



Project P10a

Dashboard for analyzing
application performance

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Project Purpose



elastic

The purpose of the project is to create a Dashboard for analyzing application performance at run-time using performance data broadcasted in http o http, with three integrated tools:

- Metricbeat
- Elasticsearch
- kibana

Metricbeat

Metricbeat is an application (daemon process) that permit to take all the information about the Machine on which it is running such as CPU percentage, Memory used and available, percentage of CPU and Memory used by a single process.

In our project **Metricbeat** is the daemon process that it is running on the “server” machine, in other words it will put on the machine in which you want to check and control the parameters.

Once read the parameter, **Metricbeat** is able to upload the information into a database using a simple PUT request formatted in JSON and this database application is Elasticsearch.

Elasticsearch

Elasticsearch is one of the powerful application dedicated to store and read data in real-time, it is based on JSON string. So when you want to store something you have to create a well-formed string in JSON with your information and you have to specify also:

- Index
- Doc_type
- Id

Kibana

At the end we need to visualize the data stored into Elasticsearch, and for this purpose we decided to use Kibana. Kibana is an open source data visualization application written in JavaScript. It provides visualization capabilities on top of the content indexed on an Elasticsearch cluster. Users can create bar, line and scatter plots, or pie charts and maps on top of large volumes of data. In other words kibana does a request to Elasticsearch each time period defined into configuration file, but will be described better during the Setup description.

Setup of all Components

For the installation of all components, we have built a script that supply all the installation and configuration steps of Elasticsearch, Kibana and Metricbeat. Moreover the script will configure and sets itself all the custom visualization, dashboard, and sets the index pattern required by Kibana to show properly our collected data.

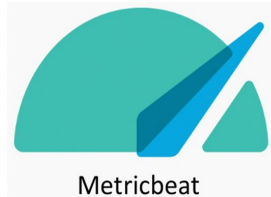
At the end of the script, the environment have all the required application configured well in order to show properly all the data required.



kibana



elasticsearch



Command for the script

How to start the components?

```
sudo -i service elasticsearch start
```

```
sudo -i service kibana start
```

```
sudo /etc/init.d/metricbeat start
```

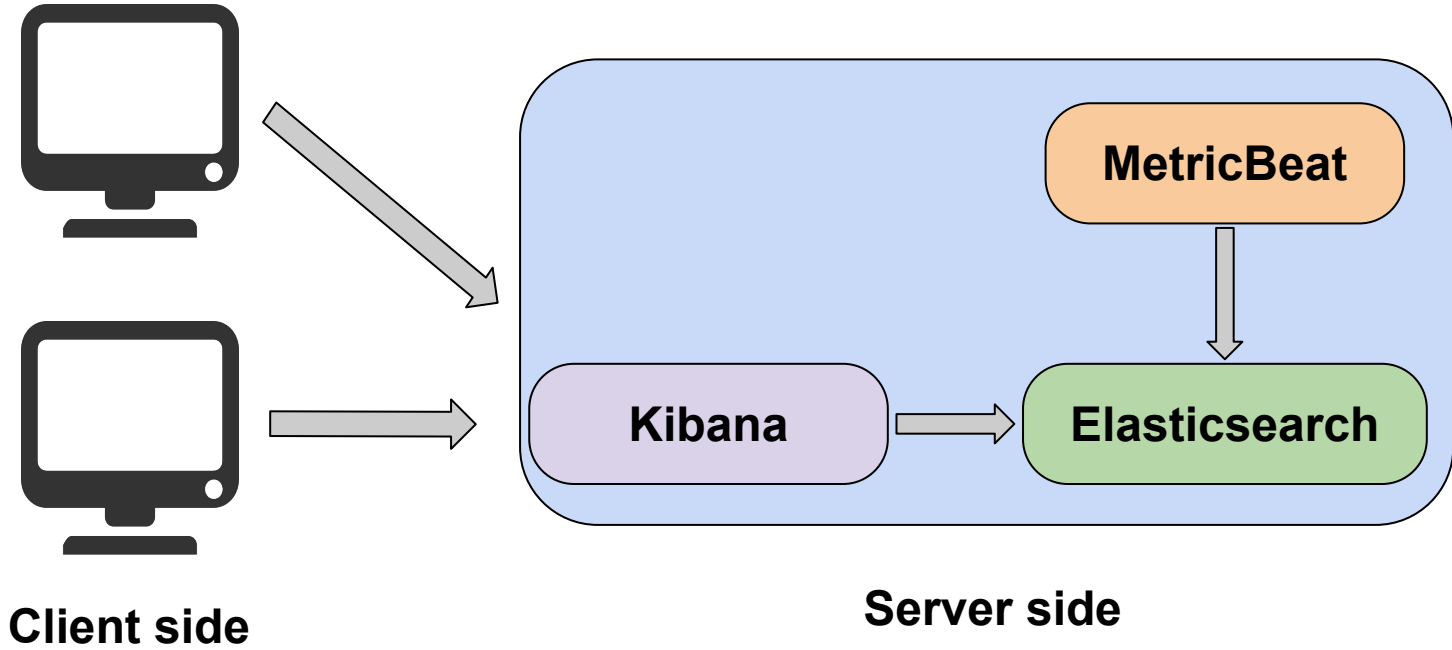
How to stop the components?

```
sudo -i service elasticsearch stop
```

```
sudo -i service kibana stop
```

```
sudo /etc/init.d/metricbeat stop
```

Example of how MetricBeat, Elasticsearch and Kibana work



Configuration files

Before running the tools we need to set the configuration files inside each tool folder, so we have one configuration file for each tool used:

- elasticsearch.yml
- metricbeat.yml
- kibana.yml

Configuration files are necessary to set the correct ip address and port for connection, to set the refresh time of data, to choose the information to visualize and also to choose the type of connection like http or https.

Monitoring a Data Order process

In order to better understanding how computer resources are used, in a sample process, we have created a Python program, that sends data to integrate Resources Metric with detailed description of the current running processes, so these information will be visible in the same graph of real time resources visualization (such CPU, Memory usage and CPU Usage per process). Special Markers highlight start and end of the process.

Moreover will be available a summary table describing all the done activities, with additional information of the process time elapsed, name of the process, and description.

Another Instance - User Data defined

Dashboard is a very flexible way to show time based data, so we have created a sample Python application that order by a bubble sort process and sends for each iteration the maximum number found.

This information will be visible in real time on a column chart Graph.

Hands On - Project Demo

End.

Project P10

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