InfluxDB & Grafana

InfluxDB

InfluxDB is a time series database written in Google's programming language "Go" that is optimised for storing and retrieving time series data in fields like operations monitoring, application metrics, Internet of Things sensor data, and real-time analytics, it is also open-source and can be used free of charge.

By indexing tags and leaving fields unindexed, it navigates the developer in the right direction for good database performance. It's versatile in that it supports a wide range of data types and allows the user to create multiple fields and tags. A purpose-built time series database, such as InfluxDB, is the best solution for working with time series data because of all these factors.

InfluxDB data can be written in a variety of ways. For both reading and writing data to the database, you can use the command line interface provided, the client libraries for your language, or the REST API made available. You can also use this API to create and delete databases and tables.

InfluxDB Basic Concepts:

1. **Measurement: I**n relational databases, a measurement is roughly equivalent to the concept of a table. A measurement is a container for data, and a database can contain multiple measurements. A measurement is made up of three types of columns. Tags, Fields, and Time.

2. **Time:** A time is nothing more than a column that tracks timestamps to perform time series operations more efficiently. The default is InfluxDB time, which is measured in nanoseconds; however, event time can be used instead.

3. **Tags:** A tag is like an indexed column. Remember that relational operations like WHERE, GROUP BY, and so on can only be performed on a column if it is marked as a Tag.

4. **Fields:** Fields are columns that can be used to perform mathematical operations such as sum, mean, non-negative derivative, and so on. String values can now also be stored as a field in recent versions.

5. **Series:** The most important concept in InfluxDB is a series. A series is made up of tags, metrics, and retention policies (default of InfluxDB). The number of unique series in an InfluxDB database is directly proportional to the cardinality of tags multiplied by the number of measurements multiplied by the retention policy.

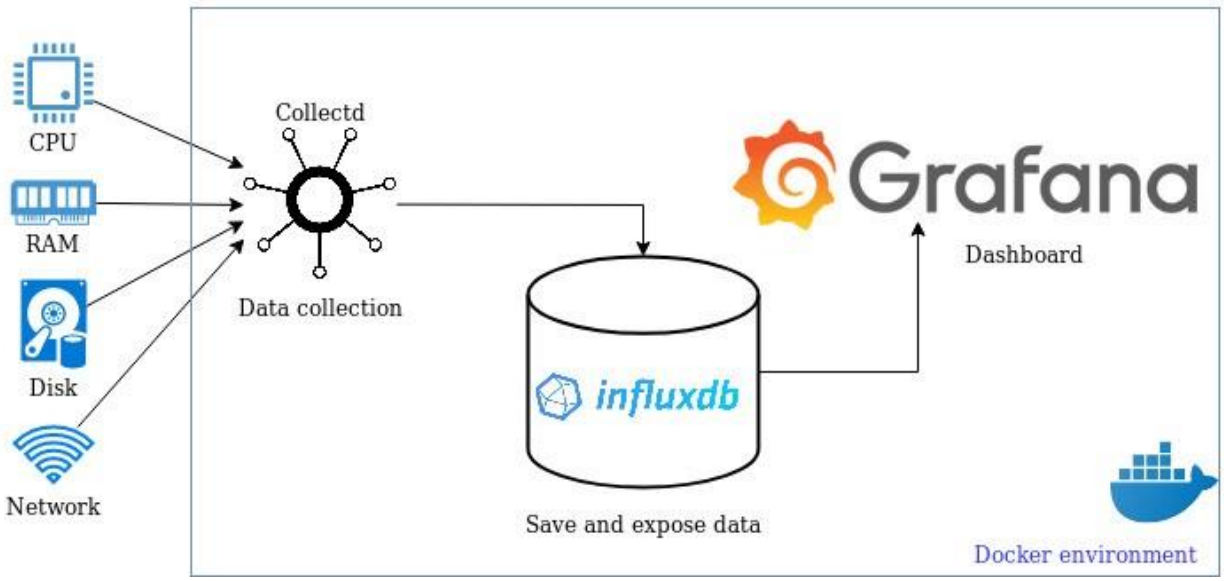
Grafana

Grafana is a visualisation and analytics software that is free and open source. It allows you to query, visualise, alert on, and explore your metrics from any location. It gives you the tools to make beautiful graphs and visualisations out of your time-series database (TSDB) data. Grafana integrates with a wide range of data sources, including Graphite, Prometheus, Influx DB, ElasticSearch, MySQL, PostgreSQL, and others.

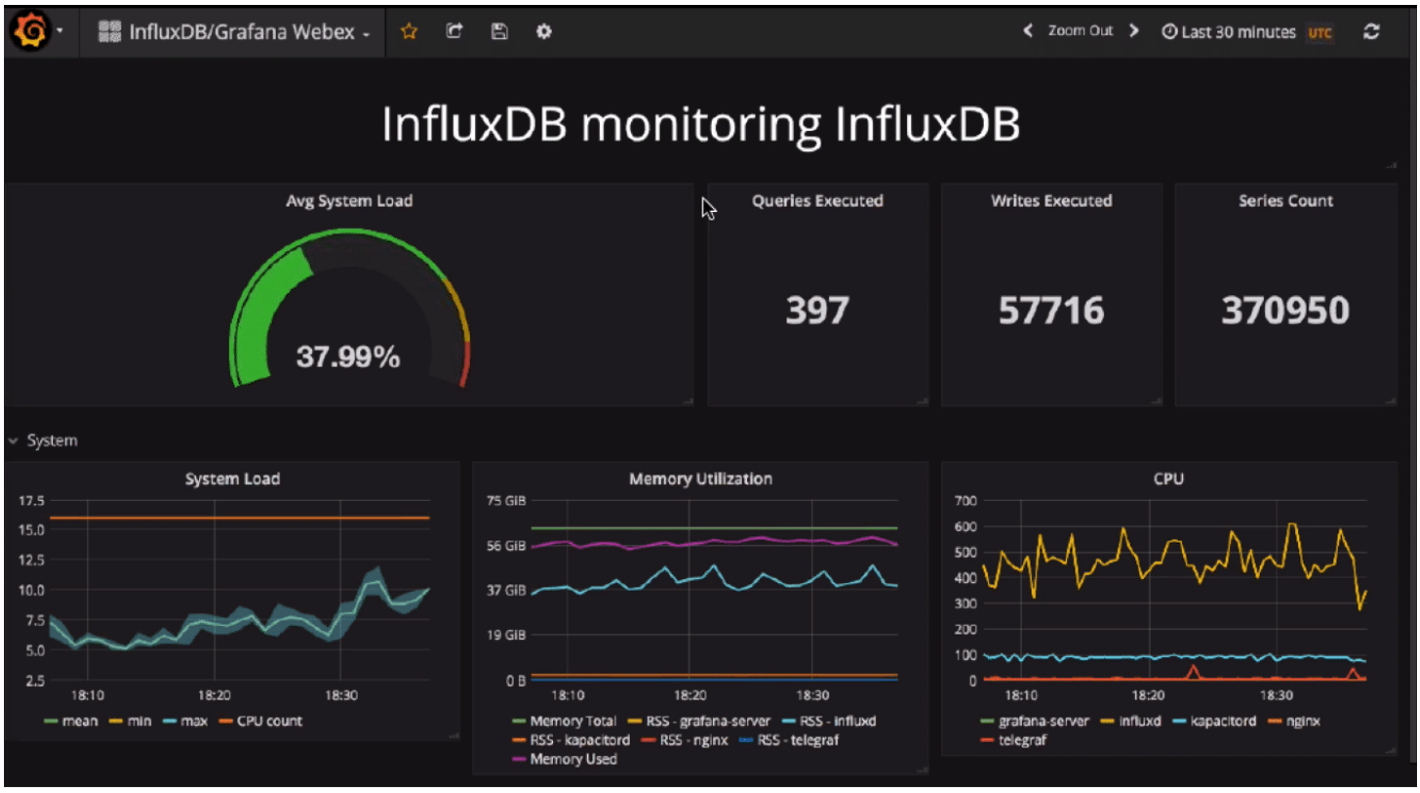
The dashboards include a wide range of visualisation options, including geo maps, heat maps, histograms, and all the charts and graphs that a business might need to analyse data. On the grid of a dashboard, there are several different individual panels. Each panel has its own set of functionalities.

It provides relative data that allows us to track user behaviour, application behaviour, the frequency of errors occurring in production or a pre-production environment, the type of errors occurring, and the contextual scenarios.

How InfluxDB and Grafana work together



After the data has been saved, various tools such as Grafana, Chronograph, and others can be used to create visualisations. The following is an example of a visualisation.



References:

Ashrafur Rahman. 2021. Beginning visualization with GRAFANA and INFLUXDB | by Ashrafur Rahman | Medium. [ONLINE] Available at: https://ashrafur.medium.com/beginning-visualization-with-grafana-and-influxdb-81701e10569d

Cristian Perez. 2021. System monitoring with Grafana, InfluxDB et Collectd | by Cristian Perez | Medium. [ONLINE] Available at: https://medium.com/@cristianpb/system-monitoring-with-grafana-influxdb-et-collectd-7827969e1fe.

Grafana Labs. 2021. Getting started | Grafana Labs . [ONLINE] Available at: https://grafana.com/docs/grafana/latest/getting-started/

Grafana Labs. 2021. Grafana Tutorial: Simple Synthetic Monitoring for Applications | Grafana Labs . [ONLINE] Available at: https://grafana.com/blog/2019/06/18/grafana-tutorial-simple-synthetic-monitoring-for-applications/

InfluxData. 2021. How to Build Grafana Dashboards with InfluxDB, Flux & InfluxQL. [ONLINE] Available at: https://www.influxdata.com/blog/how-grafana-dashboard-influxdb-flux-influxql/

InfluxDB - Grafana Documentation. 2021. InfluxDB - Grafana Documentation. [ONLINE] Available at: https://docs.huihoo.com/grafana/2.6/datasources/influxdb/index.html.

Logz.io. 2021. InfluxDB vs. Elasticsearch for Time Series Analysis | Logz.io. [ONLINE] Available at: https://logz.io/blog/influxdb-vs-elasticsearch/

Opensource.com. 2021. 10 Grafana features you need to know for effective monitoring | Opensource.com. [ONLINE] Available at: https://opensource.com/article/20/2/grafana-features

vibhor nigam. 2021. Processing Time Series Data in Real-Time with InfluxDB and Structured Streaming | by vibhor nigam | Analytics Vidhya | Medium. [ONLINE] Available at: https://medium.com/analytics-vidhya/processing-time-series-data-in-real-time-with-influxdb-and-structured-streaming-d1864154cf8b

8bitmen.com. 2021. What is Grafana? Why Use It? Everything You Should Know About It - 8bitmen.com. [ONLINE] Available at: https://www.8bitmen.com/what-is-grafana-why-use-it-everything-you-should-know-about-it/

8bitmen.com. 2021. What is Grafana? Why Use It? Everything You Should Know About It - 8bitmen.com. [ONLINE] Available at: https://www.8bitmen.com/what-is-grafana-why-use-it-everything-you-should-know-about-it/#:~:text=Grafana%20connects%20with%20every%20possible,with%20several%20different%20data%20sources.