



TELEGRAF INSTALLATION

CAN 7.0



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REVISION HISTORY

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Telegraf Installation

1. TELEGRAF

1.1 Introduction

Telegraf is an open-source server agent that uses a plugin architecture to create maximum flexibility for data collection on sensors, IoT, and other edge computing devices. Telegraf comes as a single binary, which means that install a single package to use it. There are no dependencies. Despite its relatively small size and single binary status, Telegraf is feature rich and provides a lot of functionality right out of the gate.

Collect and store all kinds of data.

Four Types of Telegraf plugins: -

These are four basic plugin types: Input, Output, Processor, and Aggregator.

1. **Input:** Telegraf Input Plugins collect metrics from the system, services, and third party APIs.
2. **Process:** Processor Plugins transform, decorate, and filter metrics before they are sent, allowing your data to be sanitized as it arrives.
3. **Aggregate:** Aggregator Plugins create aggregate metrics. For example, the average mean, minimum, and maximum from the metrics you have collected, and processed.
4. **Output:** Output Plugins write to a variety of data stores, services, & message queues, like InfluxDB, Graphite, OpenTSDB, Datadog, Kafka, MQTT, NSQ, and others.

Telegraf also has output plugins to send metrics to a variety of other datastores, services, and message queues, including InfluxDB, Graphite, OpenTSDB, Datadog, Librato, Kafka, MQTT, NSQ, and many others.

1.2. Installation (RHEL)

As of this document, there is no official repository for RHEL 8. We use InfluxData repository for RHEL 7, which functions well.

```
$sudo yum -y update

$cat <<EOF | sudo tee /etc/yum.repos.d/influxdb.repo [influxdb] name = InfluxDB Repository -
RHEL baseurl = https://repos.influxdata.com/rhel/8/x86_64/stable/ enabled = 1 gpgcheck = 0
gpgkey = https://repos.influxdata.com/influxdb.key
EOF

$sudo yum -y install telegraf

$sudo systemctl enable --now telegraf

$sudo systemctl status telegraf
```

```
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$ sudo systemctl status telegraf
● telegraf.service - Telegraf
   Loaded: loaded (/usr/lib/systemd/system/telegraf.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2023-08-03 02:30:30 UTC; 56min ago
     Docs: https://github.com/influxdata/telegraf
   Main PID: 1222 (telegraf)
      Tasks: 14 (limit: 99752)
     Memory: 193.9M
    CGroup: /system.slice/telegraf.service
            └─1222 /usr/bin/telegraf -config /etc/telegraf/telegraf.conf -config-directory /etc/telegraf/telegraf.d

Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Available plugins: 237 inputs, 9 aggregators, 20
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded inputs: cpu disk diskio kernel mem proces
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded aggregators:
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded processors:
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded secretstores:
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded outputs: influxdb
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Tags enabled: host=ip-172-31-23-138.ap-south-1.c
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! [agent] Config: Interval:10s, Quiet:false, Hostn
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! [agent] Config: Interval:10s, Quiet:false, Hostn
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! [agent] Config: Interval:10s, Quiet:false, Hostn
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! [agent] Config: Interval:10s, Quiet:false, Hostn
[ec2-user@ip-172-31-23-138 ~]$
```

1.3. Telegraf Configuration

All the Telegraf configuration are done in the telegraf.conf file, which is present under the folder /etc/telegraf/.

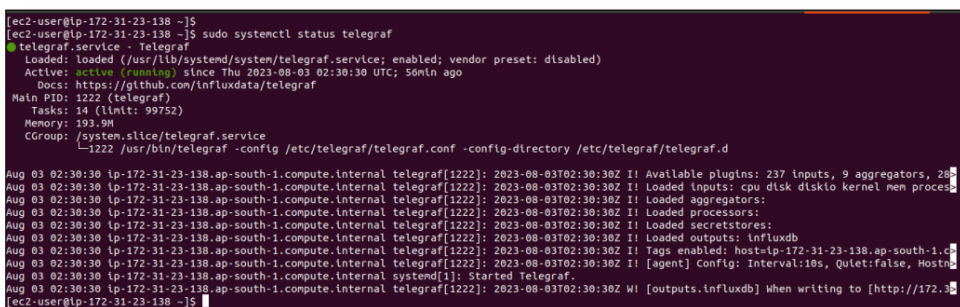
Input Plugins Configuration:

```
$vi /etc/telegraf/telegraf.conf
# Read metrics about cpu usage
[[inputs.cpu]]
  ## Whether to report per-cpu stats or not
  percpu = true
  ## Whether to report total system cpu stats or not
  totalcpu = true
  ## If true, collect raw CPU time metrics
  collect_cpu_time = false
  ## If true, compute and report the sum of all non-idle CPU states
  report_active = false
  ## If true and the info is available then add core_id and physical_id tags
  core_tags = false
```

Multiple plugin options available like memory, diskio etc. which can be enabled and loaded to Telegraf configuration.

Once all the input plugins are loaded, Telegraf must be restated using the command below.

```
$ sudo systemctl restart telegraf
$ sudo systemctl status telegraf
```



```
ec2-user@ip-172-31-23-138 ~]$
ec2-user@ip-172-31-23-138 ~]$ sudo systemctl status telegraf
● telegraf.service - Telegraf
   Loaded: loaded (/usr/lib/systemd/system/telegraf.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2023-08-03 02:30:30 UTC; 56min ago
     Docs: https://github.com/influxdata/telegraf
   Main PID: 1222 (telegraf)
      Tasks: 14 (limit: 99752)
     Memory: 193.9M
    CGroup: /system.slice/telegraf.service
            └─1222 /usr/bin/telegraf -config /etc/telegraf/telegraf.conf -config-directory /etc/telegraf/telegraf.d

Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Available plugins: 237 inputs, 9 aggregators, 28
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded inputs: cpu disk diskio kernel mem proces
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded aggregators:
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded processors:
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded secretstores:
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Loaded outputs: influxdb
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Tags enabled: host=ip-172-31-23-138.ap-south-1.c
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! [agent] Config: Interval:10s, Quiet:false, Hostn
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z I! Started Telegraf.
Aug 03 02:30:30 ip-172-31-23-138.ap-south-1.compute.internal telegraf[1222]: 2023-08-03T02:30:30Z W! [outputs.influxdb] When writing to [http://172.3
ec2-user@ip-172-31-23-138 ~]$
```

2. INFLUXDB

2.1 Introduction

InfluxDB is an open-source, high-performance time-series database designed to handle time-sensitive data and metrics. It is optimized for storing, querying, and visualizing time-stamped data, making it an ideal solution for applications that require real-time monitoring, analytics, and data-driven decision-making. With its flexible data model, powerful query language, and scalability, InfluxDB has become a popular choice for developers and organizations seeking efficient time-series data storage and analysis solutions.

2.2 Installation

```
$cat <<EOF | sudo tee /etc/yum.repos.d/influxdb.repo [influxdb] name = InfluxDB
Repository - RHEL \${releasever} baseurl =
https://repos.influxdata.com/rhel/\${releasever}/\${basearch}/stable enabled = 1 gpgcheck = 1
gpgkey = https://repos.influxdata.com/influxdb.key EOF

$sudo dnf makecache

$sudo dnf -y install influxdb

$sudo systemctl enable --now influxd

$sudo systemctl status influxdb

$sudo firewall-cmd --add-port=8086/tcp --permanent
$sudo firewall-cmd --reload

$sudo systemctl restart influxdb
```

Configure InfluxDB http Authentication

```
$ sudo vi /etc/influxdb/influxdb.conf

[http]

auth-enabled = true

$sudo systemctl restart influxdb

$curl -X POST "http://localhost:8086/query" --data-urlencode "q=CREATE USER \
username WITH PASSWORD 'strongpassword' WITH ALL PRIVILEGES"
```

Replace:

- **username** with your own username
- **strongpassword** with your own password (**Note: password requires single quotes**)

```
$influx -username 'username' -password 'password'

$curl -G http://localhost:8086/query -u username:password --data-urlencode "q=SHOW
DATABASES"
```

```
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$ curl -G http://localhost:8086/query -u telegraf:telegraf --data-urlencode "q=SHOW DATABASES"
{"results":[{"statement_id":0,"series":[{"name":"databases","columns":["name"],"values":[["telegraf"],["_internal"]]]}]}]
[ec2-user@ip-172-31-23-138 ~]$
```

```
$sudo systemctl status influxdb
```

```

[ec2-user@ip-172-31-23-138 ~]$ sudo systemctl status influxd
● influxd.service - InfluxDB is an open-source, distributed, time series database
   Loaded: loaded (/usr/lib/systemd/system/influxd.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2023-08-03 02:30:31 UTC; 57min ago
     Docs: https://docs.influxdata.com/influxdb/
   Process: 1213 ExecStart=/usr/lib/influxdb/scripts/influxd-systemd-start.sh (code=exited, status=0/SUCCESS)
  Main PID: 1235 (influxd)
    Tasks: 20 (limit: 99752)
   Memory: 173.6M
    CGroup: /system.slice/influxd.service
           └─1235 /usr/bin/influxd -config /etc/influxdb/influxdb.conf

Aug 03 03:26:01 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:26:01 +0000]
Aug 03 03:26:11 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:26:11 +0000]
Aug 03 03:26:21 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:26:21 +0000]
Aug 03 03:26:31 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:26:31 +0000]
Aug 03 03:26:41 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:26:41 +0000]
Aug 03 03:26:51 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:26:51 +0000]
Aug 03 03:27:01 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:27:01 +0000]
Aug 03 03:27:11 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:27:11 +0000]
Aug 03 03:27:21 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:27:21 +0000]
Aug 03 03:27:31 ip-172-31-23-138.ap-south-1.compute.internal influxd-systemd-start.sh[1213]: [httpd] 172.31.23.138 - - [03/Aug/2023:03:27:31 +0000]
[ec2-user@ip-172-31-23-138 ~]$
[ec2-user@ip-172-31-23-138 ~]$

```

2.3 InfluxDB Configuration

Configuring Influxdb in Telegraf configuration file for loading the data from server to Influxdb. Multiple output plugin options available. We are using influxdb output plugin as influxdb is widely used and default database for telegraf.

```

$ sudo vi /etc/telegraf/telegraf.conf

[[outputs.influxdb]]
  urls = ["http://127.0.0.1:8086"]
  database = "telegraf"

```

Specify the IP address and port number of the server on which the influx dB is running. Below is the screenshot of configuration for reference.

```

# # Configuration for sending metrics to InfluxDB
[[outputs.influxdb]]
#   ## The full HTTP or UDP URL for your InfluxDB instance.
#   ##
#   ## Multiple URLs can be specified for a single cluster, only ONE of the
#   ## urls will be written to each interval.
#   # urls = ["unix:///var/run/influxdb.sock"]
#   # urls = ["udp://127.0.0.1:8089"]
#   urls = ["http://172.31.23.138:8086"]
#
#   ## The target database for metrics; will be created as needed.
#   ## For UDP url endpoint database needs to be configured on server side.
#   database = "telegraf"
#
#   ## The value of this tag will be used to determine the database. If this
#   ## tag is not set the 'database' option is used as the default.
#   # database_tag = ""
#
#   ## If true, the 'database_tag' will not be included in the written metric.
#   # exclude_database_tag = false
#
#   ## If true, no CREATE DATABASE queries will be sent. Set to true when using
#   ## Telegraf with a user without permissions to create databases or when the
#   ## database already exists.
#   # skip_database_creation = false
#

```

After making the changes, restart the telegraf using the below command.

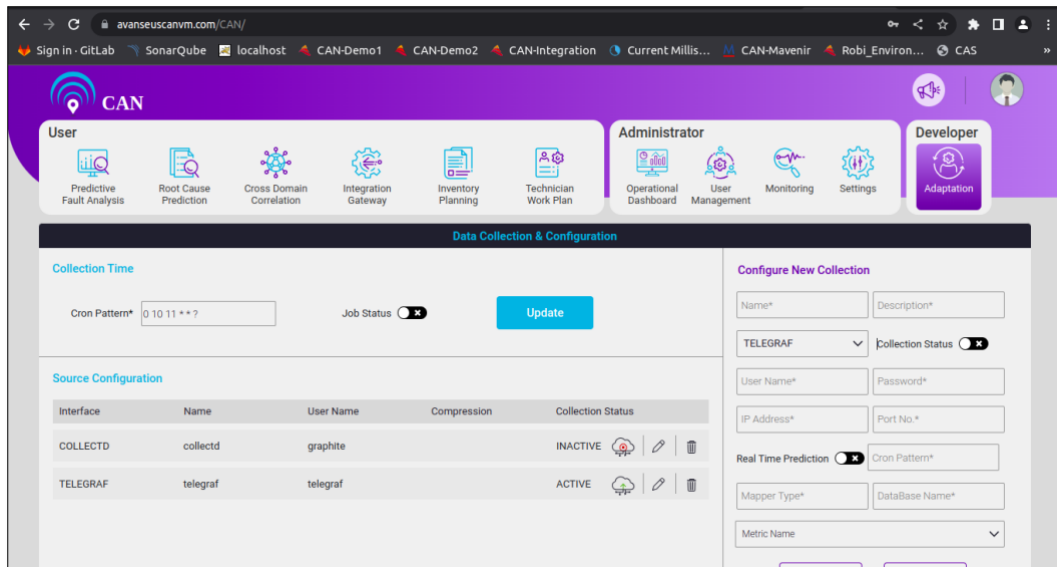
```

$ sudo systemctl restart telegraf
$ sudo systemctl status telegraf

```

3. Configuration in CAN module

In CAN module, under Data Collection and Configuration tab, configure the collectd to collect the data. Below is the screenshot for reference.



With appropriate details, CAN module can start collecting the data, start the Realtime streaming (Anomaly detection), and breach prediction activities.

References

- https://computingforgeeks.com/install-and-configure-telegraf-on-rhel-centos/?expand_article=1
- https://computingforgeeks.com/how-to-install-influxdb-on-rhel-8-centos-8/?expand_article=1&expand_article=1
- <https://github.com/influxdata/telegraf#input-plugins>