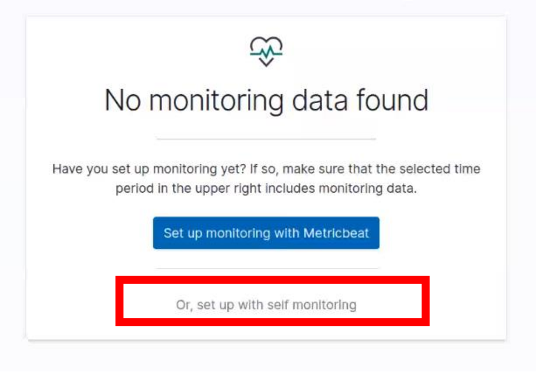
Lab 2 : Scale Elasticsearch with shards & nodes

In Lab 1, we installed a 1 node cluster and loaded some data in it, using the default sharding settings.

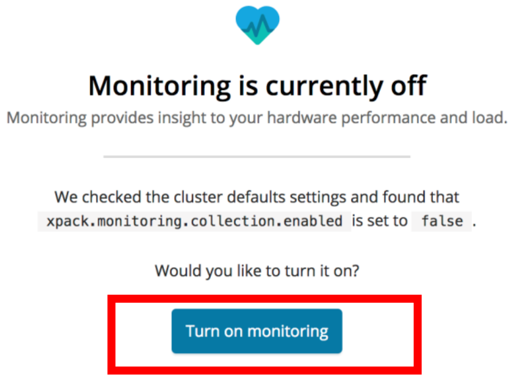
Go in Kibana, under Stack Monitoring, click on, “Or, set up with self-monitoring” (do not click on set up monitoring with metricbeat!!). Then on the next screen, click on “Turn on Monitoring”, and then wait for a couple of seconds :



No monitoring data found

Have you set up monitoring yet? If so, make sure that the selected time period in the upper right includes monitoring data.

Set up monitoring with Metricbeat
Or, set up with self monitoring

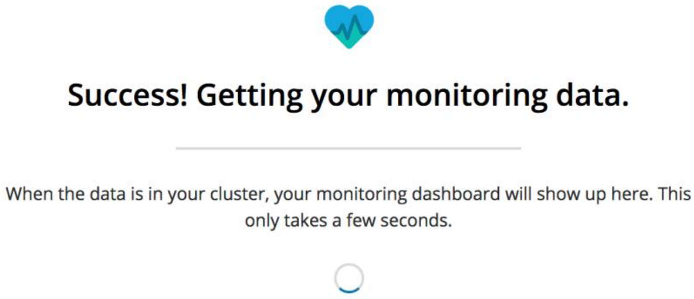


Monitoring is currently off

Monitoring provides insight to your hardware performance and load.

We checked the cluster defaults settings and found that `xpack.monitoring.collection.enabled` is set to `false` .

Would you like to turn it on?



Success! Getting your monitoring data.

When the data is in your cluster, your monitoring dashboard will show up here. This only takes a few seconds.

If the screen does not refresh, please click again on Monitoring in the menu. You should see an overview of your current cluster, number of Elasticsearch nodes, of indices, of Kibana, …

2.1 Do a screenshot of the monitoring and add it to your report

Go under “indices”, look at the indexes you created in lab1 (bank, logstash-2015.05.*, Shakespeare).

What is their status ? Do they have unassigned shards ?

2.2 Do a screenshot of indices monitoring and add it to your report

Meaning of status color in “Indices” monitoring :

- Green : all shards of the index assigned
- Yellow : some replicas shards of the index not assigned
- Red : some primary shards of the index not assigned (some data are not available)

Why is there unassigned shards for all our indices created in Lab 1 ?

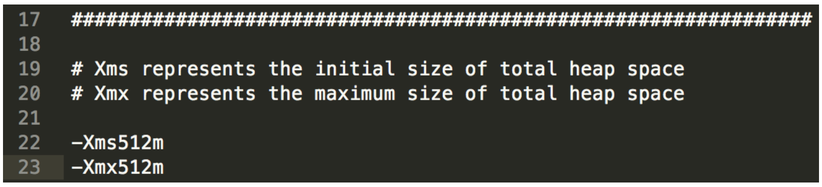
Click on the “bank” index, you will see the details of memory usage, disk usage, search rate, index rate, document count, … and at the bottom the shard legend, where you will see that the only primary shard is assigned to the node currently running, while there is 1 “copy” (replica) unassigned.

2.3 Do a screenshot of the monitoring of the “bank” index and add it to your report

Now, let’s try to add some nodes to the cluster, so these shards can be assigned and we can benefit from high availability.

Shutdown Kibana, and then Elasticsearch.

Edit jvm.options and change xms and xmx settings to 512m instead of 1g. This is to limit the memory usage of each Elasticsearch instance we will run.



```
################################################################

# Xms represents the initial size of total heap space
# Xmx represents the maximum size of total heap space

-Xms512m
-Xmx512m
```

Now, re-launch Elasticsearch with the following parameters :

```
./elasticsearch-7.*.*/bin/elasticsearch -E node.name=node1
```

And launch Kibana : ./kibana-7.*.*/bin/kibana

And then go under Monitoring > Indices > Bank
Nothing should have change except the node name which is not random anymore, and which is node1.
Stay on the monitoring page, and in parallel launch a new terminal and launch another Elasticsearch node :

```
./elasticsearch-7.*.*/bin/elasticsearch -E node.name=node2 -E path.data=data2 -E path.logs=log2
```

2.4 Do a screenshot of the monitoring of the “bank” index, after the addition of 1 node and add it to your report. Comment about what happen on the bank index monitoring page ?

Stay on the monitoring page, and in parallel launch a new terminal and launch a 3rd Elasticsearch node

```
./elasticsearch-7.*.*/bin/elasticsearch -E node.name=node3 -E path.data=data3 -E path.logs=log3
```

Let’s update Kibana configuration, so it becomes aware of the 3 available nodes in the cluster:
Add this line in ./kibana-7.*.*/config/kibana.yml:

```
    elasticsearch.hosts: ["http://localhost:9200","http://localhost:9201","http://localhost:9202"]
```

Then restart Kibana. And go back to the monitoring page for the next questions.

2.5 Do a screenshot of the monitoring of the “bank” index, after the addition of 2 nodes and add it to your report. Comment about what happen on the bank index monitoring page ?

Go back to monitoring > Indices – are all your indices green now ? Are there still unassigned shards ?

2.6 Do a screenshot of indices monitoring, after the addition of 2 nodes and add it to your report

Do we really need replicas for bank – maybe we have another data source elsewhere ?

Let’s move it down to 0 replicas.

Go to the console and execute this query :

```
PUT /bank/_settings
{
  "number_of_replicas": 0
}
```

Go back to Monitoring > Indices > Bank

2.7 Do a screenshot of the monitoring of the “bank” index, after reducing number of replica to 0 and add it to your report. What happened ?

We changed our mind, maybe we don’t need high availability for the bank data, but we expect a lot of read operations, because all customers accessing their web bank portal will generate queries to the clusters to get current balance and so on. We want to leverage all the machines in the clusters, by making sure each node has a copy of the data. Let’s increase replicas to 2 = Each primary will have 2 copies.

```
PUT /bank/_settings
{
  "number_of_replicas": 2
}
```

2.8 Do a screenshot of the monitoring of the “bank” index, after increasing number of replica to 2 and add it to your report. What happened ?

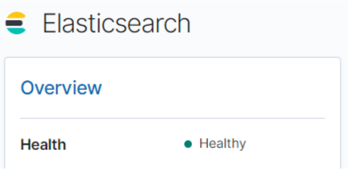
Move it back to the default :

```
PUT /bank/_settings
{
  "number_of_replicas": 1
}
```

From here and for the next labs, you will need to have at least 2 nodes running, so you can get a master elected. If you want to run only with 1 node for the next labs, please follow this procedure:

- Shutdown node 3

- Check Cluster Health in monitoring and wait for it to be green



Elasticsearch

Overview

Health ● Healthy

- Execute the following commands in DevTools **before to shutdown the node 2:**

```
POST /_cluster/voting_config_exclusions?node_names=node2
```

- Check if your node is excluded from voting here :

```
GET /_cluster/state?filter_path=metadata.cluster_coordination.voting_config_exclusions
```

- From there you can shutdown node 2

- Please note that from now your cluster health will be Yellow since there is no possible replication