**Kubernetes**

* Kubernetes used to manage containers. ( it is container orchestration technologies. It supports all public cloud providers)

**Compotators:**

1. Docker Swarm
2. Mesos

**Tasks Associated with Containers:**

1. Deployment of container
2. Redundancy and availability of container
3. Scaling up/down container
4. Load balancer
5. Health check
6. Service discovery etc…

**Why we need to use these tools?**

* Trend from Monolith to Microservices.
* Increased usage of containers.

**Terminology:**

**Kubernetes cluster:** each cluster having these components

1. Control plane/ Master
2. C-M : control manager
3. C -M -M: cloud control manager
4. API: API Server
5. Scheduler:
6. etcd: key, value pair database
7. Nodes/ Servers(EC2 VMS)
8. Kubelet: this will communicate/interact with Master
9. K-proxy: this will interact with other nodes.

Note:

* Every node contains one or more PODS based on Instance Type (Node type).
* Each POD contains one CONTAINER only. In some cases, we use 2 also.
* Each POD having IP Address and that is unique.
* POD IP changing so we need to use SERVICE (it provides STATIC IP) for STATIC IP we can also provide DOMAIN NAME by using INGRESS.

**EKS (Elastic Kubernetes Services) provided by AWS**

**Installation of KUBERNETES Cluster:**

1. We can create Kubernetes Cluster by using AWS Console Management but it creates “M4” type servers. So I used AWS CLI method.
2. Installation AWS CLI in Local Machine (Windows)

**GO TO ===>** [**https://docs.aws.amazon.com/cli/latest/userguide/install-cliv2-windows.html**](https://docs.aws.amazon.com/cli/latest/userguide/install-cliv2-windows.html)

**Click on ===>** <https://awscli.amazonaws.com/AWSCLIV2.msi> and click “next”

**NEXT ===> open “cmd”**

**Check Installed or Not===> aws –version**

1. Install Kubectl (Windows)

**Got to ===>** [**https://docs.aws.amazon.com/eks/latest/userguide/install-kubectl.html**](https://docs.aws.amazon.com/eks/latest/userguide/install-kubectl.html)

**copy===> curl -o kubectl.exe** [**https://amazon-eks.s3.us-west-2.amazonaws.com/1.20.4/2021-04-12/bin/windows/amd64/kubectl.exe**](https://amazon-eks.s3.us-west-2.amazonaws.com/1.20.4/2021-04-12/bin/windows/amd64/kubectl.exe)

**open ===> open “powe shell” ===> run as administrator**

**open ===> cmd**

**Check ===> kubectl version --short --client**

1. **Install choco (windows)**

**Go To ===>** [**https://chocolatey.org/install**](https://chocolatey.org/install)

**Click on ===> “**[Get-ExecutionPolicy](https://go.microsoft.com/fwlink/?LinkID=135170) “

**Open ===> powershell ===> run as administrator “**[Get-ExecutionPolicy](https://go.microsoft.com/fwlink/?LinkID=135170)”

**Displays(Restricted) then ===> Set-ExecutionPolicy AllSigned**

**Then ===> “**Set-ExecutionPolicy Bypass -Scope Process -Force; [System.Net.ServicePointManager]::SecurityProtocol = [System.Net.ServicePointManager]::SecurityProtocol -bor 3072; iex ((New-Object System.Net.WebClient).DownloadString('https://chocolatey.org/install.ps1'))”

Check ===> choco

**Now: install eksctl**

**Go to ===>** [**https://docs.aws.amazon.com/eks/latest/userguide/eksctl.html**](https://docs.aws.amazon.com/eks/latest/userguide/eksctl.html)

**Then ===> choco install -y eksctl**

**Check ===> eksctl version**

1. **Need to run “aws configure”**

* Need a user with programmatic access
* Run **aws configure** in Power shell
* Provide “ Access key ID “, “ Secret access key “, “ region “

**Create Kubernetes Cluster by using eksctl:**

**Go to this link:** <https://docs.aws.amazon.com/eks/latest/userguide/create-cluster.html>

**Use this link for CONFIG file:** <https://github.com/weaveworks/eksctl/tree/main/examples>

1. Open “powershell” **as administrator**
2. Use like

**eksctl create cluster --name test-cluster --version 1.19 --region us-east-2 --nodegroup-name linux-nodes --node-type t2.micro --nodes 3**

syntax:

[ eksctl create cluster **--name <provide name> --version <mention version> --region <name region> --nodegroup-name <provide name> node-type <mention type> --node no.of ]**

1. To delete cluster

eksctl delete cluster test-cluster