

Федеральное государственное бюджетное образовательное
учреждение высшего образования
«Сибирский государственный университет телекоммуникаций и
информатики»

Лабораторная работа №3

Архитектура вычислительных систем

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1. Создаём Dockerfile и запускаем контейнеры

```
FROM ubuntu:latest

RUN apt update && apt install -y openssh-server python3 python3-pip sudo

RUN mkdir /var/run/ssh

RUN echo 'root:2024' | chpasswd

RUN sed -i 's/#PermitRootLogin prohibit-password/PermitRootLogin yes/' /etc/ssh/sshd_config
RUN sed -i 's/#PasswordAuthentication yes/PasswordAuthentication yes/' /etc/ssh/sshd_config

EXPOSE 22

CMD ["/usr/sbin/sshd", "-D"]
```

```
~/Documents/Sibsutis/Kypc 3/AVS/Lab 3 main ?1
$ docker run -d -p 2222:22 --name cont_1 lab_3:latest
80c25cb0eaf9591a49884d32ed4bfd869787fa93af5dc9f781c968f6e7ecb30

~/Documents/Sibsutis/Kypc 3/AVS/Lab 3 main ?1
$ docker run -d -p 2223:22 --name cont_2 lab_3:latest
03976cbb58bf8ea45e0da95a559c9df797c8b5446775946995b88a015279df97

~/Documents/Sibsutis/Kypc 3/AVS/Lab 3 main ?1
$ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
lab_3 latest eb95f18a713b 4 minutes ago 671MB
nginx latest 39286ab8a5e1 3 weeks ago 188MB

~/Documents/Sibsutis/Kypc 3/AVS/Lab 3 main ?1
$ docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
03976cbb58bf lab_3:latest "/usr/sbin/sshd -D" 10 seconds ago Up 10 seconds 0.0.0.0:2223->22/tcp, [::]:2223->22/tcp cont_2
80c25cb0eaf9 lab_3:latest "/usr/sbin/sshd -D" 17 seconds ago Up 16 seconds 0.0.0.0:2222->22/tcp, [::]:2222->22/tcp cont_1
```

Проверка портов

```
ssh root@localhost -p 2222
The authenticity of host '[localhost]:2222 ([::1]:2222)' can't be established.
ED25519 key fingerprint is SHA256:lkzH0fsyNkspA4WymdXCInd2gPv5jLUD0PIdVT+auFW.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[localhost]:2222' (ED25519) to the list of known hosts.
root@localhost's password:
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.10.9-arch1-1 x86_64)

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

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

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@80c25cb0eaf9:~#

ssh root@localhost -p 2223
The authenticity of host '[localhost]:2223 ([::1]:2223)' can't be established.
ED25519 key fingerprint is SHA256:lkzH0fsyNkspA4WymdXCInd2gPv5jLUD0PIdVT+auFW.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:4: [localhost]:2222
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[localhost]:2223' (ED25519) to the list of known hosts.
root@localhost's password:
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.10.9-arch1-1 x86_64)

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

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

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@03976cbb58bf:~#
```

Создаём структуру каталогов {inventory,playbooks,roles}

```
~/Documents/Sibsutis/Kypc 3/AVS/Lab 3 main ?1
$ mkdir -p ansible/{inventory,playbooks,roles}

~/Documents/Sibsutis/Kypc 3/AVS/Lab 3 main ?1
$ ls ansible
inventory  playbooks  roles
```

Создаём ansible.cfg

```
4 [defaults]
3 inventory = inventory/hosts
2 roles_path = roles
1 remote_user = root
  become = true
```

Делаем конфигурацию для подключения к нашим контейнерам

```
2 [cont_group]
1 cont_1 ansible_host=localhost ansible_port=2222 ansible_user=root ansible_ssh_private_key_file=~/.ssh/id_rsa
  cont_2 ansible_host=localhost ansible_port=2223 ansible_user=root ansible_ssh_private_key_file=~/.ssh/id_rsa
```

Генерируем ssh ключи для наших контейнеров и хост-машины.

```
root@08c25cb8eaf9:~# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:gV/MZjoCmgvRSUliFtdi318X98MNRjuJU8Yf7xT9Ru8 root@08c25cb8eaf9
The key's randomart image is:
+---[RSA 3072]-----+
|.oo.      o*.o|
|o+.. .. o  =o*B|
|..o..+... * o.*+D|
|..oo.o..*. ....O|
|. o ..S. .  = |
|. . . .  E|
|. . . .  |
|. . . .  |
+---[SHA256]-----+
root@08c25cb8eaf9:~#
```

```
root@03976cbb58bf:~# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:oeQ6AdVc4hBAV8stMrcYYLW1ir3BbIVqTR7ogu0DFxc root@03976cbb58bf
The key's randomart image is:
+---[RSA 3072]-----+
|.o+=E*+o. |
|oo.+*==o. |
|o.+=*+.. |
|o.X++o .  |
|+=oX. o S  |
|o+. oo     |
| o.o       |
|. .        |
+---[SHA256]-----+
root@03976cbb58bf:~#
```

```
~/Documents/Sibsutis/Kypc 3/AVS/Lab 3/ansible main ↑1 ?1
> ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/dxrk_/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/dxrk_/.ssh/id_rsa
Your public key has been saved in /home/dxrk_/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:ikrfoPmK0Hj2ksiCXVfL74L/ToU02odbzmgEk9WT6IQ dxrk_@Legion
The key's randomart image is:
+---[RSA 3072]-----+
|      oo+ . |
|      E o + |
|      o o . |
|      . = . |
|      .S +. . |
|.o .... oo+ . |
|*+..o.. .+o+= |
|**o= o . +o. |
|o *+o . o+o+ |
+---[SHA256]-----+
```

Проверяем доступ к нашим контейнерам

```
~/Documents/Sibsutis/Kypc 3/AVS/Lab 3/ansible main ↑1 ?1
> ansible -m ping all
[WARNING]: Platform linux on host cont_2 is using the discovered Python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
cont_2 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.12"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Platform linux on host cont_1 is using the discovered Python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
cont_1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.12"
  },
  "changed": false,
  "ping": "pong"
}
```

```
~/Documents/Sibsutis/Kypc 3/AVS/Lab 3/ansible main ↑1 ?1
> ansible -m setup cont_1 >> cont_1.txt && ansible -m setup cont_2 >> cont_2.txt
```

```

A ~/Documents/Sibsutis/Kypc 3/AVS/Lab 3/ansible main ↑1 ?1
) ansible -m ping cont_1,cont_2
[WARNING]: Platform linux on host cont_1 is using the discovered Python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
cont_1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.12"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Platform linux on host cont_2 is using the discovered Python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
cont_2 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.12"
  },
  "changed": false,
  "ping": "pong"
}

```

DOD 3

```

A ~/Documents/Sibsutis/Kypc 3/AVS/Lab 3/ansible main ↑1 ?1
) ansible -m shell -a hostname cont_1,cont_2
[WARNING]: Platform linux on host cont_1 is using the discovered Python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
cont_1 | CHANGED | rc=0 >>
00c25cb0eaf9
[WARNING]: Platform linux on host cont_2 is using the discovered Python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
cont_2 | CHANGED | rc=0 >>
03976cbb58bf

```

DOD 4

```

1 "hostname": "{{ ansible_hostname }}",
2 "distribution": "{{ ansible_distribution }}",
3 "distribution_version": "{{ ansible_distribution_version }}",
4 "kernel": "{{ ansible_kernel }}",
5 "architecture": "{{ ansible_architecture }}",
6 "cpu_cores": "{{ ansible_processor_cores }}",
7 "memory_mb": "{{ ansible_memory_mb.real.total }}",
8 }

```

```

1 - name: Playbook yaml
2   hosts: all
3   tasks:
4     - name: yaml
5       ansible.builtin.setup:
6
7     - name: Create system info JSON
8       ansible.builtin.template:
9         src: system_info.j2
10        dest: /tmp/system_info.json
11

```

```

A ~/Documents/Sibutis/Kypc 3/AVS/Lab 3/ansible main 1 ?1
> ansible-playbook playbooks/system_info.yml

PLAY [Playbook yaml] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host cont_2 is using the discovered Python interpreter at /usr/bin/python3.12, but futur
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [cont_2]
[WARNING]: Platform linux on host cont_1 is using the discovered Python interpreter at /usr/bin/python3.12, but futur
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [cont_1]

TASK [yaml] *****
ok: [cont_1]
ok: [cont_2]

TASK [Create system info JSON] *****
changed: [cont_1]
changed: [cont_2]

PLAY RECAP *****
cont_1      : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
cont_2      : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

```

root@00c25cb0eaf9:~# cat /tmp/system_info.json
{
  "hostname": "00c25cb0eaf9",
  "distribution": "Ubuntu",
  "distribution_version": "24.04",
  "kernel": "6.10.10-arch1-1",
  "architecture": "x86_64",
  "cpu_cores": "8",
  "memory_mb": "15171",
}
root@00c25cb0eaf9:~#

```

```

root@03976cbb58bf:~# cat /tmp/system_info.json
{
  "hostname": "03976cbb58bf",
  "distribution": "Ubuntu",
  "distribution_version": "24.04",
  "kernel": "6.10.10-arch1-1",
  "architecture": "x86_64",
  "cpu_cores": "8",
  "memory_mb": "15171",
}
root@03976cbb58bf:~#

```