

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.  
[root@192 network-scripts]#
```

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


```
Linux
[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...
```

← → ↺

🔒 https://192.168.23.16:2224/manage

 HIGH AVAILABILITY
MANAGEMENT

MANAGE CLUSTERS PERMISSIONS

hacluster ▾

MANAGE CLUSTERS

[✕ Remove](#) [+ Add Existing](#) [+ Create New](#)

All	✓	🛡️	⚠️	✕
1	0	0	0	1
NAME		NODES	RESOURCES	
<input type="checkbox"/>	✕ mycluster	6 6	unknown ▶	

INFORMATION ABOUT CLUSTERS

Cluster: mycluster (quorate unknown)

Warnings:

No fencing configured in the cluster
Not authorized against node(s) 192.168.2.135, 192.168.2.133, 192.168.2.134
GUI is not authorized against node(s) 192.168.2.133, 192.168.2.134, 192.168.2.135
There are few authentication problems. To fix them, click [here](#).
Cluster is offline

▶ Nodes (6 | Issues: 6) (displaying only issues)

NODE	STATUS	QUORUM
192.168.2.133	✕ unknown	unknown
192.168.2.134	✕ unknown	unknown
192.168.2.135	✕ unknown	unknown
192.168.23.16	🛡️ online	YES
192.168.23.17	🛡️ online	YES
192.168.23.18	🛡️ online	YES

2. Развернуть на этом кластере высокодоступный веб-сервер Apache

```
[root@192 network-scripts]# curl http://192.168.23.16
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN" "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd"><html><head>
<meta http-equiv="content-type" content="text/html; charset=UTF-8">
  <title>Apache HTTP Server Test Page powered by CentOS</title>
  <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
```

Создаём виртуальный IP через который будет доступен кластер

В случае 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
```