ISCSI Multipath

ICD - Infraestruturas e Centros de Dados

2020/2021

The main goal of this guide is to understand how to use and configure ISCSI multipath in Linux systems.

For the exercises described next, the following tools must be installed,

- VirtualBox - `https://www.virtualbox.org`

while useful ISCSI documentation is available at:

- ISCSI - `https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/5/html/online_storage_reconfiguration_guide/iscsi-modifying-link-loss-behavior-dmmultipath`
- ISCSI configurations - `https://www.certdepot.net/rhel7-configure-iscsi-target-initiator-persistently/`

Steps

VM Deployment and Configuration

1. Use the two DRBD VMs from guide 2.
2. Launch the VMs.
3. Stop resource d1 at both VMs with *drbdadm down d1*:

   Run command *drbdadm status* to check the replicas synchronisation status.
4. Change DRDB configurations at both VMs.
5. For both VMs, at */etc/drbd.d/global_common.conf* add:

```
common {
      options {
        auto-promote yes;
      }
}
```

6. For both VMs, at */etc/drbd.d/d1.res* change to:

```
resource d1 {
            net {
                    protocol C;
                    allow-two-primaries yes;
                    after-sb-0pri discard-least-changes;
                    after-sb-1pri discard-secondary;
                    after-sb-2pri call-pri-lost-after-sb;
            }
            on drbd1 {
                    device    /dev/drbd1;
                    disk      /dev/sdb;
                    address   10.0.0.3:7789;
                    meta-disk internal;
            }
            on drbd2 {
                    device    /dev/drbd1;
                    disk      /dev/sdb;
                    address   10.0.0.4:7789;
                    meta-disk internal;
            }
 }
```

7. In both VMs run *drbdadm up d1*.

   Run the command *rbdadm status* to check the replicas synchronisation status.

8. In both VMs run *drbdadm --force primary d1*.

   Run the command *drbdadm status* to check the replicas synchronisation status.

ISCSI Target Configuration

1. Install ISCSI target packages in both VMs

```
yum install targetcli
```

2. Configure the ISCSI target by running *targetcli* and the following commands in VM1. Note that the name of the targets may change.

```
cd backstores/block
create d1 /dev/drbd1
cd  /iscsi
create
cd iqn.2003-01.org.linux-iscsi.drbd1.x8664:sn.0e8222b18d06/tpg1/luns
```

```
create /backstores/block/d1
cd /iscsi/iqn.2003-01.org.linux-iscsi.drbd.x8664:sn.0e8222b18d06/tpg1/
set attribute authentication=0 demo_mode_write_protect=0
set attribute generate_node_acls=1 cache_dynamic_acls=1
exit
```

3. Edit file */etc/target/saveconfig.json*.
4. Change the *wwn* identifier at VM1 (*e.g., iqn.2003-01.org.linux-iscsi.drbd.x8664:drbd1*.
5. Copy file */etc/target/saveconfig.json* to VM2.
6. Change the *wwn* identifier at VM2 (*e.g., iqn.2003-01.org.linux-iscsi.drbd.x8664:drbd2*.
7. Enable the ISCSI target in both VMs *systemctl enable target*. You can also run *systemctl restart target* to reload configurations if necessary.

ISCSI Client

1. Clone the VM template done at the Warmup exercise and launch the VM.
2. Change ip to 10.0.0.5 and name to *iscsicli*.
3. Install ISCSI client and multipath packages.

```
yum install iscsi-initiator-utils
yum install device-mapper-multipath
```

4. Start service with *systemctl start iscsi*.
5. Discover the ISCSI target nodes:

```
iscsiadm --mode discovery --type sendtargets --portal  10.0.0.3
iscsiadm --mode discovery --type sendtargets --portal  10.0.0.4
```

6. Check the available nodes with command *iscsiadm -m node*.
7. Login to the nodes with *iscsiadm -m node -l*.
8. Check that the ISCSI disks are available with the command *lsblk --scsi*. Also the disks should have the same uuid for multipath (use comand *blkid*).

Multipath

1. Copy */usr/share/doc/device-mapper-multipath/multipath.conf* to */etc/multipath.conf*.
2. Initialise multipath service with *systemctl start multipathd*.
3. Check that a multipath device (/dev/mapper/mpath) now exists with the command *fdisk -l*.
4. Check multipath status with *multipath -l*.

   The active connection is probably the one from VM1.

Filesystem and Failures

1. At the client VM mount the filesystem partition (*e.g., mount /dev/mapper/mpatha /mnt/test*) and check data.

2. Disable the ISCSI network connection at VM1 (*drbd1*) with the command *iptables -A INPUT -p tcp --dport 3260 -j DROP*.

3. Check multipath status with *multipath -l*.

   Now the enabled connection is the one from VM2.

   The connection with VM1 is now faulty.

4. Re-enable the ISCSI network connection with *iptables -D INPUT -p tcp --dport 3260 -j DROP*.

   The connection with VM1 is no longer faulty.

Learning outcomes Experiment ISCSI and multipath deployment and configuration. Assess how multipath fault-tolerant storage services.