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AOS8, InfluxDB and Grafana Analytics

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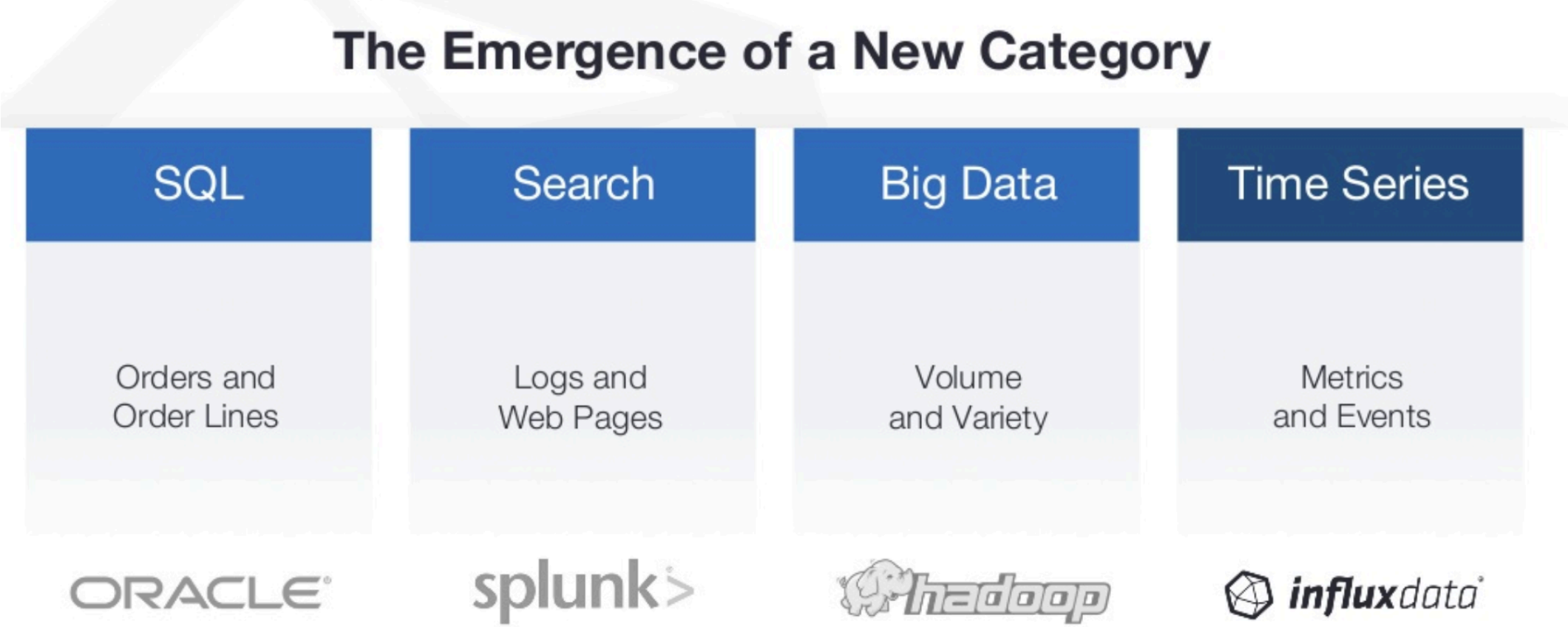
October 2018

Why InfluxDB?



https://www.slideshare.net/influxdata/roadshow-september-2018

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Why Grafana?

Get a complete picture with 30+ data sources

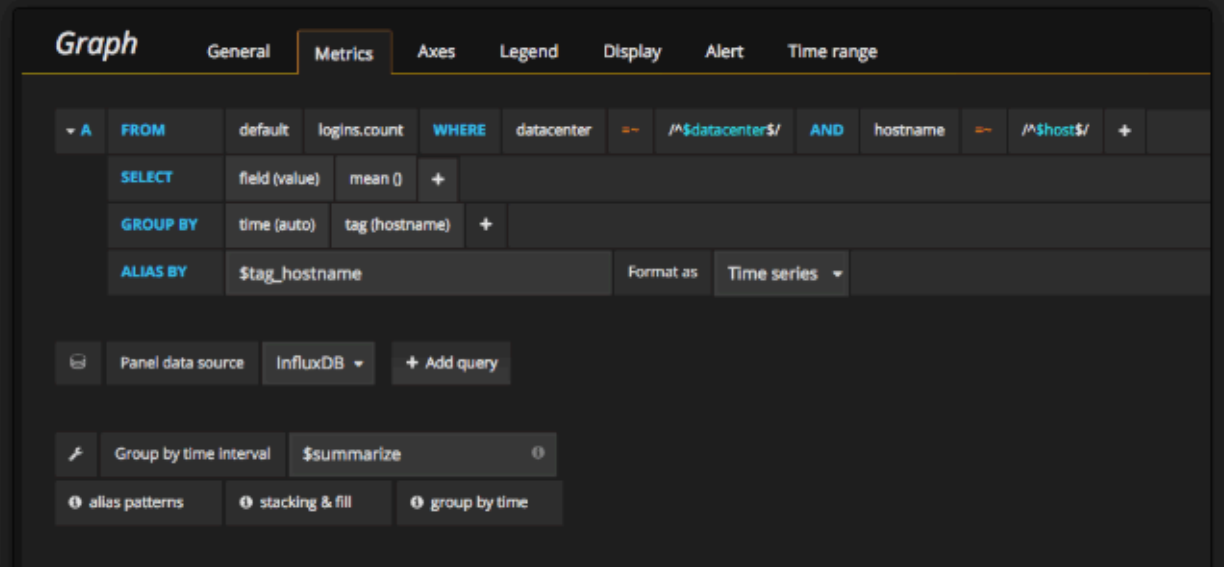
Grafana supports over 30 open source and commercial data sources. Pull together your data wherever it lives, and build the perfect dashboard.

graphite | influxdb | Prometheus | elasticsearch | AWS CloudWatch | And more...

Built-in InfluxDB Support

- Rich query editor with measurement, tag and tag value completion
- Automatic handling of group by time
- Templating queries for generic dashboards
- Alias patterns for short readable series names
- Ad hoc filters for exploration dashboards

Get Grafana | Read more about InfluxDB



https://grafana.com/grafana?feature=DS_InfluxDB

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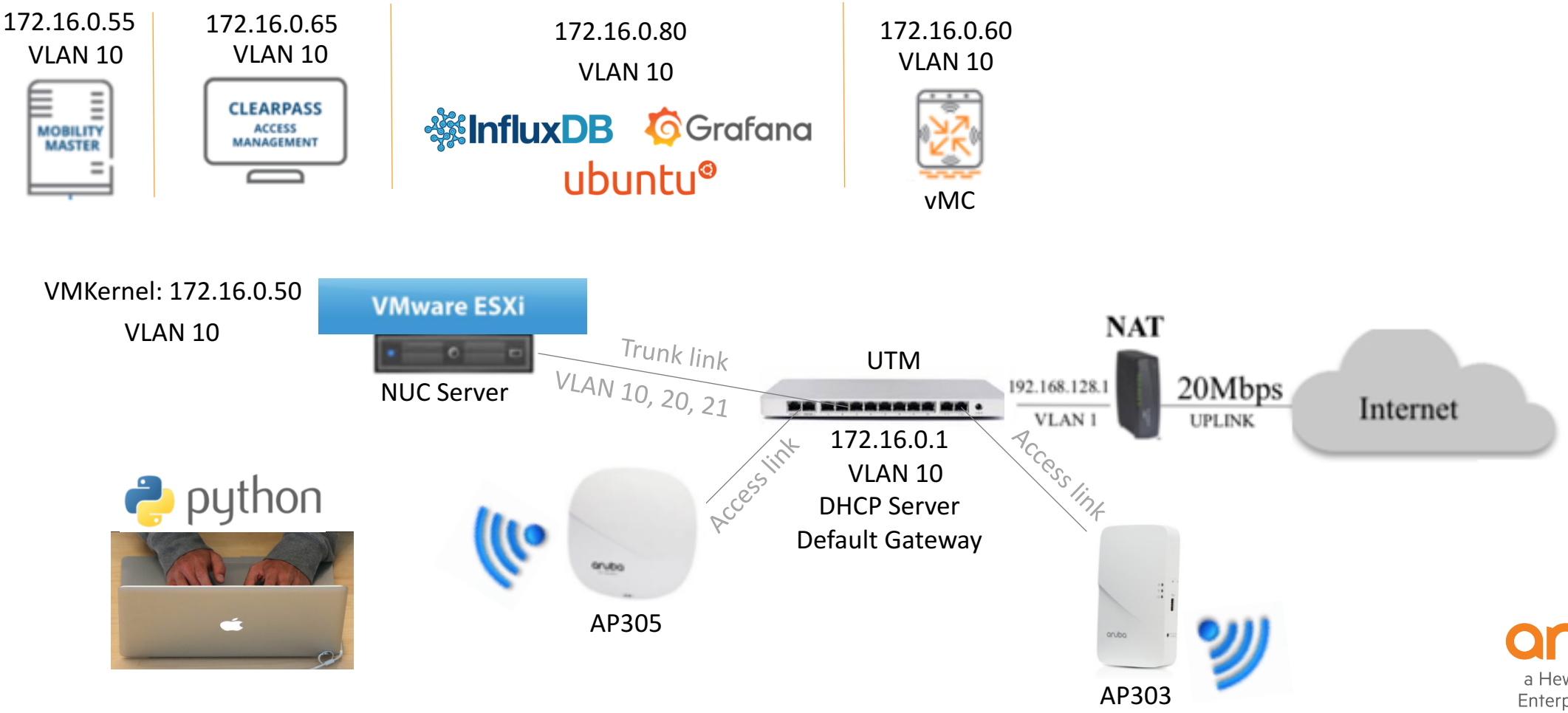
Physical Diagram



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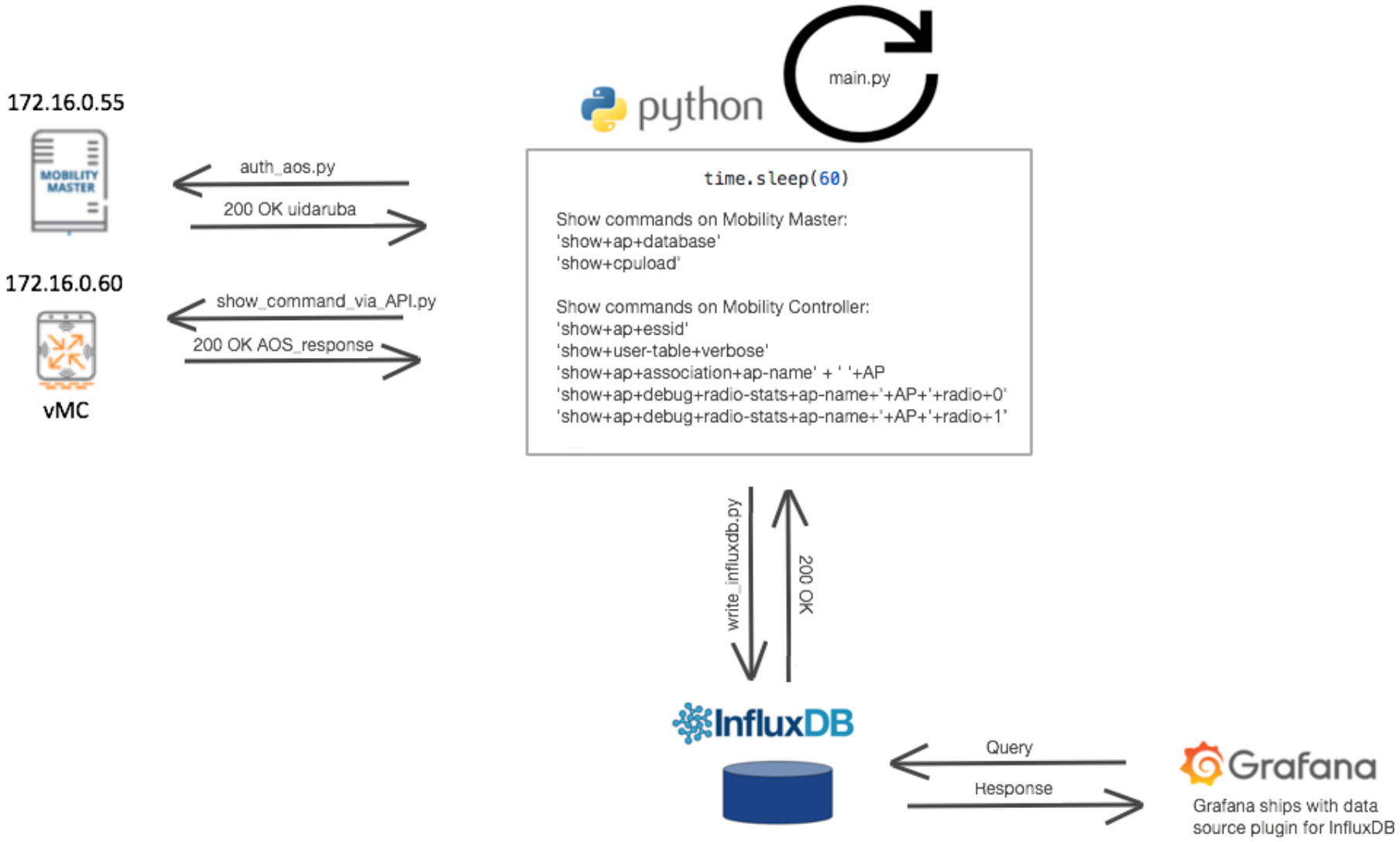
Logical Diagram



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NUC Server

- NUC7i5BNH Core i5
- HyperX 16GB Kit of 2 (2x8GB) 2133MHz DDR4
- Samsung 960 EVO Series - 250GB PCIe NVMe
- Seagate Firecuda Gaming 1TB 2.5-Inch SATA 6GB/s 5400rpm - ST1000LX015

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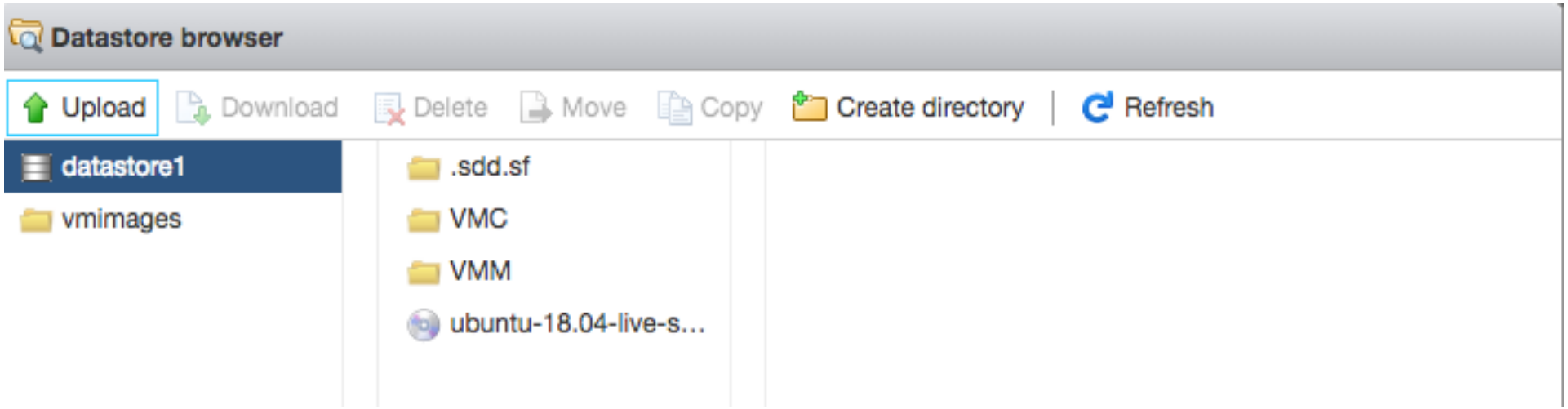
Install Ubuntu Server

Ubuntu – ISO file to datastore

Upload the ISO file to datastore



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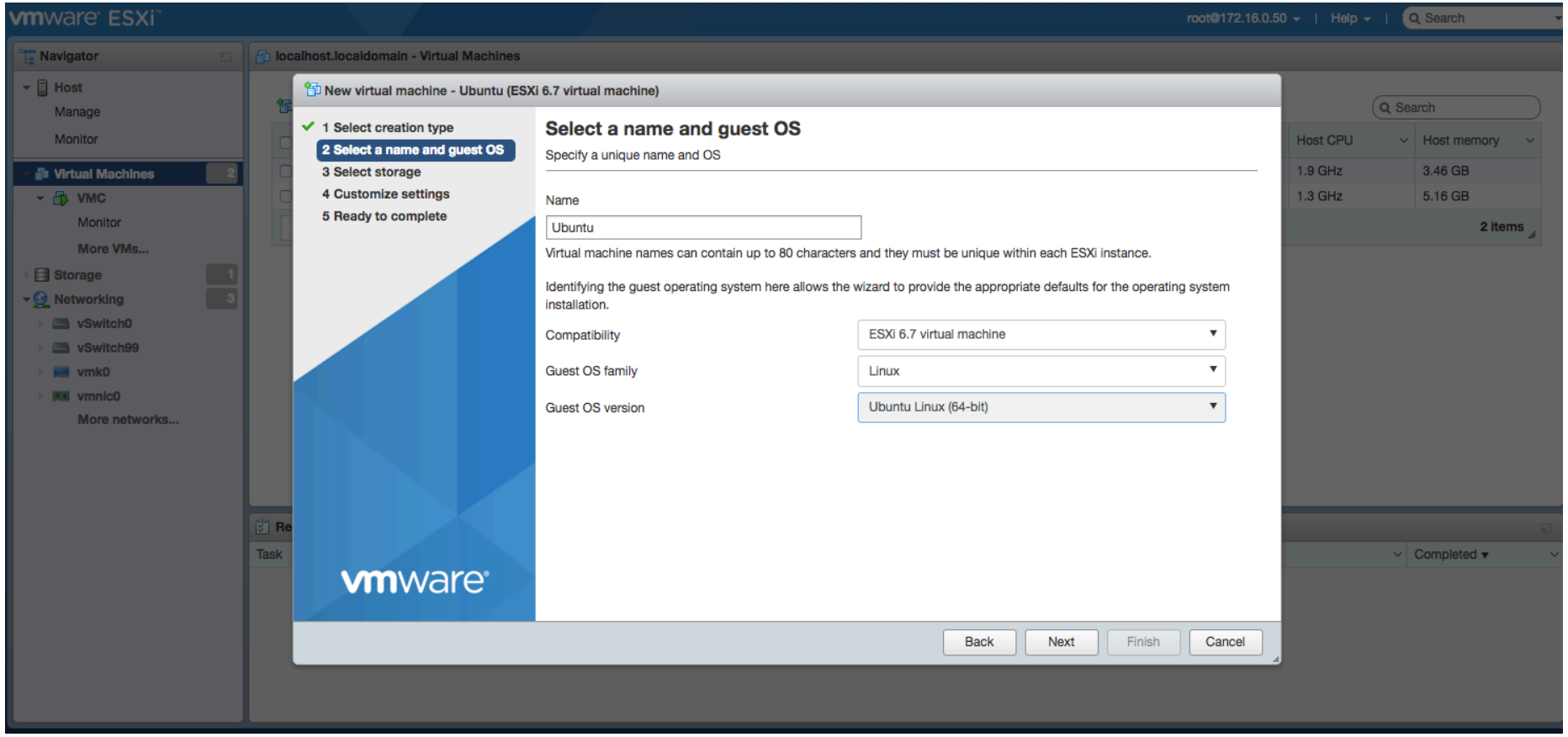
Create the Ubuntu VM



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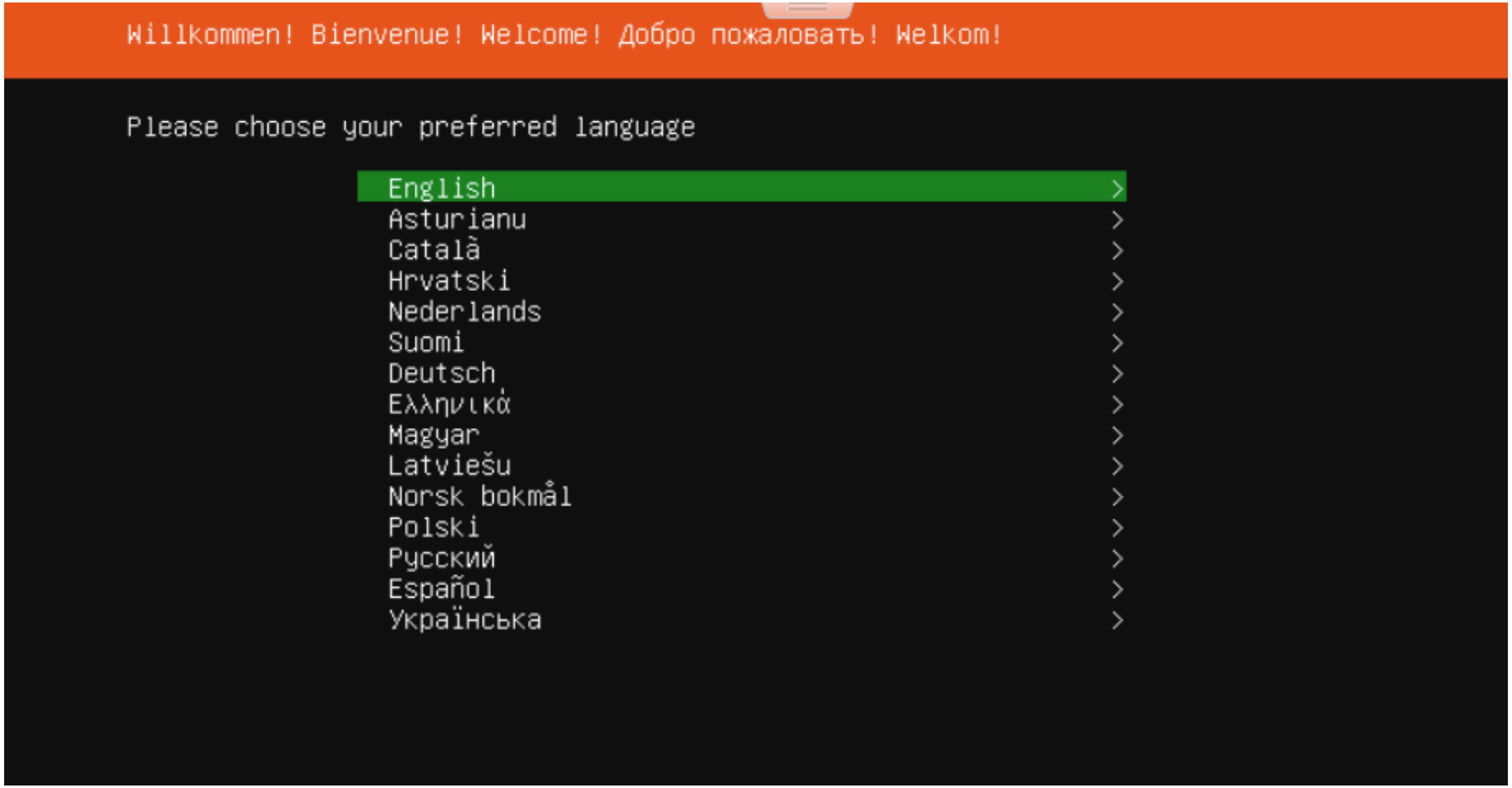
Ubuntu– Power on the VM



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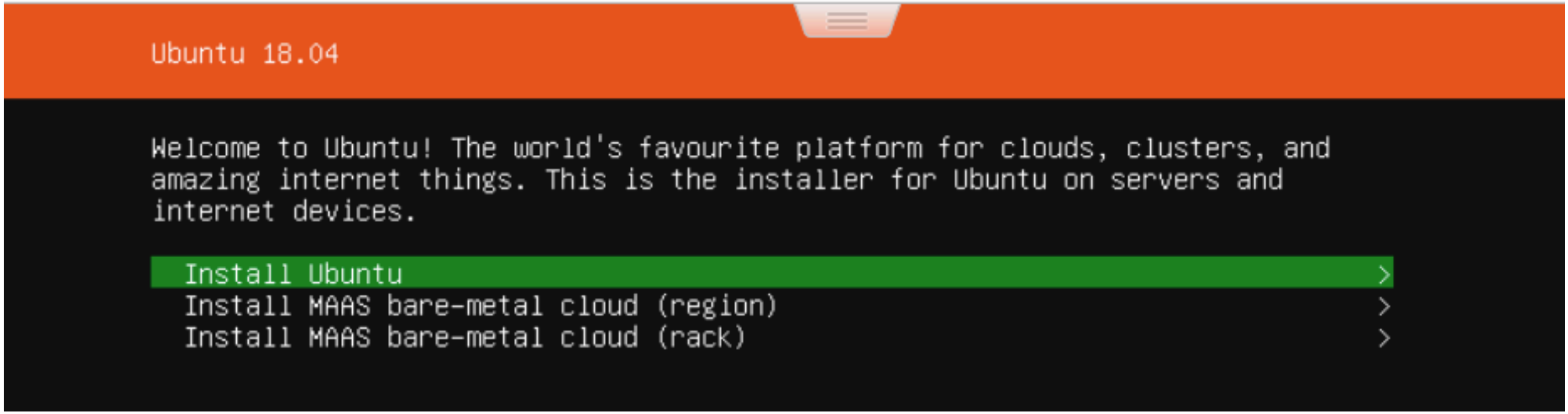
Choose install Ubuntu



Ubuntu– Set network parameters

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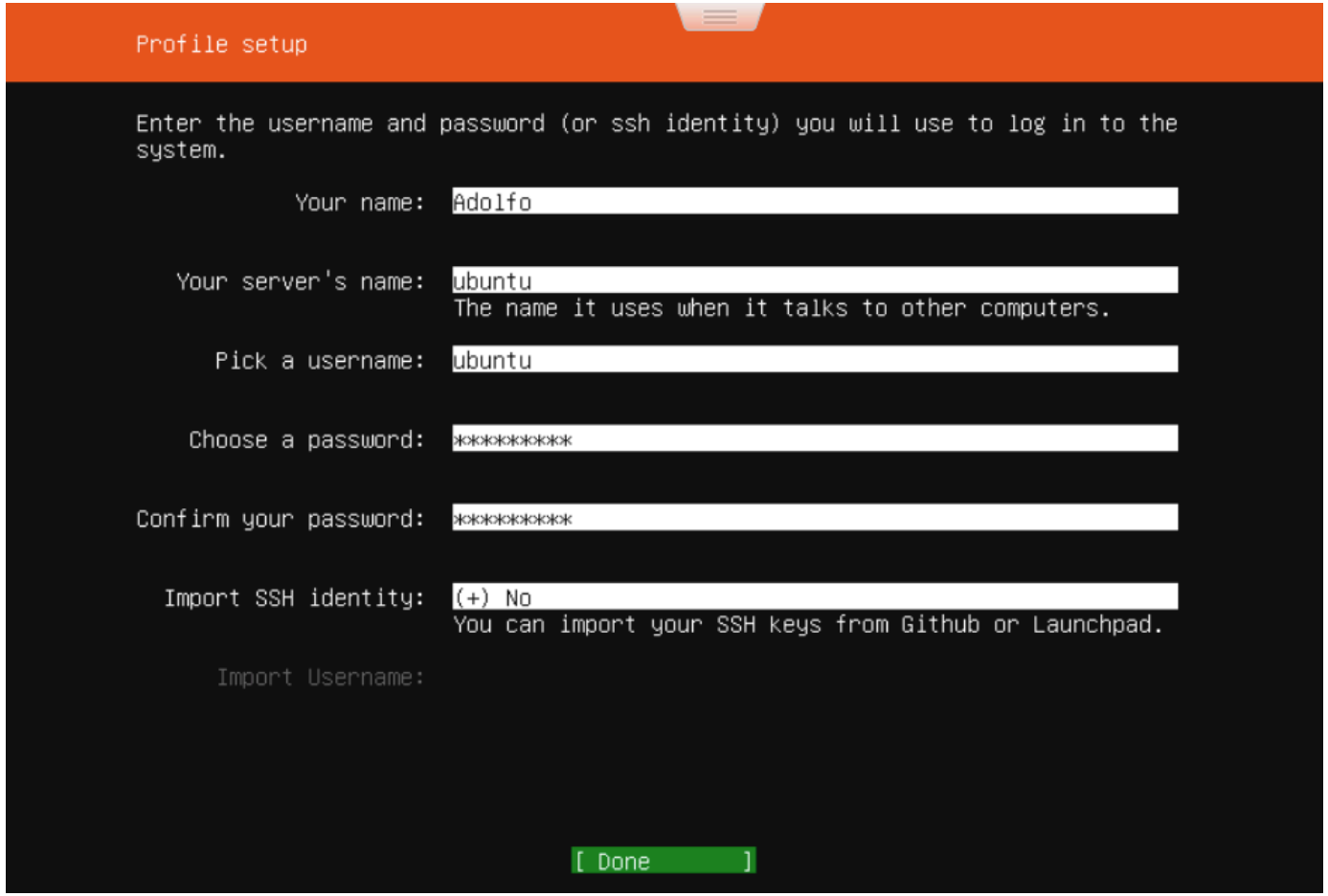
Ubuntu– create root / password



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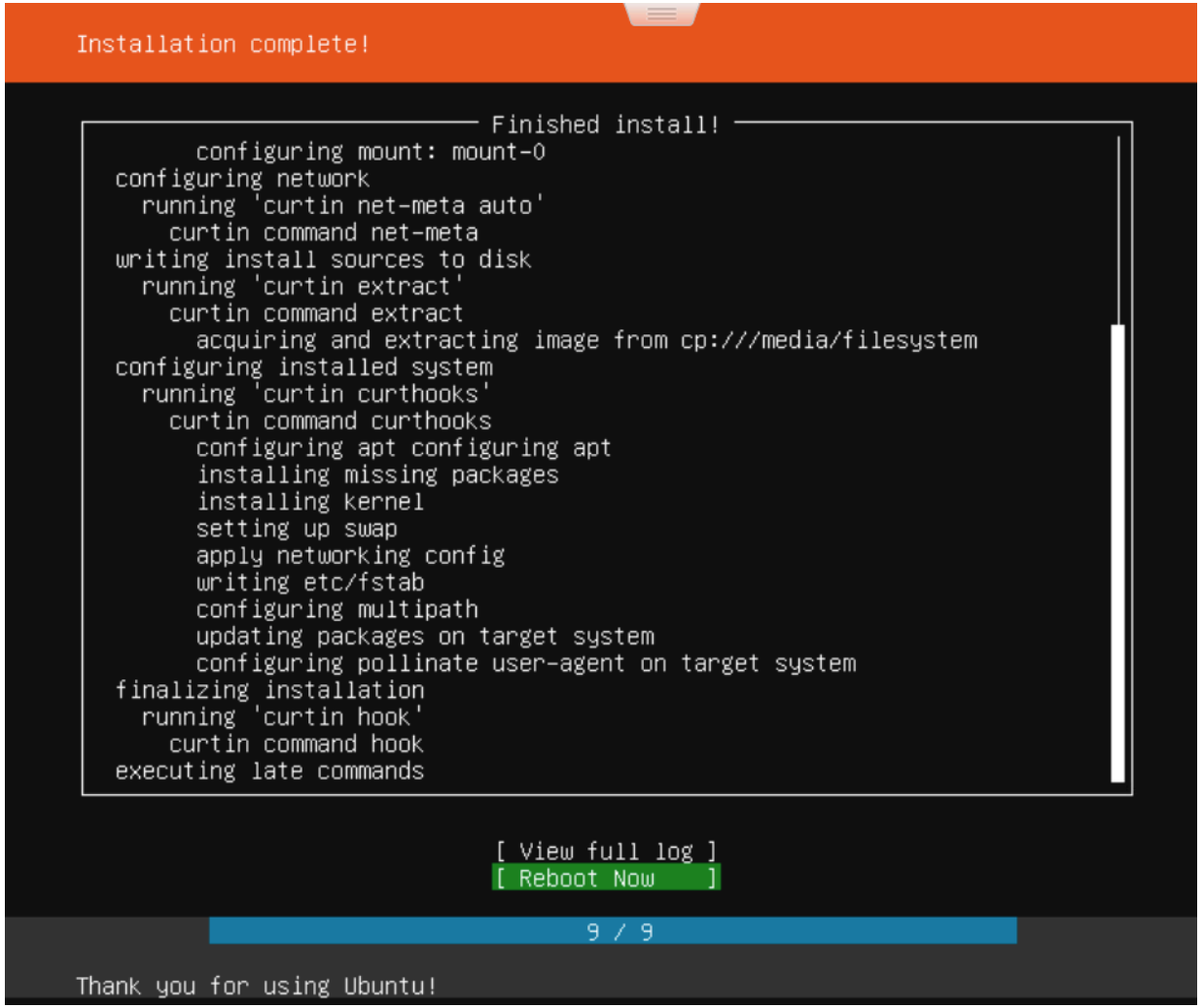
Ubuntu– Reboot VM after installation



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Ubuntu– Remove installation medium

```
[  OK  ] Stopped Load/Save Random Seed.
[  OK  ] Unmounted /rofs.
[  OK  ] Unmounted /tmp.
[  OK  ] Stopped target Swap.
[  OK  ] Stopped Network Service.
[  OK  ] Stopped target Network (Pre).
[  OK  ] Stopped Apply Kernel Variables.
[  OK  ] Stopped Load Kernel Modules.
[  OK  ] Unmounted /target.
[  OK  ] Reached target Unmount All Filesystems.
[  OK  ] Stopped target Local File Systems (Pre).
[  OK  ] Stopped Remount Root and Kernel File Systems.
[  OK  ] Stopped Create Static Device Nodes in /dev.
[  OK  ] Reached target Shutdown.
         Starting Shuts down the "live" preinstalled system cleanly...
         Stopping Monitoring of LVM2 mirrors, snapshots etc. using dmeventd or progress polling...
[  OK  ] Stopped Monitoring of LVM2 mirrors, snapshots etc. using dmeventd or progress polling.
         Stopping LVM2 metadata daemon...
[  OK  ] Stopped LVM2 metadata daemon.
Please remove the installation medium, then press ENTER:
```

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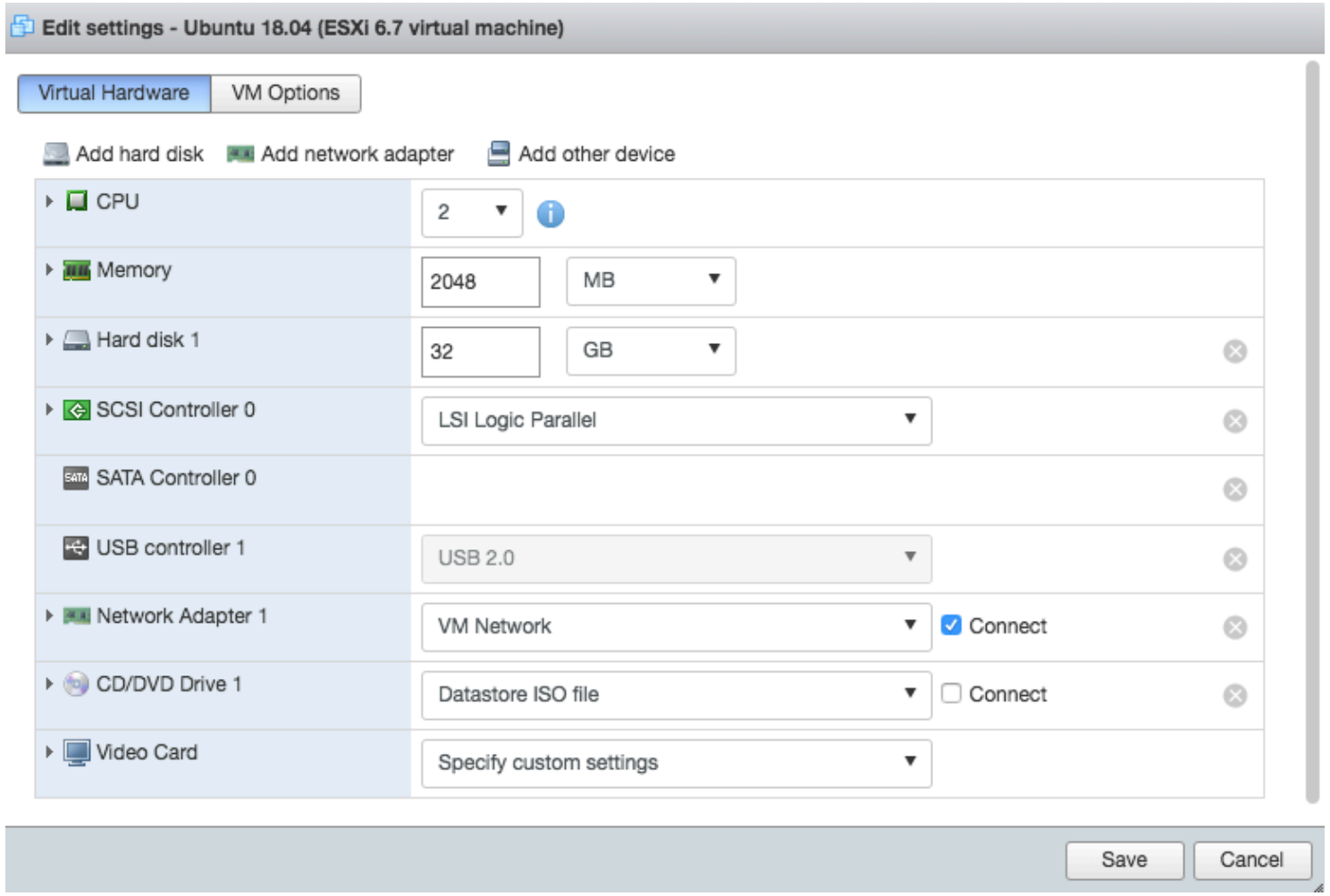
Ubuntu– Disconnect the CD/DVD Drive



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Ubuntu– Server ready!

```
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-36-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Mon Oct 29 13:48:33 UTC 2018

  System load:  0.52               Processes:             194
  Usage of /:   16.1% of 31.37GB   Users logged in:       0
  Memory usage: 18%                IP address for ens160: 172.16.0.80
  Swap usage:   0%

 * Security certifications for Ubuntu!
   We now have FIPS, STIG, CC and a CIS Benchmark.

   - http://bit.ly/Security_Certification

 * Want to make a highly secure kiosk, smart display or touchscreen?
   Here's a step-by-step tutorial for a rainy weekend, or a startup.

   - https://bit.ly/secure-kiosk


41 packages can be updated.
0 updates are security updates.
```

```
ubuntu@ubuntu:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 18.04.1 LTS
Release:        18.04
Codename:       bionic
ubuntu@ubuntu:~$
```

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Install InfluxDB

http://www.andremiller.net/content/grafana-and-influxdb-quickstart-on-ubuntu

https://docs.influxdata.com/influxdb/v1.6/introduction/installation/

Upgrade packages

```
ubuntu@ubuntu:~$ sudo apt-get update
[sudo] password for ubuntu:
Hit:1 http://archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:3 http://archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu bionic-backports InRelease
Reading package lists... Done
ubuntu@ubuntu:~$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
```

Add the InfluxData repository

```
ubuntu@ubuntu:~$ curl -sL https://repos.influxdata.com/influxdb.key | sudo apt-key add -
OK
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ source /etc/lsb-release
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ echo "deb https://repos.influxdata.com/${DISTRIB_ID,,} ${DISTRIB_CODENAME} stable" | sudo tee /etc/apt/sources.list.d/influxdb.list
deb https://repos.influxdata.com/ubuntu bionic stable
ubuntu@ubuntu:~$ _
```

https://docs.influxdata.com/influxdb/v1.6/introduction/installation/

Install the InfluxDB service:

```
ubuntu@ubuntu:~$ sudo apt-get update && sudo apt-get install influxdb
Hit:1 http://archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:3 http://archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu bionic-backports InRelease
Get:5 https://repos.influxdata.com/ubuntu bionic InRelease [4,731 B]
Get:6 https://repos.influxdata.com/ubuntu bionic/stable amd64 Packages [921 B]
Fetched 5,652 B in 1s (5,336 B/s)
Reading package lists... Done
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-4.15.0-20 linux-headers-4.15.0-20-generic linux-image-4.15.0-20-generic linux-modules-4.15.0-20-generic linux-modules-extra-4.15.0-20-generic
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  influxdb
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 24.9 MB of archives.
After this operation, 81.0 MB of additional disk space will be used.
Get:1 https://repos.influxdata.com/ubuntu bionic/stable amd64 influxdb amd64 1.6.3-1 [24.9 MB]
Fetched 24.9 MB in 4s (5,619 kB/s)
Selecting previously unselected package influxdb.
(Reading database ... 137891 files and directories currently installed.)
Preparing to unpack .../influxdb_1.6.3-1_amd64.deb ...
Unpacking influxdb (1.6.3-1) ...
Setting up influxdb (1.6.3-1) ...
Created symlink /etc/systemd/system/influxd.service → /lib/systemd/system/influxdb.service.
Created symlink /etc/systemd/system/multi-user.target.wants/influxdb.service → /lib/systemd/system/influxdb.service.
Processing triggers for man-db (2.8.3-2) ...
ubuntu@ubuntu:~$
```

https://docs.influxdata.com/influxdb/v1.6/introduction/installation/

Start the InfluxDB service:

```
ubuntu@ubuntu:~$ sudo service influxdb start
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$ sudo service influxdb status
● influxdb.service - InfluxDB is an open-source, distributed, time series database
   Loaded: loaded (/lib/systemd/system/influxdb.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2018-10-05 20:15:34 UTC; 7s ago
     Docs: https://docs.influxdata.com/influxdb/
 Main PID: 30191 (influxd)
    Tasks: 10 (limit: 2321)
   CGroup: /system.slice/influxdb.service
           └─30191 /usr/bin/influxd -config /etc/influxdb/influxdb.conf

Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961516Z lvl=info msg="Starting precreation service" log_id=0AyTmakl000 service=shard-precreation check_interval=10m advance_period=30m
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961531Z lvl=info msg="Starting snapshot service" log_id=0AyTmakl000 service=snapshot
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961539Z lvl=info msg="Starting continuous query service" log_id=0AyTmakl000 service=continuous_querier
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961550Z lvl=info msg="Starting HTTP service" log_id=0AyTmakl000 service=httpd authentication=false
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961555Z lvl=info msg="opened HTTP access log" log_id=0AyTmakl000 service=httpd path=stderr
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961560Z lvl=info msg="Storing statistics" log_id=0AyTmakl000 service=monitor db_instance=_internal db_rp=monitor interval=10s
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961670Z lvl=info msg="Listening on HTTP" log_id=0AyTmakl000 service=httpd addr=[::]:8086 https=false
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961690Z lvl=info msg="Starting retention policy enforcement service" log_id=0AyTmakl000 service=retention check_interval=30m
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.961878Z lvl=info msg="Sending usage statistics to usage.influxdata.com" log_id=0AyTmakl000
Oct 05 20:15:34 ubuntu influxd[30191]: ts=2018-10-05T20:15:34.962979Z lvl=info msg="Listening for signals" log_id=0AyTmakl000
ubuntu@ubuntu:~$
```

https://docs.influxdata.com/influxdb/v1.6/introduction/installation/

Create users “root” and “grafana” in InfluxDB:

```
ubuntu@ubuntu:~$ influx
Connected to http://localhost:8086 version 1.6.3
InfluxDB shell version: 1.6.3
>
> CREATE DATABASE example
>
> use example
Using database example
```

```
> CREATE USER "grafana" WITH PASSWORD 'Aruba123!'
> CREATE USER "root" WITH PASSWORD 'Aruba123!'
> GRANT READ ON example to grafana
> GRANT ALL ON example TO root
```

```
> show users
user    admin
----    -----
grafana false
root    false
```

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Install Grafana

http://docs.grafana.org/installation/debian/

https://grafana.com/grafana/download

Download Grafana v5.2.4

```
ubuntu@ubuntu:~$ wget https://s3-us-west-2.amazonaws.com/grafana-releases/release/grafana_5.2.4_amd64.deb
--2018-10-05 21:12:29--  https://s3-us-west-2.amazonaws.com/grafana-releases/release/grafana_5.2.4_amd64.deb
Resolving s3-us-west-2.amazonaws.com (s3-us-west-2.amazonaws.com)... 54.231.168.216
Connecting to s3-us-west-2.amazonaws.com (s3-us-west-2.amazonaws.com)|54.231.168.216|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 54491294 (52M) [application/x-debian-package]
Saving to: 'grafana_5.2.4_amd64.deb'

grafana_5.2.4_amd64.deb                             100%[===================================================================================================>]  51.97M  5.93MB/s    in 17s

2018-10-05 21:12:48 (3.01 MB/s) - 'grafana_5.2.4_amd64.deb' saved [54491294/54491294]

ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ sudo apt-get install -y adduser libfontconfig
[sudo] password for ubuntu:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'libfontconfig1' instead of 'libfontconfig'
adduser is already the newest version (3.116ubuntu1).
```

Install Grafana v5.2.4

```
ubuntu@ubuntu:~$ sudo dpkg -i grafana_5.2.4_amd64.deb
Selecting previously unselected package grafana.
(Reading database ... 138033 files and directories currently installed.)
Preparing to unpack grafana_5.2.4_amd64.deb ...
Unpacking grafana (5.2.4) ...
Setting up grafana (5.2.4) ...
Adding system user `grafana' (UID 113) ...
Adding new user `grafana' (UID 113) with group `grafana' ...
Not creating home directory `/usr/share/grafana'.
### NOT starting on installation, please execute the following statements to configure grafana to start automatically using systemd
 sudo /bin/systemctl daemon-reload
 sudo /bin/systemctl enable grafana-server
### You can start grafana-server by executing
 sudo /bin/systemctl start grafana-server
Processing triggers for systemd (237-3ubuntu10.3) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ubuntu:~$ _
```

Check firewall and allow TCP port 3000

```
ubuntu@ubuntu:~$ service ufw status
● ufw.service - Uncomplicated firewall
   Loaded: loaded (/lib/systemd/system/ufw.service; enabled; vendor preset: enabled)
   Active: active (exited) since Fri 2018-10-05 19:51:13 UTC; 1h 35min ago
     Docs: man:ufw(8)
 Main PID: 477 (code=exited, status=0/SUCCESS)
    Tasks: 0 (limit: 2321)
   CGroup: /system.slice/ufw.service

Warning: Journal has been rotated since unit was started. Log output is incomplete or unavailable.
ubuntu@ubuntu:~$
```

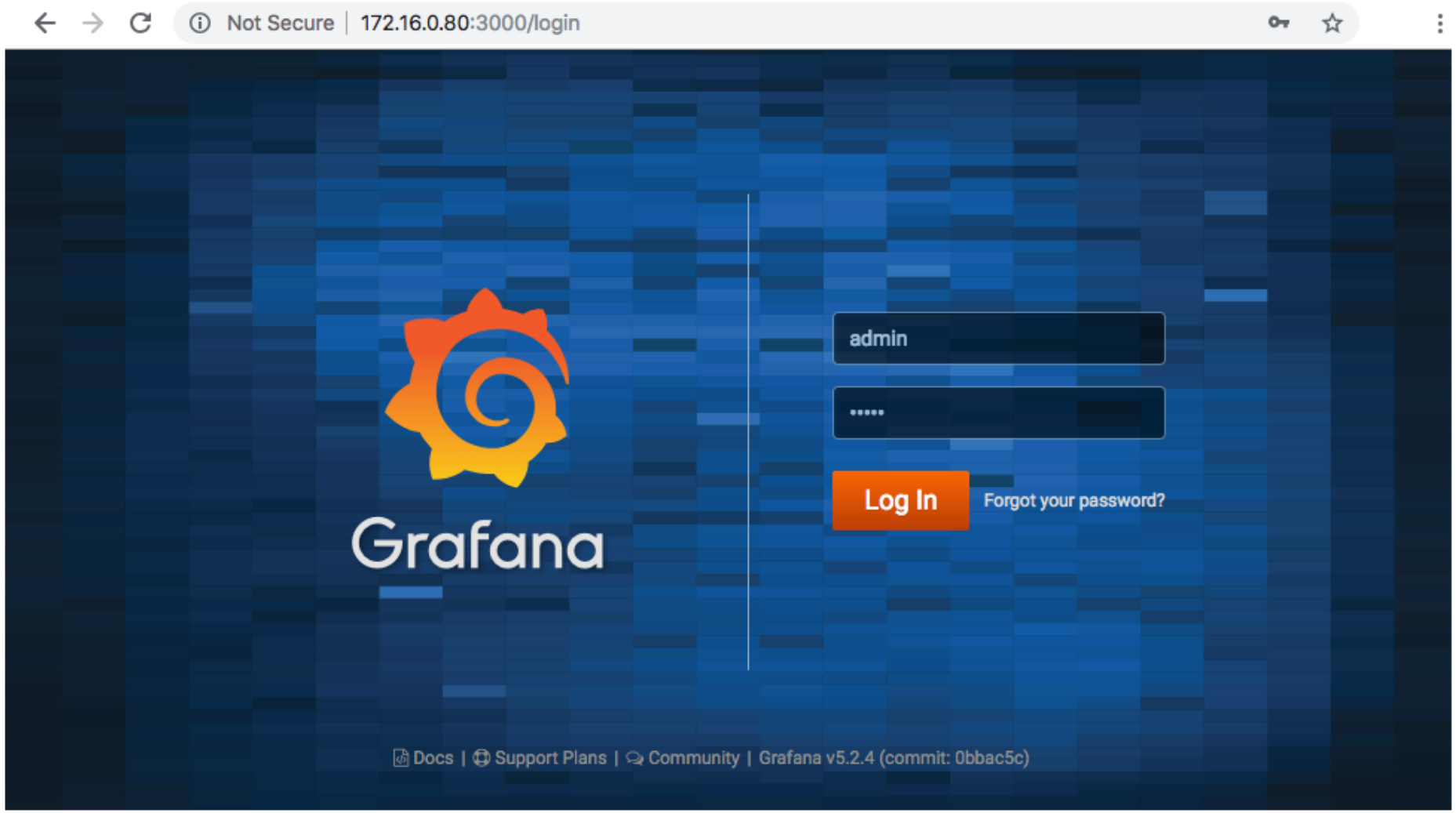
```
ubuntu@ubuntu:~$ sudo ufw allow 3000/tcp
Rules updated
Rules updated (v6)
ubuntu@ubuntu:~$
```

Start Grafana service

```
ubuntu@ubuntu:~$  sudo /bin/systemctl daemon-reload
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$ sudo /bin/systemctl enable grafana-server
Synchronizing state of grafana-server.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable grafana-server
Created symlink /etc/systemd/system/multi-user.target.wants/grafana-server.service → /usr/lib/systemd/system/grafana-server.service.
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$ sudo /bin/systemctl start grafana-server
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ service grafana-server status
● grafana-server.service - Grafana instance
   Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2018-10-05 21:31:20 UTC; 9s ago
     Docs: http://docs.grafana.org
 Main PID: 30627 (grafana-server)
    Tasks: 9 (limit: 2321)
```

Test Grafana - username/password: admin/admin



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Connect InfluxDB to Grafana

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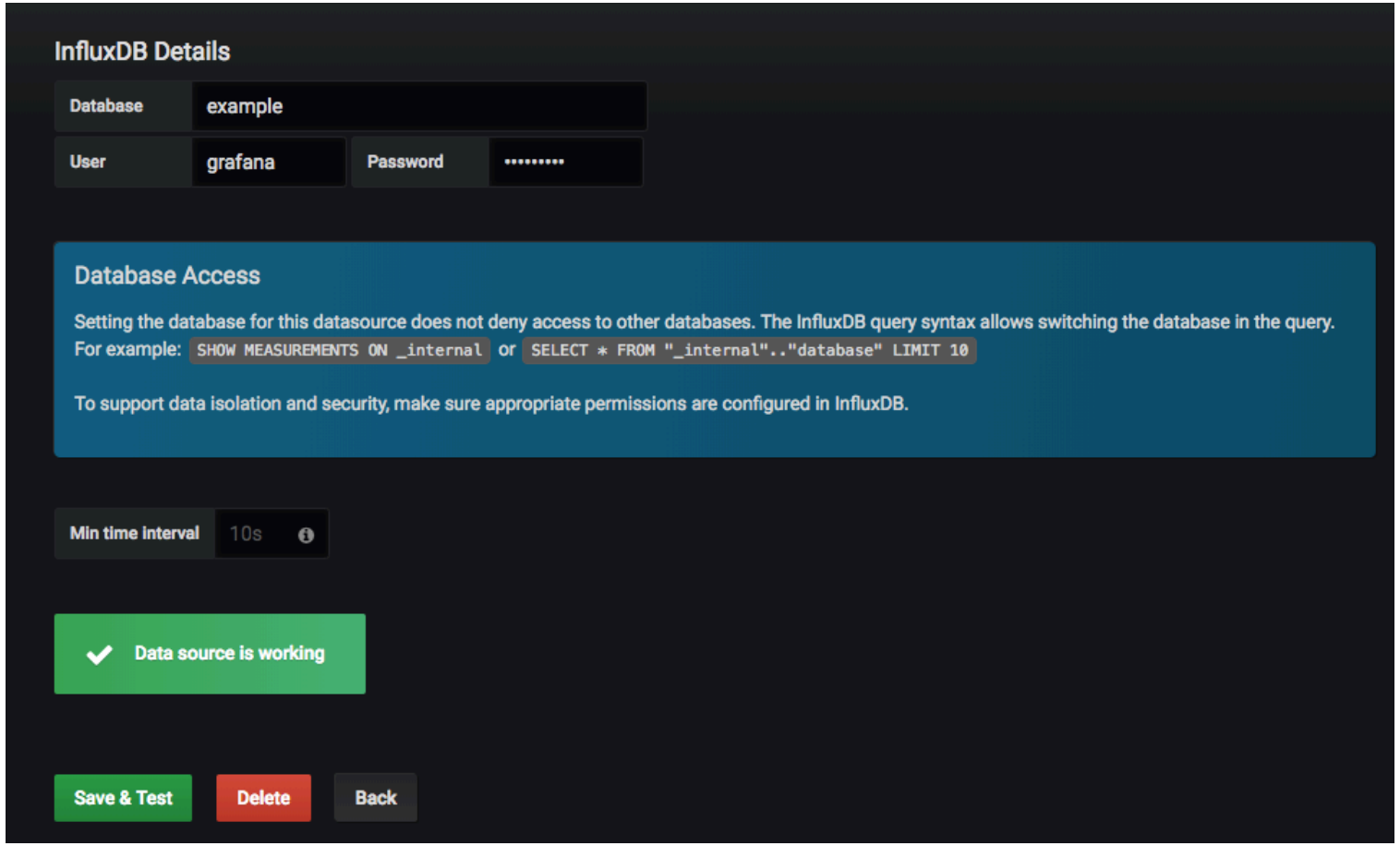
Enter a database from InfluxDB



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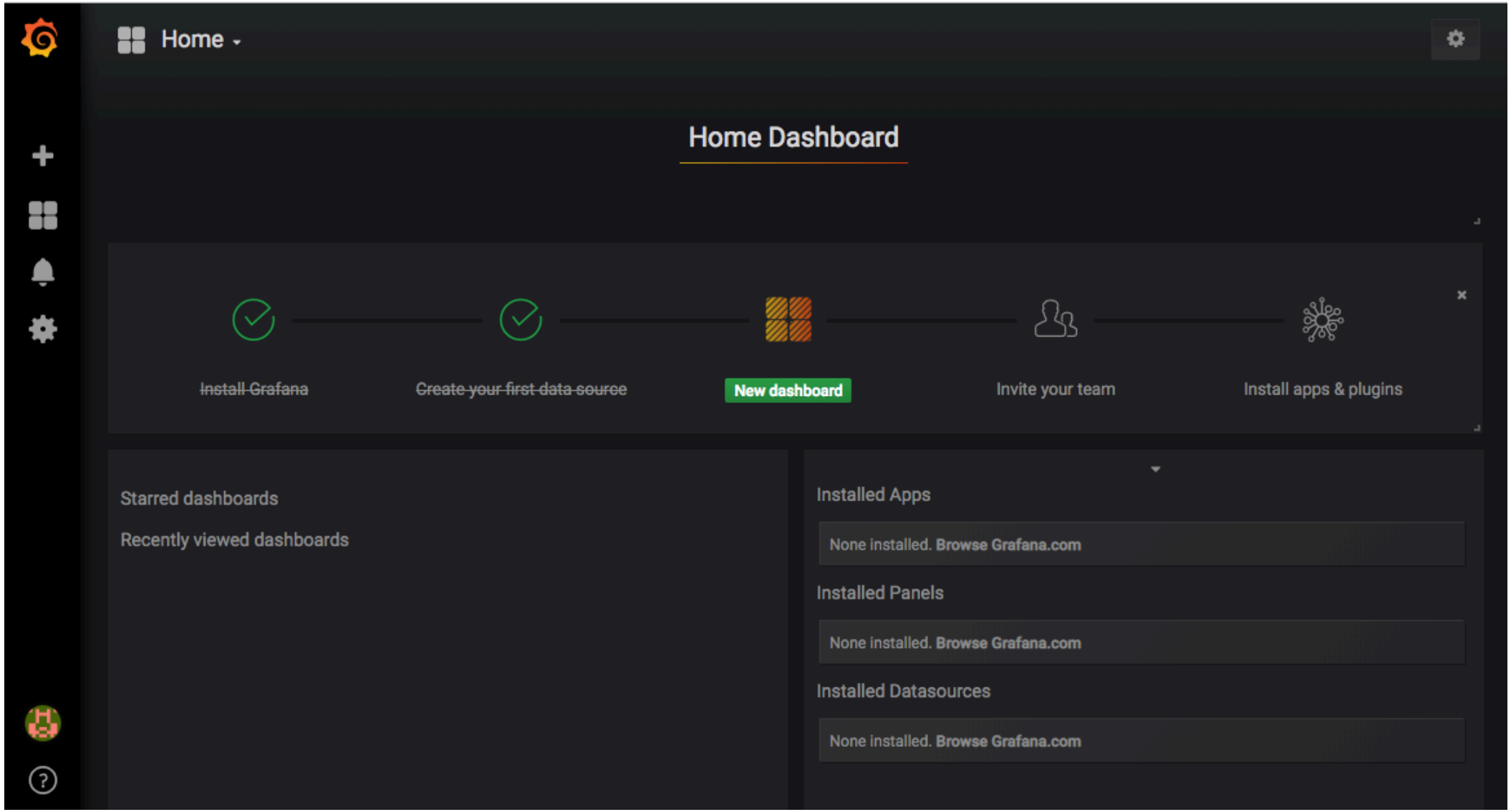

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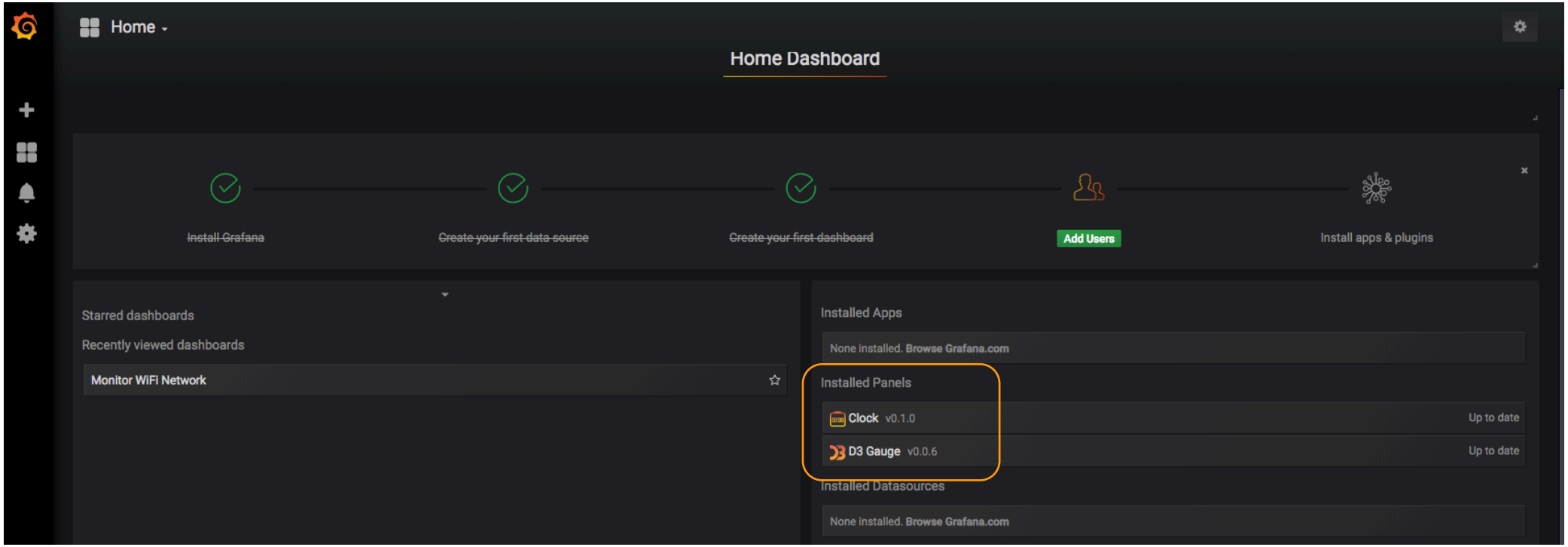
Install D3-based Gauge and Clock panel for Grafana

```
ubuntu@ubuntu:~$ sudo chmod 777 /var/lib/grafana/plugins
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$ grafana-cli plugins install briangann-gauge-panel
installing briangann-gauge-panel @ 0.0.6
from url: https://grafana.com/api/plugins/briangann-gauge-panel/versions/0.0.6/download
into: /var/lib/grafana/plugins

✔ Installed briangann-gauge-panel successfully

Restart grafana after installing plugins . <service grafana-server restart>

ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ grafana-cli plugins install grafana-clock-panel
installing grafana-clock-panel @ 0.1.0
from url: https://grafana.com/api/plugins/grafana-clock-panel/versions/0.1.0/download
into: /var/lib/grafana/plugins

✔ Installed grafana-clock-panel successfully

Restart grafana after installing plugins . <service grafana-server restart>

ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ service grafana-server restart
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ===
Authentication is required to restart 'grafana-server.service'.
Authenticating as: Adolfo (ubuntu)
Password:
==== AUTHENTICATION COMPLETE ===
ubuntu@ubuntu:~$
```

D3-based Gauge and Clock panel installed



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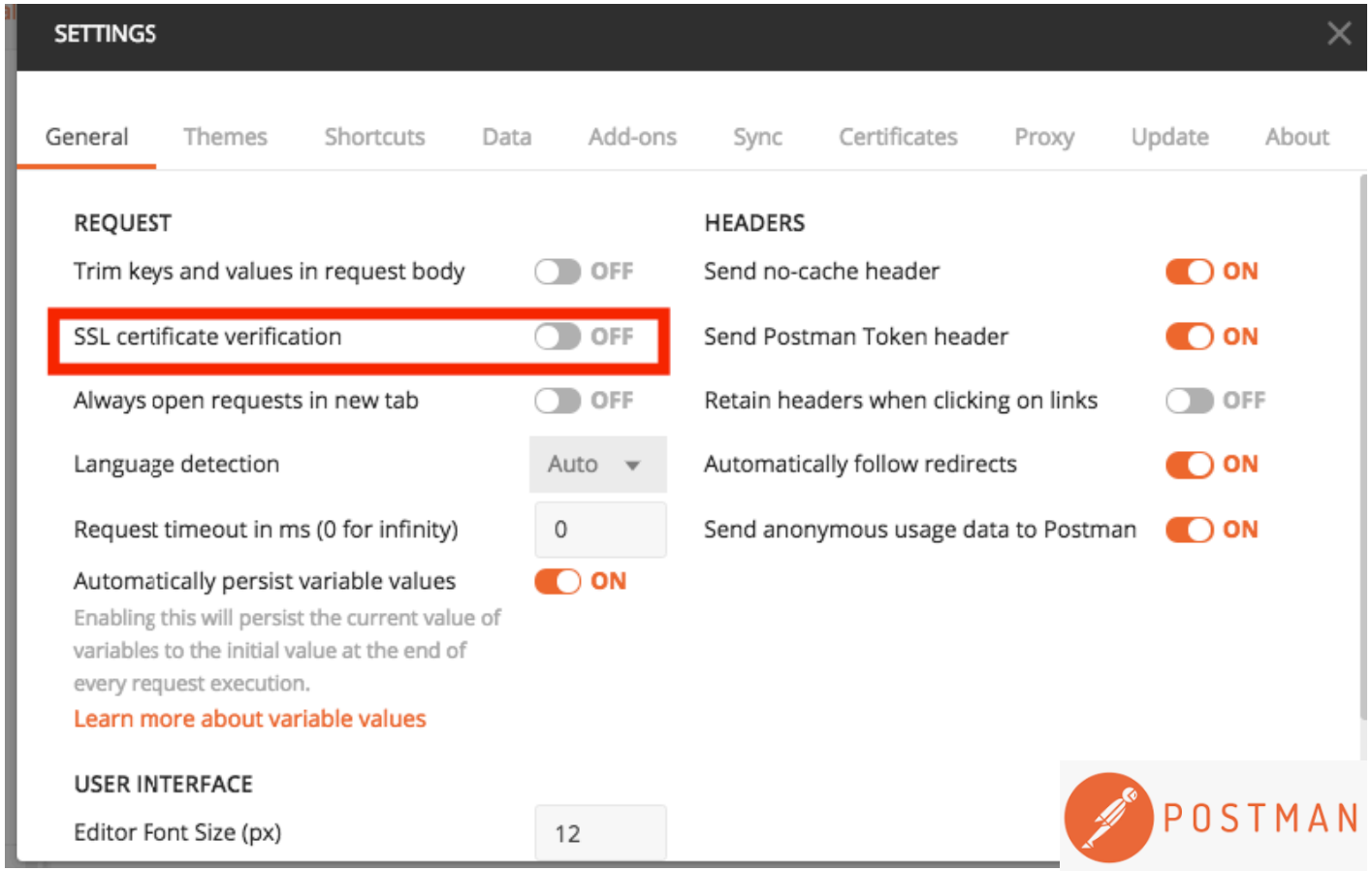
Task: Test REST APIs – Mobility Master

Turn off SSL verification



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Get the UIDARUBA

https://172.16.0.55:4343/v1/api/login

https://172.16.0.55:4343/v1/api/login

POST https://172.16.0.55:4343/v1/api/login Send Save

Params Authorization Headers (1) Body Pre-request Script Tests Cookies Code

KEY	VALUE	DESCRIPTION
Content-Type	application/json	
Key	Value	Description

Bulk Edit Presets

Body Cookies (2) Headers (11) Test Results Status: 200 OK Time: 22 ms Size: 547 B Download

Params Authorization Headers (1) Body Pre-request Script Tests Cookies Code

form-data x-www-form-urlencoded raw binary JSON (application/json)

```
1 username=admin&password=Aruba123!
```

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Answer from Mobility Master

Body | Cookies (2) | Headers (11) | Test Results

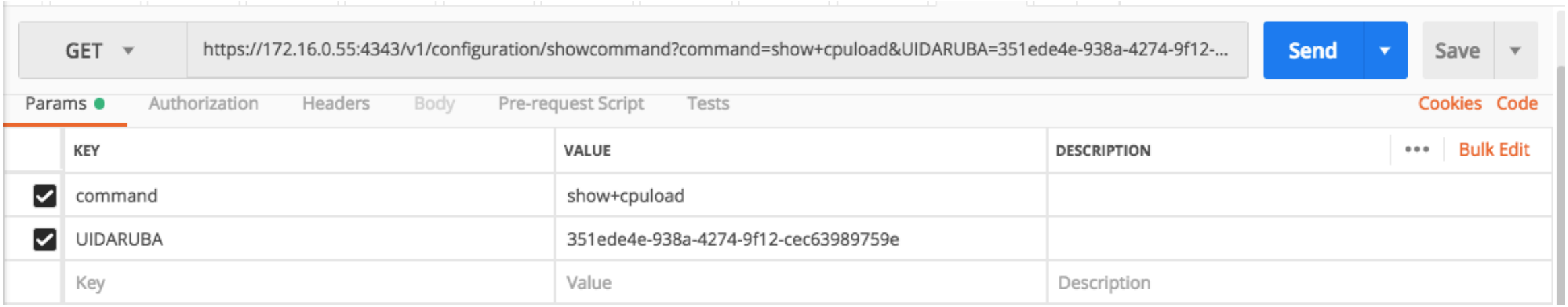
Status: 200 OK | Time: 32 ms | Size: 547 B | Download

Pretty | Raw | Preview | JSON


```
{
    "_global_result": {
        "status": "0",
        "status_str": "You've logged in successfully.",
        "UIDARUBA": "886b81b1-2dd4-4863-8cb3-f793365f9bdf"
    }
}
```

Testing the “show cpuload” command

https://172.16.0.55:4343/v1/configuration/showcommand?command=show+cpuload&UIDARUBA=351ede4e-938a-4274-9f12-cec63989759e



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Answer from Mobility Master

Body | Cookies (2) | Headers (11) | Test Results

Status: 200 OK | Time: 30 ms | Size: 412 B | Download

Pretty | Raw | Preview

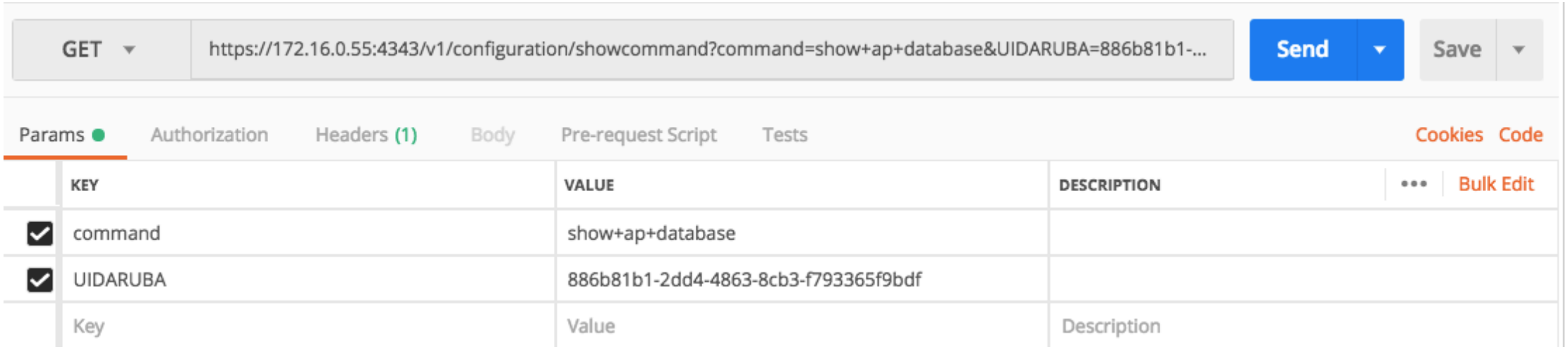

```
{
  "_data": [
    "user 1.9%, system 1.2%, idle 96.9%"
  ]
}
```


```
(ArubaMM-VA) [mynode] #show cpuload

user 1.9%, system 1.1%, idle 97.0%
(ArubaMM-VA) [mynode] #
```

Testing the “show ap database” command

https://172.16.0.55:4343/v1/configuration/showcommand?command=show+ap+database&UIDARUBA=ae5bfdab-8d5b-453a-95f5-1f68170f7931



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Answer from Mobility Master

Body | Cookies (2) | Headers (11) | Test Results

Status: 200 OK Time: 27 ms Size: 2.01 KB Download

Pretty | Raw | Preview | JSON


```
{
    "AP Radio Database": [
        {
            "AP Type": "303H",
            "Flags": "2",
            "Group": "default",
            "IP Address": "172.16.0.5",
            "Name": "AP303",
            "Radio 0 Mode/Chan/EIRP": "APVHT/149+/21.0",
            "Radio 1 Mode/Chan/EIRP": "APHT/11/12.0",
            "Standby IP": "0.0.0.0",
            "Status": "Up 22m:2s",
            "Switch IP": "172.16.0.60"
        },
        {
            "AP Type": "305",
            "Flags": "2",
            "Group": "default",
            "IP Address": "172.16.0.2",
            "Name": "AP305",
            "Radio 0 Mode/Chan/EIRP": "APVHT/153-/21.0",
            "Radio 1 Mode/Chan/EIRP": "APHT/6/12.0",
            "Standby IP": "0.0.0.0",
            "Status": "Up 6h:40m:4s",
            "Switch IP": "172.16.0.60"
        }
    ],
```


```
(ArubaMM-VA) [mynode] #show ap database

AP Database
-----------
Name   Group    AP Type  IP Address  Status         Flags  Switch IP    Standby IP
----   -----    -------  ----------  ------         -----  ---------    ----------
AP303  default  303H     172.16.0.5  Up 35m:13s     2      172.16.0.60  0.0.0.0
AP305  default  305      172.16.0.2  Up 6h:53m:15s  2      172.16.0.60  0.0.0.0
```

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Task: Test REST APIs – Mobility Controller

Get the UIDARUBA

https://172.16.0.60:4343/v1/api/login

POST https://172.16.0.60:4343/v1/api/login Send Save

Params Authorization Headers (1) Body Pre-request Script Tests Cookies Code

KEY	VALUE	DESCRIPTION
Content-Type	application/json	
Key	Value	Description

Bulk Edit Presets

Params Authorization Headers (1) Body Pre-request Script Tests Cookies Code

form-data x-www-form-urlencoded raw binary JSON (application/json)

```
1 username=admin&password=Aruba123!
```

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Answer from Mobility Controller

Body | Cookies (1) | Headers (11) | Test Results

Status: 200 OK | Time: 37 ms | Size: 547 B | Download

Pretty | Raw | Preview | JSON


```
{
    "_global_result": {
        "status": "0",
        "status_str": "You've logged in successfully.",
        "UIDARUBA": "d1e982c2-10cb-409b-ba41-da3182734c84"
    }
}
```

Testing the “show user-table verbose ” command

https://172.16.0.60:4343/v1/configuration/showcommand?command=show+user-table+verbose&UIDARUBA=55760062-512f-48f2-b2c2-5e3ed269345d

GET https://172.16.0.60:4343/v1/configuration/showcommand?command=show+user-table+verbose&UIDARUBA=55760062-512f-48f2-b2c2-5e... Send Save

Params Authorization Headers Body Pre-request Script Tests Cookies Code

	KEY	VALUE	DESCRIPTION
☑	command	show+user-table+verbose	
☑	UIDARUBA	55760062-512f-48f2-b2c2-5e3ed269345d	
	Key	Value	Description

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Answer from Mobility Controller

Body | Cookies (1) | Headers (11) | Test Results | Status: 200 OK | Time: 29 ms | Size: 2.51 KB | Download

Pretty | Raw | Preview | JSON


```
1  {
2      "Users": [
3          {
4              "AP name": "N/A",
5              "Age(d:h:m)": "00:00:27",
6              "Auth": "TRANSPORT-VPN",
7              "Bwm": null,
8              "Essid/Bssid/Phy": null,
9              "Forward mode": "tunnel",
10             "Host Name": null,
11             "IP": "172.16.0.2",
12             "MAC": "00:00:00:00:00:00",
13             "Name": null,
14             "Profile": "default-cap",
15             "Roaming": null,
16             "Role": "sys-ap-role",
17             "Server": "Internal",
18             "Type": null,
19             "UaStr:ParseDisable/Flag/ShortIndex": "OFF/0/0",
20             "User Type": "WIRELESS",
21             "VPN link": null,
22             "Vlan": "0 (0)"
23         },
24         {
25             "AP name": "AP305",
26             "Age(d:h:m)": "00:00:09",
```


```
(ArubaMC-VA) #show user-table verbose

Users
-----
    IP          MAC            Name      Role         Age(d:h:m)  Auth           VPN link  AP name  Roaming   Essid/Bssid/Phy                          Profile                 Forward mode  Type     Host Name  User Type  Server     Vlan     Bwm  UaSt
r:ParseDisable/Flag/ShortIndex
----------  ------------       ------    ----         ----------  ----           --------  -------  -------   ---------------                          -------                 ------------  ----     ---------  ---------  ------     ----     ---  ----
------------------------------
172.16.0.2  00:00:00:00:00:00             sys-ap-role  00:00:37    TRANSPORT-VPN            N/A                                                       default-cap             tunnel                          WIRELESS   Internal   0 (0)        OFF/
0/0
172.16.0.4  2c:0e:3d:9a:0d:5c  employee1  guest        00:00:19    802.1x                   AP305    Wireless  GravityHotelEmployee/20:a6:cd:b4:ca:80/g-HT  Gravity Hotel - Employee  tunnel        Android            WIRELESS   Clearpass  10 (10)      ON/1
/88
172.16.0.3  c8:f6:50:7f:0c:ed  employee2  guest        00:00:22    802.1x                   AP305    Wireless  GravityHotelEmployee/20:a6:cd:b4:ca:90/a-HT  Gravity Hotel - Employee  tunnel        iPad               WIRELESS   Clearpass  10 (10)      ON/1
/21

User Entries: 3/3
 Curr/Cum Alloc:3/3 Free:0/0 Dyn:3 AllocErr:0 FreeErr:0
(ArubaMC-VA) #_
```

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Testing the “show ap association ap-name AP305” command

https://172.16.0.60:4343/v1/configuration/showcommand?command=show+ap+association+ap-name AP305&UIDARUBA=d1e982c2-10cb-409b-ba41-da3182734c84

GET | https://172.16.0.60:4343/v1/configuration/showcommand?command=show+ap+association+ap-name AP3... | Send | Save

Params | Authorization | Headers (1) | Body | Pre-request Script | Tests | Cookies | Code

KEY	VALUE	DESCRIPTION
command	show+ap+association+ap-name AP305	
UIDARUBA	d1e982c2-10cb-409b-ba41-da3182734c84	
Key	Value	Description

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Answer from Mobility Controller

Body | Cookies (1) | Headers (11) | Test Results

Status: 200 OK Time: 32 ms Size: 1.67 KB Download

Pretty | Raw | Preview | JSON


```
{
    "Association Table": [
        {
            "Band steer moves (T/S)": "0/0",
            "Flags": "WVAB",
            "Name": "AP305",
            "aid": "2",
            "assoc": "y",
            "assoc. time": "2h:59m:24s",
            "auth": "y",
            "bssid": "20:a6:cd:b4:ca:90",
            "essid": "GravityHotelEmployee",
            "l-int": "20",
            "mac": "c8:f6:50:7f:0c:ed",
            "num assoc": "1",
            "phy": "a-HT-40sgi-2ss",
            "phy_cap": "a-HT-40sgi-2ss-V",
            "tunnel-id": "0x10014",
            "vlan-id": "10"
        }
```


```
(ArubaMC-VA) #show ap association ap-name AP305

The phy column shows client's operational capabilities for current association

Flags: A: Active, B: Band Steerable, H: Hotspot(802.11u) client, K: 802.11K client, M: Mu beam formee, R: 802.11R client, W: WMM client, w: 802.11w client V: 802.11v BSS trans capable

PHY Details: HT   : High throughput;      20: 20MHz;  40: 40MHz; t: turbo-rates (256-QAM)
             VHT  : Very High throughput; 80: 80MHz; 160: 160MHz; 80p80: 80MHz + 80MHz
             <n>ss: <n> spatial streams

Association Table
-----------------
Name   bssid              mac               auth  assoc  aid  l-int  essid                vlan-id  tunnel-id  phy            assoc. time  num assoc  Flags  Band steer moves (T/S)  phy_cap
----   -----              ---               ----  -----  ---  -----  -----                -------  ---------  ---            -----------  ---------  -----  ----------------------  -------
AP305  20:a6:cd:b4:ca:90  c8:f6:50:7f:0c:ed  y     y      2    20     GravityHotelEmployee 10       0x10014    a-HT-40sgi-2ss 2h:59m:56s   1          WVAB   0/0                     a-HT-40sgi-2ss-V
Num Clients:1
Total num of dual-band capable clients:1
Total num of dual-band capable clients in 2.4G band:0
Total num of dual-band capable clients in 5G band:1
```

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Testing the “show ap essid” command

https://172.16.0.60:4343/v1/configuration/showcommand?command=show+ap+essid&UIDARUBA=8373a5c4-3037-436e-afd2-f9b6e1c3cff1

GET https://172.16.0.60:4343/v1/configuration/showcommand?command=show+ap+essid&UIDARUBA=8373a5c4-3037-436e-afd2-f9b6e1c3cff1 Send Save

Params Authorization Headers Body Pre-request Script Tests Cookies Code

	KEY	VALUE	DESCRIPTION
☑	command	show+ap+essid	
☑	UIDARUBA	8373a5c4-3037-436e-afd2-f9b6e1c3cff1	
	Key	Value	Description

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Answer from Mobility Controller

Body | Cookies (1) | Headers (11) | Test Results — Status: 200 OK | Time: 20 ms | Size: 925 B

Pretty | Raw | Preview | JSON


```
{
    "ESSID Summary": [
        {
            "APs": "1",
            "Clients": "0",
            "ESSID": "GravityHotelVoucher",
            "Encryption": "Open",
            "VLAN(s)": "21"
        },
        {
            "APs": "1",
            "Clients": "1",
            "ESSID": "GravityHotelEmployee",
            "Encryption": "WPA2 8021X AES",
            "VLAN(s)": "10"
        },
        {
            "APs": "1",
            "Clients": "0",
            "ESSID": "GravityHotelFree",
            "Encryption": "Open",
            "VLAN(s)": "20"
        }
    ],
    "_data": [
        "3"
    ],
    "_meta": [
        "ESSID",
        "APs",
        "Clients",
        "VLAN(s)",
        "Encryption"
    ]
}
```


```
(ArubaMC-VA) #show ap essid

ESSID Summary
-------------
ESSID                APs  Clients  VLAN(s)  Encryption
-----                ---  -------  -------  ----------
GravityHotelVoucher  1    0        21       Open
GravityHotelEmployee 1    1        10       WPA2 8021X AES
GravityHotelFree     1    0        20       Open
Num ESSID:3
(ArubaMC-VA) #
```

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Testing the “show ap debug radio-stats ap-name <AP-NAME> radio 1” command

https://172.16.0.60:4343/v1/configuration/showcommand?command=show+ap+essid&UIDARUBA=8373a5c4-3037-436e-afd2-f9b6e1c3cff1

GET https://172.16.0.60:4343/v1/configuration/showcommand?command=show+ap+essid&UIDARUBA=8373a5c4-3037-436e-afd2-f9b6e1c3cff1 Send Save

Params Authorization Headers Body Pre-request Script Tests Cookies Code

	KEY	VALUE	DESCRIPTION
☑	command	show+ap+essid	
☑	UIDARUBA	8373a5c4-3037-436e-afd2-f9b6e1c3cff1	
	Key	Value	Description

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Answer from Mobility Controller

Body | Cookies (1) | Headers (11) | Test Results | Status: 200 OK | Time: 55 ms | Size: 19.39 KB | Download

Pretty | Raw | Preview | JSON


```
169 {
170     "Parameter": "Tx Data Bytes Transmitted",
171     "Value": "5347054"
172 },
173 {
174     "Parameter": "Tx Data Bytes",
175     "Value": "5353262"
176 },
177 {
178     "Parameter": "Tx Time Data Transmitted",
179     "Value": "6119928"
180 },
```


```
(ArubaMC-VA) #show ap debug radio-stats ap-name AP303 radio 1 | include "Data Bytes"
Tx Data Bytes Transmitted          5347054
Tx Data Bytes                      5353262
Tx Data Bytes   12 Mbps  (Mon)     1023257
Tx Data Bytes   24 Mbps  (Mon)     1826100
Tx Data Bytes   36 Mbps  (Mon)     923242
Tx Data Bytes   54 Mbps  (Mon)     852882
```

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Task: Install Influxdb python library

https://www.influxdata.com/blog/getting-started-python-influxdb/

Install influxdb python library

https://github.com/influxdata/influxdb-python

```
(env)                                                    $ pip install influxdb
Collecting influxdb
  Using cached https://files.pythonhosted.org/packages/3b/62/462d9b3675d9df3255d317d36076cfb1ae83042920a9b79e3b14d752f511/influxdb-5.2.0-py2.py3-no
ne-any.whl
Collecting python-dateutil>=2.6.0 (from influxdb)
  Using cached https://files.pythonhosted.org/packages/cf/f5/af2b09c957ace60dcfac112b669c45c8c97e32f94aa8b56da4c6d1682825/python_dateutil-2.7.3-py2
.py3-none-any.whl
Requirement already satisfied: six>=1.10.0 in ./env/lib/python3.6/site-packages (from influxdb)
Requirement already satisfied: requests>=2.17.0 in ./env/lib/python3.6/site-packages (from influxdb)
Collecting pytz (from influxdb)
  Using cached https://files.pythonhosted.org/packages/30/4e/27c34b62430286c6d59177a0842ed90dc789ce5d1ed740887653b898779a/pytz-2018.5-py2.py3-none-
any.whl
Requirement already satisfied: urllib3<1.24,>=1.21.1 in ./env/lib/python3.6/site-packages (from requests>=2.17.0->influxdb)
Requirement already satisfied: certifi>=2017.4.17 in ./env/lib/python3.6/site-packages (from requests>=2.17.0->influxdb)
Requirement already satisfied: idna<2.8,>=2.5 in ./env/lib/python3.6/site-packages (from requests>=2.17.0->influxdb)
Requirement already satisfied: chardet<3.1.0,>=3.0.2 in ./env/lib/python3.6/site-packages (from requests>=2.17.0->influxdb)
Installing collected packages: python-dateutil, pytz, influxdb
Successfully installed influxdb-5.2.0 python-dateutil-2.7.3 pytz-2018.5
You are using pip version 9.0.1, however version 18.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
(env                                                     n$
```

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Python: virtual environment

requirements.txt

```
astroid==2.0.4
certifi==2018.8.24
chardet==3.0.4
idna==2.7
influxdb==5.2.0
isort==4.3.4
lazy-object-proxy==1.3.1
mccabe==0.6.1
pylint==2.1.1
python-dateutil==2.7.3
pytz==2018.5
requests==2.19.1
six==1.11.0
typed-ast==1.1.0
urllib3==1.23
wrapt==1.10.11
```

```
(env) $ python -V
 Python 3.6.4
```

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Task: Run the Python script - available here: https://github.com/adolfobolivar/AOS8-InfluDB-Grafana

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Task: Check influxDB after execute the python script

Measurements created by python script

List of measurements for “example” database (*measurement is conceptually similar to a table*)

```
ubuntu@ubuntu:~$ influx
Connected to http://localhost:8086 version 1.6.3
InfluxDB shell version: 1.6.3
>
> use example
Using database example
>
> show measurements
name: measurements
name
----
Bandwidth_Consumed_CRCs
Number_Associations_APs
Number_Clients_SSID
Status_of_APs
cpuload
type_users
>
```

Details of each Measurement

Fields
Tags

```
> select * from Status_of_APs
name: Status_of_APs
time                Name  Status Switch IP
----                ----  ------ ---------
1540431094000000000 AP303 1      172.16.0.60
1540431094000000000 AP305 1      172.16.0.60
1540431156000000000 AP303 1      172.16.0.60
1540431156000000000 AP305 1      172.16.0.60
1540431216000000000 AP303 1      172.16.0.60
```

```
> select * from Number_Clients_SSID
name: Number_Clients_SSID
time                Clients ESSID              Switch IP
----                ------- -----              ---------
1540431095000000000 2       GravityHotelEmployee 172.16.0.60
1540431095000000000 0       GravityHotelVoucher  172.16.0.60
1540431095000000000 0       GravityHotelFree     172.16.0.60
1540431156000000000 0       GravityHotelVoucher  172.16.0.60
1540431156000000000 0       GravityHotelFree     172.16.0.60
1540431156000000000 2       GravityHotelEmployee 172.16.0.60
```

```
> select * from Number_Associations_APs
name: Number_Associations_APs
time                Name  Num Clients
----                ----  -----------
1540431095000000000 AP303 0
1540431095000000000 AP305 2
1540431156000000000 AP303 0
1540431156000000000 AP305 2
```

```
> select * from type_users
name: type_users
time                AP name Android OS X Switch IP  iPad
----                ------- ------- ---- ---------  ----
1540431095000000000 AP305   1       0    172.16.0.60 1
1540431095000000000 N/A     0       0    172.16.0.60 0
1540431156000000000 AP305   1       0    172.16.0.60 1
1540431156000000000 N/A     0       0    172.16.0.60 0
1540431217000000000 AP305   1       0    172.16.0.60 1
1540431217000000000 N/A     0       0    172.16.0.60 0
```

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Details of each Measurement

Fields

Tags

```
> select * from Bandwidth_Consumed_CRCs
name: Bandwidth_Consumed_CRCs
time                Name  Radio  Rx CRC Errors Rx Data Bytes Tx Data Bytes Transmitted
----                ----  -----  ------------- ------------- -------------------------
1540431095000000000 AP303 2.4Ghz 253068        0             0
1540431095000000000 AP303 5Ghz   20247         2122785       4969928
1540431095000000000 AP305 5Ghz   934           10259953      136672371
1540431096000000000 AP305 2.4Ghz 29634         2595287       21393289
1540431156000000000 AP303 2.4Ghz 254548        0             0
1540431156000000000 AP303 5Ghz   20503         2122785       4969928
1540431156000000000 AP305 2.4Ghz 29686         2595287       21393289
1540431156000000000 AP305 5Ghz   942           10941058      146463205
1540431217000000000 AP303 2.4Ghz 255785        0             0
```

```
> select * from cpuload
name: cpuload
time                Status Switch IP
----                ------ ---------
1540486694000000000 3.2    172.16.0.55
1540486755000000000 8.3    172.16.0.55
1540486816000000000 3.1    172.16.0.55
1540486876000000000 3.2    172.16.0.55
```

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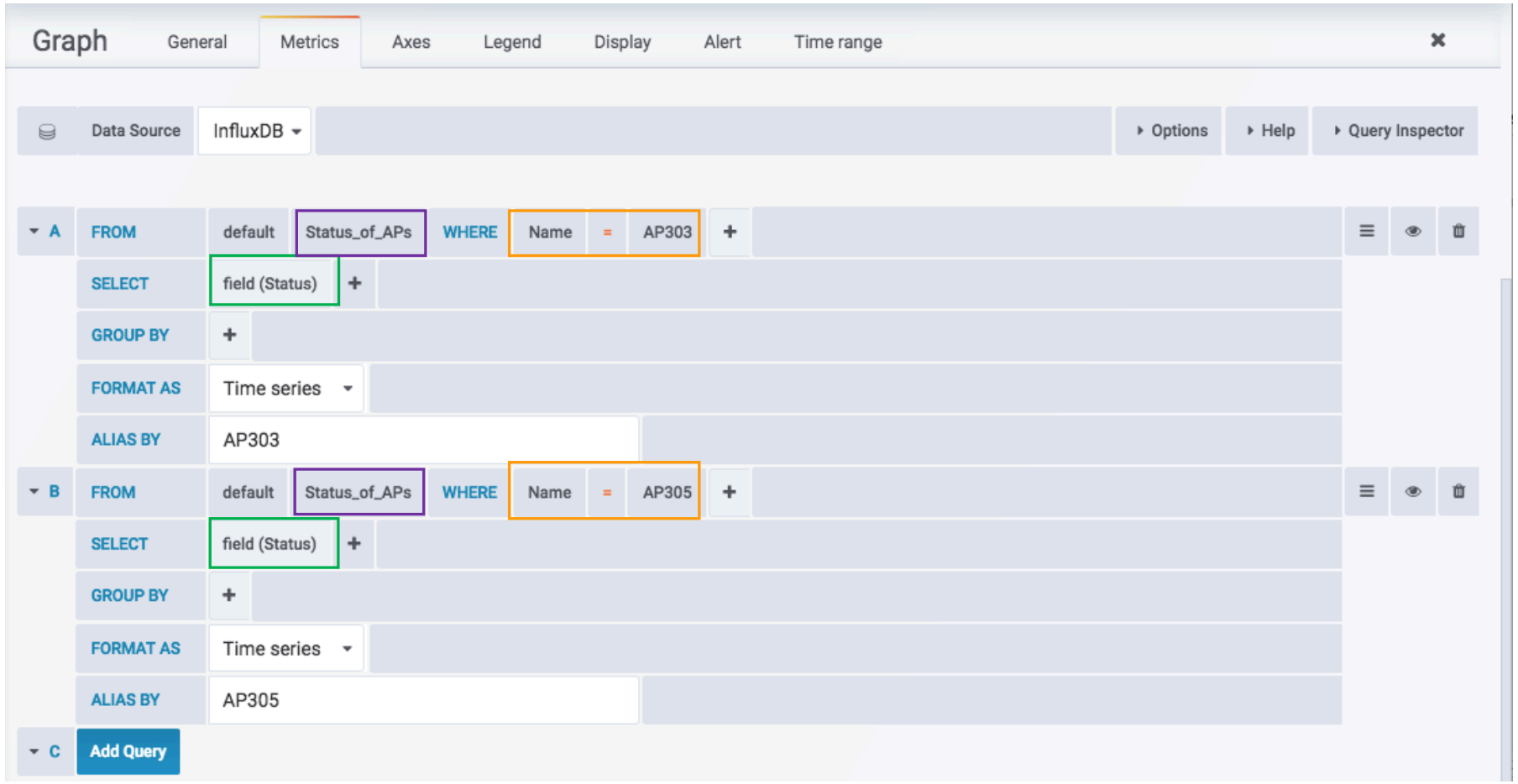
Task: Create the Dashboard in Grafana

Configure InfluxDB queries in Grafana



Measurement

Fields

Tags

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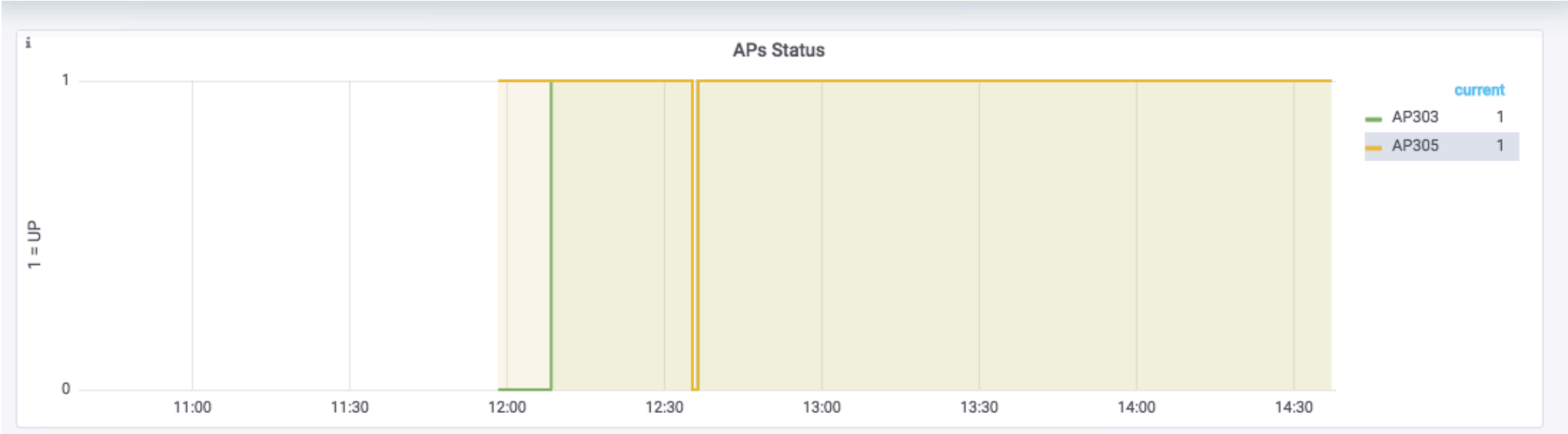
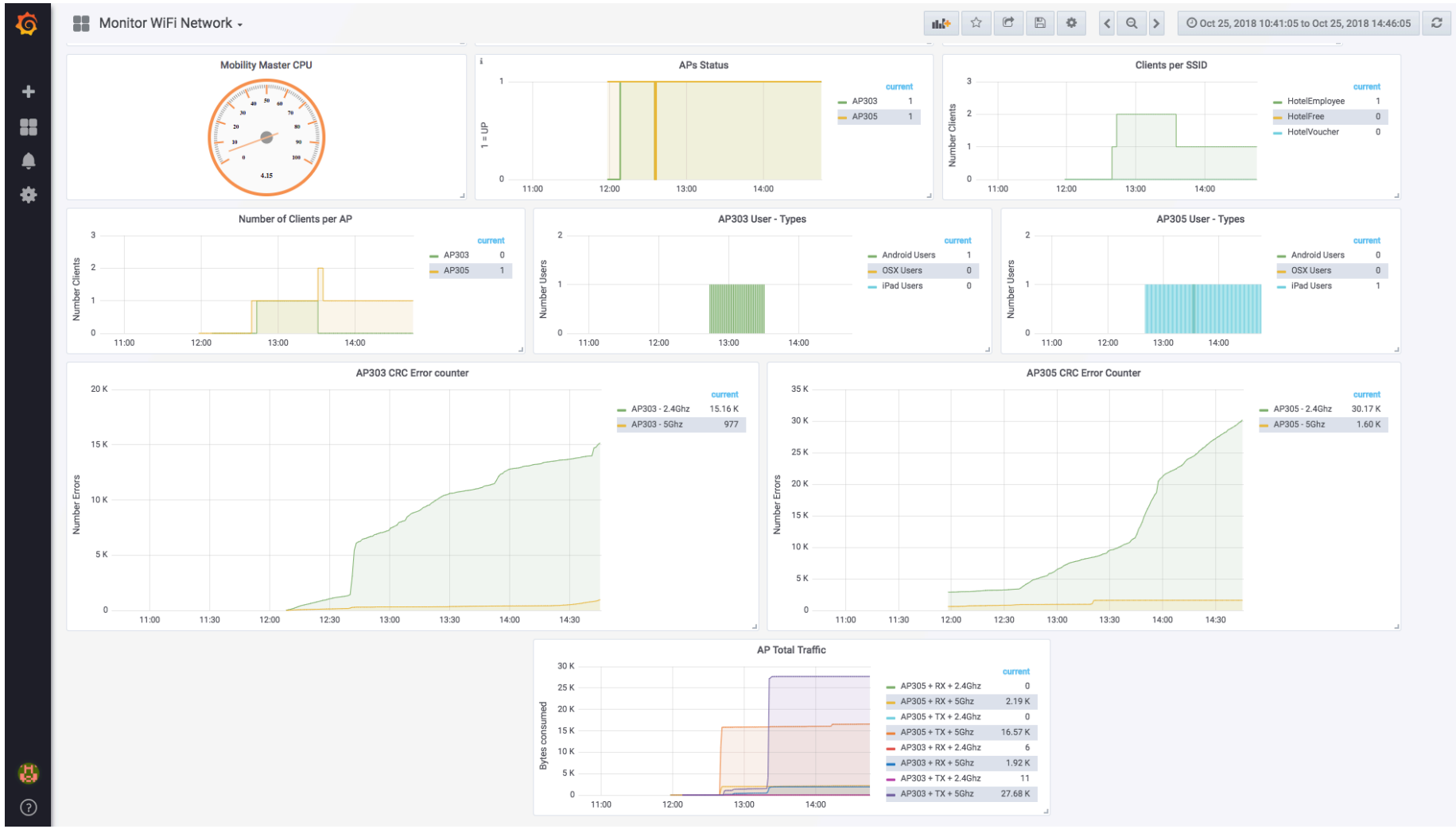
Report in Grafana



Dashboard in Grafana



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Thanks