,>=3.10 in /usr/lib64/python2.7/site-packages (from awscli) (3.10)
Requirement already satisfied: colorama<0.4.4,>=0.2.5 in /usr/lib/python2.7/site-packages (from awscli) (0.3.9)
Requirement already satisfied: rsa<=4.5.0,>=3.1.2 in /usr/lib/python2.7/site-packages (from awscli) (3.4.1)
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /usr/lib/python2.7/site-packages (from botocore==1.18.6->awscli) (0.9.3)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lib/python2.7/site-packages (from botocore==1.18.6->awscli) (2.6.1)
Requirement already satisfied: urllib3<1.26,>=1.20 in /usr/lib/python2.7/site-packages (from botocore==1.18.6->awscli) (1.25.9)
Requirement already satisfied: futures<4.0.0,>=2.2.0 in /usr/lib/python2.7/site-packages (from s3transfer<0.4.0,>=0.3.0->awscli) (3.0.5)
Requirement already satisfied: pyasn1>=0.1.3 in /usr/lib/python2.7/site-packages (from rsa<=4.5.0,>=3.1.2->awscli) (0.1.9)
Requirement already satisfied: six>=1.5 in /usr/lib/python2.7/site-packages (from python-dateutil<3.0.0,>=2.1->botocore==1.18.6->awscli) (1.11.0)
[root@ip-172-31-92-93 ~]# aws --version
aws-cli/1.18.147 Python/2.7.18 Linux/5.10.205-195.804.amzn2.x86_64 botocore/1.18.6
[root@ip-172-31-92-93 ~]#
```

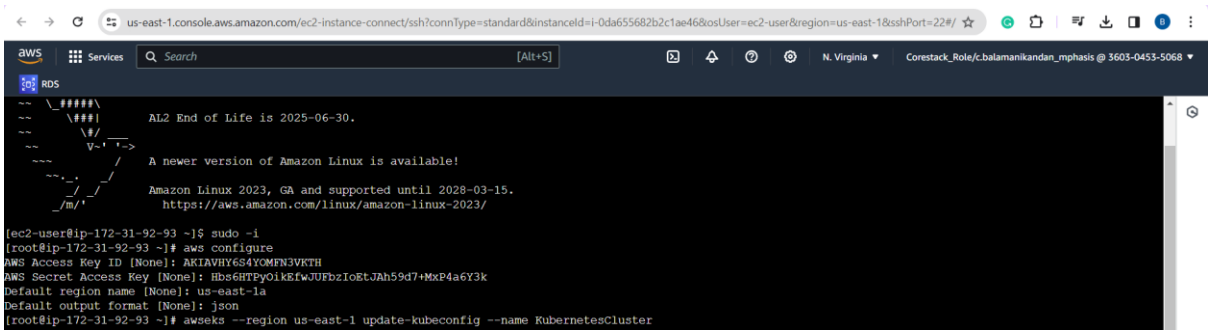
i-0da655682b2c1ae46 (kubernetesinstallation)

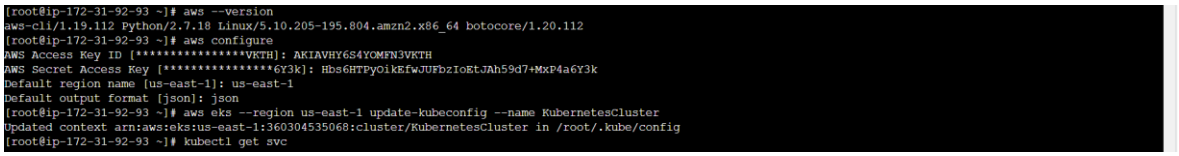
PublicIPs: 35.175.152.191 PrivateIPs: 172.31.92.93






us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/users/details/dev-user?section=security_credentials
Identity and Access Management (IAM)
Search IAM
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Access reports
Access Analyzer
External access
Unused access
Analyzer settings
Credential report
Device type
Identifier
Certifications
Created on
No MFA devices. Assign an MFA device to improve the security of your AWS environment
Assign MFA device
Access keys (1)
Create access key
Use access keys to send programmatic calls to AWS from the AWS CLI, AWS Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time. Learn more
AKIAVHY6S4YOMFN3VKTH
Actions
Description
devlopers-key
Status
Active
Last used
None
Created
2 minutes ago
Last used region
N/A
Last used service
N/A
Access denied
You don't have permission to iam:ListSSHPublicKeys. To request access, copy the following text and send it to your AWS administrator. Learn more about
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0da655682b2c1ae46&osUser=ec2-user&region=us-east-1&sshPort=22#/
N. Virginia
Corestack_Role/c.balamanikandan_mphasis @ 3603-0453-5068
AL2 End of Life is 2025-06-30.
A newer version of Amazon Linux is available!
Amazon Linux 2023, GA and supported until 2028-03-15.
https://aws.amazon.com/linux/amazon-linux-2023/
[ec2-user@ip-172-31-92-93 ~]$ sudo -i
[root@ip-172-31-92-93 ~]# aws configure
AWS Access Key ID [None]: AKIAVHY6S4YOMFN3VKTH
AWS Secret Access Key [None]: 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
Default region name [None]: us-east-1a
Default output format [None]: json
[root@ip-172-31-92-93 ~]# awseks --region us-east-1 update-kubeconfig --name KubernetesCluster


[root@ip-172-31-92-93 ~]# aws --version
aws-cli/1.19.112 Python/2.7.18 Linux/5.10.205-195.804.amzn2.x86_64 botocore/1.20.112
[root@ip-172-31-92-93 ~]# aws configure
AWS Access Key ID [**********VKTH]: AKIAVHY6S4YOMFN3VKTH
AWS Secret Access Key [**********6Y3k]: 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
Default region name [us-east-1]: us-east-1
Default output format [json]: json
[root@ip-172-31-92-93 ~]# aws eks --region us-east-1 update-kubeconfig --name KubernetesCluster
Updated context arn:aws:eks:us-east-1:360304535068:cluster/KubernetesCluster in /root/.kube/config
[root@ip-172-31-92-93 ~]# kubectl get svc