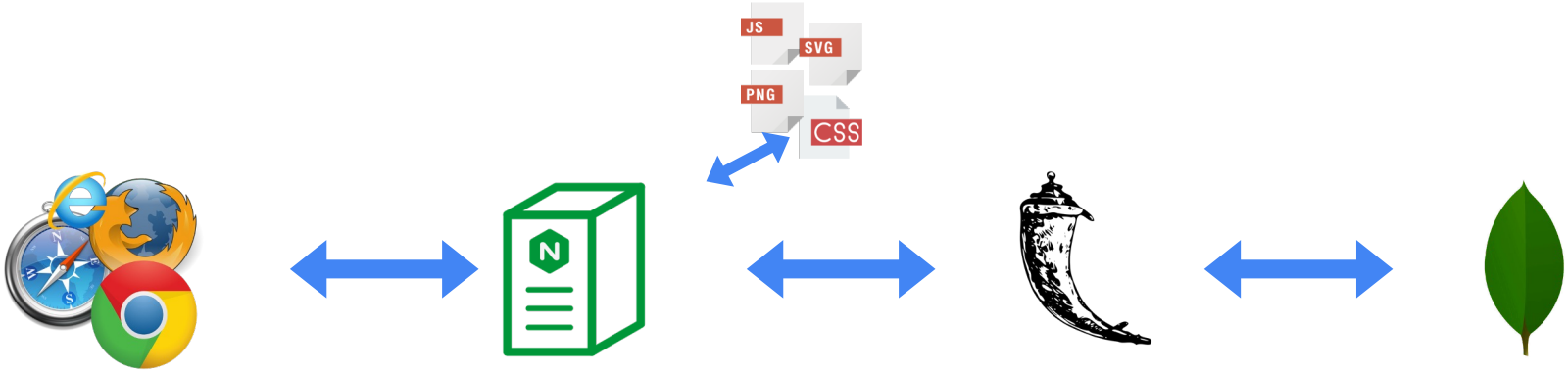
Web Application Development

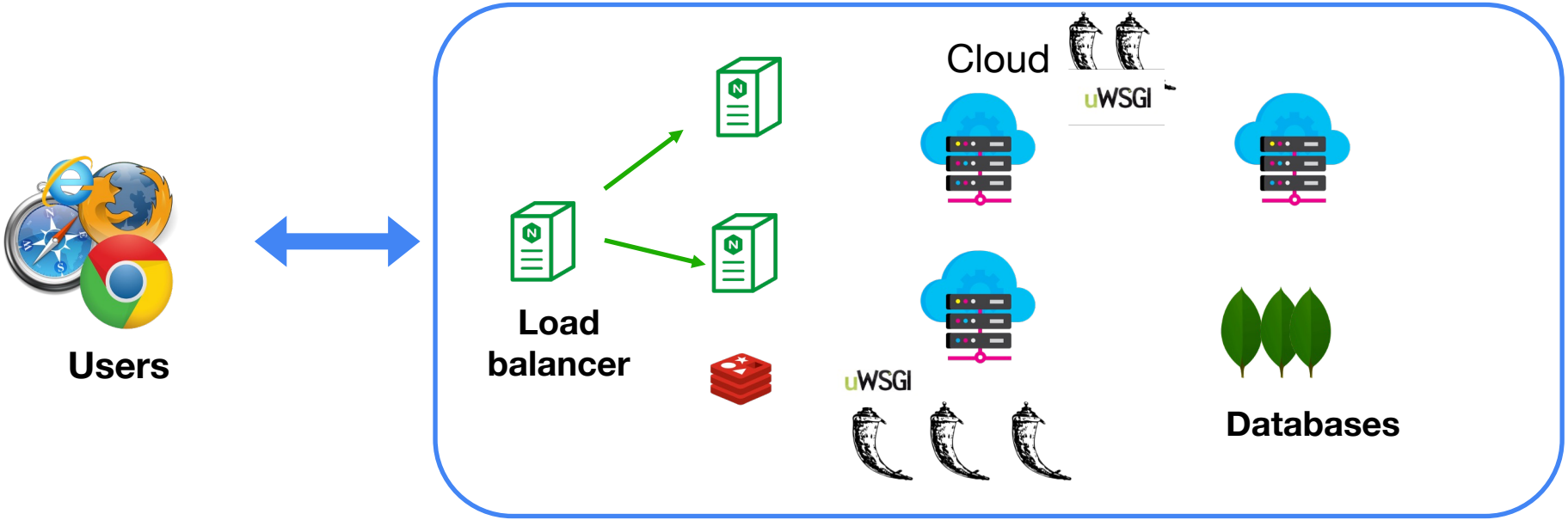
Production


Production

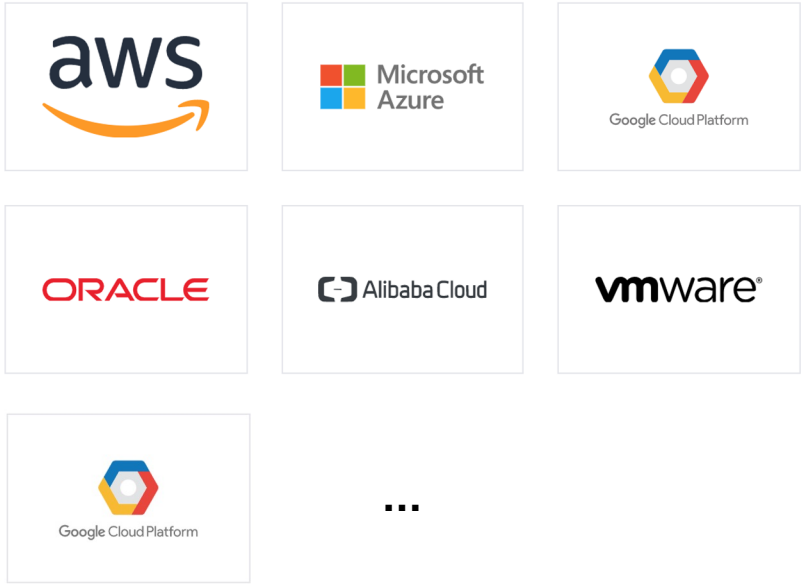
Web Application Architecture



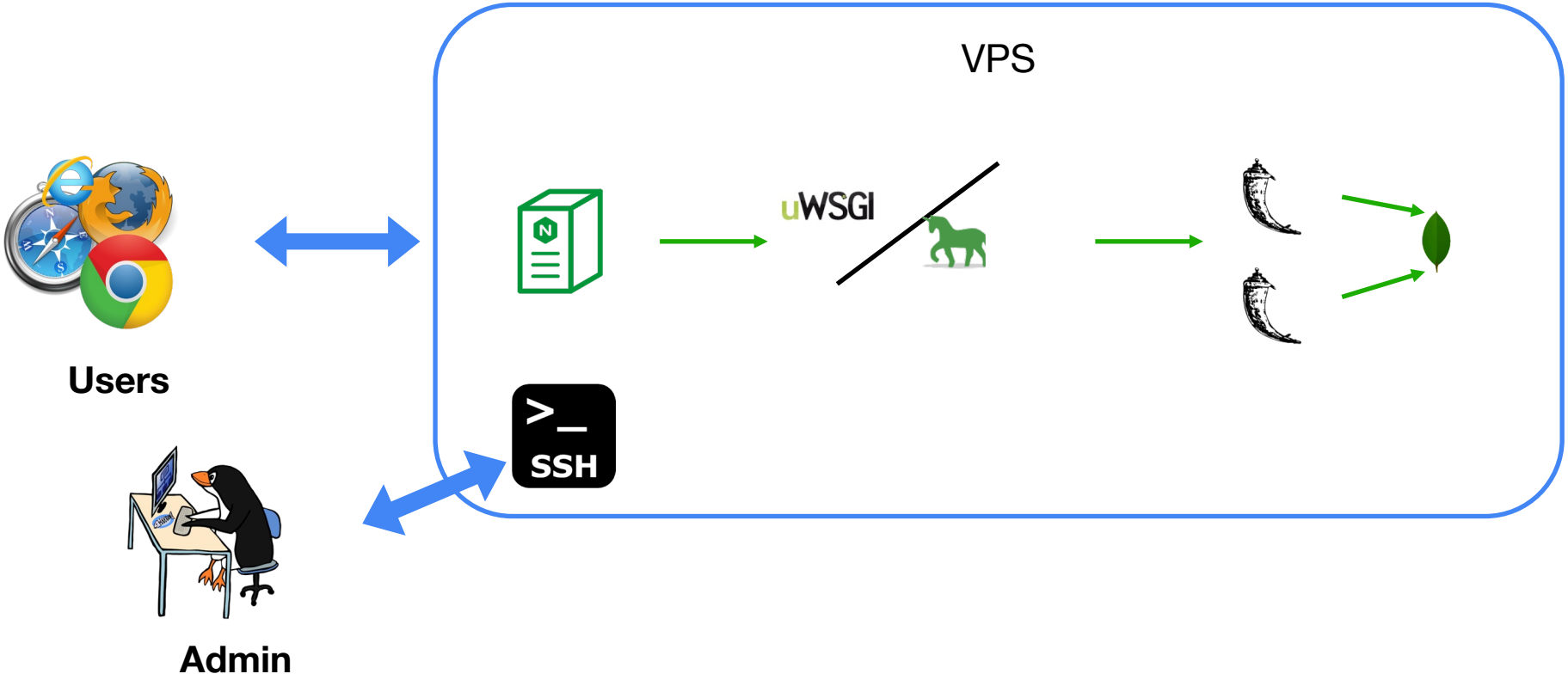
Web Application Architecture



Infrastructure providers



Simple infrastructure



Algorithm

- Generate SSH keys
- Buy VPS
- Connect via SSH
- Basic OS configuration
- Setup environment

SSH keygen

> ssh-keygen

Generating public/private rsa key pair.

Enter file in which to save the key (/<_your_path_>/.ssh/id_rsa):

> [enter]

OK

> cat /<_your_path_>/.ssh/id_rsa.pub

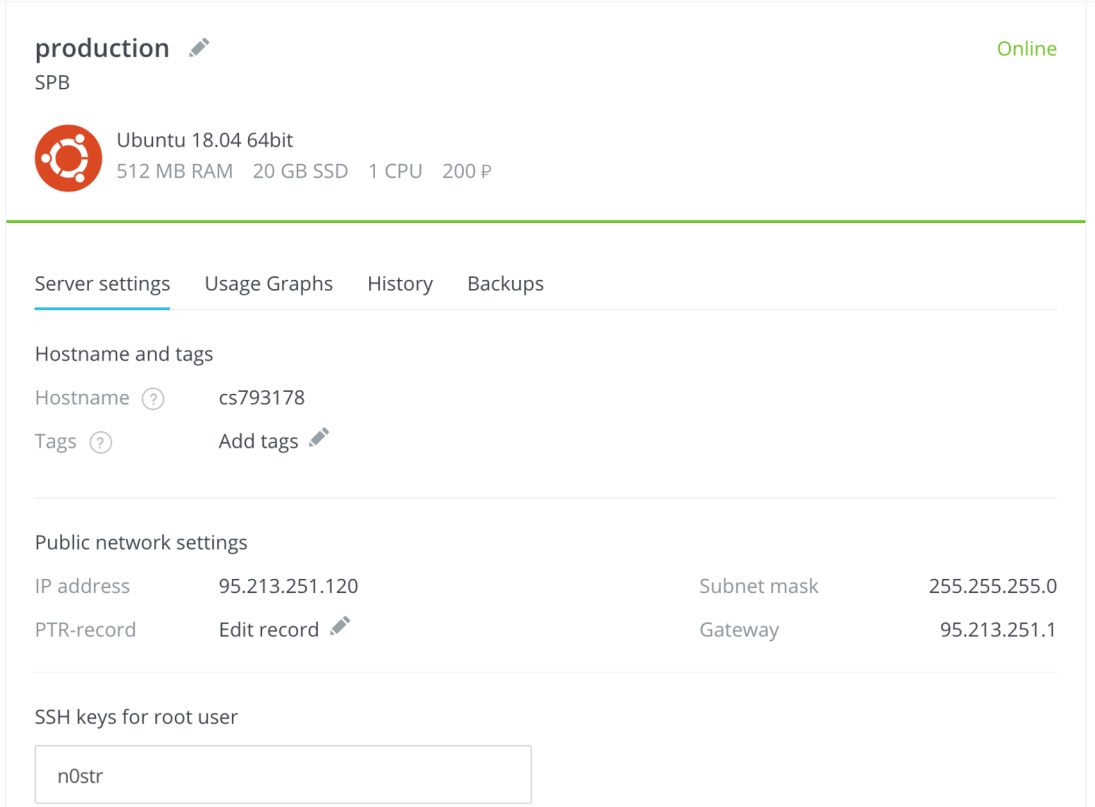
```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQDy21Sz18T67eA6O/Romm30cyvlLnTP3OlwpyLE4r97CUGy6Axs
pjGoYLIwU4NpeGZouD2/wHkPmXC40QzLY7mxqKzmvZJtfe2KCrHR4z+eopeGqU5+jHyBtASci+4rOXvh
m8yrm1VQzm1ST9fcF4gQNkbnXrrl5q3hoHgjPGe5enOjorvHam1LDXF6EaLmUuKrx5qfNzkOq6eMVE5C
tc/oOy/uWehpklc+cFiAPWiR6EVwMv5eDJUrEBWvkYCR5jYFCHipHgG5BnzUvqf0Uhf0NP2cjChZ9xPm
ZQ3sZUDOZ2pRBhNlBxMUSuKXiwXlmaPMkvtm74BzKJit8fXowVHD
```

Buy VPS

- vultr.com
- digitalocean.com
- vscale.io

- I will provide a VPS for each group project (if you need one)

Buy VPS


production
Online
SPB
Ubuntu 18.04 64bit
512 MB RAM 20 GB SSD 1 CPU 200 ₽
Server settings
Usage Graphs
History
Backups
Hostname and tags
Hostname
cs793178
Tags
Add tags
Public network settings
IP address
95.213.251.120
Subnet mask
255.255.255.0
PTR-record
Edit record
Gateway
95.213.251.1
SSH keys for root user
n0str

Connect via SSH

```
> ssh root@95.213.251.120

The authenticity of host '95.213.251.120 (95.213.251.120)' can't be
established.

ECDSA key fingerprint is SHA256:…/…

Are you sure you want to continue connecting (yes/no/[fingerprint])?

> yes

Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 4.15.0-76-generic x86_64)

root@cs793178:~#
```

Basic os configuration

- Update packages
- Create users
- Check SSH settings
- Setup firewall
- Add SSH keys of the team members

Setup environment

- Install GIT, Python
- Install Nginx web server
- Install MongoDB
- Install other software
- Configure Nginx and MongoDB
- Clone and run the web application

Vim

`:w` - write (save) the file, but don't exit

`:wq` - write (save) and quit

`:q!` - quit and throw away unsaved changes

`/pattern` - search for pattern

`i` - insert before the cursor

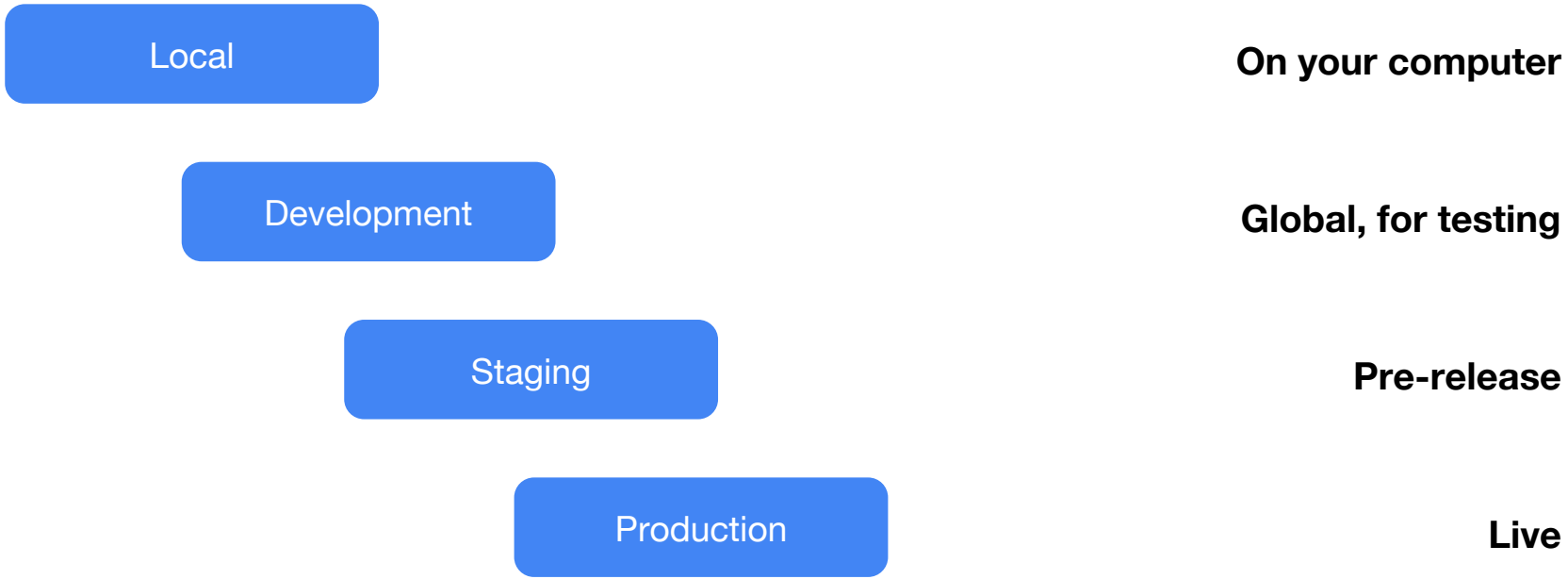
`o` - append (open) a new line below the current line

`Escape` - exit insert mode

.vimrc

```
syntax on
colorscheme desert
set tabstop=4
set shiftwidth=4
set expandtab
```

Deploy

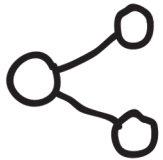

Local
On your computer
Development
Global, for testing
Staging
Pre-release
Production
Live

Deploy

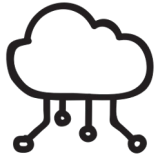
Deploy in our world

Configure

Setup access



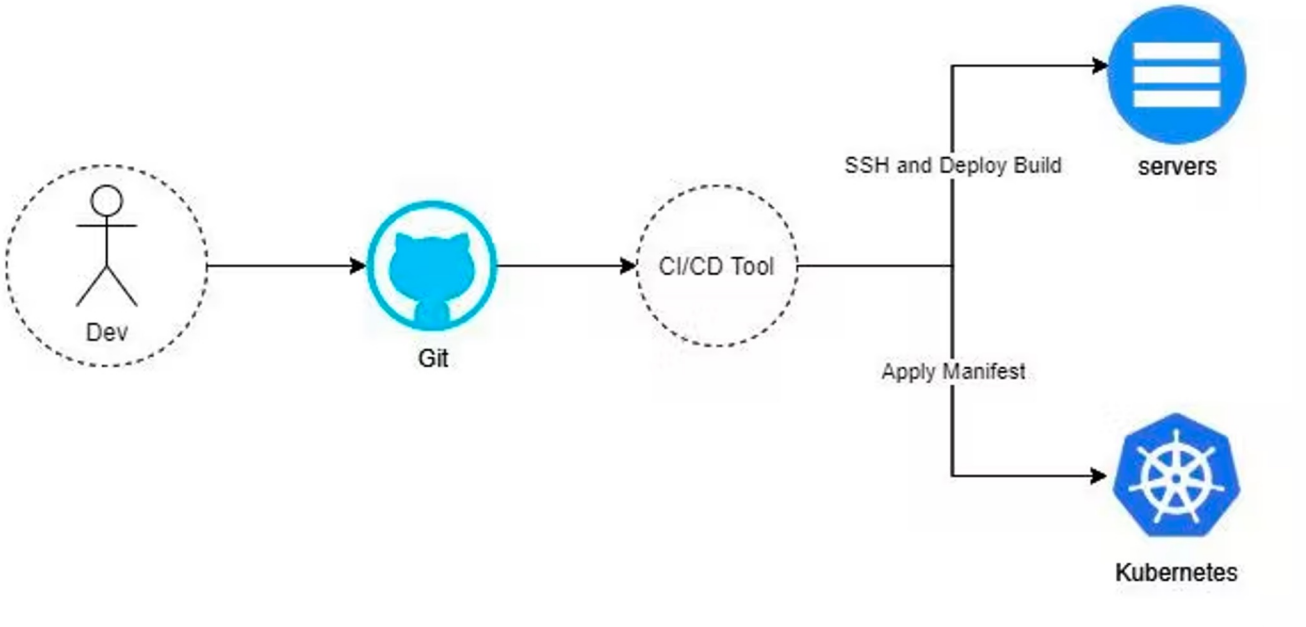
Get sources from GIT



Connect all parts

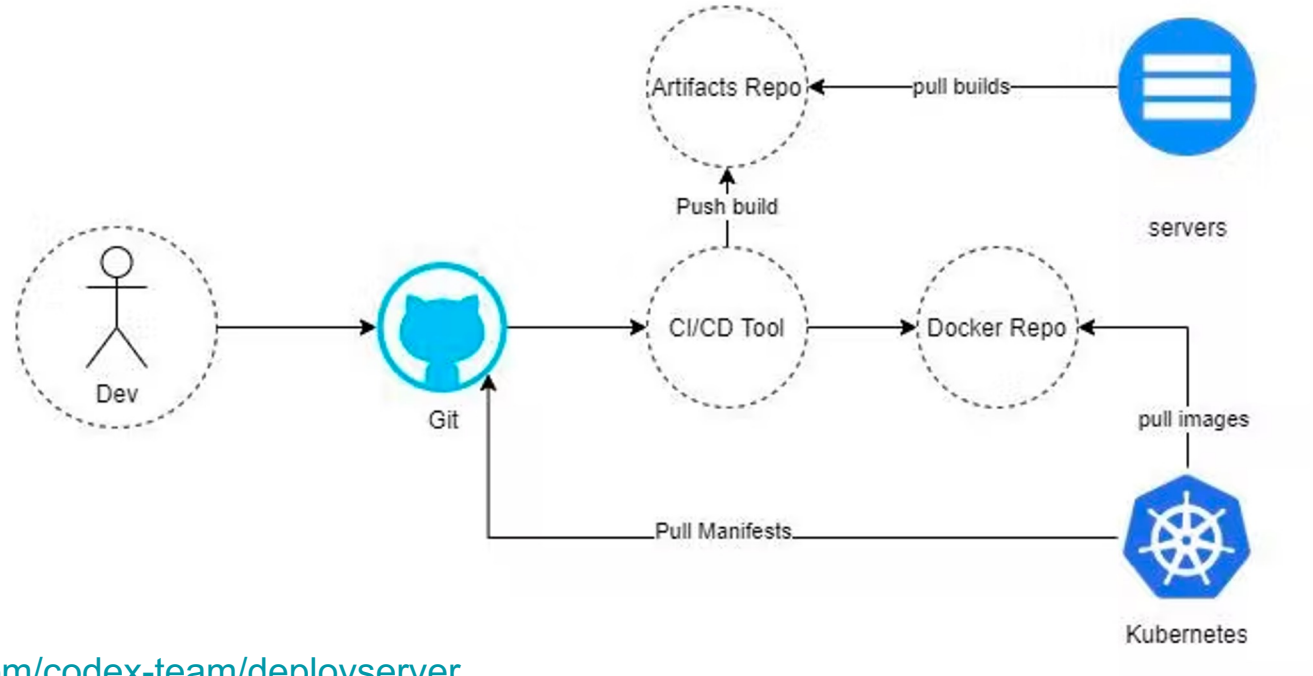
Monitoring

Push vs Pull



https://github.com/appleboy/ssh-action

Push vs Pull



https://github.com/codex-team/deployserver

Nginx

```
server {
    listen 80;
    server_name website.itmo.xyz;

    location / {
        proxy_pass http://localhost:5000/;
    }
}
```

/etc/nginx/sites-available/default

Nginx

0.0.0.0:80

Nginx

localhost:5000

Flask

Nginx basic auth

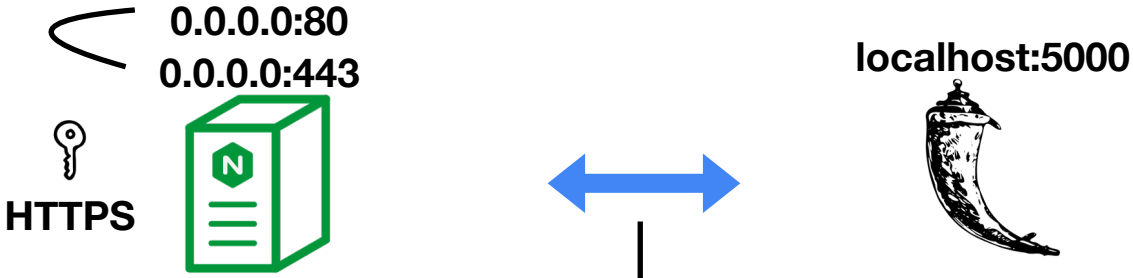
```
> apt install -y apache2-utils
> htpasswd -c /etc/nginx/.htpasswd user
New password:
Re-type new password:
Adding password for user user
```

… **add to /etc/nginx/sites-available/**…

```
        auth_basic            "You shall not pass";
        auth_basic_user_file /etc/nginx/.htpasswd;
```

```
> service nginx reload
```

Nginx




```
20:47:42.411987 IP localhost.5000 > localhost.34592: Flags [P.], seq 18:155, ack 561, win 512, options [nop,nop,TS val 1843124502 ecr 1843124502], length 137
E...'.@.@..+..... ..)...8S.....
m...m...Content-Type: text/html; charset=utf-8
Content-Length: 774
Server: Werkzeug/1.0.1 Python/3.6.9
Date: Fri, 24 Apr 2020 17:47:42 GMT


20:47:42.411992 IP localhost.34592 > localhost.5000: Flags [.], ack 155, win 511, options [nop,nop,TS val 1843124502 ecr 1843124502], length 0
E..4x.@.@..... ....8S..)......(.....
m...m...
20:47:42.412039 IP localhost.5000 > localhost.34592: Flags [P.], seq 155:929, ack 561, win 512, options [nop,nop,TS val 1843124502 ecr 1843124502], length 774
E..:'.@.@..... ..)...8S...../.....
m...m...<!DOCTYPE html>
<html>
  <head>
    <title>This is an example page</title>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
```

Certbot

```
apt-get update
apt install certbot python3-certbot-nginx
certbot --nginx
```

Nginx config

Nginx with SSL

```
server {
    if ($host = l5.itmo.xyz) {
        return 301 https://$host$request_uri;
    } # managed by Certbot

    listen 80 ;
    server_name l5.itmo.xyz;
    return 404; # managed by Certbot
}
```

```
server {
    access_log access.log;
    access_log error.log;

    location / {
        proxy_pass http://localhost:5000/;
    }

    server_name l5.itmo.xyz; # managed by Certbot

    listen 443 ssl; # managed by Certbot
    ssl_certificate /etc/letsencrypt/live/l5.itmo.xyz/fullchain.pem; #
    ssl_certificate_key /etc/letsencrypt/live/l5.itmo.xyz/privkey.pem;
    include /etc/letsencrypt/options-ssl-nginx.conf; # managed by Cert
    ssl_dhparam /etc/letsencrypt/ssl-dhparams.pem; # managed by Certbo
}
```

Screen

```
apt install screen
screen
screen -r
screen -ls
Ctrl+a Ctrl+d
exit
```

Systemd

```
[Unit]
Description=Example WAD application
After=network.target

[Service]
User=root
WorkingDirectory=/root/demo/
ExecStart=/usr/bin/python3 01_logging.py
Restart=always

[Install]
WantedBy=multi-user.target
```

/etc/systemd/system/wad.service

```
systemctl enable wad.service
systemctl daemon-reload

service wad status
service wad start
service wad stop
service wad restart

journalctl -u wad.service
journalctl -u wad.service --
since "15 minutes ago»
```