# Отчет
## по лабораторной работе *№3*
## по дисциплине «**Инфраструктура как код**»

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**УНИВЕРСИТЕТ ИТМО**

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# Цель работы

Поднять приложение на Django, используя Nginx для обработки статических файлов и прокси используя роли, научиться шаблонизации конфигураций.
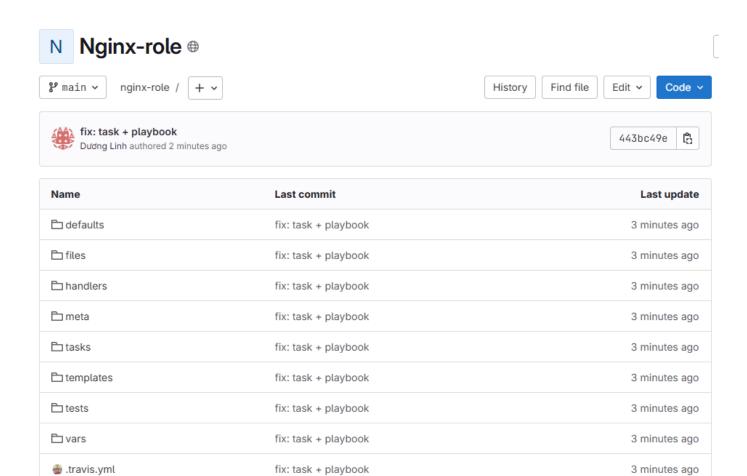
**Django-приложение:** [репо](#)

**Docker-образ:** https://hub.docker.com/repository/docker/timurbabs/django

**Ход работы**

1. Поднять Vagrant-окружение при помощи файла Vagrantfile, используя команду **vagrant up**
2. Написать роль для установки nginx, запушить в репозиторий и добавить в requirements.yml
3. Подготовить в инвентори шаблон конфигурационного файла для Nginx и для default-сайта, с настройками для отдачи статических файлов
4. Учесть в шаблоне проксирование динамики в контейнер с Django
5. Написать плейбук установки через роли nginx на хосты группы web, и docker на хосты группы app

Запустить приложение на хостах группы app или подготовить docker-compose.yml для запуска приложения

Create a repository for nginx role on gitlab

# N  Nginx-role ⊕

⏱ main ▾  nginx-role /  + ▾

History  Find file  Edit ▾  **Code** ▾

**fix: task + playbook**
Dương Linh authored 2 minutes ago

443bc49e  📋

| Name | Last commit | Last update |
|------|-------------|-------------|
| 📁 defaults | fix: task + playbook | 3 minutes ago |
| 📁 files | fix: task + playbook | 3 minutes ago |
| 📁 handlers | fix: task + playbook | 3 minutes ago |
| 📁 meta | fix: task + playbook | 3 minutes ago |
| 📁 tasks | fix: task + playbook | 3 minutes ago |
| 📁 templates | fix: task + playbook | 3 minutes ago |
| 📁 tests | fix: task + playbook | 3 minutes ago |
| 📁 vars | fix: task + playbook | 3 minutes ago |
| 🍥 .travis.yml | fix: task + playbook | 3 minutes ago |
| M↓ README.md | fix: task + playbook | 3 minutes ago |

Write: tasks, variables, handler, template, file

Create index.html

```
vagrant@srv2:~/roles/nginx/files$ cat index.html
<!DOCTYPE html>
<html>
<head>
    <title>Document</title>
</head>
<body>
    <p>Hi! My name is Linh</p>
</body>
</html>
```

Default:

```
vagrant@srv2:~/roles/nginx/defaults$ cat main.yml
---
nginx_state: "latest"

nginx_default_html_src: "files/index.html"
nginx_default_html_dest: "/var/www/html"

nginx_config_src: "templates/nginx.conf.j2"
nginx_config_available: "/etc/nginx/sites-available/default"
nginx_config_enable: "/etc/nginx/sites-enabled/default"

nginx_template_server_name: "localhost"
nginx_template_static_root: "/var/www/html"
```

Template:

```
vagrant@srv2:~/iac/roles/nginx/templates$ cat nginx.conf.j2
server {
  listen 80;

  server_name "{{ nginx_template_server_name }}";

  root "{{ nginx_template_static_root }}";
  index index.html index.htm;

  location / {
        try_files $uri $uri/ =404;
  }
}
```

Handler:

```
vagrant@srv2:~/iac/roles/nginx/handlers$ cat main.yml
---
- name: "Reload Nginx"
  service:
    name: nginx
    state: reloaded
```

Tasks:

```
vagrant@srv2:~/iac/roles/nginx/tasks$ cat main.yml
---
- name: "Install Nginx"
  apt:
    name: nginx
    state: "{{ nginx_state }}"
    update_cache: yes

- name: "Copy Nginx Default HTML"
  copy:
    src: "{{ nginx_default_html_src }}"
    dest: "{{ nginx_default_html_dest }}"
    mode: preserve

- name: "Copy Nginx Config File"
  template:
    src: "{{ nginx_config_src }}"
    dest: "{{ nginx_config_available }}"
  notify: "Reload Nginx"

- name: "Enable Configuration"
  file:
    src: "{{ nginx_config_available }}"
    dest: "{{ nginx_config_enabled }}"
    state: link
  notify: "Reload Nginx"
```

Inventory file:

```
vagrant@srv2:~/iac/lab3$ cat hosts
srv1 ansible_ssh_host=192.168.56.201 ansible_user=vagrant ansible_password=vagrant
srv3 ansible_ssh_host=192.168.56.203 ansible_user=vagrant ansible_password=vagrant

[app]
srv1

[docker]
srv1

[web]
srv3
```

Push to gitlab,com

```
vagrant@srv2:~/iac/roles/nginx$ git config user.email "euhhnil@yandex.ru"
Fatal: not in a git directory
vagrant@srv2:~/iac/roles/nginx$ git init
Initialized empty Git repository in /home/vagrant/iac/roles/nginx/.git/
vagrant@srv2:~/iac/roles/nginx$ git config user.email "euhhnil@yandex.ru"
vagrant@srv2:~/iac/roles/nginx$ git config user.name "euhhnil"
vagrant@srv2:~/iac/roles/nginx$ git add .
```

```
vagrant@srv2:~/iac/roles/nginx$ git commit -m "fix: task + playbook"
[master (root-commit) 443bc49] fix: task + playbook
 11 files changed, 198 insertions(+)
 create mode 100644 .travis.yml
 create mode 100644 README.md
 create mode 100644 defaults/main.yml
 create mode 100644 files/index.html
 create mode 100644 handlers/main.yml
 create mode 100644 meta/main.yml
 create mode 100644 tasks/main.yml
 create mode 100644 templates/nginx.conf.j2
 create mode 100644 tests/inventory
 create mode 100644 tests/test.yml
 create mode 100644 vars/main.yml
```

```
vagrant@srv2:~/iac/roles/nginx$ git push -uf origin main
Username for 'https://gitlab.com': euhhnil
Password for 'https://euhhnil@gitlab.com':
Enumerating objects: 21, done.
Counting objects: 100% (21/21), done.
Delta compression using up to 2 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (21/21), 3.36 KiB | 3.36 MiB/s, done.
Total 21 (delta 0), reused 0 (delta 0)
To https://gitlab.com/devops-itmo2/nginx-role.git
 + e51de48...443bc49 main -> main (forced update)
Branch 'main' set up to track remote branch 'main' from 'origin'.
```

Add roles repository to requirements.yaml

```
vagrant@srv2:~/iac$ cat requirements.yaml
roles:
  - src: git+https://gitlab.com/devops-itmo2/docker-role.git
    version: main
    name: docker
  - src: git+https://gitlab.com/devops-itmo2/nginx-role.git
    version: main
    name: nginx
```

Install role by file requirements.yaml

```
name: nginx
vagrant@srv2:~/iac$ ansible-galaxy role install -f -r requirements.yaml
- changing role docker from main to main
- extracting docker to /home/vagrant/.ansible/roles/docker
- docker (main) was installed successfully
- extracting nginx to /home/vagrant/.ansible/roles/nginx
- nginx (main) was installed successfully
```

Write playbook to install nginx on [web] and django on docker [app] and do proxy pass

```
vagrant@srv2:~/iac/lab3$ cat nginx-playbook.yaml
---
- name: "Setup Nginx"
  hosts: web
  become: true

  roles:
    - nginx

- name: "Install Docker to app hosts"
  hosts: "app"
  become: true

  roles:
    - docker
  vars:
    - docker_user: "vagrant"
  tasks:
    - name: "Run Django Application"
      docker_container:
        name: django-app
        image: timurbabs/django:latest
        state: started
        ports:
          - "8000:8000"
```

Run above playbook

```
vagrant@srv2:~/iac/lab3$ ansible-playbook -i hosts nginx-playbook.yaml

PLAY [Setup Nginx] ************************************************************************************

TASK [Gathering Facts] *******************************************************************************
ok: [srv3]

TASK [nginx : Install Nginx] *************************************************************************
ok: [srv3]

TASK [nginx : Copy Nginx Default HTML] **************************************************************
ok: [srv3]

TASK [nginx : Copy Nginx Config File] ***************************************************************
ok: [srv3]

TASK [nginx : Enable Configuration] *****************************************************************
ok: [srv3]

PLAY [Install Docker to app hosts] ****************************************************************

TASK [Gathering Facts] *******************************************************************************
ok: [srv1]

TASK [docker : Update and install dependencies] **************************************************
ok: [srv1]

TASK [docker : Add key repository] *****************************************************************
ok: [srv1]

TASK [docker : Add Docker repository] ************************************************************
ok: [srv1]

TASK [docker : Install Docker CE] ******************************************************************
ok: [srv1]

TASK [docker : Ensure Docker is running] *********************************************************
ok: [srv1]

TASK [docker : Add user to Docker group] *********************************************************
ok: [srv1]

TASK [Run Django Application] ***********************************************************************
ok: [srv1]

PLAY RECAP *******************************************************************************************
srv1                       : ok=8    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
srv3                       : ok=5    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```