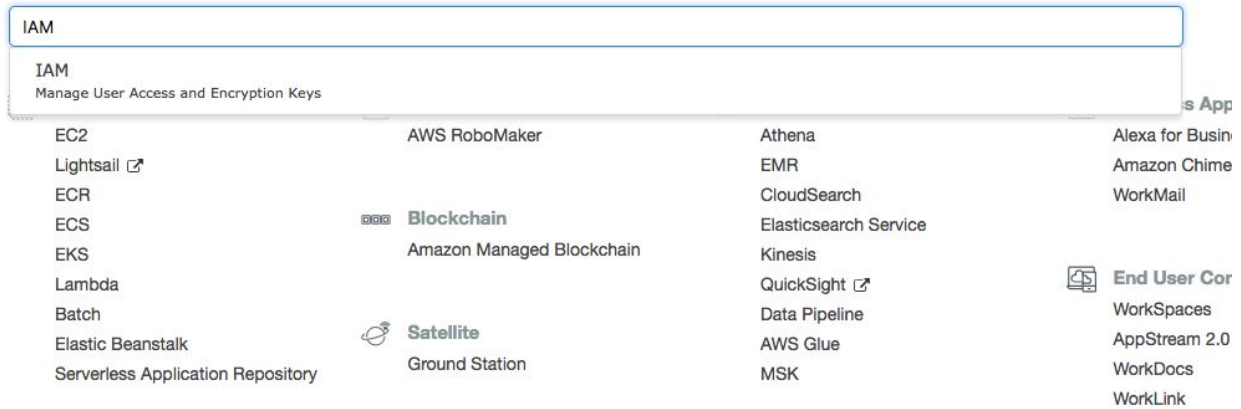


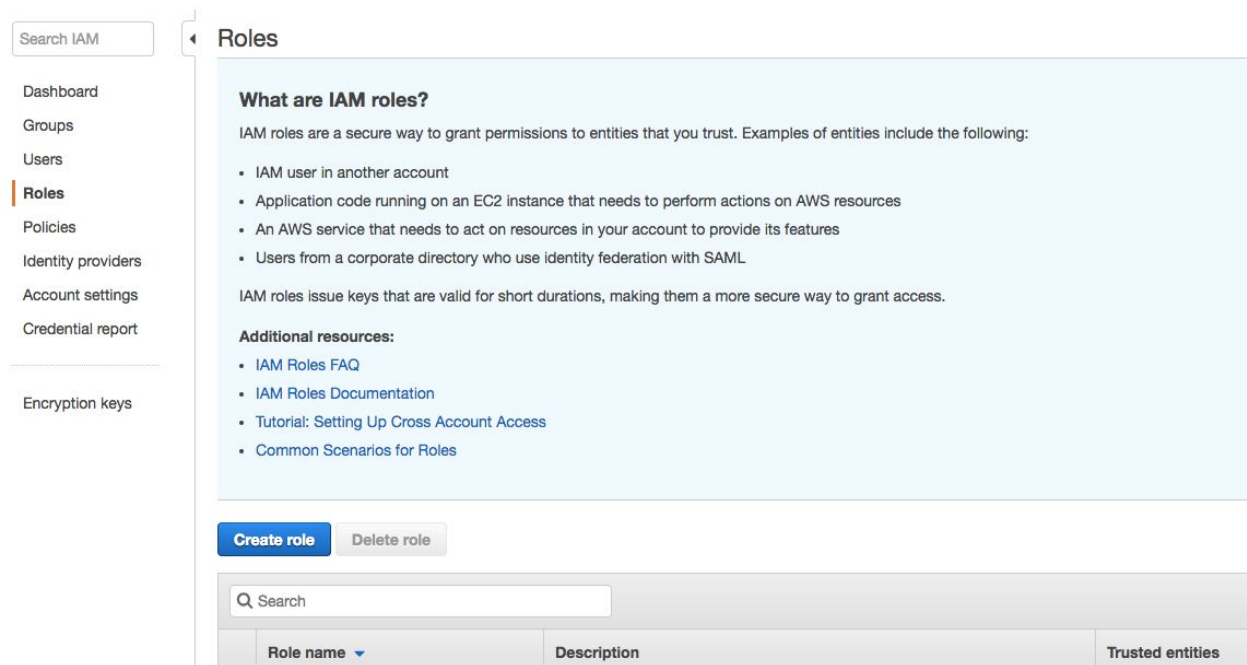
EKS setup

Step1: Create a IAM role to assign permission EKS to control resources on your behalf.

Goto aws aws services and search IAM.



After enter in IAM roles in left side you will get **Roles** menu, click on this you will get windows like this.



Then click on Create role then select **EKS** get a window like

AWS service
 EC2, Lambda and others

Another AWS account
 Belonging to you or 3rd party

Web identity
 Cognito or any OpenID provider

SAML 2.0 federation
 Your corporate directory

Allows AWS services to perform actions on your behalf. [Learn more](#)

Choose the service that will use this role

EC2
Allows EC2 instances to call AWS services on your behalf.

Lambda
Allows Lambda functions to call AWS services on your behalf.

API Gateway	CodeBuild	EKS	Kinesis	S3
AWS Backup	CodeDeploy	EMR	Lambda	SMS
AWS Support	Config	ElastiCache	Lex	SNS
Amplify	Connect	Elastic Beanstalk	License Manager	SWF
AppSync	DMS	Elastic Container Service	Machine Learning	SageMaker
Application Auto Scaling	Data Lifecycle Manager	Elastic Transcoder	Macie	Security Hub
Application Discovery Service	Data Pipeline	ElasticLoadBalancing	MediaConvert	Service Catalog

* Required
Cancel
Next: Permissions

Click on **Next:** Permission get like

▼ Attached permissions policies

The type of role that you selected requires the following policy.

Filter policies ▼		Showing 2 results	
Q Search			
Policy name ▼	Used as	Description	
▶ AmazonEKSClusterPolicy	Permissions policy (1)	This policy provides Kubernetes the permissio...	
▶ AmazonEKSServicePolicy	Permissions policy (1)	This policy allows Amazon Elastic Container S...	

Then click on **Next:Tags** at rigth bottom will get like

IAM tags are key-value pairs you can add to your role. Tags can include user information, such as an email address, or can be descriptive, such as a job title. You can use the tags to organize, track, or control access for this role. [Learn more](#)

Key	Value (optional)	Remove
<input type="text" value="Add new key"/>	<input type="text"/>	

You can add 50 more tags.

Put any key and value you want, by the way its optional you may leave this.

Now click on right bottom **Next: Review**

Create role

1 2 3 4

Review

Provide the required information below and review this role before you create it.

Role name*

Use alphanumeric and '+=, @-_' characters. Maximum 64 characters.

Role description

Allows EKS to manage clusters on your behalf.

Maximum 1000 characters. Use alphanumeric and '+=, @-_' characters.

Trusted entities AWS service: eks.amazonaws.com

Policies



[AmazonEKSClusterPolicy](#)

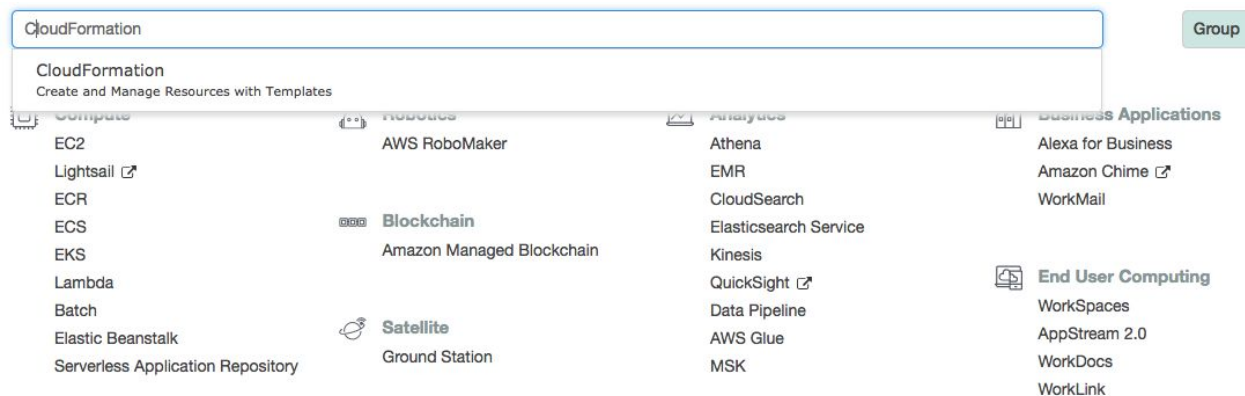


[AmazonEKSServicePolicy](#)

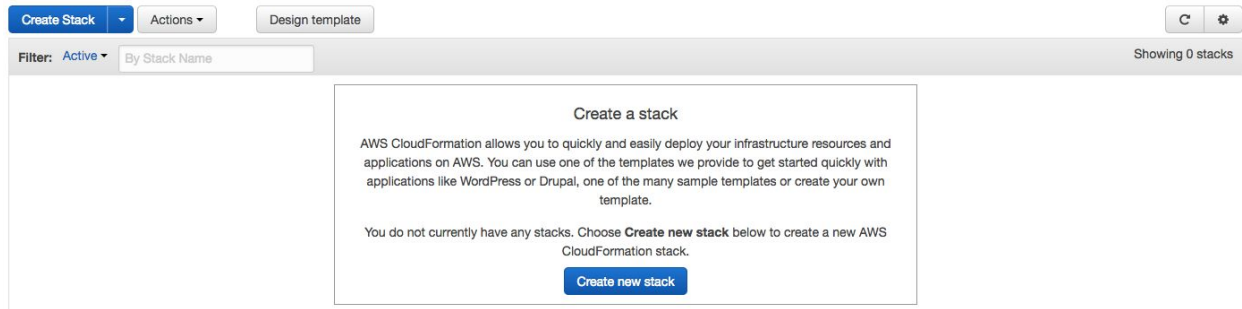
Put the name as you wish, i put **eks-role** here. Now click on **Create role** .
You IAM role created now.

Step2: Now create VPC and security groups using cloud formation templates.

Goto aws services and search cloud formation



Click on CloudFormation



Now click on Create Stack Select Template

Select the template that describes the stack that you want to create. A stack is a group of related resources that you manage as a single unit.

Design a template Use AWS CloudFormation Designer to create or modify an existing template. [Learn more.](#)

Choose a template A template is a JSON/YAML-formatted text file that describes your stack's resources and their properties. [Learn more.](#)

☐ Select a sample template

☐ Upload a template to Amazon S3

No file chosen

☒ Specify an Amazon S3 template URL

Now select the last option(Specify an Amazon S3 template) and copy below link

<https://amazon-eks.s3-us-west-2.amazonaws.com/cloudformation/2019-02-11/amazon-eks-vpc-sample.yaml>

Design a template Use AWS CloudFormation Designer to create or modify an existing template. [Learn more.](#)

Choose a template A template is a JSON/YAML-formatted text file that describes your stack's resources and their properties. [Learn more.](#)

☐ Select a sample template

☐ Upload a template to Amazon S3

No file chosen

☒ Specify an Amazon S3 template URL

[View/Edit template in Designer](#)

Now click on **Next**

Specify Details

Specify a stack name and parameter values. You can use or change the default parameter values, which are defined in the AWS CloudFormation template. [Learn more.](#)

Stack name

Parameters

Worker Network Configuration

VpcBlock

192.168.0.0/16

The CIDR range for the VPC. This should be a valid private (RFC 1918) CIDR range.

Subnet01Block

192.168.64.0/18

CidrBlock for subnet 01 within the VPC

Subnet02Block

192.168.128.0/18

CidrBlock for subnet 02 within the VPC

Subnet03Block

192.168.192.0/18

CidrBlock for subnet 03 within the VPC. This is used only if the region has more than 2 AZs.

[Cancel](#)

[Previous](#)

[Next](#)

Now put the stack name here i have put vpc for me.

Options

Tags

You can specify tags (key-value pairs) for resources in your stack. You can add up to 50 unique key-value pairs for each stack. [Learn more.](#)

	Key (127 characters maximum)	Value (255 characters maximum)	
1	<input type="text"/>	<input type="text"/>	+

Permissions

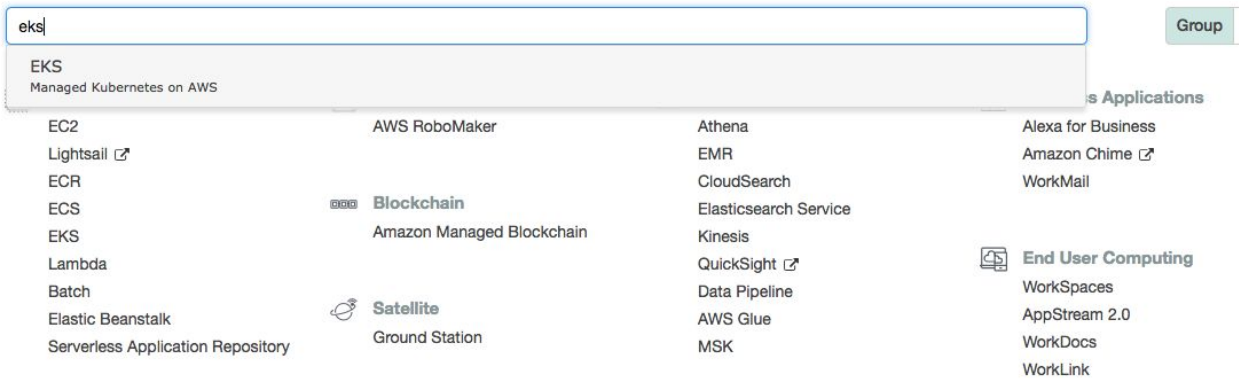
Put key and value here its optional, now click right bottom **Next** get Review window then click on **Create** Button. It will look like

Create Stack	Actions	Design template	C	⚙
Filter: Active	By Stack Name			Showing 1 stack
Stack Name	Created Time	Status	Drift Status	Description
<input checked="" type="checkbox"/> vpc	2019-03-14 14:27:39 UTC+0550	CREATE_IN_PROGRESS	NOT_CHECKED	Amazon EKS Sample VPC

It will take few minutes to complete.

Step3: Create EKS cluster

Goto aws services and search **eks**



Inside EKS gets like

Containers

Elastic Container Service for Kubernetes (Amazon EKS)

Fully managed Kubernetes control plane

Amazon EKS is a managed service that makes it easy for you to use Kubernetes on AWS without needing to install and operate your own Kubernetes control plane.

Create EKS cluster

Cluster name

Next step

Click on Next step,

Create cluster

Cluster configuration

Cluster name

Enter a unique name for your Amazon EKS cluster.

Kubernetes Version

Select the Kubernetes version to install.

Role name [↗](#)

Select the IAM Role to allow Amazon EKS and the Kubernetes control plane to manage AWS resources on your behalf.

Networking

VPC [↗](#)

Select a VPC to use for your EKS Cluster resources.

Subnets [↗](#)

Choose the subnets in your VPC where your worker nodes will run.

Put the following fields

1. Cluster name
2. Role name (we have created earlier)
3. VPC (we have created earlier)
4. Security Group (not default)

Then click on bottom right Create

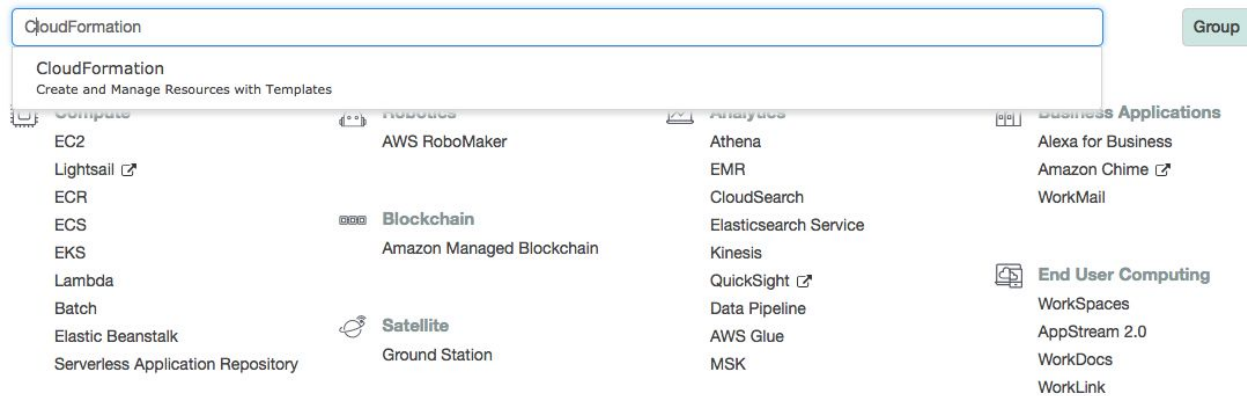
It will take some time, after creation it will like

Clusters (1)			↻	Delete	Create cluster
<input type="text" value="Find clusters by name"/>			< 1 >		
Cluster name	Kubernetes Version	Status			
<input type="radio"/> eks	1.11	✓ ACTIVE			

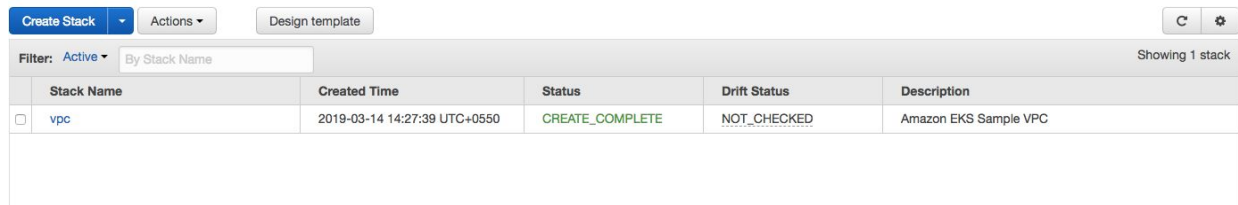
Here eks is the cluster name.

Step4: Now create worker nodes using cloud formation templates.

Goto aws services and search cloud formation



Inside cloudformation you will get like.



This vpc is what we have created earlier now have to create worker nodes.

Click on Create Stack

Select Template

Select the template that describes the stack that you want to create. A stack is a group of related resources that you manage as a single unit.

Design a template Use AWS CloudFormation Designer to create or modify an existing template. [Learn more.](#)

Design template

Choose a template A template is a JSON/YAML-formatted text file that describes your stack's resources and their properties. [Learn more.](#)

☐ Select a sample template

☐ Upload a template to Amazon S3

Choose file No file chosen

☒ Specify an Amazon S3 template URL

Now select the last option(Specify an Amazon S3 template) and copy below link

<https://amazon-eks.s3-us-west-2.amazonaws.com/cloudformation/2019-02-11/amazon-eks-nodegroup.yaml>

after put this link it will like

Design a template Use AWS CloudFormation Designer to create or modify an existing template. [Learn more.](#)

Design template

Choose a template A template is a JSON/YAML-formatted text file that describes your stack's resources and their properties. [Learn more.](#)

☐ Select a sample template

☐ Upload a template to Amazon S3

Choose file

No file chosen

☒ Specify an Amazon S3 template URL

[View/Edit template in Designer](#)

Now click on Next Button , see

Specify Details

Specify a stack name and parameter values. You can use or change the default parameter values, which are defined in

Stack name

Parameters

EKS Cluster

ClusterName

The cluster name provided when the cluster

ClusterControlPlaneSecurityGroup

Search by ID, name or Name tag value



The security group of the cluster control plane.

Worker Node Configuration

NodeGroupName

Unique identifier for the Node Group.

NodeAutoScalingGroupMinimumSize

1

Minimum size of Node Group ASG.

NodeAutoScalingGroupDesiredCapacity

3

Desired capacity of Node Group ASG.

Put the following values in the following fields.

1. Stack name
2. ClusterName (cluster name created earlier)
3. NodeGroupName
4. NodeAutoScalingGroupMinSize(1)
5. NodeAutoScalingGroupDesiredCapacity(2)
6. NodeAutoScalingGroupMaxSize(3)
7. NodeImageId(ami-0eeeeef929db40543c)
8. KeyName
9. VpcId(created earlier)
10. Subnets

After fulfill the above details click on **next** button.

Tags

You can specify tags (key-value pairs) for resources in your stack. You can add up to 50 unique key-value pairs for each stack. [Learn more.](#)

	Key (127 characters maximum)	Value (255 characters maximum)	
1	eks	nodes	
2	<input type="text"/>	<input type="text"/>	

Put the key & value its opetional then click Next button. Then it will show you all resources that will create.

Now click on right bottom **Create** button.

Its creating your resources, it will take some time.

Create Stack

Actions

Design template

C

⚙

Filter: Active

By Stack Name

Showing 2 stacks

	Stack Name	Created Time	Status	Drift Status	Description
<input checked="" type="checkbox"/>	nodes	2019-03-13 22:00:36 UTC+0550	UPDATE_COMPLETE	NOT_CHECKED	Amazon EKS - Node Group
<input type="checkbox"/>	vpc	2019-03-13 21:47:19 UTC+0550	CREATE_COMPLETE	NOT_CHECKED	Amazon EKS Sample VPC

Now all task has finished on aws

Now setup your local machine,

1. Aws cli
2. Kubectl (<https://docs.aws.amazon.com/eks/latest/userguide/install-kubectl.html>)
3. Aws authenticators
(<https://docs.aws.amazon.com/eks/latest/userguide/install-aws-iam-authenticator.html>)

Now download the following

curl -O

<https://amazon-eks.s3-us-west-2.amazonaws.com/cloudformation/2019-02-11/aws-auth-cm.yaml>

And have to edit this, its see like

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: aws-auth
  namespace: kube-system
data:
  mapRoles: |
    - rolearn: <ARN of instance role (not instance profile)>
      username: system:node:{{EC2PrivateDNSName}}
      groups:
        - system:bootstrappers
        - system:nodes
```

We have to replace value of - rolearn:

Create Stack	Actions	Design template	C	⚙
Filter: Active	By Stack Name	Showing 2 stacks		
Stack Name	Created Time	Status	Drift Status	Description
<input checked="" type="checkbox"/> nodes	2019-03-13 22:00:36 UTC+0550	UPDATE_COMPLETE	NOT_CHECKED	Amazon EKS - Node Group
<input type="checkbox"/> vpc	2019-03-13 21:47:19 UTC+0550	CREATE_COMPLETE	NOT_CHECKED	Amazon EKS Sample VPC

Click on node

nodes

Other Actions Update Stack

Stack name: nodes

Stack ID: arn:aws:cloudformation:us-east-1:701958254764:stack/nodes/544900c0-45ad-11e9-8ba9-0e061c1f1416

Status: UPDATE_COMPLETE

Status reason:

Termination protection: Disabled

Drift status: NOT_CHECKED [View details](#)

Last drift check time:

IAM role:

Description Amazon EKS - Node Group

Outputs

Resources

Now click on output

Key	Value	Description	Export Name
NodeInstanceRole	arn:aws:iam::701958254764:role/nodes-NodeInstanceRole-NQTTVYT6Y4J4	The node instance role	

Copy the value and past it in aws-auth-cm.yaml file, we have edit earlier.

This file will look like.

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: aws-auth
  namespace: kube-system
data:
  mapRoles: |
    - rolearn: arn:aws:iam::23858473249:role/nodes-NodeInstanceRole-dhsgtbbsw
      username: system:node:{{EC2PrivateDNSName}}
      groups:
        - system:bootstrappers
        - system:nodes
```

Save this file.

Run the following commands

```
$ aws eks --region us-east-1 update-kubeconfig --name eks
$ kubectl apply -f aws-auth-cm.yaml
```

Now all things are setup

Now get the nodes using

```
$ kubectl get nodes
```

```
ubuntu@ip-172-31-26-223:~/msrcosmos$ kubectl get nodes
NAME                                STATUS    ROLES    AGE    VERSION
ip-192-168-118-23.ec2.internal      Ready    <none>   17h    v1.11.5
ip-192-168-188-194.ec2.internal     Ready    <none>   17h    v1.11.5
ubuntu@ip-172-31-26-223:~/msrcosmos$
```

Step5:

1. **Tomcat deployment:** for tomcat deployment we have two file **tomcat-deployment.yaml** & **tomcat-service.yaml** i have shared these files on github also,
tomcat-deployment.yaml is kubernete object of type deployment, by this file we will launch an application of tomcat.
tomcat-service.yaml is kubernete object type of service define the logical setup of pods of tomcat application In cluster.

Run the following commands for Tomcat deployment

```
$ kubectl create -f tomcat-deployment.yaml
```

```
$ kubectl create -f tomcat-service.yaml
```

2. CouchDB deployment: for couchdb deployment we have two file

couchdb-deployment.yaml & **couchdb-service.yaml** i have shared these files on github also,

couchdb-deployment.yaml is kubernetes object of type deployment, by this file we will launch a couchdb application.

couchdb-service.yaml is kubernetes object type of service define the logical setup of pods of couchdb application in cluster.

Run the following commands for CouchDB deployment

```
$ kubectl create -f couchdb-deployment.yaml
```

```
$ kubectl create -f couchdb-service.yaml
```

Now get services using

```
$ kubectl get services -o wide
```

It looks like

```
service/tomcat-pod created
ubuntu@ip-172-31-26-223:~/msrcosmos$ kubectl get services -o wide
NAME          TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE    SELECTOR
couchdb-pod    LoadBalancer  10.100.187.107   a1f1e2ff4462811e996b60282e867f49-181338381.us-east-1.elb.amazonaws.com  5984:31757/TCP  4h    run=couchdb-pod
kubernetes    ClusterIP      10.100.0.1       <none>           443/TCP          19h    <none>
tomcat-pod     LoadBalancer  10.100.67.3      a4c437b30464c11e996b60282e867f49-2072243459.us-east-1.elb.amazonaws.com  80:30916/TCP    1m     run=tomcat-pod
ubuntu@ip-172-31-26-223:~/msrcosmos$
```

Copy the external-IP link for Tomcat like this with, its running on port 80

a4c437b30464c11e996b60282e867f49-2072243459.us-east-1.elb.amazonaws.com

Now you will see Tomcat application

Now external-IP link for couchdb like this with port 5984

a1f1e2ff4462811e996b60282e867f49-181338381.us-east-1.elb.amazonaws.com
:5984/_utils

Put the following credentials

User: msrccosmos

Pass: msrccosmos