



We will use Multipath for link HA and improved performance. Install the needed packages first:

```
root@proxmox01:~# apt-get install open-iscsi multipath-tools root@proxmox02:~# apt-get install open-iscsi multipath-tools
```

Then we discover the target and login on both proxmox nodes:

```
root@proxmox01:~# systemctl start open-iscsi.service
```

```
root@proxmox01:~# iscsiadm -m discovery -t st -p 192.168.0.180
192.168.0.180:3260,1 iqn.2016-02.local.virtual:virtual.vg1
10.20.1.180:3260,1 iqn.2016-02.local.virtual:virtual.vg1

root@proxmox01:~# iscsiadm -m node --login

root@proxmox01:~# iscsiadm -m node
10.20.1.180:3260,1 iqn.2016-02.local.virtual:virtual.vg1
192.168.0.180:3260,1 iqn.2016-02.local.virtual:virtual.vg1

root@proxmox02:~# iscsiadm -m session -P 1
Target: iqn.2016-02.local.virtual:virtual.vg1 (non-flash)
Current Portal: 10.20.1.180:3260,1
Persistent Portal: 10.20.1.180:3260,1
*****
Interface:
*****
Iface Name: default
Iface Transport: tcp
Iface Initiatorname: iqn.1993-08.org.debian:01:674b46a9745
Iface IPaddress: 10.20.1.186
Iface HWaddress: <empty>
Iface Netdev: <empty>
SID: 1
iSCSI Connection State: LOGGED IN
iSCSI Session State: LOGGED_IN
Internal iscsid Session State: NO CHANGE
Current Portal: 192.168.0.180:3260,1
Persistent Portal: 192.168.0.180:3260,1
*****
Interface:
*****
Iface Name: default
Iface Transport: tcp
Iface Initiatorname: iqn.1993-08.org.debian:01:674b46a9745
Iface IPaddress: 192.168.0.186
Iface HWaddress: <empty>
Iface Netdev: <empty>
SID: 2
iSCSI Connection State: LOGGED IN
iSCSI Session State: LOGGED_IN
Internal iscsid Session State: NO CHANGE
```

```
root@proxmox01:~# ls SCSI
[0:0:0:0]    cd/dvd  QEMU      QEMU DVD-ROM    1.4.  /dev/sr0
[2:0:0:0]    disk    SCST_FIO  VDISK-LUN01     311   /dev/sdb
[3:0:0:0]    disk    SCST_FIO  VDISK-LUN01     311   /dev/sda
```

We can see two new SCSI block devices have been introduced to the system, /dev/sda and /dev/sdb. Next is Multipathing setup. First we find the WWID of the new device:

```
root@proxmox01:~# /lib/udev/scsi_id -g -d /dev/sda
23238363932313833

root@proxmox01:~# /lib/udev/scsi_id -g -d /dev/sdb
23238363932313833
```

that we then use in the Multipath config file /etc/multipath.conf that we create, for both proxmox nodes:



```
defaults {
    user_friendly_names    yes
    polling_interval        2
    path_selector            "round-robin 0"
    path_grouping_policy    multibus
    path_checker             readsector0
    getuid_callout          "/lib/udev/scsi_id -g -u -d /dev/%n"
    rr_min_io               100
    failback                immediate
    no_path_retry           queue
}
blacklist {
    wwid .*
}
blacklist_exceptions {
    wwid "23238363932313833"
    property "(ID SCSI_VPD|ID_WWN|ID_SERIAL)"
}
multipaths {
    multipath {
        wwid "23238363932313833"
        alias mylun
    }
}
```

and after loading Multipath kernel modules on both proxmox nodes:

```
root@proxmox02:~# modprobe -v dm_multipath
insmod /lib/modules/4.2.6-1-pve/kernel/drivers/scsi/device_handler/scsi_dh.ko
insmod /lib/modules/4.2.6-1-pve/kernel/drivers/md/dm-multipath.ko

root@proxmox02:~# modprobe -v dm_round_robin
insmod /lib/modules/4.2.6-1-pve/kernel/drivers/md/dm-round-robin.ko
```

and restarting Multipath service/daemon for both proxmox nodes:

```
root@proxmox01:~# systemctl stop multipath-tools.service
root@proxmox01:~# systemctl start multipath-tools.service
root@proxmox02:~# systemctl status -l multipath-tools.service
multipath-tools.service - LSB: multipath daemon
Loaded: loaded (/etc/init.d/multipath-tools)
Active: active (running) since Fri 2016-03-04 17:40:44 AEDT; 6s ago
Process: 8177 ExecStop=/etc/init.d/multipath-tools stop (code=exited, status=0/SUCCESS)
Process: 8191 ExecStart=/etc/init.d/multipath-tools start (code=exited, status=0/SUCCESS)
CGroup: /system.slice/multipath-tools.service
└─8195 /sbin/multipathd

Mar 04 17:40:44 proxmox02 multipath-tools[8191]: Starting multipath daemon: multipathd.
Mar 04 17:40:44 proxmox02 multipathd[8195]: sda: using deprecated getuid callout
Mar 04 17:40:44 proxmox02 multipathd[8195]: sdb: using deprecated getuid callout
Mar 04 17:40:44 proxmox02 multipathd[8195]: mylun: load table [0 41934848 multipath 1
queue_if_no_path 0 1 1 round-robin 0 2 1 8:0 1 8:16 1]
Mar 04 17:40:44 proxmox02 multipathd[8195]: mylun: event checker started
Mar 04 17:40:44 proxmox02 multipathd[8195]: path checkers start up
```

we can see the multipath device mylun created:

```
root@proxmox01:~# multipath -ll
mylun (23238363932313833) dm-1 SCST_FIO,VDISK-LUN01
size=20G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-+- policy='round-robin 0' prio=1 status=active
   |- 2:0:0:0 sdb 8:16 active ready running
   `- 3:0:0:0 sda 8:0 active ready running

root@proxmox01:~# dmsetup ls
```



```
pve-swap    (251:3)
pve-root    (251:0)
mylun       (251:1)
pve-data    (251:4)
vg_drbd0-vm-107--disk--1 (251:5)
vg_proxmox-lv_proxmox    (251:2)
```

Next we create the volume group on one proxmox node only:

```
root@proxmox01:~# pvcreate /dev/mapper/mylun root@proxmox01:~# vgcreate vg_iscsi /dev/mapper/mylun
```

Finally, using the PVE web GUI, we add new LVM storage using the newly created vg_iscsi volume group in the Datacenter and set it as Active and Shared.

Type	Content
Directory	VZDump bac
Directory	VZDump bac
Directory	Disk image, (
NFS	VZDump bac
Directory	Disk image, I
NFS	VZDump bac
NFS	VZDump bac
LVM	Disk image, (

At the end, in order to log in and establish the sessions to the iSCSI targets on reboot we set the startup mode to automatic in the iscsi initiator config file /etc/iscsi/iscsid.conf on both proxmox nodes:

```
[...]
node.startup = automatic
[...]
```

We can see all the shared VG's and volumes created in the cluster on both nodes for all 3 storage types we have setup above:

```
root@proxmox01:~# vgs
VG          #PV #LV #SN Attr   VSize  VFree
pve         1  3  0 wz--n- 31.87g 3.87g
vg_drbd0    1  1  0 wz--n-  9.31g 3.31g
vg_drbd1    1  1  0 wz--n- 11.68g 5.68g
vg_iscsi    1  1  0 wz--n- 19.99g 13.99g
vg_proxmox  1  1  0 wz--n- 20.00g  0

root@proxmox01:~# lvs
LV          VG          Attr      LSize  Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
data        pve          -wi-ao---- 16.38g
root        pve          -wi-ao----  7.75g
```

