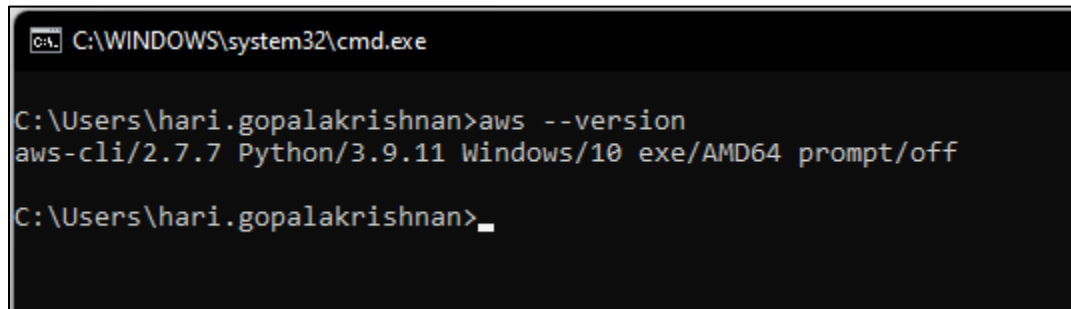


Assignment 8 :: Deploy EKS cluster using GUI and CLI on AWS. Deploy deployment using httpd image on EKS.

Step 1 :: Install AWS CLI

Step 1.1 :: Check for aws version



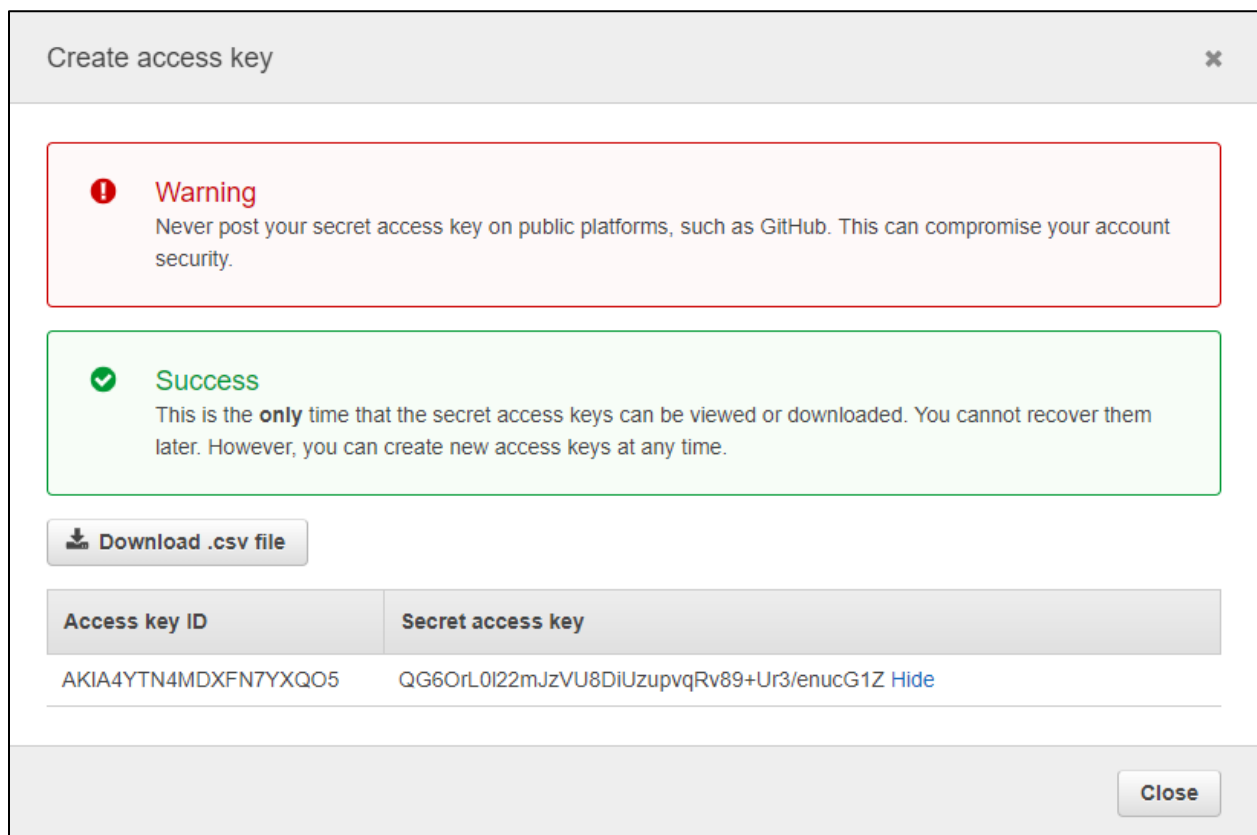
```
C:\WINDOWS\system32\cmd.exe

C:\Users\hari.gopalakrishnan>aws --version
aws-cli/2.7.7 Python/3.9.11 Windows/10 exe/AMD64 prompt/off

C:\Users\hari.gopalakrishnan>
```

Step 1.2 :: Configure AWS Command Line using Security Credentials

- Go to AWS Management Console --> Services --> IAM
- Select the IAM User: hari.gopalakrishnan@globallogic.com
- Click on Security credentials tab
- Click on Create access key
- Copy Access ID and Secret access key



The screenshot shows the 'Create access key' dialog box in the AWS Management Console. It features a warning message about not posting secret keys on public platforms, a success message indicating this is the only time the keys can be viewed, and a 'Download .csv file' button. Below these messages is a table with two columns: 'Access key ID' and 'Secret access key'. The 'Access key ID' is AKIA4YTN4MDXFN7YXQO5, and the 'Secret access key' is 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, followed by a 'Hide' link. A 'Close' button is located at the bottom right.

Access key ID	Secret access key
AKIA4YTN4MDXFN7YXQO5	QG6OrL0l22mJzVU8DiUzupvqRv89+Ur3/enucG1Z Hide

- Run “aws configure”

```
C:\Users\hari.gopalakrishnan>aws configure
AWS Access Key ID [*****4GJA]: AKIA4YTN4MDXFN7YXQ05
AWS Secret Access Key [*****VTLH]:
Default region name [us-east-1]:
Default output format [None]:

C:\Users\hari.gopalakrishnan>
```

- Test if aws cli is working fine

```
C:\WINDOWS\system32\cmd.exe

C:\Users\hari.gopalakrishnan\.aws>aws ec2 describe-vpcs
{
  "Vpcs": [
    {
      "CidrBlock": "172.31.0.0/16",
      "DhcpOptionsId": "dopt-a6d8badc",
      "State": "available",
      "VpcId": "vpc-389a5a45",
      "OwnerId": "877477519598",
      "InstanceTenancy": "default",
      "CidrBlockAssociationSet": [
        {
          "AssociationId": "vpc-cidr-assoc-37b36e58",
          "CidrBlock": "172.31.0.0/16",
          "CidrBlockState": {
            "State": "associated"
          }
        }
      ],
      "IsDefault": true,
      "Tags": [
        {
          "Key": "Name",
          "Value": "Default"
        }
      ]
    }
  ]
}
```

C:\Users\hari.gopalakrishnan\.aws>_

Step 2 :: Install kubectl CLI

Install and check the version

- **mkdir kubectlbinary**

- `cd kubectlbinary`
- `curl -o kubect.exe https://amazon-eks.s3.us-west-2.amazonaws.com/1.16.8/2020-04-16/bin/windows/amd64/kubect.exe`
- Update the system Path environment variable
 - `C:\Users\hari.gopalakrishnan\kubectlbinary`
- Verify the kubect client version
 - `kubect version --short --client`
 - `kubect version --client`

```
C:\WINDOWS\system32\cmd.exe
C:\Users\hari.gopalakrishnan>mkdir kubectlbinary
C:\Users\hari.gopalakrishnan>cd kubectlbinary
C:\Users\hari.gopalakrishnan\kubectlbinary>curl -o kubect.exe https://amazon-eks.s3.us-west-2.amazonaws.com/1.16.8/2020-04-16/bin/windows/amd64/kubect.exe
  % Total    % Received % Xferd  Average Speed   Time    Time     Time
  % Total    % Received % Xferd  Average Speed   Time    Time     Time
100 56.0M 100 56.0M    0     0 328k    0 0:02:54 --:--:-- 4649k
C:\Users\hari.gopalakrishnan\kubectlbinary>pwd
'pwd' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\hari.gopalakrishnan\kubectlbinary>kubect version --short --client
Client Version: v1.16.8-eks-e16311
C:\Users\hari.gopalakrishnan\kubectlbinary>kubect version --client
Client Version: version.Info{Major:"1", Minor:"16", GitVersion:"v1.16.8-eks-e16311", GitCommit:"e163110a0dc2f39c325af96d819b4925419eb", GitTreeState:"clean", BuildDate:"2020-03-27T22:40:13Z", GoVersion:"go1.13.8", Compiler:"gc", Plat
form:"windows/amd64"}
C:\Users\hari.gopalakrishnan\kubectlbinary>
```

Step 3 :: Install eksctl

- `@'%SystemRoot%\System32\WindowsPowerShell\v1.0\powershell.exe' -NoProfile -InputFormat None -ExecutionPolicy Bypass -Command "[System.Net.ServicePointManager]::SecurityProtocol = 3072; iex ((New-Object System.Net.WebClient).DownloadString('https://community.chocolatey.org/install.ps1'))" && SET "PATH=%PATH%;%ALLUSERSPROFILE%\chocolatey\bin"`
- `choco install -y eksctl`
- `eksctl version`

```
Administrator: Command Prompt
C:\WINDOWS\system32>choco install -y eksctl
Chocolatey v1.1.0
Installing the following packages:
eksctl
By installing, you accept licenses for the packages.
Progress: Downloading eksctl 0.105.0... 100%
eksctl v0.105.0 [Approved]
eksctl package files install completed. Performing other installation steps.
eksctl is going to be installed in 'C:\ProgramData\chocolatey\lib\eksctl\tools'
Downloading eksctl 64 bit
from 'https://github.com/weaveworks/eksctl/releases/download/v0.105.0/eksctl_Windows_amd64.zip'
Progress: 100% - Completed download of C:\Users\hari.gopalakrishnan\AppData\Local\Temp\chocolatey\eksctl\0.105.0\eksctl_Windows_amd64.zip (27.84 MB).
Download of eksctl_Windows_amd64.zip (27.84 MB) completed.
Hashes match.
Extracting C:\Users\hari.gopalakrishnan\AppData\Local\Temp\chocolatey\eksctl\0.105.0\eksctl_Windows_amd64.zip to C:\ProgramData\chocolatey\lib\eksctl\tools...
C:\ProgramData\chocolatey\lib\eksctl\tools
ShimGen has successfully created a shim for eksctl.exe
The install of eksctl was successful.
Software installed to 'C:\ProgramData\chocolatey\lib\eksctl\tools'

Chocolatey installed 1/1 packages.
See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).
C:\WINDOWS\system32>eksctl version
0.105.0
C:\WINDOWS\system32>
```

Step 4 : : Creating a cluster

eksctl create cluster --name=hari-cluster-cli --region=us-east-1 --zones=us-east-1a,us-east-1b --without-nodegroup

```
Administrator: Command Prompt
C:\WINDOWS\system32>eksctl create cluster --name=hari-cluster-cli --region=us-east-1 --zones=us-east-1a,us-east-1b --without-nodegroup
2022-07-12 17:43:47 [i] eksctl version 0.105.0
2022-07-12 17:43:47 [i] using region us-east-1
2022-07-12 17:43:47 [i] subnets for us-east-1a - public:192.168.0.0/19 private:192.168.64.0/19
2022-07-12 17:43:47 [i] subnets for us-east-1b - public:192.168.32.0/19 private:192.168.96.0/19
2022-07-12 17:43:47 [i] using Kubernetes version 1.22
2022-07-12 17:43:47 [i] creating EKS cluster "hari-cluster-cli" in "us-east-1" region with
2022-07-12 17:43:47 [i] if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=us-east-1 --cluster=hari-cluster-cli'
2022-07-12 17:43:47 [i] Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "hari-cluster-cli" in "us-east-1"
2022-07-12 17:43:47 [i] Cloudwatch logging will not be enabled for cluster "hari-cluster-cli" in "us-east-1"
2022-07-12 17:43:47 [i] you can enable it with 'eksctl utils update-cluster-logging --enable-types={SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)} --region=us-east-1 --cluster=hari-cluster-cli'
2022-07-12 17:43:47 [i]
2 sequential tasks: { create cluster control plane "hari-cluster-cli", wait for control plane to become ready
}
2022-07-12 17:43:47 [i] building cluster stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:43:48 [i] deploying stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:44:18 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:44:49 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:45:58 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:46:51 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:47:52 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:48:53 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:49:54 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:50:55 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:51:56 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:52:57 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:53:58 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-cluster"
2022-07-12 17:56:05 [i] waiting for the control plane availability...
2022-07-12 17:56:07 [✓] saved kubeconfig as "C:\Users\hari.gopalakrishnan\.kube\config"
2022-07-12 17:56:07 [i] no tasks
2022-07-12 17:56:07 [✓] all EKS cluster resources for "hari-cluster-cli" have been created
2022-07-12 17:56:11 [i] kubectl command should work with "C:\Users\hari.gopalakrishnan\.kube\config", try 'kubectl get nodes'
2022-07-12 17:56:11 [✓] EKS cluster "hari-cluster-cli" in "us-east-1" region is ready
C:\WINDOWS\system32>
```

Cluster Detail | us-east-1.console.aws.amazon.com/eks/home?region=us-east-1#/clusters/hari-cluster-cli

hari-cluster-cli | Delete cluster

Your current user or role does not have access to Kubernetes objects on this EKS cluster. This may be due to the current user or role not having Kubernetes RBAC permissions to describe cluster resources or not having an entry in the cluster's auth config map. [Learn more](#)

Cluster info

Property	Value
Kubernetes version	1.22
Status	Active
Provider	EKS

Details

Property	Value
API server endpoint	https://975BA764D3935E80372CB17AE2533FDC.gr7.us-east-1.eks.amazonaws.com
OpenID Connect provider URL	https://oidc.eks.us-east-1.amazonaws.com/id/975BA764D3935E80372CB17AE2533FDC
Created	22 minutes ago
Certificate authority	View
Cluster IAM role ARN	arn:aws:iam::877477519598:role/eksctl-hari-cluster-cli-cluster-ServiceRole-1FYFMDA1RDFQ
Cluster ARN	arn:aws:eks:us-east-1:877477519598:cluster/hari-cluster-cli
Platform version	eks.3

Secrets encryption

Property	Value
Secrets encryption	Disabled
KMS key ID	-

```
C:\WINDOWS\system32>eksctl get clusters
NAME                REGION    EKSCTL CREATED
hari-cluster-cli    us-east-1 True

C:\WINDOWS\system32>
```

Step 5 :: Create nodes to the eks cluster

Step 5.1 :: Create a ssh key

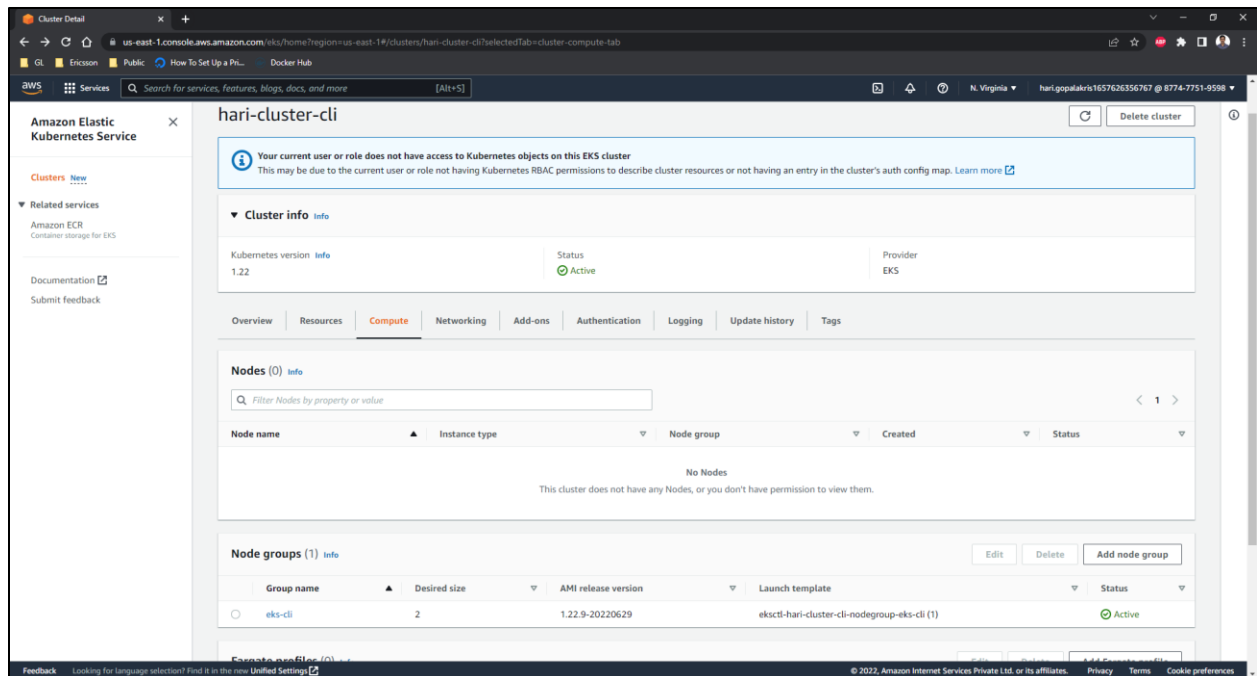
```
C:\WINDOWS\system32>aws ec2 create-key-pair --key-name eksKeyPair
{
  "KeyFingerprint": "2a3c3b8a4e12:d0:ch:08:1f:3d:9a:6b:e8:30:99:14:0f:ef:c0:76",
  "KeyMaterial": "-----BEGIN RSA PRIVATE KEY-----\nMIIEpQIBAAKCAQEAJxJgAmL9uS13TAUTxnn+K70MtIwFyyeX3Tu/7BTpyb3FvntvemQlFqH+JQA7napQ+ZdhcIheDYLhKjaIcyeWd2nx8BYew+ZXIRhA050RfO2VxEd3/5P+nB0RnxqN43ncUx7K0k3InPzPz3mBgtmPhG9AU2Qu/HSR8I1f66Vmh4vpm5YH4K1vgr6FXjZ+HfrfAadTPGRXg5em4pQDY+OmKc7002aDYa52+VfThvIu6za3facIqQuUd7/+dLSbITfJ50ekgxbuAt+5MA1Pk5Z5SC193/VWwVnCCuT/vVqqr16PCYE1keXpAbIF6GK1ob548QIDQA8aQIBABBN04IMf9QUXHSVnxE75Wht19FHSHTauds1EEIwAPQ8uXKXPhg7VJdGZ2vWep07JhQlH9vZCvH52VnV0vJzhe1PPu4J4m9YKDYKxR/XBPfT11akyJ5BRK1Agm+HqD0amwJ2D0vnoVdZvY2kYttDwaQ4QvY311XehJHmgqAP9S3DC137TTEqT1G2JBAw2Vnc+HwJm2N1KvL1T3AKPQ4u1A1q1wVYwmeofeES3mAdgJoh8ToV+Yuy515VngCKctKxxz+H18A0G0N05XCV3S1S0Teta10Y/4m6gJ5J50b0d2Y1THKtvcIcVnTX2BqIcgyEAJHJ30KJm0d07ouPhdC681vB5SHF8uItokk8A58qd7o/xBzCxbwInJ1L706e81TPdQpweQ355f6/gv6uJkGeh8J1PE1TnZ9Wvccy/Fom1GR031K0v1nKhP7Q21TAjyydyvVubx35XCX6u0013AHuH3Kxnc3vg1t1B32B0RcgvIAshbpVnsqZ186Z2015c11N08ImUp2x0Zv2mGcJ7mz1UAI70H11C4C11+531mLmK45VnItatZCjshyQV1K7yVwqE45bn2GxvH78Hf/nkyVmqzRFXIPrP6Bv3vLen0VnVSha1/SUzD/HU25rhm08R26J05F9Eaf8pYa/KCgYb+hrp1qU7A1Qhz31Z3ChpVme2B3C1bXVQToB1J6vK1v8AAWuPwC1430d0u/ekyY6L8B2v0zR8RnQ/D3np0vFpud0p0CJemL+5d4qL2p0p9f9M/Z+uhd8Z7J7gm6ZvJLSe+H1PAHAYG1VnKstktbtf/5Gha2P0K+QKngQCf587/24HdLqY0mVky/ang806uqLAKcKX1m6HtE503187FwHPR8ZPL42p6g4J8pW+BL1Hf18WzP82wEP3+3AAZ0R2JKPvufP2p0LNg0J1yGhKx0ZK3b+Qu8MELch1ggdFHB4Jt/H9TzGHVDF68Z5Kk3hVnuVevYQK8gCcu08P855vY1dU6KngJ6575A0dKkUT84UR65T1/A23+eqgCwqVnm0470n1CZK03LELBMX1huFecwK530V31xk1abn9+hB1C1uJ193xd2/dwC10Vn5VL5FFbJ107zucLCF0dh6FOnAK5f/rMH27onVgpp6mL4ewehQz=Vn-----END RSA PRIVATE KEY-----",
  "KeyName": "eksKeyPair",
  "KeyPairId": "key-0add21815e9d59103"
}
```

C:\WINDOWS\system32>

Step 5.2 :: Create nodes

eksctl create nodegroup --cluster=hari-cluster-cli --region=us-east-1 --name=eks-cli --node-type=t3.medium --nodes=2 --nodes-min=2 --nodes-max=4 --node-volume-size=20 --ssh-access --ssh-public-key=eksKeyPair --managed --asg-access --ssh-access --external-dns-access --full-ecr-access --appmesh-access --alb-ingress-access

```
Administrator: Command Prompt
C:\WINDOWS\system32>eksctl create nodegroup --cluster=hari-cluster-cli --region=us-east-1 --name=eks-cli --node-type=t3.medium --nodes=2 --nodes-min=2 --nodes-max=4 --node-volume-size=20 --ssh-access --ssh-public-key=eksKeyPair --managed
--asg-access --external-dns-access --full-ecr-access --appmesh-access --alb-ingress-access
2022-07-12 18:17:08 [i] will use version 1.22 for new nodegroup(s) based on control plane version
2022-07-12 18:17:14 [i] nodegroup "eks-cli" will use "" [AmazonLinux2/1.22]
2022-07-12 18:17:15 [i] using EC2 key pair MiQ(strings=coll)
2022-07-12 18:17:17 [i] 1 nodegroup (eks-cli) was included (based on the include/exclude rules)
2022-07-12 18:17:17 [i] will create a CloudFormation stack for each of 1 managed nodegroups in cluster "hari-cluster-cli"
2022-07-12 18:17:17 [i] sequential tasks: { fix cluster compatibility, 1 task: { 1 task: { create managed nodegroup "eks-cli" } } }
2022-07-12 18:17:17 [i] checking cluster stack for missing resources
2022-07-12 18:17:18 [i] cluster stack has all required resources
2022-07-12 18:17:19 [i] building managed nodegroup stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:17:20 [i] deploying stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:17:20 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:17:51 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:18:43 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:19:01 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:21:00 [i] waiting for CloudFormation stack "eksctl-hari-cluster-cli-nodegroup-eks-cli"
2022-07-12 18:21:00 [i] no tasks
2022-07-12 18:21:00 [i] created 0 nodegroup(s) in cluster "hari-cluster-cli"
2022-07-12 18:21:01 [i] nodegroup "eks-cli" has 2 node(s)
2022-07-12 18:21:01 [i] node "ip-192-168-54-51.ec2.internal" is ready
2022-07-12 18:21:01 [i] node "ip-192-168-7-58.ec2.internal" is ready
2022-07-12 18:21:01 [i] waiting for at least 2 node(s) to become ready in "eks-cli"
2022-07-12 18:21:01 [i] node "ip-192-168-54-51.ec2.internal" is ready
2022-07-12 18:21:01 [i] node "ip-192-168-7-58.ec2.internal" is ready
2022-07-12 18:21:01 [i] created 1 managed nodegroup(s) in cluster "hari-cluster-cli"
2022-07-12 18:21:03 [i] checking security group configuration for all nodegroups
2022-07-12 18:21:03 [i] all nodegroups have up-to-date cloudformation templates
C:\WINDOWS\system32>
```



```
Administrator: Command Prompt
C:\WINDOWS\system32>kubectl get nodes -o wide
NAME                                STATUS    ROLES    AGE   VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION   CONTAINER-RUNTIME
ip-192-168-54-51.ec2.internal        Ready    <none>    4m9s   v1.22.9-eks-810597c   192.168.54.51   3.221.170.129   Amazon Linux 2       5.4.196-108.356.amzn2.x86_64   docker://20.10.13
ip-192-168-7-58.ec2.internal         Ready    <none>    4m15s   v1.22.9-eks-810597c   192.168.7.58    18.209.172.61   Amazon Linux 2       5.4.196-108.356.amzn2.x86_64   docker://20.10.13
C:\WINDOWS\system32>
```

Step 5.3 :: Create a httpd pod and check its status

kubectl run httpd --image=httpd
kubectl get pods -o wide

```
Administrator: Command Prompt
C:\WINDOWS\system32>kubectl get pods -o wide
NAME                                READY    STATUS    RESTARTS   AGE   IP              NODE                                NOMINATED NODE   READINESS GATES
httpd-86f8b7f7cd-fwbrf              1/1      Running   0           3m56s   192.168.39.187   ip-192-168-54-51.ec2.internal      <none>           <none>
C:\WINDOWS\system32>
```