Infosys - DGARM

Observability Cluster Setup Document

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Document Control

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Installation of Elasticsearch

1. **Enable subscription-manager register**

```
subscription-manager register --username actual_user --password
actual_pass
```

- Note :- After installation please subscription-manager unregister
  Command :- `subscription-manager unregister`

2. **Install java on node (server), check the java version and Installation it**

```
yum  install java*
java -version
```

3. **make Elasticsearch as user**

```
useradd elasticsearch
groupadd elasticsearch
```

4. **create data directory as per elasticsearch node functionality**

```
mkdir /data                          // for normal node master and data
mkdir /ml-data                           // for ml node
```

5. **create ELASTIC Directory for installation work**

```
mkdir ELASTIC
cd ELASTIC
```

Download Elasticsearch rpm package

```
wget
https://artifacts.elastic.co/downloads/elasticsearch/elasticsearch-
9.1.5-x86_64.rpm
```

Install Elasticsearch

```
sudo rpm -ivh elasticsearch-9.1.5-x86_64.rpm
```

```
[root@localhost ELASTIC]# ls -ltr
total 660728
-rw-r--r--. 1 root root       161 Oct  6 16:44 elasticsearch-9.1.5-x86_64.rpm.sha512
-rw-r--r--. 1 root root 676579945 Oct  6 16:44 elasticsearch-9.1.5-x86_64.rpm
```

6. **take backup of original elasticsearch.yml file before make any changes**

```
cp /etc/elasticsearch/elasticsearch.yml
/etc/elasticsearch/elasticsearch_yml.backup
```

7. Change ownership of elk directories and owner

```
chown -R root:elasticsearch /etc/elasticsearch
chown -R root:elasticsearch /data
chown -R root:elasticsearch /var/log/elasticsearch
```

```
[root@localhost elasticsearch]# ls -ltr
total 56
-rw-rw----. 1 root          elasticsearch   197 Oct  3 03:41 roles.yml
-rw-rw----. 1 root          elasticsearch   473 Oct  3 03:41 role_mapping.yml
-rw-rw----. 1 root          elasticsearch 20073 Oct  3 03:41 log4j2.properties
-rw-rw----. 1 root          elasticsearch  3445 Oct  3 03:41 jvm.options
-rw-rw----. 1 root          elasticsearch  1042 Oct  3 03:41 elasticsearch-plugins.example.yml
drwxr-s---. 2 root          elasticsearch     6 Oct  3 03:43 jvm.options.d
-rw-rw----. 1 root          elasticsearch   536 Jan  6 17:21 elasticsearch.keystore
-rw-r-----. 1 root          elasticsearch  4054 Jan  6 17:22 elasticsearch_yml.backup
drwxr-x---. 2 elasticsearch elasticsearch  4096 Jan 13 17:07 certs
-rw-rw----. 1 root          elasticsearch  5627 Jan 13 17:31 elasticsearch.yml
-rw-rw----. 1 root          elasticsearch     0 Jan 13 19:39 users
-rw-rw----. 1 root          elasticsearch     0 Jan 13 19:39 users_roles
[root@localhost elasticsearch]#
```

8. Put necessary node certificates in elasticsearch certs folder

```
cd /etc/elasticsearch/certs
```

```
[root@[redacted] ~]# cd /etc/elasticsearch/certs/
[root@[redacted] certs]# ls -l
total 56
-rw-r--r--. 1 elasticsearch elasticsearch  4175 Oct 23 16:31 ca.crt
-rw-r--r--. 1 elasticsearch elasticsearch   229 Oct 23 17:13 [redacted].cnf
-rw-r--r--. 1 elasticsearch elasticsearch  2155 Oct 23 17:13 [redacted].crt
-rw-r--r--. 1 elasticsearch elasticsearch  6330 Oct 23 17:13 [redacted].fullchain.crt
-rw-------. 1 elasticsearch elasticsearch  3272 Oct 23 17:13 [redacted].key
-rw-rw----. 1 elasticsearch elasticsearch  1935 Oct 22 13:19 http_ca.crt
-rw-rw----. 1 elasticsearch elasticsearch 10093 Oct 22 13:19 http.p12
-rw-r--r--. 1 elasticsearch elasticsearch  2175 Oct 23 13:56 intermediateCA.crt
-rw-rw----. 1 elasticsearch elasticsearch  5838 Oct 22 13:19 transport.p12
[root@[redacted] certs]#
```

Note :- .cnf, .dgarm.gov.in.crt, fullchain.crt and key will different as per node

9. Enter host entry in hosts file

Note : host entry wil be different for DR and Prod as per cluster design or setup

```
nano /etc/hosts
```

All ELK Cluster node entry

10. go to elasticserch folder and make changes in yml file

```
nano elasticsearch.yml
```

```
  GNU nano 5.6.1                                                elastics
#
cluster.name: [redacted]
#
# ------------------------------------ Node ------------------------------------
#
# Use a descriptive name for the node:
#
node.name: [redacted]
node.roles: [ master, data_hot, data_content ]
#
# Add custom attributes to the node:
#
#node.attr.rack: r1
#
# ---------------------------------- Paths ------------------------------------
#
# Path to directory where to store the data (separate multiple locations by comma
#
path.data: /data
#
# Path to log files:
#
path.logs: /var/log/elasticsearch
#
# ---------------------------------- Memory -----------------------------------
#
```

```
#network.host: [redacted]
network.host: [redacted]
http.port: 9200
#
# By default Elasticsearch listens for HTTP traffic on the first free port it
# finds starting at 9200. Set a specific HTTP port here:
#
#http.port: 9200
#
# For more information, consult the network module documentation.
#
# --------------------------------- Discovery ---------------------------------
#
# Pass an initial list of hosts to perform discovery when this node is started:
# The default list of hosts is ["127.0.0.1", "[::1]"]
#
#discovery.seed_hosts: ["host1", "host2"]
discovery.seed_hosts: [[redacted]]
#discovery.seed_hosts: [[redacted]]
#
# Bootstrap the cluster using an initial set of master-eligible nodes:
#
#cluster.initial_master_nodes: ["node-1", "node-2"]
cluster.initial_master_nodes: [[redacted]]
#cluster.initial_master_nodes: [[redacted]]
```

```
xpack.security.enrollment.enabled: true

# Enable encryption for HTTP API client connections, such as Kibana, Logstash, and Agents
#xpack.security.http.ssl:
#  enabled: true
#  keystore.path: certs/http.p12

# Enable encryption and mutual authentication between cluster nodes
#xpack.security.transport.ssl:
#  enabled: true
#  verification_mode: certificate
#  keystore.path: certs/transport.p12
#  truststore.path: certs/transport.p12
#xpack.security.transport.ssl.enabled: false
xpack.security.enabled: true
xpack.security.transport.ssl.enabled: true
xpack.security.transport.ssl.verification_mode: certificate
xpack.security.transport.ssl.certificate: /etc/elasticsearch/certs/[redacted].fullchain.crt
xpack.security.transport.ssl.key: /etc/elasticsearch/certs/[redacted].key
xpack.security.transport.ssl.certificate_authorities: ["/etc/elasticsearch/certs/ca.crt"]
  #xpack.security.transport.ssl.keystore.path: /etc/elasticsearch/certs/transport.p12
  #xpack.security.transport.ssl.truststore.path: /etc/elasticsearch/certs/transport.p12


xpack.security.http.ssl.enabled: true
xpack.security.http.ssl.certificate: /etc/elasticsearch/certs/[redacted].fullchain.crt
xpack.security.http.ssl.key: /etc/elasticsearch/certs/[redacted].key
xpack.security.http.ssl.certificate_authorities: ["/etc/elasticsearch/certs/ca.crt"]
  #xpack.security.http.ssl.keystore.path: /etc/elasticsearch/certs/transport.p12
  #xpack.security.http.ssl.truststore.path: /etc/elasticsearch/certs/transport.p12

# Create a new cluster with the current node only
# Additional nodes can still join the cluster later
#cluster.initial_master_nodes: ["dcplelkschmdh01"]

# Allow HTTP API connections from anywhere
# Connections are encrypted and require user authentication
http.host: 0.0.0.0
```

```
# Allow HTTP API connections from anywhere
# Connections are encrypted and require user authenticati
http.host: 0.0.0.0

# Allow other nodes to join the cluster from anywhere
# Connections are encrypted and mutually authenticated
#transport.host: 0.0.0.0
#bootstrap.memory_lock: true

action.destructive_requires_name: true
```

11. start 9200 and 9300 port

```
systemctl start firewalld
firewall-cmd --permanent --add-port=9200/tcp
firewall-cmd --permanent --add-port=9300/tcp
systemctl reload firewalld
```

12. start the elasticsearch service

```
sudo systemctl daemon-reload
sudo systemctl enable elasticsearch
sudo systemctl start  elasticsearch
sudo systemctl restart  elasticsearch
sudo systemctl status elasticsearch
sudo systemctl stop elasticsearch
```

13. Commands for check the error of Elasticsearch

```
sudo journalctl -u elasticsearch.service
sudo journalctl -u elasticsearch.service -f
```

14. Elasticsearch Instance

```
ps aux | grep elasticsearch
sudo netstat -plnt | grep 9200
```

15. command to change password for Elasticsearch user i custom form

```
/usr/share/bin/elasticsearch-reset-password -u elastic -i    // set custom password
```

Note:- The same steps are followed for all other Elasticsearch nodes.

Overview for Elasticsearch nodes:- 3 master nodes, 2 hot data nodes, 4 warm data nodes, 2 ml nodes.

Logstash Installation

1. Enable subscription-manager register

```
subscription-manager register --username ABC --password
abc@123
```

Note :- After installation please subscription-manager unregister
Command :- subscription-manager unregister

2. Install java on node (server), check the java version and Installation it

```
yum  install java*
java -version
```

3. make logstash as user and group

```
useradd logstash
Groupadd logstash
```

4. create logstash Directory for installation work

```
mkdir /logstash
cd /logstash/
wget https://artifacts.elastic.co/downloads/logstash/logstash-
    9.1.5-x86_64.rpm
rpm -ivh logstash-9.1.5-x86_64.rpm
```

5. make certs folder and copy all important certificate

```
/etc/logstash
mkdir certs
```

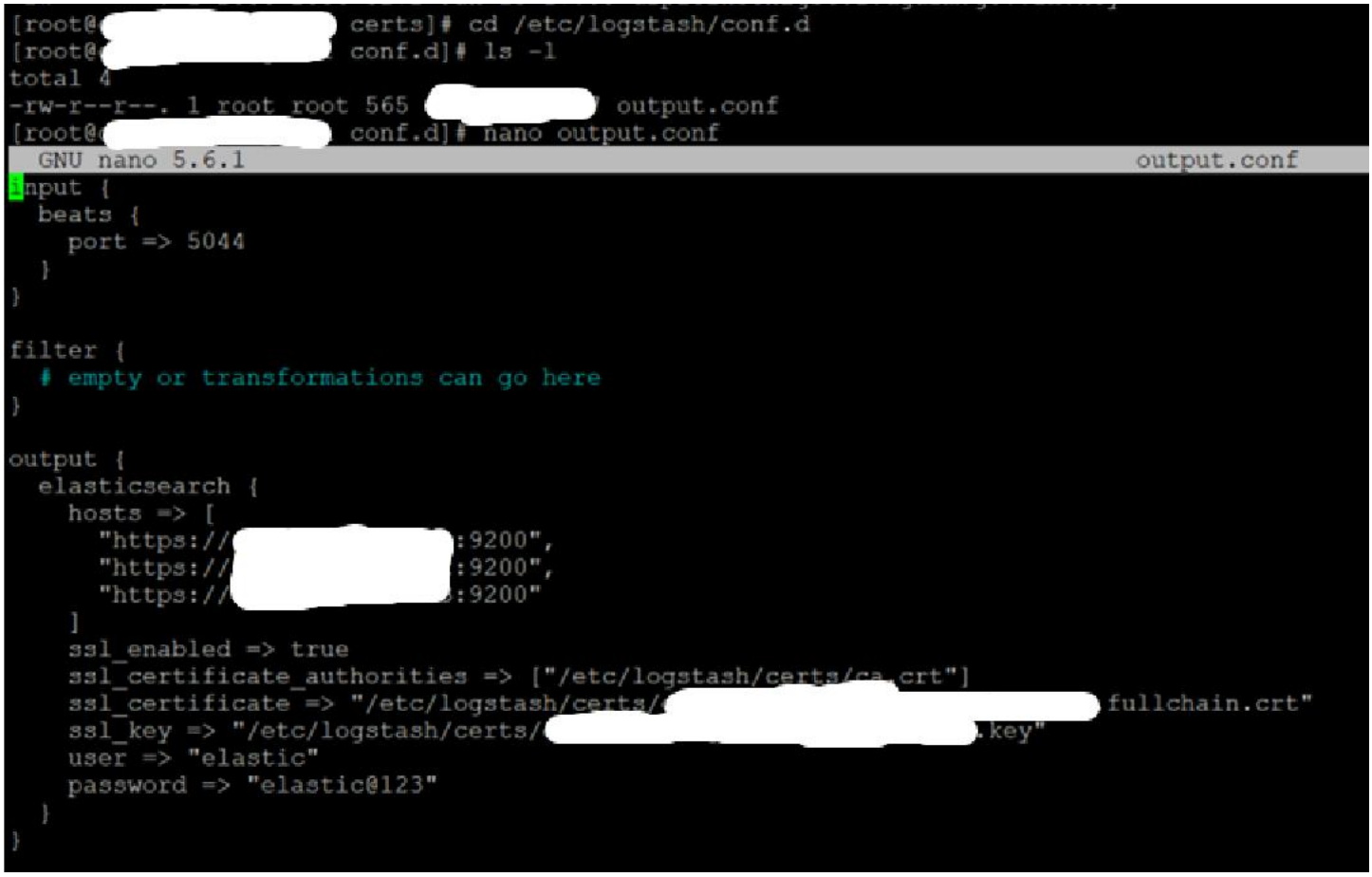
```
cd /etc/logstash/certs/
```

6. changer owner and directory permission

```
chown -R logstash:logstash /etc/logstash /usr/share/logstash
/var/log/logstash /var/lib/logstash
```

7 . Go to config directory and create conf file as per requirement

```
/etc/logstash/conf.d
 nano output.conf
```



8 . Start the port

```
firewall-cmd --permanent --add-port=5044/tcp
systemctl reload firewalld
sudo firewall-cmd --list-ports
```

9.Restart logstash service and check the status

```
sudo systemctl daemon-reload
sudo systemctl enable logstash
```

```
sudo systemctl start logstash
sudo systemctl restart logstash
sudo systemctl status logstash
```

Note :- Please put Certifcate and other details as per host and server.
Same process will be followed for the other logstash node also.

Kibana Installation

1. **Enable subscription-manager register**

```
subscription-manager register --username ABC --password abc@123
```

Note :- After installation please subscription-manager unregister

Command :- subscription-manager unregister

2. **Install java on node (server), check the java version and Install it**

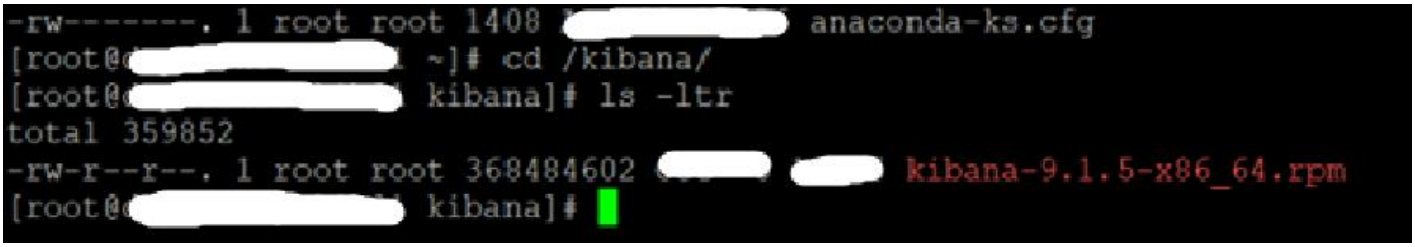
```
yum  install java*
java -version
```

3. **Make Kibana as user and group**

```
useradd elasticsearch
groupadd elasticsearch
```

4. **Create Kibana Directory for installation work**

```
mkdir /kibana
cd /kibana/
wget https://artifacts.elastic.co/downloads/kibana/kibana-9.1.5-x86_64.rpm
yum install net-tools
rpm -ivh kibana-9.1.5-x86_64.rpm
```



5. **put all certificates in certs directory**


```
cd /etc/kibana/certs/
```

6. make changes in kibana.yml file

```
# Enables you to specify a file where Kibana stores log output.
logging:
  appenders:
    file:
      type: file
      fileName: /var/log/kibana/kibana.log
      layout:
        type: json
  root:
    appenders:
      - default
      - file
#  policy:
```

Note : As per node, cluster and server host name will be different

7. open port and reload

```
firewall-cmd --permanent --add-port=5601/tcp
systemctl reload firewalld
netstat -an | grep 5601
```

8. Give permission to kibana respect folders

```
chown -R kibana:kibana /etc/kibana/certs
chown  -R kibana:kibana /opt/kibana
chown  -R kibana:kibana /var/log/kibana
```

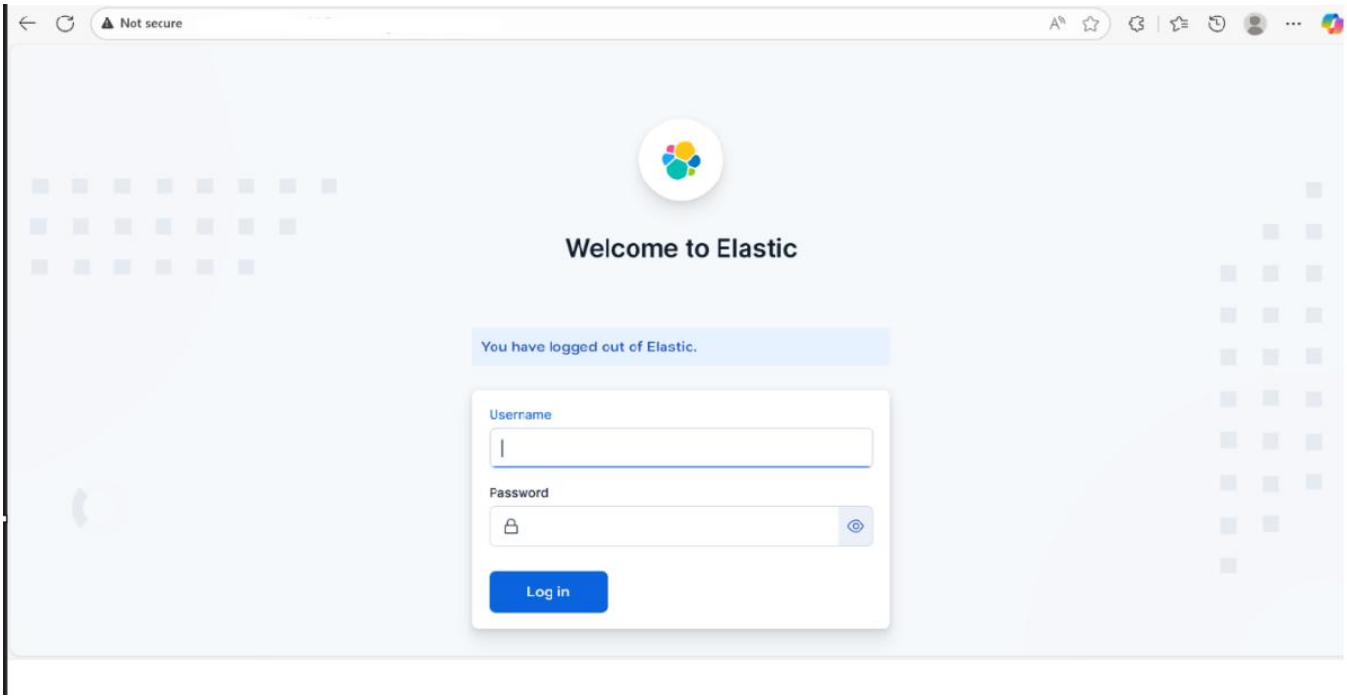
9. restart kibana service

```
sudo systemctl daemon-reload
sudo systemctl enable kibana
sudo systemctl start kibana
sudo systemctl restart kibana
sudo systemctl status kibana
```

10. Command to reset kibana_system user password from elasticsearch master node.

```
Cd /usr/share/elasticsearch
Sudo  ./bin/elasticsearch-reset-password -u kibana_system
```

11. Now go to search engine and access kiban dashboard or url



https://kibanalocalhost:5601

Enter elastic and its password

Username :- elastic

Password :- custom or auto generated.

Note: The same process will be followed for the other Kibana node.

APM Installation on ELK setup

1. **Enable subscription-manager register**

```
subscription-manager register --username actual_user --password
actual_pass
```

Note :- After installation please subscription-manager unregister
Command :- subscription-manager unregister

2. **Install java on node (server), check the java version and Installation it**

```
yum  install java*
java -version
```

3. **make apm-server as user**

```
useradd apm-server
    groupadd apm-server
```

4. **Create APM directory and install apm-server**

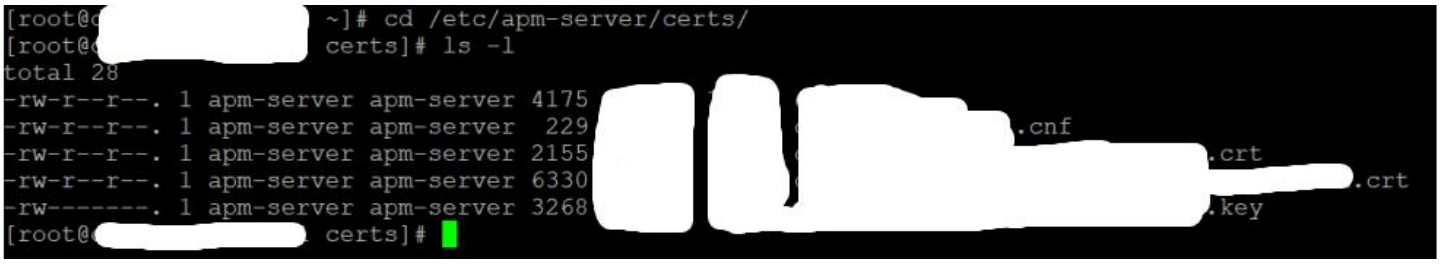
```
mkdir /apm
cd /apm/
wget https://artifacts.elastic.co/downloads/apm-server/apm-server-9.1.5-
x86_64.rpm
rpm -ivh apm-server-9.1.5-x86_64.rpm
```

5. **Take backup of yml file and make changes**

```
cd /etc/apm-server/
cp apm-server.yml apm-server_yml.backup
nano apm-server.yml
```

6. **Put certificate on certs location under apm directory**

```
cd /etc/apm-server/certs/
```



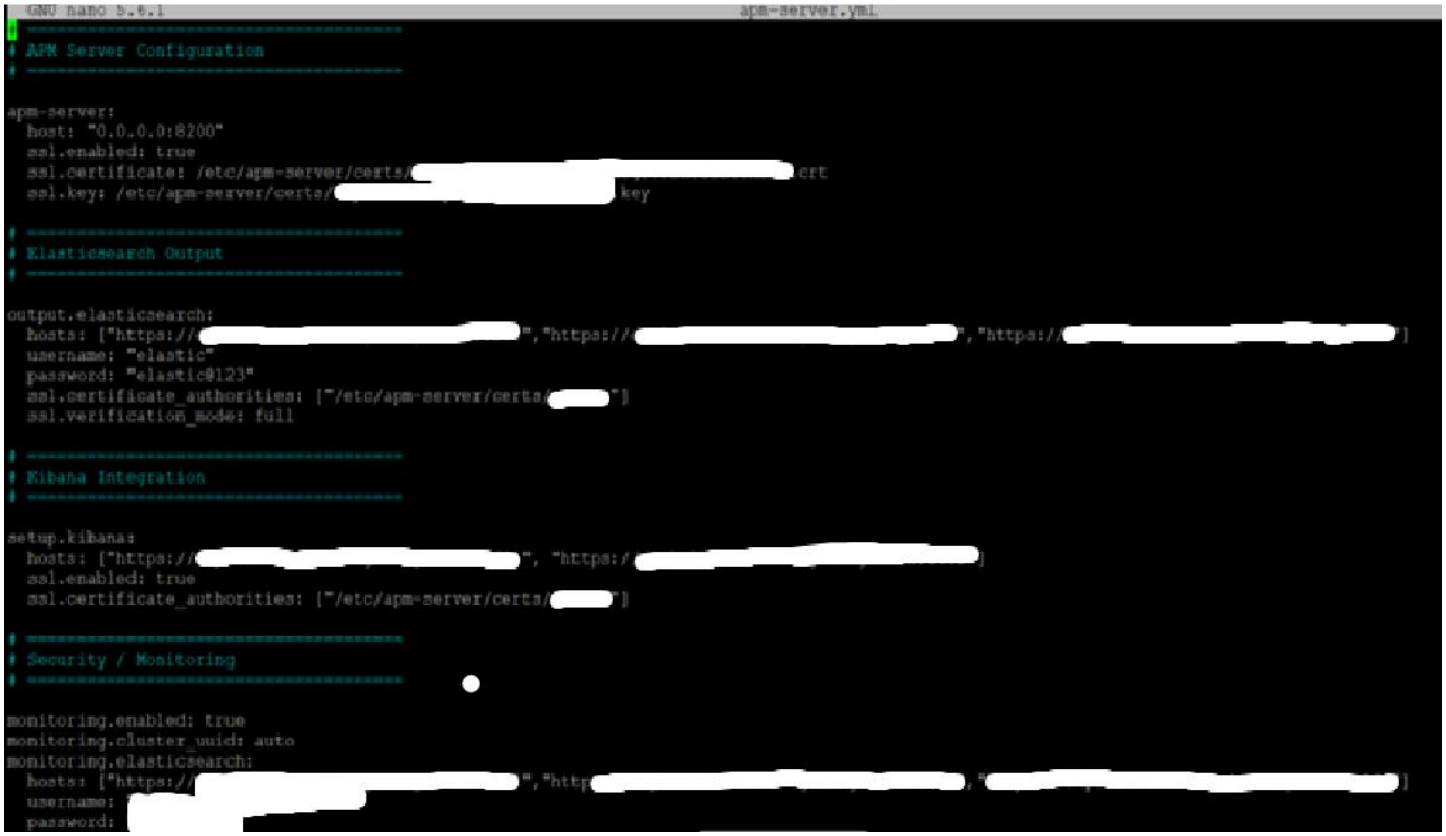
7. **Set permission for apm folders**

```
chown -R apm-server:apm-server /etc/apm-server/
chown -R apm-server:apm-server /var/log/apm-server/
```

8. **Make changes in apm conf yml file**

```
cd /etc/apm-server/
```

```
nano  apm-server.yml
```



Save yml file

9. **Open port 8200 for apm**

```
sudo firewall-cmd --zone=public --add-port=8200/tcp –permanent
sudo firewall-cmd –reload
sudo firewall-cmd --list-ports
firewall-cmd --list-all
```

Note:- The same process will be followed for other apm node.

10. **Put ca certificate**

```
cp ca.crt /etc/pki/ca-trust/source/anchors/
```

Note :- copy ca certificate from elastic master location and copy it on apm server given location

11. **Start apm service and check the status**

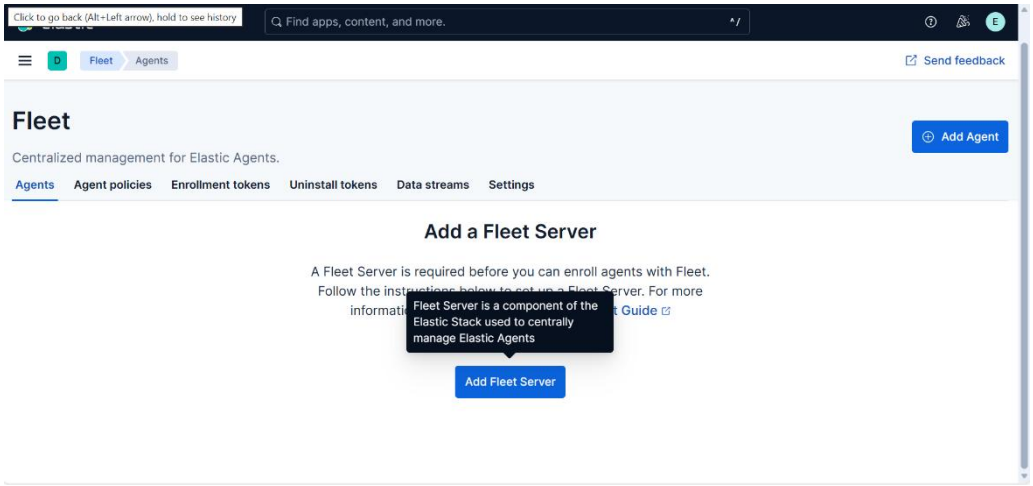
```
systemctl daemon-reload
systemctl status apm-server.service
systemctl enable  apm-server.service  --now
journalctl -xe -f -u apm-server.service  --no-pager
journalctl -xe -f apm-server.service  --no-pager
journalctl -xe -f -u apm-server.service  --no-pager
```

Fleet Installation in Elastic Cluster

1. Go to Fleet Server and Enter All ELK Host entry in host file

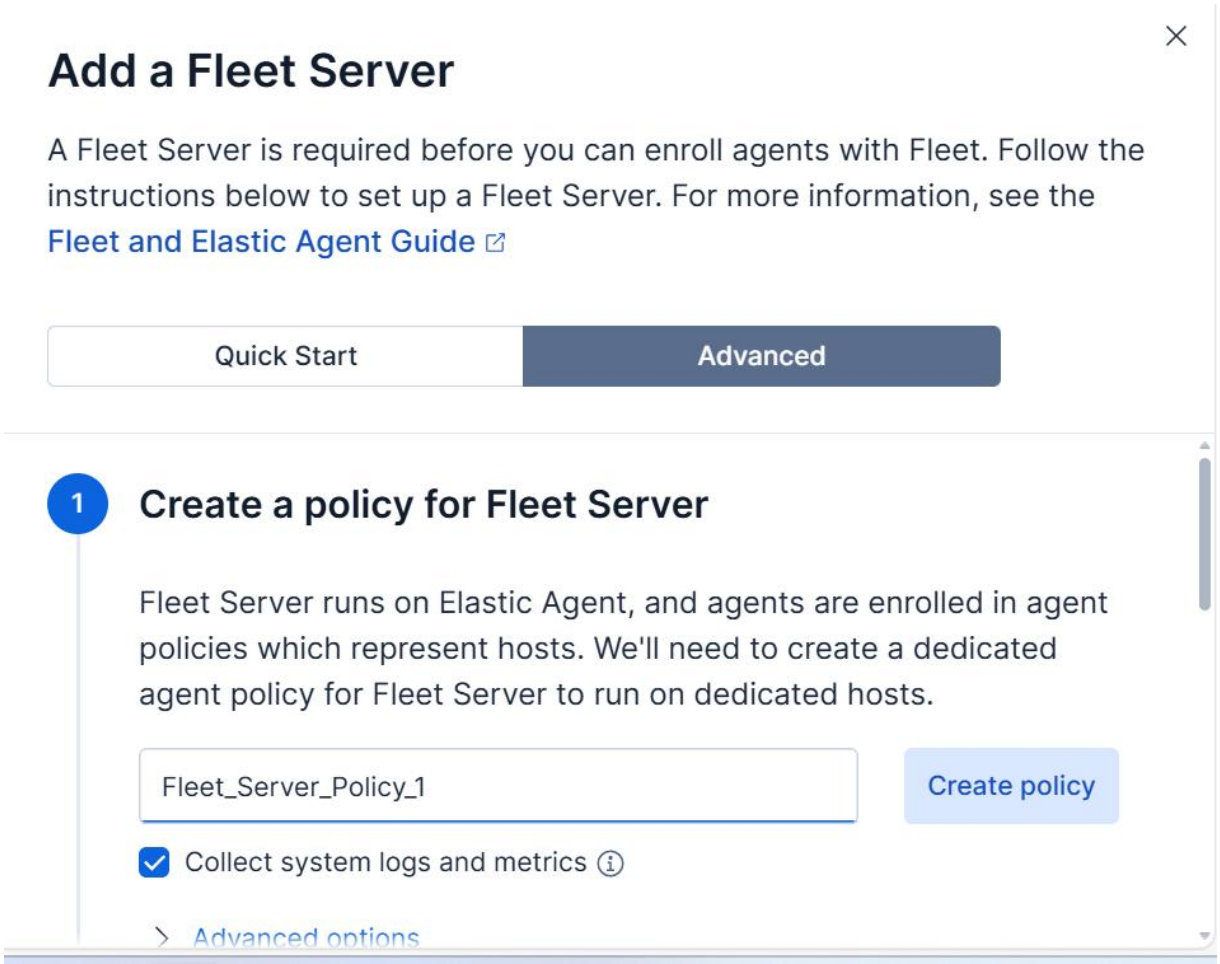
```
nano /etc/hosts
```

2. Copy ca.crt certificate in certificate directory




```
Cd /etc/pki/ca-trust/source/anchors/
Copy certificate here and run update-ca-trust command.
```

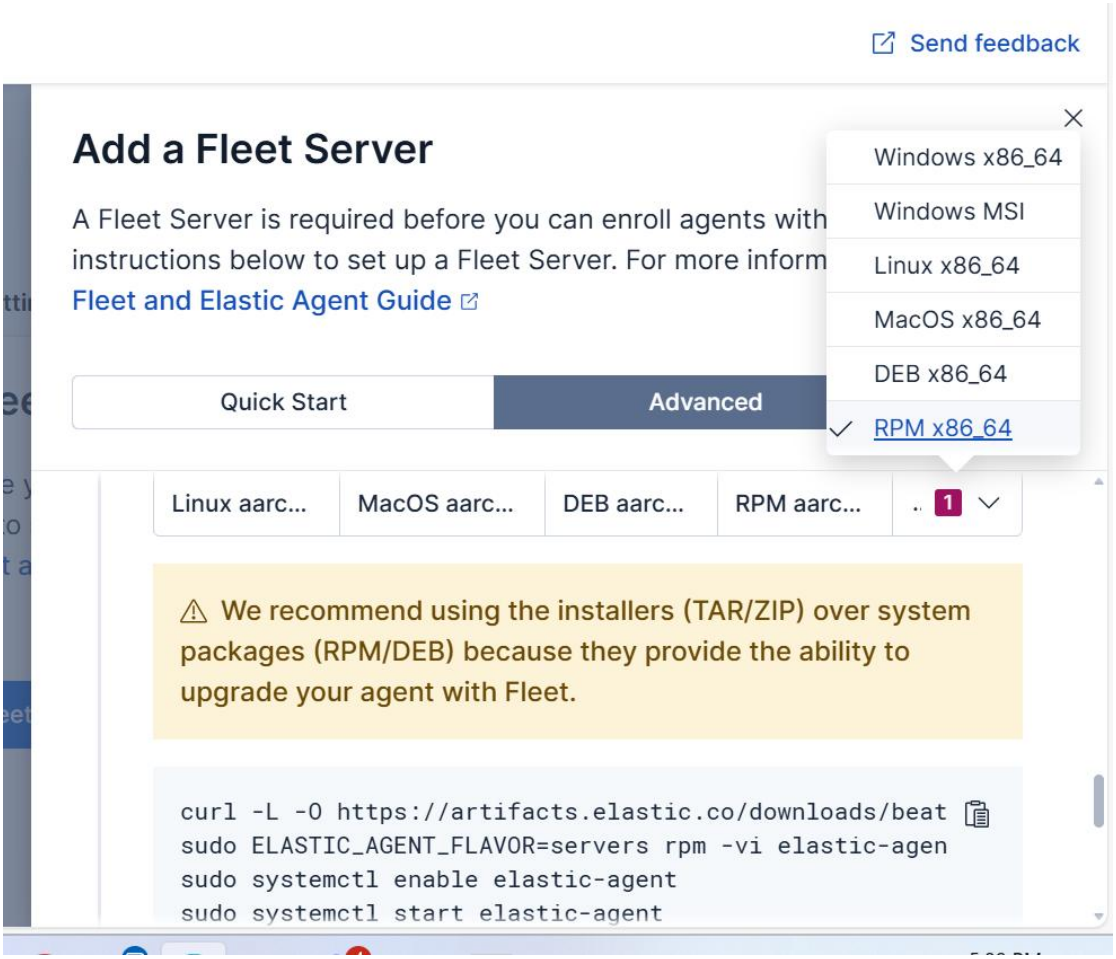
3. Make fleet directory and go inside fleet and install elastic-agent rpm here



3. **Go to Kibana and go to fleet section via 3 line in left side and add fleet.**

5.select or click to add fleet server and under advanced section give Policy name as per our requirements can give custom any name

NOTE :- Follow the step which shows after creating policy to install fleet. To install fleet we need to install elastic-agent on server it automatically installs fleet on that particular server.



1. **Select rpm or tar option for Installation of elastic-agent on our server and copy that installation command and run in our /fleet directory of server**

```
[root@ fleet]# curl -L -O https://artifacts.elastic.co/downloads/beats/elastic-agent/elastic-agent-9.1.5-linux-x86_64.tar.gz
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  445M  100  445M    0     0  11.6M      0  0:00:38  0:00:38 --:--:-- 12.9M
[root@ fleet]# tar xzvf elastic-agent-9.1.5-linux-x86_64.tar.gz
elastic-agent-9.1.5-linux-x86_64/.elastic-agent.active.commit
elastic-agent-9.1.5-linux-x86_64/data/elastic-agent-7bee01/otelcol
elastic-agent-9.1.5-linux-x86_64/data/elastic-agent-7bee01/elastic-agent
```

2. After installing elastic-agent bring or copy all respect certificate on fleet server under elastic-agent directory

```
curl -L -O https://artifacts.elastic.co/downloads/beats/elastic-agent/elastic-agent-9.1.5-x86_64.rpm
sudo ELASTIC_AGENT_FLAVOR=servers rpm -vi elastic-agent-9.1.5-x86_64.rpm
sudo systemctl enable elastic-agent
sudo systemctl start elastic-agent

sudo elastic-agent enroll --url=https://                    :8220 \
  --fleet-server-es=https://                    :9200 \

  --fleet-server-service-token=
  RnZDlicEFydw \
  --fleet-server-policy=fleet-server-policy \
  --certificate-authorities=/etc/elastic-agent/ \
  --fleet-server-es-ca=/etc/elastic-agent/certs/ \
  --fleet-server-cert=/etc/elastic-agent/certs/ \
  --fleet-server-cert-key=/etc/elastic-agent/certs/ \
  --fleet-server-port=8220
```

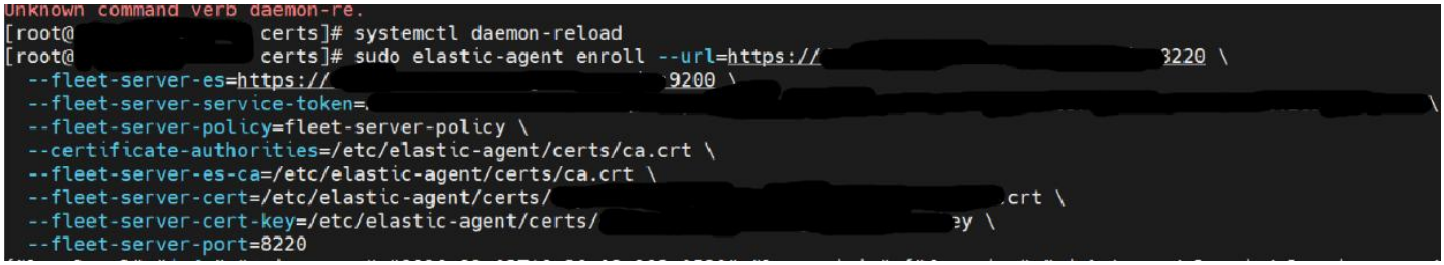
```
[root@ fleet]# cd elastic-agent-9.1.5-linux-x86_64
[root@ elastic-agent-9.1.5-linux-x86_64]#
```

cd /etc/elastic-agent
mkdir certs
cd /etc/elastic-agent/certs
Give proper permission to certificate and certs directory to.

3. Open port 8220 for elastic-agent and fleet

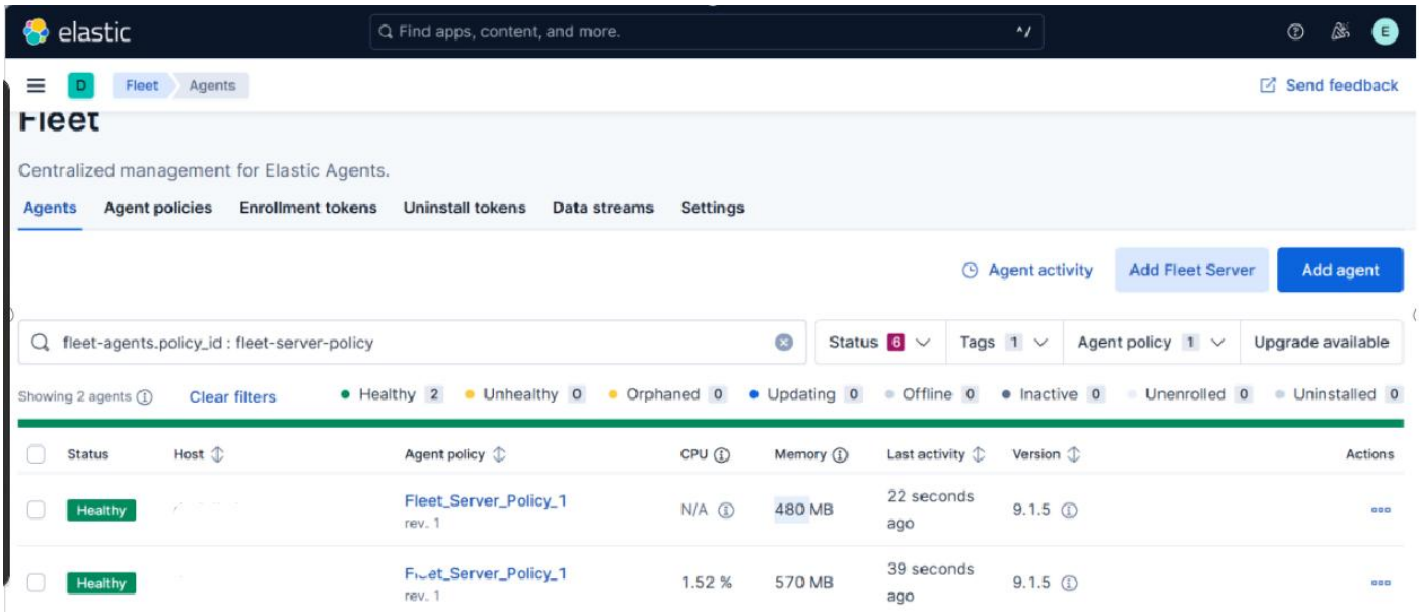
4. Run installation or enroll command which is given in kibana UI for elastic-agent

5. Check status on both UI and CLI. It should be **successfully enroll elastic-agent**



Note :- same steps we need to follow for another 2nd node of fleet instead of default fleet we need to give respect fleet url.

Add new fleet server host and Rest of the steps remaining same.



Note:- The same process will be followed for the other fleet node also.