Лабораторная работа № 1. Подготовка лабораторного стенда.

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Цель работы

- Приобретение практических навыков установки Rocky Linux на виртуальную машину с помощью инструмента Vagrant.

Утилиты для работы

- Vagrant v2.3.4 (`https://vagrantup.com`);
- VirtualBox v7.0.16 (`https://www.virtualbox.org`).
- Packer v1.11.2 (`https://www.packer.io`).

Подготовка лабораторного стенда

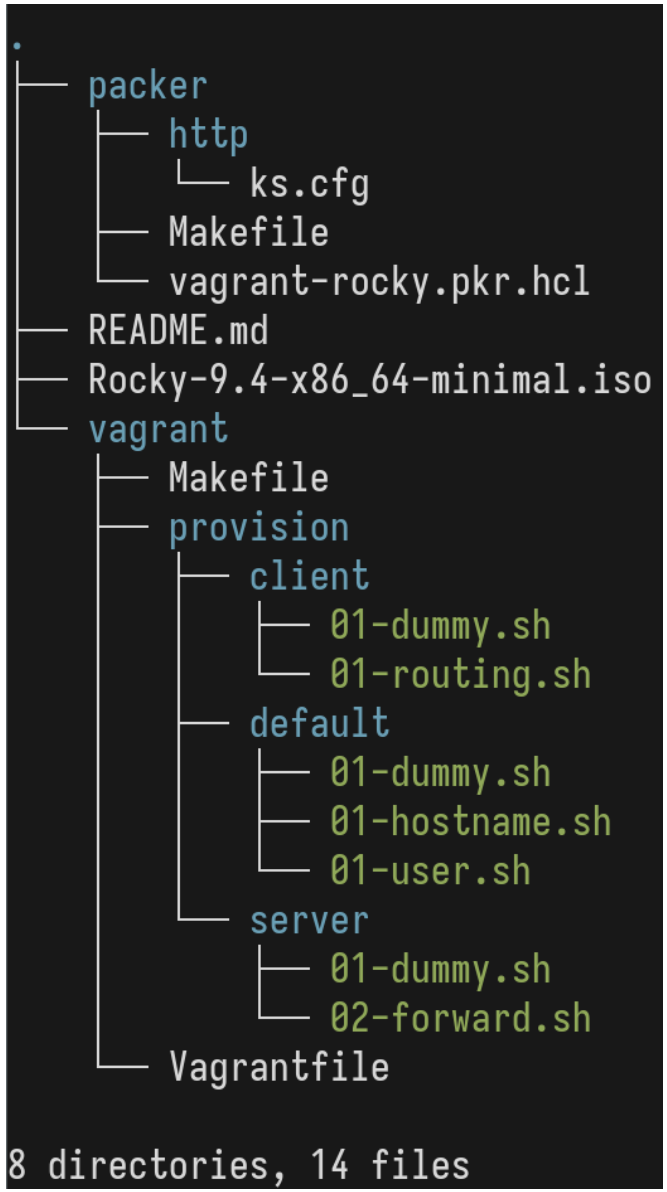

Рис.: Структура рабочего каталога.

Подготовка лабораторного стенда

```
➜  packer make init
Installed plugin github.com/hashicorp/virtualbox v1.1.1 in "/home/dastarikov/tmp/dastarikov/packer/.config/packe
r/plugins/github.com/hashicorp/virtualbox/packer-plugin-virtualbox_v1.1.1_x5.0_linux_amd64"
Installed plugin github.com/hashicorp/vagrant v1.1.5 in "/home/dastarikov/tmp/dastarikov/packer/.config/packer/p
lugins/github.com/hashicorp/vagrant/packer-plugin-vagrant_v1.1.5_x5.0_linux_amd64"
➜  packer make box
virtualbox-iso.virtualbox: output will be in this color.

==> virtualbox-iso.virtualbox: Cannot find "Default Guest Additions ISO" in vboxmanage output (or it is empty)
==> virtualbox-iso.virtualbox: Retrieving Guest additions checksums
==> virtualbox-iso.virtualbox: Trying https://download.virtualbox.org/virtualbox/7.0.16/SHA256SUMS
==> virtualbox-iso.virtualbox: Trying https://download.virtualbox.org/virtualbox/7.0.16/SHA256SUMS
==> virtualbox-iso.virtualbox: https://download.virtualbox.org/virtualbox/7.0.16/SHA256SUMS => /home/dastarikov/
.cache/packer/5b060e44da4c1f6a9149d5d2c3cf7c3c45824122
==> virtualbox-iso.virtualbox: Retrieving Guest additions
==> virtualbox-iso.virtualbox: Trying https://download.virtualbox.org/virtualbox/7.0.16/VBoxGuestAdditions_7.0.1
6.iso
==> virtualbox-iso.virtualbox: Trying https://download.virtualbox.org/virtualbox/7.0.16/VBoxGuestAdditions_7.0.1
6.iso?checksum=269dcd2217aedfea65daaa75317ffa32c0e3110e541f7dce74a8d16973eca0df
==> virtualbox-iso.virtualbox: https://download.virtualbox.org/virtualbox/7.0.16/VBoxGuestAdditions_7.0.16.iso?c
hecksum=269dcd2217aedfea65daaa75317ffa32c0e3110e541f7dce74a8d16973eca0df => /home/dastarikov/.cache/packer/b2963
```

Рис.: Запуск формирования box-файла.

Подготовка лабораторного стенда

```
Build 'virtualbox-iso.virtualbox' finished after 45 minutes 21 seconds.

==> Wait completed after 45 minutes 21 seconds

==> Builds finished. The artifacts of successful builds are:
--> virtualbox-iso.virtualbox: 'virtualbox' provider box: vagrant-virtualbox-rocky-9-x86_64.box
➜  packer ls
http  Makefile  Rocky-9.4-x86_64-minimal.iso  vagrant-rocky.pkr.hcl  vagrant-virtualbox-rocky-9-x86_64.box  vm
```

Рис.: Окончание сброки образа.

```
➜  vagrant make addbox
==> box: Box file was not detected as metadata. Adding it directly...
==> box: Adding box 'rocky9' (v0) for provider:
    box: Unpacking necessary files from: file:///home/dastarikov/tmp/dastarikov/vagrant/vagrant-virtualbox-rocky-9-x86_
64.box
==> box: Successfully added box 'rocky9' (v0) for 'virtualbox'!
```

Рис.: Регистрация образа в Vagrant.

Подготовка лабораторного стенда

```
➜  vagrant make server-up
Installing the 'vagrant-vbguest' plugin. This can take a few minutes...
Fetching vagrant-libvirt-0.12.2.gem
Fetching micromachine-3.0.0.gem
Fetching vagrant-vbguest-0.32.0.gem
Removing stackprof-flamegraph.pl
Removing stackprof-gprof2dot.py
Successfully uninstalled vagrant-libvirt-0.12.2
Installed the plugin 'vagrant-vbguest (0.32.0)'!
touch plugins
Bringing machine 'server' up with 'virtualbox' provider...
```

Рис.: Запуск виртуальной машины server

Подготовка лабораторного стенда

```
→  vagrant make client-up
Bringing machine 'client' up with 'virtualbox' provider...
==> client: Cloning VM...
==> client: Matching MAC address for NAT networking...
==> client: Setting the name of the VM: client
==> client: Fixed port collision for 22 => 2222. Now on port 2200.
==> client: Clearing any previously set network interfaces...
==> client: Preparing network interfaces based on configuration...
    client: Adapter 1: nat
    client: Adapter 2: intnet
==> client: Forwarding ports...
    client: 22 (guest) => 2200 (host) (adapter 1)
==> client: Running 'pre-boot' VM customizations...
==> client: Booting VM...
```

Рис.: Запуск виртуальной машины client

Подключение по ssh

```
➜  vagrant vagrant ssh server
==> server: The machine you're attempting to SSH into is configured to use
==> server: password-based authentication. Vagrant can't script entering the
==> server: password for you. If you're prompted for a password, please enter
==> server: the same password you have configured in the Vagrantfile.
vagrant@127.0.0.1's password:
Last login: Wed Oct  2 06:25:05 2024 from 10.0.2.2
[vagrant@server ~]$ id
uid=1000(vagrant) gid=1000(vagrant) groups=1000(vagrant) context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
[vagrant@server ~]$ su - dastarikov
Password:
[dastarikov@server.dastarikov.net ~]$ id
uid=1001(dastarikov) gid=1001(dastarikov) groups=1001(dastarikov),10(wheel) context=unconfined_u:unconfined_r:unconfine
d_t:s0-s0:c0.c1023
[dastarikov@server.dastarikov.net ~]$
logout
[vagrant@server ~]$
logout
```

Рис.: Подключение к серверу из консоли.

```
➜  vagrant vagrant ssh client
==> client: The machine you're attempting to SSH into is configured to use
==> client: password-based authentication. Vagrant can't script entering the
==> client: password for you. If you're prompted for a password, please enter
==> client: the same password you have configured in the Vagrantfile.
vagrant@127.0.0.1's password:
Last login: Wed Oct  2 06:25:05 2024 from 10.0.2.2
[vagrant@client ~]$ su - dastarikov
Password:
[dastarikov@client.dastarikov.net ~]$ id
uid=1001(dastarikov) gid=1001(dastarikov) groups=1001(dastarikov),10(wheel) context=unconfined_u:unconfined_r:unconfine
d_t:s0-s0:c0.c1023
[dastarikov@client.dastarikov.net ~]$
logout
[vagrant@client ~]$
logout
```

Рис.: Подключение к клиенту из консоли.

Подготовка лабораторного стенда

```
→  vagrant make server-halt
==> server: Attempting graceful shutdown of VM...
→  vagrant make client-halt
==> client: Attempting graceful shutdown of VM...
```

Рис.: Выключение виртуальных машин.

Подготовка лабораторного стенда

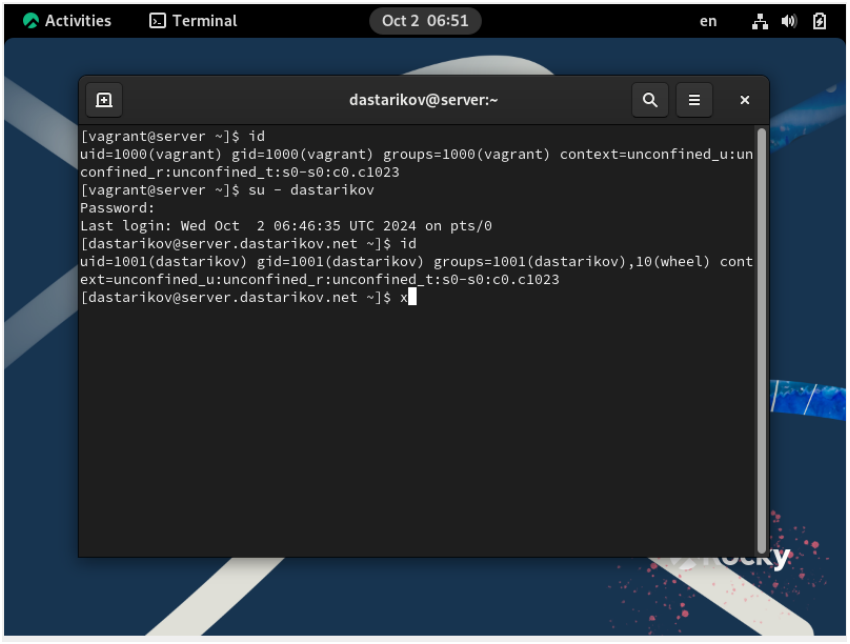

Рис.: Работа в графическом окружении сервера.

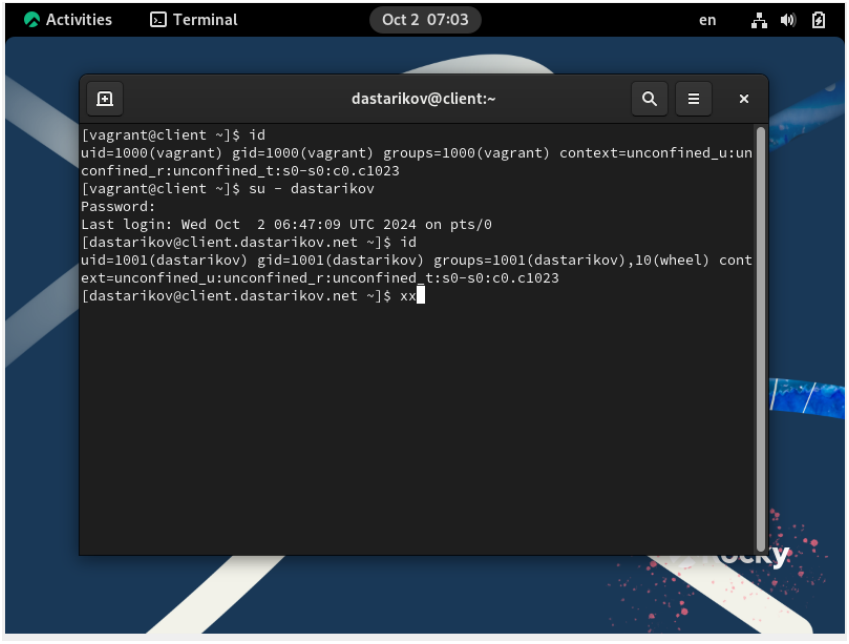

Рис.: Работа в графическом окружении клиента.

Внесение изменений в настройки внутреннего окружения

```
# Common configuration
config.vm.provision "common user",
type: "shell",
preserve_order: true,
path: "provision/default/01-user.sh"
config.vm.provision "common hostname",
type: "shell",
preserve_order: true,
run: "always",
path: "provision/default/01-hostname.sh"
```

Внесение изменений в настройки внутреннего окружения

```
→  vagrant make server-provision
Bringing machine 'server' up with 'virtualbox' provider...
==> server: You assigned a static IP ending in ".1" to this machine.
==> server: This is very often used by the router and can cause the
==> server: network to not work properly. If the network doesn't work
==> server: properly, try changing this IP.
==> server: You assigned a static IP ending in ".1" to this machine.
==> server: This is very often used by the router and can cause the
==> server: network to not work properly. If the network doesn't work
==> server: properly, try changing this IP.
==> server: Clearing any previously set forwarded ports...
==> server: Clearing any previously set network interfaces...
==> server: Preparing network interfaces based on configuration...
    server: Adapter 1: nat
    server: Adapter 2: intnet
==> server: Forwarding ports...
    server: 22 (guest) => 2222 (host) (adapter 1)
==> server: Running 'pre-boot' VM customizations...
==> server: Booting VM...
```

Рис.: Фиксирование изменений настроек сервера.

```
→  vagrant make client-provision
Bringing machine 'client' up with 'virtualbox' provider...
==> client: Clearing any previously set forwarded ports...
==> client: Fixed port collision for 22 => 2222. Now on port 2200.
==> client: Clearing any previously set network interfaces...
==> client: Preparing network interfaces based on configuration...
    client: Adapter 1: nat
    client: Adapter 2: intnet
==> client: Forwarding ports...
    client: 22 (guest) => 2200 (host) (adapter 1)
==> client: Running 'pre-boot' VM customizations...
==> client: Booting VM...
==> client: Waiting for machine to boot. This may take a few minutes...
    client: SSH address: 127.0.0.1:2200
    client: SSH username: vagrant
    client: SSH auth method: password
```

Рис.: Фиксирование изменений настроек клиента.

Внесение изменений в настройки внутреннего окружения

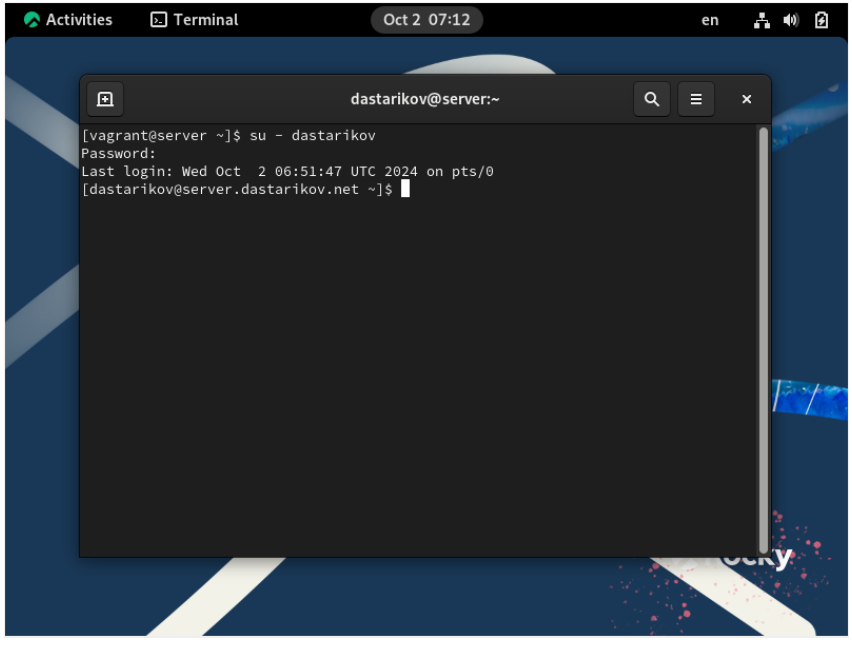

Рис.: Проверка отображения приглашения на сервере.

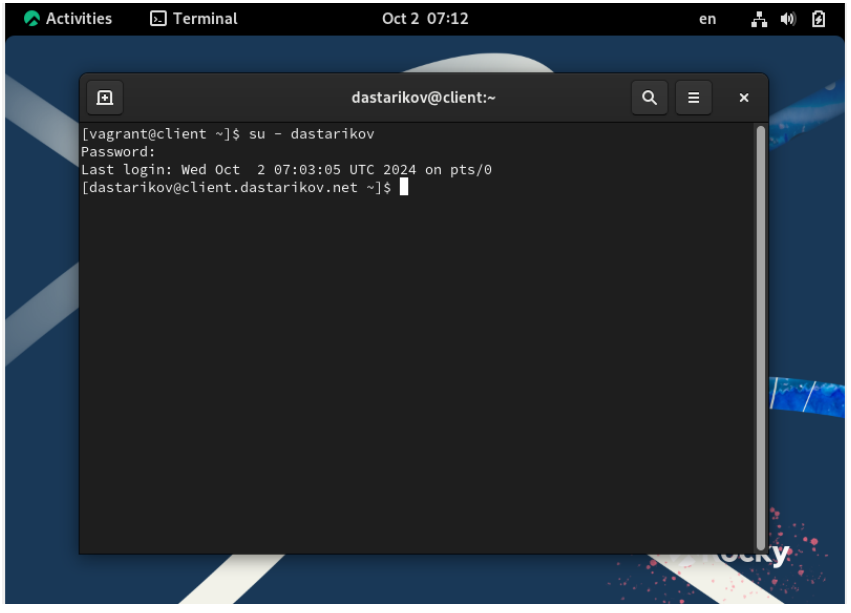

Рис.: Проверка отображения приглашения на клиенте.

Выводы

- В рамках лабораторной работы познакомились с инструментом Vagrant и подготовили лабораторный стенд.