RED HAT STORAGE FOR MERE MORTALS

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AGENDA

• What is Red Hat Storage?
• History
• Community
• Architecture
• Node Installation
• Installing RHS
• Adding servers to the trusted pool
• Distributed volumes
• Replicated volumes
• Distributed + replicated volumes
AGENDA

● Attaching to Red Hat Storage with NFS
WHAT IS RED HAT STORAGE?
WHAT IS RED HAT STORAGE

• Red Hat Storage is a commercially supported distribution of GlusterFS
• GlusterFS is a scale-out network-attached storage filesystem which uses commodity x86 hardware and inexpensive disks, JBODs, or (rarely) SAN
• It can use ethernet or InfiniBand RDMA for transport
HISTORY

- The company Gluster was founded in 2005 by founder and CTO Anand Babu Periasamy (now an angel investor in Silicon Valley)
- In 2010, Ben Golub (now CEO of Docker) became the CEO
- In 2011, Red Hat acquired Gluster
- In 2012, Red Hat Storage was launched
As Fedora is the upstream project from which Red Hat uses technologies to build Red Hat Enterprise Linux, the Gluster Project (www.gluster.org) is the upstream for Red Hat Storage.

- Documentation, IRC channels, development tools and docs, etc. are all there for the community.
- Community governance with Red Hat's sponsorship.
ARCHITECTURE
ARCHITECTURE

- Server component (glusterfsd)
- Client component (glusterfs)
- The client runs in user space (FUSE)
- File location determined by a hashing algorithm - no metadata services
  - No SPOF
- Global namespace
NODE INSTALLATION
[root@gluster1 ~]# chkconfig iptables off; service iptables stop
iptables: Setting chains to policy ACCEPT: filter [ OK ]
iptables: Flushing firewall rules: [ OK ]
iptables: Unloading modules: [ OK ]
[root@gluster1 ~]#
[root@gluster1 ~]# perl -pi -e 's/SELINUX=enforcing/SELINUX=permissive/' /etc/selinux/config
[root@gluster1 ~]# init 6
# fdisk /dev/vdb
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel.
Building a new DOS disklabel with disk identifier 0x66e2aa02.
Changes will remain in memory only, until you decide to write them.
After that, of course, the previous content won’t be recoverable.

Warning: invalid flag 0x6000 of partition table 4 will be corrected by write

WARNING: DOS-compatible mode is deprecated. It’s strongly recommended to
switch off the mode (command 'c') and change display units to
sectors (command 'u').

Command (m for help): n
Command action
  e  extended
  p  primary partition (1-4)

p
Partition number (1-4): 1
First cylinder (1-12190, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-12190, default 12190):
Using default value 12190

Command (m for help): w
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.
[root@gluster1 ~]#
NODE INSTALLATION

• Note the inode option “size” is set to 512 bytes, not the default 256!
[root@gluster1 ~]# mkfs.xfs -i size=512 /dev/vdb1
meta-data=/dev/vdb1 isize=512 agcount=4, agsize=383983 blks
    = sectsz=512 attr=2, projid32bit=0
data  = bsize=4096 blocks=1535932, imaxpct=25
    = sunit=8 swidth=0 blks
namei =version 2 bsize=4096 ascii-c=0
log   =internal log bsize=4096 blocks=2560, version=2
    = sectsz=512 sunit=0 blks, lazy-count=1
realtime =none extsz=4096 blocks=0, rtextents=0
[root@gluster1 ~]#
#redhat #rhsummit
[root@gluster1 ~]# mkdir -p /export/gluster
[root@gluster1 ~]#
[root@gluster1 ~]# mount /dev/vdb1 /export/gluster/
[root@gluster1 ~]# df -h
Filesystem  Size  Used  Avail  Use%  Mounted on
/dev/vda3   4.9G  1.9G  2.8G   40%   /
/tmps       939M   0  939M    0%  /dev/shm
/dev/vda1   485M  38M  447M    9%  /boot
/dev/vdb1   5.0G  33M  4.7G    1%  /export/gluster
[root@gluster1 ~]
NODE INSTALLATION

- Once you've mounted the filesystem, you can “cheat” and get the correct syntax for /etc/fstab from /etc/mtab.
[root@gluster1 ~]# tail -l /etc/mtab
/dev/vdb1 /export/gluster xfs rw 0 0
[root@gluster1 ~]# tail -l /etc/mtab >> /etc/fstab
[root@gluster1 ~]# cat /etc/fstab

# /etc/fstab
# Created by anaconda on Tue Jun 23 11:38:07 2015
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=85038fff-345c-4ee7-a20e-2b9470fbafef / ext4 defaults
  1 1
UUID=3d7199f3-a256-48fc-9c34-35e54e1c568f /boot ext4 defaults
  1 2
UUID=42a56342-01ec-44f4-80d3-78cd889648e4 swap swap defaults
  0 0
/dev/vdb1 /export/gluster xfs rw 0 0

[root@gluster1 ~]# [ ]
NODE INSTALLATION

- Register the systems to Red Hat
subscription-manager repos --enable=rhel-6-server-rpms --enable=rhel-scalefs-for-rhel-6-server-rpms --enable=rhs-3-for-rhel-6-server-rpms

Repo rhel-6-server-rpms is enabled for this system.
Repo rhel-scalefs-for-rhel-6-server-rpms is enabled for this system.
Repo rhs-3-for-rhel-6-server-rpms is enabled for this system.
[root@gluster1 ~]# yum install redhat-storage-server
Loaded plugins: product-id, security, subscription-manager
This system is receiving updates from Red Hat Subscription Management.
<table>
<thead>
<tr>
<th>File</th>
<th>Version</th>
<th>Architecture</th>
<th>Source Repository</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>audit-libs</td>
<td>x86_64 2.3.7-5.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>71 k</td>
</tr>
<tr>
<td>cyrus-sasl</td>
<td>x86_64 2.1.23-15.el6_6.2</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>78 k</td>
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<tr>
<td>cyrus-sasl-lib</td>
<td>x86_64 2.1.23-15.el6_6.2</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>136 k</td>
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<tr>
<td>cyrus-sasl-plain</td>
<td>x86_64 2.1.23-15.el6_6.2</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>31 k</td>
</tr>
<tr>
<td>fire</td>
<td>x86_64 5.04-21.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>47 k</td>
</tr>
<tr>
<td>file-libs</td>
<td>x86_64 5.04-21.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>313 k</td>
</tr>
<tr>
<td>gnutls</td>
<td>x86_64 2.8.5-14.el5_5</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>346 k</td>
</tr>
<tr>
<td>keyutils-libs</td>
<td>x86_64 1.4-5.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>20 k</td>
</tr>
<tr>
<td>kpartx</td>
<td>x86_64 0.4.9-80.el6_6.3</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>63 k</td>
</tr>
<tr>
<td>libX11</td>
<td>x86_64 1.6.0-2.2.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>586 k</td>
</tr>
<tr>
<td>libX11-common</td>
<td></td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>192 k</td>
</tr>
<tr>
<td>libselinux</td>
<td>x86_64 2.0.94-5.8.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>109 k</td>
</tr>
<tr>
<td>libselinux-utils</td>
<td>x86_64 2.0.94-5.8.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>82 k</td>
</tr>
<tr>
<td>policycoreutils</td>
<td>x86_64 2.0.83-19.47.el5_6.1</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>680 k</td>
</tr>
<tr>
<td>sg3-utils-libs</td>
<td>x86_64 1.28-6.el6</td>
<td></td>
<td>rhel-6-server-rpms</td>
<td>52 k</td>
</tr>
</tbody>
</table>

Transaction Summary

Install 179 Package(s)
Upgrade 16 Package(s)

Total download size: 122 M

Is this ok [y/N]:
Dependency Updated:
  audit.i686 0:2.3.7-5.el6
  audit-libs.i686 0:2.3.7-5.el6
  cyrus-sasl.i686 0:2.1.23-15.el6_6.2
  cyrus-sasl-lib.i686 0:2.1.23-15.el6_6.2
  cyrus-sasl-plain.i686 0:2.1.23-15.el6_6.2
  file.i686 0:5.84-21.el6
  file-libs.i686 0:5.84-21.el6
  gnu-utils.i686 0:2.8.5-14.el6_5
  keyutils-libs.i686 0:1.4-5.el6
  kpartx.i686 0:8.4-90.el6_6.3
  libX11.i686 0:1.6.0-2.2.el6
  libX11-common.noarch 0:1.6.0-2.2.el6
  libselinux.i686 0:2.0.94-5.8.el6
  libselinux-utils.i686 0:2.0.94-5.8.el6
  policycoreutils.i686 0:2.0.83-19.47.el6_6.1
  sq3-utils-libs.i686 0:1.28-6.el6

Replaced:
  redhat-logos.noarch 0:60.0.14-1.el6

Complete!
[root@gluster1 ~]#
dependency updated:

```
adisk, libas, lib64, lib82, 2.2.3.7-5.e16
adisk, lib64, lib82, 2.2.3.7-5.e16
libas, lib64, 82.2.1.23-15.a66.6.2
libas, lib64, 82.2.1.23-15.a66.6.2
libas, lib64, 82.2.1.23-15.a66.6.2
libas, lib64, 82.2.1.23-15.a66.6.2
```

replaced:

```
redhat-logos.mark 8068.8,14-1.e16
```

complete:

```
redhat-logos.mark 8068.8,14-1.e16
```

dependency updated:

```
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
```

replaced:

```
redhat-logos.mark 8068.8,14-1.e16
```

complete:

```
redhat-logos.mark 8068.8,14-1.e16
```

dependency updated:

```
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
install, libas, lib64, 82.2.1.23-15.a66.6.2
```

replaced:

```
redhat-logos.mark 8068.8,14-1.e16
```

complete:

```
redhat-logos.mark 8068.8,14-1.e16
```

#redhat #rhsummit
[root@gluster1 ~]# chkconfig glusterd --list
    glusterd  0:off  1:off  2:on  3:on  4:on  5:on  6:off
[root@gluster1 ~]#
[root@gluster1 ~]# service glusterd start
Starting glusterd: [ OK ]
[root@gluster1 ~]#
CLIENT INSTALLATION
[root@host189 ~]# subscription-manager register --auto-attach
Username: tcameron@redhat.com
Password:
The system has been registered with ID: 5c203798-4c40-4cc4-a4bb-9f7451a8131e
Installed Product Current Status:
Product Name: Red Hat Enterprise Linux Server
Status: Subscribed

[root@host189 ~]#
subscription-manager repos --disable="*"
Repo of-mo-5.4-for-rhel-6-debug-rpms is disabled for this system.
Repo rhel-server-rhscl-6-beta-source-rpms is disabled for this system.
Repo rhel-6-server-ose-2.1-jbossamp-debug-rpms is disabled for this system.
Repo rhel-6-server-ose-2.2-infra-debug-rpms is disabled for this system.
Repo rhel-6-server-ose-2.1-node-debug-rpms is disabled for this system.
Repo rhel-6-server-extras-rpms is disabled for this system.
Repo rhel-6-server-supplementary-source-rpms is disabled for this system.
Repo rhel-6-server-rhev-beta-rpms is disabled for this system.
Repo rhel-6-server-for-rhel-6-server-aus-rpms is disabled for this system.
Repo rhel-6-server-ose-infra-6-beta-rpms is disabled for this system.
Repo rhel-6-server-rhevm-3.1-debug-rpms is disabled for this system.
Repo rhel-6-serveroptional-source-rpms is disabled for this system.
Repo rhel-rs-for-rhel-6-server-beta-debug-rpms is disabled for this system.
Repo rhel-6-server-eus-rh-common-debug-rpms is disabled for this system.
Repo jboss-apache-6-for-rhel-6-server-source-rpms is disabled for this system.
Repo rhel-6-server-rh-common-beta-debug-rpms is disabled for this system.
Repo rhel-6-server-rmg-management-rpms is disabled for this system.
Repo rhel-6-server-rhevm-3.4-debug-rpms is disabled for this system.
Repo rhel-6-server-rhel-beta-source-rpms is disabled for this system.
Repo rhel-6-server-rheeph-1.2-installer-rpms is disabled for this system.
Repo rhel-6-server-osbs-rhel-beta-debug-rpms is disabled for this system.
Repo rhel-6-server-rhel-beta-rpms is disabled for this system.
Repo rhel-server-osb-6-folsom-source-rpms is disabled for this system.
[root@host189 ~]#
subscription-manager repos --enable=rhel-6-server-rpms --enable=rhel-6-server-rhs-client-1-rpms
Repo rhel-6-server-rpms is enabled for this system.
Repo rhel-6-server-rhs-client-1-rpms is enabled for this system.
[root@host189 ~]# yum install glusterfs glusterfs-fuse
Installing: glusterfs-libbs-3.6.0.53-1.el6.x86_64 1/4
Installing: glusterfs-3.6.0.53-1.el6.x86_64 2/4
Installing: glusterfs-apl-3.6.0.53-1.el6.x86_64 3/4
Installing: glusterfs-fuse-3.6.0.53-1.el6.x86_64 4/4

rhel-6-server-rpms/productid
Verifying: glusterfs-apl-3.6.0.53-1.el6.x86_64 1/4
Verifying: glusterfs-libbs-3.6.0.53-1.el6.x86_64 2/4
Verifying: glusterfs-fuse-3.6.0.53-1.el6.x86_64 3/4
Verifying: glusterfs-3.6.0.53-1.el6.x86_64 4/4

Installed:
glusterfs.x86_64 0:3.6.0.53-1.el6  glusterfs-fuse.x86_64 0:3.6.0.53-1.el6

Dependency Installed:
glusterfs-apl.x86_64 0:3.6.0.53-1.el6  glusterfs-libbs.x86_64 0:3.6.0.53-1.el6

Complete!
[root@host189 ~]#
ADDING SERVERS TO THE TRUSTED POOL
[root@gluster1 ~]# gluster peer probe gluster2.tc.redhat.com
peer probe: success.
[root@gluster1 ~]# gluster peer probe gluster3.tc.redhat.com
peer probe: success.
[root@gluster1 ~]# gluster peer probe gluster4.tc.redhat.com
peer probe: success.
[root@gluster1 ~]#
[root@cluster1 ~]# gluster peer probe gluster2.tc.redhat.com
peer probe: success.
[root@cluster1 ~]# gluster peer probe gluster3.tc.redhat.com
peer probe: success.
[root@cluster1 ~]# gluster peer probe gluster4.tc.redhat.com
peer probe: success.
[root@cluster1 ~]# gluster peer status
Number of Peers: 3

Hostname: gluster2.tc.redhat.com
Uuid: a9cb18d7-1f62-45e9-9flb-3f5fd1b4a7b6
State: Peer in Cluster (Connected)

Hostname: gluster3.tc.redhat.com
Uuid: 03ddc0d1-flf3-4421-8bba-de4e3e7c924a
State: Peer in Cluster (Connected)

Hostname: gluster4.tc.redhat.com
Uuid: 2d995c17-99df-47a2-8d29-73e03012f4d11
State: Peer in Cluster (Connected)
[root@cluster1 ~]#
DISTRIBUTED VOLUMES
[root@gluster1 ~]# mkdir /export/gluster/brick1
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume create distributed gluster1.tc.redhat.com:/export/gluster/brick1/ gluster2.tc.redhat.com:/export/gluster/brick1/ gluster3.tc.redhat.com:/export/gluster/brick1/ gluster4.tc.redhat.com:/export/gluster/brick1/

volume create: distributed: success: please start the volume to access data
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume status
Volume distributed is not started

[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume start distributed
volume start: distributed: success
[root@gluster1 ~]#
```
[root@gluster1 ~]# gluster volume start distributed
volume start: distributed: success
[root@gluster1 ~]# gluster volume status
Status of volume: distributed

<table>
<thead>
<tr>
<th>Gluster process</th>
<th>TCP Port</th>
<th>ROMA Port</th>
<th>Online</th>
<th>Pid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick gluster1.tc.redhat.com:/export/gluster</td>
<td>49152</td>
<td>0</td>
<td>Y</td>
<td>2584</td>
</tr>
<tr>
<td>r/brick1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brick gluster2.tc.redhat.com:/export/gluster</td>
<td>49152</td>
<td>0</td>
<td>Y</td>
<td>2442</td>
</tr>
<tr>
<td>r/brick1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brick gluster3.tc.redhat.com:/export/gluster</td>
<td>49152</td>
<td>0</td>
<td>Y</td>
<td>2439</td>
</tr>
<tr>
<td>r/brick1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brick gluster4.tc.redhat.com:/export/gluster</td>
<td>49152</td>
<td>0</td>
<td>Y</td>
<td>2435</td>
</tr>
<tr>
<td>r/brick1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFS Server on localhost</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>NFS Server on gluster3.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>NFS Server on gluster4.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>NFS Server on gluster2.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Task Status of Volume distributed

There are no active volume tasks
```

[root@gluster1 ~]# gluster volume info

Volume Name: distributed
Type: Distribute
Volume ID: 315c0f4f-fa57-4dc7-a21e-bb45988b663b
Status: Started
Snap Volume: no
Number of Bricks: 4
Transport-type: tcp
Bricks:
  Brick1: gluster1.tc.redhat.com:/export/gluster/brick1
  Brick2: gluster2.tc.redhat.com:/export/gluster/brick1
  Brick3: gluster3.tc.redhat.com:/export/gluster/brick1
  Brick4: gluster4.tc.redhat.com:/export/gluster/brick1
Options Reconfigured:
  performance.readdir-ahead: on
  snap-max-hard-limit: 256
  snap-max-soft-limit: 90
  auto-delete: disable

[root@gluster1 ~]#
ACCESSING DISTRIBUTED VOLUMES
root@t540p:~

[tcameron@t540p Desktop]$ su -
Password:
[root@t540p ~]# mount -t glusterfs gluster1.tc.redhat.com:/distributed /mnt/gluster/
[root@t540p ~]# df -h /mnt/gluster/
Filesystem     Size  Used  Avail Use% Mounted on
gluster1.tc.redhat.com:/distributed  24G   129M   24G   1% /mnt/gluster
[root@t540p ~]#
TEST FILE CREATION

- Note that on the client, creating 1000 files indicates that there are 1000 files in one mount point
root@t540p:/mnt/gluster

[root@t540p ~]# cd /mnt/gluster/
[root@t540p gluster]# ls
[root@t540p gluster]# for i in $(seq 1 1000); do echo $i > $i; done
[root@t540p gluster]# ls | wc -l
1000
[root@t540p gluster]#
But when you look at the bricks, the files are **roughly** distributed with about a quarter of them on each of the 4 machines.
[root@gluster1 ~]# ls /export/gluster/brick1/ | wc -l
231
[root@gluster1 ~]#
[root@t540p gluster]# cd ..
[root@t540p mnt]# umount gluster
[root@t540p mnt]#
[root@gluster1 ~]# gluster volume stop distributed
Stopping volume will make its data inaccessible. Do you want to continue? (y/n)
y
volume stop: distributed: success
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume delete distributed
Deleting volume will erase all information about the volume. Do you want to continue? (y/n) y
volume delete: distributed: success
[root@gluster1 ~]#
REPLICATED VOLUMES
mkdir -p /export/gluster/brick2
[root@gluster1 ~]# gluster volume create replicated replica 2 gluster1.tc.redhat.com:/export/gluster/brick2/ gluster2.tc.redhat.com:/export/gluster/brick2/
volume create: replicated: success: please start the volume to access data
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume start replicated
volume start: replicated: success
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume status
Volume distributed is not started

Status of volume: replicated

<table>
<thead>
<tr>
<th>Gluster process</th>
<th>TCP Port</th>
<th>ROMA Port</th>
<th>Online</th>
<th>Pid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick gluster1.tc.redhat.com:/export/gluster/r/brick2</td>
<td>49153</td>
<td>0</td>
<td>Y</td>
<td>2824</td>
</tr>
<tr>
<td>Brick gluster2.tc.redhat.com:/export/gluster/r/brick2</td>
<td>49153</td>
<td>0</td>
<td>Y</td>
<td>2615</td>
</tr>
<tr>
<td>NFS Server on localhost</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Self-heal Daemon on localhost</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>2946</td>
</tr>
<tr>
<td>NFS Server on gluster4.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Self-heal Daemon on gluster4.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>2584</td>
</tr>
<tr>
<td>NFS Server on gluster3.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Self-heal Daemon on gluster3.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>2588</td>
</tr>
<tr>
<td>NFS Server on gluster2.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Self-heal Daemon on gluster2.tc.redhat.com</td>
<td>N/A</td>
<td>N/A</td>
<td>Y</td>
<td>2638</td>
</tr>
</tbody>
</table>

Task Status of Volume replicated
There are no active volume tasks

[root@gluster1 ~]#
> `# gluster volume info replicated`

**Volume Name:** replicated  
**Type:** Replicate  
**Volume ID:** 9418ba4-2d43-4f87-8d99-dbab82d0f2c  
**Status:** Started  
**Snapshot Volume:** no  
**Number of Bricks:** 1 x 2 = 2  
**Transport-type:** tcp  
**Bricks:**  
Brick1: gluster1.tc.redhat.com:/export/gluster/brick2  
Brick2: gluster2.tc.redhat.com:/export/gluster/brick2  
**Options Reconfigured:**  
performance.readdir-ahead: on  
auto-delete: disable  
snap-max-soft-limit: 90  
snap-max-hard-limit: 256

> `[root@gluster1 ~]#`
ACCESSING REPLICATED VOLUMES
#rhsummit

```
[root@t540p ~]# mount -t glusterfs gluster1.tc.redhat.com:replicated /mnt/gluster/
[root@t540p ~]# df -h /mnt/gluster/
Filesystem        Size  Used  Avail Use% Mounted on
gluster1.tc.redhat.com:replicated  5.9G  34M  5.9G  1% /mnt/gluster
[root@t540p ~]# ```
ACCESSING REPLICATED VOLUMES

- This time, creating 1000 files from the client creates 1000 files on each of the replicas.
[root@t540p ~]# cd /mnt/gluster/
[root@t540p gluster]# for i in $(seq 1 1000); do echo $i > $i; done
[root@t540p gluster]# ls | wc -l
1000
[root@t540p gluster]#
[root@gluster1 ~]# ls /export/gluster/brick2/ | wc -l
1000
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume stop replicated
Stopping volume will make its data inaccessible. Do you want to continue? (y/n) y
volume stop: replicated: success
[root@gluster1 ~]#
# gluster volume delete replicated
Deleting volume will erase all information about the volume. Do you want to continue? (y/n) y
volume delete: replicated: success
[root@cluster1 ~]#
DISTRIBUTED + REPLICATED VOLUMES
[root@gluster1 ~]# mkdir /export/gluster/brick3
[root@gluster1 ~]#
[root@gluster1 ~]#
[root@gluster1 ~]# gluster volume start dist-rep
volume start: dist-rep: success
[root@gluster1 ~]#
gluster volume status dist-rep

Status of volume: dist-rep

Cluster process | TCP Port | RDMA Port | Online | Pid
---|---|---|---|---
Brick gluster1.tc.redhat.com:/export/gluster r/brick3 | 49154 | 0 | Y | 3628
Brick gluster2.tc.redhat.com:/export/gluster r/brick3 | 49154 | 0 | Y | 3504
Brick gluster3.tc.redhat.com:/export/gluster r/brick3 | 49153 | 0 | Y | 3488
Brick gluster4.tc.redhat.com:/export/gluster r/brick3 | 49153 | 0 | Y | 3488
NFS Server on localhost | 2049 | 0 | Y | 3642
Self-heal Daemon on localhost | N/A | N/A | Y | 3651
NFS Server on gluster2.tc.redhat.com | 2049 | 0 | Y | 3519
Self-heal Daemon on gluster2.tc.redhat.com | N/A | N/A | Y | 3526
NFS Server on gluster4.tc.redhat.com | 2049 | 0 | Y | 3502
Self-heal Daemon on gluster4.tc.redhat.com | N/A | N/A | Y | 3518
NFS Server on gluster3.tc.redhat.com | 2049 | 0 | Y | 3503
Self-heal Daemon on gluster3.tc.redhat.com | N/A | N/A | Y | 3510

Task Status of Volume dist-rep

There are no active volume tasks

gluster
Volume Name: dist-rep
Type: Distributed-Replicate
Volume ID: B16B2B0a4-2b89-4d10-b4de-ad1166649e0c
Status: Started
Snap Volume: no
Number of Bricks: 2 x 2 = 4
Transport-type: tcp
Bricks:
Brick1: gluster1.tc.redhat.com:/export/gluster/brick3
Brick2: gluster2.tc.redhat.com:/export/gluster/brick3
Brick3: gluster3.tc.redhat.com:/export/gluster/brick3
Brick4: gluster4.tc.redhat.com:/export/gluster/brick3
Options Reconfigured:
performance.readdir-ahead: on
auto-delete: disable
snap-max-soft-limit: 90
snap-max-hard-limit: 256
ACCESSING DISTRIBUTED + REPLICATED VOLUMES
```
[root@host189 ~]# mount -t glusterfs gluster1:dist-rep /mnt/gluster/
[root@host189 ~]# df -h /mnt/gluster/
Filesystem   Size  Used  Avail %Used Mounted on
gluster1:dist-rep 12G  65M   12G   1% /mnt/gluster
[root@host189 ~]#  
```
ACCESSING DISTRIBUTED+REPLICATED VOLUMES

• This time, since it's a distributed set of replicated (in this case, two way, or mirrored) volumes, creating 1000 files on the clients results in approximately half of the files getting created on each of the distributed nodes, then it is replicated. So 500-ish files on each node.
for i in $(seq 1 1000); do echo $i > i; done
ls | wc -l

[root@gluster1 ~]# ls /export/gluster/brick3 | wc -l
501
[root@gluster1 ~]#
[root@cluster1 ~]# gluster volume stop dist-rep
Stopping volume will make its data inaccessible. Do you want to continue? (y/n) y
volume stop: dist-rep: success

[root@cluster1 ~]# gluster volume delete dist-rep
Deleting volume will erase all information about the volume. Do you want to continue? (y/n) y
volume delete: dist-rep: success

[root@cluster1 ~]#
CONNECTING VIA NFS
CONNECTING VIA NFS

• On the client, install the utilities necessary for NFS
[root@host189 ~]# yum install nfs-utils
Installed:
  nrs-utils.x86_64 1:1.2.3-54.el6

Dependency Installed:
  nrs-utils.x86_64 1:1.2.3-54.el6
  libevent.x86_64 8:1.4.13-4.el6
  libgssglue.x86_64 0:0.1-11.el6
  libnslrpc.x86_64 8:8.2.1-10.el6
  nfs-utils-lib.x86_64 0:1.1.5-9.el6_6
  rpcbind.x86_64 0:8.2.0-11.el6

Dependency Updated:
  keyutils-libs.x86_64 0:1.4-5.el6

Complete!
[root@host189 ~]#
[root@host189 ~]# chkconfig rpcbind on
[root@host189 ~]# service rpcbind start
Starting rpcbind: [ OK ]
[root@host189 ~]# chkconfig nfslock on
[root@host189 ~]# service nfslock start
Starting NFS statd: [ OK ]
[root@host189 ~]#
[root@host189 ~]# showmount -e gluster1.tc.redhat.com
Export list for gluster1.tc.redhat.com:
/dist-rep *
[root@host189 ~]#
[root@host189 ~]# mkdir /mnt/nfs
[root@host189 ~]# mount -t nfs gluster1.tc.redhat.com:/dist-rep /mnt/nfs
[root@host189 ~]# df -h /mnt/nfs

Filesystem Size Used Avail Use% Mounted on
gluster1.tc.redhat.com:/dist-rep 12G 65M 12G 1% /mnt/nfs

[root@host189 ~]#
QUESTIONS?
THANKS! DO THE SURVEY!
LEARN. NETWORK.
EXPERIENCE OPEN SOURCE.