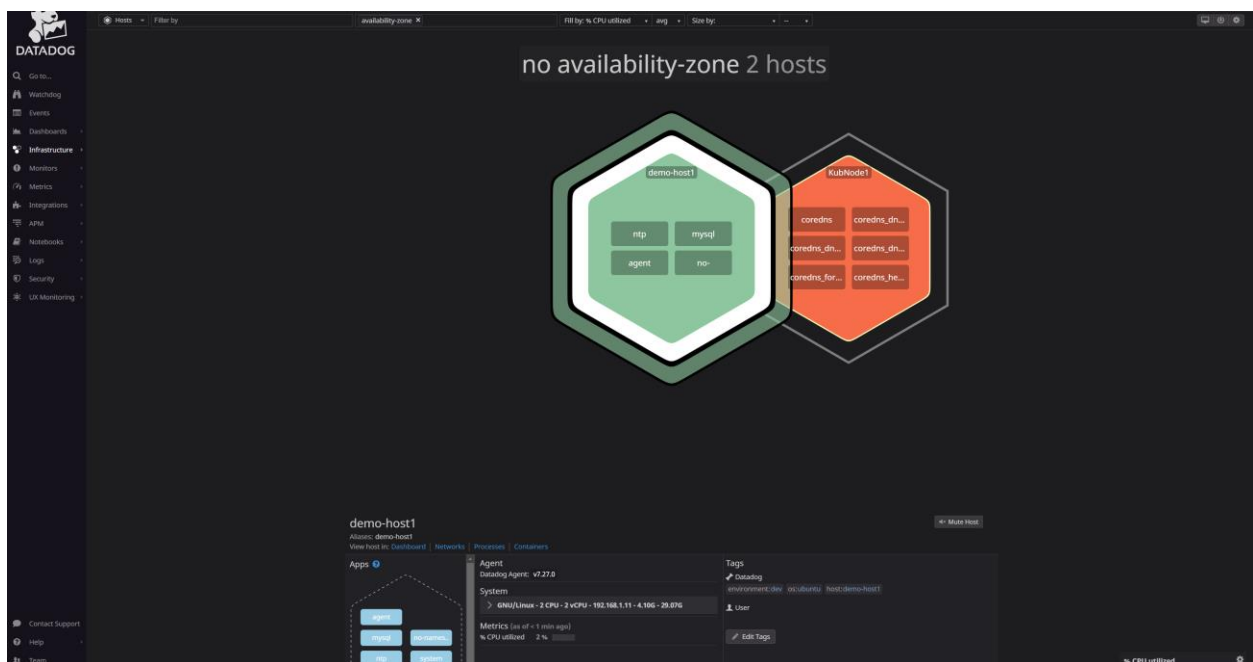


## Collecting Metrics:

Adding Tags to host:

```
tags: ["environment:dev", "os:ubuntu"]

## @param env - string - optional
## The environment name where the agent is running. Attached in-app to every
## metric, event, log, trace, and service check emitted by this Agent.
##
# env: <environment name>
```



## MySQL Integration and Log Collection

```
@code:~$ mysql -u datadog --password= -e "show status" | \
> grep Uptime && echo -e "\033[0;32mMySQL user - OK\033[0m" || \
> echo -e "\033[0;31mCannot connect to MySQL\033[0m"
mysql: [Warning] Using a password on the command line interface can be insecure.
Uptime 948
Uptime_since_flush_status 948
MySQL user - OK
@code:~$
```

## Mysql integration config with error log collection

```
@code: /etc/datadog-agent/conf.d/mysql.d

instances:
  - server: 127.0.0.1
    user: datadog
    pass: "12345678"
    port: "3306"
    options:
      replication: false
      galera_cluster: true
      extra_status_metrics: true
      extra_innodb_metrics: true
      extra_performance_metrics: true
      schema_size_metrics: false
      disable_innodb_metrics: false
logs:
  - type: file
    path: /var/log/mysql/mysql_error.log
    source: mysql
    service: test-mysqldb
(END)
```

## Enable Logging in the agent config

```
@code: /etc/datadog-agent/conf.d

## The name of your context (optional SNMP v3-only parameter).
#
# context_name: <CONTEXT_NAME>

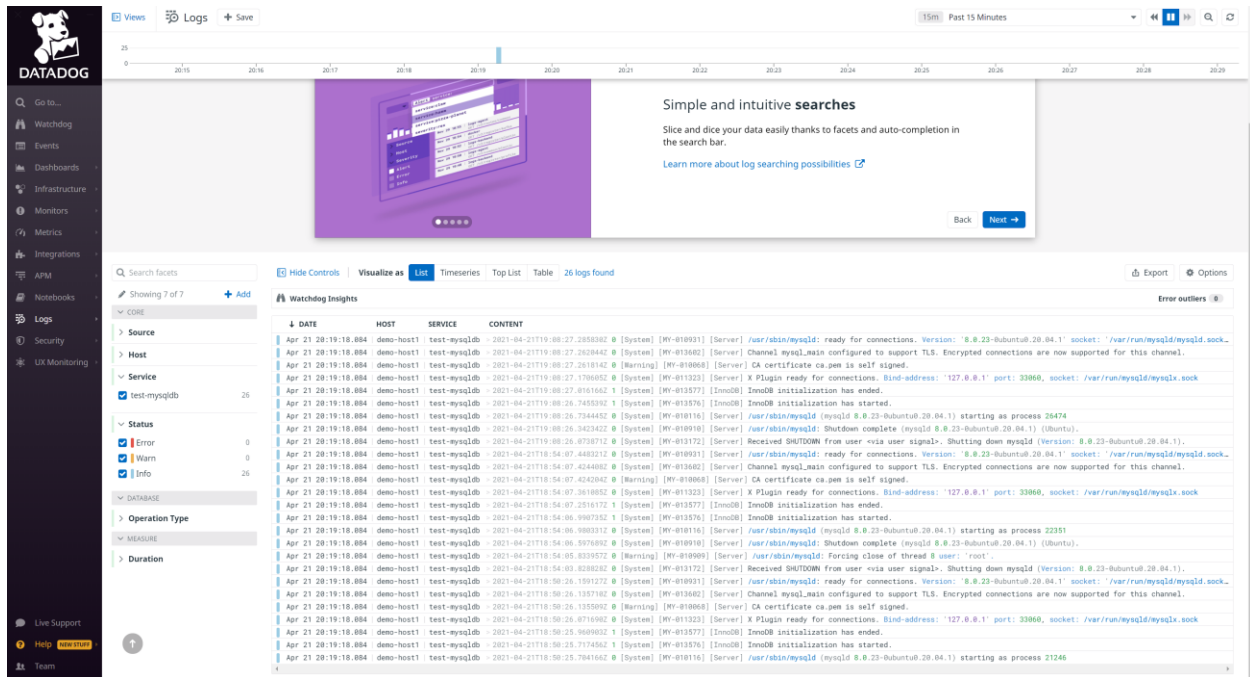
## @param ad_identifier - string - optional - default: snmp
## A unique identifier to attach to devices from that subnetwork.
## When configuring the SNMP integration in snmp.d/auto_conf.yaml,
## specify the corresponding ad_identifier at the top of the file.
#
# ad_identifier: snmp

## @param loader - string - optional - default: python
## Check loader to use. Available loaders:
## - core: will use corecheck SNMP integration
## - python: will use python SNMP integration
#
# loader: core

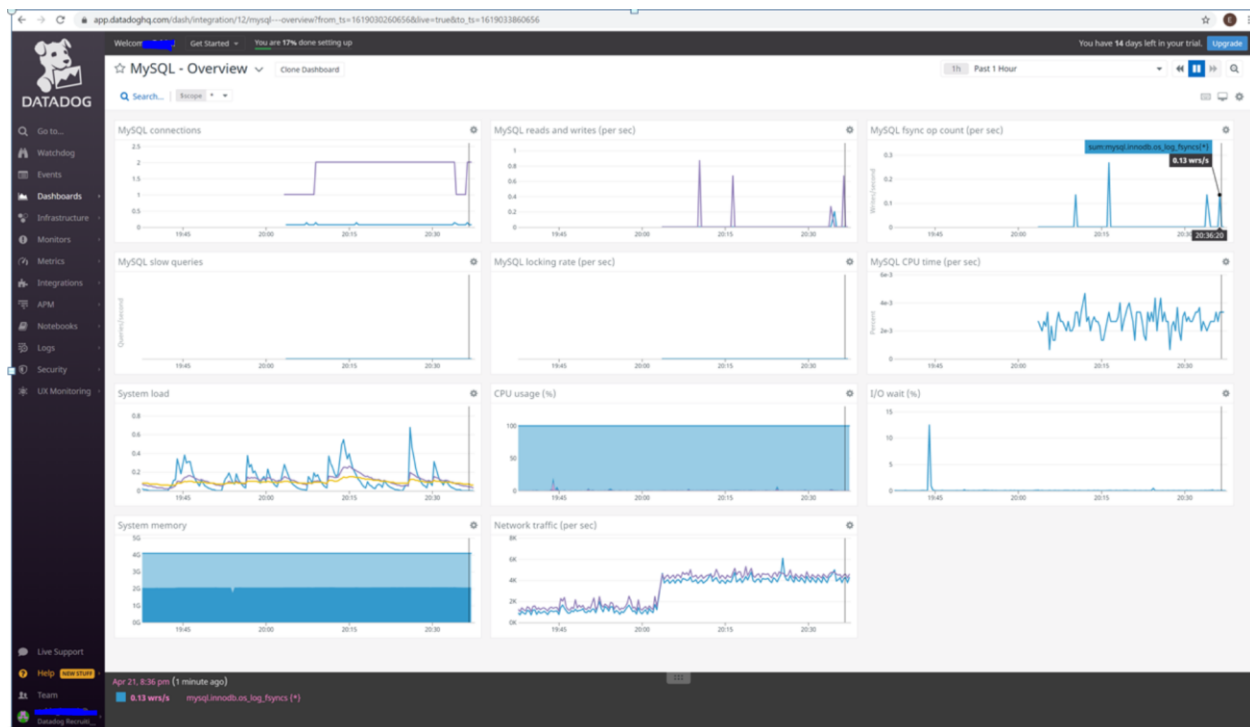
#####
# Log collection Configuration #
#####

## @param logs_enabled - boolean - optional - default: false
## Enable Datadog Agent log collection by setting logs_enabled to true.
#
logs_enabled: true
```

## Mysql Logs



## Mysql Metrics



Check sends a random metric between 0,1000 name my\_metric

/etc/datadog-agent/checks.d/random\_metric.py

```
# the following try/except block will make the custom check compatible with any Agent version
try:
    # first, try to import the base class from new versions of the Agent...
    from datadog_checks.base import AgentCheck
    import random
except ImportError:
    # ...if the above failed, the check is running in Agent version < 6.6.0
    from checks import AgentCheck

# content of the special variable __version__ will be shown in the Agent status page
__version__ = "1.0.0"

class RandomCheck(AgentCheck):
    def check(self, instance):
        self.gauge('my_metric', random.randint(0,1000), tags=['environment:dev'] + self.instance.get('tags', []))

(END)
```

/etc/datadog-agent/conf.d/random\_metric.yaml (interval = 45 sec)

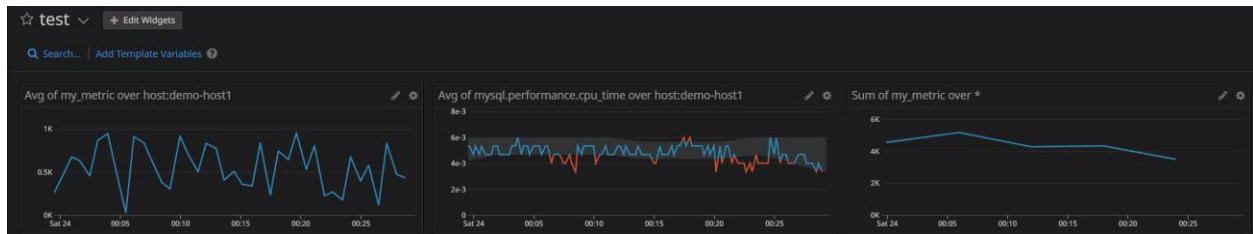
```
init_config:

instances:
  - min_collection_interval: 45

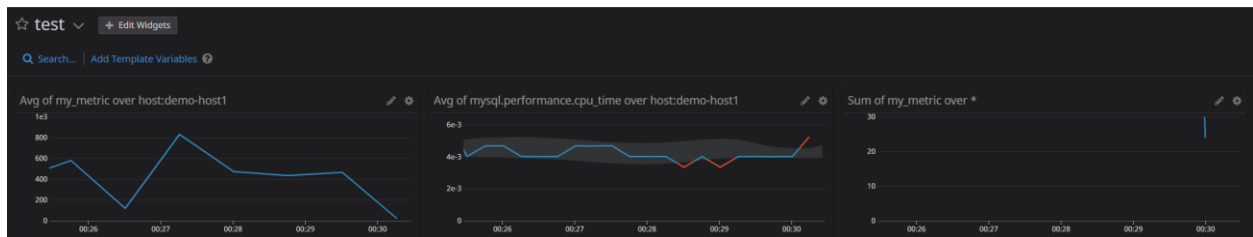
(END)
```

# Visualizing Data:

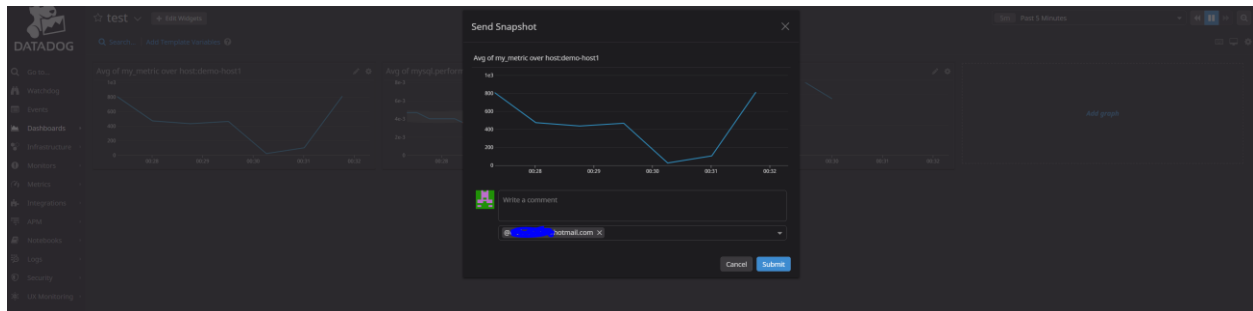
## Dashboard



Set the Timeboard's timeframe to the past 5 minute

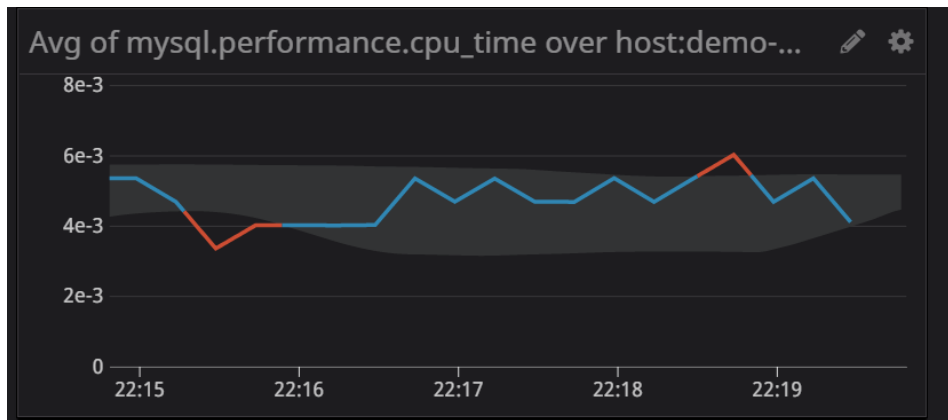


## Snapshot



- **Bonus Question:** What is the Anomaly graph displaying?

Shows the deviation of the metric based on the “bounds” sensitivity.



## Monitoring Data

The screenshot shows the Datadog alert configuration interface for an alert titled "My Metric is HIGH!". The interface is divided into several sections:

- Choose the detection method:** The "Threshold alert" method is selected. A description states: "An alert is triggered whenever a metric crosses a threshold."
- Define the metric:** The metric is defined as "my\_metric" from the "host:demo-..." source, aggregated by "avg" over the "last 5 minutes".
- Set alert conditions:**
  - Trigger when the metric is: above the threshold, as average, during the last 5 minutes.
  - Alert threshold: 800
  - Warning threshold: 700
  - Alert recovery threshold: 600
  - Warning recovery threshold: 500
  - Require: "A full window of data for evaluation"
  - Notify: "If data is missing for more than 10 minutes"
  - After 1 hour: "automatically resolve this alert from a no data state"
  - Delay evaluation by: 0 seconds
- Say what's happening:** The alert message is configured to send a message to the "ops" channel. The message content is:
 

```
My Metric is HIGH!
[{{#alert}} my_metric = {{value}}, from [{{host}}] critical threshold triggered! [{{#alert}}]
[{{#warning}} my_metric = {{value}}, from [{{host}}] warning threshold triggered! [{{#warning}}]
[{{#no_data}} my_metric = {{value}}, from [{{host}}] is not reporting anymore! [{{#no_data}}]

[{{#alert_recovery}} my_metric = {{value}}, from [{{host}}] critical threshold is cooling down! [{{#alert_recovery}}]
[{{#warning_recovery}} my_metric = {{value}}, from [{{host}}] warning threshold is cooling down! [{{#warning_recovery}}]
[{{#no_data_recovery}} my_metric = {{value}}, from [{{host}}] is recovered! [{{#no_data_recovery}}]
@{{#channel}}@{{#channel}}
```

## 1 Choose what to silence

By Monitor Name

By Monitor Tags

Monitor:

My\_Metric is HIGH!

Group scope (optional, default all groups):

\* X

[Preview Affected Monitors](#)

## 2 Schedule

One Time

Recurring

Start Date:

2021/04/24

Time Zone:

Europe/London

Repeat Every:

1

weeks

Repeat On:

☒ Sun

☐ Mon

☐ Tue

☐ Wed

☐ Thu

☐ Fri

☒ Sat

Beginning:

12:00 AM

Duration:

1

days

Repeat Until:

No end date

Summary:

From 12:00am to 12:00am next day  
Weekly on Sunday and Saturday

Preview:

- Sun, Apr 25, 2021, 12:00:00 am
- Sat, May 1, 2021, 12:00:00 am
- Sun, May 2, 2021, 12:00:00 am
- Sat, May 8, 2021, 12:00:00 am
- Sun, May 9, 2021, 12:00:00 am
- ...

## 3 Add a message

[Preview](#)

[Edit](#)

[Markdown Help](#)

This alert is muted on Weekends on purpose!

@cristian@hotmai.com

## 4 Notify your team

@cristian@hotmai.com X

Cancel

Save

## 1 Choose what to silence

By Monitor Name

By Monitor Tags

Monitor:

My\_Metric is HIGH!

Group scope (optional, default all groups):

\* X

[Preview Affected Monitors](#)

## 2 Schedule

One Time

Recurring

Start Date:

2021/04/23

Time Zone:

Europe/London

Repeat Every:

1

weeks

Repeat On:

☐ Sun

☒ Mon

☒ Tue

☒ Wed

☒ Thu

☒ Fri

☐ Sat

Beginning:

07:00 PM

Duration:

14

hours

Repeat Until:

No end date

Summary:

From 7:00pm to 9:00am next day

Weekly on Monday, Tuesday, Wednesday, Thursday, and Friday

Preview:

- Mon, Apr 26, 2021, 7:00:00 pm
- Tue, Apr 27, 2021, 7:00:00 pm
- Wed, Apr 28, 2021, 7:00:00 pm
- Thu, Apr 29, 2021, 7:00:00 pm
- Fri, Apr 30, 2021, 7:00:00 pm
- ...

## 3 Add a message

[Preview](#)

[Edit](#)

[Markdown Help](#)

This alert is muted on weekday on purpose! @ [redacted]@hotmail.com

## 4 Notify your team

@ [redacted]@hotmail.com X

Cancel

Save



## Warning Threshold breached

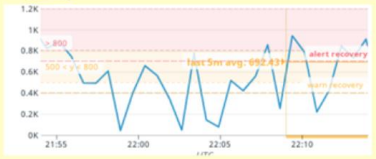
← [Monitor Alert] Warn: My\_Metric is HIGH!

Datadog Alerting <alert@datadog.co>  
Wed 4/21/2021 10:15 PM  
To: You

**DATADOG**

[Warn] My\_Metric is HIGH!  
my\_metric = 692.429, from 192.168.1.11 warning threshold triggered!

[@hotmail.com](#)



avg(last\_5m):avg:my\_metric(host:demo-host1) > 800  
The monitor was last triggered at Wed Apr 21 2021 22:14:02 UTC.

[\[Monitor Status\]](#) · [\[Edit Monitor\]](#) · [\[Show Processes\]](#) · [\[Related Logs\]](#)

This alert was raised by account Datadog Recruiting Candidate

[View in Datadog](#)

To manage your Datadog subscriptions, click [here](#).

## Warning Threshold Recovered


← [Monitor Alert] Recovered: My\_Metric is HIGH!

Datadog Alerting <alert@datadog.co>  
Wed 4/21/2021 10:29 PM  
To: You

**DATADOG**

[Recovered] My\_Metric is HIGH!  
my\_metric = 298.5, from 192.168.1.11 warning threshold is cooling down!

[@hotmail.com](#)



avg(last\_5m):avg:my\_metric(host:demo-host1) > 800  
The monitor was last triggered at Wed Apr 21 2021 22:14:02 UTC.

[\[Monitor Status\]](#) · [\[Edit Monitor\]](#) · [\[Show Processes\]](#) · [\[Related Logs\]](#)

This alert was raised by account Datadog Recruiting Candidate

[View in Datadog](#)

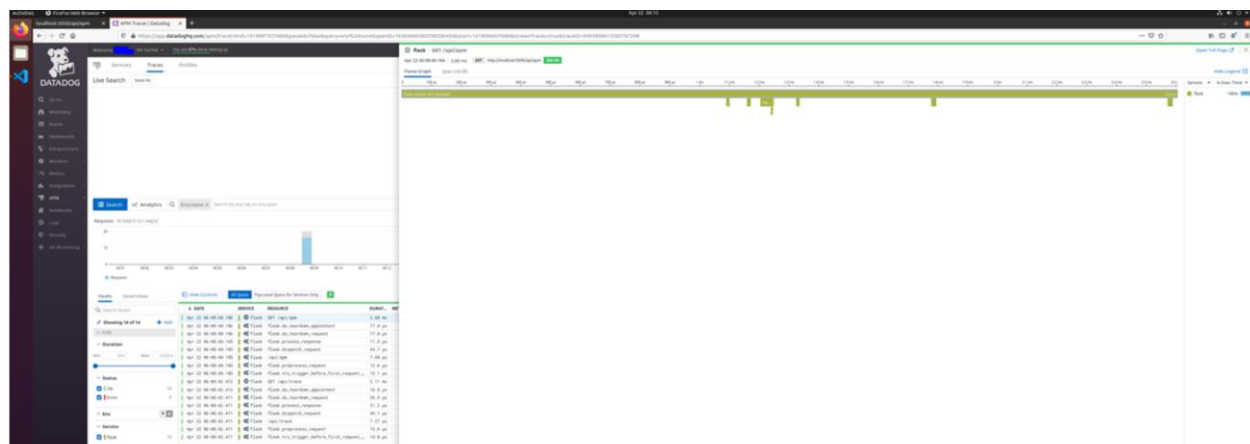
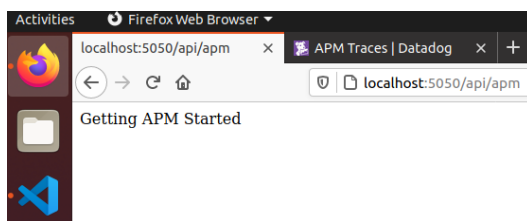
To manage your Datadog subscriptions, click [here](#).

## Collecting APM Data:

```
@code:~$ pip install ddtrace
Defaulting to user installation because normal site-packages is not writeable
Collecting ddtrace
  Downloading ddtrace-0.48.0-cp38-cp38-manylinux2010_x86_64.whl (2.3 MB)
    | ████████████████████ | 2.3 MB 4.4 MB/s
Requirement already satisfied: protobuf>=3 in /usr/lib/python3/dist-packages (from ddtrace) (3.6.1)
Collecting tenacity>=5
  Downloading tenacity-7.0.0-py2.py3-none-any.whl (23 kB)
Requirement already satisfied: six>=1.9.0 in /usr/lib/python3/dist-packages (from tenacity>=5->ddtrace) (1.14.0)
Installing collected packages: tenacity, ddtrace
Successfully installed ddtrace-0.48.0 tenacity-7.0.0
```

```
#code::~$ systemctl --type=service
```

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
accounts-daemon.service	loaded	active	running	Accounts Service
acpid.service	loaded	active	running	ACPI event daemon
alsa-restore.service	loaded	active	exited	Save/Restore Sound Card State
apparmor.service	loaded	active	exited	Load AppArmor profiles
apport.service	loaded	active	exited	LSB: automatic crash report generation
avahi-daemon.service	loaded	active	running	Avahi mDNS/DNS-SD Stack
bluetooth.service	loaded	active	running	Bluetooth service
colord.service	loaded	active	running	Manage, Install and Generate Color Profiles
console-setup.service	loaded	active	exited	Set console font and keypad
cron.service	loaded	active	running	Regular background program processing daemon
cups-browsed.service	loaded	active	running	Make remote CUPS printers available locally
cups.service	loaded	active	running	CUPS Scheduler
datadog-agent-process.service	loaded	active	running	Datadog Process Agent
datadog-agent-trace.service	loaded	active	running	Datadog Trace Agent (APM)
datadog-agent.service	loaded	active	running	Datadog Agent



```

ddpy v x
ddpy ...
1 from flask import Flask
2 import logging
3 import sys
4 import os
5 from ddtrace import tracer
6
7
8
9 # Have flask use stdout as the logger
10 main_logger = logging.getLogger()
11 main_logger.setLevel(logging.DEBUG)
12 c = logging.StreamHandler(sys.stdout)
13 formatter = logging.Formatter('%(asctime)s - %(name)s - %(levelname)s - %(message)s')
14 c.setFormatter(formatter)
15 main_logger.addHandler(c)
16
17 app = Flask(__name__)
18
19 @app.route('/')
20 def api_entrypoint():
21     return 'Endpoint to the Application'
22
23 @app.route('/api/apm')
24 def apm_endpoint():
25     return 'Getting APM Started'
26
27 @app.route('/api/trace')
28 def trace_endpoint():
29     return 'Posting Traces'
30
31 if __name__ == '__main__':
32     app.run(host='0.0.0.0', port='5050')

```

```

Python
ddtrace-run /usr/bin/python3 /home/erik...
n/Documents/code/python/first_project/test-project/dd.py
* Serving Flask app "dd" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
INFO:werkzeug: * Running on http://0.0.0.0:5050/ (Press CTRL+C to quit)
2021-04-22 06:22:03,187 - werkzeug - INFO - * Running on http://0.0.0.0:5050/ (Press CTRL+C to quit)
DEBUG:ddtrace.settings.http:Checking header 'host' tracing in whitelist set()
2021-04-22 06:22:03,855 - ddtrace.settings.http - DEBUG - Checking header 'host' tracing in whitel...
DEBUG:ddtrace.settings.http:Checking header 'user-agent' tracing in whitelist set()
2021-04-22 06:22:03,855 - ddtrace.settings.http - DEBUG - Checking header 'user-agent' tracing in whi...
DEBUG:ddtrace.settings.http:Checking header 'accept' tracing in whitelist set()
2021-04-22 06:22:03,855 - ddtrace.settings.http - DEBUG - Checking header 'accept' tracing in whitel...
DEBUG:ddtrace.settings.http:Checking header 'accept-language' tracing in whitelist set()
2021-04-22 06:22:03,856 - ddtrace.settings.http - DEBUG - Checking header 'accept-language' tracing in...
DEBUG:ddtrace.settings.http:Checking header 'accept-encoding' tracing in whitelist set()
2021-04-22 06:22:03,856 - ddtrace.settings.http - DEBUG - Checking header 'accept-encoding' tracing in...
DEBUG:ddtrace.settings.http:Checking header 'connection' tracing in whitelist set()
2021-04-22 06:22:03,859 - ddtrace.settings.http - DEBUG - Checking header 'connection' tracing in whi...
DEBUG:ddtrace.settings.http:Checking header 'upgrade-insecure-requests' tracing in whitelist set()
2021-04-22 06:22:03,859 - ddtrace.settings.http - DEBUG - Checking header 'upgrade-insecure-requests'...
DEBUG:ddtrace.settings.http:Checking header 'content-type' tracing in whitelist set()
2021-04-22 06:22:03,860 - ddtrace.settings.http - DEBUG - Checking header 'content-type' tracing in wh...
DEBUG:ddtrace.settings.http:Checking header 'content-length' tracing in whitelist set()
2021-04-22 06:22:03,861 - ddtrace.settings.http - DEBUG - Checking header 'content-length' tracing in...
DEBUG:ddtrace.tracer:writing 8 spans (enabled=True)
2021-04-22 06:22:03,861 - ddtrace.tracer - DEBUG - writing 8 spans (enabled=True)
DEBUG:ddtrace.tracer:
  name: flask.request
  id: 2475783923436544493
  trace id 11176789769361683921
  parent_id None
  service flask
  resource GET /api/apm
  type web
  start 1619097723.855127
  end 1619097723.8615055
  duration 0.0063785
  error 0
  tags
    'flask.endpoint': apm_endpoint
    'flask.url_rule': /api/apm
    'flask.version': 1.1.2
    'http.method': GET
    'http.status_code': 200
    'http.url': http://localhost:5050/api/apm
    'runtime.id': 7a3d9b622ad42b4ad8f761e9d373d5d
2021-04-22 06:22:03,862 - ddtrace.tracer - DEBUG -
  trace id 11176789769361683921

```

Dashboard Link: [https://app.datadoghq.com/dashboard/53h-5f8-cmh/final-dashboard?from\\_ts=1619093890680&live=true&to\\_ts=1619097490680](https://app.datadoghq.com/dashboard/53h-5f8-cmh/final-dashboard?from_ts=1619093890680&live=true&to_ts=1619097490680)

Service: Is the application itself

Resource: An action within the application



## Kubernetes Integration:

```
933 helm repo add datadog https://helm.datadoghq.com
934 helm repo add stable https://charts.helm.sh/stable
935 helm repo update
936 helm install datadog-agent -f values.yaml --set datadog.apiKey=2ac363121e9d08ba5b384b9698fd8f60 datadog/datadog --set targetSystem=linux
937 kubectl get pods
```

## Enable APM:

### Values.yaml

```
## Enable apm agent and provide custom configs
apm:
  # datadog.apm.enabled -- Enable this to enable APM and tracing, on port 8126
  ## ref: https://github.com/DataDog/docker-dd-agent#tracing-from-the-host
  enabled: true
```

Update DD Helm Chart(A couple of changes were required in values.yaml to complete kubernetes integration)

```
1002 vi values.yaml
1003 helm upgrade -f values.yaml datadog-agent datadog/datadog
```

```
root@KubMaster:~/dd$ helm upgrade -f values.yaml datadog-agent datadog/datadog
Release "datadog-agent" has been upgraded. Happy Helming!
NAME: datadog-agent
LAST DEPLOYED: Fri Apr 23 10:08:22 2021
NAMESPACE: default
STATUS: deployed
REVISION: 2
TEST SUITE: None
NOTES:
Datadog agents are spinning up on each node in your cluster. After a few
minutes, you should see your agents starting in your event stream:
https://app.datadoghq.com/event/stream

The Datadog Agent is listening on port 8126 for APM service.
root@KubMaster:~/dd$ vi values.yaml
```

**Kubernetes Pods Overview** Clone Dashboard

Scope: \* Cluster: \* Namespace: \* Deployment: \* Statefulset: \* Daemonset: \* Job: \*

### Overview

**Pods Running**

**Pods running by Namespace**

**Pods Running (changed weekly)**

- datadog-agent-kube... (new)
- flask-deployment, de... (new)
- influx, default (new)
- calico-kube-control... (new)
- N/A, kube-system
- datadog-agent-clust... (new)

**Pods in Bad Phase by Namespaces**

No Data

### Pods

**CPU Usage by Pod**

**Memory Usage by Pod**

**Most CPU-intensive pods** (4h)

Pod Name	CPU Usage (MilliCores)
datadog-agent-rq9fx	145.55
datadog-agent-xf82x	127.16
datadog-agent-l6tm4	89.44
calico-node-n9zxd	48.45
datadog-agent-cluster-agent-f46f96...	5.31
coredns-74ff55c5b-pvbk5	4.57
coredns-74ff55c5b-zwg6w	4.31
datadog-agent-cluster-agent-79978...	4.10
datadog-agent-cluster-agent-58b87...	4.01
calico-kube-controllers-6dfcd885bf...	1.65

**Most memory-intensive pods** (4h)

Pod Name	Memory Usage (MiB)
datadog-agent-rq9fx	177.82
datadog-agent-xf82x	157.61
datadog-agent-l6tm4	151.38
calico-node-n9zxd	79.25
coredns-74ff55c5b-pvbk5	49.40
datadog-agent-cluster-agent-f46f96...	39.50
kube-proxy-h7jtl	39.34
datadog-agent-cluster-agent-79978...	36.48
influx-7d99cd8c4-jdvmb	34.71
datadog-agent-cluster-agent-58b87...	33.73

**Pod Status Phase**

sum(kubernetes\_state\_pod\_status\_phase{\*\*,\*pod\_phase:running,\*},\*\*\*)

The screenshot shows the Datadog Infrastructure List page. The table displays the following data:

HOSTNAME	STATUS	CPU	MEMORY	LOAD	APPS
kubemaster1	ACTIVE	15.0%	< 0.1%	0.4	datadog, prometheus, request, duration, seconds, prometheus, dns, request, dns, bytes, prometheus, dns, response, dns, bytes, prometheus, forward, request, duration, seconds, prometheus, health, request, duration, seconds, datadog
demo-host1	ACTIVE	2.84%	< 0.1%	0.04	integration, test, dns, prometheus, dns, bytes, system
kubemaster1	ACTIVE	—	—	—	kubemaster, kube, system
kubemaster	ACTIVE	—	—	—	kubemaster, kube

## Same Flask App running in K8s

### Docker Image creation and push to registry

← → ↺

⚠ Not secure | gitlab/root/test-project/-/jobs/127

GitLab

Projects ▾ Groups ▾ More ▾ 🔧

T test-project

🏠 Project overview

📁 Repository

📄 Issues 0

🔄 Merge Requests 0

🔗 CI/CD

Pipelines

Editor

Jobs

Schedules

🛡 Security & Compliance

👤 Operations

📦 Packages & Registries

📊 Analytics

📖 Wiki

✂ Snippets

👥 Members


⚙ Settings

⏏ Collapse sidebar

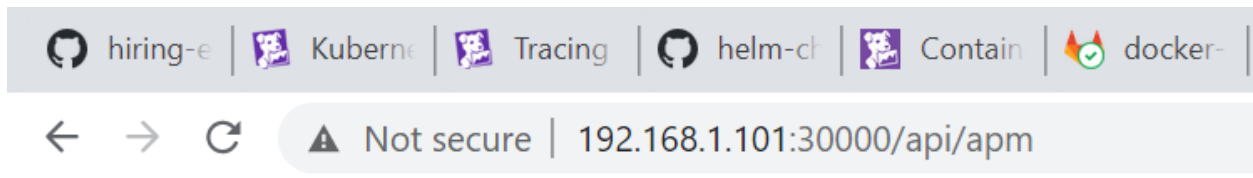
```
839 ---> Running in ae67b87ac16c
840 Collecting ddtrace
841   Downloading ddtrace-0.48.0-cp38-cp38-manylinux2010_x86_64.whl (2.3 MB)
842 Collecting tenacity>=5
843   Downloading tenacity-7.0.0-py2.py3-none-any.whl (23 kB)
844 Collecting protobuf>=3
845   Downloading protobuf-3.15.8-cp38-cp38-manylinux1_x86_64.whl (1.0 MB)
846 Collecting six>=1.9.0
847   Downloading six-1.15.0-py2.py3-none-any.whl (10 kB)
848 Installing collected packages: six, tenacity, protobuf, ddtrace
849 Successfully installed ddtrace-0.48.0 protobuf-3.15.8 six-1.15.0 tenacity-7.0.0
850 Removing intermediate container ae67b87ac16c
851 ---> 985a7e56de5d
852 Step 5/9 : RUN mkdir /app
853 ---> Running in d7bddcb2dda6
854 Removing intermediate container d7bddcb2dda6
855 ---> 4502594fac2e
856 Step 6/9 : WORKDIR /app
857 ---> Running in 7b19d7814fdb
858 Removing intermediate container 7b19d7814fdb
859 ---> eaf9980e3686
860 Step 7/9 : ADD . /app/
861 ---> 4fba889b8460
862 Step 8/9 : EXPOSE 5000
863 ---> Running in 61d1ccdb575c
864 Removing intermediate container 61d1ccdb575c
865 ---> 6bf98014b102
866 Step 9/9 : CMD ["ddtrace-run", "python3.8", "/app/dd.py"]
867 ---> Running in f17a54a18735
868 Removing intermediate container f17a54a18735
869 ---> df78c304fc34
870 Successfully built df78c304fc34
871 Successfully tagged [REDACTED]/demo:1.0
872 $ docker push [REDACTED]/demo:1.0
873 The push refers to repository [docker.io/erkucuk/demo]
874 f07846c6d5ac: Preparing
875 807975d6bf10: Preparing
876 33a4d82082fc: Preparing
877 091b3094ec20: Preparing
878 8944060aef96: Preparing
879 346be19f13b0: Preparing
880 935f303ebf75: Preparing
881 0e64bafdc7ee: Preparing
882 346be19f13b0: Waiting
883 935f303ebf75: Waiting
884 0e64bafdc7ee: Waiting
885 807975d6bf10: Pushed
886 f07846c6d5ac: Pushed
887 346be19f13b0: Layer already exists
888 935f303ebf75: Layer already exists
889 0e64bafdc7ee: Layer already exists
890 091b3094ec20: Pushed
891 33a4d82082fc: Pushed
892 8944060aef96: Pushed
893 1.0: digest: sha256:d15f207576cc50b215cefd2955f858f5acf807b31c0b318650937480f95c5c74 size: 1995
894 Job succeeded
```



## Running Flask App as a deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: flask-deployment
  labels:
    app: flask
spec:
  replicas: 1
  selector:
    matchLabels:
      app: flask
  template:
    metadata:
      labels:
        app: flask
    spec:
      containers:
        - name: flask
          image: demo:1.0
          imagePullPolicy: Always
          env:
            - name: DD_AGENT_HOST
              valueFrom:
                fieldRef:
                  fieldPath: status.hostIP
          ports:
            - containerPort: 5050
          imagePullSecrets:
            - name: regcred
dd dep.yaml (END)
```

## Verify the deployment working



## Getting APM Started

### Check trace collection for the service running in Kubernetes

