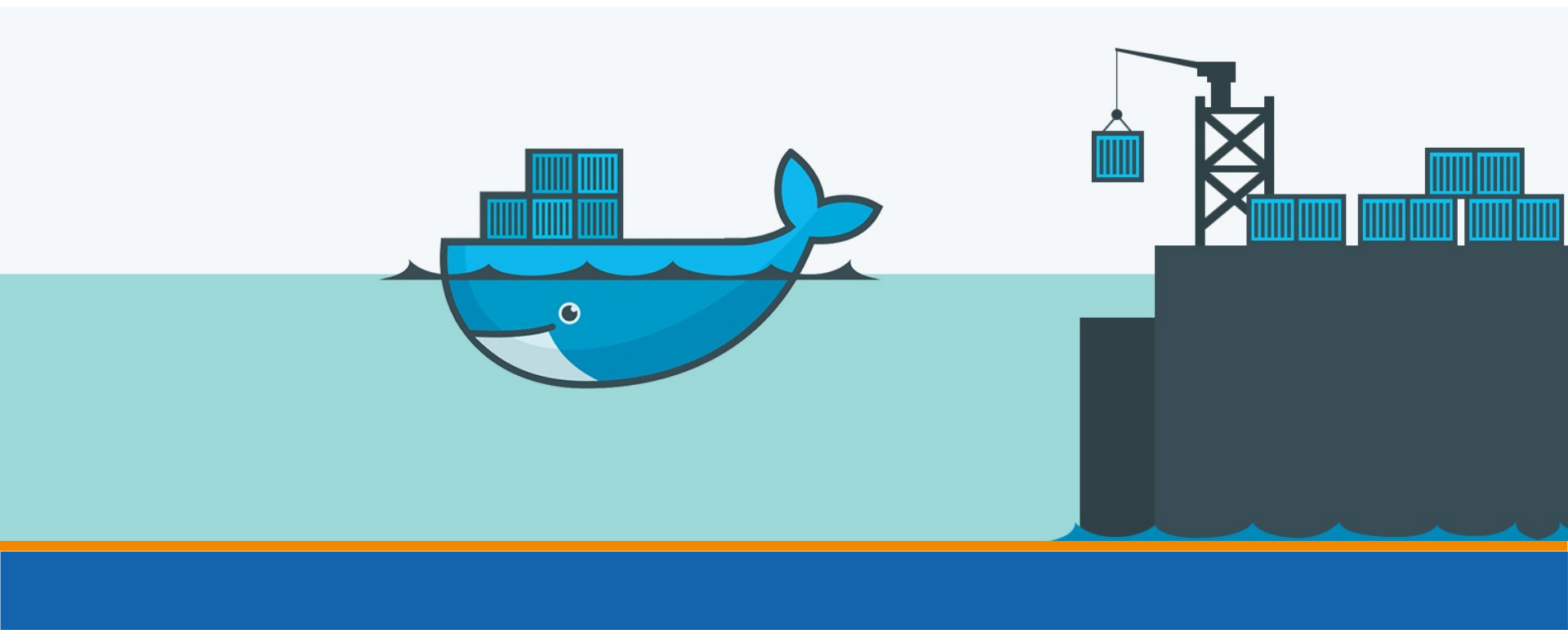
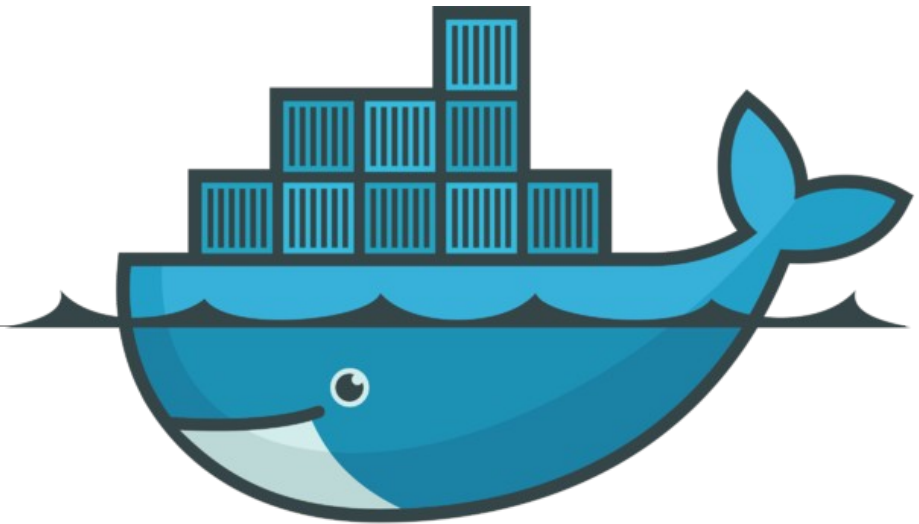


Docker para Provedores



Docker para Provedores



THIAGO DANTAS

1 Container



1.1 O que é container?

Container $\neq$ VM

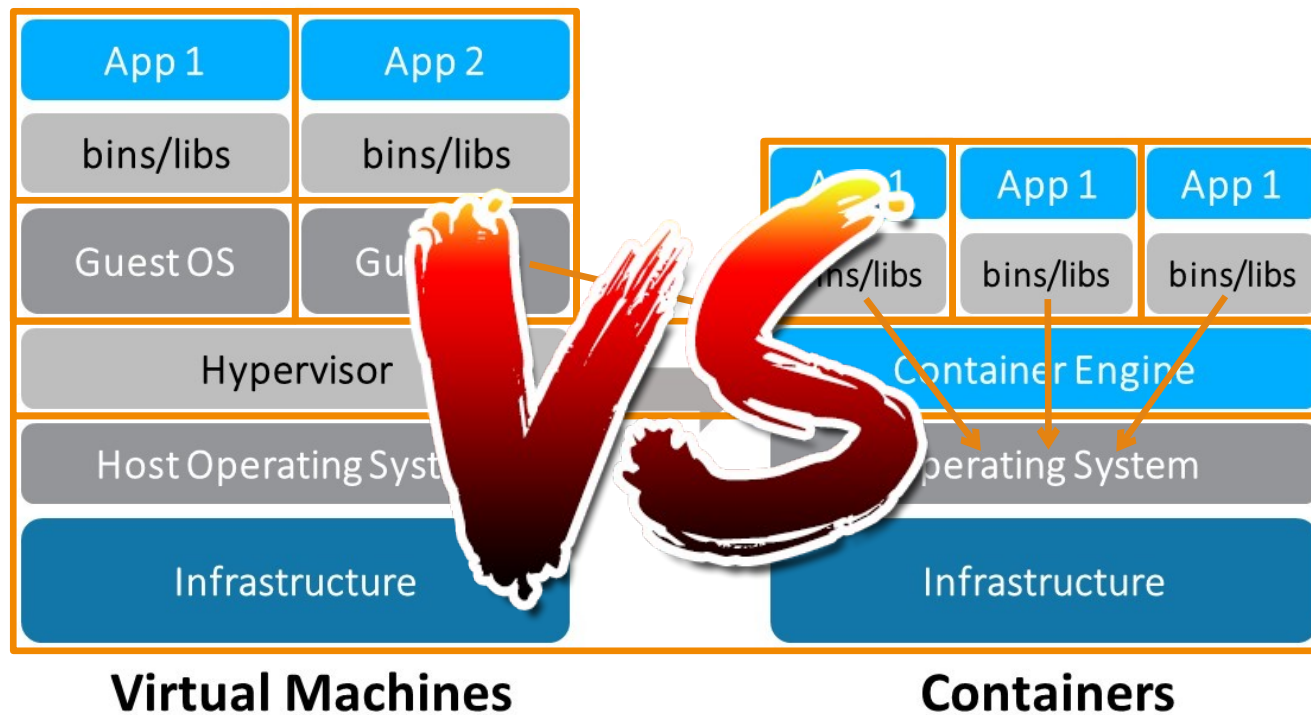
1.1 O que é container?

"Container é o encapsulamento de uma aplicação e suas dependências, que compartilham o kernel do sistema operacional do host hospedeiro."

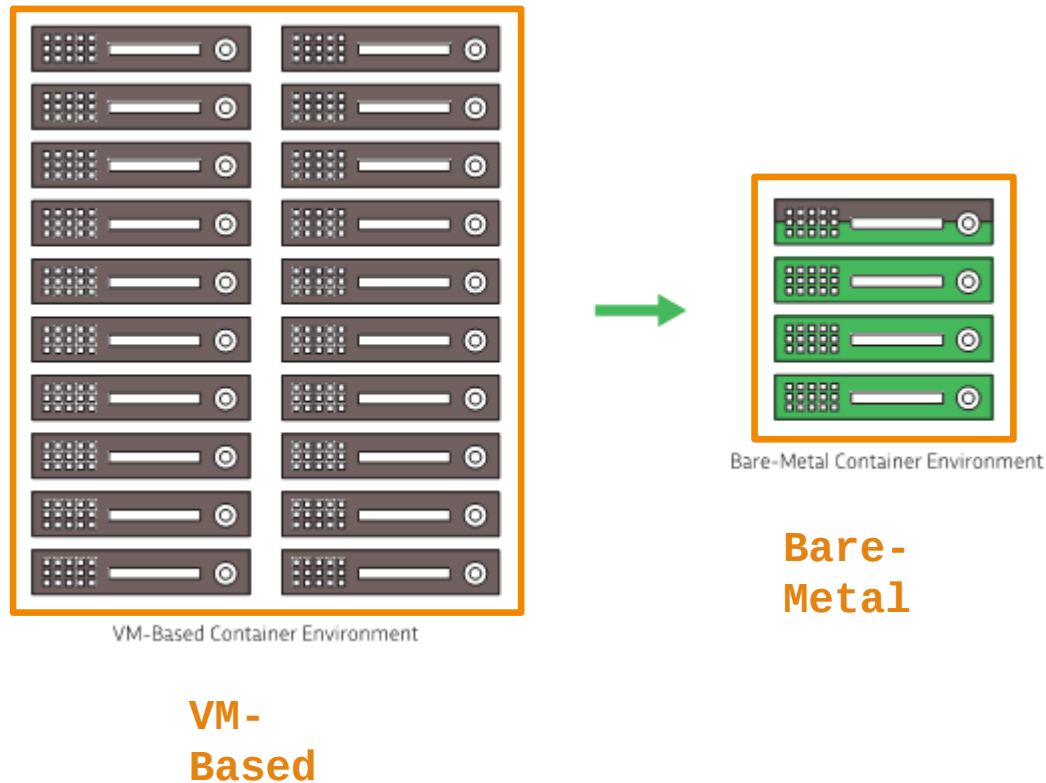
1.1 O que é container?

Containers são
efêmeros

1.2 Container vs VM



1.2 Container vs VM



1.2 Quando surgiu?

→ ° **Unix** (1979):

- ° **chroot**: Forma de isolar o filesystem.

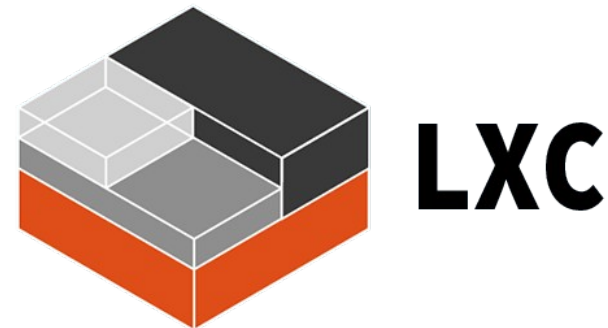
...

→ ° **CGroups** (2006):

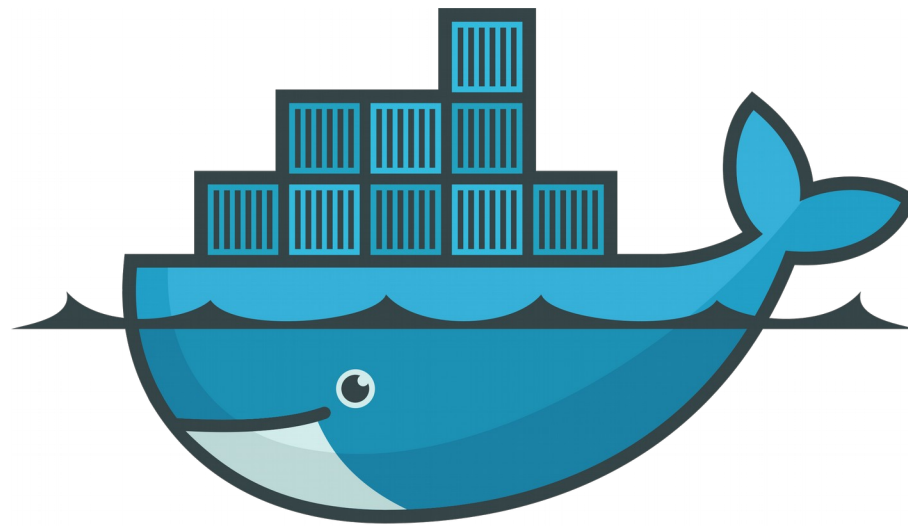
- ° Criado para o kernel do Linux;
- ° Iniciou a utilização de containers em seus datacenters.

→ ° **LXC** (Linux Containers):

- ° Projeto iniciado em 2008;
- ° Criado por desenvolvedores da **Virtuozzo**, **IBM**, **Google** etc;
- ° Traz consigo o **CGroups**, **namespaces** e **chroot**;
- ° Proporcionou uma completa e estável solução para criação e gerenciamento de containers.



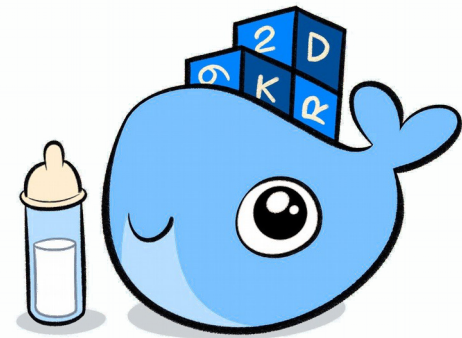
2 Docker



docker

2.1 O que é Docker?

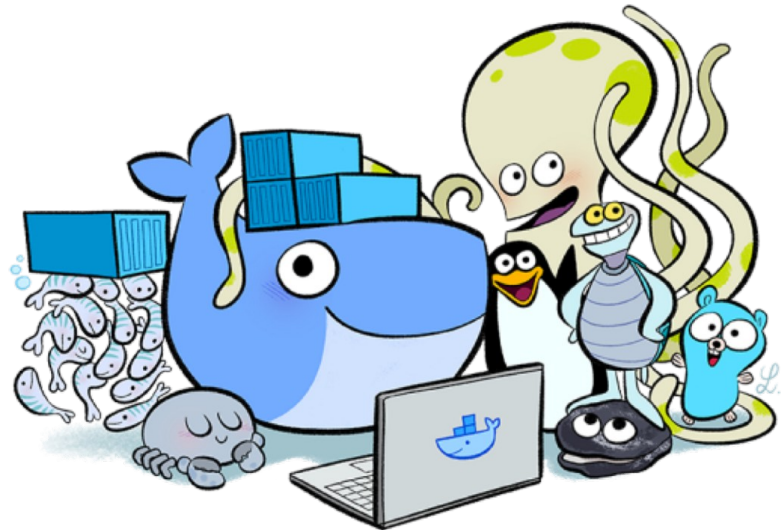
- ◦ 2008: Solomon Hykes fundou a dotCloud;
 - Empresa especializada em PaaS (Platform-as-a-Service);
 - Diferencial: o seu PaaS não era atrelado a nenhuma linguagem específica.
- ◦ 2013: a dotCloud decide tornar open source o core de sua plataforma:
- ◦ Primeiras versões: wrapper do LXC integrado ao Union Filesystem:
 - Seu crescimento foi fantástico e muito rápido;
 - Em seis meses seu GitHub possuía:
 - Mais de seis mil stars;
 - Mais de 170 pessoas contribuindo para o projeto.
- ◦ dotCloud passa a se chamar Docker e a versão 1.0 é lançada!



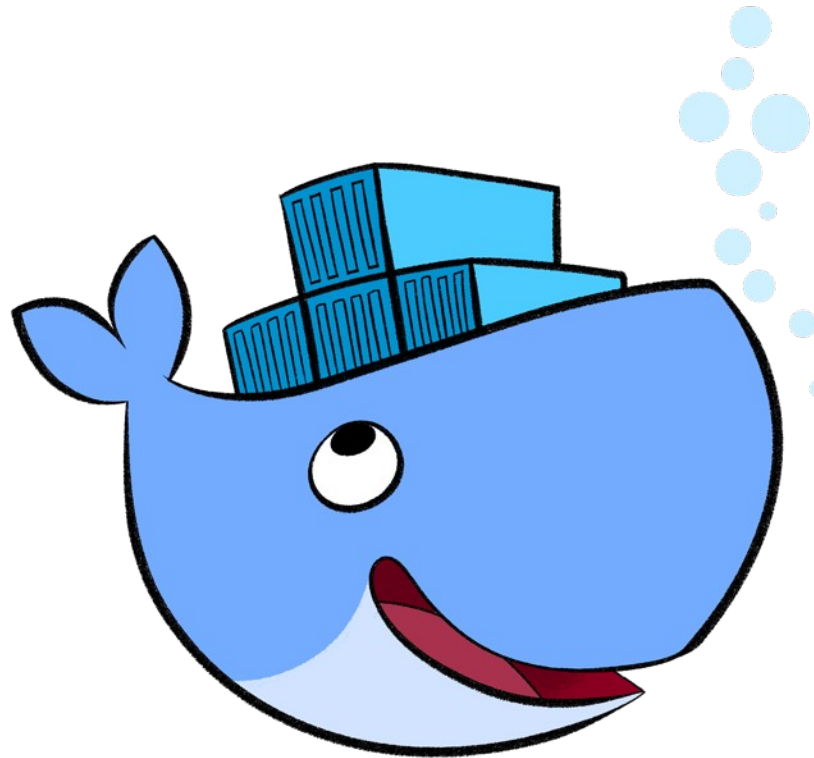
2.1 O que é Docker?

- Programa escrito em GO;
- Desenvolvido pensando em:

- ◦ Agilidade;
- ◦ Portabilidade;
- ◦ Economia de recursos.



3 Executando containers



3.1 Subindo containers

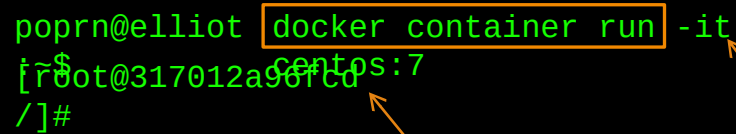
```
poprn@elliott docker container run -it
ubuntu:19.04
Unable to find image 'ubuntu:19.04' locally
19.04: Pulling from library/ubuntu
34dce65423d3: Already exists
796769e96d24: Already exists
2a0eada9611d: Already exists
d6830a7cd972: Already exists
Digest:
sha256:23f56d855075d7a8ca49b79d61edaab2f28645f4834767abf1b7d3884b9
69e92
500167f1ef3a5ac5b:/#
Status: Downloaded newer image for ubuntu:19.04
```

3.1 Subindo containers

```
poprn@elliott docker container run -it  
~$ debian:10  
root@f3a86d9927ab:~# apt-get update && apt-get install -y  
:/# apache2  
root@f3a86d9927ab:~# /etc/init.d/apache2  
:/# start  
root@f3a86d9927ab:~# ps -ef  
:/#  
UID          PID    PPID  C STIME TTY          TIME CMD  
root           1         0  0 14:45 pts/0        00:00:00 bash  
root          30         1  0 14:48 ?            00:00:00  
/usr/sbin/apache2 -k start  
www-data      33        30  0 14:48 ?            00:00:00  
/usr/sbin/apache2 -k start  
www-data      34        30  0 14:48 ?            00:00:00  
/usr/sbin/apache2 -k start  
root         108         1  0 14:48 pts/0        00:00:00 ps -ef
```

3.1 Subindo containers

```
poprn@elliott docker container run -it  
[~$  
[root@317012a96fcd  
/]#
```



3.2 Com faz pra ver?

```
poprn@elliott docker container
```

```
poprn@elliott$ docker container ls
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS
0a4e6a01a958   centos:7   "/bin/bash"             7 seconds ago Up 5 seconds
badcb98b21a9   debian:10  "bash"                  16 seconds ago Up 14 seconds
895ac6fdd289   ubuntu:19.04 "/bin/bash"             30 seconds ago Up 28 seconds
exciting
```

3.3 Controlando o container

```
poprn@elliott docker container attach
:~$ CONTAINER|ID
poprn@elliott docker container create -it
:~$ ubuntu

poprn@elliott docker container start
:~$ CONTAINER|ID
poprn@elliott docker container stop
:~$ CONTAINER|ID
poprn@elliott docker container restart
:~$ CONTAINER|ID

poprn@elliott docker container pause
:~$ CONTAINER|ID
poprn@elliott docker container unpause
:~$ CONTAINER|ID

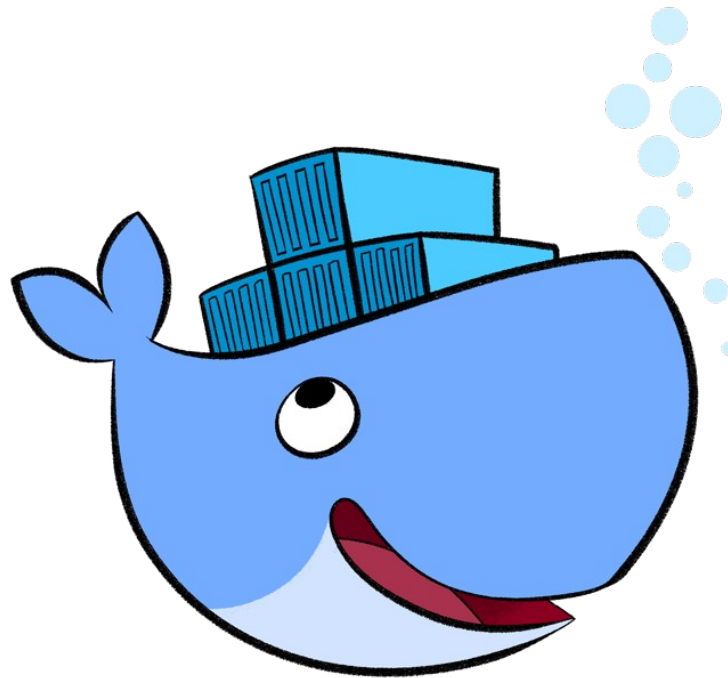
poprn@elliott docker container cp FILE|DIR
:~$ CONTAINER:PATH
poprn@elliott docker container exec CONTAINER|ID
:~$ COMMAND
poprn@elliott docker container rm
:~$ CONTAINER|ID
```

4 O que posso fazer?



4.1 Alguns serviços

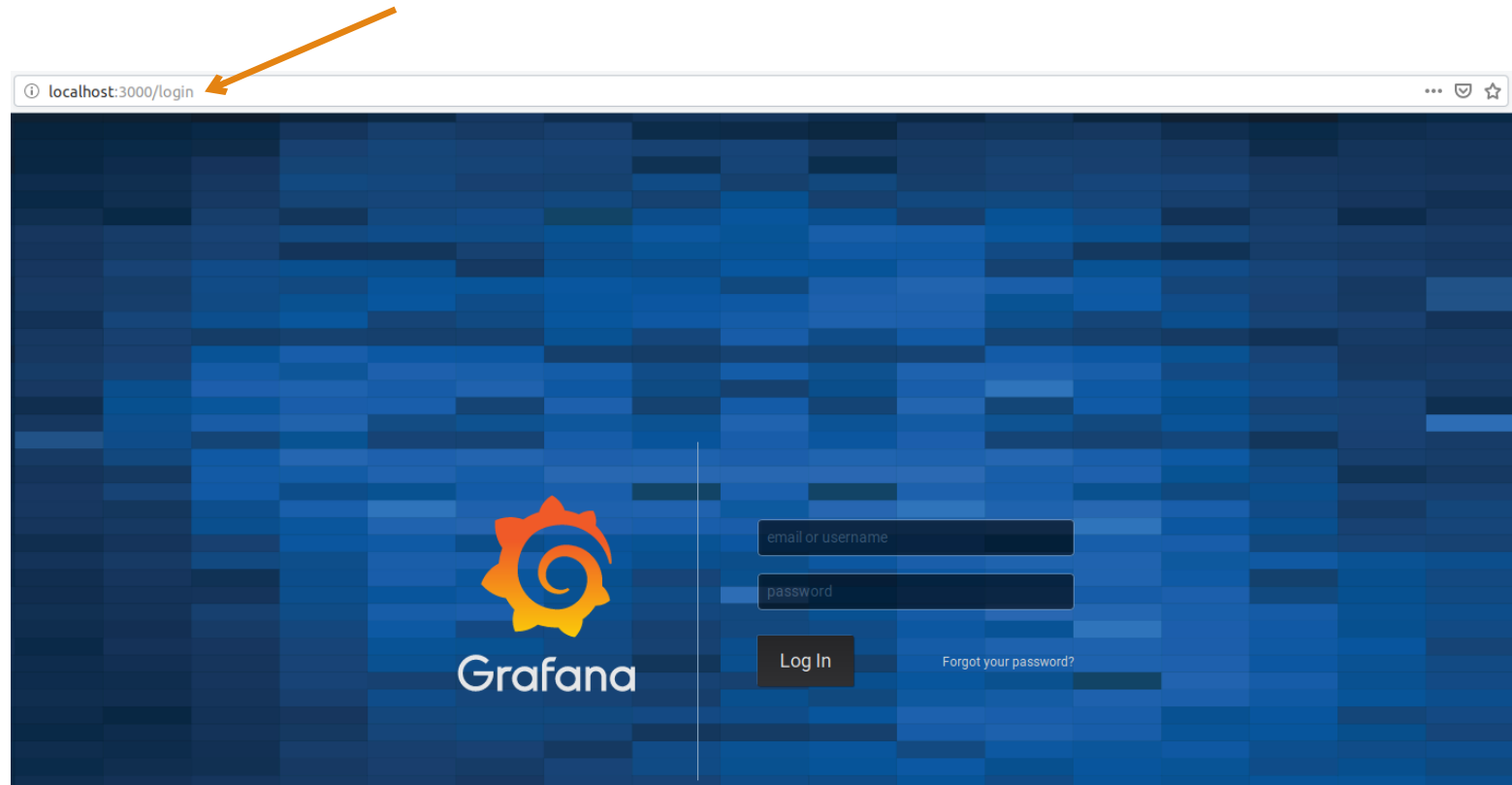
- DNS? ✓
- Zabbix? ✓
- Prometheus? ✓
- Grafana? ✓
- Wiki? ✓
- Site? ✓
- Speedtest? ✓



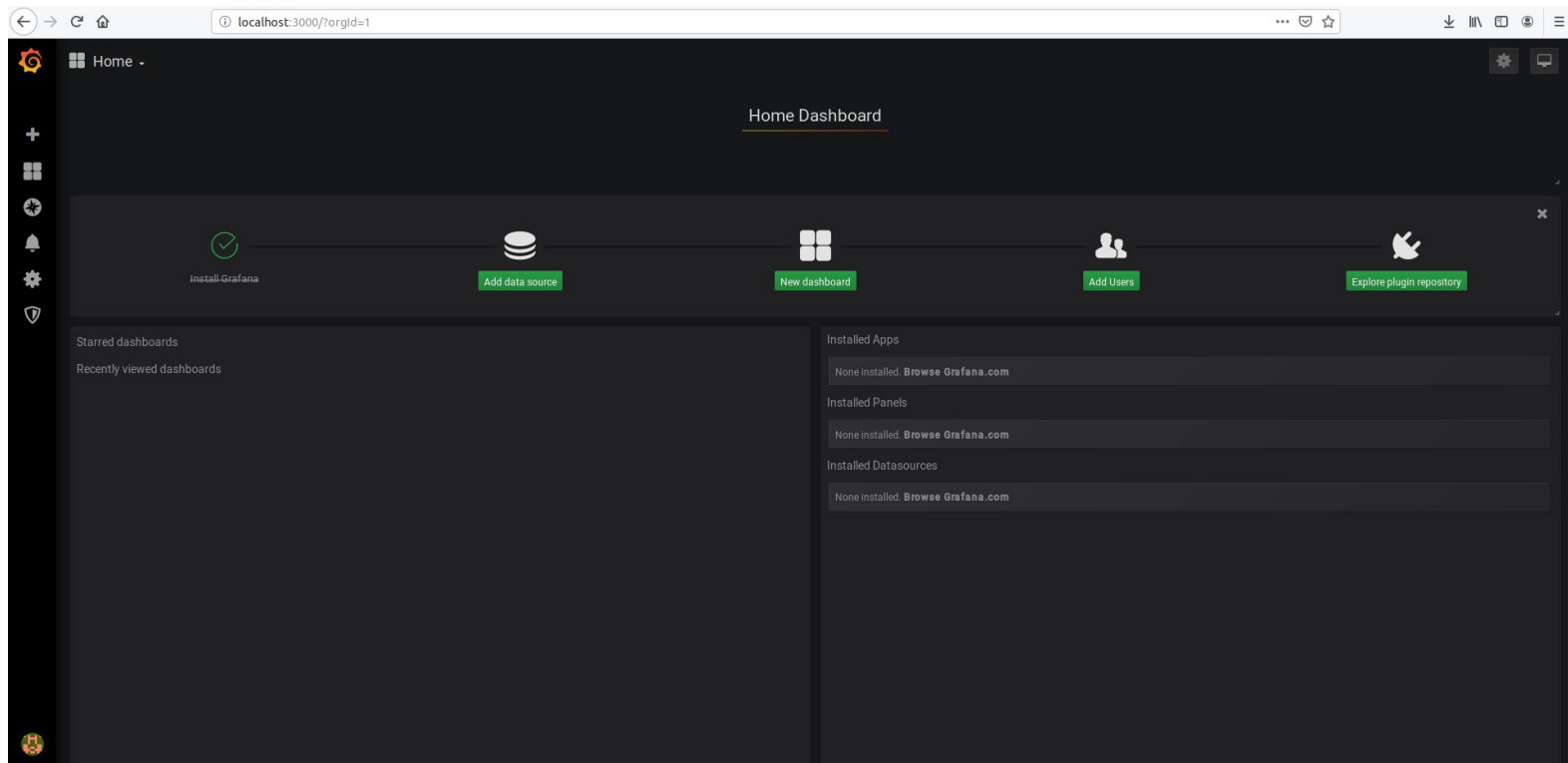
4.2 DNS, Prometheus e Grafana

```
poprn@elliott docker container run -d -p 53:53/tcp -p 53:53/udp sameersbn/  
:~$ bind  
bed3d94ce33d73ff5feee16c34e9f6413e4ae945e0cee16da9366eff  
5398b515  
poprn@elliott docker container run -d -p 9090:9090 -v \  
:~$ /tmp/prometheus.yml:/etc/prometheus/prometheus.yml  
prom/prometheus  
abc35252h55j655k635jkjk563k747kegaf23346j4tty74r34e54gy5  
6h7735h3  
poprn@elliott docker container run -d --name=grafana -p 3000:3000 grafana/  
:~$ grafana
```

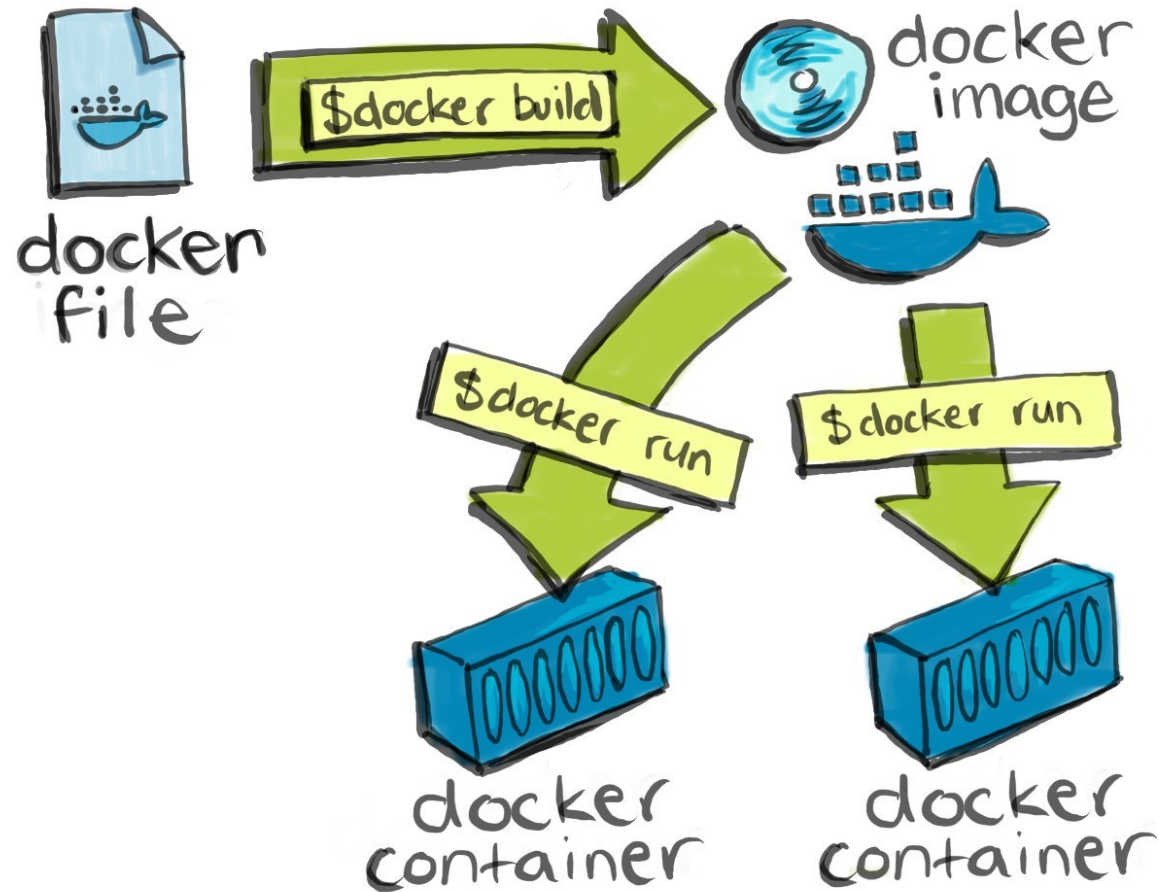
4.3 Acesando o grafana



4.3 Acesando o grafana

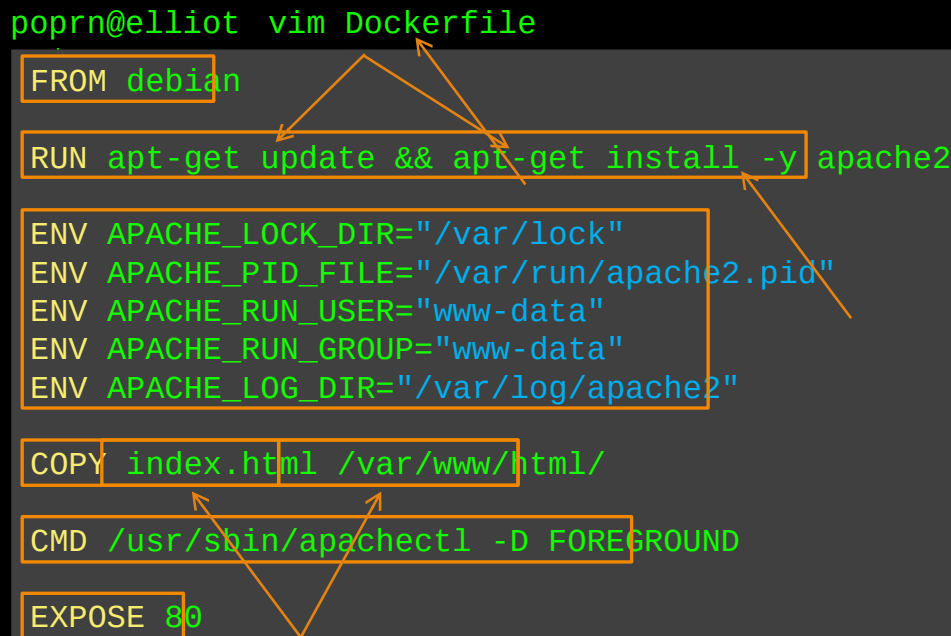


5 Imagens



5.1 Dockerfile

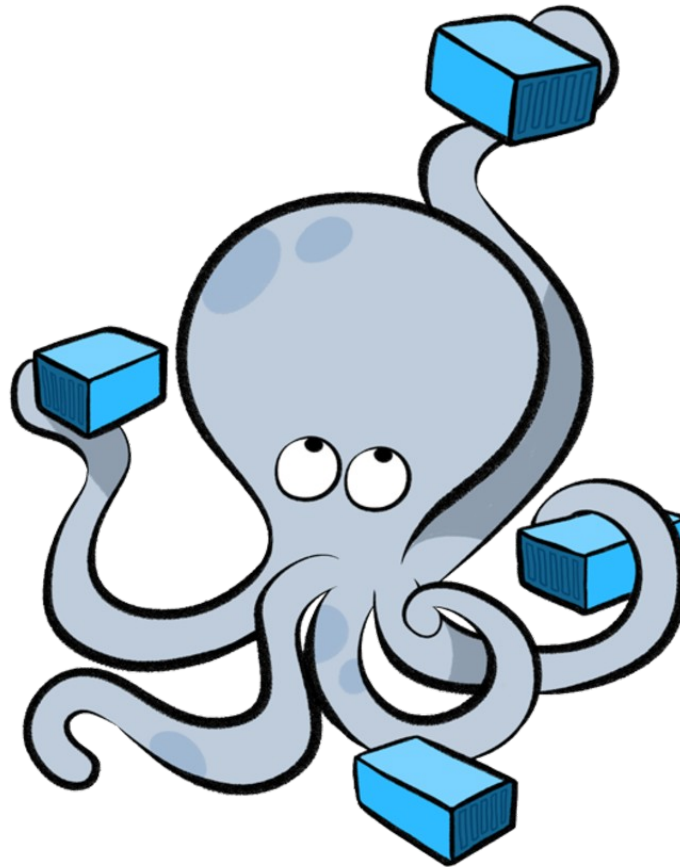
```
poprn@elliott vim Dockerfile
FROM debian
RUN apt-get update && apt-get install -y apache2
ENV APACHE_LOCK_DIR="/var/lock"
ENV APACHE_PID_FILE="/var/run/apache2.pid"
ENV APACHE_RUN_USER="www-data"
ENV APACHE_RUN_GROUP="www-data"
ENV APACHE_LOG_DIR="/var/log/apache2"
COPY index.html /var/www/html/
CMD /usr/sbin/apachectl -D FOREGROUND
EXPOSE 80
```



5.2 Build

```
poprn@elliott docker image build -t
:~$ meu_apache:1.0 .
Successfully built
ae1effff361b9
poprn@elliott docker image
:~$
REPOSITORY    TAG    IMAGE ID    CREATED
meu_apache    1.0    ae1effff361b9    1 minutes ago
poprn@elliott docker container run -d -p 80:80
:~$ 243MB meu_apache:1.0
```

6 Docker Compose

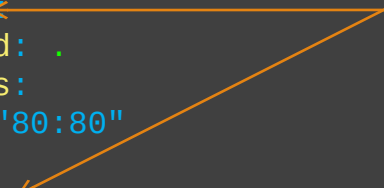


6.1 Docker Compose

```
poprn@elliott vim docker-compose.yml
```

```
version: '3'

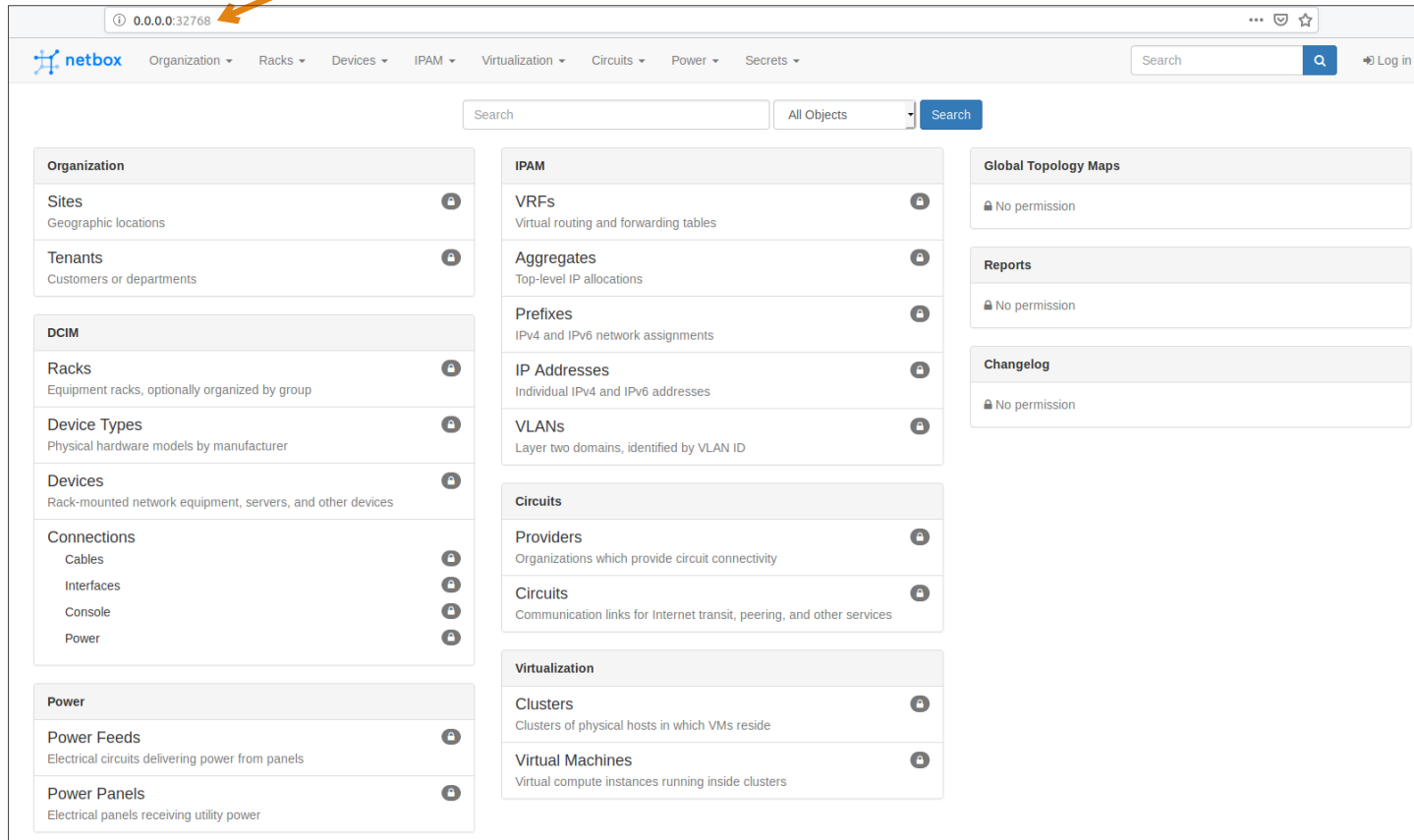
services:
  zabbix:
    build: .
    ports:
      - "80:80"
  postgres:
    image: "postgres:latest"
    ...
```



6.2 Netbox project

```
poprn@elliott git clone https://github.com/netbox-community/netbox-
:~$ docker git
poprn@elliott cd netbox-
:~$ docker
poprn@elliott docker-compose
poprn@elliott docker-compose up
Starting netbox-docker-master_postgres_1 ...
done
Starting netbox-docker-master_redis_1      ...
done
Starting netbox-docker-master_netbox-
worker_1 ... done
Starting netbox-docker-
master_netbox_1      ... done
Starting netbox-docker-
master_nginx_1       ... done
```

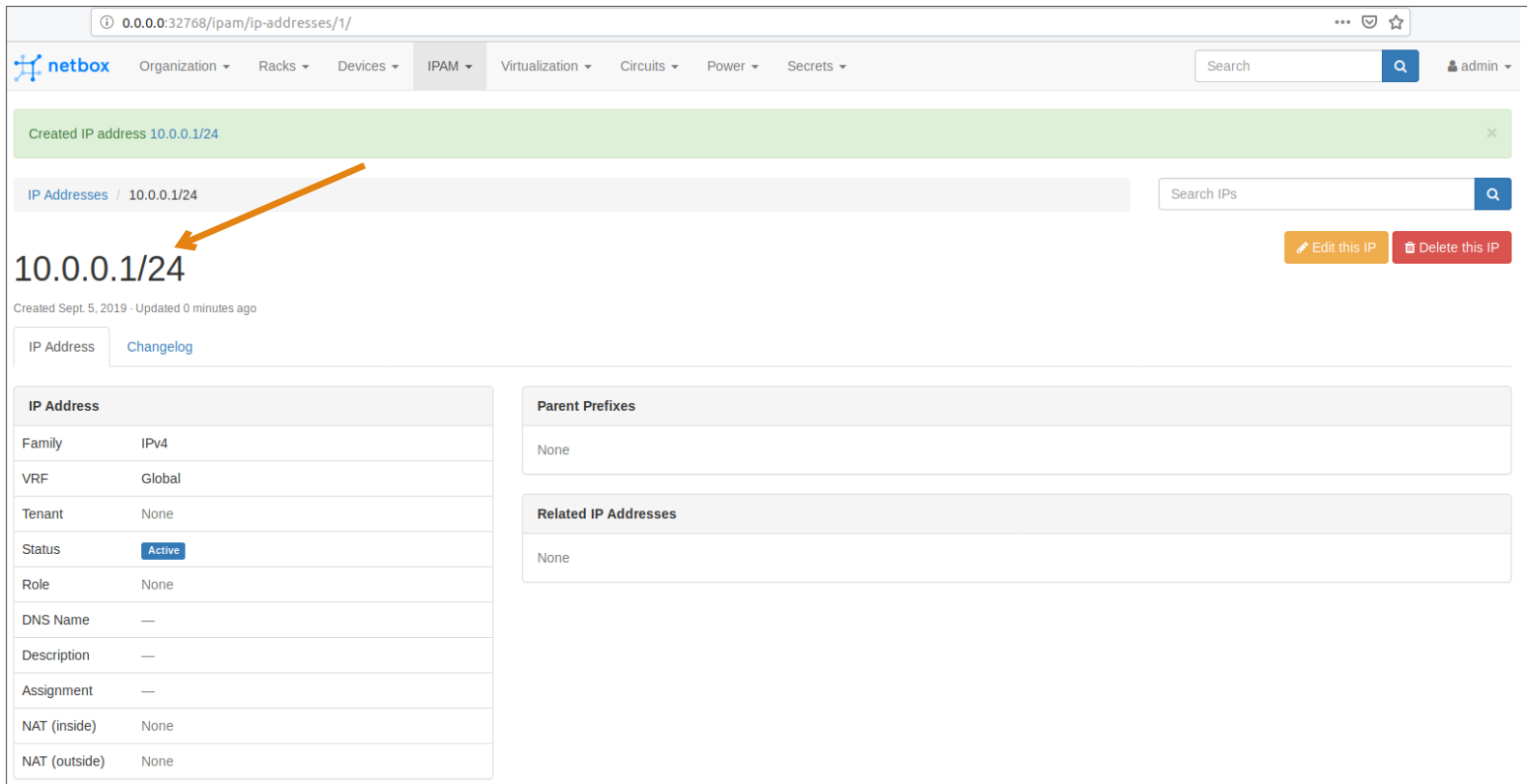
6.3 Acessando o Netbox



The screenshot displays the Netbox web interface. The browser's address bar shows the IP address 0.0.0.0:32768, with an orange arrow pointing to it. The Netbox logo is visible in the top left corner. The navigation menu includes Organization, Racks, Devices, IPAM, Virtualization, Circuits, Power, and Secrets. A search bar is located in the top right corner. The main content area is divided into several sections:

- Organization**
 - Sites: Geographic locations
 - Tenants: Customers or departments
- DCIM**
 - Racks: Equipment racks, optionally organized by group
 - Device Types: Physical hardware models by manufacturer
 - Devices: Rack-mounted network equipment, servers, and other devices
 - Connections
 - Cables
 - Interfaces
 - Console
 - Power
- Power**
 - Power Feeds: Electrical circuits delivering power from panels
 - Power Panels: Electrical panels receiving utility power
- IPAM**
 - VRFs: Virtual routing and forwarding tables
 - Aggregates: Top-level IP allocations
 - Prefixes: IPv4 and IPv6 network assignments
 - IP Addresses: Individual IPv4 and IPv6 addresses
 - VLANs: Layer two domains, identified by VLAN ID
- Circuits**
 - Providers: Organizations which provide circuit connectivity
 - Circuits: Communication links for Internet transit, peering, and other services
- Virtualization**
 - Clusters: Clusters of physical hosts in which VMs reside
 - Virtual Machines: Virtual compute instances running inside clusters
- Global Topology Maps**
 - No permission
- Reports**
 - No permission
- Changelog**
 - No permission

6.3 Acessando o Netbox



0.0.0.0:32768/ipam/ip-addresses/1/

netbox Organization Racks Devices IPAM Virtualization Circuits Power Secrets Search admin

Created IP address 10.0.0.1/24

IP Addresses / 10.0.0.1/24 Search IPs

10.0.0.1/24

Created Sept. 5, 2019 - Updated 0 minutes ago

IP Address Changelog

IP Address	
Family	IPv4
VRF	Global
Tenant	None
Status	Active
Role	None
DNS Name	—
Description	—
Assignment	—
NAT (inside)	None
NAT (outside)	None

Parent Prefixes
None

Related IP Addresses
None

Edit this IP Delete this IP

PoP-RN/RNP

`thiago.dantas@pop-rn.rnp.br`