ZABBIX
HA CLUSTER SETUPS

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ZABBIX SUMMIT '19

WHAT AND WHY?

ZABBIX
HA CLUSTER SETUPS

HA is a must.

but...

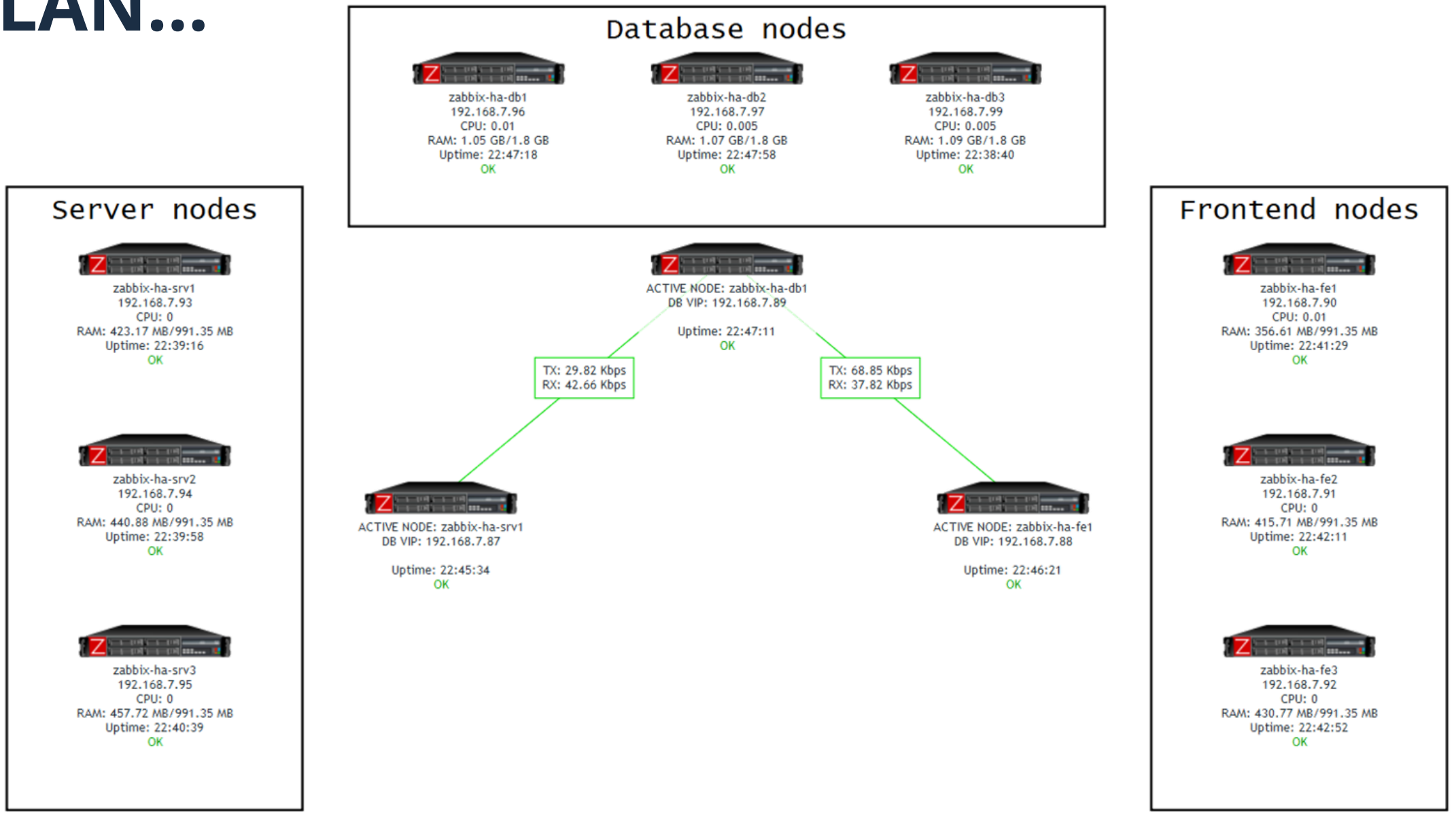
Keep things simple

Tested, common and time proven solution

Open source components used

True HA starts with 3

A PLAN...



A PLAN...

bare minimum

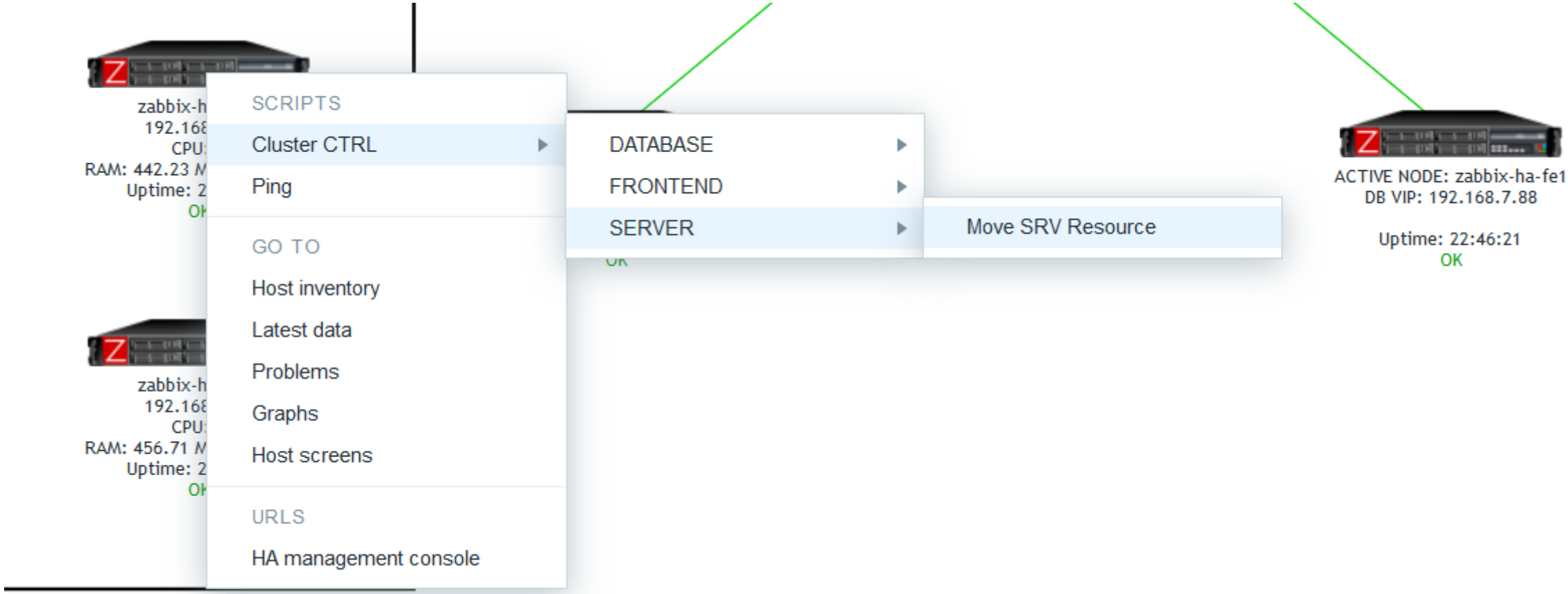
no complex automation at first

understand the basics

nodes will switch automaticaly if basic resources die or conectivity problems

at first: manual control/override in case of problems

A PLAN...



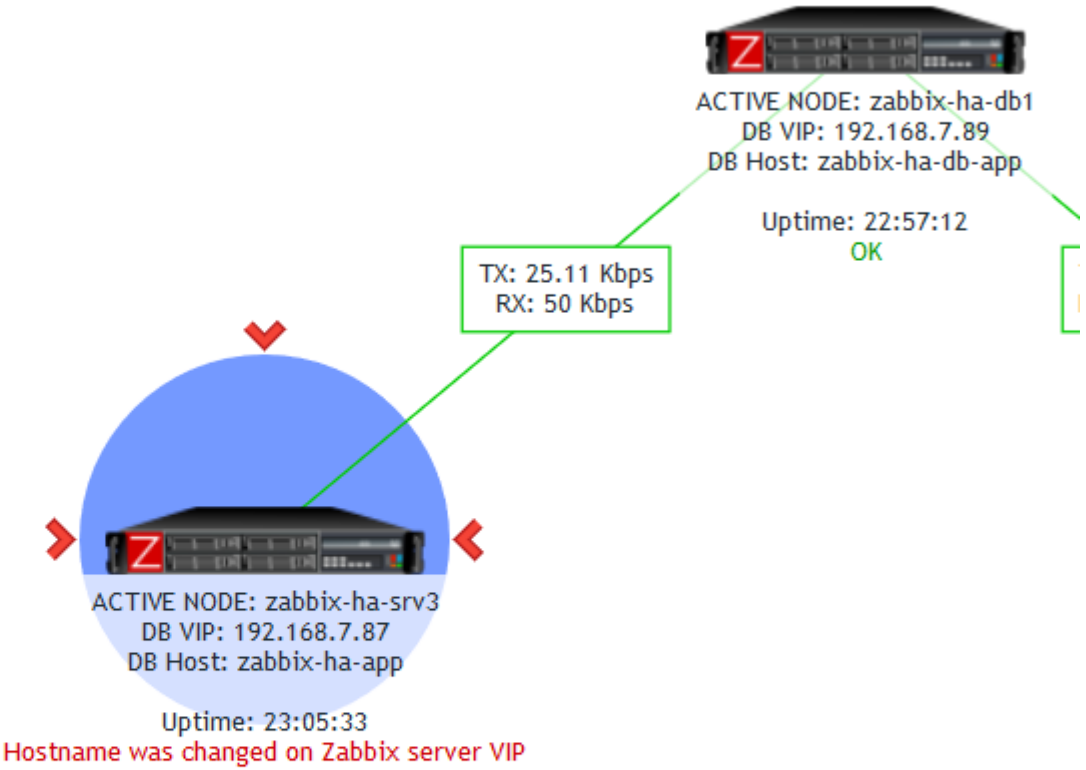
A PLAN...

Server nodes

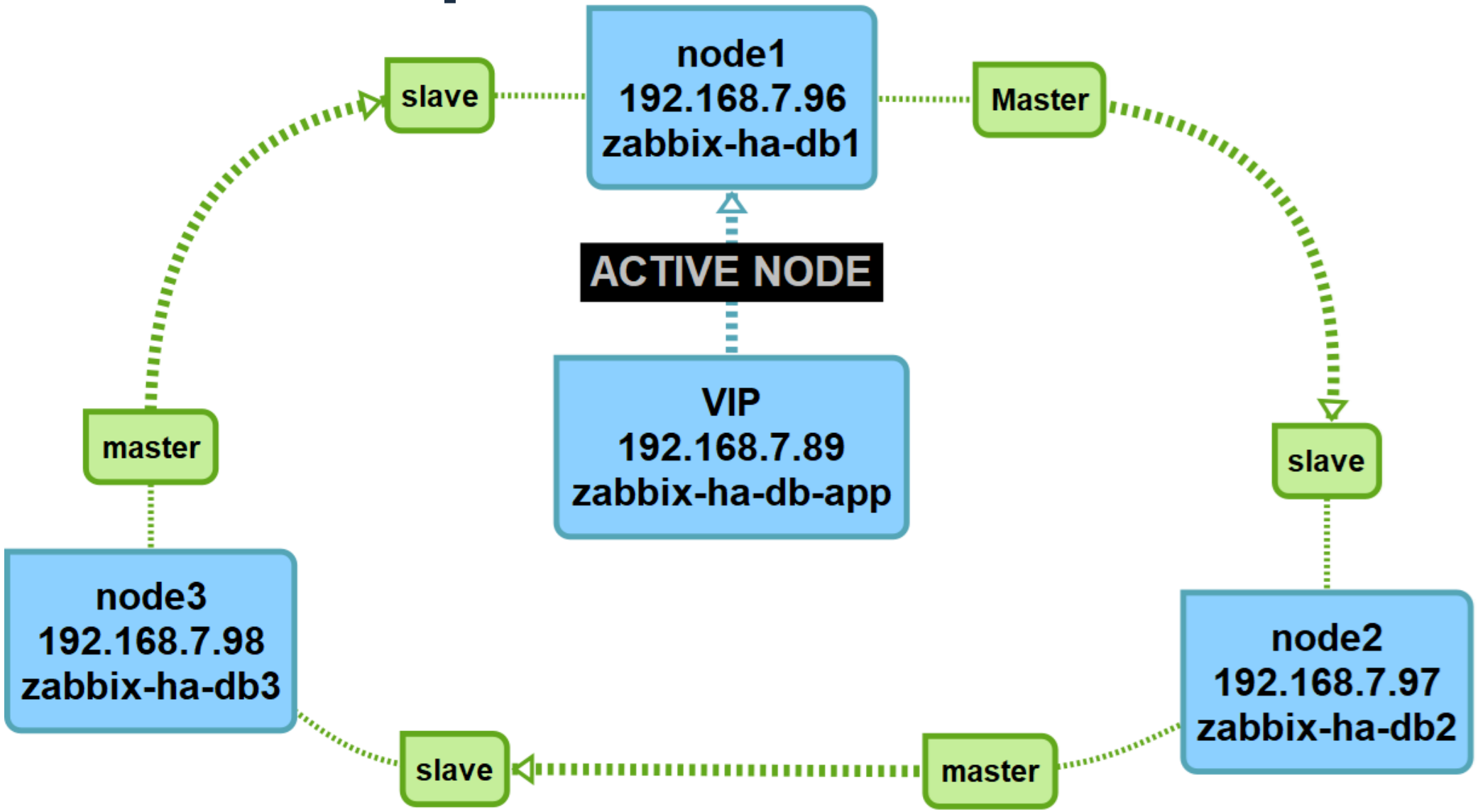
zabbix-ha-srv1
192.168.7.93
CPU: 0
RAM: 453.74 MB/991.35 MB
Uptime: 22:59:16
OK

zabbix-ha-srv2
192.168.7.94
CPU: 0.01
RAM: 412.81 MB/991.35 MB
Uptime: 22:59:58
OK

zabbix-ha-srv3
192.168.7.95
CPU: 0
RAM: 428.06 MB/991.35 MB
Uptime: 23:00:39
OK



DB cluster setup



all cluster ip’s and hostnames

VIPs for cluster:

192.168.7.87 zabbix-ha-app
192.168.7.89 zabbix-ha-db-app
192.168.7.88 zabbix-ha-fe-app

IP's for nodes:

DB nodes:

192.168.7.96 zabbix-ha-db1
192.168.7.97 zabbix-ha-db2
192.168.7.99 zabbix-ha-db3

zabbix server nodes:

192.168.7.93 zabbix-ha-srv1
192.168.7.94 zabbix-ha-srv2
192.168.7.95 zabbix-ha-srv3

Front-end nodes:

192.168.7.90 zabbix-ha-fe1
192.168.7.91 zabbix-ha-fe2
192.168.7.92 zabbix-ha-fe3

VM preparations

ntp (Time settings same on all nodes)

localization

firewall

selinux … :-/

/etc/hosts: don’t relay on DNS

Storage: Separate block devices for DB, logs, apps and configs)

Zabbix Agent on all nodes

DATABASE CLUSTER

ZABBIX
HA CLUSTER SETUPS

On all DB nodes:

```
## Install HA components:
yum groupinstall 'High Availability' -y
## OR:
yum groupinstall ha –y

## Create user for cluster:
echo <CLUSTER_PASSWORD> | passwd --stdin hacluster
```

On node1: cluster setup

```
# Authentificate cluster nodes:
pcs cluster auth zabbix-ha-db1 zabbix-ha-db2 zabbix-ha-db3 \
username: hacluster
password: <CLUSTER_PASSWORD>

zabbix-ha-db1: Authorized
zabbix-ha-db2: Authorized
zabbix-ha-db3: Authorized
```

On node1: cluster setup

```
# Create zabbix-db-cluster:
pcs cluster setup --name zabbix_db_cluster \
zabbix-ha-db1 zabbix-ha-db2 zabbix-ha-db3 –force

## Create resource for cluster virtual IP (VIP)
pcs resource create virtual_ip ocf:heartbeat:IPaddr2 \
ip=192.168.7.89 op monitor interval=5s --group zabbix_db_cluster
```

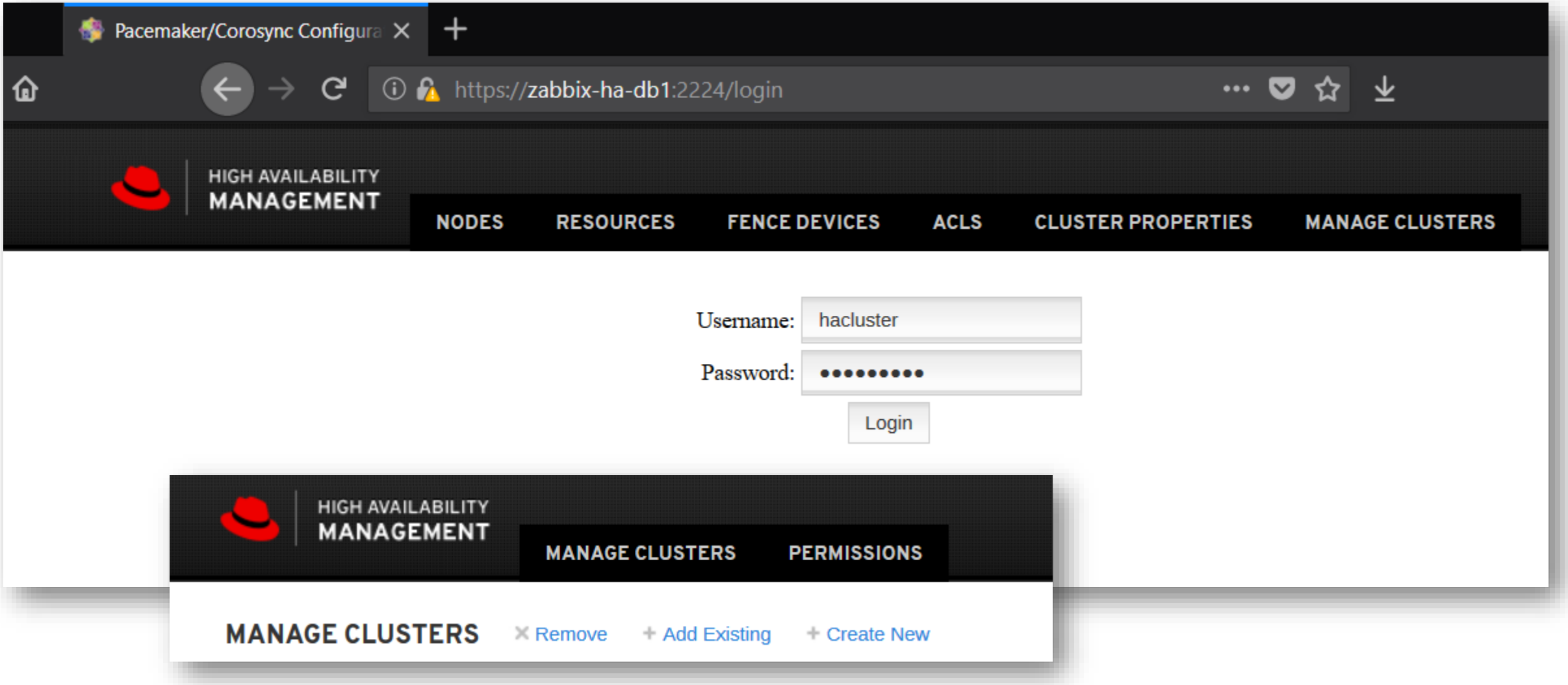
On node1: cluster setup

```
## check:
pcs status

## Restart cluster services in case of:
## “cluster is not currently running on this node” error
pcs cluster stop --all && pcs cluster start --all

# in case you have a firewalld:
firewall-cmd --permanent --add-service=high-availability && firewall-cmd --reload
```

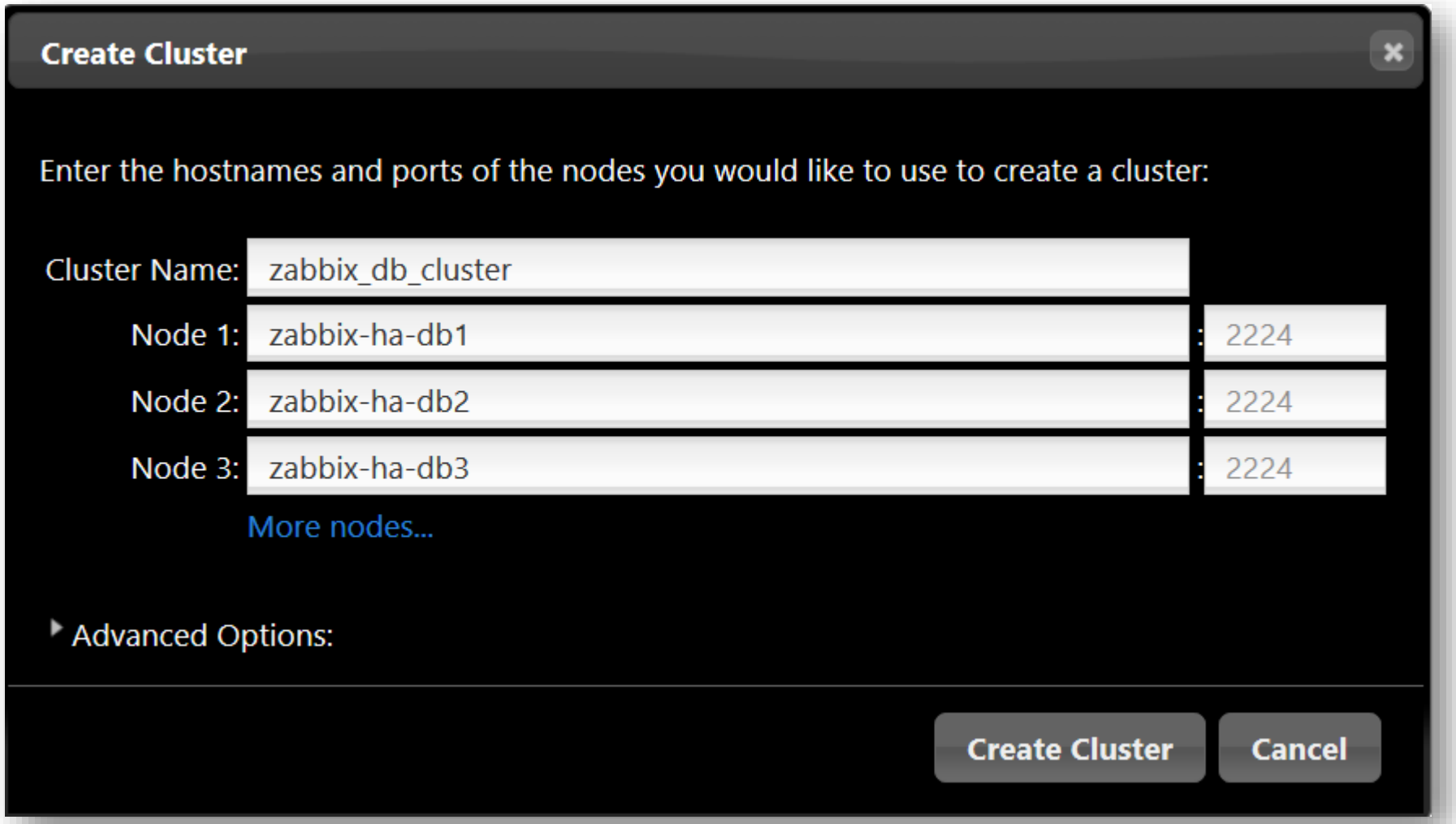
On node1: cluster setup

```
## Prevent Resources from Moving after Recovery
pcs resource defaults resource-stickiness=100

## if you are not using fencing disable STONITH:
pcs property set stonith-enabled=false

## othervise resource won’t start
## STONITH = Shoot the other node in the head!
```

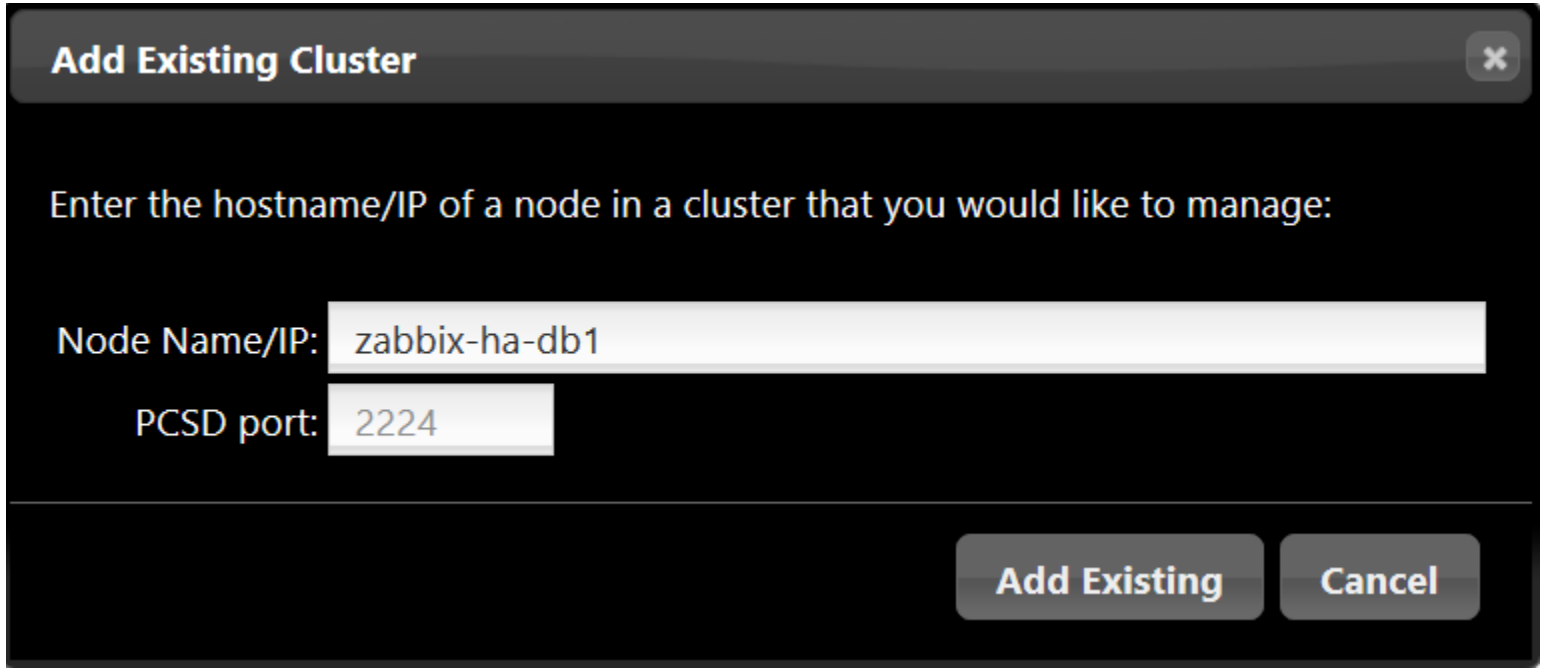
Did you know there is a GUI?!



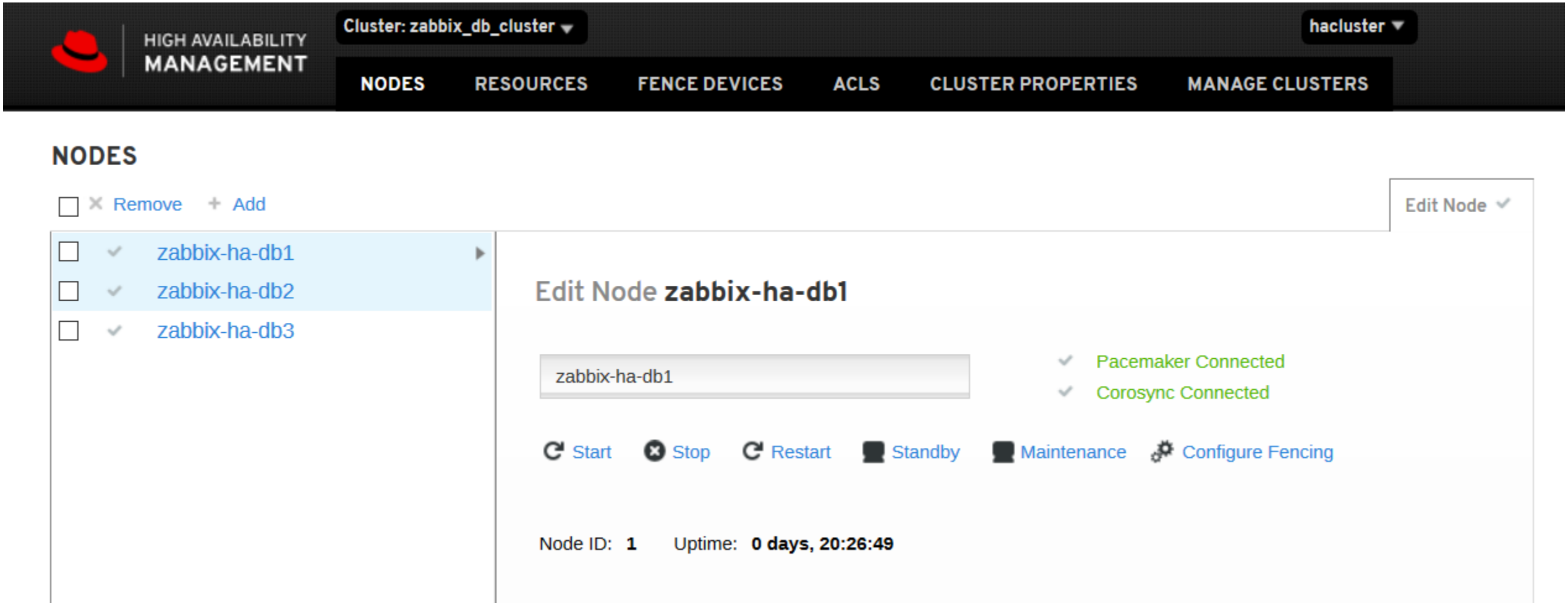
Cluster creation via pscd GUI



Cluster creation via pscd GUI



Cluster creation via pscd GUI



[Red Hat Enterprise Linux7 >> High Availability Add-On Reference >> Chapter 2. The pcsd Web UI]

MariaDB install and replication setup

```
## install MariaDB server on all 3 DB nodes:
yum install mariadb-server –y

## tune/configure db settings:
cp ./zabbixdb.cnf /etc/my.cnf.d/

## Start and enable to start on boot:
systemctl start mariadb
systemctl enable mariadb

## secure your installation and create <MYSQL_ROOT_PASSWORD>:
mysql_secure_installation
```

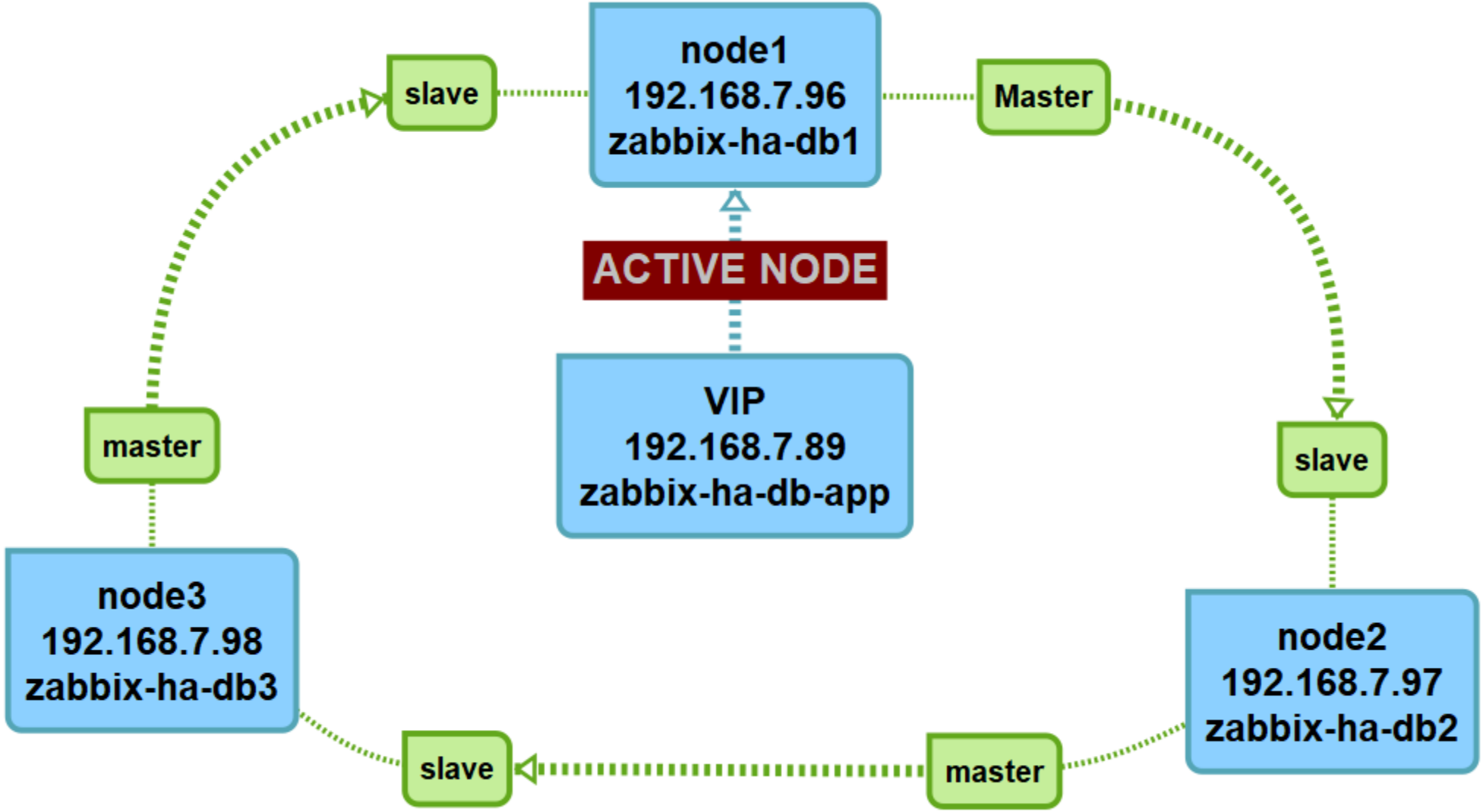
MariaDB install and replication setup

```
cat zabbixdb.cnf
[mysqld]
# ZABBIX specific settings and tuning
default-storage-engine          = InnoDB
innodb                          = FORCE
innodb_file_per_table           = 1
innodb_buffer_pool_size         = 512M          # 50-75% of total RAM
innodb_buffer_pool_instances    = 8           # For MySQL 5.5 - 4, for 5.6+ - 8
innodb_flush_log_at_trx_commit  = 2
innodb_flush_method             = O_DIRECT
innodb_io_capacity              = 800           # HDD disks 500-800,    SSD disks - 2000
sync-binlog                     = 0
query-cache-size                = 0
server_id                       = 96            # for id settings IPs last number used
report_host                     = zabbix-ha-db1
log-slave-updates
log_bin                         = /var/lib/mysql/log-bin
log_bin_index                   = /var/lib/mysql/log-bin.index
relay_log                       = /var/lib/mysql/relay-bin
relay_log_index                 = /var/lib/mysql/relay-bin.index
binlog_format                   = mixed
binlog_cache_size               = 64M
max_binlog_size                 = 1G
expire_logs_days                = 5
binlog_checksum                 = crc32
max_allowed_packet              = 500M
```

MariaDB install and replication setup

```
## Must be set on every db node acordingly

vi /etc/my.cnf.d/zabbixdb.cnf
server_id                       = 96                ## Last number of IP
report_host                     = zabbix-ha-db1     ## Hostname
```

Remember the PLAN?!



Replicaton setup: node1 (zabbix-ha-db1)

```
## Login to MySQL:
mysql –uroot –p<MYSQL_ROOT_PASSWORD>

MariaDB [(none)]> STOP SLAVE;
MariaDB [(none)]> GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'<NODE2_IP>'
identified by '<REPLICATOR_PASSWORD>';
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]> SHOW MASTER STATUS\G
*************************** 1. row ***************************
            File: log-bin.000001
        Position: 245
    Binlog_Do_DB:
Binlog_Ignore_DB:
1 row in set (0.00 sec)
```

Replicaton setup: node2 (zabbix-ha-db2)

```
## Login to MySQL:
mysql -uroot -p<MYSQL_ROOT_PASSWORD>

STOP SLAVE;

CHANGE MASTER TO MASTER_HOST ='<NODE1_IP>', MASTER_USER = 'replicator',
MASTER_PASSWORD = '<REPLICATOR_PASSWORD>', MASTER_LOG_FILE='log-bin.000001',
MASTER_LOG_POS = 245;

GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'<NODE3_IP>' identified by
'<REPLICATOR_PASSWORD>';

RESET MASTER;
START SLAVE;
```

Replicaton setup: node2 (zabbix-ha-db2)

```
SHOW SLAVE STATUS\G
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: <NODE1_IP>
                  Master_User: replicator
                  ...
                Master_Log_File: log-bin.000001
          Read_Master_Log_Pos: 245
                  ...
               Slave_IO_Running: Yes
              Slave_SQL_Running: Yes
                  ...
                  Last_IO_Errno: 0
                  Last_IO_Error:
```

Replicaton setup: node2 (zabbix-ha-db2)

```
MariaDB [(none)]> SHOW MASTER STATUS\G
*************************** 1. row ***************************
            File: log-bin.000001
        Position: 245
    Binlog_Do_DB:
Binlog_Ignore_DB:
```

Replicaton setup: node3 (zabbix-ha-db3)

```
## Login to MySQL:
mysql -uroot -p<MYSQL_ROOT_PASSWORD>

STOP SLAVE;

CHANGE MASTER TO MASTER_HOST ='<NODE2_IP>', MASTER_USER = 'replicator',
MASTER_PASSWORD = '<REPLICATOR_PASSWORD>', MASTER_LOG_FILE='log-bin.000001',
MASTER_LOG_POS = 245;

GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'<NODE1_IP>' identified by
'<REPLICATOR_PASSWORD>';

RESET MASTER;
START SLAVE;
```

Replicaton setup: node3 (zabbix-ha-db3)

```
SHOW SLAVE STATUS\G
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: <NODE2_IP>
                  Master_User: replicator
                  ...
                Slave_IO_Running: Yes
               Slave_SQL_Running: Yes
                ...
                  Last_IO_Errno: 0
                  Last_IO_Error:
```

Replicaton setup: node3 (zabbix-ha-db3)

```
MariaDB [(none)]> SHOW MASTER STATUS\G
*************************** 1. row ***************************
            File: log-bin.000001
        Position: 245
    Binlog_Do_DB:
Binlog_Ignore_DB:
```

Replicaton setup: node1 (zabbix-ha-db1)

```
STOP SLAVE;
CHANGE MASTER TO MASTER_HOST ='<NODE3_IP>', MASTER_USER = 'replicator',
MASTER_PASSWORD = '<REPLICATOR_PASSWORD>', MASTER_LOG_FILE='log-bin.000001',
MASTER_LOG_POS =245;
START SLAVE;

SHOW SLAVE STATUS\G
*************************** 1. row ***************************
               Slave_IO_State: Waiting for master to send event
                  Master_Host: <NODE3_IP>
                  Master_User: replicator
              ...
                 Last_IO_Errno: 0
                 Last_IO_Error:
```

Prepare zabbix DB: node1 (zabbix-ha-db1)

```
## From this point forward all MySQL queries can be executed on any node
## All queries will be replicated to other nodes!
## We will use <NODE1>,
...
```

```
## Login to mysql and create zabbix db/user:
create database zabbix character set utf8 collate utf8_bin;
grant all privileges on zabbix.* to zabbix@'%' identified by '<DB_ZABBIX_PASS>';
quit

## upload db scema and basic conf:
## create.sql.gz copied from main zabbix server
## located in /usr/share/doc/zabbix-server-mysql-*/create.sql.gz
zcat create.sql.gz | mysql -uzabbix -p<DB_ZABBIX_PASS> zabbix
```

Prepare zabbix DB: node1 (zabbix-ha-db1)

```
## And this is the moment you would setup Partitioning
## But that’s the other story... :)
## SO, We proceed to server setup.
```

Mysql replication Debug commands

```
SHOW BINARY LOGS;

SHOW SLAVE STATUS;

SHOW MASTER STATUS\g

RESET MASTER;  ## removes all binary log files that are listed in the index file, leaving
               ## only a single, empty binary log file with a numeric suffix of .000001

RESET MASTER TO 1234; ## reset to specific binary log position

PURGE BINARY LOGS BEFORE '2019-10-11 00:20:00';
                     ## Numbering is not reset, may be safely used while replication
                     ## slaves are running.

FLUSH BINARY LOGS;    ## Will reset state of binary logs and restarts numbering
```

SERVER CLUSTER

ZABBIX
HA CLUSTER SETUPS

server cluster

```
## Install HA components:
yum groupinstall ha –y

## Create user for cluster:
echo zabbix123 | passwd --stdin hacluster

## install zabbix server:
yum install -y zabbix-server

## DON’T START OR ENABLE – that will be managed by HA components
```

server cluster

```
## Copy default zabbix_server.conf file:
cp zabbix_server.conf /etc/zabbix/zabbix_server.conf

## and modify acordingly
vi zabbix_server.conf
...
SourceIP=192.168.7.87 #VIP for zabbix-server cluster
...
DBHost=192.168.7.89 # VIP of the DB's
DBName=zabbix
DBUser=zabbix
DBPassword=<DB_ZABBIX_PASS>
...

## Deploy to all server nodes
```

server cluster

```
## Authentificate cluster nodes:
pcs cluster auth zabbix-ha-db1 zabbix-ha-db2 zabbix-ha-db3
username: hacluster
password: <CLUSTER_PASSWORD>

## Create zabbix_server_cluster:
pcs cluster setup --name zabbix_server_cluster \
zabbix-ha-srv1 zabbix-ha-srv2 zabbix-ha-srv3 --force

## Disable fencing as for now we will not use it:
pcs property set stonith-enabled=false

## Restart:
pcs cluster stop --all && pcs cluster start --all
```

server cluster: resources

```
## Prevent Resources from Moving after Recovery
pcs resource defaults resource-stickiness=100

## VIP for zabbix server app:
pcs resource create virtual_ip_server ocf:heartbeat:IPaddr2 ip=192.168.7.87 op
monitor interval=5s --group zabbix_server_cluster

## control zabbix-server daemon:
pcs resource create ZabbixServer systemd:zabbix-server op monitor interval=10s --
group zabbix_server_cluster
```

server cluster: resources

```
## Add colocation: resources must run on same node:
pcs constraint colocation add virtual_ip_server ZabbixServer INFINITY –force

## in specific order:
pcs constraint order virtual_ip_server then ZabbixServer

## Set start/stop timeout operations
pcs resource op add ZabbixServer start interval=0s timeout=60s
pcs resource op add ZabbixServer stop interval=0s timeout=120s
```

server cluster: check

```
[root@zabbix-ha-srv1 ~]# pcs status
Cluster name: zabbix_server_cluster
Stack: corosync
Current DC: zabbix-ha-srv2 (version 1.1.20-5.el7_7.1-3c4c782f70) - partition
with quorum
...
3 nodes configured
2 resources configured

Online: [ zabbix-ha-srv1 zabbix-ha-srv2 zabbix-ha-srv3 ]

Full list of resources:
 Resource Group: zabbix_server_cluster
     virtual_ip_server  (ocf::heartbeat:IPaddr2):       Started zabbix-ha-srv1
     ZabbixServer       (systemd:zabbix-server):        Started zabbix-ha-srv1
```

FRONTEND CLUSTER

ZABBIX
HA CLUSTER SETUPS

Frontend cluster

```
## Install HA components:
yum groupinstall ha –y

## Create user for cluster:
echo zabbix123 | passwd --stdin hacluster

## install zabbix frontend:
yum install -y zabbix-web-mysql

## DON’T START OR ENABLE – that will be managed by HA components
```

Frontend cluster

```
## Prepare zabbix-FE config:
cat /etc/zabbix/web/zabbix.conf.php
$DB['TYPE']     = 'MYSQL';
$DB['SERVER']   = '192.168.7.89';
$DB['PORT']     = '0';
$DB['DATABASE'] = 'zabbix';
$DB['USER']     = 'zabbix';
$DB['PASSWORD'] = 'zabbix123';
...
$ZBX_SERVER      = '192.168.7.87';
$ZBX_SERVER_PORT = '10051';
$ZBX_SERVER_NAME = 'ZABBIX-HA';

## Deploy to all FE nodes on same location: /etc/zabbix/web/
```

Frontend cluster

```
## create resource for apache Enable the server-status page.

vi /etc/httpd/conf.d/serverstatus.conf

Listen 127.0.0.1:8080
<VirtualHost localhost:8080>
<Location /server-status>
RewriteEngine Off
SetHandler server-status
Allow from 127.0.0.1
Order deny,allow
Deny from all
</Location>
</VirtualHost>
```

Frontend cluster

```
## set apache to listen only on VIP

vi /etc/httpd/conf/httpd.conf +/Listen 80

## change to:
...
Listen 192.168.7.88:80
...

## Or...
```

Frontend cluster

```
## Authentificate cluster nodes:
pcs cluster auth zabbix-he-fe1 zabbix-ha-fe2 zabbix-ha-fe3
username: hacluster
password: <CLUSTER_PASSWORD>

## Create zabbix_frontend_cluster:
pcs cluster setup --name zabbix_fe_cluster \
zabbix-ha-fe1 zabbix-ha-fe2 zabbix-ha-fe3 --force

## Restart:
pcs cluster stop --all && pcs cluster start –all

## Disable fencing as for now we will not use it:
pcs property set stonith-enabled=false
```

Frontend cluster: resources

```
## VIP for FE
pcs resource create virtual_ip_fe ocf:heartbeat:IPaddr2 ip=192.168.7.88 op
monitor interval=5s --group zabbix_fe_cluster

## for Apache:
pcs resource create zabbix_fe ocf:heartbeat:apache \
configfile=/etc/httpd/conf/httpd.conf \
statusurl="http://localhost:8080/server-status" op \
monitor interval=30s --group zabbix_fe_cluster
```

Frontend cluster: resources

```
## Add colocation: resources must run on same node:
pcs constraint colocation add virtual_ip_fe zabbix_fe INFINITY

## in specific order:
pcs constraint order virtual_ip_fe then zabbix_fe

pcs resource defaults resource-stickiness=100

## Set start/stop timeout operations
pcs resource op add zabbix_fe start interval=0s timeout=60s
pcs resource op add zabbix_fe stop interval=0s timeout=120s
```

where to get more info:

```
google...

      https://access.redhat.com/documentation/en-us/
            ## look for: Red Hat Enterprise Linux >> 7 >>
                        High Availability Add-On Reference

            https://clusterlabs.org/

      Contact Zabbix sales :)
```

THANK YOU!

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ZABBIX Senior Trainer

ZABBIX SUMMIT '19

zabbix