МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное образовательное учреждение
высшего образования
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ФИЗИКО-ТЕХНИЧЕСКИЙ ИНСТИТУТ
Кафедра компьютерной инженерии и моделирования

ОТЧЕТ ПО ПРАКТИЧЕСКОМУ ЗАДАНИЮ №6
«Знакомство с Ansible»

Практическая работа
по дисциплине «Современные технологии программирования»
студента 1 курса группы ПИ-б-о-232
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направления подготовки 09.03.04 «Программная инженерия»

Симферополь, 2024

Цель: Ознакомиться на практике с инструментом для удаленного управления конфигурациями Ansible.

Ход выполнения задания.

Машина с Ansible

1,2

```
asan@asan:~$ cd /etc/netplan/
asan@asan:/etc/netplan$ ls
50-cloud-init.yaml
asan@asan:/etc/netplan$ sudo netplan get
[sudo] password for asan:
network:
  version: 2
  ethernets:
    enp0s3:
      dhcp4: true
asan@asan:/etc/netplan$ sudo nano 01-dns.yaml
asan@asan:/etc/netplan$ sudo netplan generate

** (generate:1630): WARNING **: 14:52:31.962: Permissions for /etc/netplan/01-dns.
yaml are too open. Netplan configuration should NOT be accessible by others.
asan@asan:/etc/netplan$ sudo netplan applay
usage: /usr/sbin/netplan  [-h] [--debug]  ...
/usr/sbin/netplan : error: argument : invalid choice: 'applay' (choose from 'help'
, 'apply', 'generate', 'get', 'info', 'ip', 'set', 'rebind', 'status', 'try')
asan@asan:/etc/netplan$ sudo netplan get

** (process:1682): WARNING **: 14:52:45.068: Permissions for /etc/netplan/01-dns.y
aml are too open. Netplan configuration should NOT be accessible by others.
network:
  version: 2
  ethernets:
    enp0s3:
      nameservers:
        addresses:
        - 8.8.8.8
      dhcp4: true
asan@asan:/etc/netplan$
```

3

```
asan@asan:/etc/netplan$ sudo apt-get update
Get:1 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 Packages [1,401 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/main Translation-en [513 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/main amd64 c-n-f Metadata [30.5 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/restricted amd64 Packages [93.9 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [76.8 k
B]
Get:10 http://archive.ubuntu.com/ubuntu noble/restricted Translation-en [18.7 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/restricted amd64 c-n-f Metadata [416
 B]
Get:12 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
```

4,5

```
asan@asan:~$ python3 --version
Python 3.12.3
asan@asan:~$ python3 -m pip -V
pip 24.0 from /usr/lib/python3/dist-packages/pip (python 3.12)
asan@asan:~$
```

6,7,8

```
asan@asan:~$ ansible --version
ansible [core 2.16.3]
  config file = None
  configured module search path = ['/home/asan/.ansible/plugins/modules', '/usr/sh
are/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /home/asan/.ansible/collections:/usr/share/ansible
/collections
  executable location = /usr/bin/ansible
  python version = 3.12.3 (main, Apr 10 2024, 05:33:47) [GCC 13.2.0] (/usr/bin/pyt
hon3)
  jinja version = 3.1.2
  libyaml = True
asan@asan:~$
```

Машина с Docker Compose

1,2

```
asan@asan:~$ cd /etc/netplan/
asan@asan:/etc/netplan$ ls
50-cloud-init.yaml
asan@asan:/etc/netplan$ sudo nano 01-dns.yaml
[sudo] password for asan:
asan@asan:/etc/netplan$ sudo netplan generate

** (generate:1698): WARNING **: 15:32:30.676: Permissions for /etc/netplan/01-dns.
yaml are too open. Netplan configuration should NOT be accessible by others.
asan@asan:/etc/netplan$ sudo netplan applay
usage: /usr/sbin/netplan  [-h] [--debug]  ...
/usr/sbin/netplan : error: argument : invalid choice: 'applay' (choose from 'help'
, 'apply', 'generate', 'get', 'info', 'ip', 'set', 'rebind', 'status', 'try')
asan@asan:/etc/netplan$ sudo netplan get

** (process:1753): WARNING **: 15:33:05.078: Permissions for /etc/netplan/01-dns.y
aml are too open. Netplan configuration should NOT be accessible by others.
network:
  version: 2
  ethernets:
    enp0s3:
      nameservers:
        addresses:
        - 8.8.8.8
      dhcp4: true
asan@asan:/etc/netplan$
```

3

```
asan@asan:/etc/netplan$ sudo apt-get update
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [80.3 k
B]
Get:4 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [22.2 k
B]
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [6,78
4 B]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [
108 B]
Get:7 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components
 [212 B]
```

4

```
asan@asan:~$ sudo apt-get install ca-certificates curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20240203).
ca-certificates set to manually installed.
The following additional packages will be installed:
  libcurl3t64-gnutls libcurl4t64
The following packages will be upgraded:
  curl libcurl3t64-gnutls libcurl4t64
3 upgraded, 0 newly installed, 0 to remove and 41 not upgraded.
Need to get 900 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
```

```
asan@asan:~$ sudo install -m 0755 -d /etc/apt/keyrings
asan@asan:~$ sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg -o /etc/
apt/keyrings/docker.asc
asan@asan:~$ sudo chmod a+r /etc/apt/keyrings/docker.asc
asan@asan:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyri
ngs/docker.asc] https://download.docker.com/linux/ubuntu $(. /etc/os-release && ec
ho "$VERSION_CODENAME") stable" | sudo tee /etc/apt/sources.list.d/docker.list > /
dev/null
asan@asan:~$ sudo apt-get update
Get:1 https://download.docker.com/linux/ubuntu noble InRelease [48.8 kB]
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Get:3 https://download.docker.com/linux/ubuntu noble/stable amd64 Packages [6,952
B]
Hit:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:5 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Fetched 55.8 kB in 1s (77.2 kB/s)
Reading package lists... Done
asan@asan:~$ sudo apt-get install docker-ce docker-ce-cli containerd.io docker-bui
ldx-plugin docker-compose-plugin
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  docker-ce-rootless-extras libltdl7 libslirp0 pigz slirp4netns
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
The following NEW packages will be installed:
  containerd.io docker-buildx-plugin docker-ce docker-ce-cli
  docker-ce-rootless-extras docker-compose-plugin libltdl7 libslirp0 pigz
  slirp4netns
0 upgraded, 10 newly installed, 0 to remove and 41 not upgraded.
Need to get 122 MB of archives.
After this operation, 434 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

```
asan@asan:~$ docker compose version
Docker Compose version v2.27.0
asan@asan:~$
```

Создаём сервера

1,2,3

```
asan@asan:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP gr
oup default qlen 1000
    link/ether 08:00:27:7f:9f:81 brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.108/24 metric 100 brd 192.168.0.255 scope global dynamic enp0s3
       valid_lft 86040sec preferred_lft 86040sec
    inet6 fe80::a00:27ff:fe7f:9f81/64 scope link
       valid_lft forever preferred_lft forever
asan@asan:~$ ip r
default via 192.168.0.1 dev enp0s3 proto dhcp src 192.168.0.108 metric 100
192.168.0.0/24 dev enp0s3 proto kernel scope link src 192.168.0.108 metric 100
192.168.0.1 dev enp0s3 proto dhcp scope link src 192.168.0.108 metric 100
asan@asan:~$ sudo apt install net-tools
[sudo] password for asan:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
net-tools is already the newest version (2.10-0.1ubuntu4).
net-tools set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 37 not upgraded.
asan@asan:~$ arp -e
Address                  HWtype  HWaddress           Flags Mask            Iface
_gateway                 ether   00:31:92:1d:c7:c4   C                     enp0s3
192.168.0.106            ether   14:13:33:58:12:4d   C                     enp0s3
asan@asan:~$
```

4

```
asan@asan:~$ sudo apt-get install nmap
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libblas3 liblinear4 liblua5.4-0 libssh2-1t64 nmap-common
Suggested packages:
  liblinear-tools liblinear-dev ncat ndiff zenmap
The following NEW packages will be installed:
  libblas3 liblinear4 liblua5.4-0 libssh2-1t64 nmap nmap-common
0 upgraded, 6 newly installed, 0 to remove and 37 not upgraded.
Need to get 6,452 kB of archives.
After this operation, 28.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

```
asan@asan:~$ sudo nmap -Pn 192.168.0.1/24
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-05-29 20:26 UTC
Nmap scan report for _gateway (192.168.0.1)
Host is up (0.013s latency).
Not shown: 996 closed tcp ports (reset)
PORT     STATE SERVICE
23/tcp   open  telnet
53/tcp   open  domain
80/tcp   open  http
1900/tcp open  upnp
MAC Address: 00:31:92:1D:C7:C4 (TP-Link Limited)

Nmap scan report for 192.168.0.102
Host is up (0.013s latency).
All 1000 scanned ports on 192.168.0.102 are in ignored states.
Not shown: 1000 closed tcp ports (reset)
MAC Address: DC:B7:2E:66:62:A2 (Xiaomi Communications)

Nmap scan report for 192.168.0.106
Host is up (0.000051s latency).
Not shown: 999 closed tcp ports (reset)
PORT   STATE SERVICE
22/tcp open  ssh
MAC Address: 14:13:33:58:12:4D (AzureWave Technology)

Nmap scan report for asan (192.168.0.108)
Host is up (0.0000060s latency).
Not shown: 999 closed tcp ports (reset)
PORT   STATE SERVICE
22/tcp open  ssh

Nmap done: 256 IP addresses (4 hosts up) scanned in 74.11 seconds
```

1,2

```
  GNU nano 7.2                          compose.yaml *
services:
  test: # Так я назвал сервис
    image: rastasheep/ubuntu-sshd # Тот самый базовый образ
    dns:
      - 8.8.8.8   # Гугловый
    networks:
      outside:
        ipv4_address: 192.168.0.100 # Свободный ip из нашей подсети

# Здесь создаём docker-сеть
networks:
  outside: # Так я назвал сеть
    driver: ipvlan
    driver_opts:
      parent: enp0s3 # Сетевой интерфейс
    ipam:
      config:
        - subnet: 192.168.0.0/24 # Адрес подсети и маска
          gateway: 192.168.0.1
```

3

```
asan@asan:~$ nano compose.yaml
asan@asan:~$ docker compose up -d
[+] Running 14/14
 ✔ test Pulled                                                    15.3s
   ✔ a48c500ed24e Pull complete                                    4.8s
   ✔ 1e1de00ff7e1 Pull complete                                    4.9s
   ✔ 0330ca45a200 Pull complete                                    4.9s
   ✔ 471db38bcfbf Pull complete                                    4.9s
   ✔ 0b4aba487617 Pull complete                                    4.9s
   ✔ b42109ad2a3d Pull complete                                    9.1s
   ✔ dde737735b18 Pull complete                                   12.9s
   ✔ d836c14266f7 Pull complete                                   12.9s
   ✔ 5ed86b5d4a15 Pull complete                                   12.9s
   ✔ 5273c120f396 Pull complete                                   12.9s
   ✔ b0299e0551df Pull complete                                   12.9s
   ✔ 0ae38e059780 Pull complete                                   12.9s
   ✔ ca79c723275f Pull complete                                   13.0s
[+] Running 2/2
 ✔ Network asan_outside   Created                                  0.0s
 ✔ Container asan-test-1  Started                                  0.7s
```

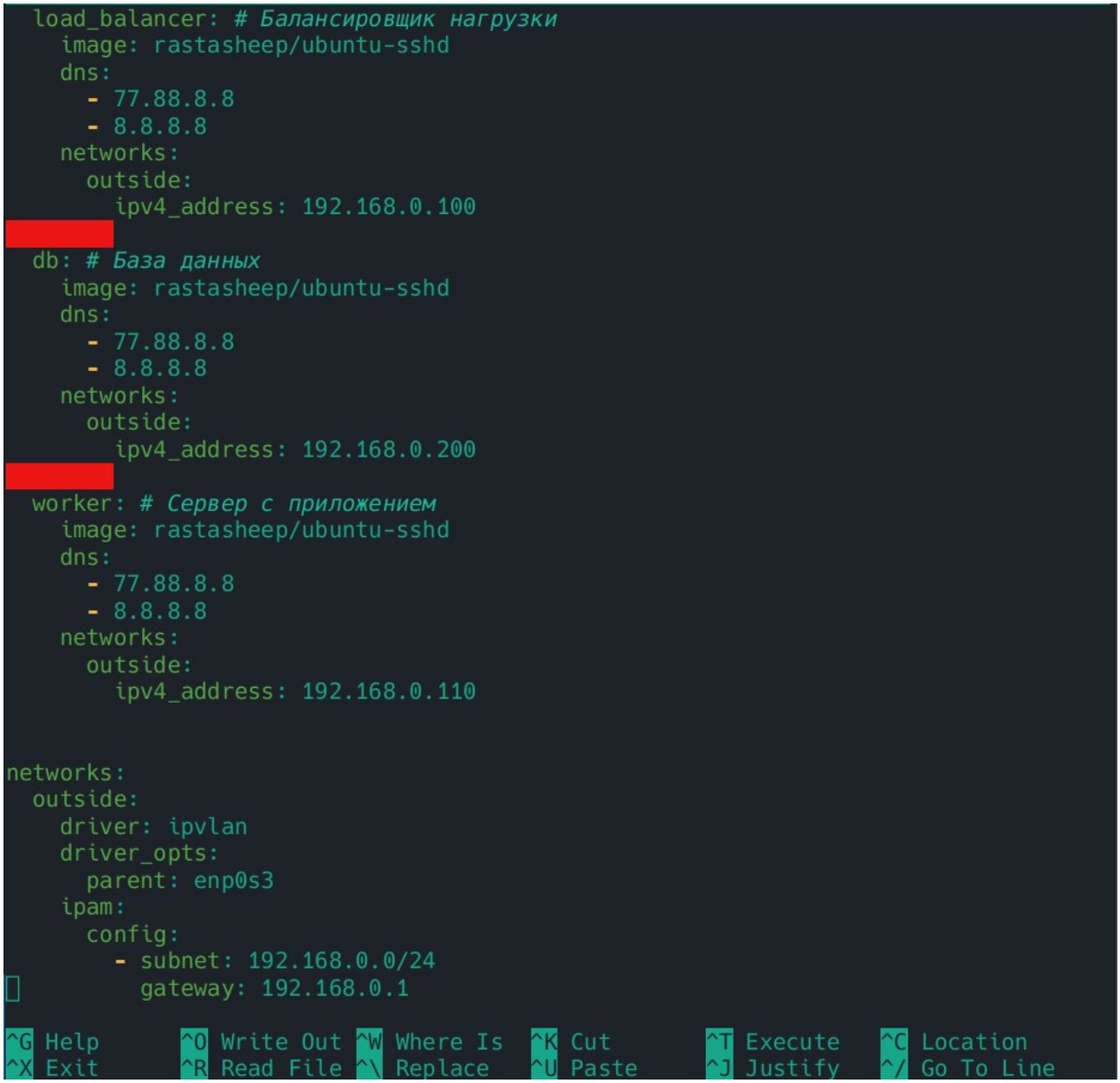
4

```
~ ssh root@192.168.0.100
root@192.168.0.100's password:
root@58cb6113f012:~#
```

5

```
asan@asan:~$ docker compose down
[+] Running 2/0
 ✔ Container asan-test-1  Removed                                  0.1s
 ✔ Network asan_outside   Removed                                  0.0s
asan@asan:~$
```

1


load_balancer: # Балансировщик нагрузки
image: rastasheep/ubuntu-sshd
dns:
- 77.88.8.8
- 8.8.8.8
networks:
outside:
ipv4_address: 192.168.0.100
db: # База данных
image: rastasheep/ubuntu-sshd
dns:
- 77.88.8.8
- 8.8.8.8
networks:
outside:
ipv4_address: 192.168.0.200
worker: # Сервер с приложением
image: rastasheep/ubuntu-sshd
dns:
- 77.88.8.8
- 8.8.8.8
networks:
outside:
ipv4_address: 192.168.0.110
networks:
outside:
driver: ipvlan
driver_opts:
parent: enp0s3
ipam:
config:
- subnet: 192.168.0.0/24
gateway: 192.168.0.1
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line

1,2,3,4,5

```
asan@asan:~$ ansible-inventory --list
[WARNING]: No inventory was parsed, only implicit localhost is available
{
    "_meta": {
        "hostvars": {}
    },
    "all": {
        "children": [
            "ungrouped"
        ]
    }
}
asan@asan:~$ ansible --version | grep config
  config file = None
  configured module search path = ['/home/asan/.ansible/plugins/modules', '/usr/sh
are/ansible/plugins/modules']
asan@asan:~$ mkdir app
asan@asan:~$ cd app
asan@asan:~/app$ mkdir ansible
asan@asan:~/app$ cd ansible/
asan@asan:~/app/ansible$ nano ansible.cfg
asan@asan:~/app/ansible$ ansible --version | grep config
  config file = /home/asan/app/ansible/ansible.cfg
  configured module search path = ['/home/asan/.ansible/plugins/modules', '/usr/sh
are/ansible/plugins/modules']
asan@asan:~/app/ansible$
```

6,7,8

```
asan@asan:~/app/ansible$ nano hosts
asan@asan:~/app/ansible$ ansible-inventory --list
{
    "_meta": {
        "hostvars": {
            "db": {
                "ansible_host": "192.168.0.200",
                "ansible_password": "root",
                "ansible_user": "root"
            },
            "load_balancer": {
                "ansible_host": "192.168.0.100",
                "ansible_password": "root",
                "ansible_user": "root"
            },
            "worker": {
                "ansible_host": "192.168.0.110",
                "ansible_password": "root",
                "ansible_user": "root"
            }
        }
    },
    "all": {
        "children": [
            "ungrouped"
        ]
    },
    "ungrouped": {
        "hosts": [
            "load_balancer",
            "db",
            "worker"
        ]
    }
}
asan@asan:~/app/ansible$
```

9

```
asan@asan:~/app/ansible$ ansible all -m ping
load_balancer | FAILED! => {
    "msg": "to use the 'ssh' connection type with passwords or pkcs11_provider, yo
u must install the sshpass program"
}
db | FAILED! => {
    "msg": "to use the 'ssh' connection type with passwords or pkcs11_provider, yo
u must install the sshpass program"
}
worker | FAILED! => {
    "msg": "to use the 'ssh' connection type with passwords or pkcs11_provider, yo
u must install the sshpass program"
}
```

10

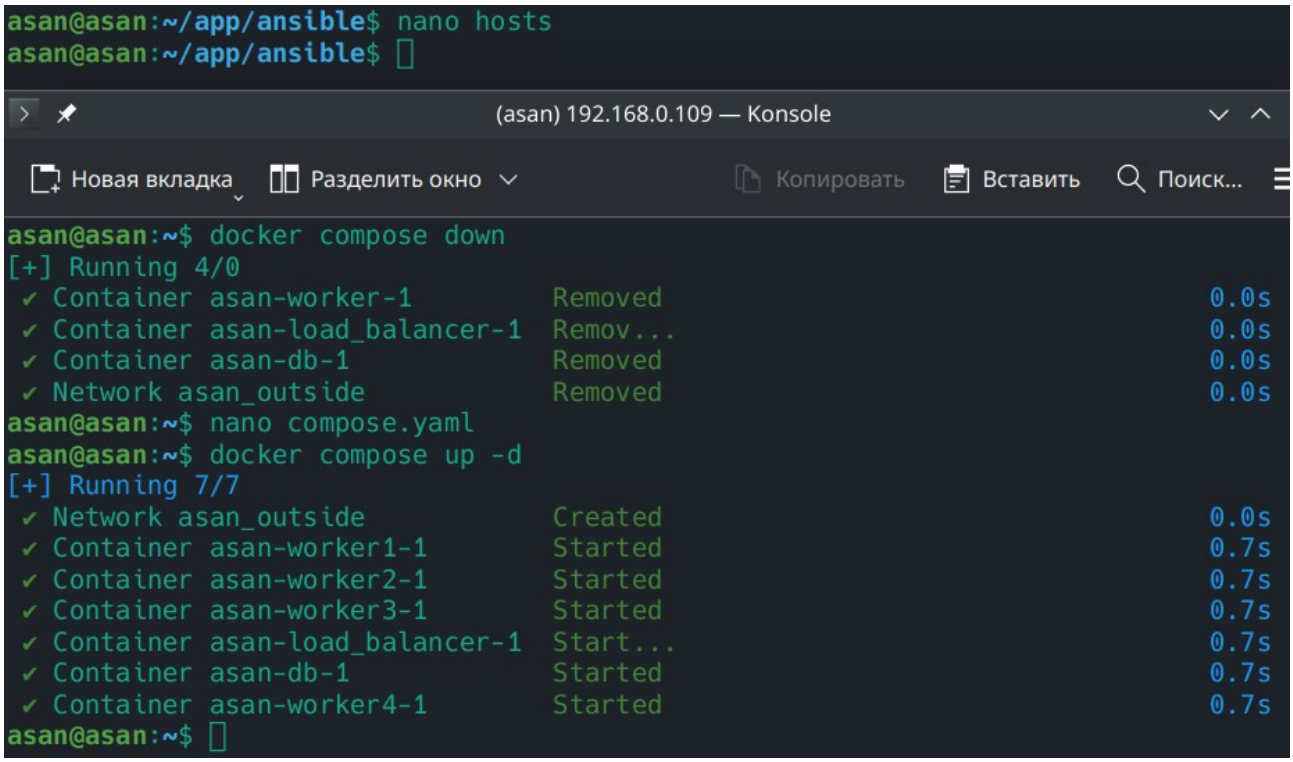
```
asan@asan:~/app/ansible$ ansible all -m ping
load_balancer | FAILED! => {
    "msg": "Using a SSH password instead of a key is not possible because Host Key
 checking is enabled and sshpass does not support this.  Please add this host's fi
ngerprint to your known_hosts file to manage this host."
}
db | FAILED! => {
    "msg": "Using a SSH password instead of a key is not possible because Host Key
 checking is enabled and sshpass does not support this.  Please add this host's fi
ngerprint to your known_hosts file to manage this host."
}
worker | FAILED! => {
    "msg": "Using a SSH password instead of a key is not possible because Host Key
 checking is enabled and sshpass does not support this.  Please add this host's fi
ngerprint to your known_hosts file to manage this host."
}
asan@asan:~/app/ansible$
```

11,12

```
asan@asan:~/app/ansible$ nano ansible.cfg
asan@asan:~/app/ansible$ ansible all -m ping
db | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
load_balancer | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
asan@asan:~/app/ansible$
```

Разделение на группы

1,2,3



4,5

```
asan@asan:~/app/ansible$ ansible all -m ping
worker2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
db | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
load_balancer | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker4 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
```

```
asan@asan:~/app/ansible$ ansible prod -m ping
worker3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
asan@asan:~/app/ansible$
```

Изменяем способ доступа к серверам

1,2

```
asan@asan:~/app/ansible$ cp hosts hosts_root
asan@asan:~/app/ansible$ ansible -i hosts_root all -m ping
load_balancer | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
db | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker4 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
```

3,4

```
asan@asan:~/app/ansible$ ansible staging -m apt -a "update_cache=yes"
worker4 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "cache_update_time": 1717070662,
    "cache_updated": false,
    "changed": false
}
asan@asan:~/app/ansible$ ansible staging -m apt -a "name=sudo state=latest"
worker4 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "cache_update_time": 1717070662,
    "cache_updated": false,
    "changed": true,
    "stderr": "debconf: delaying package configuration, since apt-utils is not ins
talled\n",
    "stderr_lines": [
        "debconf: delaying package configuration, since apt-utils is not installed
"
    ],
```

5,6

```
asan@asan:~/app/ansible$ ansible staging -m group -a'name=ansible state=present'
worker4 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "gid": 1000,
    "name": "ansible",
    "state": "present",
    "system": false
}
asan@asan:~/app/ansible$ ansible staging -m copy -a"content='%ansible ALL=(ALL:ALL
) NOPASSWD:ALL' dest=/etc/sudoers.d/ansible validate='/usr/sbin/visudo -cf %s'"
worker4 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "checksum": "18a81547f64e8f74b52c8871ba04227641ab2d06",
    "dest": "/etc/sudoers.d/ansible",
    "gid": 0,
    "group": "root",
    "md5sum": "2d654c6d64d6f3d8117d30adc5158e45",
    "mode": "0644",
    "owner": "root",
    "size": 35,
    "src": "/root/.ansible/tmp/ansible-tmp-1717070797.476268-2279-14048422749943/s
ource",
    "state": "file",
    "uid": 0
}
asan@asan:~/app/ansible$
```

7

```
asan@asan:~/app/ansible$ ansible staging -m user -a"name=ansible shell=/bin/bash g
roups=ansible append=yes password={{ '123' | password_hash('sha512') }} update_pas
sword=on_create"
worker4 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "comment": "",
    "create_home": true,
    "group": 100,
    "groups": "ansible",
    "home": "/home/ansible",
    "name": "ansible",
    "password": "NOT_LOGGING_PASSWORD",
    "shell": "/bin/bash",
    "state": "present",
    "system": false,
    "uid": 1000
}
asan@asan:~/app/ansible$
```

8

```
asan@asan:~/app/ansible$ mkdir keys
asan@asan:~/app/ansible$ cd keys/
asan@asan:~/app/ansible/keys$ ssh-keygen -t rsa -b 4096 -f ansible_key
Generating public/private rsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in ansible_key
Your public key has been saved in ansible_key.pub
The key fingerprint is:
SHA256:Z1KazevdLAUss07H5GK1oTXbzy7aNrK/loVEpZ7vH7M asan@asan
The key's randomart image is:
+---[RSA 4096]----+
|               ..|
|              .. |
|          .. ..  |
|         *o O... |
|        S =@ Oo. |
|         +*.* +..|
|         +.o . B.|
|          ...o+*.*|
|           . +O*E=|
+----[SHA256]-----+
```

```
asan@asan:~/app/ansible$ ansible staging -m authorized_key -a"user=ansible key=\"{
{ lookup('file', '/home/' + lookup('env', 'USER') + '/app/ansible/keys/ansible_key
.pub') }}\""
worker4 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "comment": null,
    "exclusive": false,
    "follow": false,
    "key": "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDxmqYhdUzfEU9dOqfMLTGjsYq4B6I5jP
6wdP5v14oFkZWj62+BvNraGkTEDe/26aumjwbKG9UqiCzWB0wxiF1M+AM/pEDJ2qhMcI6vV9xlkzdAHf9s
Ujw7+OSHQeA6LIwlc+WGKexJG4O/deFZ0KI/RjXO3VeNKH5WR1uY/VD9BeGPLbaLbX/8V+EjnQf070kyfi
Cum8onaYYJ2mGChJTfAzoDv/FfGz6LtFwQU/pIwa569dEVTo+rkLVAcx0pYoE5bGISnjVKjbxYER1aLKyE
R8VCr17sXjglytZT2n9DddGIjEgdVitoJoU2eNnZVbalD+JXfUCy0JPjUT5xNaGLjA5izQPhtuqsPD1t4Q
1K4srPdWu8DAx/e/Q0JCBmfSYXrwpKkdT7xZ+Ie50niKjNjyNoO60GIwuwXp5cVkS328Jj4v1+eUQf9GwV
ufhIuEBFhsCcBx6j9MsEGMk125DufUIIKcSR/DuaBwC+miq94Pb/rRnEd0gfBk0v7H5op4N2EwMd5Kqvsy
4dTxmtXx2LpH2dPILQ5nzrbCz+9Pwzwigvzb33Wvx2Gq0Idybgr9XMfoDd77qYRkt4Pnd136TI9N67FXsP
w5ggOoJtND9YDOeANBI2lvouIjt1pENUspZ0wbNagliFL80nSLyszKE0bp1rpaR2oXRB0JGdDoYWAw== a
san@asan",
    "key_options": null,
    "keyfile": "/home/ansible/.ssh/authorized_keys",
    "manage_dir": true,
    "path": null,
    "state": "present",
    "user": "ansible",
    "validate_certs": true
}
asan@asan:~/app/ansible$
```

9

```
asan@asan:~/app/ansible$ ansible staging -m user -a"name=root password='*' update_
password=always"
worker4 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "append": false,
    "changed": true,
    "comment": "root",
    "group": 0,
    "home": "/root",
    "move_home": false,
    "name": "root",
    "password": "NOT_LOGGING_PASSWORD",
    "shell": "/bin/bash",
    "state": "present",
    "uid": 0
}
```

10

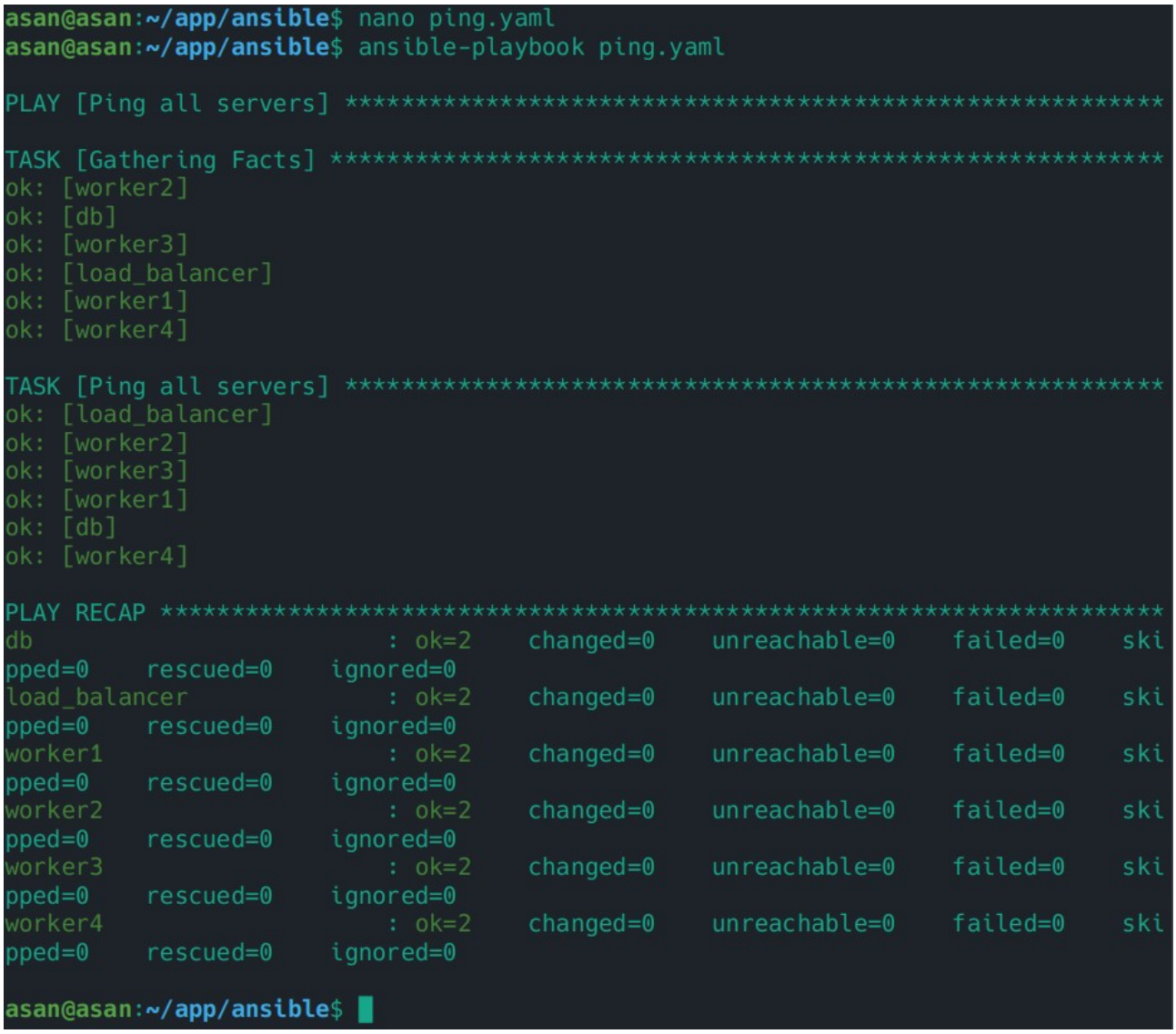
```
asan@asan:~/app/ansible$ ansible all -m ping
worker2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker4 | UNREACHABLE! => {
    "changed": false,
    "msg": "Invalid/incorrect password: Permission denied, please try again.",
    "unreachable": true
}
worker3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
db | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
load_balancer | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
```

11,12

```
asan@asan:~/app/ansible$ nano hosts
asan@asan:~/app/ansible$ ansible all -m ping
worker1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
load_balancer | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
db | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
worker4 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
```

Пишем сценарий

1,2,3,4



4

```
asan@asan:~/app/ansible$ nano setup.yaml
asan@asan:~/app/ansible$ ansible-playbook setup.yaml

PLAY [Change access from root to ansible user and apt-package update servers] ****

TASK [Gathering Facts] *********************************************************
ok: [db]
ok: [worker3]
ok: [worker1]
ok: [load_balancer]
ok: [worker2]
ok: [worker4]

TASK [Change apt-package update servers] ***************************************
changed: [db]
changed: [load_balancer]
changed: [worker2]
changed: [worker3]
changed: [worker1]
changed: [worker4]

TASK [Install sudo] ************************************************************
changed: [worker2]
ok: [worker4]
changed: [worker3]
changed: [worker1]
changed: [load_balancer]
changed: [db]

TASK [Create group ansible] ****************************************************
changed: [db]
changed: [worker1]
changed: [worker2]
changed: [worker3]
changed: [load_balancer]
TASK [Add group to sudoers] ****************************************************
changed: [db]
changed: [worker1]
changed: [worker3]
changed: [worker2]
changed: [load_balancer]
ok: [worker4]

TASK [Create user ansible and add to ansible group] ****************************
changed: [worker2]
changed: [worker1]
changed: [worker3]
changed: [db]
changed: [load_balancer]
ok: [worker4]

PLAY RECAP *********************************************************************
db                         : ok=8    changed=7    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
load_balancer              : ok=8    changed=7    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker1                    : ok=8    changed=7    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker2                    : ok=8    changed=7    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker3                    : ok=8    changed=7    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker4                    : ok=8    changed=1    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0

asan@asan:~/app/ansible$
```

5

```
asan@asan:~/app/ansible$ ansible-playbook ping.yaml

PLAY [Ping all servers] ****************************************************

TASK [Gathering Facts] *****************************************************
fatal: [load_balancer]: UNREACHABLE! => {"changed": false, "msg": "Invalid/incorre
ct password: Permission denied, please try again.", "unreachable": true}
fatal: [worker1]: UNREACHABLE! => {"changed": false, "msg": "Invalid/incorrect pas
sword: Permission denied, please try again.", "unreachable": true}
fatal: [db]: UNREACHABLE! => {"changed": false, "msg": "Invalid/incorrect password
: Permission denied, please try again.", "unreachable": true}
fatal: [worker3]: UNREACHABLE! => {"changed": false, "msg": "Invalid/incorrect pas
sword: Permission denied, please try again.", "unreachable": true}
fatal: [worker2]: UNREACHABLE! => {"changed": false, "msg": "Invalid/incorrect pas
sword: Permission denied, please try again.", "unreachable": true}
ok: [worker4]

TASK [Ping all servers] ****************************************************
ok: [worker4]

PLAY RECAP *****************************************************************
db                         : ok=0    changed=0    unreachable=1    failed=0    ski
pped=0    rescued=0    ignored=0
load_balancer              : ok=0    changed=0    unreachable=1    failed=0    ski
pped=0    rescued=0    ignored=0
worker1                    : ok=0    changed=0    unreachable=1    failed=0    ski
pped=0    rescued=0    ignored=0
worker2                    : ok=0    changed=0    unreachable=1    failed=0    ski
pped=0    rescued=0    ignored=0
worker3                    : ok=0    changed=0    unreachable=1    failed=0    ski
pped=0    rescued=0    ignored=0
worker4                    : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0

asan@asan:~/app/ansible$
```

6

```
asan@asan:~/app/ansible$ nano hosts
asan@asan:~/app/ansible$ ansible-playbook ping.yaml

PLAY [Ping all servers] ****************************************************

TASK [Gathering Facts] *****************************************************
ok: [db]
ok: [load_balancer]
ok: [worker2]
ok: [worker3]
ok: [worker1]
ok: [worker4]

TASK [Ping all servers] ****************************************************
ok: [db]
ok: [worker3]
ok: [worker2]
ok: [load_balancer]
ok: [worker1]
ok: [worker4]

PLAY RECAP *****************************************************************
db                         : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
load_balancer              : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker1                    : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker2                    : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker3                    : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker4                    : ok=2    changed=0    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0

asan@asan:~/app/ansible$
```

Установка софта на сервер базы данных

1,2,3,4,5,6,7

```
asan@asan:~/app/ansible$ nano install_mysql.yaml
asan@asan:~/app/ansible$ ansible-playbook install_mysql.yaml

PLAY [Install_mysql] ***********************************************************

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

TASK [Install pip] *************************************************************
changed: [db]

TASK [Install PyMySQL] *********************************************************
changed: [db]

TASK [Install mysql server] ****************************************************
changed: [db]

TASK [Stop mysql server] *******************************************************
ok: [db]

TASK [Copy credentials file to home directory] *********************************
changed: [db]

TASK [Create ansible credentials file] *****************************************
changed: [db]

TASK [Remane user and password items] ******************************************
changed: [db]

TASK [Allow bind to all hosts] *************************************************
changed: [db]

TASK [Started and enabled mysql server] ****************************************
changed: [db]

TASK [Create database user] ****************************************************
[WARNING]: Option column_case_sensitive is not provided. The default is now
false, so the column's name will be uppercased. The default will be changed to
true in community.mysql 4.0.0.
changed: [db]

PLAY RECAP *********************************************************************
db                         : ok=11   changed=9    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0

asan@asan:~/app/ansible$
```

Установка софта на рабочие сервера

1,2,3

```
asan@asan:~/app/ansible$ nano install_worker_soft.yaml
asan@asan:~/app/ansible$ ansible-playbook install_worker_soft.yaml

PLAY [Install worker soft] *****************************************************

TASK [Gathering Facts] *********************************************************
ok: [worker4]
ok: [worker3]
ok: [worker1]
ok: [worker2]

TASK [Install python3 pip venv git] ********************************************
changed: [worker3]
changed: [worker1]
changed: [worker4]
changed: [worker2]

TASK [Clone Git repository] ****************************************************
changed: [worker4]
changed: [worker3]
changed: [worker1]
changed: [worker2]

TASK [Set data to app config] **************************************************
changed: [worker4]
changed: [worker1]
changed: [worker2]
changed: [worker3]

TASK [Create virtual env] ******************************************************
changed: [worker3]
changed: [worker1]
changed: [worker2]
changed: [worker4]

TASK [Install requirements into virtual env] ***********************************
changed: [worker3]
changed: [worker2]
changed: [worker4]
changed: [worker1]
TASK [Run app] *****************************************************************
changed: [worker1]
changed: [worker2]
changed: [worker3]
changed: [worker4]

PLAY RECAP *********************************************************************
worker1                    : ok=7    changed=6    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker2                    : ok=7    changed=6    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker3                    : ok=7    changed=6    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
worker4                    : ok=7    changed=6    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0

asan@asan:~/app/ansible$
```

Установка софта на сервер балансировщика нагрузки

1,2

```
asan@asan:~/app/ansible$ ansible-playbook install_haproxy.yaml

PLAY [Install worker soft] *****************************************************

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

TASK [Install haproxy] *********************************************************
ok: [load_balancer]

TASK [Stop haproxy] ************************************************************
changed: [load_balancer]

TASK [Backup original config] **************************************************
ok: [load_balancer]

TASK [Restore original config from backup] *************************************
changed: [load_balancer]

TASK [Gen Routing (temporary file)] ********************************************
ok: [load_balancer]

TASK [Join haproxy.cfg и my_routs.cfg] *****************************************
changed: [load_balancer]

TASK [Start and enabled haproxy] ***********************************************
changed: [load_balancer]

PLAY RECAP *********************************************************************
load_balancer              : ok=8    changed=4    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0
```

Проверка работоспособности приложения

Ответы на вопросы.

Вывод: