

## Elektronikos fakultetas

Kompiuterijos ir ryšių technologijų katedra

Debesų kompiuterija

Modulis ELKRM17304

## Automatizavimas Ansible pagalba

Laboratorinio darbo nr. 4 ataskaita

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## Automatizavimas Ansible pagalba

### Darbo tikslas

- Išbandyti Ansible įrankį.

### Darbo eiga

#### Infrastruktūros paruošimas

Šiuo metu KDV naudoju *Windows 10*. Darbui atlikti pasirinkau terminalo emuliatorių *MinTTY* ir CLI įrankių sistemą *MSYS2*.

Pastaroji Windows OS emuliuoja \*nix aplinką. [1]

#### Prisijungimas prie savo serverio nr. 1

Kol laukiau SSH paslaugos pasiekiamumo, tikrinau nurodytą TCP prievadą. Prisiminiau ir išmėginau kelis būdus:

```
$ ssh 158.129.200.236 45522
ssh: connect to host 158.129.200.236 port 22: Connection timed out
$
```

```
$ telnet 158.129.200.236 45522
Trying 158.129.200.236...
^C
$
```

```
$ ssh ssh://stud@158.129.200.236:45522
^C
$
```

Išskyrus tikrinimą netcat įrankiu, kurį savo klientinėje OS spėjau *tik įsidiegti*:

```

$ pacman -S openbsd-netcat
resolving dependencies...
looking for conflicting packages...
Packages (1) openbsd-netcat-1.217_2-1
Total Download Size: 0.03 MiB
Total Installed Size: 0.12 MiB

:: Proceed with installation? [Y/n]
:: Retrieving packages...
  openbsd-netcat-1.217_2-1-x86_64                               35.4 KiB  37.8 KiB/s
00:01 [#####] 100%
(1/1) checking keys in keyring
[#####] 100%
(1/1) checking package integrity
[#####] 100%
(1/1) loading package files
[#####] 100%
(1/1) checking for file conflicts
[#####] 100%
(1/1) checking available disk space
[#####] 100%
:: Processing package changes...
(1/1) installing openbsd-netcat
[#####] 100%
$

```

Tuomet laboratorinė SSH paslauga tapo jau pasiekiamo..:

```

$ telnet 158.129.200.236 45522
Trying 158.129.200.236...
Connected to 158.129.200.236.
Escape character is '^]'.
SSH-2.0-OpenSSH_8.2p1 Ubuntu-4ubuntu0.3
^]

```

```

Connection closed by foreign host.
$

```

... ir pagaliau prisijungiau prie serverio nr.1:

```

$ ssh ssh://stud@158.129.200.236:45522
stud@158.129.200.236's password:
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.4.0-90-generic x86_64)

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

System information as of Tue 07 Dec 2021 04:31:42 PM UTC

System load: 0.0          Processes:                229
Usage of /:  41.0% of 19.56GB Users logged in:             0
Memory usage: 9%          IPv4 address for docker0: 172.17.0.1
Swap usage:  0%           IPv4 address for ens160:  10.128.67.8

 * Super-optimized for small spaces - read how we shrank the memory
   footprint of MicroK8s to make it the smallest full K8s around.

https://ubuntu.com/blog/microk8s-memory-optimisation

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

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Tue Oct 19 19:27:21 2021 from 81.29.22.28
stud@cc-lab:~$

```

## Gauto OS atnaujinimas:

```
stud@cc-lab:~$ id
uid=1001(stud) gid=1001(stud) groups=1001(stud),27(sudo)

stud@cc-lab:~$ sudo apt update
[sudo] password for stud:
Hit:1 http://lt.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://lt.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://lt.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 http://lt.archive.ubuntu.com/ubuntu focal-security InRelease
Reading package lists... Done
Building dependency tree
Reading state information... Done
43 packages can be upgraded. Run 'apt list --upgradable' to see them.
stud@cc-lab:~$
```

## Ansible įdiegimas:

```
stud@cc-lab:~$ sudo apt install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jmespath python3-kerberos
python3-libcloud python3-lockfile python3-netaddr python3-ntlm-auth
python3-requests-kerberos python3-requests-ntlm python3-selinux python3-winrm python3-xlrd python3-xlsxwriter
Suggested packages:
  cowsay sshpass python-lockfile-doc ipython3 python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jmespath python3-
kerberos python3-libcloud python3-lockfile python3-netaddr
python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-selinux python3-winrm
python3-xlrd python3-xlsxwriter
0 upgraded, 16 newly installed, 0 to remove and 43 not upgraded.
Need to get 9,644 kB of archives.
After this operation, 90.2 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://lt.archive.ubuntu.com/ubuntu focal/main amd64 python3-crypto amd64 2.6.1-13ubuntu2 [237
kB]
Get:2 http://lt.archive.ubuntu.com/ubuntu focal/main amd64 python3-dnspython all 1.16.0-1build1 [89.1
kB]
Get:3 http://lt.archive.ubuntu.com/ubuntu focal/main amd64 ieee-data all 20180805.1 [1,589 kB]
Get:4 http://lt.archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-netaddr all 0.7.19-3ubuntu1
[236 kB]
Get:5 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 ansible all 2.9.6+dfsg-1 [5,794 kB]
Get:6 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-argcomplete all 1.8.1-
1.3ubuntu1 [27.2 kB]
Get:7 http://lt.archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-jmespath all 0.9.4-2ubuntu1
[21.5 kB]
Get:8 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-kerberos amd64 1.1.14-3.1build1
[22.6 kB]
Get:9 http://lt.archive.ubuntu.com/ubuntu focal/main amd64 python3-lockfile all 1:0.12.2-2ubuntu2
[14.6 kB]
Get:10 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-libcloud all 2.8.0-1 [1,403
kB]
Get:11 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-ntlm-auth all 1.1.0-1 [19.6
kB]
Get:12 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-kerberos all 0.12.0-2
[11.9 kB]
Get:13 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-ntlm all 1.1.0-1
[6,004 B]
Get:14 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-selinux amd64 3.0-1build2 [139
kB]
Get:15 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-xlrd all 0.12.0-1 [12.6
kB]
Get:16 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Fetched 9,644 kB in 1s (10.9 MB/s)
Selecting previously unselected package python3-crypto.
(Reading database ... 107888 files and directories currently installed.)
Preparing to unpack .../00-python3-crypto_2.6.1-13ubuntu2_amd64.deb ...
Unpacking python3-crypto (2.6.1-13ubuntu2) ...
Selecting previously unselected package python3-dnspython.
```

```

Preparing to unpack .../01-python3-dnspython_1.16.0-1build1_all.deb ...
Unpacking python3-dnspython (1.16.0-1build1) ...
Selecting previously unselected package ieee-data.
Preparing to unpack .../02-ieee-data_20180805.1_all.deb ...
Unpacking ieee-data (20180805.1) ...

Progress: [ 8%]
[#####.....]
.....]

Selecting previously unselected package python3-netaddr.
Preparing to unpack .../03-python3-netaddr_0.7.19-3ubuntu1_all.deb ...
Unpacking python3-netaddr (0.7.19-3ubuntu1) ...
Selecting previously unselected package ansible.
Preparing to unpack .../04-ansible_2.9.6+dfsg-1_all.deb ...
Unpacking ansible (2.9.6+dfsg-1) ...
Selecting previously unselected package python3-argcomplete.
Preparing to unpack .../05-python3-argcomplete_1.8.1-1.3ubuntu1_all.deb ...
Unpacking python3-argcomplete (1.8.1-1.3ubuntu1) ...
Selecting previously unselected package python3-jmespath.
Preparing to unpack .../06-python3-jmespath_0.9.4-2ubuntu1_all.deb ...
Unpacking python3-jmespath (0.9.4-2ubuntu1) ...
Selecting previously unselected package python3-kerberos.
Preparing to unpack .../07-python3-kerberos_1.1.14-3.1build1_amd64.deb ...
Unpacking python3-kerberos (1.1.14-3.1build1) ...
Selecting previously unselected package python3-lockfile.
Preparing to unpack .../08-python3-lockfile_1%3a0.12.2-2ubuntu2_all.deb ...
Unpacking python3-lockfile (1:0.12.2-2ubuntu2) ...
Selecting previously unselected package python3-libcloud.
Preparing to unpack .../09-python3-libcloud_2.8.0-1_all.deb ...
Unpacking python3-libcloud (2.8.0-1) ...
Selecting previously unselected package python3-ntlm-auth.
Preparing to unpack .../10-python3-ntlm-auth_1.1.0-1_all.deb ...
Unpacking python3-ntlm-auth (1.1.0-1) ...
Selecting previously unselected package python3-requests-kerberos.
Preparing to unpack .../11-python3-requests-kerberos_0.12.0-2_all.deb ...
Unpacking python3-requests-kerberos (0.12.0-2) ...
Selecting previously unselected package python3-requests-ntlm.
Preparing to unpack .../12-python3-requests-ntlm_1.1.0-1_all.deb ...
Unpacking python3-requests-ntlm (1.1.0-1) ...
Selecting previously unselected package python3-selinux.
Preparing to unpack .../13-python3-selinux_3.0-1build2_amd64.deb ...
Unpacking python3-selinux (3.0-1build2) ...
Selecting previously unselected package python3-xltdict.
Preparing to unpack .../14-python3-xltdict_0.12.0-1_all.deb ...
Unpacking python3-xltdict (0.12.0-1) ...
Selecting previously unselected package python3-winrm.
Preparing to unpack .../15-python3-winrm_0.3.0-2_all.deb ...
Unpacking python3-winrm (0.3.0-2) ...
Setting up python3-lockfile (1:0.12.2-2ubuntu2) ...
Setting up python3-ntlm-auth (1.1.0-1) ...
Setting up python3-kerberos (1.1.14-3.1build1) ...
Setting up python3-xltdict (0.12.0-1) ...
Setting up python3-jmespath (0.9.4-2ubuntu1) ...
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ieee-data (20180805.1) ...
Setting up python3-dnspython (1.16.0-1build1) ...
Setting up python3-selinux (3.0-1build2) ...
Setting up python3-crypto (2.6.1-13ubuntu2) ...
Setting up python3-argcomplete (1.8.1-1.3ubuntu1) ...
Setting up python3-requests-ntlm (1.1.0-1) ...
Setting up python3-libcloud (2.8.0-1) ...
Setting up python3-netaddr (0.7.19-3ubuntu1) ...
Setting up python3-winrm (0.3.0-2) ...
Setting up ansible (2.9.6+dfsg-1) ...
Processing triggers for man-db (2.9.1-1) ...
stud@cc-lab:~$

```

Tikrinu *Ansible* versiją:

```
stud@cc-lab:~$ ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/stud/.ansible/plugins/modules',
'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Sep 28 2021, 16:10:42) [GCC 9.3.0]
stud@cc-lab:~$
```

- ⇒ *Ansible* įdiegtas.

## Ryšio tarp serverių tikrinimas ir pradinis aprašymas

Patikrinu kai kuriuos serverio nr. 1 IP nustatymus:

```
stud@cc-lab:~$ 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
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:50:56:9a:28:de brd ff:ff:ff:ff:ff:ff
    inet 10.128.67.8/24 brd 10.128.67.255 scope global ens160
        valid_lft forever preferred_lft forever
    inet6 fe80::250:56ff:fe9a:28de/64 scope link
        valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
    link/ether 02:42:5b:81:0f:4a brd ff:ff:ff:ff:ff:ff
    inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
        valid_lft forever preferred_lft forever

stud@cc-lab:~$ ip r
default via 10.128.67.254 dev ens160 proto dhcp src 10.128.67.8 metric 100
10.128.67.0/24 dev ens160 proto kernel scope link src 10.128.67.8
10.128.67.254 dev ens160 proto dhcp scope link src 10.128.67.8 metric 100
172.17.0.0/16 dev docker0 proto kernel scope link src 172.17.0.1 linkdown
stud@cc-lab:~$
```

Ieškau „kaimynų“ (serverio nr. 2) su sniferiu:

```
stud@ecc-lab:~$ sudo tcpdump -tni ens160 not tcp port 22
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens160, link-type EN10MB (Ethernet), capture size 262144 bytes
```

```
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
LLDP, length 338: sw-rlab-301-top
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
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ARP, Request who-has 10.128.67.13 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.13 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
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ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.13 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.13 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.13 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.13 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.12 tell 10.128.67.5, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
LLDP, length 338: sw-rlab-301-top
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
ARP, Request who-has 10.128.67.14 tell 10.128.67.6, length 46
^C
52 packets captured
52 packets received by filter
0 packets dropped by kernel
stud@ecc-lab:~$
```

- ⇒ „Kaimynai“ tyli.

Diegiu tinklo skenerį:

```

stud@cc-lab:~$ sudo apt install nmap
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libblas3 liblinear4 liblua5.3-0 lua-lpeg nmap-common
Suggested packages:
  liblinear-tools liblinear-dev ncat ndiff zenmap
The following NEW packages will be installed:
  libblas3 liblinear4 liblua5.3-0 lua-lpeg nmap nmap-common
0 upgraded, 6 newly installed, 0 to remove and 43 not upgraded.
Need to get 5,669 kB of archives.
After this operation, 26.8 MB of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://lt.archive.ubuntu.com/ubuntu focal/main amd64 libblas3 amd64 3.9.0-1build1 [142 kB]
Get:2 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 liblinear4 amd64 2.3.0+dfsg-3build1 [41.7 kB]
Get:3 http://lt.archive.ubuntu.com/ubuntu focal/main amd64 liblua5.3-0 amd64 5.3.3-1.1ubuntu2 [116 kB]
Get:4 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 lua-lpeg amd64 1.0.2-1 [31.4 kB]
Get:5 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 nmap-common all 7.80+dfsg1-2build1 [3,676 kB]
Get:6 http://lt.archive.ubuntu.com/ubuntu focal/universe amd64 nmap amd64 7.80+dfsg1-2build1 [1,662 kB]
Fetched 5,669 kB in 3s (1,860 kB/s)
Selecting previously unselected package libblas3:amd64.
(Reading database ... 117331 files and directories currently installed.)
Preparing to unpack .../0-libblas3_3.9.0-1build1_amd64.deb ...
Unpacking libblas3:amd64 (3.9.0-1build1) ...
Selecting previously unselected package liblinear4:amd64.
Preparing to unpack .../1-liblinear4_2.3.0+dfsg-3build1_amd64.deb ...
Unpacking liblinear4:amd64 (2.3.0+dfsg-3build1) ...
Selecting previously unselected package liblua5.3-0:amd64.
Preparing to unpack .../2-liblua5.3-0_5.3.3-1.1ubuntu2_amd64.deb ...
Unpacking liblua5.3-0:amd64 (5.3.3-1.1ubuntu2) ...
Selecting previously unselected package lua-lpeg:amd64.
Preparing to unpack .../3-lua-lpeg_1.0.2-1_amd64.deb ...
Unpacking lua-lpeg:amd64 (1.0.2-1) ...
Selecting previously unselected package nmap-common.
Preparing to unpack .../4-nmap-common_7.80+dfsg1-2build1_all.deb ...
Unpacking nmap-common (7.80+dfsg1-2build1) ...
Selecting previously unselected package nmap.
Preparing to unpack .../5-nmap_7.80+dfsg1-2build1_amd64.deb ...
Unpacking nmap (7.80+dfsg1-2build1) ...
Setting up lua-lpeg:amd64 (1.0.2-1) ...
Setting up libblas3:amd64 (3.9.0-1build1) ...
update-alternatives: using /usr/lib/x86_64-linux-gnu/blas/libblas.so.3 to provide /usr/lib/x86_64-linux-gnu/libblas.so.3 (libblas.so.3-x86_64-linux-gnu) in auto mode
Setting up nmap-common (7.80+dfsg1-2build1) ...
Setting up liblua5.3-0:amd64 (5.3.3-1.1ubuntu2) ...
Setting up liblinear4:amd64 (2.3.0+dfsg-3build1) ...
Setting up nmap (7.80+dfsg1-2build1) ...

Progress: [ 88%]
[#####]
#####.....]

Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
stud@cc-lab:~$

```

Ir ieškau jų skenuodamas duotą vidinį potinklį:



```

stud@cc-lab:~$ ip a | awk '/inet/'
    inet 127.0.0.1/8 scope host lo
    inet 10.128.67.8/24 brd 10.128.67.255 scope global ens160
    inet6 fe80::250:56ff:fe9a:28de/64 scope link
    inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0

stud@cc-lab:~$ sudo nmap -sP 10.128.67.8/24
Starting Nmap 7.80 ( https://nmap.org ) at 2021-12-07 16:44 UTC
Nmap scan report for 10.128.67.3
Host is up (0.00025s latency).
MAC Address: 00:50:56:9A:2F:79 (VMware)
Nmap scan report for 10.128.67.4
Host is up (0.00017s latency).
MAC Address: 00:50:56:9A:D3:7C (VMware)
Nmap scan report for 10.128.67.5
Host is up (0.00016s latency).
MAC Address: 00:50:56:9A:FD:C6 (VMware)
Nmap scan report for 10.128.67.6
Host is up (0.00016s latency).
MAC Address: 00:50:56:9A:04:4E (VMware)
Nmap scan report for 10.128.67.9
Host is up (0.00023s latency).
MAC Address: 00:50:56:9A:B7:C7 (VMware)
Nmap scan report for 10.128.67.10
Host is up (0.00017s latency).
MAC Address: 00:50:56:9A:2A:F0 (VMware)
Nmap scan report for 10.128.67.11
Host is up (0.00016s latency).
MAC Address: 00:50:56:9A:BD:36 (VMware)
Nmap scan report for 10.128.67.12
Host is up (0.00011s latency).
MAC Address: 00:50:56:9A:5A:91 (VMware)
Nmap scan report for cc-lab (10.128.67.8)
Host is up.
Nmap done: 256 IP addresses (9 hosts up) scanned in 1.82 seconds
stud@cc-lab:~$

```

- ⇒ Radau aštuonis kaimynus, turbūt grupiokų serverius nr. 1.
- ⇒ Kol neaišku, kuris IP kam priklauso, treniruosisi su savo serveriu 10.128.67.8 kaip pagrindiniu taikiniu.

Tikrinu /etc/hosts failo formatą ir turinį:

```

stud@cc-lab:~$ tail /etc/hosts
127.0.0.1 localhost
127.0.1.1 cc-lab

# The following lines are desirable for IPv6 capable hosts
::1      ip6-localhost ip6-loopback
fe00::0  ip6-localnet
ff00::0  ip6-mcastprefix
ff02::1  ip6-allnodes
ff02::2  ip6-allrouters
stud@cc-lab:~$

```

Aprašau jame savo serverį nr. 1, tik vardu serveris2 :

```
stud@cc-lab:~$ echo '10.128.67.8    serveris2' >> /etc/hosts
-bash: /etc/hosts: Permission denied

stud@cc-lab:~$ echo '10.128.67.8    serveris2' | sudo tee -a /etc/hosts
10.128.67.8    serveris2

stud@cc-lab:~$ tail /etc/hosts
127.0.0.1 localhost
127.0.1.1 cc-lab

# The following lines are desirable for IPv6 capable hosts
::1        ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
10.128.67.8    serveris2
stud@cc-lab:~$
```

Patikrinu vardo išsprendimą:

```
stud@cc-lab:~$ ping serveris2
PING serveris2 (10.128.67.8) 56(84) bytes of data.
64 bytes from serveris2 (10.128.67.8): icmp_seq=1 ttl=64 time=0.084 ms
64 bytes from serveris2 (10.128.67.8): icmp_seq=2 ttl=64 time=0.053 ms
^C
--- serveris2 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1016ms
rtt min/avg/max/mdev = 0.053/0.068/0.084/0.015 ms
stud@cc-lab:~$
```

- ⇒ Laikinas vardas veikia.

## SSH ryšio ir rakto paruošimas

Darbo su SSH raktais prisiminimui pasinaudoju straipsneliu: [2]

Sukuriu stud paskyrai naują SSH raktą:

```
stud@cc-lab:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/stud/.ssh/id_rsa):
Created directory '/home/stud/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/stud/.ssh/id_rsa
Your public key has been saved in /home/stud/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:eRmPaDqOuSZ8j+MXGe9DMR0b9ewfCVJqK/0IjWWDH4g stud@cc-lab
The key's randomart image is:
+---[RSA 3072]-----+
|
|      . . .
|      =.=
|      . *o+=+
|      . *S=++..
|      E =oX.. . o
|      .  o@ B   .
|      o +=+. * .
|      =*=o
+-----[SHA256]-----+
stud@cc-lab:~$
```

- ⇒ Dėl patogumo ir nereikalaus padidinto saugumo, *Passphrase* neįjungiau (nurodžiau tuščią).
- ⇒ Kadangi pradžiai išmėginsiu raktą savo paties serveryje, viešas jo raktas išsisaugos jame pačiame kaip atskiras SSH mazgų įrašas.

- ⇒ Kadangi šiame įrašė telpa ne vien IP adresas, bet ir serverio vardas, dėl tvarkos reiktų jungtis vardu (tuomet išspręstasis IP adresas išsisaugo kartu).
- ⇒ O tam, kad šio įrašo apie SSH mazgą vėliau netektų keisti / taisyti, reiktų prisijungimui naudoti jau galutinį mazgo vardą, nebe testinį serveris2.

Pašalinu pradinį, testinį mazgo vardą (dvi eilutes) iš sisteminės lentelės ir įrašau adekvatų vardą:

```
stud@cc-lab:~$ sudo vim /etc/hosts
...

stud@cc-lab:~$ echo -e '# 2021-12-07 saukrs: pradedu laborą nr. 4,\n10.128.67.8    serveris1' | sudo
tee -a /etc/hosts
# 2021-12-07 saukrs: pradedu laborą nr. 4,
10.128.67.8    serveris1
stud@cc-lab:~$
```

Įsitikinu, kad failą sukonfigūravau teisingai:

```
stud@cc-lab:~$ tail /etc/hosts
127.0.1.1 cc-lab

# The following lines are desirable for IPv6 capable hosts
::1      ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
# 2021-12-07 saukrs: pradedu laborą nr. 4,
10.128.67.8    serveris1
stud@cc-lab:~$
```

Tikrinu vardą serveris1, išsisprendžia:

```
stud@cc-lab:~$ ping serveris1
PING serveris1 (10.128.67.8) 56(84) bytes of data.
64 bytes from serveris1 (10.128.67.8): icmp_seq=1 ttl=64 time=0.060 ms
64 bytes from serveris1 (10.128.67.8): icmp_seq=2 ttl=64 time=0.055 ms
^C
--- serveris1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 0.055/0.057/0.060/0.002 ms
stud@cc-lab:~$
```

Jungiuosi prie savo serverio su slaptažodžiu, patvirtinu rakto eliptinį pėdsaką ir iškart atsijungiu su ^D kombinacija:

```
stud@cc-lab:~$ ssh serveris1
The authenticity of host 'serveris1 (10.128.67.8)' can't be established.
ECDSA key fingerprint is SHA256:53taBSfMAMqEJLYWDEYZqm5IOYHYeEiBNK6eUvelagE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'serveris1,10.128.67.8' (ECDSA) to the list of known hosts.
stud@serveris1's password:

stud@cc-lab:~$ ^D
stud@cc-lab:~$
```

- ⇒ Prieš viešojo SSH rakto kopijavimą į serverį verta patikslinti, ar serverio ECDSA (eliptinis) rakto pėdsakas yra autentiškas.  
Visiškai nesuprantu, kaip tinkamai tai padaryti + atpažinti galimą „pasiklausymą“ / MITM ataką. [3]  
Todėl tiesiog įvedžiau yes.
- ⇒ serveris1 jau pilnai paruoštas jungimuisi per SSH (su slaptažodžiu).

## Serverio nr. 1 savęs pasiekimas (testinis) naudojantis SSH raktu

Kopijuoju SSH raktą į savo paties (tą patį) serverį:

```
stud@cc-lab:~$ ssh-copy-id serveris1
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/stud/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are
already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to
install the new keys
stud@serveris1's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'serveris1'"
and check to make sure that only the key(s) you wanted were added.

stud@cc-lab:~$
```

Ir tikrinu SSH prisijungimą tuo raktu:

```
stud@cc-lab:~$ ssh serveris1
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.4.0-90-generic x86_64)

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

System information as of Tue 07 Dec 2021 04:54:55 PM UTC

System load:  0.02               Processes:           233
Usage of /:   42.0% of 19.56GB   Users logged in:    1
Memory usage: 11%               IPv4 address for docker0: 172.17.0.1
Swap usage:   0%                IPv4 address for ens160: 10.128.67.8

 * Super-optimized for small spaces - read how we shrank the memory
   footprint of MicroK8s to make it the smallest full K8s around.

https://ubuntu.com/blog/microk8s-memory-optimisation

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

Last login: Tue Dec  7 16:31:43 2021 from 86.38.73.194

stud@cc-lab:~$ w
 16:54:58 up 57 min,  2 users,  load average: 0.10, 0.04, 0.01
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
stud      pts/0    86.38.73.194    16:31    1.00s  0.25s  0.02s ssh serveris1
stud      pts/1    10.128.67.8     16:54    2.00s  0.05s  0.00s w

stud@cc-lab:~$ logout
Connection to serveris1 closed.
stud@cc-lab:~$
```

- ⇒ Testinis SSH prisijungimas raktu į serveris1 jau irgi veikia.

## Inventory failo paruošimas

### Testinė konfigūracija

Bandau /etc/hosts formatu įtraukti serveris1 aprašymą ir į numatytąjį inventorinį failą /etc/ansible/hosts:

(pažvelgus į pastarojo turinį pasirodė, jog formatas toks pats)

```
stud@cc-lab:~$ echo -e '# 2021-12-07 saukrs: pradedu laborą nr. 4,\n[servers]\n10.128.67.8\nserveris2' | sudo tee -a /etc/ansible/hosts
# 2021-12-07 saukrs: pradedu laborą nr. 4,
[servers]
10.128.67.8    serveris2
stud@cc-lab:~$
```

- ⇒ Čia apibrėžiau serverių grupę `servers`.

Tikrinu inventoriaus failą:

```
stud@cc-lab:~$ ansible-inventory --list -y
[WARNING]: * Failed to parse /etc/ansible/hosts with yaml plugin: Syntax Error while loading YAML.
did not find expected <document start> The error appears to be in
'/etc/ansible/hosts': line 47, column 1, but may be elsewhere in the file depending on the exact
syntax problem. The offending line appears to be: [servers] 10.128.67.8
serveris2 ^ here
[WARNING]: * Failed to parse /etc/ansible/hosts with ini plugin: /etc/ansible/hosts:47: Expected
key=value host variable assignment, got: serveris2
[WARNING]: Unable to parse /etc/ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
all:
  children:
    ungrouped: {}
stud@cc-lab:~$
```

- ⇒ Bloga inventorinio failo struktūra.
- ⇒ Nors vietoj `serveris1` klaidingai įrašiau `serveris2`, kol kas situacijos tai nekeitė.

Šalinu tris savo įterptas eilutes (taisydamas failo turinį redaktoriuje):

```
stud@cc-lab:~$ sudo vim /etc/ansible/hosts
...
stud@cc-lab:~$
```

Kol rasiu klaidą, inventoriuje aprašau mazgą nenaudodamas vardo išvis — tik IP adresą:

```
stud@cc-lab:~$ echo -e '# 2021-12-07 saukrs: pradedu laborą nr. 4,\n[servers]\n10.128.67.8' | sudo tee
-a /etc/ansible/hosts
# 2021-12-07 saukrs: pradedu laborą nr. 4,
[servers]
10.128.67.8
```

Dabar *Ansible* inventorius pradėjo veikti:

```
stud@cc-lab:~$ ansible-inventory --list -y
all:
  children:
    servers:
      hosts:
        10.128.67.8: {}
    ungrouped: {}
stud@cc-lab:~$
```

## Pirmas *Inventory* failo testas

Tikrinu *Ansible* gebėjimą jungtis prie testinio inventorinio (t. y. savo paties) serverio:

```
stud@cc-lab:~$ ansible all -m ping -u stud
10.128.67.8 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
stud@cc-lab:~$
```

- ⇒ *Ansible* mazgas jau prisijungia prie paties savęs (kol kas tik IP adresu).

### *Inventory* failo tikslinimas

LD aprašyme pagaliau atkreipiau dėmesį, kad *Ansible* hosts failas naudoja *kiek kitoki* formatą aprašyti mazgui.

- ⇒ Šis formatas yra lankstesnis — skirtingose situacijose turi galimybę „šakotis“: [4]

Failas	Pirmas stulpelis	Antras stulpelis
/etc/hosts	<IP adresas>	vardas
/etc/ansible/hosts IP adresams	<IP adresas>	—
/etc/ansible/hosts registruotuotiems vardams	vardas	—
/etc/ansible/hosts neregistruotuotiems vardams	vardas	ansible_host=<IP adresas>

- ⇒ Jis turi ir kitų galimybių (pvz. nurodyti netipinį mazgo TCP prievadą SSH prisijungimui).

Taigi, ištrinu savo pradinę /etc/ansible/hosts konfigūraciją:

```
stud@cc-lab:~$ sudo vim /etc/ansible/hosts
...
stud@cc-lab:~$
```

Papildau ją kitu formatu:

```
stud@cc-lab:~$ echo -e '# 2021-12-07 saukrs: pradedu laborą nr. 4,\n[servers]\nserver1\nansible_host=10.128.67.8' | sudo tee -a /etc/ansible/hosts
# 2021-12-07 saukrs: pradedu laborą nr. 4,
[servers]
server1 ansible_host=10.128.67.8
stud@cc-lab:~$
```

Patikrinu šį formatą — tinkamas:

```
stud@cc-lab:~$ ansible-inventory --list -y
all:
  children:
    servers:
      hosts:
        server1:
          ansible_host: 10.128.67.8
      ungrouped: {}
stud@cc-lab:~$
```

Patikrinu inventorinio failo veikimą — veikia:

```
stud@cc-lab:~$ ansible all -m ping -u stud
server1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
stud@cc-lab:~$
```

Nustoju naudoti CLI raktą `-u stud`, nes dabar virtualioje laboratorijoje magistrantai dirba vien su šia paskyra, kitų vardų nenaudojame:

```
stud@cc-lab:~$ ansible all -m ping
server1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
stud@cc-lab:~$
```

- ⇒ susipažinta su `/etc/ansible/hosts` formatu, sukurta testinė konfigūracija.

## Aprašau serverį nr. 2

LD aprašo susirandu mano serveriui nr. 2 priskirtą IP adresą: `10.128.67.20`.

Pirmiausia aprašau jį `/etc/hosts` faile:

```
stud@cc-lab:~$ echo '10.128.67.20    serveris2' | sudo tee -a /etc/hosts
10.128.67.20    serveris2

stud@cc-lab:~$ tail /etc/hosts

# The following lines are desirable for IPv6 capable hosts
::1    ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
# 2021-12-07 saukrs: pradedu laborą nr. 4,
10.128.67.8    serveris1
10.128.67.20    serveris2
stud@cc-lab:~$
```

Paskui ir *Ansible* inventoriuje:

```
stud@cc-lab:~$ echo 'serveris2 ansible_host=10.128.67.20' | sudo tee -a /etc/ansible/hosts
serveris2 ansible_host=10.128.67.20

stud@cc-lab:~$ tail /etc/ansible/hosts

# Here's another example of host ranges, this time there are no
# leading 0s:

#db-[99:101]-node.example.com

# 2021-12-07 saukrs: pradedu laborą nr. 4,
[servers]
server1 ansible_host=10.128.67.8
serveris2 ansible_host=10.128.67.20
stud@cc-lab:~$
```

- ⇒ Pastebiu netiksliai užrašytą serverio nr. 1 vardą.

## Konfigūracijos klaidų taisymas

Pataisau serverio nr. 1 aprašymą redaktoriumi, rankiniu būdu:

```
stud@cc-lab:~$ sudo vim /etc/ansible/hosts
...
# 2021-12-07 saukrs: pradedu laborą nr. 4,
[servers]
serveris1 ansible_host=10.128.67.8
serveris2 ansible_host=10.128.67.20

47,8      All
stud@cc-lab:~$
```

Įsitikinu, kad *Inventory* papildžiau teisingai:

```
stud@cc-lab:~$ ansible-inventory --list -y
all:
  children:
    servers:
      hosts:
        serveris1:
          ansible_host: 10.128.67.8
        serveris2:
          ansible_host: 10.128.67.20
      ungrouped: {}
stud@cc-lab:~$
```

- ⇒ Jei /etc/ansible/hosts faile naudotume tik vardus (be IP adresų), tokias klaidas varduose (tą patį vardą, keliuose vietose aprašomą skirtingai) būtų pavykę pastebėti iškart.
- ⇒ Paruoštas ir patikrintas inventoriaus failas, jame aprašytas serveris nr. 2.

## Ansible prisijungimų tikrinimas

*Ansible* valdymo mazge startuoju komandą:

```
stud@cc-lab:~$ ansible all -m ping
The authenticity of host '10.128.67.20 (10.128.67.20)' can't be established.
ECDSA key fingerprint is SHA256:53taBSfMAMqEJLYWDEYZqm5IOYHYeEiBNK6eUvelagE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? serveris1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
yes^C
serveris2 | UNREACHABLE! => {
  "changed": false,
  "msg": "Failed to connect to the host via ssh: Warning: Permanently added '10.128.67.20' (ECDSA)
to the list of known hosts.\r\nstud@10.128.67.20: Permission denied (pub
lickey,password).",
  "unreachable": true
}
stud@cc-lab:~$
```

- ⇒ Vis dar neparuošiau SSH prisijungimo iš serveris1 į serveris2.

## Tolimesnis SSH prisijungimų tvarkymas

Kopijuojau serverio nr. 1 raktą į serverį nr. 2:



```
stud@cc-lab:~$ ssh-copy-id serveris2
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/stud/.ssh/id_rsa.pub"
The authenticity of host 'serveris2 (10.128.67.20)' can't be established.
ECDSA key fingerprint is SHA256:53taBSfMAMqEJLYWDEYZqm5IOYHYeEiBNK6eUvelagE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are
already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to
install the new keys
stud@serveris2's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'serveris2'"
and check to make sure that only the key(s) you wanted were added.

stud@cc-lab:~$
```

## Antras prisijungimų tikrinimas

```
stud@cc-lab:~$ ansible all -m ping
serveris1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
serveris2 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
stud@cc-lab:~$
```

- ⇒ Galų gale abu serveriai atsiliepia tinkamai. Rezultatas panašus į pateiktąjį LD apraše.  
*Ansible* valdymo mazgas palaiko ryšį su dviem serveriais (vienu testiniu ir vienu produkcinio).

## Nuotolinis komandų vykdymas

### LD užduoties *Ad-hoc* komandos

```
stud@cc-lab:~$ ansible all -a "df -h"
serveris1 | CHANGED | rc=0 >>
Filesystem                                Size  Used Avail Use% Mounted on
udev                                      1.5G   0    1.5G   0% /dev
tmpfs                                    300M  1.2M  299M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv        20G   8.3G   11G   45% /
tmpfs                                    1.5G  124K   1.5G   1% /dev/shm
tmpfs                                    5.0M   0    5.0M   0% /run/lock
tmpfs                                    1.5G   0    1.5G   0% /sys/fs/cgroup
/dev/loop0                              56M   56M   0  100% /snap/core18/2246
/dev/loop1                              56M   56M   0  100% /snap/core18/2253
/dev/loop3                              62M   62M   0  100% /snap/core20/1270
/dev/loop2                              62M   62M   0  100% /snap/core20/1242
/dev/loop4                              68M   68M   0  100% /snap/lxd/21835
/dev/loop5                              68M   68M   0  100% /snap/lxd/21803
/dev/loop7                              33M   33M   0  100% /snap/snapd/13640
/dev/loop6                              117M  117M   0  100% /snap/docker/1125
/dev/loop8                              43M   43M   0  100% /snap/snapd/14066
/dev/sda2                              976M  203M  707M   23% /boot
tmpfs                                    300M   0    300M   0% /run/user/1001
serveris2 | CHANGED | rc=0 >>
Filesystem                                Size  Used Avail Use% Mounted on
udev                                      1.5G   0    1.5G   0% /dev
tmpfs                                    300M  1.2M  299M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv        20G   7.7G   11G   42% /
tmpfs                                    1.5G   0    1.5G   0% /dev/shm
tmpfs                                    5.0M   0    5.0M   0% /run/lock
tmpfs                                    1.5G   0    1.5G   0% /sys/fs/cgroup
/dev/loop1                              56M   56M   0  100% /snap/core18/2246
/dev/loop2                              62M   62M   0  100% /snap/core20/1169
/dev/loop0                              56M   56M   0  100% /snap/core18/2128
/dev/loop3                              68M   68M   0  100% /snap/lxd/21803
/dev/loop4                              68M   68M   0  100% /snap/lxd/21835
/dev/loop5                              117M  117M   0  100% /snap/docker/1125
/dev/loop6                              43M   43M   0  100% /snap/snapd/13831
/dev/loop7                              33M   33M   0  100% /snap/snapd/13640
/dev/sda2                              976M  203M  707M   23% /boot
tmpfs                                    300M   0    300M   0% /run/user/1001
stud@cc-lab:~$
```

- ⇒ Gaunu serverių primontuotų failinių sistemų (FS) būsenas.

```
stud@cc-lab:~$ ansible all -a uptime
serveris1 | CHANGED | rc=0 >>
 17:08:48 up 1:10, 2 users, load average: 0.07, 0.02, 0.00
serveris2 | CHANGED | rc=0 >>
 17:08:48 up 51 min, 1 user, load average: 0.00, 0.00, 0.00
stud@cc-lab:~$
```

- ⇒ Gaunu serverių veikimo trukmes ir sisteminės apkrovas (*System load*).
- ⇒ *Ansible* abi LD komandas įvykdė abiejuose serveriuose sėkmingai.

## Kitos (paprastos) *Ad-hoc* komandas

```
stud@cc-lab:~$ ansible all -a "ip r"
serveris2 | CHANGED | rc=0 >>
default via 10.128.67.254 dev ens160 proto dhcp src 10.128.67.20 metric 100
10.128.67.0/24 dev ens160 proto kernel scope link src 10.128.67.20
10.128.67.254 dev ens160 proto dhcp scope link src 10.128.67.20 metric 100
172.17.0.0/16 dev docker0 proto kernel scope link src 172.17.0.1 linkdown
serveris1 | CHANGED | rc=0 >>
default via 10.128.67.254 dev ens160 proto dhcp src 10.128.67.8 metric 100
10.128.67.0/24 dev ens160 proto kernel scope link src 10.128.67.8
10.128.67.254 dev ens160 proto dhcp scope link src 10.128.67.8 metric 100
172.17.0.0/16 dev docker0 proto kernel scope link src 172.17.0.1 linkdown
stud@cc-lab:~$
```

- ⇒ Gavau maršrutų lenteles.

```

stud@cc-lab:~$ ansible all -a w
serveris2 | CHANGED | rc=0 >>
 17:19:21 up 1:01, 1 user, load average: 0.00, 0.00, 0.00
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
stud      pts/0    10.128.67.8      17:19    1.00s  0.19s  0.00s w
serveris1 | CHANGED | rc=0 >>
 17:19:21 up 1:21, 2 users, load average: 0.00, 0.00, 0.00
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
stud      pts/0    86.38.73.194     16:31    5.00s  1.64s  0.00s ssh -C -o ControlMaster=auto -o
ControlPersist=60s -o KbdInteractiveAuthentication=no -o PreferredAuthenticat
ions=gssapi-with-mic,gssapi-keyex,hostbased,publickey -o PasswordAuthentication=no -o
ConnectTimeout=10 -o ControlPath=/home/stud/.ansible/cp/62369c22bf -tt 10.128.67.8 /bin
/sh -c '/usr/bin/python3 /home/stud/.ansible/tmp/ansible-tmp-1638897559.5734017-
231528218158292/AnsiballZ_command.py && sleep 0'
stud      pts/3    10.128.67.8      17:19    1.00s  0.21s  0.01s w
stud@cc-lab:~$

```

- ⇒ Gavau prisijungusių vartotojų skaičių ir aktyvias vykdomas programas.
- ⇒ Čia atsitiktinai pastebiu, kad *Ansible* jungimuisi į serverius naudoja komandą `ssh` su gana ilga komandine eilute:

```

ssh \
-C \
-o ControlMaster=auto \
-o ControlPersist=60s \
-o KbdInteractiveAuthentication=no \
-o PreferredAuthentications=gssapi-with-mic,gssapi-keyex,hostbased,publickey \
-o PasswordAuthentication=no \
-o ConnectTimeout=10 \
-o ControlPath=/home/stud/.ansible/cp/62369c22bf \
-tt \
10.128.67.8 /bin/sh \
-c '/usr/bin/python3 \
/home/stud/.ansible/tmp/ansible-tmp-1638897559.5734017-231528218158292/AnsiballZ_command.py
\
&& sleep 0'

```

- ⇒ ... ir nuotoliniame serveryje startuoja tokį *Python* skriptą:

```

/usr/bin/python3 /home/stud/.ansible/tmp/ansible-tmp-1638897559.5734017-
231528218158292/AnsiballZ_command.py

```

- ⇒ Panašu, kad skriptą `AnsiballZ_command.py` *Ansible* į nuotolinį serverį sau nusikopijuoja prieš pat vykdymą.

Leidžiu paskutinę paprastą komandą:

```

stud@cc-lab:~$ ansible all -a "lsb_release -d"
serveris1 | CHANGED | rc=0 >>
Description:    Ubuntu 20.04.3 LTS
serveris2 | CHANGED | rc=0 >>
Description:    Ubuntu 20.04.3 LTS
stud@cc-lab:~$

```

- ⇒ Visos paprastos (pavienės) *Ad-hoc* komandos veikia.

## Kompozitinės *Ad-hoc* komandos

Mėginu komandą `lscpu | awk '/^CPU/'` nustatyti mašinos CPU branduolių skaičių:

```
stud@ecc-lab:~$ ansible all -a "lscpu | awk '/^CPU/'"
serveris2 | FAILED | rc=1 >>
lscpu: bad usage
Try 'lscpu --help' for more information.non-zero return code
serveris1 | FAILED | rc=1 >>
lscpu: bad usage
Try 'lscpu --help' for more information.non-zero return code
stud@ecc-lab:~$
```

- ⇒ Neveikia, ir neaišku, kokią komandinę eilutę `lscpu` gavo, kad „pyksta“.

Mėginu visą komandą įvykdyti *Bash* pagalba:

```
stud@ecc-lab:~$ ansible all -a bash -c "lscpu | awk '/^CPU/'"
serveris1 | FAILED | rc=-1 >>
the connection plugin 'lscpu | awk '/^CPU/'' was not found
serveris2 | FAILED | rc=-1 >>
the connection plugin 'lscpu | awk '/^CPU/'' was not found
stud@ecc-lab:~$
```

- ⇒ Blogai: šitaip raktą `-c` *Ansible* pasiima sau ir pasimeta.

Visą komandinę eilutę kartu su `bash` apgaubiu išorinėmis dvigubomis kabutėmis (kaip vientisą, vieną argumentą), o vidines dvigubąsias „eskepinu“:

```
stud@ecc-lab:~$ ansible all -a "bash -c \"lscpu | awk '/^CPU.s/'\""
serveris1 | CHANGED | rc=0 >>
CPU(s):                2
serveris2 | CHANGED | rc=0 >>
CPU(s):                2
stud@ecc-lab:~$
```

- ⇒ Pagaliau veikia. Beje, `awk` komandą šiek tiek papildžiau, kad grąžintų tik vieną eilutę per mazgą.

Pamėginu išsitraukti ir CPU taktinį dažnį:

```
stud@ecc-lab:~$ ansible all -a "bash -c \"lscpu | awk '/^CPU.s|Hz/'\""
serveris1 | CHANGED | rc=0 >>
CPU(s):                2
Model name:            Intel(R) Xeon(R) CPU           E5645  @ 2.40GHz
CPU MHz:               2400.085
serveris2 | CHANGED | rc=0 >>
CPU(s):                2
Model name:            Intel(R) Xeon(R) CPU           E5620  @ 2.40GHz
CPU MHz:               2400.085
stud@ecc-lab:~$
```

- ⇒ *Ansible* geba vykdyti ir *Bash*-kompozitines *Ad-hoc* komandas.
- ⇒ Pamiršau patikrinti *Ansible* hostų grupavimą, t.y. nurodyti serverių grupę `servers` vietoje `all`.  
Esu įsitikinęs, kad ji veiktų taip pat puikiai.

## (Bonus) *Ansible* grojaraščių vykdymas

Pradedu kurti atskirą grojaraštį (*Playbook*):

```

stud@cc-lab:~$ ls -Al
total 52
drwxrwxr-x 4 stud stud 4096 Dec  7 16:57 .ansible
-rw----- 1 stud stud 1005 Dec  7 16:54 .bash_history
-rw-r--r-- 1 stud stud 220 Oct 19 14:14 .bash_logout
-rw-r--r-- 1 stud stud 3771 Oct 19 14:14 .bashrc
drwxrwxr-x 3 stud stud 4096 Oct 19 16:23 build
drwx----- 2 stud stud 4096 Oct 19 14:21 .cache
-rw----- 1 stud stud  39 Dec  7 16:41 .lessht
drwxrwxr-x 3 stud stud 4096 Oct 19 16:08 .local
-rw-r--r-- 1 stud stud  807 Oct 19 14:14 .profile
drwxr-xr-x 3 stud stud 4096 Oct 19 15:40 snap
drwx----- 2 stud stud 4096 Dec  7 17:07 .ssh
-rw-r--r-- 1 stud stud   0 Oct 19 14:15 .sudo_as_admin_successful
drwxrwxr-x 2 stud stud 4096 Oct 19 15:40 test
-rw----- 1 stud stud 1162 Dec  7 16:38 .viminfo

stud@cc-lab:~$ mkdir src

stud@cc-lab:~$ cd src

stud@cc-lab:~/src$ vim saukrs-1.yml
...

```

Kopijuoju pavyzdį iš *Red Hat* Blog-įrašo: [5]

```

# 2021-12-07 saukrs: kopijuoju iš https://www.redhat.com/en/blog/ansible-101-ansible-beginners
#
- name: saukrs Playbook nr.1
  hosts: serveris2
  tasks:
    - name: diegiame nginx
      yum:
        name: nginx
        state: present

```

Bandau grojaraštį:

```

[1]+  Stopped                  vim saukrs-1.yml

stud@cc-lab:~/src$ ansible-playbook saukrs-1.yml
ERROR! Syntax Error while loading YAML.
  mapping values are not allowed in this context

The error appears to be in '/home/stud/src/saukrs-1.yml': line 7, column 12, but may
be elsewhere in the file depending on the exact syntax problem.

The offending line appears to be:

    - name: diegiame nginx
      yum:
        ^ here
stud@cc-lab:~/src$

```

- ⇒ Klaida. Bet ne faktas, kad septintoje eilutėje.

Įterpiu YAML pradžios žymę --- :

```

stud@cc-lab:~/src$ fg

```

```

---
# 2021-12-07 saukrs: kopijuojau iš https://www.redhat.com/en/blog/ansible-101-ansible-beginners
- name: saukrs Playbook nr.1
  hosts: serveris2
  tasks:
    - name: diegiame nginx
      yum:
        name: nginx
        state: present

```

- ⇒ Klaida išlieka tokia pati.

Įsikopijuoja kitą pavyzdį: [6]

```
stud@ecc-lab:~/src$ vim saukrs-2.yml
```

```

---
- hosts: all
  become: yes
  tasks:
    - name: Install packages
      apt:
        name:
          - ntpdate
          - nmap
        state: latest
        cache_valid_time: 3600

```

Bandau antrą grojaraštį:

```

[1]+  Stopped                  vim saukrs-2.yml
stud@ecc-lab:~/src$ ansible-playbook saukrs-2.yml

```

```

PLAY [all]
*****
*****

TASK [Gathering Facts]
*****
*****
fatal: [serveris1]: FAILED! => {"msg": "Missing sudo password"}
fatal: [serveris2]: FAILED! => {"msg": "Missing sudo password"}

PLAY RECAP
*****
*****
serveris1           : ok=0    changed=0    unreachable=0    failed=1    skipped=0    rescued=0
ignored=0
serveris2           : ok=0    changed=0    unreachable=0    failed=1    skipped=0    rescued=0
ignored=0

stud@ecc-lab:~/src$

```

- ⇒ Grojaraštis nr. 2 sintaksės klaidų nebeturi, tačiau praneša, kad trūksta `sudo` slaptažodžio.
- ⇒ Gražina `ok=0` ir `failed=1`.

Suguglinu patarimą naudoti papildomą raktą `--ask-become-pass` : [7]

```
stud@ccc-lab:~/src$ ansible-playbook saukrs-2.yml --ask-become-pass
BECOME password:
```

```
PLAY [all]
```

```
*****
*****
```

```
TASK [Gathering Facts]
```

```
*****
*****
```

```
ok: [serveris1]
```

```
ok: [serveris2]
```

```
TASK [Install packages]
```

```
*****
*****
```

```
changed: [serveris1]
```

```
changed: [serveris2]
```

```
PLAY RECAP
```

```
*****
*****
```

```
serveris1          : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0
```

```
ignored=0
```

```
serveris2          : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0
```

```
ignored=0
```

```
stud@ccc-lab:~/src$
```

- ⇒ *Ansible* paprašė slaptažodžio — spėjau, kad stud paskyros, ir pataikiau, regis.
- ⇒ Žingsnis [Install packages] užtruko ilgiausiai:
  - serveris1 apie 10 s.
  - serveris2 apie 20 s.
- ⇒ Grojaraštis grąžina ok=2 ir failed=0.
- ⇒ Panašu, kad jis įdiegė / atnaujino abu nurodytus paketus: ntpdate ir nmap. Paketų būsenos tiesiogiai nepatikrinau.

Nutariau pasitikrinti, ką tiksliai vykdo *Ansible* ir kuri komanda paprašo sudo slaptažodžio. Dėstytojas pasiūlė naudoti -v ar net -vvv, mėginu:

```
stud@ccc-lab:~/src$ ansible-playbook saukrs-2.yml -vvv
```

```
ansible-playbook 2.9.6
```

```
  config file = /etc/ansible/ansible.cfg
```

```
  configured module search path = ['/home/stud/.ansible/plugins/modules',  
'/usr/share/ansible/plugins/modules']
```

```
  ansible python module location = /usr/lib/python3/dist-packages/ansible
```

```
  executable location = /usr/bin/ansible-playbook
```

```
  python version = 3.8.10 (default, Sep 28 2021, 16:10:42) [GCC 9.3.0]
```

```
Using /etc/ansible/ansible.cfg as config file
```

```
host_list declined parsing /etc/ansible/hosts as it did not pass its verify_file() method
```

```
script declined parsing /etc/ansible/hosts as it did not pass its verify_file() method
```

```
auto declined parsing /etc/ansible/hosts as it did not pass its verify_file() method
```

```
Parsed /etc/ansible/hosts inventory source with ini plugin
```

```
PLAYBOOK: saukrs-2.yml
```

```
*****
*****
```

```
1 plays in saukrs-2.yml
```

```
PLAY [all]
```

```
*****
*****
```

```
TASK [Gathering Facts]
```

```
*****
*****
```

```

task path: /home/stud/src/saukrs-2.yml:2
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf 10.128.67.8 '/bin/sh -c '""'echo ~ && sleep 0'""'
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 10.128.67.20 '/bin/sh -c '""'echo ~ && sleep 0'""'
<10.128.67.8> (0, b'/home/stud\n', b'')
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf 10.128.67.8 '/bin/sh -c '""'( umask 77 && mkdir -p ""
echo /home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-253348797528778 `` && echo ansible-tmp-
1638899019.7293622-253348797528778=""` echo /home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-
253348797528778 `` ) && sleep 0'""'
<10.128.67.8> (0, b'ansible-tmp-1638899019.7293622-253348797528778=/home/stud/.ansible/tmp/ansible-
tmp-1638899019.7293622-253348797528778\n', b'')
<10.128.67.20> (0, b'/home/stud\n', b'')
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 10.128.67.20 '/bin/sh -c '""'( umask 77 && mkdir -p ""
echo /home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-242494816437750 `` && echo ansible-tmp-
1638899019.7481883-242494816437750=""` echo /home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-
242494816437750 `` ) && sleep 0'""'
<10.128.67.20> (0, b'ansible-tmp-1638899019.7481883-242494816437750=/home/stud/.ansible/tmp/ansible-
tmp-1638899019.7481883-242494816437750\n', b'')
<serveris2> Attempting python interpreter discovery
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<serveris1> Attempting python interpreter discovery
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 10.128.67.20 '/bin/sh -c '""'echo PLATFORM; uname; echo
FOUND; command -v '""'/usr/bin/python'""'; command -v
'""'python3.7'""'; command -v '""'python3.6'""';
command -v '""'python3.5'""'; command -v
'""'python2.7'""'; command -v '""'python2.6'""';
command -v '""'/usr/libexec/platform-python'""'; command -v
'""'/usr/bin/python3'""'; command -v
'""'python'""'; echo ENDFOUND && sleep 0'""'
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf 10.128.67.8 '/bin/sh -c '""'echo PLATFORM; uname; echo
FOUND; command -v '""'/usr/bin/python'""'; command -v
'""'python3.7'""'; command -v '""'python3.6'""';
command -v '""'python3.5'""'; command -v
'""'python2.7'""'; command -v '""'python2.6'""';
command -v '""'/usr/libexec/platform-python'""'; command -v
'""'/usr/bin/python3'""'; command -v
'""'python'""'; echo ENDFOUND && sleep 0'""'
<10.128.67.20> (0, b'PLATFORM\nLinux\nFOUND\n/usr/bin/python3\nENDFOUND\n', b'')
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 10.128.67.20 '/bin/sh -c '""'/usr/bin/python3 && sleep
0'""'
<10.128.67.8> (0, b'PLATFORM\nLinux\nFOUND\n/usr/bin/python3\nENDFOUND\n', b'')
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf 10.128.67.8 '/bin/sh -c '""'/usr/bin/python3 && sleep
0'""'
<10.128.67.20> (0, b'{"platform_dist_result": [], "osrelease_content":
"NAME=\\\"Ubuntu\\\"\\nVERSION=\\\"20.04.3 LTS (Focal

```



```

Fossa)\\"\\nID=ubuntu\\nID_LIKE=debian\\nPRETTY_NAME=\\\"Ubuntu 20.04.3
LTS\\\"\\nVERSION_ID=\\\"20.04\\\"\\nHOME_URL=\\\"https://www.ubuntu.com/\\\"\\nSUPPORT_URL=\\\"https://help
.ubuntu.com/\\\"\\nBUG_REPORT_URL=\\\"https://bugs.launchpad.net/ubuntu/\\\"\\nPRIVACY_POLICY_URL=\\\"http
s://www.ubuntu.com/legal/terms-and-policies/privacy-
policy\\\"\\nVERSION_CODENAME=focal\\nUBUNTU_CODENAME=focal\\n}\\n', b'')
Using module file /usr/lib/python3/dist-packages/ansible/modules/system/setup.py
<10.128.67.20> PUT /home/stud/.ansible/tmp/ansible-local-8956eid90gyx/tmpmvv1n7vm T0
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-242494816437750/AnsiballZ_setup.py
<10.128.67.20> SSH: EXEC sftp -b - -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 '[10.128.67.20]'
<10.128.67.8> (0, b'{"platform_dist_result": [], "osrelease_content":
"NAME=\\\"Ubuntu\\\"\\nVERSION=\\\"20.04.3 LTS (Focal
Fossa)\\"\\nID=ubuntu\\nID_LIKE=debian\\nPRETTY_NAME=\\\"Ubuntu 20.04.3
LTS\\\"\\nVERSION_ID=\\\"20.04\\\"\\nHOME_URL=\\\"https://www.ubuntu.com/\\\"\\nSUPPORT_URL=\\\"https://help
.ubuntu.com/\\\"\\nBUG_REPORT_URL=\\\"https://bugs.launchpad.net/ubuntu/\\\"\\nPRIVACY_POLICY_URL=\\\"http
s://www.ubuntu.com/legal/terms-and-policies/privacy-
policy\\\"\\nVERSION_CODENAME=focal\\nUBUNTU_CODENAME=focal\\n}\\n', b'')
Using module file /usr/lib/python3/dist-packages/ansible/modules/system/setup.py
<10.128.67.8> PUT /home/stud/.ansible/tmp/ansible-local-8956eid90gyx/tmp7h_h8icd T0
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-253348797528778/AnsiballZ_setup.py
<10.128.67.8> SSH: EXEC sftp -b - -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf '[10.128.67.8]'
<10.128.67.20> (0, b'sftp> put /home/stud/.ansible/tmp/ansible-local-8956eid90gyx/tmpmvv1n7vm
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-242494816437750/AnsiballZ_setup.py\\n', b'')
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 10.128.67.20 '/bin/sh -c ''''chmod u+x
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-242494816437750/
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-242494816437750/AnsiballZ_setup.py && sleep
0''''''
<10.128.67.8> (0, b'sftp> put /home/stud/.ansible/tmp/ansible-local-8956eid90gyx/tmp7h_h8icd
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-253348797528778/AnsiballZ_setup.py\\n', b'')
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> (0, b'', b'')
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 -tt 10.128.67.20 '/bin/sh -c ''''sudo -H -S -n -u root
/bin/sh -c ''''''''echo BECOME-SUCCESS-uawkzdxwtwbuqhyjbiocuqvsbhmllm ; /usr/bin/python3
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-
242494816437750/AnsiballZ_setup.py'''''''''''''''''''' && sleep 0''''''
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf 10.128.67.8 '/bin/sh -c ''''chmod u+x
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-253348797528778/
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-253348797528778/AnsiballZ_setup.py && sleep
0''''''
<10.128.67.8> (0, b'', b'')
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf -tt 10.128.67.8 '/bin/sh -c ''''sudo -H -S -n -u root
/bin/sh -c ''''''''echo BECOME-SUCCESS-xucyadvmhrwwkflwsxapvnhklmvrvo ; /usr/bin/python3
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-
253348797528778/AnsiballZ_setup.py'''''''''''''''''''' && sleep 0''''''
Escalation requires password
<10.128.67.20> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.20> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/b650e54a14 10.128.67.20 '/bin/sh -c ''''rm -f -r
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7481883-242494816437750/ > /dev/null 2>&1 && sleep
0''''''
<10.128.67.20> (0, b'', b'')
Escalation requires password
fatal:[serveris2]: FAILED! => {

```

```

    "msg": "Missing sudo password"
}
<10.128.67.8> ESTABLISH SSH CONNECTION FOR USER: None
<10.128.67.8> SSH: EXEC ssh -C -o ControlMaster=auto -o ControlPersist=60s -o
KbdInteractiveAuthentication=no -o PreferredAuthentications=gssapi-with-mic,gssapi-
keyex,hostbased,publickey -o PasswordAuthentication=no -o ConnectTimeout=10 -o
ControlPath=/home/stud/.ansible/cp/62369c22bf 10.128.67.8 '/bin/sh -c ''rm -f -r
/home/stud/.ansible/tmp/ansible-tmp-1638899019.7293622-253348797528778/ > /dev/null 2>&1 && sleep
0''''''
<10.128.67.8> (0, b'', b'')
fatal: [serveris1]: FAILED! => {
    "msg": "Missing sudo password"
}

PLAY RECAP
*****
*****
serveris1          : ok=0    changed=0    unreachable=0    failed=1    skipped=0    rescued=0
ignored=0
serveris2          : ok=0    changed=0    unreachable=0    failed=1    skipped=0    rescued=0
ignored=0

stud@cc-lab:~/src$

```

- ⇒ Duomenų gavau išties daug.
- ⇒ Į serverį SFTP įrankiu kopijuojamas ir per SSH vykdomas failas `AnsiballZ_setup.py`, kurį jau identifikuojau anksčiau.
- ⇒ Iš to vis tiek neaišku, ką tiksliai tas *Python* skriptas veikia ir kada panaudoja `sudo`.
- ⇒ Gavau dėstytojo patarimą greta `become:` instrukcijos panaudoti `become_user:` nurodant jai `stud`.

Papildau antrąjį, veikiantį grojaraštį jo kilmės nuoroda ir šia instrukcija:

```

stud@cc-lab:~/src$ fg

---
# 2021-12-07 saukrs: paėmiau iš https://techexpert.tips/ansible/ansible-playbook-examples-ubuntu-
linux/ ,
...
become: yes
become_user: stud
...

```

Ir jį patikrinu:

```
[1]+ Stopped                  vim saukrs-2.yml
stud@ccc-lab:~/src$ ansible-playbook saukrs-2.yml
```

```
PLAY [all]
*****

TASK [Gathering Facts]
*****

ok: [serveris1]
ok: [serveris2]

TASK [Install packages]
*****

ok: [serveris2]
ok: [serveris1]

PLAY RECAP
*****

serveris1      : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0
ignored=0
serveris2      : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0
ignored=0

stud@ccc-lab:~/src$
```

- ⇒ BECOME password: nebeprašomas, iš vienos pusės džiugu.
- ⇒ Iš kitos pusės *Ansible* dabar nebedarė jokių pakeitimų.  
Jei paketai serveriuose dar būtų neįdiegti ar neatnaujinti, `sudo` slaptažodžio turbūt vis tiek prireiktų.
- ⇒ Kaip elgtųsi *Ansible* pastaruoju atveju (ar paprašytų slaptažodžio ne iškart, vėliau, ar tiesiog sustotų ir pateiktų klaidą), lieka man neaišku ir neištestuota.

## Laboratorinio darbo pabaiga

- Susipažinta su *Ansible* sistema.
- Sukurtas inventoriaus failas.
- Patikrintas nuotolinis komandų vykdymas.
- Patikrintas grojaraščio vykdymas

## Nuorodos

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(<https://github.com/msys2/msys2.github.io/commit/67e99dd672505c48c500c73477fbd9b698960b84#diff-b4d68dc855d0f9476d3f2ee343853bd21bf82ea9960d0cf06661baa244439dd6R9>)

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(<https://techexpert.tips/ansible/ansible-playbook-examples-ubuntu-linux/#:~:text=To%20run%20this%20Ansible%20playbook,%20use%20the%20following%20command>)

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