

**САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ  
ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО**

Отчет по лабораторной работе №2

по дисциплине: “Администрирование компьютерных сетей”

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## Задача

На целевом сервере установить Ansible и вебсервер Caddy

## Подключение к виртуальной машине:

```
alex — root@beauty-sound: ~ — ssh root@185.91.52.23 — 90x34

The default interactive shell is now zsh.
To update your account to use zsh, please run 'chsh -s /bin/zsh'.
For more details, please visit https://support.apple.com/kb/HT208050.
MacBook-Pro-Alex:~ alex$ ssh root@185.91.52.23
The authenticity of host '185.91.52.23 (185.91.52.23)' can't be established.
ED25519 key fingerprint is SHA256:9cyQFXpXungNVVFaz0ivQYr7tw9QnLBjg0TBbHvbtbPA.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '185.91.52.23' (ED25519) to the list of known hosts.
root@185.91.52.23's password:
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-126-generic x86_64)

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

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@beauty-sound:~#
```

## Часть 1. Установка и настройка Ansible

Устанавливаем пакетный менеджер pip для нашего python:

```
root@beauty-sound:~# curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py && python3 get-pip.py
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 2222k 100 2222k 0 0 3862k 0 --:--:-- --:--:-- --:--:-- 3865k
Collecting pip
  Downloading pip-24.3.1-py3-none-any.whl.metadata (3.7 kB)
Collecting setuptools
  Downloading setuptools-75.6.0-py3-none-any.whl.metadata (6.7 kB)
Collecting wheel
  Downloading wheel-0.45.1-py3-none-any.whl.metadata (2.3 kB)
  Downloading pip-24.3.1-py3-none-any.whl (1.8 MB)
  1.8/1.8 MB 16.9 MB/s eta 0:00:00
  Downloading setuptools-75.6.0-py3-none-any.whl (1.2 MB)
  1.2/1.2 MB 43.9 MB/s eta 0:00:00
  Downloading wheel-0.45.1-py3-none-any.whl (72 kB)
Installing collected packages: wheel, setuptools, pip
Successfully installed pip-24.3.1 setuptools-75.6.0 wheel-0.45.1
```

Устанавливаем ansible:

```
root@beauty-sound:~# python3 -m pip install ansible
Collecting ansible
  Downloading ansible-10.7.0-py3-none-any.whl.metadata (8.0 kB)
Collecting ansible-core==2.17.7 (from ansible)
  Downloading ansible_core-2.17.7-py3-none-any.whl.metadata (6.9 kB)
Collecting jinja2>=3.0.0 (from ansible-core==2.17.7->ansible)
  Downloading jinja2-3.1.4-py3-none-any.whl.metadata (2.6 kB)
Requirement already satisfied: PyYAML>=5.1 in /usr/lib/python3/dist-packages (from ansible-core==2.17.7->ansible) (5.4.1)
Requirement already satisfied: cryptography in /usr/lib/python3/dist-packages (from ansible-core==2.17.7->ansible) (4.0)
Collecting packaging (from ansible-core==2.17.7->ansible)
  Downloading packaging-24.2-py3-none-any.whl.metadata (3.2 kB)
Collecting resolvelib<1.0.0, >=0.5.3 (from ansible-core==2.17.7->ansible)
  Downloading resolvelib-1.0.1-py2.py3-none-any.whl.metadata (4.0 kB)
Collecting MarkupSafe>=2.0 (from jinja2>=3.0.0->ansible-core==2.17.7->ansible)
  Downloading MarkupSafe-3.0.2-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (4.0 kB)
  Downloading ansible-10.7.0-py3-none-any.whl (51.6 MB)
  51.6/51.6 MB 57.6 MB/s eta 0:00:00
  Downloading ansible_core-2.17.7-py3-none-any.whl (2.2 MB)
  2.2/2.2 MB 53.8 MB/s eta 0:00:00
  Downloading jinja2-3.1.4-py3-none-any.whl (133 kB)
  Downloading resolvelib-1.0.1-py2.py3-none-any.whl (17 kB)
  Downloading packaging-24.2-py3-none-any.whl (65 kB)
  Downloading MarkupSafe-3.0.2-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (20 kB)
Installing collected packages: resolvelib, packaging, MarkupSafe, jinja2, ansible-core, ansible
Successfully installed MarkupSafe-3.0.2 ansible-10.7.0 ansible-core-2.17.7 jinja2-3.1.4 packaging-24.2 resolvelib-1.0.1
```

Копирование локальных файлов с кодом на сервер:

```
MacBook-Pro-Alex:ansible_project alex$ scp -r ./ansible.cfg ./inventory root@185.91.52.23:/root/
root@185.91.52.23's password:
ansible.cfg
hosts
MacBook-Pro-Alex:ansible_project alex$
```

Проверяем, что файлы перенеслись:

```
root@beauty-sound:~# ls /root/
ansible.cfg  get-pip.py  inventory
```

Проверяем, что сервер с Ansible подключился (перед этим потребовалось установить `sshpass` на сервере: `apt update && apt install -y sshpass`)

```
root@beauty-sound:~# ansible my_servers -m ping
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of
that path. See https://docs.ansible.com/ansible-core/2.17/reference\_appendices/interpreter\_discovery.html for more information.
remote_server | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.10"
  },
  "changed": false,
  "ping": "pong"
}
root@beauty-sound:~# ansible my_servers -m setup
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of
that path. See https://docs.ansible.com/ansible-core/2.17/reference\_appendices/interpreter\_discovery.html for more information.
remote_server | SUCCESS => {
  "ansible_facts": {
    "ansible_all_ipv4_addresses": [
      "192.168.0.6"
    ],
    "ansible_all_ipv6_addresses": [
      "fe80::f816:3eff:feb6:4a7c"
    ],
    "ansible_apparmor": {
      "status": "enabled"
    },
    "ansible_architecture": "x86_64",
    "ansible_bios_date": "04/01/2014",
    "ansible_bios_vendor": "SeaBIOS",
    "ansible_bios_version": "1.15.0-1",
    "ansible_board_asset_tag": "NA"
```

Пробуем выполнить команду посложнее на нашем клиенте

- Создаем текстовый файл с произвольным содержимым, через модуль `shell`: `ansible my_servers -c local -m shell -a 'echo test_file_content > $HOME/test.txt'`
- Проверяем, что по нужному пути создан нужный файл с нужным именем и содержимым
- Удаляем файл через модуль `file`: `ansible my_servers -c local -m file -a 'path=$HOME/test.txt state=absent'`

```

root@beauty-sound:~# ansible my_servers -m shell -a 'echo test_file_content > $HOME/test.txt'
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10
that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more
remote_server | CHANGED | rc=0 >>

root@beauty-sound:~# cat ~/test.txt
test_file_content
root@beauty-sound:~# ansible my_servers -m file -a 'path=$HOME/test.txt state=absent'
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10
that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more
remote_server | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.10"
  },
  "changed": true,
  "path": "/root/test.txt",
  "state": "absent"
}
root@beauty-sound:~# ls ~/test.txt
ls: cannot access '/root/test.txt': No such file or directory
root@beauty-sound:~#

```

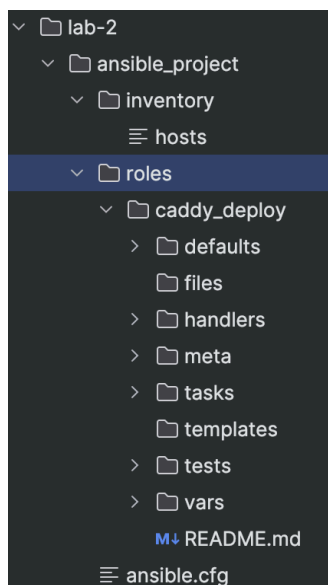
## Часть 2. Установка Caddy

Устанавливать будем вебсервер [Caddy](#). Для начала создадим в рабочей директории папку roles и в ней инициализируем исходное конфигурационное “дерево”: `ansible-galaxy init caddy_deploy`

```

mbp-alex:lab-2 alex$ mkdir roles && cd roles
mbp-alex:roles alex$ ansible-galaxy init caddy_deploy
- Role caddy_deploy was created successfully

```



Наполнили файл `roles/caddy_deploy/tasks/main.yml`. Здесь мы описываем непосредственно шаги, которые будут выполняться в нашем плейбуке

Запускаем плейбук: `ansible-playbook caddy_deploy.yml` и проверяем, успешно ли все шаги выполнились

```
root@beauty-sound:~# ansible-playbook /root/caddy_deploy.yml

PLAY [Install and configure Caddy webserver] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10, but future ins
that path. See https://docs.ansible.com/ansible-core/2.17/reference\_appendices/interpreter\_discovery.html for more information.
ok: [remote_server]

TASK [caddy_deploy : Install prerequisites] *****
changed: [remote_server]

TASK [caddy_deploy : Add key for Caddy repo] *****
changed: [remote_server]

TASK [caddy_deploy : add Caddy repo] *****
changed: [remote_server]

TASK [caddy_deploy : add Caddy src repo] *****
changed: [remote_server]

TASK [caddy_deploy : Install Caddy webserver] *****
changed: [remote_server]

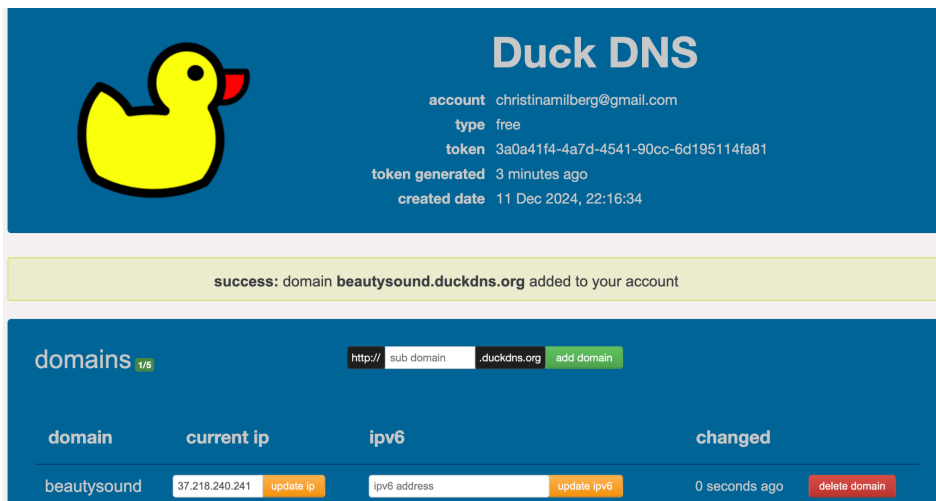
PLAY RECAP *****
remote_server      : ok=6   changed=5   unreachable=0   failed=0   skipped=0   rescued=0   ignored=0

root@beauty-sound:~#
```

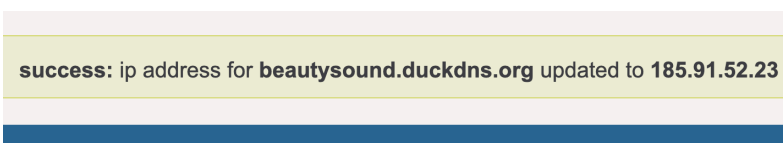
```
root@beauty-sound:~# service caddy status
● caddy.service - Caddy
   Loaded: loaded (/lib/systemd/system/caddy.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2024-12-16 17:12:27 UTC; 1min 5s ago
     Docs: https://caddyserver.com/docs/
  Main PID: 6886 (caddy)
    Tasks: 7 (limit: 2268)
   Memory: 10.6M
      CPU: 80ms
   CGroup: /system.slice/caddy.service
           └─6886 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile
```

### Часть 3. Домен и настройка Caddyfile

Регистрируем себе бесплатный домен на выданный ранее ip-адрес на сервисе [duckdns.org](https://duckdns.org)



Изменили ip адрес после того как получили виртуальную машину:



Создаём шаблон (Jinja2) и переменные (в формате `{{ var }}`), добавляем в наш плейбук (в tasks) новые шаги, отвечающие за создание конфигурационного файла из шаблона и последующую перезагрузку сервиса. Снова запускаем плейбук:

```
root@beauty-sound:~# ansible-playbook /root/caddy_deploy.yml

PLAY [Install and configure Caddy webserver] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10, but future
that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more informatio
ok: [remote_server]

TASK [caddy_deploy : Install prerequisites] *****
ok: [remote_server]

TASK [caddy_deploy : Add key for Caddy repo] *****
ok: [remote_server]

TASK [caddy_deploy : add Caddy repo] *****
ok: [remote_server]

TASK [caddy_deploy : add Caddy src repo] *****
ok: [remote_server]

TASK [caddy_deploy : Install Caddy webserver] *****
ok: [remote_server]

TASK [caddy_deploy : Create config file] *****
changed: [remote_server]

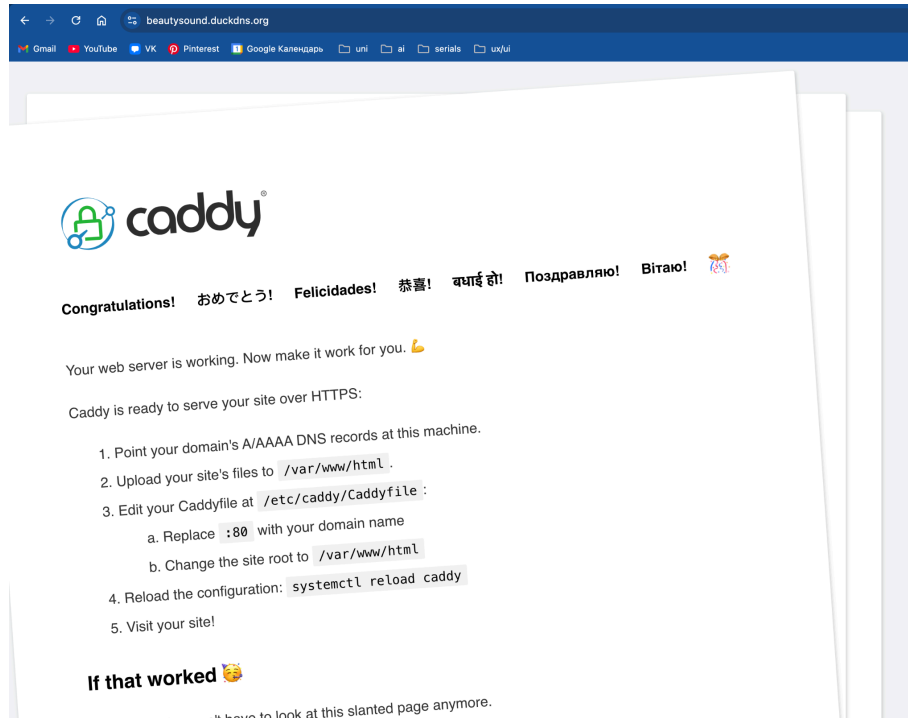
TASK [caddy_deploy : Reload with new config] *****
changed: [remote_server]

PLAY RECAP *****
remote_server      : ok=8   changed=2   unreachable=0   failed=0   skipped=0   rescued=0   ignored=0

root@beauty-sound:~#
```

Вводим в браузере имя своего домена и убеждаемся, что тестовая страничка Caddy автоматически поднялась на подписанном сертификате с https

<https://beautysound.duckdns.org/>



## Задания:

1. Создание плейбука my\_playbook.yml с содержимым:

```
1  ---
2  - name: Create, modify, and delete a file
3    hosts: my_servers # хосты из файла inventory/hosts, где будем выполнять наш плейбук
4    become: yes
5    tasks:
6      - name: Create a file
7        ansible.builtin.file:
8          path: /tmp/testfile.txt
9          state: touch # Создание пустого файла, если он не существует
10
11     - name: Add content to the file
12       ansible.builtin.copy:
13         content: "Hello, World! We are Lina & Kristina. Our team is beauty-sound."
14         dest: /tmp/testfile.txt
15         mode: '0644' # Устанавливаем права доступа
16
17     - name: Change the content of the file before deletion
18       ansible.builtin.copy:
19         content: "BLA BLA BLA"
20         dest: /tmp/testfile.txt
21         mode: '0644'
22
23     - name: Delete the file
24       ansible.builtin.file:
25         path: /tmp/testfile.txt
26         state: absent # Удаление файла
27
```

- Используется модуль `ansible.builtin.file` с параметром `state: touch` для создания пустого файла `/tmp/testfile.txt`, если он не существует.
- Модуль `ansible.builtin.copy` используется для записи строки в файл.
- Снова используем модуль `ansible.builtin.copy`, чтобы заменить содержимое файла на строку "BLA BLA BLA".
- Модуль `ansible.builtin.file` с параметром `state: absent` удаляет файл.

```

root@beauty-sound:~# ansible-playbook my_playbook.yml

PLAY [Create, modify, and delete a file] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host remote_server is using the discovered Python interpreter at /usr/bin/python3.10, but
that path. See https://docs.ansible.com/ansible-core/2.17/reference\_appendices/interpreter\_discovery.html for more info
ok: [remote_server]

TASK [Create a file] *****
changed: [remote_server]

TASK [Add content to the file] *****
changed: [remote_server]

TASK [Change the content of the file before deletion] *****
changed: [remote_server]

TASK [Delete the file] *****
changed: [remote_server]

PLAY RECAP *****
remote_server      : ok=5    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@beauty-sound:~#

```

2. Вся лабораторную работу выполнили на виртуальной машине