Kailash Parshad - HELK-Container-Security-DOCKER-Elastic-Search

GitHub: - https://github.com/at0m-b0mb/

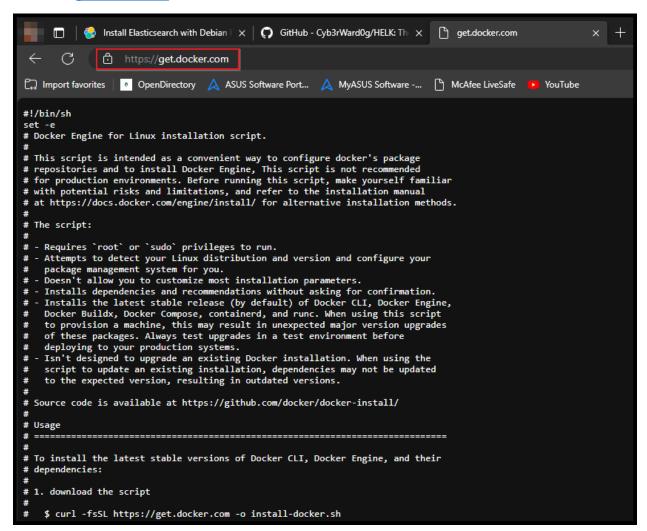
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➤ Project HELK Container Security (DOCKER)

Option 4: 8GB includes KAFKA + KSQL + ELK + NGNIX + SPARK + JUPYTER + ELASTALERT

• Installing Docker on Ubuntu: -

Link: - get.docker.com



• Copying the raw code and making a new Shell script: -

```
root@b0mb: /home/at0m/HELK
 GNU nano 6.2
                                  docker Install.sh
#!/bin/sh
# Docker Engine for Linux installation script.
 This script is intended as a convenient way to configure docker's package
# repositories and to install Docker Engine, This script is not recommended
 for production environments. Before running this script, make yourself famili>
# with potential risks and limitations, and refer to the installation manual
# at https://docs.docker.com/engine/install/ for alternative installation metho>
# The script:
 - Requires `root` or `sudo` privileges to run.
 - Attempts to detect your Linux distribution and version and configure your
 - Doesn't allow you to customize most installation parameters.
 - Installs dependencies and recommendations without asking for confirmation.
    Installs the latest stable release (by default) of Docker CLI, Docker Engin>
    Docker Buildx, Docker Compose, containerd, and runc. When using this script
    to provision a machine, this may result in unexpected major version upgrades
                               [ Read 743 lines ]
             ^O Write Out ^W Where Is
                                                                 ^C Location
G Help
                                       ^K Cut
                                                       Execute
                                                                    Go To Line
  Exit
             ^R Read File ^\ Replace
                                          Paste
                                                       Justify
```

• Giving Execution Rights and running the file (ROOT Privileges required): -

```
root@b0mb:/home/at0m/HELK# chmod +x docker_Install.sh
root@b0mb:/home/at0m/HELK# ./docker_Install.sh
# Executing docker install script, commit: e5543d473431b782227f8908005543bb4389b
8de
+ sh -c apt-get update -qq >/dev/null
+ sh -c DEBIAN_FRONTEND=noninteractive apt-get install -y -qq apt-transport-http
s ca-certificates curl >/dev/null
+ sh -c install -m 0755 -d /etc/apt/keyrings
+ sh -c curl -fsSL "https://download.docker.com/linux/ubuntu/gpg" | gpg --dearmo
r --yes -o /etc/apt/keyrings/docker.gpg
+ sh -c chmod a+r /etc/apt/keyrings/docker.gpg
+ sh -c echo "deb [arch=amd64 signed-by=/etc/apt/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu jammy stable" > /etc/apt/sources.list.d/docker.li
st
+ sh -c apt-get update -qq >/dev/null
+ sh -c DEBIAN_FRONTEND=noninteractive apt-get install -y -qq docker-ce docker-ce-cli containerd.io docker-compose-plugin docker-ce-rootless-extras docker-build
x-plugin >/dev/null
```

• Cloning the GIT repository: -

```
root@b0mb:/home/at0m/HELK# git clone https://github.com/Cyb3rWard0g/HELK.git
Cloning into 'HELK'...
remote: Enumerating objects: 10109, done.
remote: Counting objects: 100% (49/49), done.
remote: Compressing objects: 100% (33/33), done.
remote: Total 10109 (delta 23), reused 37 (delta 16), pack-reused 10060
Receiving objects: 100% (10109/10109), 852.60 MiB | 2.01 MiB/s, done.
Resolving deltas: 100% (6948/6948), done.
root@b0mb:/home/at0m/HELK#
```

• Running the install script: -

```
root@b0mb: /home/at0m/HELK/HELK/docker
                                                   Q
                                                                     ×
root@b0mb:/home/at0m/HELK/HELK/docker# sudo ./helk_install.sh
*************
          HELK - THE HUNTING ELK
** Author: Roberto Rodriguez (@Cyb3rWard0g)
** HELK build version: v0.1.9-alpha10082020 **
** HELK ELK version: 7.6.2
** License: GPL-3.0
*************
[HELK-INSTALLATION-INFO] HELK hosted on a Linux box
[HELK-INSTALLATION-INFO] Available Memory: 8479 MBs
[HELK-INSTALLATION-INFO] You're using ubuntu version jammy
*****************
      HELK - Docker Compose Build Choices
1. KAFKA + KSQL + ELK + NGINX
2. KAFKA + KSQL + ELK + NGINX + ELASTALERT
3. KAFKA + KSQL + ELK + NGINX + SPARK + JUPYTER
4. KAFKA + KSQL + ELK + NGINX + SPARK + JUPYTER + ELASTALERT
```

```
root@b0mb: /home/at0m/HELK/HELK/docker
 Ħ
6.175
[HELK-INSTALLATION-INFO] HELK IP set to 192.168.6.175
[HELK-INSTALLATION-INFO] Please make sure to create a custom Kibana password and
 store it securely for future use.
[HELK-INSTALLATION-INFO] Set HELK Kibana UI Password: hunting
[HELK-INSTALLATION-INFO] HELK Kibana UI password set to hunting
[HELK-INSTALLATION-INFO] Installing htpasswd..
[HELK-INSTALLATION-INFO] Docker already installed
[HELK-INSTALLATION-INFO] Checking if it is installed via snap..
[HELK-INSTALLATION-INFO] Snap v2.59.5 is available
[HELK-INSTALLATION-INFO] Docker not installed via snap
[HELK-INSTALLATION-INFO] Assesing if Docker is running...
[HELK-INSTALLATION-INFO] Docker is running
[HELK-INSTALLATION-INFO] Making sure you assigned enough disk space to the curre
nt Docker base directory
[HELK-INSTALLATION-INFO] Available Docker Disk: 125 GBs
[HELK-INSTALLATION-INFO] Installing docker-compose...
[HELK-INSTALLATION-INFO] Checking local vm.max_map_count variable and setting it
 to 4120294
[HELK-INSTALLATION-INFO] Setting local vm.swappiness variable to 25
[HELK-INSTALLATION-INFO] Building & running HELK from helk-kibana-notebook-analy
sis-alert-basic.yml file..
```

• Let's us check the installation logs: -

```
at0m@b0mb: ~
at0m@b0mb:~$ tail -f /var/log/helk-install.log
Pulling helk-elasticsearch (docker.elastic.co/elasticsearch/elasticsearch:7.6.2)
7.6.2: Pulling from elasticsearch/elasticsearch
Digest: sha256:59342c577e2b7082b819654d119f42514ddf47f0699c8b54dc1f0150250ce7aa
Status: Downloaded newer image for docker.elastic.co/elasticsearch/elasticsearch
:7.6.2
Pulling helk-kibana (docker.elastic.co/kibana/kibana:7.6.2)...
7.6.2: Pulling from kibana/kibana
Digest: sha256:e8f3743e404462709663422056db2d5076a7a6bd6024f64aea1599b3014c63be
Status: Downloaded newer image for docker.elastic.co/kibana/kibana:7.6.2
Pulling helk-logstash (otrf/helk-logstash:7.6.2.1)...
7.6.2.1: Pulling from otrf/helk-logstash
Digest: sha256:b1135da506f40fc1d5861db7ba844486f3a08a57af3fdb8e301ab487f51a2ac1
Status: Downloaded newer image for otrf/helk-logstash:7.6.2.1
Pulling helk-nginx (otrf/helk-nginx:0.3.0)...
0.3.0: Pulling from otrf/helk-nginx
Digest: sha256:32eb6e39681849dc3bed36cfb95bd39b25f8c66d08965b6855f64eb2ee0668ba
Status: Downloaded newer image for otrf/helk-nginx:0.3.0
Pulling helk-zookeeper (otrf/helk-zookeeper:2.4.0)...
2.4.0: Pulling from otrf/helk-zookeeper
Digest: sha256:d8a7c57c03384f5ce2b6125505c1f8e2a020432de81bde3677fcc8009fc5cfd2
Status: Downloaded newer image for otrf/helk-zookeeper:2.4.0
Pulling helk-kafka-broker (otrf/helk-kafka-broker:2.4.0)...
```

```
2.4.5: Pulling from otrf/helk-spark-master
Digest: sha256:1c3589bf181e5302153480b38e4e675afd1a29ef5d3fc6e31d9a33a566b95f18
Status: Downloaded newer image for otrf/helk-spark-master:2.4.5
Pulling helk-spark-worker (otrf/helk-spark-worker:2.4.5)...
2.4.5: Pulling from otrf/helk-spark-worker
Digest: sha256:0c3e2f759d6f286dbf740dab6a74740eb1b173d41156d50c3e4a32ea7e5aa74c
Status: Downloaded newer image for otrf/helk-spark-worker:2.4.5
Pulling helk-elastalert (otrf/helk-elastalert:latest)...
latest: Pulling from otrf/helk-elastalert
Digest: sha256:689fba01b8b238c7a5a0e41b20f1990318c74c0102c6178189baa28037c5c8a7
Status: Downloaded newer image for otrf/helk-elastalert:latest
Creating helk-elasticsearch ... done
Creating helk-kibana ... done
Creating helk-nginx ... done
Creating helk-logstash ... done
Creating helk-zookeeper ... done
Creating helk-elastalert ... done
Creating helk-spark-master ... done
Creating helk-jupyter ... done
Creating helk-spark-worker ... done
Creating helk-kafka-broker ... done
Creating helk-ksql-server ... done
                             · · · done
Creating helk-ksql-cli
```

• HELK is successfully installed: -

HELK KIBANA URL: https://192.168.6.175

HELK KIBANA USER: helk

HELK KIBANA PASSWORD: hunting

HELK SPARK MASTER UI: https://192.168.6.175:8080

HELK JUPYTER SERVER URL: https://192.168.6.175/jupyter

HELK JUPYTER CURRENT TOKEN:

a560e916917dd9d3a4a7414fa12a20b53a3aa85021a104e3

HELK ZOOKEEPER: 192.168.6.175:2181

HELK KSQL SERVER: 192.168.6.175:8088

[HELK-INSTALLATION-INFO] HELK WAS INSTALLED SUCCESSFULLY

[HELK-INSTALLATION-INFO] USE THE FOLLOWING SETTINGS TO INTERACT WITH THE HELK

K **

HELK KIBANA URL: https://192.168.6.175

HELK KIBANA USER: helk

HELK KIBANA PASSWORD: hunting

HELK SPARK MASTER UI: https://192.168.6.175:8080

HELK JUPYTER SERVER URL: https://192.168.6.175/jupyter

HELK JUPYTER CURRENT TOKEN: a560e916917dd9d3a4a7414fa12a20b53a3aa85021a104e3

HELK ZOOKEEPER: 192.168.6.175:2181

HELK KSQL SERVER: 192.168.6.175:8088

IT IS HUNTING SEASON!!!!!

You can stop all the HELK docker containers by running the following command:

[+] sudo docker-compose -f helk-kibana-notebook-analysis-alert-basic.yml stop

root@b0mb:/home/at0m/HELK/HELK/docker#

• Checking all the Running Container: -

root@b0mb:/home/at0m/HELK/HELK/docker# sudo do CONTAINER ID IMAGE STATUS PORTS	cker ps	COMMAND	CREATED
d15938e325c8 confluentinc/ksqldb-cli:latest Up 53 minutes	NAMES	"/bin/sh"	53 minutes ago
fdf7c1418dc8 confluentinc/ksqldb-server:late Up 53 minutes 0.0.0:8088->8088/tcp, :::		"/usr/bin/docker/run"	53 minutes ago
66e2ba3a89be otrf/helk-kafka-broker:2.4.0 Up 53 minutes 0.0.0.0:9092->9092/tcp, :::	helk-ksql-server 9092->9092/tcp	"./kafka-entrypoint"	53 minutes ago
14ff365cb065 otrf/helk-spark-worker:2.4.5 Up 53 minutes	helk-kafka-broker	"./spark-worker-entr"	53 minutes ago
42cd8605bc4a otrf/helk-elastalert:latest Up 53 minutes	helk-spark-worker	"./elastalert-entryp"	53 minutes ago
8d017305e737 docker_helk-jupyter Up 53 minutes 8000/tcp, 8888/tcp	helk-elastalert	"/opt/jupyter/script"	53 minutes ago

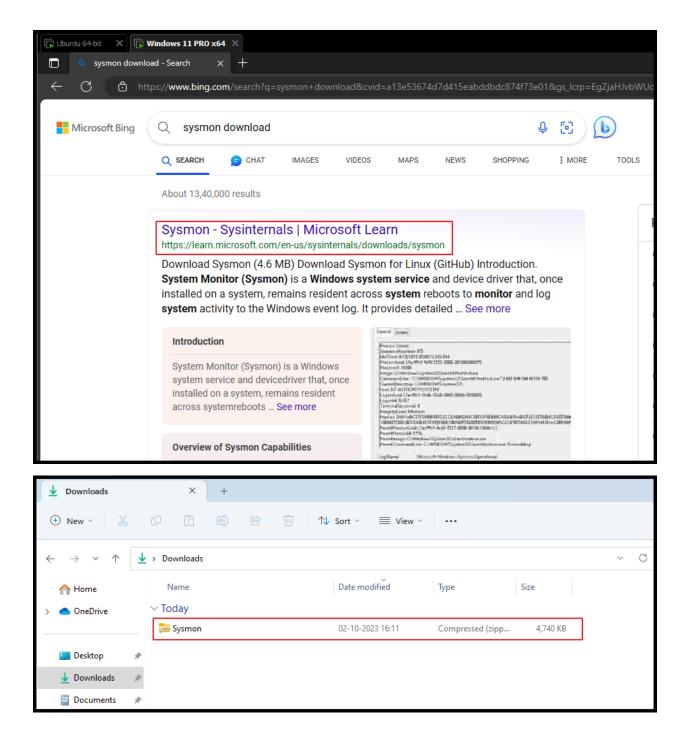
• Checking all the Resources Utilized: -

```
at0m@b0mb:~$ sudo docker stats --all
[sudo] password for at0m:
                                                                MEM USAGE / LIMIT
940KiB / 9.623GiB
406.5MiB / 9.623GiB
CONTAINER ID
                                                  CPU %
                                                                                               MEM %
                                                                                                             NET I/O
                                                                                                                                      BLOCK I/O
                                                                                                                                                                PIDS
                                                                                                             5.62kB / 0B
1.33MB / 1.12MB
                     helk-ksql-cli
                                                                                                                                      49.2kB / 0B
180MB / 5.67MB
d15938e325c8
                                                  0.00%
                                                                                               0.01%
                     helk-ksql-server
                                                                                                                                                                39
fdf7c1418dc8
                                                  0.72%
                                                                                               4.13%
                                                                406.5MiB / 9.623GiB
350.3MiB / 9.623GiB
179.8MiB / 9.623GiB
81.23MiB / 9.623GiB
80.29MiB / 9.623GiB
91.22MiB / 9.623GiB
197.5MiB / 9.623GiB
1.161GiB / 9.623GiB
5.488MiB / 9.623GiB
338.4MiB / 9.623GiB
3.593GiB / 9.623GiB
                                                                                                                                      26MB /
                     helk-kafka-broker
                                                                                                             5.76MB / 5.58MB
42.7kB / 318kB
                                                                                                                                                13.4MB
66e2ba3a89be
                                                  1.55%
                                                                                               3.55%
                                                                                                                                                                76
                     helk-spark-worker
14ff365cb065
                                                  0.22%
                                                                                               1.82%
                                                                                                                                       1.74MB / 7.16MB
                                                                                                                                                                33
                     helk-elastalert
                                                                                                                                       15.7MB /
42cd8605bc4a
                                                  13.85%
                                                                                                             42.4MB / 68.5MB
                                                                                                                                                   7.91MB
                                                                                               0.82%
                     helk-jupyter
8d017305e737
                                                  0.12%
                                                                                               0.81%
                                                                                                             5.77kB / 0B
                                                                                                                                       75.8MB / 62.8MB
                                                                                                                                                                9
                                                                                                             355kB / 262kB
390kB / 543kB
                     helk-zookeeper
5f0be8c4b73d
                                                  0.24%
                                                                                               0.93%
                                                                                                                                       40.3MB / 9.73MB
                                                                                                                                                                48
                     helk-spark-master
ac5e087e9d89
                                                  0.24%
                                                                                               2.00%
                                                                                                                                       10.6MB / 5.19MB
                                                                                                                                                                33
                                                                                                              3.14MB / 189MB
30.9MB / 31.3MB
                                                                                                                                       168MB / 4.88MB
                     helk-logstash
                                                                                                                                                                105
7ec3afb4ad94
                                                  11.16%
                                                                                               12.07%
                                                                                                                                       19.5MB / 143kB
250MB / 136MB
262MB / 748MB
e2c92f97dc8c
                     helk-nginx
                                                  0.00%
                                                                                               0.06%
fd07d46ffed7
                     helk-kibana
                                                  0.69%
                                                                                               3.43%
                                                                                                              3.56MB
                                                                                                                       / 35.7MB
2e5c1aa14c2e
                     helk-elasticsearch
                                                  6.10%
                                                                                               37.34%
                                                                                                                        45.6MB
```

• Checking the Docker Containers' Logs

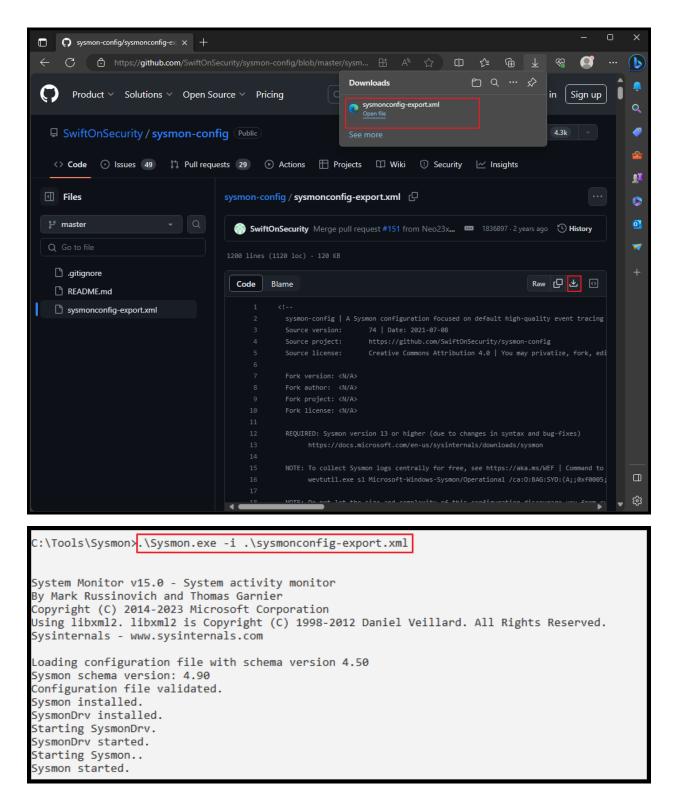
```
at0m@b0mb:~$ sudo docker logs --follow --tail 20 helk-elasticsearch
    at org.elasticsearch.index.mapper.DocumentMapper.merge(DocumentMapper.java:321) ~[elasticsearch-7.6.2.jar:7.6.2]",
  at org.elasticsearch.cluster.metadata.MetaDataMappingService$PutMappingExecutor.applyRequest(MetaDataMappingService.java:282"
   ) ~[elasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.cluster.metadata.MetaDataMappingService$PutMappingExecutor.execute(MetaDataMappingService.java:238) ~[e
 lasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.cluster.service.MasterService.executeTasks(MasterService.java:702) ~[elasticsearch-7.6.2.jar:7.6.2]"
  "at org.elasticsearch.cluster.service.MasterService.calculateTaskOutputs(MasterService.java:324) ~[elasticsearch-7.6.2.jar:7.
 6.2]
  at org.elasticsearch.cluster.service.MasterService.runTasks(MasterService.java:219) [elasticsearch-7.6.2.jar:7.6.2]"
  "at org.elasticsearch.cluster.service.MasterService.access5000(MasterService.java:73) [elasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.cluster.service.MasterService.access5000(MasterService.java:73) [elasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.cluster.service.TaskBatcher.runIfNotProcessed(TaskBatcher.java:150) [elasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.cluster.service.TaskBatcher$BatchedTask.run(TaskBatcher.java:188) [elasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.cluster.service.TaskBatcher$BatchedTask.run(TaskBatcher.java:188) [elasticsearch-7.6.2.jar:7.6.2]",
"at org.elasticsearch.common.util.govursont ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQuanable.gun(ThroadContavtScorogarionQ
   'at org.elasticsearch.common.util.concurrent.ThreadContext$ContextPreservingRunnable.run(ThreadContext.java:633) [elasticsear
  ch-7.6.2.jar:7.6.2]",
    at org.ar{\mathsf{e}}lasticsar{\mathsf{e}}arch.common.util.concurrent.PrioritizedEsThrar{\mathsf{e}}adEsThreadPoolExecutorar{\mathsf{s}}Tiar{\mathsf{e}}Tiar{\mathsf{e}}ArioritizedRunnable.runAndClar{\mathsf{e}}Tiar{\mathsf{e}}ArioritizedRunnable.runAndClar{\mathsf{e}}Arioritized
 itizedEsThreadPoolExecutor.java:252) [elasticsearch-7.6.2.jar:7.6.2]
   "at org.elasticsearch.common.util.concurrent.PrioritizedEsThreadPoolExecutor$TieBreakingPrioritizedRunnable.run(PrioritizedEsThreadPoolExecutor$TieBreakingPrioritizedRunnable.run(PrioritizedEs
 ThreadPoolExecutor.java:215) [elasticsearch-7.6.2.jar:7.6.2]",
"at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128) [?:?]",
"at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628) [?:?]",
FO". "node.id": "wUtMA2BGRsKNFsiLYaEagw" }
```

• Now install Sysmon on a Windows computer: -

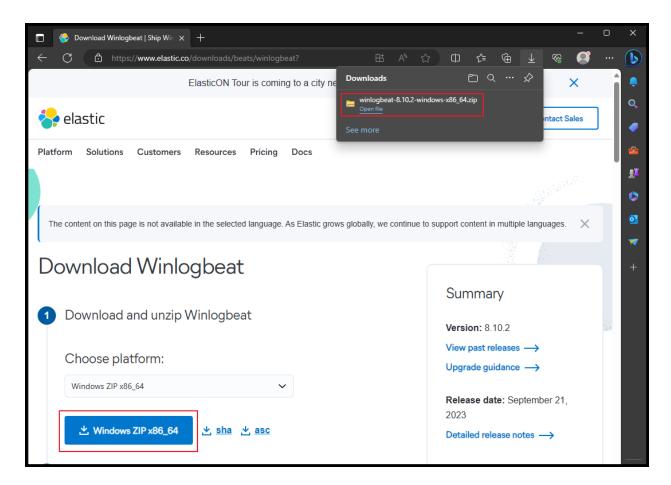


Now configure Sysmon with Github's xml config: -

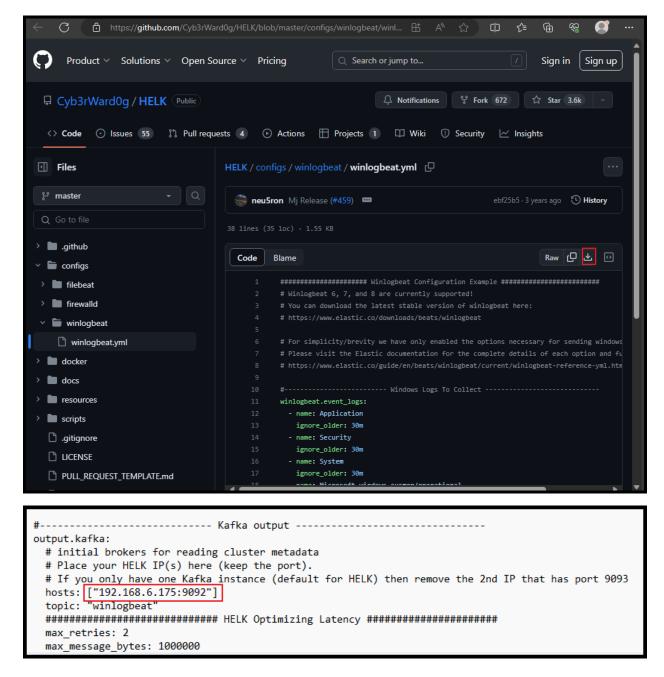
Link: -GitHub - SwiftOnSecurity/sysmon-config: Sysmon configuration file template with default high-quality event tracing



• Downloading and Installing Winlogbeat:-



Installing Winlogbeat.yml file from GitHub: -



• Now installing Winlogbeat as a Service: -

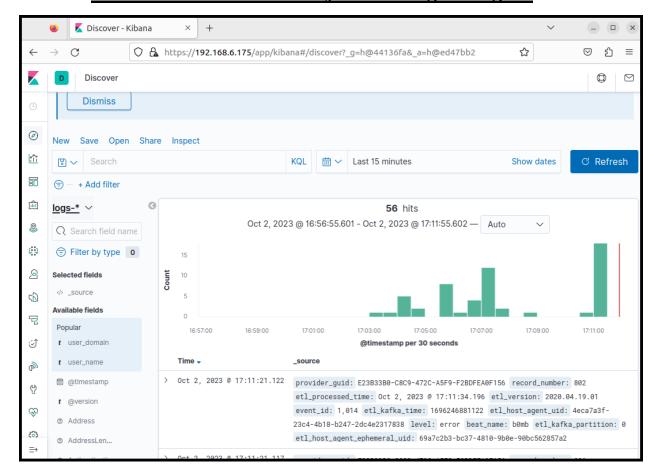
• Starting the winlogbeat service: -

```
Administrator: Command Prompt - powershell

PS C:\Windows\System32> start-service winlogbeat

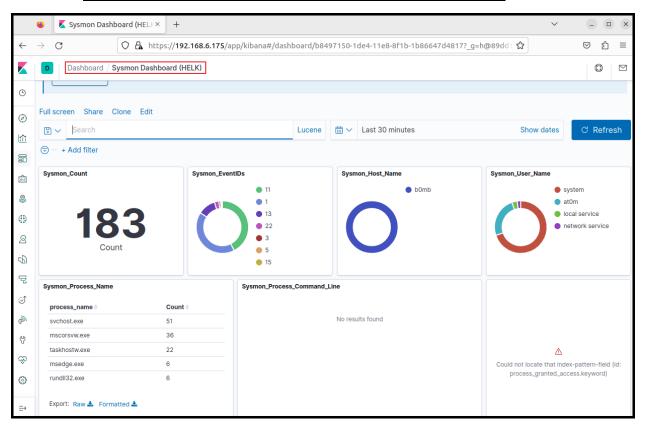
PS C:\Windows\System32>
```

• Now we will check Kibana for checking the logs: -



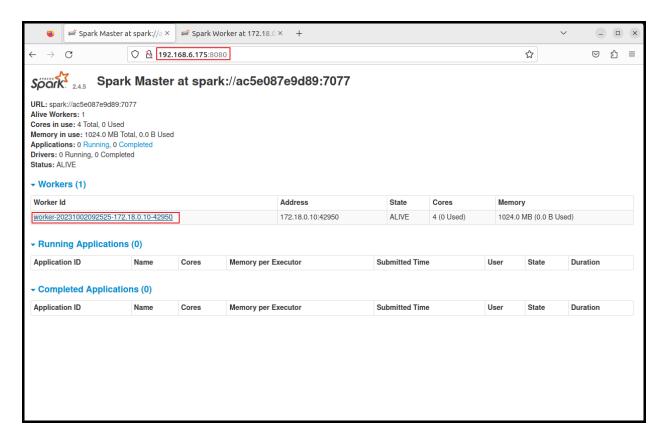


• Checking Custom HELK Sysmon Dashboard : -

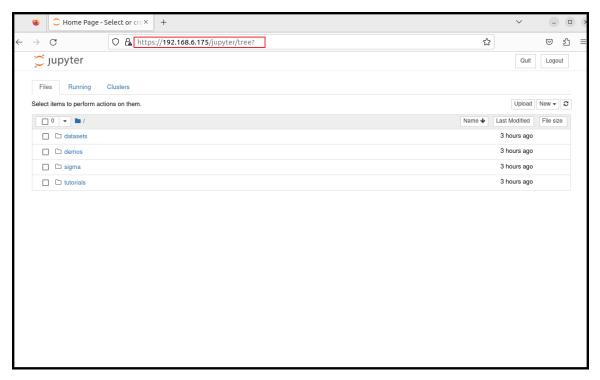


Setup was complete and successful with ELK stack!

• Now we will check the SPARK MASTER UI: -



• Checking Jupiter Notebook: -



THANKYOU