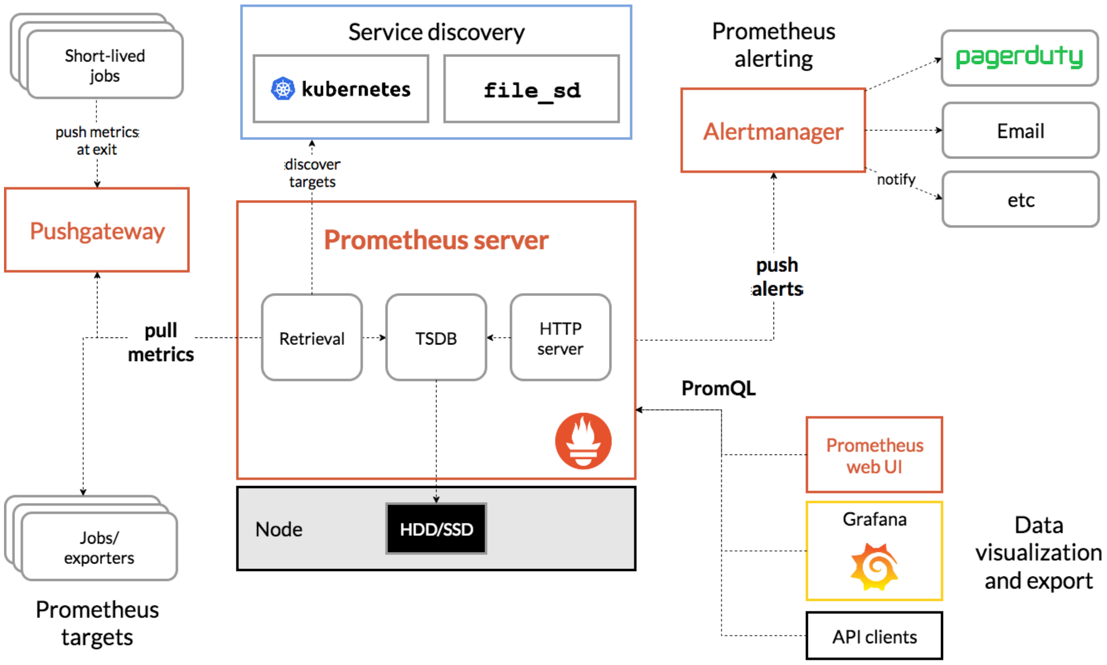
Introduction

Prometheus is an open source systems monitoring and alerting toolkit that has been adopted by a larger number of companies and organizations. Prometheus is now part of the *Cloud Native Computing Foundation (CNCF)*. It comprises of a Prometheus Server that scrapes and stores time series data and an alertmanager to handle alerts.

Architecture



Prometheus scrapes metrics from instrumented jobs and stores all scraped samples locally and runs rules over this data or generate alerts. *Grafana* can be used to visualize the collected data.

Prometheus Installation

We shall be installing Prometheus and Grafana tools on AWS EKS cluster and we assume that the AWS EKS cluster has already been provisioned. Prometheus and Grafana tools can easily be installed using *helm*

```
helm ls
```

Configure Storage Class

In order to install Prometheus and Grafana, we can use gp2 EBS volumes for local storage. However for Production deployments it is highly recommended to use io1 EBS volumes for higher performance.

```
kubectl create -f prometheus-storageclass.yaml
```

Download Prometheus

```
curl -o prometheus-values.yaml https://raw.githubusercontent.com/helm/charts/master/stable/prometheus/valu
es.yaml
```

Modify the downloaded file to uncomment the storageClass and set it to "prometheus" at line # 164 and 664

By default Prometheus server is exposed as ClusterIP, hence in order to access the Web UI we need to expose Prometheus server as a NodePort. Search for type: ClusterIP and add nodePort: 30900 and change the type to NodePort as indicated below.

```
     externalIPs: []

    loadBalancerIP: ""
    loadBalancerSourceRanges: []
    servicePort: 80
    nodePort: 30900
    type: NodePort
```

Deploy Prometheus

```
helm install -f prometheus-values.yaml stable/prometheus --name prometheus --namespace prometheus
```

Check the Prometheus deployment

```
kubectl get all -n prometheus
```

It shall render an output like this:

```
NAME                                                 READY     STATUS    RESTARTS    AGE
pod/prometheus-alertmanager-77cfdf85db-s9p48         2/2       Running   0           1m
pod/prometheus-kube-state-metrics-74d5c694c7-vqtjd   1/1       Running   0           1m
pod/prometheus-node-exporter-6dhpw                   1/1       Running   0           1m
pod/prometheus-node-exporter-nrfkn                   1/1       Running   0           1m
pod/prometheus-node-exporter-rtrm8                   1/1       Running   0           1m
pod/prometheus-pushgateway-d5fdc4f5b-dbmrg           1/1       Running   0           1m
pod/prometheus-server-6d665b876-dsmh9                2/2       Running   0           1m

NAME                                    TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)     AGE
service/prometheus-alertmanager         ClusterIP   10.100.89.154    <none>        80/TCP      1m
service/prometheus-kube-state-metrics   ClusterIP   None             <none>        80/TCP      1m
service/prometheus-node-exporter        ClusterIP   None             <none>        9100/TCP    1m
service/prometheus-pushgateway          ClusterIP   10.100.136.143   <none>        9091/TCP    1m
service/prometheus-server               NodePort    10.100.151.245   <none>        80/30900    1m

NAME                                      DESIRED    CURRENT    READY    UP-TO-DATE    AVAILABLE    NODE SELE
CTOR   AGE
daemonset.apps/prometheus-node-exporter   3          3          3        3             3            <none>
1m

NAME                                            DESIRED    CURRENT    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/prometheus-alertmanager         1          1          1             1            1m
deployment.apps/prometheus-kube-state-metrics   1          1          1             1            1m
deployment.apps/prometheus-pushgateway          1          1          1             1            1m
deployment.apps/prometheus-server               1         1         1            1           1m

NAME                                                       DESIRED   CURRENT   READY     AGE
replicaset.apps/prometheus-alertmanager-77cfdf85db         1         1         1         1m
replicaset.apps/prometheus-kube-state-metrics-74d5c694c7   1         1         1         1m
replicaset.apps/prometheus-pushgateway-d5fdc4f5b           1         1         1         1m
replicaset.apps/prometheus-server-6d665b876                1         1         1         1m
```

Access the Prometheus server

The Prometheus server can now be accessed at one of the node IP addresses at port 30900.

Grafana Installation

Download Prometheus

Run the following:

```
curl -o grafana-values.yaml https://raw.githubusercontent.com/helm/charts/master/stable/grafana/values.yam
l
```

Edit the *grafana-values.yaml* file by replacing *storageClass* with *"prometheus"*, *enabled* with true and *adminPassword* with your password *"password"*

```
persistence:
  enabled: true
  storageClassName: "prometheus"
  # accessModes:
  #   - ReadWriteOnce
  # size: 10Gi
  # annotations: {}
  # subPath: ""
  # existingClaim:

adminUser: admin
adminPassword: password
```

Uncomment the datasources section inside the *grafana-values.yaml* file and set the url attribute to point to the url of the Prometheus server

```
datasources:
 datasources.yaml:
   apiVersion: 1
   datasources:
   - name: Prometheus
     type: prometheus
     url: http://prometheus-server.prometheus.svc.cluster.local
     access: proxy
     isDefault: true
```

Change the grafana service type to LoadBalancer so that its is accessible using a AWS ELB Service url, all of these changes have been made to the file.

```
service:
  type: LoadBalancer
  port: 80
  annotations: {}
  labels: {}
```

Deploy Grafana

```
helm install -f grafana-values.yaml stable/grafana --name grafana --namespace grafana
```

```
kubectl get all -n grafana
```

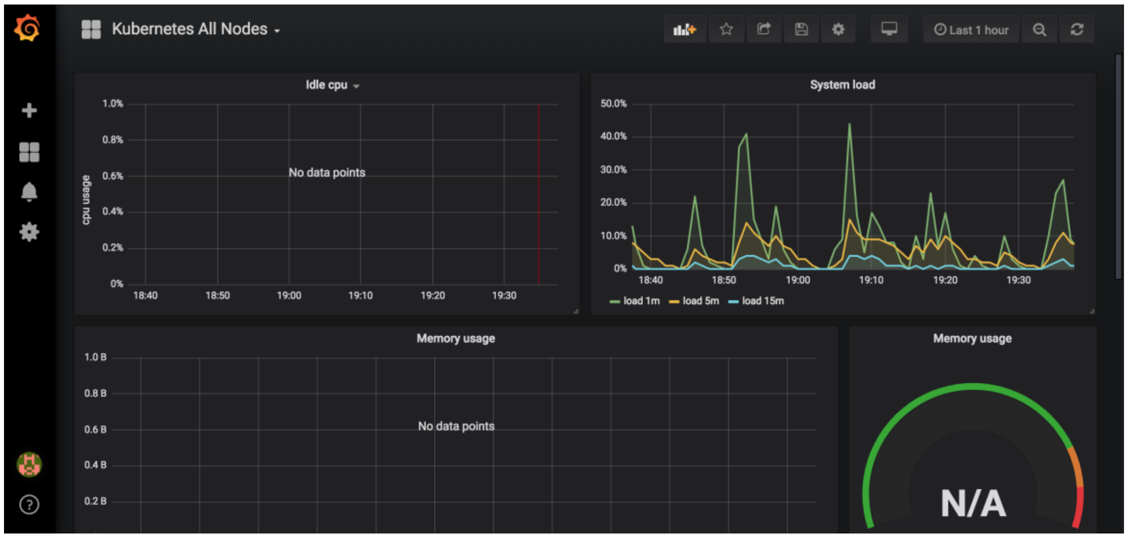
Retrieve the ELB url by running the following:

```
export ELB=$(kubectl get svc -n grafana grafana -o jsonpath='{.status.loadBalancer.ingress[0].hostname}')
```

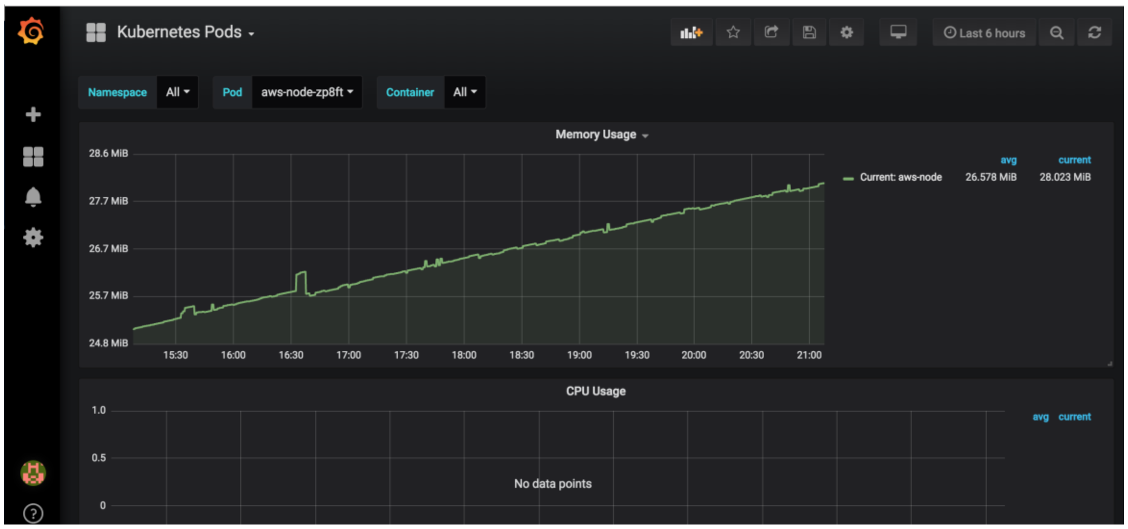
```
echo "http://$ELB"
```

Create Dashboards

Using the ELB url, login to the Grafana dashboard. Since we configured the *datasources* section above, you will notice that *Install Grafana* & *create your first data source* are already completed. Click + button on the left panel and select import, enter 3131 dashboard id under Grafana.com Dashboard and click *Load*. Leave the defaults, select *Prometheus* as the endpoint under prometheus data sources drop down, click *Import*. This will sow monitoring dashboard for all the cluster nodes.



In order to monitor the EKS Kubernetes cluster pods, create a dashboard and enter 3146 for dashboard id.



	avg	current
Current: aws-node	26.578 MiB	28.023 MiB