

# 一、原生命令

## 1、操作

```
# 查看运行容器
docker ps

# dockers监控状态
docker stats
```

```
[root@localhost docker]# docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                                                                 NAMES
d5e43adc88ec   portainer/portainer-ce:latest       "/portainer"            16 minutes ago Up 16 minutes  0.0.0.0:8000->8000/tcp, :::8000->8000/tcp, 0.0.0.0:9000->9000/tcp, :::9000->9000/tcp, 9443/tcp  portainer
c665371e53e0   registry                            "/entrypoint.sh /etc..." 11 days ago    Up 15 hours   0.0.0.0:5000->5000/tcp, :::5000->5000/tcp  ecstatic_golick
```

### docker stats命令执行结果

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %	NET I/O	BLOCK I/O	PIDS
d5e43adc88ec	portainer	0.00%	16.46MiB / 3.70GiB	0.43%	3.24MB / 123MB	0B / 1.72MB	4
c665371e53e0	ecstatic_golick	0.00%	7.422MiB / 3.70GiB	0.20%	3.31kB / 0B	42.2MB / 0B	6

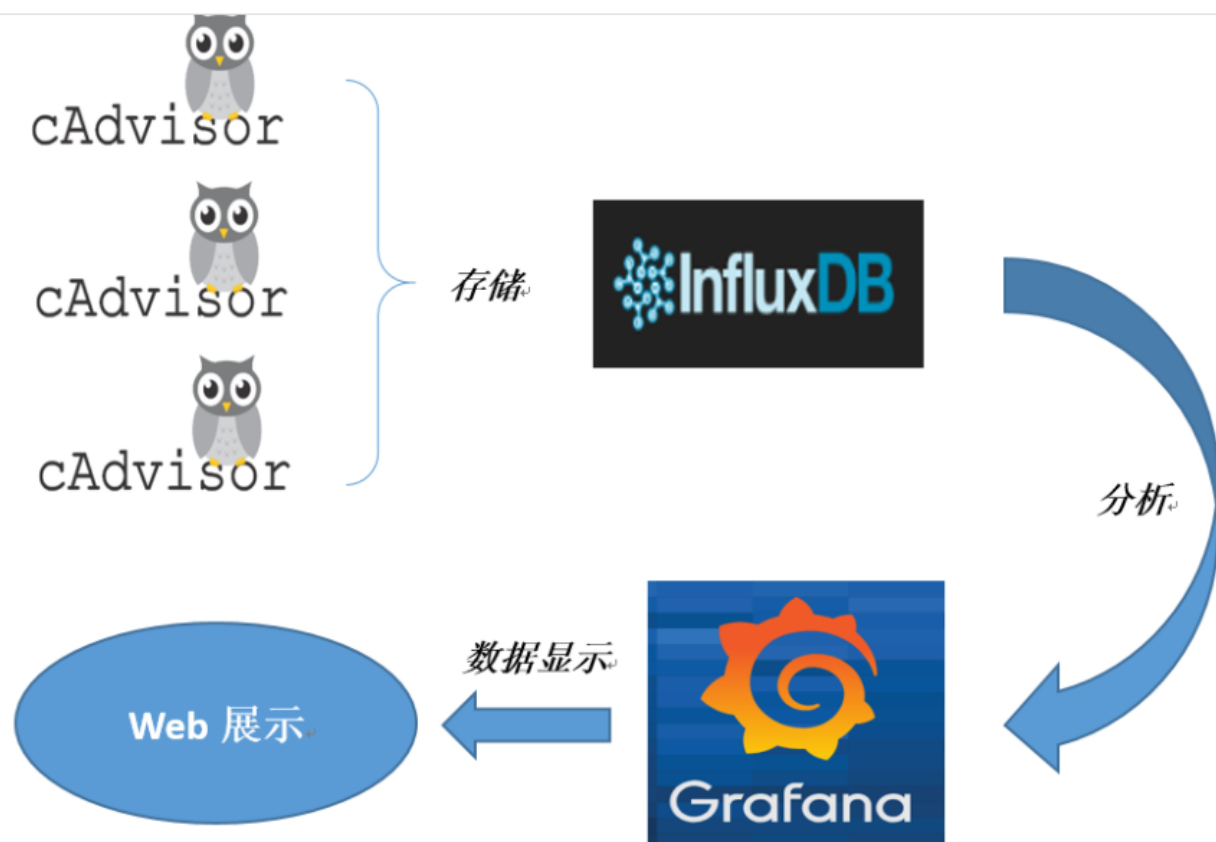
## 2、问题

通过docker stats命令可以很方便的看到当前宿主机上所有容器的CPU,内存以及网络流量等数据,一般小公司够用了。。。。但是, docker stats统计结果只能是当前宿主机的全部容器, 数据资料是实时的, 没有地方存储、没有健康指标过线预警等功能

# 二、是什么

## 1、监控3剑客

### 1. 一句话



CAdvisor监控收集+InfluxDB存储数据+Grafana展示图标

## 2. CAdvisor

### CAdvisor

CAdvisor是一个容器资源监控工具,包括容器的内存,CPU,网络IO,磁盘IO等监控,同时提供了一个WEB页面用于查看容器的实时运行状态。CAdvisor默认存储2分钟的数据,而且只是针对单物理机。不过, CAdvisor提供了很多数据集成接口,支持InfluxDB,Redis,Kafka,Elasticsearch等集成,可以加上对应配置将监控数据发往这些数据库存储起来。

CAdvisor功能主要有两点:

- 展示Host和容器两个层次的监控数据。
- 展示历史变化数据。

## 3. InfluxDB

# InfluxDB

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InfluxDB是用Go语言编写的一个开源分布式时序、事件和指标数据库,无需外部依赖。

CAdvisor默认只在本机保存最近2分钟的数据,为了持久化存储数据和统一收集展示监控数据,需要将数据存储到InfluxDB中。InfluxDB是一个时序数据库,专门用于存储时序相关数据,很适合存储CAAdvisor的数据。而且,CAAdvisor本身已经提供了InfluxDB的集成方法,丰启动容器时指定配置即可。

InfluxDB主要功能:

- 基于时间序列,支持与时间有关的相关函数(如最大、最小、求和等);
- 可度量性:你可以实时对大量数据进行计算;
- 基于事件:它支持任意的事件数据;

## 4. Grafana

# Granfana

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Grafana是一个开源的数据监控分析可视化平台,支持多种数据源配置(支持的数据源包括InfluxDB,MySQL,Elasticsearch,OpenTSDB,Graphite等)和丰富的插件及模板功能,支持图表权限控制和报警。

Grafan主要特性:

- 灵活丰富的图形化选项
- 可以混合多种风格
- 支持白天和夜间模式
- 多个数据源

## 5. 总结



- cAdvisor – Collects, aggregates, processes, and exports information about running containers
- InfluxDB – Time Series Database stores all the metrics
- Grafana – Metrics Dashboard

### 3、compose容器编排，一套带走

#### 1. 新建目录

```
mkdir /data/docker/cig
```

```
[root@localhost docker]# mkdir cig
[root@localhost docker]# cd cig
[root@localhost cig]# pwd
/data/docker/cig
```

#### 2. 新建3件套组合的docker-compose.yml

版本一：使用link关联容器(link后续会被移除不推荐)

```
version: '3.1'

volumes:
  grafana_data: {}

services:
  influxdb:
    image: tutum/influxdb:0.9
    restart: always
    environment:
      - PRE_CREATE_DB=cadvisor
    ports:
      - "8083:8083"
      - "8086:8086"
    volumes:
      - ./data/influxdb:/data
  cadvisor:
```

```

image: google/cadvisor
links:
  - influxdb:influxsrv
command: -storage_driver=influxdb -storage_driver_db=cadvisor -
storage_driver_host=influxsrv:8086
restart: always
ports:
  - "8080:8080"
volumes:
  - /:/rootfs:ro
  - /var/run:/var/run:rw
  - /sys:/sys:ro
  - /var/lib/docker:/var/lib/docker:ro
grafana:
  user: "104"
  image: grafana/grafana
  restart: always
  links:
    - influxdb:influxsrv
  ports:
    - "3000:3000"
  volumes:
    - grafana_data:/var/lib/grafana
  environment:
    - HTTP_USER=admin
    - HTTP_PASS=admin
    - INFLUXDB_HOST=influxsrv
    - INFLUXDB_PORT=8086
    - INFLUXDB_NAME=cadvisor
    - INFLUXDB_USER=root
    - INFLUXDB_PASS=root

```

版本二：使用depends\_on和networks关联容器

```

version: '3.1'

volumes:
  grafana_data: {}

services:
  influxdb:
    image: tutum/influxdb:0.9
    restart: always
    environment:
      - PRE_CREATE_DB=cadvisor
    ports:
      - "8083:8083"
      - "8086:8086"
    volumes:
      - ./data/influxdb:/data
  networks:

```

```

    - cignetwork
cadvisor:
  image: google/cadvisor
  # links:
  # - influxdb:influxsrv
  #command: -storage_driver=influxdb -storage_driver_db=cadvisor -
storage_driver_host=influxsrv:8086
  command: -storage_driver=influxdb -storage_driver_db=cadvisor -
storage_driver_host=influxdb:8086
  restart: always
  ports:
    - "8080:8080"
  volumes:
    - /:/rootfs:ro
    - /var/run:/var/run:rw
    - /sys:/sys:ro
    - /var/lib/docker:/var/lib/docker:ro
  depends_on:
    - influxdb
  networks:
    - cignetwork
grafana:
  user: "104"
  image: grafana/grafana
  restart: always
  links:
    - influxdb:influxsrv
  ports:
    - "3000:3000"
  volumes:
    - grafana_data:/var/lib/grafana
  environment:
    - HTTP_USER=admin
    - HTTP_PASS=admin
    - INFLUXDB_HOST=influxdb
    - INFLUXDB_PORT=8086
    - INFLUXDB_NAME=cadvisor
    - INFLUXDB_USER=root
    - INFLUXDB_PASS=root
  depends_on:
    - influxdb
    - cadvisor
  networks:
    - cignetwork

# 自定义网络
networks:
  cignetwork:
    driver: bridge

```

### 3. 启动docker-compose文件

```
docker-compose up
```

```
[root@localhost cig]# docker-compose up
[+] Running 27/27
✓ grafana 10 layers [#####] 0B/0B Pulled 110.6s
✓ 97518928ae5f Pull complete 20.4s
✓ 305881807f48 Pull complete 20.7s
✓ d9a64d9fd162 Pull complete 23.1s
✓ 4e368e1b924c Pull complete 23.5s
✓ 867f7fdd92d9 Pull complete 26.5s
✓ 387c55415012 Pull complete 34.7s
✓ 07f94c8f51cd Pull complete 88.4s
✓ ce8cf00ff6aa Pull complete 88.6s
✓ e4d58b5f948 Pull complete 88.7s
✓ 4080fdd4223 Pull complete 88.8s
✓ influxdb 11 layers [#####] 0B/0B Pulled 98.4s
✓ a3ed95cae802 Pull complete 0.9s
✓ 23efb549476f Pull complete 71.1s
✓ aa2f8df21433 Pull complete 71.3s
✓ ef072d3c9b41 Pull complete 71.4s
✓ c9f371853f28 Pull complete 71.6s
✓ a24d8b09713c Pull complete 72.5s
✓ 749db6d368d0 Pull complete 72.8s
✓ 09a7be9c234a Pull complete 75.4s
✓ ce08d78abe37 Pull complete 75.5s
✓ 45c4e95cdf8a Pull complete 75.6s
✓ cc4fd199ba04 Pull complete 75.7s
✓ cadvisor 3 layers [#####] 0B/0B Pulled 21.1s
✓ ff3a5c910c92 Pull complete 4.7s
✓ 44a45b65cdf Pull complete 13.9s
✓ 0bbe1a2fe2a6 Pull complete 14.5s
[+] Running 5/5
✓ Network cig_default Created 0.4s
✓ Volume "cig_grafana_data" Created 0.0s
✓ Container cig-influxdb-1 Created 2.1s
✓ Container cig-cadvisor-1 Created 0.1s
✓ Container cig-grafana-1 Created 0.1s
```

#### 4. 查看三个服务容器是否启动

```
docker ps
```

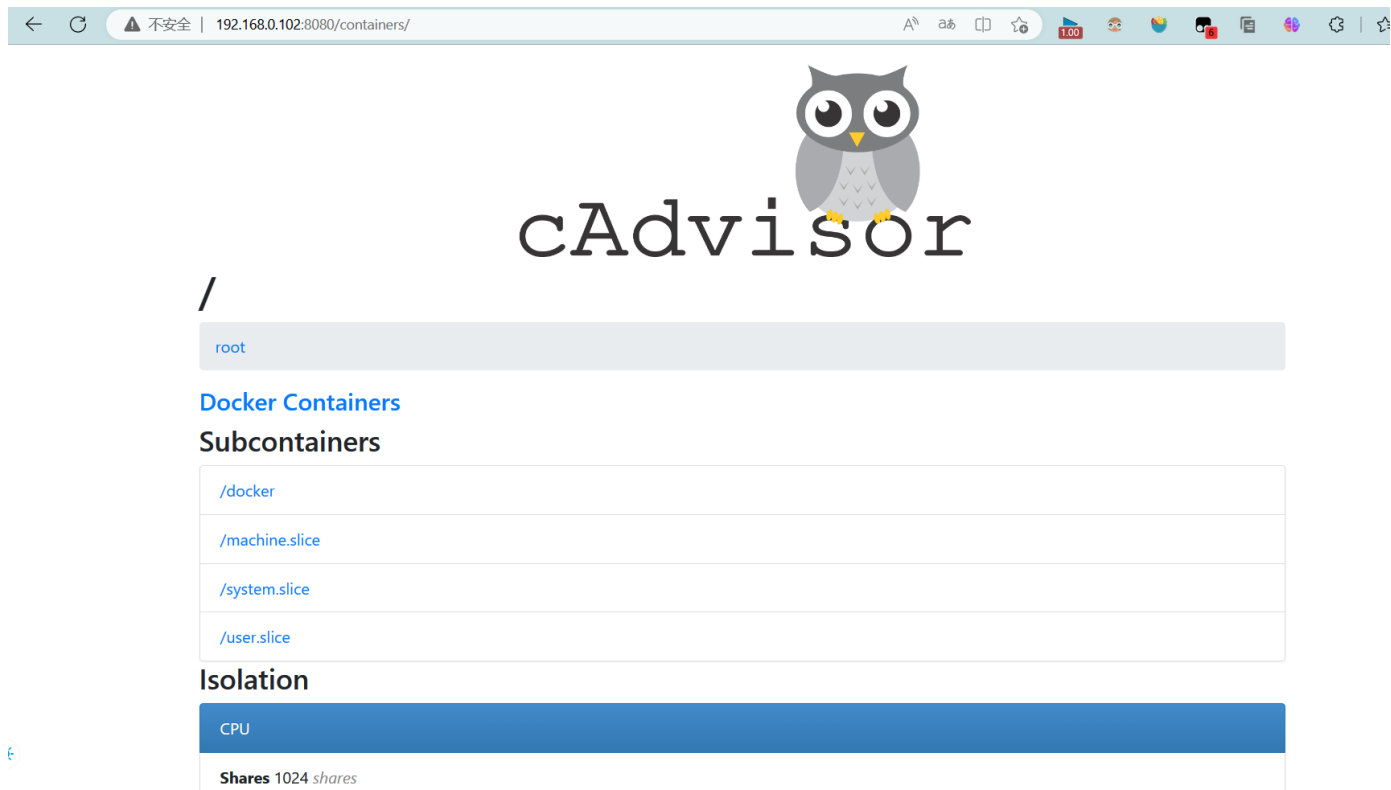
```
[root@bogon mycompose]# docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NAMES
8d7bc08117bd   google/cadvisor                     "/usr/bin/cadvisor -..." 2 minutes ago  Up 2 minutes  0.0.0.0:8080->8080/tcp, :::8080->8080/tcp  cig-cadv
790c35618751   grafana/grafana                    "/run.sh"               2 minutes ago  Up 2 minutes  0.0.0.0:3000->3000/tcp, :::3000->3000/tcp  cig-gra
419dedf036be   tutum/influxdb:0.9                 "/run.sh"               2 minutes ago  Up 2 minutes  0.0.0.0:8083->8083/tcp, :::8083->8083/tcp, 0.0.0.0:8086->8086/tcp, :::8086->8086/tcp  cig-inf
lucdb-1
c5e43adc88ec   portainer/portainer-ce:latest       /portainer              53 minutes ago  Up 53 minutes  0.0.0.0:8000->8000/tcp, :::8000->8000/tcp, 0.0.0.0:9000->9000/tcp, :::9000->9000/tcp, 9443/tcp  portain
er
c665371e53e0   registry                            "/entrypoint.sh /etc..." 11 days ago    Up 16 hours   0.0.0.0:5000->5000/tcp, :::5000->5000/tcp  ecstatic
golicl
[root@bogon mycompose]#
```

#### 5. 测试

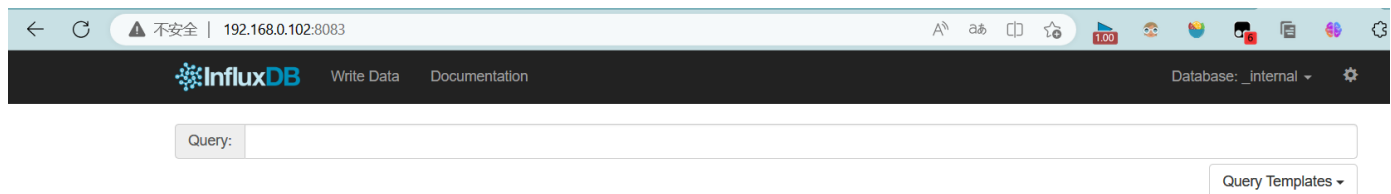
```
# 开放相应端口号 cAdvisor 8080 influxDB 8083 grafana 3000
firewall-cmd --zone=public --add-port=3000/tcp --permanent
firewall-cmd --zone=public --add-port=8080/tcp --permanent
firewall-cmd --zone=public --add-port=8083/tcp --permanent

firewall-cmd --reload
```

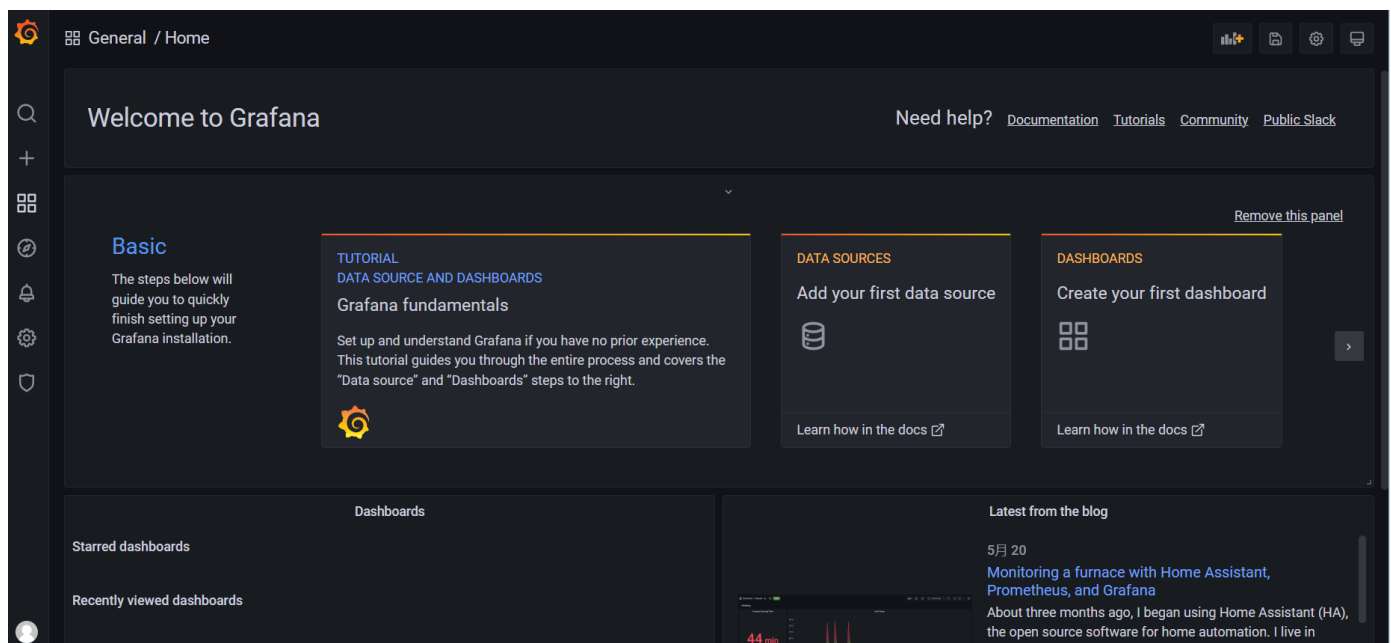
浏览cAdvisor收集服务，<http://ip:8080/>，第一次访问慢，CAdivisor也有基础的图形展示功能，这里主要用它来做数据采集



浏览influxdb存储服务, http://ip:8083



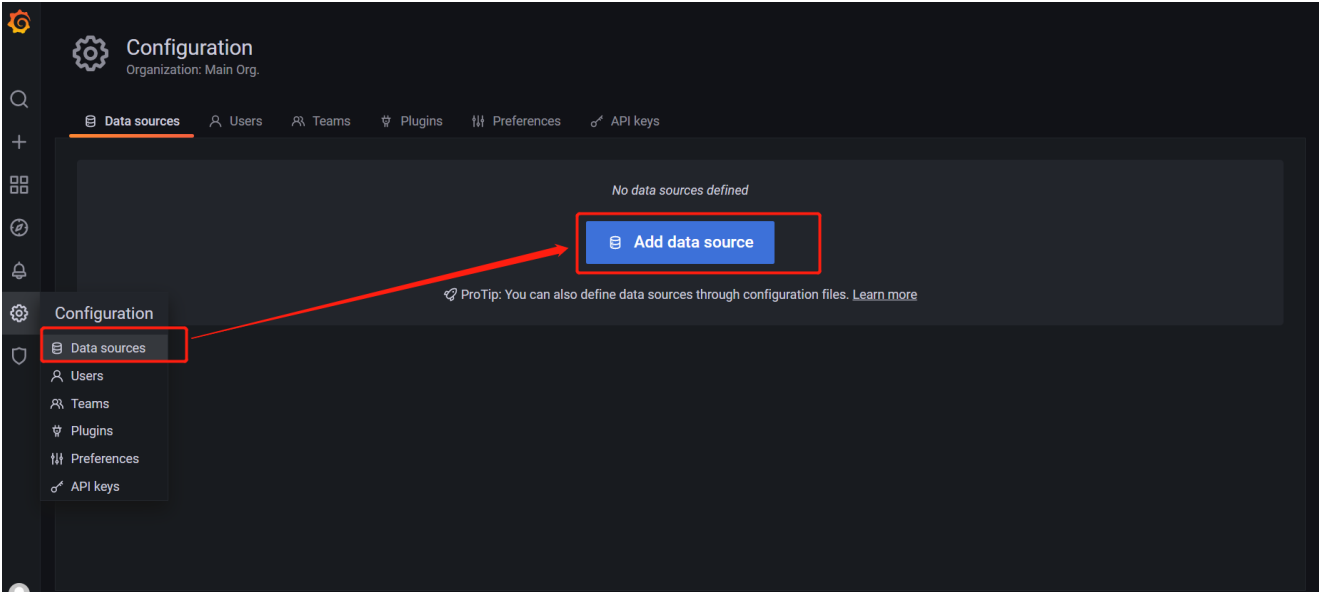
浏览grafana展现服务, http://ip:3000,默认账户密码 (admin/admin)



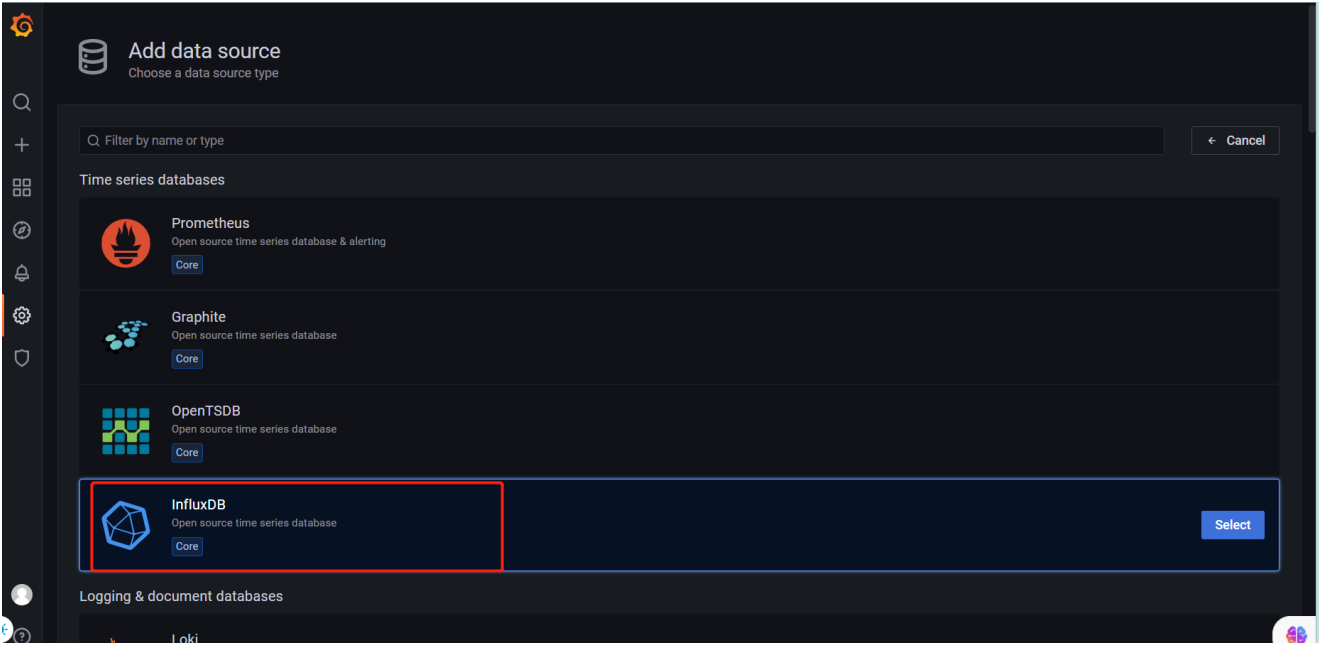
配置步骤



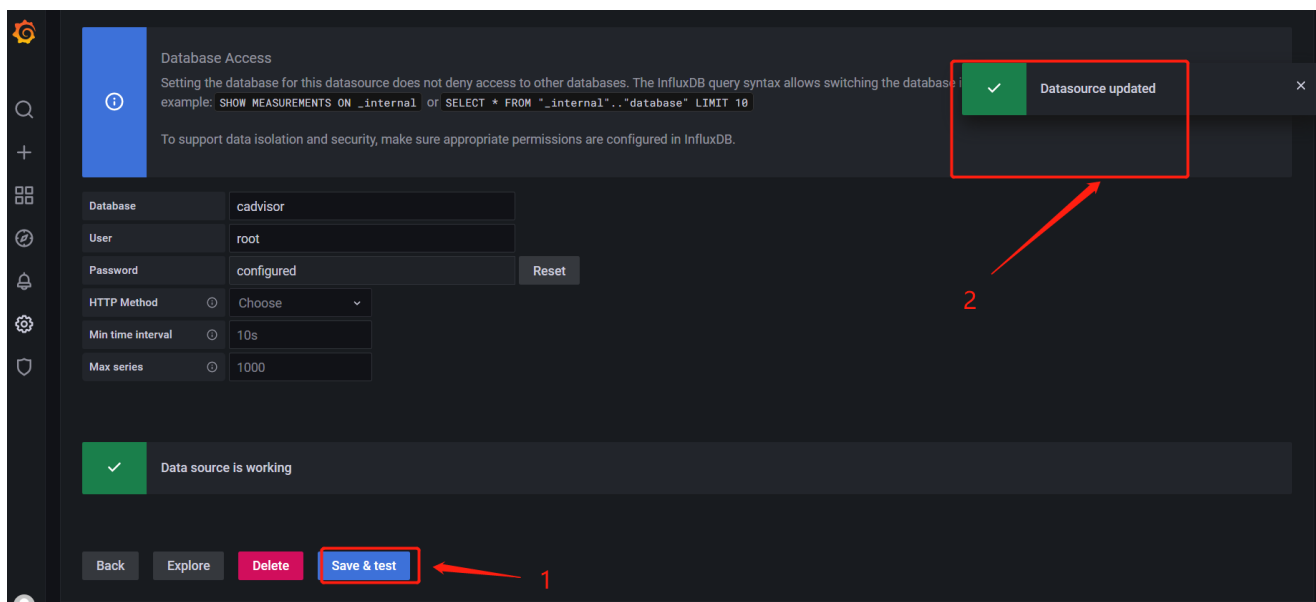
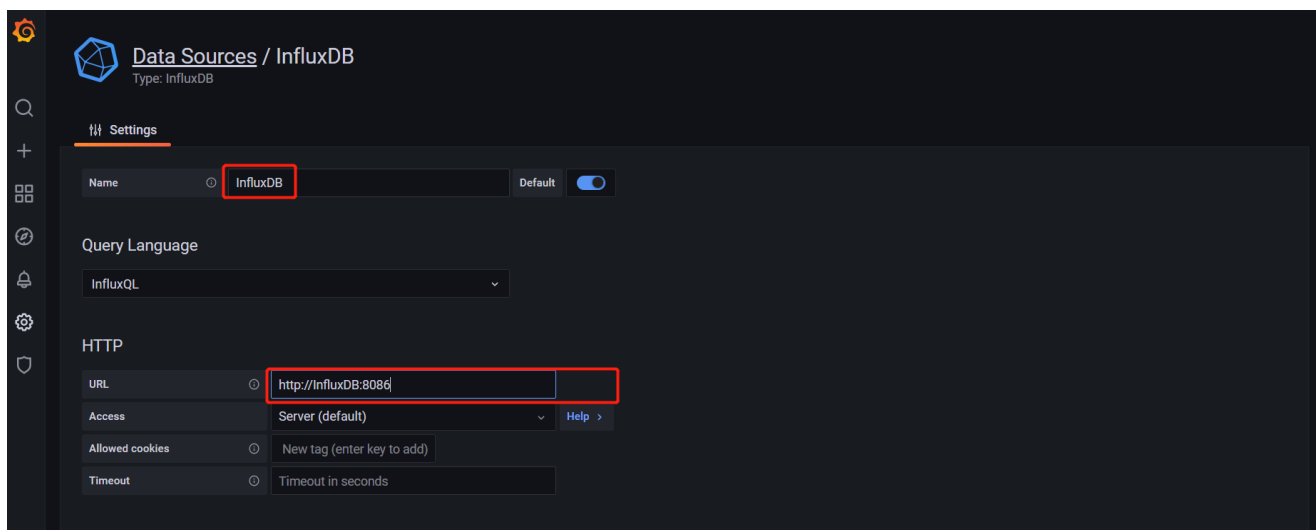
### 1. 配置数据源



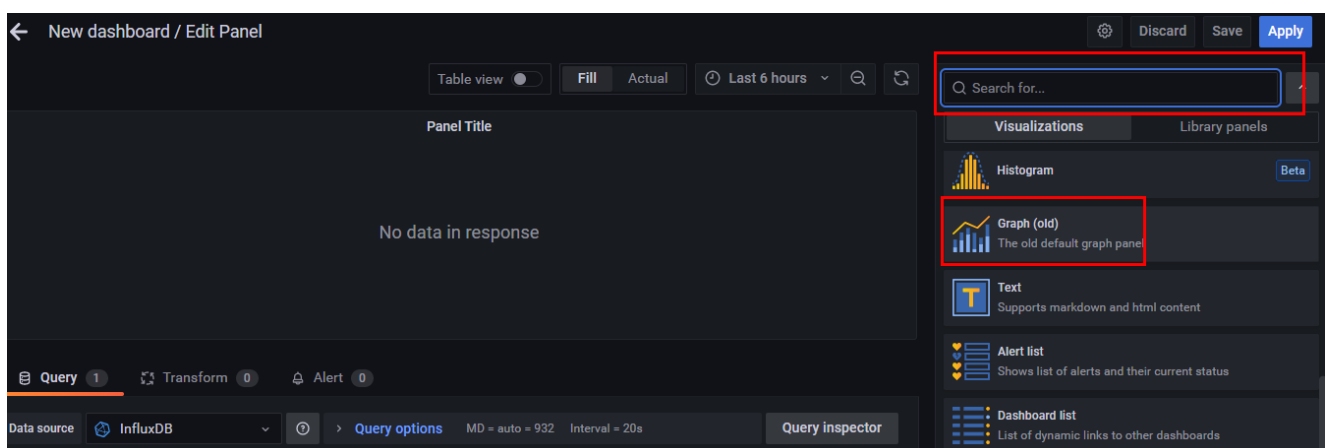
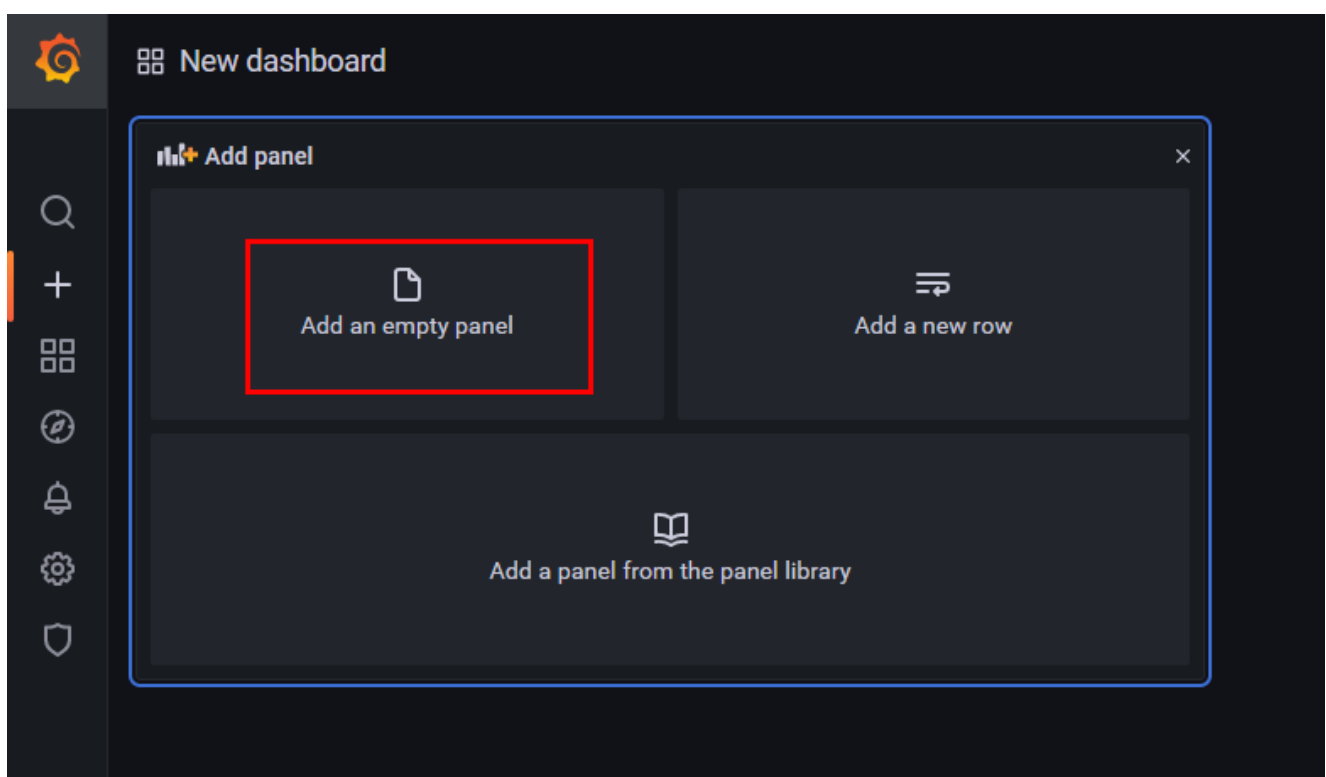
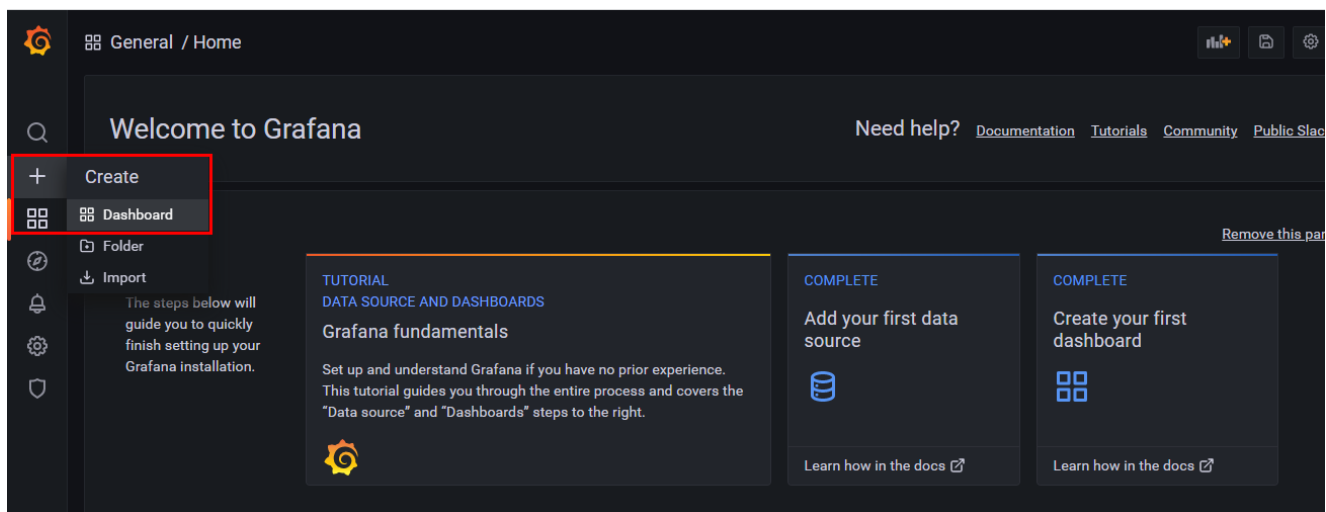
### 2. 选择InfluxDB数据源

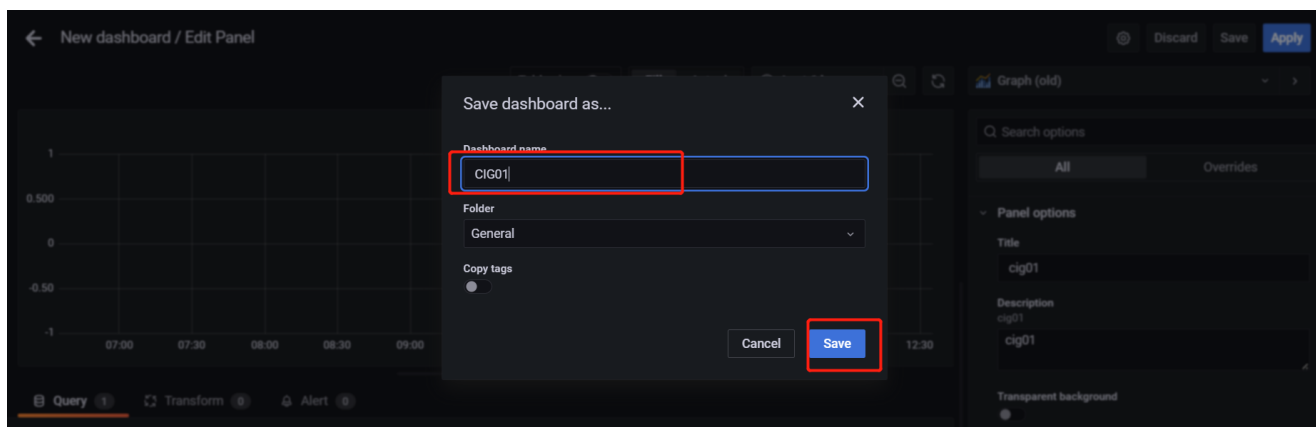
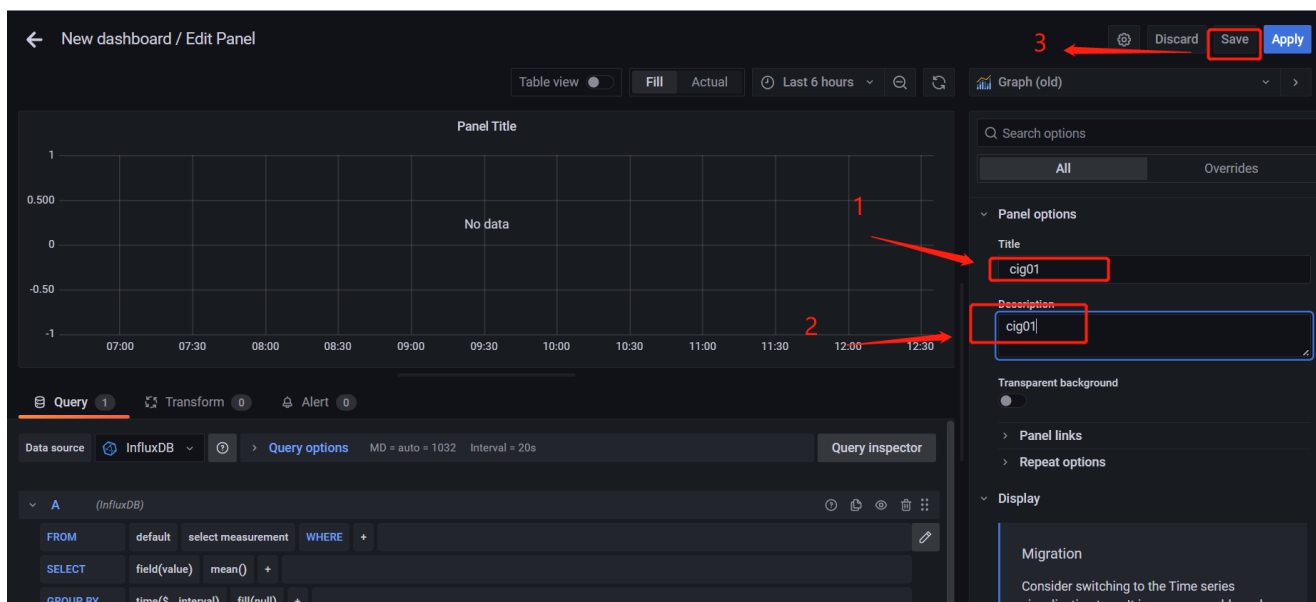
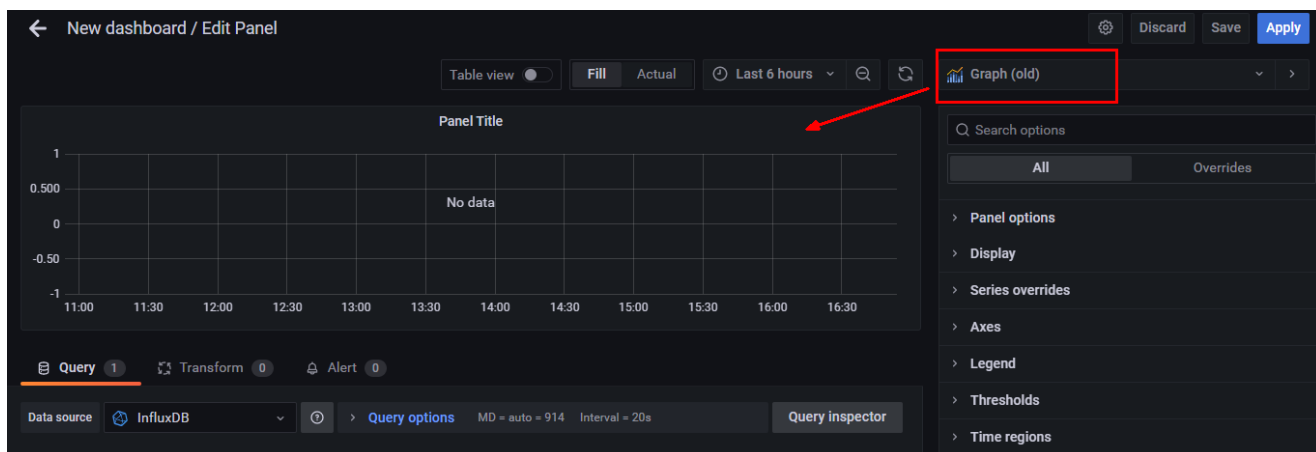


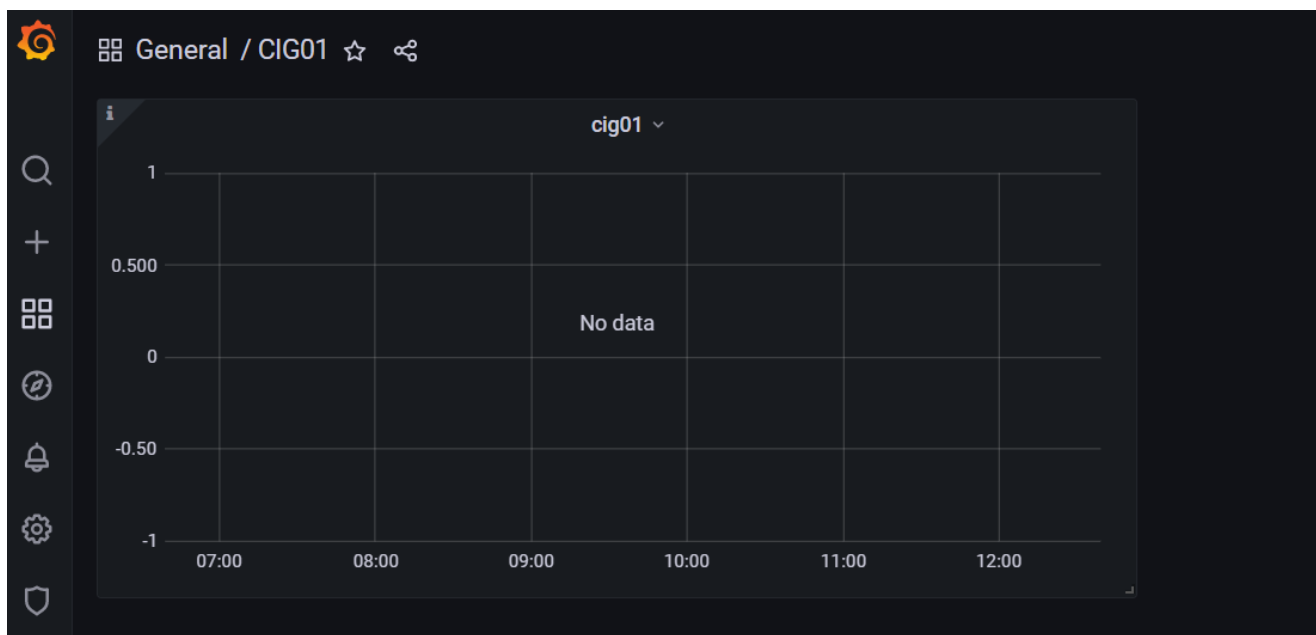
### 3. 配置细节



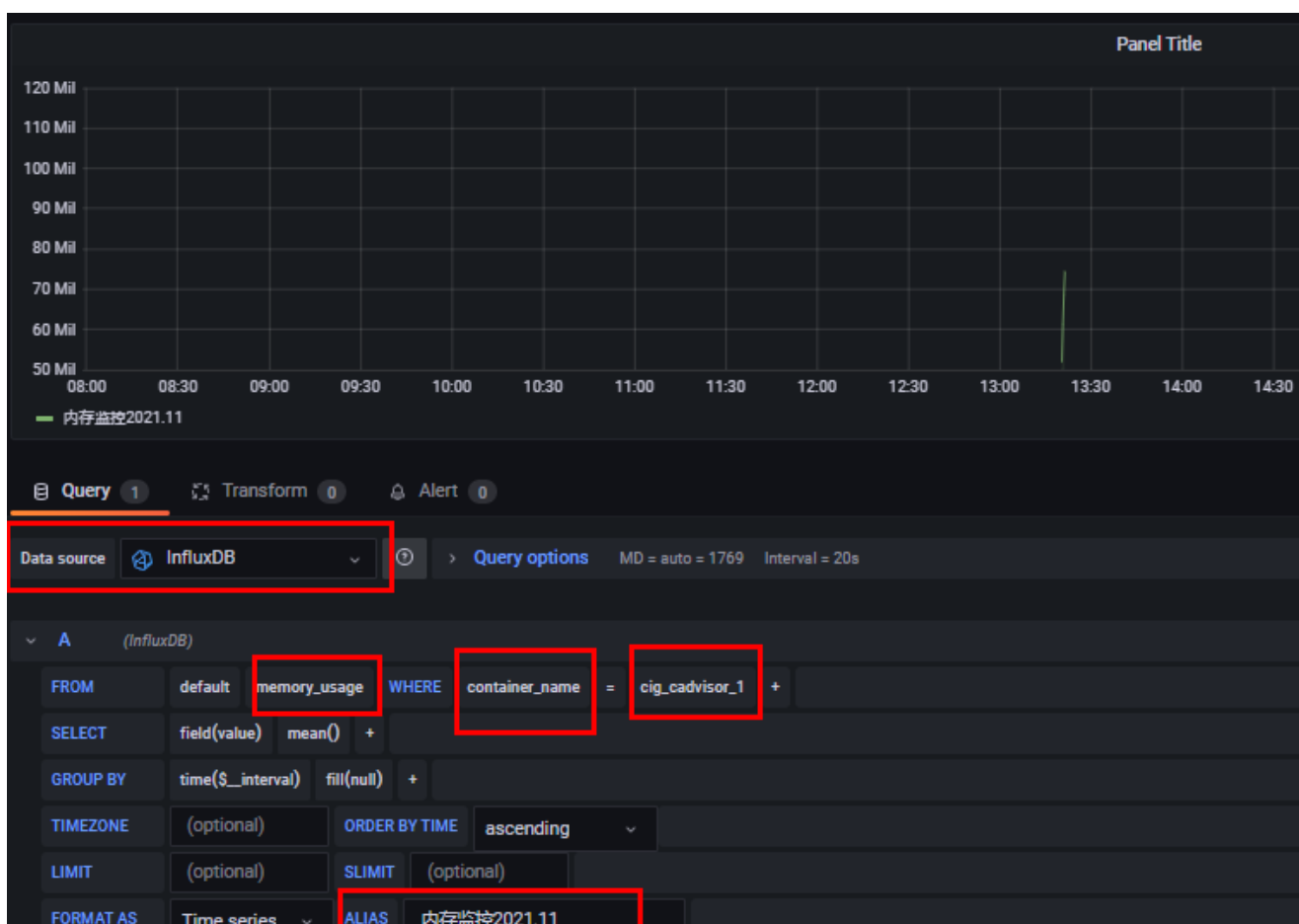
#### 4. 配置面板panel



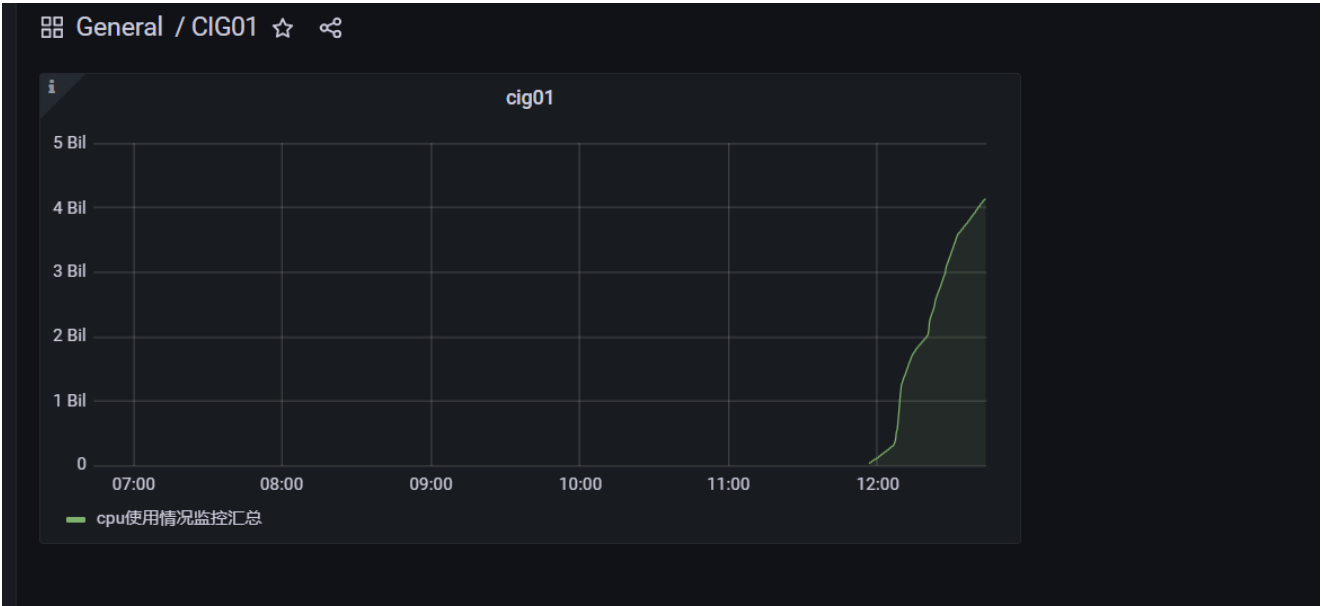




点进去配置监控维度



点击Save保存，回到面板就能看到



至此监控配置完成