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«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»

Отчет

по лабораторной работе №2 «Ansible + Caddy»

по дисциплине **«Администрирование компьютерных сетей»**

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Часть 1. Установка и настройка Ansible

1) Подключаемся к ВМ и настраиваем рабочее окружение.

```
root@sudo-rmc:~#
Microsoft Windows [Version 10.0.19045.5131]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены

C:\WINDOWS\system32>ssh root@46.148.238.108
root@46.148.238.108's password:
Permission denied, please try again.
root@46.148.238.108's password:
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-124-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.

3 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

1 additional security update can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

*** System restart required ***

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@sudo-rm: ~/Lab2
root@sudo-rm:~# mkdir Lab2
root@sudo-rm:~# cd Lab2
bash: cd: Lab2: No such file or directory
root@sudo-rm:~# cd Lab2
root@sudo-rm:~/Lab2# mkdir inventory
root@sudo-rm:~/Lab2# touch ansible.cfg
root@sudo-rm:~/Lab2# nano ansible.cfg
root@sudo-rm:~/Lab2# root@sudo-rm:~/Lab2# cd -
root
root@sudo-rm:~# cd Lab1
bash: cd: Lab1: No such file or directory
root@sudo-rm:~# ls
lab2  get-pip.py
root@sudo-rm:~# cd Lab2
root@sudo-rm:~/Lab2# ls
ansible.cfg  inventory
root@sudo-rm:~/Lab2# cd inventory
root@sudo-rm:~/Lab2/inventory# touch hosts
root@sudo-rm:~/Lab2/inventory# nano hosts
[my_servers]
local server      ansible_host=localhost
root@sudo-rm:~/Lab2/inventory# cd -
root@sudo-rm:~/Lab2#
root@sudo-rm:~/Lab2# cat ansible.cfg
[defaults]
host_key_checking = false
inventory          = inventory/hosts
root@sudo-rm:~/Lab2#
```

2) Проверяем, что сервер с Ansible подключился к “клиенту”.

```

root@sudo-mn: ~/Lab2
root@sudo-mn:~/Lab2# ansible my_servers -m ping -c local
[WARNING]: Platform linux on host local_server is using the discovered Python interpreter at /usr/bin/python3.10, but
future installation of another Python interpreter could change the meaning of that path. See
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
local_server | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.10"
  },
  "changed": false,
  "ping": "pong"
}

root@sudo-mn:~/Lab2# ansible my_servers -m setup -c local
[WARNING]: Platform linux on host local_server is using the discovered Python interpreter at /usr/bin/python3.10, but
future installation of another Python interpreter could change the meaning of that path. See
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
local_server | SUCCESS => {
  "ansible_facts": {
    "ansible_all_ipv4_addresses": [
      "192.168.0.15"
    ],
    "ansible_all_ipv6_addresses": [
      "fe80::f816:3eff:fe5:bfe1"
    ],
    "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",
    "ansible_board_name": "NA",
    "ansible_board_serial": "NA",
    "ansible_board_vendor": "NA",
    "ansible_board_version": "NA",
    "ansible_chassis_asset_tag": "NA",
    "ansible_chassis_serial": "NA",
    "ansible_chassis_vendor": "QEMU",
    "ansible_chassis_version": "pc-i440fx-6.2",
    "ansible_cmdline": {
      "BOOT_IMAGE": "/boot/vmlinuz-5.15.0-124-generic",
      "biosdevname": "0",
      "clocksource_fallback": "acpi_pm",
      "console": "ttyS0,115200",
      "consoleblank": "0",
      "gfxpayload": "text",
      "net.ifnames": "0",
      "no_timer_check": true,
      "nfsb": true,
      "nomodeset": true,
      "panic": "15",
      "ro": true,
      "root": "LABEL=cloudimg-rootfs"
    },
    "ansible_date_time": {
      "date": "2024-11-18"
    }
  }
}

```

3) Создаем текстовый файл с производным содержимым, через модуль shell; Проверяем, что по нужному пути создан нужный файл с нужным именем и содержимым; Удаляем файл через модуль file.

```

root@sudo-rm:~/Lab2# ansible my_servers -c local -m shell -a 'echo test_file_content > $HOME/test.txt'
[WARNING]: Platform linux on host local_server is using the discovered Python interpreter at /usr/bin/python3
installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.co
re/2.17/reference_appendices/interpreter_discovery.html for more information.
local_server | CHANGED | rc=0 >>

root@sudo-rm:~/Lab2# ls -la ..
total 2264
drwx----- 7 root root 4096 Nov 18 14:43 .
drwxr-xr-x 20 root root 4096 Nov 15 17:48 ..
drwxr-xr-x 3 root root 4096 Nov 18 14:41 .ansible
-rw-r--r-- 1 root root 3106 Oct 15 2021 .bashrc
drwx----- 3 root root 4096 Nov 18 14:29 .cache
drwxr-xr-x 3 root root 4096 Nov 18 14:36 .local
-rw-r--r-- 1 root root 161 Jul 9 2019 .profile
drwx----- 2 root root 4096 Nov 15 17:48 .ssh
drwxr-xr-x 3 root root 4096 Nov 18 14:37 Lab2
-rw-r--r-- 1 root root 2275758 Nov 18 14:29 get-pip.py
-rw-r--r-- 1 root root 18 Nov 18 14:43 test.txt
root@sudo-rm:~/Lab2#

root@sudo-rm:~/Lab2# ansible my_servers -c local -m file -a 'path=$HOME/test.txt state=absent'
[WARNING]: Platform linux on host local_server is using the discovered Python interpreter at /usr/bin/python3
installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.co
re/2.17/reference_appendices/interpreter_discovery.html for more information.
local_server | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.10"
  },
  "changed": true,
  "path": "/root/test.txt",
  "state": "absent"
}
root@sudo-rm:~/Lab2# cat ../test.txt
cat: ../test.txt: No such file or directory

```

Часть 2. Установка Caddy

- 1) В части 1 были рассмотрены базовые ad-hoc команды для Ansible, пора переходить к более сложным конструкциям - Ansible Playbooks. Устанавливать будем вебсервер Caddy. Для начала создадим в рабочей директории папку roles и в ней инициализируем исходное конфигурационное “дерево”.

```

root@sudo-rm:~/Lab2# mkdir roles
root@sudo-rm:~/Lab2# cd roles
root@sudo-rm:~/Lab2/roles# ansible-galaxy init caddy_deploy
- Role caddy_deploy was created successfully
root@sudo-rm:~/Lab2/roles# tree
Command 'tree' not found, but can be installed with:
snap install tree # version 2.1.3+pkg-5852, or
apt install tree # version 2.0.2-1
See 'snap info tree' for additional versions.
root@sudo-rm:~/Lab2/roles# snap install tree
2024-11-18T14:45:59Z INFO Waiting for automatic snapd restart...
tree 2.1.3+pkg-5852 from B B B (Buo-ren Lin) (brlin) installed
root@sudo-rm:~/Lab2/roles# tree
locales-launch: Data of en_US locale not found, generating, please wait...
├── caddy_deploy
│   ├── README.md
│   ├── defaults
│   │   └── main.yml
│   ├── files
│   ├── handlers
│   │   └── main.yml
│   ├── meta
│   │   └── main.yml
│   ├── tasks
│   │   └── main.yml
│   ├── templates
│   ├── tests
│   │   ├── inventory
│   │   └── test.yml
│   └── vars
│       └── main.yml
10 directories, 8 files

```

- 2) Наполняем файл main.yml. Здесь мы описываем непосредственно шаги, которые будут выполняться в нашем плейбуке.

```

YAML
---
# tasks file for caddy_deploy

- name: Install prerequisites
  apt:
    pkg:
      - debian-keyring
      - debian-archive-keyring
      - apt-transport-https
      - curl

- name: Add key for Caddy repo
  apt_key:
    url: https://dl.cloudsmith.io/public/caddy/stable/gpg.key
    state: present
    keyring: /usr/share/keyrings/caddy-stable-archive-keyring.gpg

- name: add Caddy repo
  apt_repository:
    repo: "deb [signed-by=/usr/share/keyrings/caddy-stable-archive-keyring.gpg] https://dl.cloudsmith.io/public/caddy/stable/deb/debian
    state: present
    filename: caddy-stable

- name: add Caddy src repo
  apt_repository:
    repo: "deb-src [signed-by=/usr/share/keyrings/caddy-stable-archive-keyring.gpg] https://dl.cloudsmith.io/public/caddy/stable/deb/debian
    state: present
    filename: caddy-stable

- name: Install Caddy webserver
  apt:
    name: caddy
    update_cache: yes
    state: present

```

- 3) Наконец, в рабочей директории создаем собственно файл конфигурации самого плейбука, где указываем нужные нам hosts и роли.

```

YAML
---
- name: Install and configure Caddy webserver # Любое описание
  hosts: my_servers # хосты из файла inventory/hosts, где будем выполнять
  connection: local # аналог -с local, но для плейбуков

  roles:
    - caddy_deploy # собственно, роль для выполнения

```


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

```
root@sudo-rm:~/Lab2# ansible-playbook caddy_deploy.yml
PLAY [Install and configure Caddy webserver] *****
TASK [Gathering Facts] *****
[WARNING]: Platform linux on host local_server is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another Python interpreter
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [local_server]
TASK [caddy_deploy : Install prerequisites] *****
changed: [local_server]
TASK [caddy_deploy : Add key for Caddy repo] *****
changed: [local_server]
TASK [caddy_deploy : add Caddy repo] *****
changed: [local_server]
TASK [caddy_deploy : add Caddy src repo] *****
changed: [local_server]
TASK [caddy_deploy : Install Caddy webserver] *****
changed: [local_server]
PLAY RECAP *****
local_server      : ok=6   changed=5   unreachable=0   failed=0   skipped=0   rescued=0   ignored=0

root@sudo-rm:~/Lab2# service caddy status
Command 'service' not found, did you mean:
  Command 'service' from deb init-system-helpers (1.62)
try: apt install <deb name>
root@sudo-rm:~/Lab2# service caddy status
* caddy.service - Caddy
   Loaded: loaded (/lib/systemd/system/caddy.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2024-11-18 14:57:07 UTC; 55s ago
     Docs: https://caddyserver.com/docs/
   Main PID: 40342 (caddy)
    Tasks: 8 (limit: 2268)
   Memory: 19.8M
      CPU: 77ms
   CGroup: /system.slice/caddy.service
           └─40342 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile
```

Часть 3. Домен и настройка Caddyfile

- 1) Регистрируем себе бесплатный домен `laba2.duckdns.org` на выданный ранее ip-адрес.



Duck DNS

account stefphf@github

type free

token 1902522f-eac9-468c-b2e4-9aba6144cd5d

token generated 3 weeks ago

created date 18 Nov 2024, 14:51:30

domains 1/5

domain	current ip	ipv6	changed
laba2	46.148.238.108 <input type="button" value="update ip"/>	<input type="text" value="ipv6 address"/> <input type="button" value="update ipv6"/>	3 weeks ago

This site is protected by reCAPTCHA and the Google [Privacy Policy](#) and [Terms of Service](#) apply.

- 2) Попробуем использовать доп. возможности плейбуков - создадим шаблон (Jinja2) и переменные (в формате {{ var }}).

roles/caddy_deploy/templates/Caddyfile.j2

```
Bash
{{ domain_name }} {
    root * /usr/share/caddy
    file_server

    log {
        output file {{ log.file }}
        format json
        level {{ log.level }}
    }
}
```

roles/caddy_deploy/vars/main.yml

```
YAML
---
# vars file for caddy_deploy

domain_name: прописываем.свой.домен

log: # Можно поиграться со значениями
  file: /var/log/caddy_access.log
  level: "INFO"
```

- 3) Добавляем в наш плейбук (в tasks) новые шаги, отвечающие за создание конфигурационного файла из шаблона и последующую перезагрузку сервиса.

```
YAML
- ...

- ...

- name: Create config file
  template:
    src: templates/Caddyfile.j2 # Откуда берем
    dest: /etc/caddy/Caddyfile # Куда кладем

- name: Reload with new config
  service:
    name: caddy
    state: reloaded
```

- 4) Снова запускаем плейбук, после чего вводим в браузере имя своего домена и убеждаемся, что тестовая страничка Caddy автоматически поднялась на подписанном сертификате с https.

```
root@sudo-rm:~/Lab2# ansible-playbook caddy_deploy.yml
PLAY [Install and configure Caddy webserver] *****
TASK [Gathering Facts] *****
[WARNING]: Platform linux on host local_server is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of a
could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more
ok: [local_server]
TASK [caddy_deploy : Install prerequisites] *****
ok: [local_server]
TASK [caddy_deploy : Add key for Caddy repo] *****
ok: [local_server]
TASK [caddy_deploy : add Caddy repo] *****
ok: [local_server]
TASK [caddy_deploy : add Caddy src repo] *****
ok: [local_server]
TASK [caddy_deploy : Install Caddy webserver] *****
ok: [local_server]
TASK [caddy_deploy : Create config file] *****
changed: [local_server]
TASK [caddy_deploy : Reload with new config] *****
changed: [local_server]
PLAY RECAP *****
local_server : ok=8 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@sudo-rm:~/Lab2# cat /etc/caddy/Caddyfile
lab2.duckdns.org {
  root * /usr/share/caddy
  file_server

  log {
    output file /var/log/caddy_access.log
    format json
    level INFO
  }
}
```



Congratulations! おめでとう! Felicitades! 恭喜! बधाई हो! Поздравляю! Вітаю!



Your web server is working. Now make it work for you. 🍌

Caddy is ready to serve your site over HTTPS:

1. Point your domain's A/AAAA DNS records at this machine.

... to `http://www/html`.

Задание: Вариант 2.

Вместо дефолтного шаблона, была подставлена простая html страница.

```
root@sudo-rm: ~/Lab2
GNU nano 6.2
roles/caddy_deploy/files/index.html
<!DOCTYPE html>
<html lang="ru">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Лабораторная работа 2</title>
</head>
<body>
  <h1>Лабораторная работа 2 выполнена!</h1>
  <p>Эта страница подтверждает успешное выполнение лабораторной работы. Все задачи были выполнены в срок, а результат вы видите на экране!</p>
</body>
</html>
```

Был добавлен новый шаг в файл tasks/main.yml.

```
- name: Deploy custom index.html
  copy:
    src: files/index.html
    dest: /usr/share/caddy/index.html
    owner: root
    group: root
    mode: 0644
```

Конечный результат можно посмотреть в виде страницы по адресу <https://laba2.duckdns.org/>

