Lab 11. Monitoring Server Infrastructure

In the previous lab, we covered how to effectively run the Elastic Stack in a production environment, and the best practices to follow when running the Elastic Stack in production.

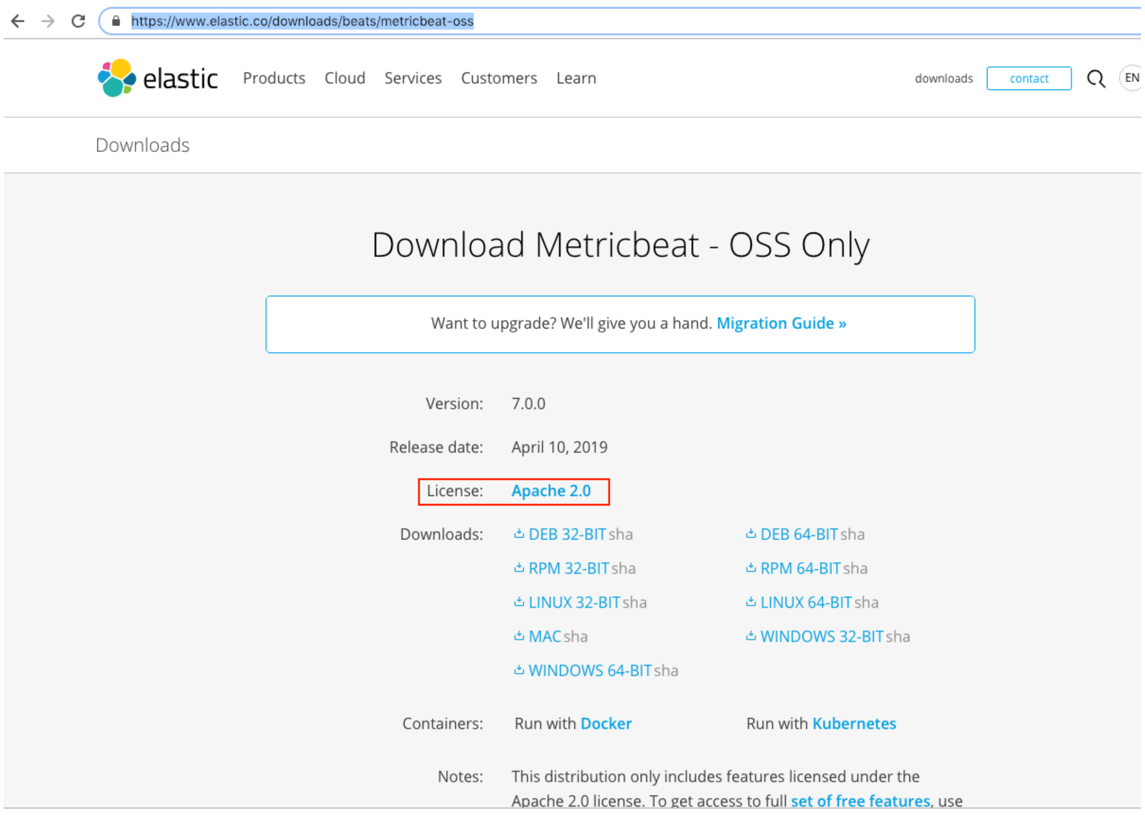
In this lab, we will be covering how to use the Beats platform to monitor server infrastructure. We will learn about Metricbeat in detail, a Beat that helps IT administrators and application support teams monitor their applications and server infrastructure and respond to infrastructure outages in a timely manner.

In this lab, we will cover the following topics:

- Metricbeat
- Configuring Metricbeat
- Capturing system metrics
- Deployment architecture

Downloading and installing Metricbeat

Navigate to https://www.elastic.co/downloads/beats/metricbeat-oss and, depending on your operating system, download the ZIP/TAR file, as shown in the following screenshot. The installation of Metricbeat is simple and straightforward as follows:



Download Metricbeat - OSS Only

Want to upgrade? We'll give you a hand. Migration Guide »

Version: 7.0.0

Release date: April 10, 2019

License: Apache 2.0

Downloads: DEB 32-BIT sha, DEB 64-BIT sha, RPM 32-BIT sha, RPM 64-BIT sha, LINUX 32-BIT sha, LINUX 64-BIT sha, MAC sha, WINDOWS 32-BIT sha, WINDOWS 64-BIT sha

Containers: Run with Docker, Run with Kubernetes

Notes: This distribution only includes features licensed under the Apache 2.0 license. To get access to full set of free features, use

Note

For this tutorial, we'll use the Apache 2.0 version of Metricbeat. Beats version 7.0.x is compatible with Elasticsearch 6.7.x and 7.0.x, and Logstash 6.7.x and 7.0.x. The compatibility matrix can be found at https://www.elastic.co/support/matrix#matrix_compatibility. When you come across Elasticsearch and Logstash examples, or scenarios using Beats in this lab, make sure that you have compatible versions of Elasticsearch and Logstash installed.

Installing on Linux

Unzip the `tar.gz` package and navigate to the newly created folder, as shown in the following code snippet:

```
$>tar -xzf metricbeat-7.0.0-linux-x86_64.tar.gz
$>cd metricbeat
```

Note

To install using dep/rpm, execute the appropriate commands in the Terminal as follows:

**deb: `curl -L -O https://artifacts.elastic.co/downloads/beats/metricbeat/metricbeat-7.0.0-amd64.deb``sudo dpkg -i metricbeat-7.0.0-amd64.deb`

**rpm: `curl -L -O https://artifacts.elastic.co/downloads/beats/metricbeat/metricbeat-7.0.0-x86_64.rpm``sudo rpm -vi metricbeat-7.0.0-x86_64.rpm`

Metricbeat will be installed in the `/usr/share/metricbeat` directory. The configuration files will be present in `/etc/metricbeat`. The `init` script will be present in `/etc/init.d/metricbeat`. The log files will be present within the `/var/log/metricbeat` directory.

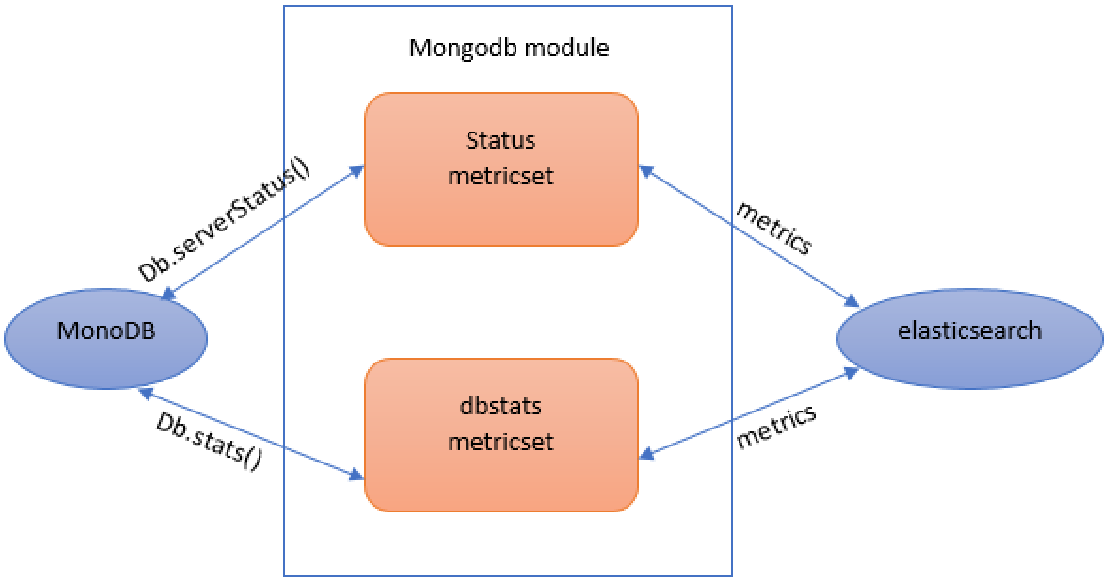
Architecture

Metricbeat is made up of two components: one is called **modules** and the other is called **metricsets**. A Metricbeat module defines the basic logic of collecting data from a specific service, such as MongoDB, Apache, and so on. The module specifies details about the service, including how to connect, how often to collect metrics, and which metrics to collect.

Each module has one or more metricsets. A metricset is the component that collects a list of related metrics from services or the operating system using a single request. It structures event data and ships it to the configured outputs, such as Elasticsearch or Logstash.

Metricbeat collects metrics periodically, based on the interval specified in the `metricbeat.yml` configuration file, and publishes the event to the configured output asynchronously. Since the events are published asynchronously, just like in Filebeat, which guarantees delivery at least once, if the configured output is not available, the events will be lost.

For example, the MongoDB module provides the `status` and `dbstats` metricsets, which collect information and statistics by parsing the returned response obtained from running the `db.serverStatus()` and `db.stats()` commands on MongoDB, as shown in the following diagram:



Event structure

Metricbeat sends two types of event:

- Regular events containing the fetched metrics
- Error events when the service is down/unreachable

Irrespective of the type of event, all events have the same basic structure and contain the following fields as a minimum, irrespective of the type of module that's enabled:

- `@timestamp` : Time when the event was captured
- `host.hostname` : Hostname of the server on which Beat is running
- `host.os` : Operating system details of the server where Beat is running
- `agent.type` : Name given to Beat
- `agent.version` : The Beat version
- `event.module` : Name of the module that the data is from
- `event.dataset` : Name of the metricset that the data is from

In the case of error events, an error field such as `error.message` , containing the error message, code, and type, will be appended to the event.

An example of a regular event is as follows:

```
{"@timestamp" : "2019-04-22T12:40:16.608Z",
"service" : {
  "type" : "system"
},
"system" : {
  "uptime" : {
    "duration" : {
      "ms" : 830231705
    }
  }
},
"event" : {
  "module" : "system",
  "duration" : 221012700,
  "dataset" : "system.uptime"
},
"metricset" : {
  "name" : "uptime"
},
"agent" : {
  "type" : "metricbeat",
  "ephemeral_id" : "1956888d-7da0-469f-9a38-ab8b9ad52e07",
  "hostname" : "madsh01-I21350",
  "id" : "5b28d885-1389-4e32-a3a9-3c5e8f9063b0",
  "version" : "7.0.0"
},
"ecs" : {
  "version" : "1.0.0"
},
"host" : {
  "name" : "madsh01-I21350",
  "os" : {
    "kernel" : "6.1.7601.24408 (win7sp1_ldr_escrow.190320-1700)",
    "build" : "7601.24411",
    "platform" : "windows",
    "version" : "6.1",
    "family" : "windows",
    "name" : "Windows 7 Enterprise"
  },
  "id" : "254667db-4667-46f9-8cf5-0d52ccf2beb9",
  "hostname" : "madsh01-I21350",
  "architecture" : "x86_64"
}
}
```

An example of an error event when `mongodb` is not reachable is as follows:

```
{
  "@timestamp": "2019-04-02T11:53:08.056Z",
  "metricset": {
    "host": "localhost:27017",
    "rtt": 1003057,
    "module": "mongodb",
    "name": "status"
  },
"error": {
    "message": "no reachable servers"
  },
  "mongodb": {
    "status": {}
}
```

Along with the minimum fields (the basic structure of the event) that Metricbeat ships with, it ships fields related to the modules that are enabled. The complete list of fields it ships with per module can be obtained at https://www.elastic.co/guide/en/beats/metricbeat/current/exported-fields.html.

Configuring Metricbeat

The configurations related to Metricbeat are stored in a configuration file named `metricbeat.yml`, which uses YAML syntax.

The `metricbeat.yml` file contains the following:

- Module configuration
- General settings
- Output configuration
- Processor configuration
- Path configuration
- Dashboard configuration
- Logging configuration

Let's explore some of these sections.

Note

The location of the `metricbeat.yml` file will be present in the installation directory if `.zip` or `.tar` files are used for installation. If `.dep` or `.rpm` files are used for installation, then it will be present in the `/etc/metricbeat` location.

Module configuration

Metricbeat comes bundled with various modules to collect metrics from the system and applications, such as Apache, MongoDB, Redis, MySQL, and so on.

Metricbeat provides two ways of enabling modules and metricsets as follows:

- Enabling module configs in the `modules.d` directory
- Enabling module configs in the `metricbeat.yml` file

Enabling module configs in the modules.d directory

The `modules.d` directory contains default configurations for all the modules that are available in Metricbeat. The configuration that's specific to a module is stored in a `.yml` file, with the name of the file being the name of the module. For example, the configuration related to the MySQL module will be stored in the `mysql.yml` file. By default, except for the `system` module, all other modules are disabled. To list the modules that are available in Metricbeat, execute the following command:

```
metricbeat modules list
```

The `modules list` command displays all the available modules and also lists which modules are currently enabled/disabled.

Note

If a module is disabled, then in the `modules.d` directory, the configuration related to the module will be stored with the `.disabled` extension.

Since each module comes with default configurations, make the appropriate changes in the module configuration file.

The basic configuration for the `mongodb` module will look as follows:

```
- module: mongodb
  metricsets: ["dbstats", "status"]
  period: 10s
  hosts: ["localhost:27017"]
  username: user
  password: pass
```

To enable it, execute the `modules enable` command, passing one or more module names. For example:

```
metricbeat modules enable redis mongodb
```

Similar to disabling modules, execute the `modules disable` command, passing one or more module names to it. For example:

```
metricbeat modules disable redis mongodb
```

Note

To enable dynamic config reloading, set `reload.enabled` to true and specify a frequency with which to look for config file changes. Set the `reload.period` parameter under the `metricbeat.config.modules` property.

For example:

`#metricbeat.yml``metricbeat.config.modules:``path: ${path.config}/modules.d/*.yml``reload.enabled: true``reload.period: 20s`

Enabling module configs in the metricbeat.yml file

If you're used to using earlier versions of Metricbeat, you can enable the appropriate modules and metricsets in the `metricbeat.yml` file directly by adding entries to the `metricbeat.modules` list. Each entry in the list begins with a dash (`-`) and is followed by the settings for that module. For example:

```
metricbeat.modules:
#------------------ Memcached Module -----------------------------
- module: memcached
  metricsets: ["stats"]
  period: 10s
  hosts: ["localhost:11211"]

#------------------- MongoDB Module ------------------------------
- module: mongodb
  metricsets: ["dbstats", "status"]
  period: 5s
```

Note

It is possible to specify a module multiple times and specify a different period one or more metricsets should be used for. For example: `#------- Couchbase Module -----------------------------``- module: couchbase``metricsets: ["bucket"]``period: 15s``hosts: ["localhost:8091"]``- module: couchbase``metricsets: ["cluster", "node"]``period: 30s``hosts: ["localhost:8091"]`

General settings

This section contains configuration options and some general settings to control the behavior of Metricbeat.

Some of these configuration options/settings are as follows:

- `name` : The name of the shipper that publishes the network data. By default, the hostname is used for this field, as follows:

```
name: "dc1-host1"
```

- `tags` : A list of tags that will be included in the `tags` field of every event Metricbeat ships. Tags make it easy to group servers by different logical properties and are useful when filtering events in Kibana and Logstash, as follows:

```
tags: ["staging", "web-tier","dc1"]
```

- `max_procs` : The maximum number of CPUs that can be executing simultaneously. The default is the number of logical CPUs available in the system:

```
max_procs: 2
```

Output configuration

This section is all about configuring outputs where the events need to be shipped. Events can be sent to single or multiple outputs simultaneously. The allowed outputs are Elasticsearch, Logstash, Kafka, Redis, file, and console. Some outputs that can be configured are as follows:

- `elasticsearch` : This is used to send events directly to Elasticsearch. A sample Elasticsearch output configuration is shown in the following code snippet:

```
output.elasticsearch:
  enabled: true
  hosts: ["localhost:9200"]
```

Using the `enabled` setting, you can enable or disable the output. `hosts` accepts one or more Elasticsearch node/servers. Multiple hosts can be defined for failover purposes. When multiple hosts are configured, the events are distributed to these nodes in a round-robin order. If Elasticsearch is secure, then credentials can be passed using the `username` and `password` settings, as follows:

```
output.elasticsearch:
  enabled: true
  hosts: ["localhost:9200"]
  username: "elasticuser"
  password: "password"
```

To ship events to the Elasticsearch ingest node pipeline so that they can be preprocessed before being stored in Elasticsearch, pipeline information can be provided using the `pipleline` setting, as follows:

```
output.elasticsearch:
  enabled: true
  hosts: ["localhost:9200"]
  pipeline: "ngnix_log_pipeline"
```

The default index the data gets written to is in the `metricbeat-%{[beat.version]}-%{+yyyy.MM.dd}` format. This will create a new index every day. For example, if today is April 02, 2019, then all the events are placed in the `metricbeat-7.0.0-2019-04-02` index. You can override the index name or the pattern using the `index` setting. In the following configuration snippet, a new index is created for every month, as follows:

```
output.elasticsearch:
hosts: ["http://localhost:9200"]
  index: "metricbeat-%{[beat.version]}-%{+yyyy.MM}"
```

Using the `indices` setting, you can conditionally place the events in the appropriate index that matches the specified condition. In the following code snippet, if the message contains the `DEBUG` string, it will be placed in the `debug-%{+yyyy.MM.dd}` index. If the message contains the `ERR` string, it will be placed in the `error-%{+yyyy.MM.dd}` index. If the message contains neither of these strings, then those events will be pushed to the `logs-%{+yyyy.MM.dd}` index, as specified in the `index` parameter, as follows:

```
output.elasticsearch:
hosts: ["http://localhost:9200"]
  index: "logs-%{+yyyy.MM.dd}"indices:
-index: "debug-%{+yyyy.MM.dd}"
      when.contains:
message: "DEBUG"-index: "error-%{+yyyy.MM.dd}"
      when.contains:
message: "ERR"
```

Note

When the `index` parameter is overridden, disable templates and dashboards by adding the following settings:

`setup.dashboards.enabled: false``setup.template.enabled: false`

Alternatively, provide the values for `setup.template.name` and `setup.template.pattern` in the `metricbeat.yml` configuration file; otherwise, Metricbeat will fail to run.

- `logstash` : This is used to send events to Logstash.

Note

To use Logstash as output, Logstash needs to be configured with the Beats input plugin so it can receive incoming Beats events.

A sample Logstash output configuration is as follows:

```
output.logstash:
  enabled: true
  hosts: ["localhost:5044"]
```

Using the `enabled` setting, you can enable or disable the output. `hosts` accepts one or more Logstash servers. Multiple hosts can be defined for failover purposes. If the configured host is unresponsive, then the event will be sent to one of the other configured hosts. When multiple hosts are configured,events are distributed in a random order. To enable load-balancing events across the Logstash hosts, use the `loadbalance` flag, set to `true`, as follows:

```
output.logstash:
hosts: ["localhost:5045", "localhost:5046"]
```

```
  loadbalance: true
```

- `console`: This is used to send events to `stdout`. These events are written in JSON format. This is useful during debugging or testing.

A sample console configuration is as follows:

```
output.console:
  enabled: true
pretty: true
```

Logging

This section contains the options for configuring the Metricbeat logging output. The logging system can write logs to syslog or rotate log files. If logging is not explicitly configured, file output is used on Windows systems, and syslog output is used on Linux and OS X.

A sample configuration is as follows:

```
logging.level: debug
logging.to_files: true
logging.files:
 path: C:\logs\metricbeat
 name: metricbeat.log
 keepfiles: 10
```

Some of the available configuration options are as follows:

- `level`: To specify the logging level.
- `to_files`: To write all logging output to files. The files are subject to file rotation. This is the default value.
- `to_syslog`: To write logging output to syslogs if this setting is set to `true`.
- `files.path`, `files.name`, and `files.keepfiles`: These are used to specify the location of the file, the name of the file, and the number of recently rotated log files to keep on the disk.

Capturing system metrics

In order to monitor and capture metrics related to servers, Metricbeat provides the `system` module.
The `system` module provides the following metricsets to capture server metrics, as follows:

- `core`: This metricset provides usage statistics for each CPU core.
- `cpu`: This metricset provides CPU statistics.
- `diskio`: This metricset provides disk IO metrics collected from the operating system. One event is created for each disk mounted on the system.
- `filesystem`: This metricset provides filesystem statistics. For each file system, one event is created.
- `process`: This metricset provides process statistics. One event is created for each process.
- `process_summary`: This metricset collects high-level statistics about the running processes.
- `fsstat`: This metricset provides overall filesystem statistics.
- `load:` This metricset provides load statistics.
- `memory`: This metricset provides memory statistics.
- `network`: This metricset provides network IO metrics collected from the operating system. One event is created for each network interface.

- `socket`: This metricset reports an event for each new TCP socket that it sees. This metricset is available on Linux only and requires kernel 2.6.14 or newer.

Some of these metricsets provide configuration options for fine-tuning returned metrics. For example, the `cpu` metricset provides a `cpu.metrics` configuration to control the CPU metrics that are reported. However, metricsets such as `memory` and `diskio` don't provide any configuration options. Unlike other modules, which can be monitored from other servers by configuring the hosts appropriately (not a highly recommended approach), `system` modules are local to the server and can collect the metrics of underlying hosts.

Note

A complete list of fields per metricset that are exported by the `system` module can be found at https://www.elastic.co/guide/en/beats/metricbeat/current/exported-fields-system.html.

Running Metricbeat with the system module

Let's make use of Metricbeat and capture system metrics.

Make sure that Kibana 7.0 and Elasticsearch 7.0 are running:

1. Replace the content of `metricbeat.yml` with the following configuration and save the file:

```
############### Metricbeat Configuration Example ################
#============== Modules configuration =========================

metricbeat.config.modules:
  # Glob pattern for configuration loading
  path: ${path.config}/modules.d/*.yml

  # Set to true to enable config reloading
  reload.enabled: false

  # Period on which files under path should be checked for changes
  #reload.period: 10s

#=========== Elasticsearch template setting =================

setup.template.settings:
  index.number_of_shards: 1
  index.codec: best_compression
  #_source.enabled: false

#=================== General  Settings===============================
name: metricbeat_inst1

tags: ["system-metrics", "localhost"]

fields:
  env: test-env

#============================== Dashboards ===========================
setup.dashboards.enabled: true

#============================== Kibana Settings ===========================
setup.kibana:
  host: "localhost:5601"
  #username: "elastic"
  #password: "changeme"

#-------------------------- Elasticsearch output Settings ---------------------
output.elasticsearch:
  # Array of hosts to connect to.
  hosts: ["localhost:9200"]
  #username: "elastic"
  #password: "changeme"
```

Note

The `setup.dashboards.enabled: true` setting loads sample dashboards to the Kibana index during startup, which are loaded via the Kibana API. If Elasticsearch and Kibana are secured, make sure that you uncomment the `username` and `password` parameters and set the appropriate values.

2. By default, the `system` module is enabled. Make sure that it is enabled by executing the following command:

```
Windows:
E:\metricbeat-7.0.0-windows-x86_64>metricbeat.exe modules enable system
Module system is already enabled

Linux:
[locationOfMetricBeat]$./metricbeat modules enable system
Module system is already enabled
```

3. You can verify the metricsets that are enabled for the `system` module by opening the `system.yml` file, which can be found under the `modules.d` directory, as follows:

```
#system.yml
- module: system
  period: 10s
  metricsets:
    - cpu
    #- load
    - memory
    - network
    - process
    - process_summary
    #- socket_summary
    #- core
    #- diskio
    #- socket
  processes: ['.*']
  process.include_top_n:
    by_cpu: 5 # include top 5 processes by CPU
    by_memory: 5 # include top 5 processes by memory

- module: system
```

```
  period: 1m
  metricsets:
    - filesystem
    - fsstat
  processors:
  - drop_event.when.regexp:
      system.filesystem.mount_point: '^/(sys|cgroup|proc|dev|etc|host|lib)($|/)'
```

As seen in the preceding code, the configuration module is defined twice, with different periods to use for a set of metricsets. The `cpu`, `memory`, `network`, `process`, `process_summary`, `filesystem`, and `fsstats` metricsets are enabled.

4. Start Metricbeat by executing the following command:

```
Windows:
E:\metricbeat-7.0.0-windows-x86_64>metricbeat.exe -e



Linux:
[locationOfMetricBeat]$./metricbeat -e
```

Once Metricbeat is started, it loads sample Kibana dashboards and starts shipping metrics to Elasticsearch. To validate this, execute the following command:

```
curl -X GET 'http://localhost:9200/_cat/indices?v=&format=json'

Sample Response:
[
    {
        "health": "yellow",
        "status": "open",
        "index": "metricbeat-7.0.0-2019.04.02",
        "uuid": "w2WoP2IhQ9eG7vSU_HmgnA",
        "pri": "1",
        "rep": "1",
        "docs.count": "29",
        "docs.deleted": "0",
        "store.size": "45.3kb",
        "pri.store.size": "45.3kb"
    },
    {
        "health": "yellow",
        "status": "open",
        "index": ".kibana",
        "uuid": "sSzeYu-YTtWR8vr2nzKrbg",
        "pri": "1",
        "rep": "1",
        "docs.count": "108",
        "docs.deleted": "59",
        "store.size": "289.3kb",
        "pri.store.size": "289.3kb"
    }
]
```

```
curl -X GET 'http://localhost:9200/_cat/indices?v'

health status index uuid pri rep docs.count docs.deleted store.size pri.store.size
yellow open metricbeat-7.0.0-2019.04.02 w2WoP2IhQ9eG7vSU_HmgnA 1 1 29 0 45.3kb 45.3kb
yellow open .kibana sSzeYu-YTtWR8vr2nzKrbg 1 1 108 59 289.3kb 289.3kb
```

Specifying aliases

Elasticsearch allows the user to create an alias---a virtual index name that can be used to refer to an index or multiple indices.The Elasticsearch index API aliases an index with a name. This enables all the APIs to automatically convert their alias names into the actual index name.

Say, for example, that we want to query against a set of similar indexes. Rather than specifying each of the index names in the query, we can make use of aliases and execute the query against the alias. The alias will internally point to all the indexes and perform a query against them. This will be highly beneficial if we added certain indexes dynamically on a regular basis, so that one application/user performing the query need not worry about including those indexes in the query as long as the index is updated with the alias (which can be done manually by an admin or specified during index creation).

Let's say the IT admin creates an alias pointing to all the indexes containing the metrics for a specific month. For example, as shown in the following code snippet, an alias called `april_04_metrics` is created for all the indexes of the `metricbeat-7.0.0-2019.04.*` pattern, that is, those Metricbeats indexes that are created on a daily basis in the month of April 2019:

```
curl -X POST   http://localhost:9200/_aliases  -H 'content-type: application/json' -d
'
{
 "actions":
 [
   {"add":{ "index" : "metricbeat-7.0.0-2019.04.*", "alias": "april_04_metrics"} }
   ]
}'
```

Now, using the `april_04_metrics` alias name, the query can be executed against all the indexes of the`metricbeat-7.0.0-2019.04.*` pattern as follows:

```
curl -X GET http://localhost:9200/april_04_metrics/_search
```

In the following example, the `sales` alias is created against the `it_sales` and `retail_sales` indexes. In the future, if a new sales index gets created, then that index can also point to the `sales` index so that the end user/application can always make use of the `sales` endpoint to query all sales data, as follows:

```
curl -X POST   http://localhost:9200/_aliases -d '{
"actions":[
    {"add":{"index":"it_sales","alias":"sales"}},
    {"add":{"index":"retail_sales","alias":"sales"}}
]}
```

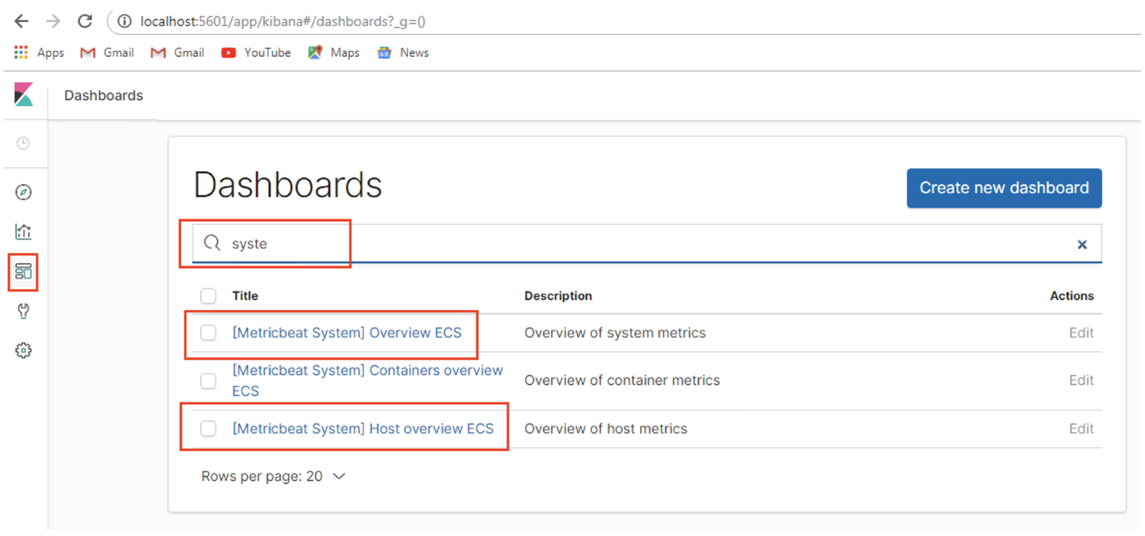
To remove an alias from an index, use the `remove` action of the aliases API, as follows:

```
curl -X POST   http://localhost:9200/_aliases -d '
{"actions":[{"remove":{"index":"retail_sales","alias":"sales"}}]}
```

Visualizing system metrics using Kibana

To visualize the system metrics using Kibana, execute the following steps:

1. Navigate to `http://localhost:5601` and open up Kibana.
2. Click on the `Dashboard` link found in the left navigation menu and select either `[Metricbeat System] Overview ECS` or `[Metricbeat System] Host Overview ECS` from the dashboard, as shown in the following screenshot:



localhost:5601/app/kibana#/dashboards?_g=()

Dashboards

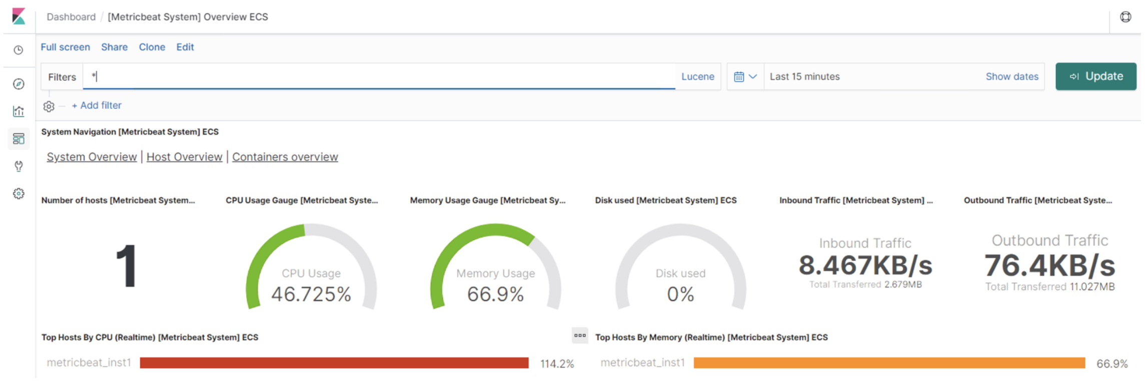
Create new dashboard

syste

Title	Description	Actions
[Metricbeat System] Overview ECS	Overview of system metrics	Edit
[Metricbeat System] Containers overview ECS	Overview of container metrics	Edit
[Metricbeat System] Host overview ECS	Overview of host metrics	Edit

Rows per page: 20

[Metricbeat System] Overview Dashboard ECS: This dashboard provides an overview of all the systems that are being monitored. Since we are monitoring only a single host, we see that the **Number of hosts** is **1**, as shown in the following screenshot:



Dashboard / [Metricbeat System] Overview ECS

Full screen Share Clone Edit

Filters *

Lucene Last 15 minutes Show dates Update

+ Add filter

System Navigation [Metricbeat System] ECS

System Overview | Host Overview | Containers overview

Number of hosts [Metricbeat System...	CPU Usage Gauge [Metricbeat Syste...	Memory Usage Gauge [Metricbeat Sy...	Disk used [Metricbeat System] ECS	Inbound Traffic [Metricbeat System] ...	Outbound Traffic [Metricbeat Syste...
1	CPU Usage 46.725%	Memory Usage 66.9%	Disk used 0%	Inbound Traffic 8.467KB/s Total Transferred 2.679MB	Outbound Traffic 76.4KB/s Total Transferred 11.027MB

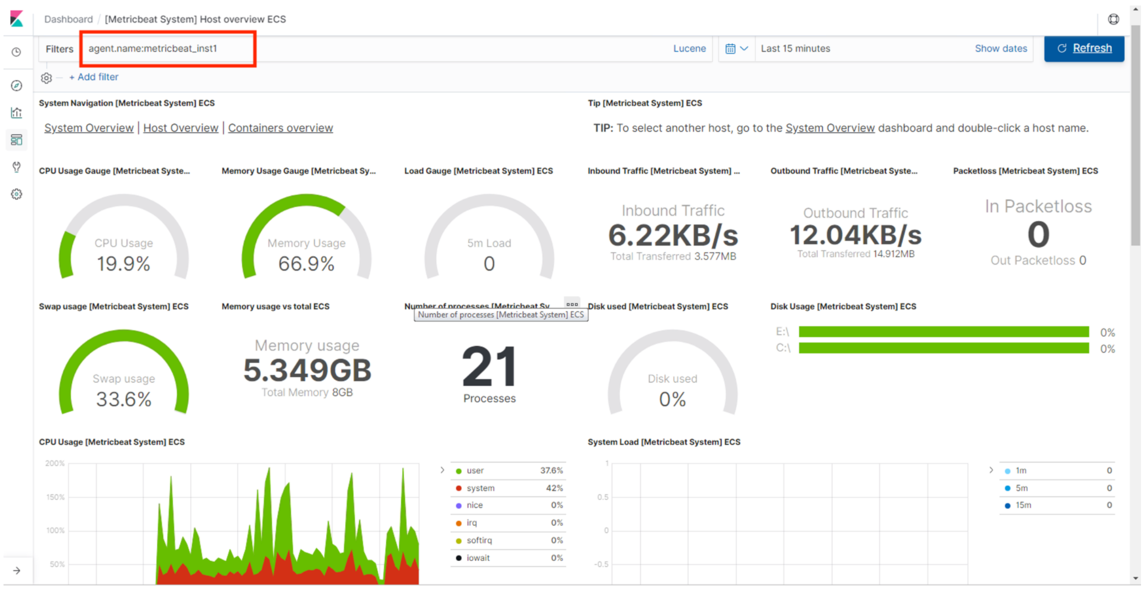
Top Hosts By CPU (Realtime) [Metricbeat System] ECS

metricbeat_inst1 114.2%

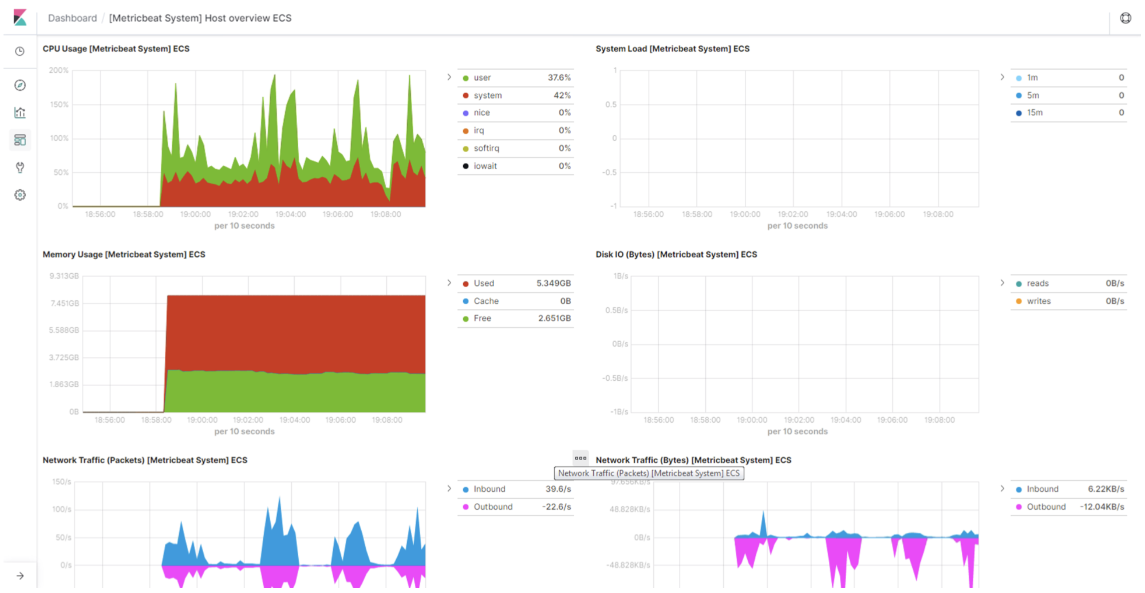
Top Hosts By Memory (Realtime) [Metricbeat System] ECS

metricbeat_inst1 66.9%

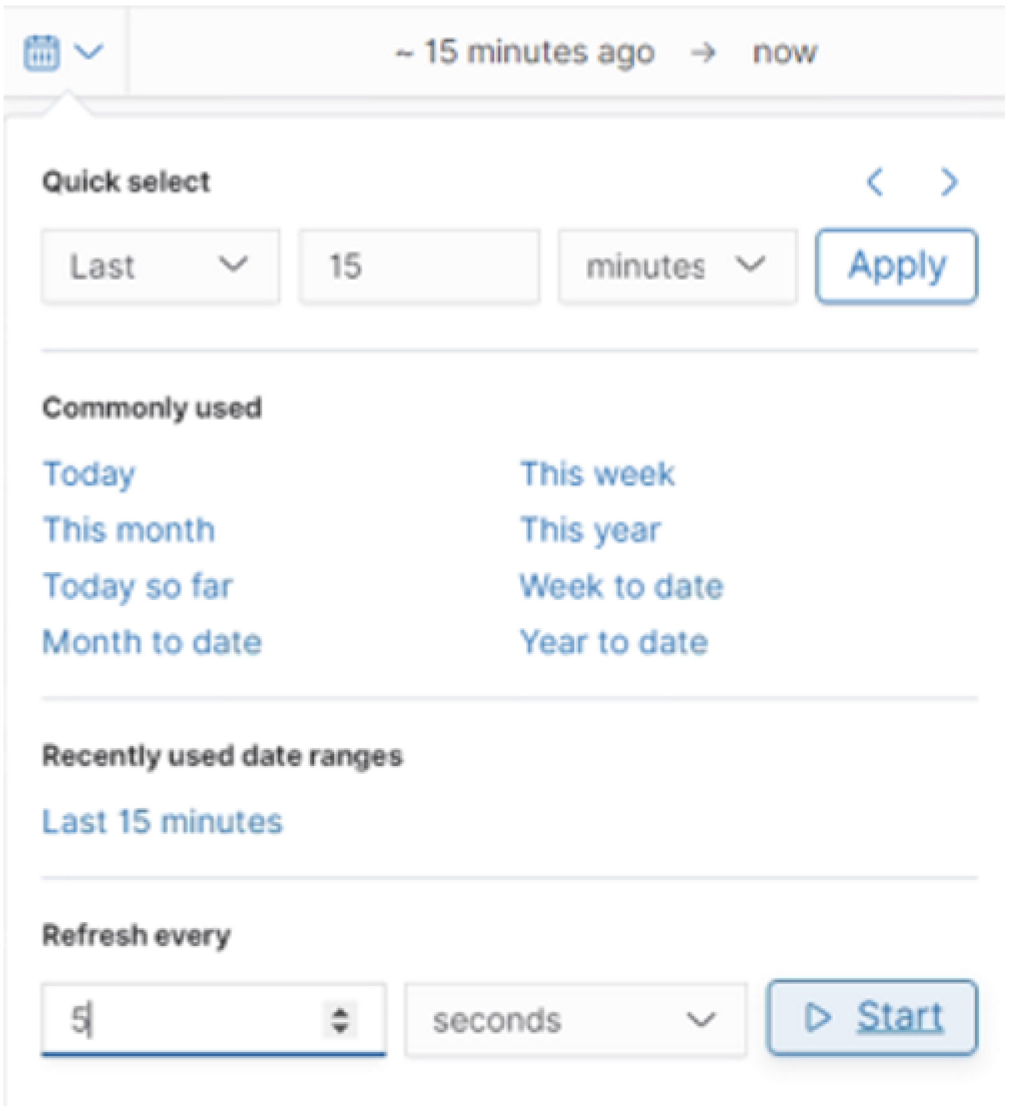
Metricbeat Host Overview Dashboard: This dashboard is useful for finding the detailed metrics of individual systems/hosts. In order to filter metrics based on a particular host, enter the search/filter criterion in the search/query bar. In the following screenshot, the filter criterion is **agent.name:metricbeat_inst1**. Any attribute that uniquely identifies a system/host can be used; for example, you can filter based on**host.hostname**, as follows:


Dashboard / [Metricbeat System] Host overview ECS
Filters
agent.name:metricbeat_inst1
Lucene
Last 15 minutes
Show dates
Refresh
+ Add filter
System Navigation [Metricbeat System] ECS
System Overview | Host Overview | Containers overview
Tip [Metricbeat System] ECS
TIP: To select another host, go to the System Overview dashboard and double-click a host name.
CPU Usage 19.9%
Memory Usage 66.9%
5m Load 0
Inbound Traffic 6.22KB/s Total Transferred 3.577MB
Outbound Traffic 12.04KB/s Total Transferred 14.912MB
In Packetloss 0 Out Packetloss 0
Swap usage 33.6%
Memory usage 5.349GB Total Memory 8GB
21 Processes
Disk used 0%
E:\ 0%
C:\ 0%
CPU Usage [Metricbeat System] ECS
System Load [Metricbeat System] ECS
user 37.6%
system 42%
nice 0%
irq 0%
softirq 0%
iowait 0%
1m 0
5m 0
15m 0

Since the `diskio` and `load` metricsets were disabled in the system module configuration, we will see empty visualizations for the **Disk IO** and **System Load** visualizations, as shown in the following screenshot:


Dashboard / [Metricbeat System] Host overview ECS
CPU Usage [Metricbeat System] ECS
System Load [Metricbeat System] ECS
user 37.6%
system 42%
nice 0%
irq 0%
softirq 0%
iowait 0%
1m 0
5m 0
15m 0
Memory Usage [Metricbeat System] ECS
Used 5.349GB
Cache 0B
Free 2.651GB
Disk IO (Bytes) [Metricbeat System] ECS
reads 0B/s
writes 0B/s
Network Traffic (Packets) [Metricbeat System] ECS
Inbound 39.6/s
Outbound -22.6/s
Network Traffic (Bytes) [Metricbeat System] ECS
Inbound 6.22KB/s
Outbound -12.04KB/s
per 10 seconds

To see the dashboard refresh in real time, in the top right corner select the time and enter the appropriate refresh interval. Then, click the `Start` button as shown in the following screenshot:



Summary

In this lab, we covered another Beat library called Metricbeat in detail. We covered how to install and configure Metricbeat so that it can send operational metrics to Elasticsearch. We also covered the various deployment architectures for building real-time monitoring solutions using Elasticsearch Stack in order to monitor servers and applications. This helps IT administrators and application support personnel gain insights into the behavior of applications and servers, and allows them to respond in a timely manner in the event of an infrastructure outage.