1. Развернуть 3 виртуальные машины и настроить HA-кластер на них.

Устанавливаем на 3 ноды необходимые компоненты

```
yum install pcs fence-agents-all -y
```

Добавляем правила для firewalld

```
Complete!
[root@192 network-scripts]# firewall-cmd --permanent --add-service=high-availability
success
[root@192 network-scripts]# firewall-cmd --reload
success
```

Меняем пароль для пользователя hacluster

```
[root@192 network-scripts]# id hacluster
uid=189(hacluster) gid=189(haclient) groups=189(haclient)
[root@192 network-scripts]# echo centos | passwd --stdin hacluster
Changing password for user hacluster.
passwd: all authentication tokens updated successfully.
```

Авторизируем ноды

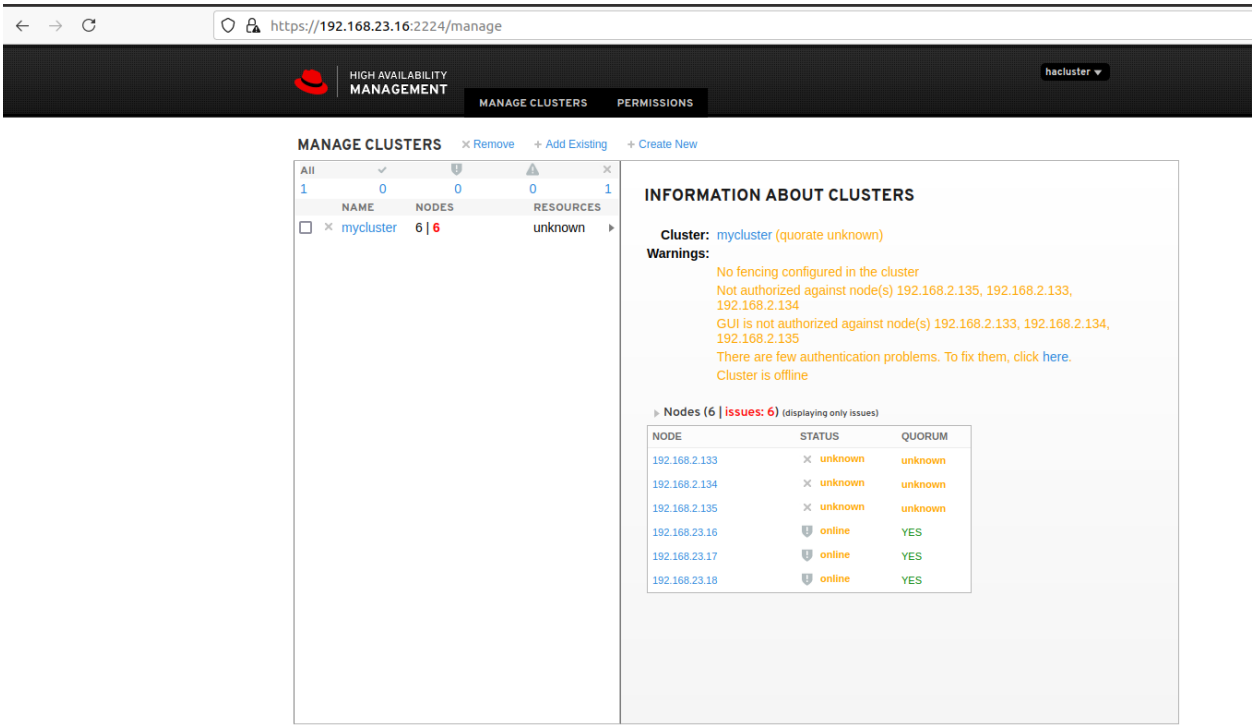
```
Error: 192.168.23.17: Username and/or password is incorrect
[root@192 network-scripts]# pcs cluster auth 192.168.23.16 192.168.23.17 192.168.23.18
Username: hacluster
Password:
192.168.23.18: Authorized
192.168.23.16: Authorized
192.168.23.17: Authorized
[root@192 network-scripts]#
```

Создаём кластер

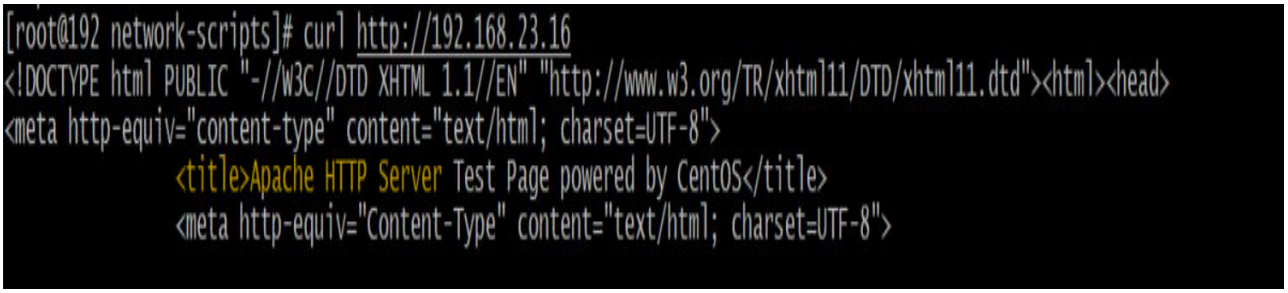
```
[root@192 network-scripts]# pcs cluster auth 192.168.23.16 192.168.23.17 192.168.23.18
Username: hacluster
Password:
Error: 192.168.23.18: Username and/or password is incorrect
Error: 192.168.23.16: Username and/or password is incorrect
Error: 192.168.23.17: Username and/or password is incorrect
[root@192 network-scripts]# pcs cluster auth 192.168.23.16 192.168.23.17 192.168.23.18
Username: hacluster
Password:
Error: 192.168.23.18: Username and/or password is incorrect
Error: 192.168.23.16: Username and/or password is incorrect
Error: 192.168.23.17: Username and/or password is incorrect
[root@192 network-scripts]# pcs cluster auth 192.168.23.16 192.168.23.17 192.168.23.18
Username: hacluster
Password:
192.168.23.18: Authorized
192.168.23.16: Authorized
192.168.23.17: Authorized
[root@192 network-scripts]# pcs cluster setup --start --name mycluster 192.168.23.16 192.168.23.17 192.168.23.18
Destroying cluster on nodes: 192.168.23.16, 192.168.23.17, 192.168.23.18...
192.168.23.18: Stopping Cluster (pacemaker)...
192.168.23.16: Stopping Cluster (pacemaker)...
192.168.23.17: Stopping Cluster (pacemaker)...
192.168.23.17: Successfully destroyed cluster
192.168.23.16: Successfully destroyed cluster
192.168.23.18: Successfully destroyed cluster

Sending 'pacemaker_remote authkey' to '192.168.23.16', '192.168.23.17', '192.168.23.18'
192.168.23.17: successful distribution of the file 'pacemaker_remote authkey'
192.168.23.18: successful distribution of the file 'pacemaker_remote authkey'
192.168.23.16: successful distribution of the file 'pacemaker_remote authkey'
Sending cluster config files to the nodes...
192.168.23.16: Succeeded
192.168.23.17: Succeeded
192.168.23.18: Succeeded

Starting cluster on nodes: 192.168.23.16, 192.168.23.17, 192.168.23.18...
```



2.Развернуть на этом кластере высокодоступный веб-сервер Apache



Создаём виртуальный IP через который будет доступен кластер

В случаи отключения одной из нод через 60 сек виртуальный IP назначен другой другой ноде и сервис будет доступен

pcs resource create virtual_ip ocf:heartbeat:IPaddr2 ip=192.168.0.15 cidr_netmask=24 op monitor interval=60s