

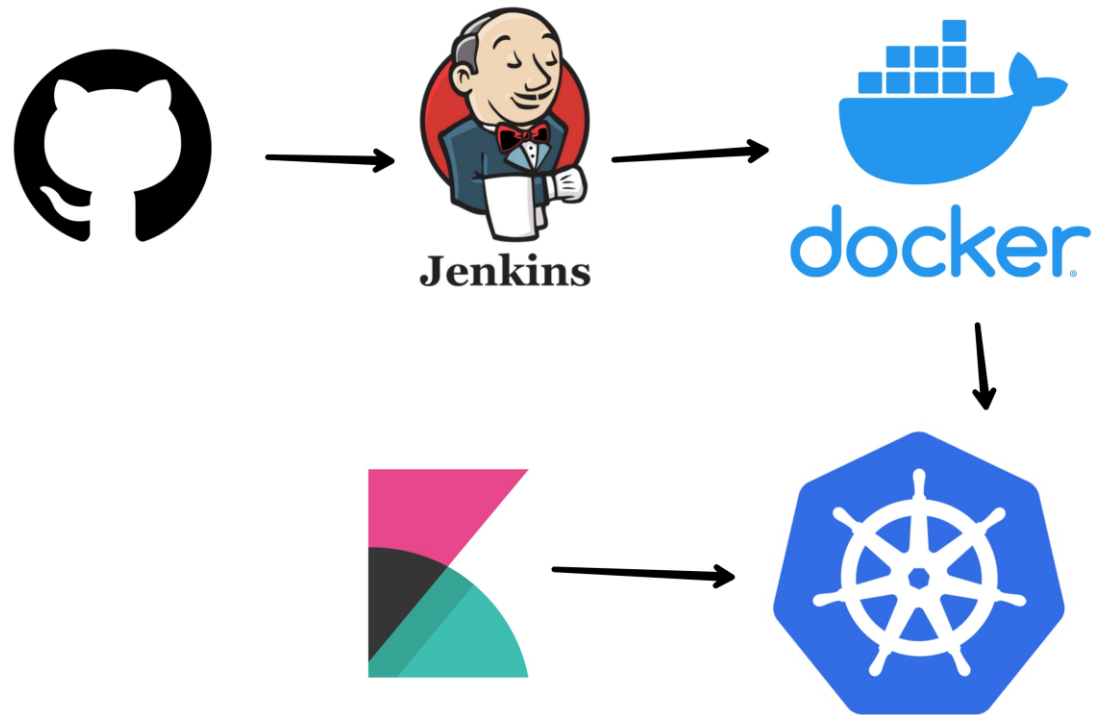
CI/CD Pipeline & Monitoring

SUMANTH SUBRAHMANYA

Tools

- ▶ *GitHub*
- ▶ *Jenkins*
- ▶ *DockerHub*
- ▶ *Kubernetes*
- ▶ *ELK*
- ▶ *APM server*
- ▶ *Ntop*

Design & Expectation



Kubernetes errors

```
Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/sba.kubernetes-cluster (master)
$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-flask  0/1     1            0           4m33s

Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/sba.kubernetes-cluster (master)
$ kubectl create deployment kubernetes-flask --image=kubernetes.yml
Error: failed to create deployment: deployments.apps "kubernetes-flask" already exists
```

```
Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/sba.kubernetes-cluster (master)
$ kubectl create deployment kubernetes-flasks --image=kubernetes.yml
deployment.apps/kubernetes-flasks created
```

```
Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/sba.kubernetes-cluster (master)
$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
kubernetes-flask  0/1     1            0           10m
kubernetes-flasks 0/1     1            0           4s
```

```
Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/sba.kubernetes-cluster (master)
$
```

```
kubernetes_deployment.nginx: Still creating... [1m30s elapsed]
kubernetes_deployment.nginx: Still creating... [1m40s elapsed]
kubernetes_deployment.nginx: Still creating... [1m50s elapsed]
kubernetes_deployment.nginx: Still creating... [2m0s elapsed]
kubernetes_deployment.nginx: Still creating... [2m10s elapsed]
kubernetes_deployment.nginx: Still creating... [2m20s elapsed]
kubernetes_deployment.nginx: Still creating... [2m30s elapsed]
kubernetes_deployment.nginx: Still creating... [2m40s elapsed]
kubernetes_deployment.nginx: Still creating... [2m50s elapsed]
kubernetes_deployment.nginx: Still creating... [3m0s elapsed]
kubernetes_deployment.nginx: Still creating... [3m10s elapsed]
kubernetes_deployment.nginx: Still creating... [3m20s elapsed]
kubernetes_deployment.nginx: Still creating... [3m30s elapsed]
kubernetes_deployment.nginx: Still creating... [3m40s elapsed]
kubernetes_deployment.nginx: Still creating... [3m50s elapsed]
kubernetes_deployment.nginx: Still creating... [4m0s elapsed]
kubernetes_deployment.nginx: Still creating... [4m10s elapsed]
kubernetes_deployment.nginx: Still creating... [4m20s elapsed]
kubernetes_deployment.nginx: Still creating... [4m30s elapsed]
kubernetes_deployment.nginx: Still creating... [4m40s elapsed]
kubernetes_deployment.nginx: Still creating... [4m50s elapsed]
kubernetes_deployment.nginx: Still creating... [5m0s elapsed]
kubernetes_deployment.nginx: Still creating... [5m10s elapsed]
kubernetes_deployment.nginx: Still creating... [5m20s elapsed]
kubernetes_deployment.nginx: Still creating... [5m30s elapsed]
kubernetes_deployment.nginx: Still creating... [5m40s elapsed]
kubernetes_deployment.nginx: Still creating... [5m50s elapsed]
kubernetes_deployment.nginx: Still creating... [6m0s elapsed]
kubernetes_deployment.nginx: Still creating... [6m10s elapsed]
kubernetes_deployment.nginx: Still creating... [6m20s elapsed]
kubernetes_deployment.nginx: Still creating... [6m30s elapsed]
kubernetes_deployment.nginx: Still creating... [6m40s elapsed]
kubernetes_deployment.nginx: Still creating... [6m50s elapsed]
kubernetes_deployment.nginx: Still creating... [7m0s elapsed]
kubernetes_deployment.nginx: Still creating... [7m10s elapsed]
kubernetes_deployment.nginx: Still creating... [7m20s elapsed]
kubernetes_deployment.nginx: Still creating... [7m30s elapsed]
kubernetes_deployment.nginx: Still creating... [7m40s elapsed]
kubernetes_deployment.nginx: Still creating... [7m50s elapsed]
kubernetes_deployment.nginx: Still creating... [8m0s elapsed]
kubernetes_deployment.nginx: Still creating... [8m10s elapsed]
kubernetes_deployment.nginx: Still creating... [8m20s elapsed]
kubernetes_deployment.nginx: Still creating... [8m30s elapsed]
kubernetes_deployment.nginx: Still creating... [8m40s elapsed]
kubernetes_deployment.nginx: Still creating... [8m50s elapsed]
```

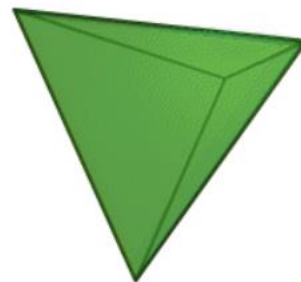
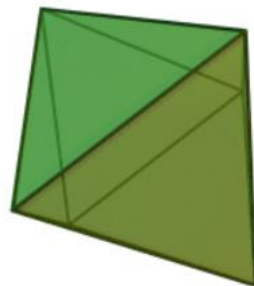
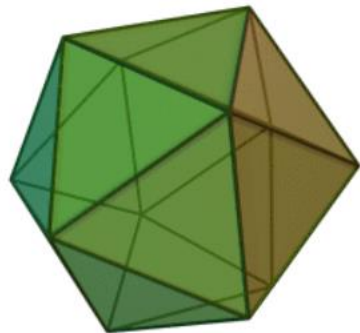
```
MINGW64/C:/Users/Sumanth/dev/exercise.docker-elk/docker-elk
742892a8a090: Pull complete
73a85693a49: Pull complete
06339ee4b372: Pull complete
0426277712f3: Pull complete
11f80b05c6d6: Pull complete
8b478d243a49: Pull complete
80c45513a68: Pull complete
ceff8b062394: Pull complete
e4a662c480c3: Pull complete
1c38860e4f9c: Pull complete
Digest: sha256:f9fa6a1af699a3c4348a045a8d076443f146a0748f0102bf3de22eaf150eb42
Status: Downloaded newer image for selk/elk:latest
* Starting periodic command scheduler cron
* Starting Elasticsearch Server
waiting for Elasticsearch to be up (1/30)
waiting for Elasticsearch to be up (2/30)
waiting for Elasticsearch to be up (3/30)
waiting for Elasticsearch to be up (4/30)
waiting for Elasticsearch to be up (5/30)
waiting for Elasticsearch to be up (6/30)
waiting for Elasticsearch to be up (7/30)
waiting for Elasticsearch to be up (8/30)
waiting for Elasticsearch to be up (9/30)
waiting for Elasticsearch to be up (10/30)
waiting for Elasticsearch to be up (11/30)
waiting for Elasticsearch to be up (12/30)
waiting for Elasticsearch to be up (13/30)
waiting for Elasticsearch to be up (14/30)
waiting for Elasticsearch to be up (15/30)
waiting for Elasticsearch to be up (16/30)
waiting for Elasticsearch to be up (17/30)
waiting for Elasticsearch to be up (18/30)
waiting for Elasticsearch to be up (19/30)
waiting for Elasticsearch to be up (20/30)
waiting for Elasticsearch to be up (21/30)
waiting for Elasticsearch to be up (22/30)
waiting for Elasticsearch to be up (23/30)
waiting for Elasticsearch to be up (24/30)
waiting for Elasticsearch to be up (25/30)
waiting for Elasticsearch to be up (26/30)
waiting for Elasticsearch to be up (27/30)
waiting for Elasticsearch to be up (28/30)
waiting for Elasticsearch to be up (29/30)
waiting for Elasticsearch to be up (30/30)
Could not start Elasticsearch. Exiting.
Elasticsearch log follows below.
cat: /var/log/elasticsearch/elasticsearch.log: No such file or directory

Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/exercise.docker-elk/docker-elk (main)
$ winpty docker run -p 5601:5601 -p 9200:9200 -p 5044:5044 -it --name elk selk/elk
docker: Error response from daemon: Conflict: the container name "/elk" is already in use by container "f3281ad7". You have to remove (or rename) that container to be able to reuse the name.
See 'docker run --help'.

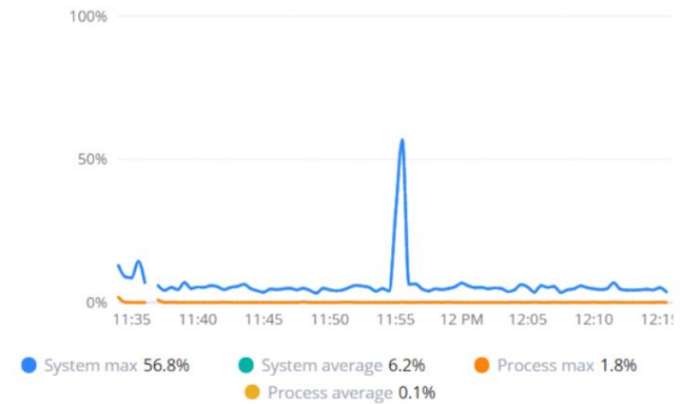
Sumanth@DESKTOP-DA7RVT8 MINGW64 ~/dev/exercise.docker-elk/docker-elk (main)
```

localhost:8000

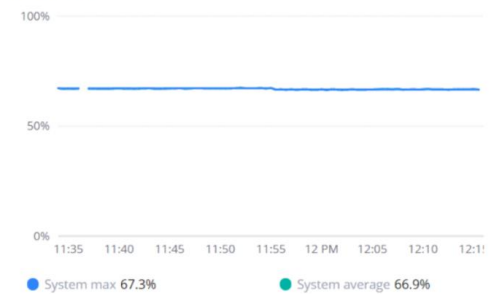
The quickest of brown foxes.



CPU usage



Memory usage



Ntop

Administrator: Windows PowerShell

Ntop on DESKTOP-DA7RVT8

CPU[|||||] 08.8% Tasks: 245 total, 10 running
 Mem[|||||] 65.4% Size: 7 GB
 Pge[|||||] 54.8% Uptime: 02:17:35:23

ID	USER	PRI	CPU%	MEM	THRD	DISK	TIME	PROCESS
21444	Sumanth	8	00.0%	29.5 MB	7	0.0 MB/s	00:04:06:00	nierserver.exe
21400	Sumanth	8	00.0%	12.1 MB	28	0.0 MB/s	00:04:06:19	NortonSecurity.exe
21116	Sumanth	10	00.0%	4.7 MB	2	0.0 MB/s	00:04:06:47	SynTPHelper.exe
21108	SYSTEM	8	00.0%	8.7 MB	2	0.0 MB/s	00:04:06:42	svchost.exe
20964	Sumanth	8	00.0%	36.0 MB	5	0.0 MB/s	00:04:06:49	svchost.exe
20952	Sumanth	8	00.0%	9.9 MB	2	0.0 MB/s	00:04:06:00	HPMSGSVCS.exe
20916	Sumanth	8	00.0%	100.3 MB	59	0.0 MB/s	00:04:05:59	SearchUI.exe
20772	Sumanth	8	00.0%	10.5 MB	14	0.0 MB/s	00:00:19:02	YourPhone.exe
20668	Sumanth	8	00.0%	12.0 MB	2	0.0 MB/s	00:04:06:49	svchost.exe
20656	Sumanth	8	00.0%	35.6 MB	17	0.0 MB/s	00:04:02:46	Chef Workstation App.exe
20636	Sumanth	8	00.2%	5.9 MB	5	0.0 MB/s	00:00:00:29	ntop.exe
20624	SYSTEM	8	00.0%	6.1 MB	4	0.0 MB/s	00:04:06:57	svchost.exe
20528	Sumanth	8	00.0%	6.0 MB	4	0.0 MB/s	00:04:05:46	conhost.exe
20440	Sumanth	8	00.0%	26.4 MB	3	0.0 MB/s	00:03:13:10	RuntimeBroker.exe
19808	Sumanth	8	00.0%	39.8 MB	23	0.0 MB/s	00:04:05:59	RadeonSettings.exe
19596	Sumanth	8	00.0%	12.3 MB	2	0.0 MB/s	00:04:04:49	svchost.exe
19560	Sumanth	8	00.0%	19.0 MB	9	0.0 MB/s	00:03:26:50	chrome.exe
19304	Sumanth	8	00.0%	9.8 MB	7	0.0 MB/s	00:04:06:11	CiscoVideoGuardMonitor.exe
19088	Sumanth	6	00.0%	1.0 MB	2	0.0 MB/s	00:04:06:49	HPJumpStartLaunch.exe
18988	Sumanth	8	00.0%	41.6 MB	14	0.0 MB/s	00:02:12:33	ShellExperienceHost.exe
18904	SYSTEM	8	00.0%	6.9 MB	4	0.0 MB/s	00:19:32:54	svchost.exe
18860	Sumanth	8	00.0%	14.3 MB	5	0.0 MB/s	00:01:55:47	conhost.exe
18756	SYSTEM	13	00.4%	81.0 MB	16	0.0 MB/s	00:13:08:19	dwm.exe
18516	Sumanth	6	00.0%	4.5 MB	6	0.0 MB/s	00:04:06:26	SettingSyncHost.exe
18488	Sumanth	8	00.0%	24.9 MB	11	0.0 MB/s	00:04:06:49	svchost.exe
18148	Sumanth	8	00.0%	23.0 MB	8	0.0 MB/s	00:04:06:42	svchost.exe
17908	Sumanth	8	00.0%	8.8 MB	2	0.0 MB/s	00:04:06:15	SecurityHealthSystray.exe
17832	Sumanth	10	00.0%	37.2 MB	14	0.0 MB/s	00:04:02:57	Chef Workstation App.exe
17712	Sumanth	4	00.0%	148.9 MB	17	0.1 MB/s	00:04:02:41	chrome.exe
17392	Sumanth	8	00.0%	7.5 MB	4	0.0 MB/s	00:03:16:17	conhost.exe
17144	SYSTEM	13	00.0%	10.2 MB	6	0.0 MB/s	00:13:08:20	winlogon.exe
17060	Sumanth	8	00.0%	129.9 MB	38	0.0 MB/s	00:01:22:40	POWERPNT.EXE
16876	Sumanth	8	00.0%	6.3 MB	2	0.0 MB/s	00:00:26:40	py.exe
16640	Sumanth	10	00.0%	181.0 MB	22	0.0 MB/s	00:03:16:23	Code.exe
16636	Sumanth	8	00.0%	137.8 MB	16	0.0 MB/s	00:04:04:26	chrome.exe
16568	Sumanth	8	00.2%	161.2 MB	85	0.0 MB/s	00:04:06:43	explorer.exe
16460	Sumanth	8	00.0%	5.9 MB	2	0.0 MB/s	00:04:05:46	schtasks.exe
16416	Sumanth	8	00.0%	45.8 MB	17	0.0 MB/s	00:00:51:18	Microsoft.Photos.exe
15816	Sumanth	8	00.0%	13.8 MB	8	0.0 MB/s	00:04:06:18	dllhost.exe
15588	Sumanth	8	00.0%	8.4 MB	2	0.0 MB/s	00:02:08:33	RuntimeBroker.exe
15552	Sumanth	8	00.0%	6.9 MB	4	0.0 MB/s	00:03:16:16	bash.exe
15444	Sumanth	13	00.0%	15.2 MB	9	0.0 MB/s	00:04:06:27	TabTip.exe

Dockerfile, Jenkinsfile, Kubernetes.yml

```
1 FROM python:3.7-alpine
2
3
4 USER root
5
6 WORKDIR /app
7
8 ADD . /app
9
10 RUN pip install --trusted-host pypi.python.org -r requirements.txt
11
12 EXPOSE 80
13
14 ENV NAME World
15
16 CMD ["python", "web.py"]
```

```
1 stage('Cloning Git'){
2
3     steps {
4         script{
5             sh 'https://github.com/Sumanth5/case-study'
6         }
7     }
8
9     stage('Build docker image '){
10         steps {
11             script {
12                 sh 'docker image build -t $DOCKER_HUB_REPO:latest .'
13                 sh 'docker image tag $DOCKER_HUB_REPO:latest $DOCKER_HUB_REPO:$BUILD_NUMBER'
14                 echo "image built successfully"
15             }
16         }
17     }
18
19     stage('Push Docker Image'){
20
21     }
22
23     checkout scm
24
25     docker.withRegistry('https://registry.hub.docker.com', 'dockerhub') {
26
27         def customImage = docker.push("sumanth55/kubes")
28
29         customImage.push()
30     }
31 }
```

```
1 #Deployment
2 apiVersion: apps/v1
3 kind: Deployment
4 metadata:
5     name: app-deployment
6     labels:
7         app: flask
8 spec:
9     replicas: 3
10    selector:
11        matchLabels:
12            app: flask
13    template:
14        metadata:
15            labels:
16                app: flask
17    spec:
18        containers:
19            - name: flask
20              image: sumanth55/kubes
21              ports:
22                  - containerPort: 80
23    ---
24 #Service
25 apiVersion: v1
26 kind: Service
27 metadata:
28     name: app-service
29 spec:
30     selector:
31         app: flask
32     ports:
33         - protocol: TCP
34           port: 80
35           targetPort: 8080
36           nodePort: 31000
37     type: NodePort
```

Future Implementations

- ▶ *Fix the pipeline with microK8s*
- ▶ *Implement AWS*
- ▶ *Send alert when high memory usage using Kibana.*