Scripting

Version 3.4 introduced the ability to generate command output in xml format using the `--xml` parameter. The example below shows how this can be used from python to form the basis of server side automation scripts.

```
#!/usr/bin/env python
# Run the gluster command natively first to
# understand the xml layout.
#
# Invocation : <prog name> <volume name>
#

import xml.etree.ElementTree as ETree
import sys
from subprocess import Popen, PIPE

glfsCmd = Popen(['gluster',
                 'vol',
                 'status',
                 sys.argv[1],
                 'detail',
                 '--xml'],stdout=PIPE)

# cmdOut will be a string object
cmdOut  = glfsCmd.communicate()[0]

# Parse the string, making an xml object
xmlRoot = ETree.fromstring(cmdOut)

# Return a list of 'sizeTotal' elements
brickSize = xmlRoot.findall('.//sizeTotal')

# Return a list of 'sizeFree' elements
brickFree = xmlRoot.findall('.//sizeFree')

# Just count the number of 'path' elements in
# the XML to indicate the number of bricks in the
# volume
numBricks = len(xmlRoot.findall('.//path'))

# Loop through each brickSize element, forming a
# new list of values, that are then sum'd
rawTotal = sum([float(thisBrick.text) for thisBrick in
brickSize])

rawFree  = sum([float(thisBrick.text) for thisBrick in
brickFree])

pctUsed  = ((rawTotal-rawFree)/rawTotal)

print "\nVolume Name: " + sys.argv[1]
print "Number of Bricks %5d" % (numBricks)
print "Raw Volume Size  %5.02f (GB)" %
(rawTotal/1024**3)
print "Raw Free         %5.02f (GB)" %
(rawFree/1024**3)
print "%% Used           %5.02f\n" % (pctUsed)
```

TroubleShooting

Gluster uses the following log locations to record events and activity within the cluster

geo-replication

```
/var/log/glusterfs/geo-replication/*
```

self-heal operations

```
/var/log/glusterfs/glustershd.log
```

NFS access

```
/var/log/glusterfs/nfs.log
```

SMB access

```
/var/log/samba/glusterfs-<VOLNAME>-
ClientIP.log
```

Upgrading to v3.4

Your Version	Upgrade Overview*
3.3	"Cold", or rolling upgrades are supported. Once complete, an upgrade of all the native clients is recommended.
3.x	Downtime is required due to changes in the xlators and location of config files.

**Further detail is available on gluster.org*

Recommended Configuration Limits

Max Number of peers in a cluster	64
Clients per Volume	1000
Max Bricks per Node	4
Max bricksize (TB)	100

Useful Links

Web

http://www.gluster.org
http://forge.gluster.org

IRC Channel

irc.gnu.org#gluster

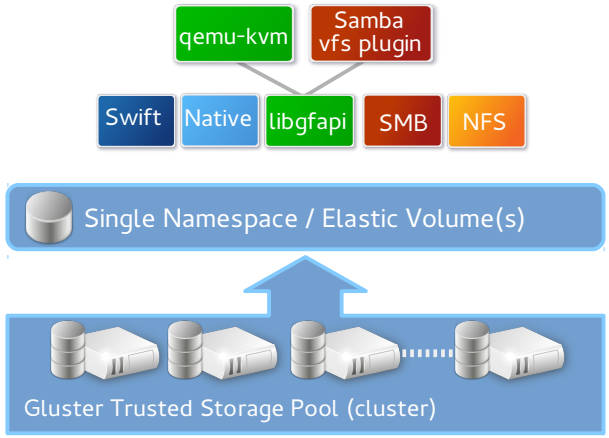
Mail Lists

gluster-users@gluster.org
gluster-devel@nongnu.org

DRAFT

Getting Started with Gluster 3.4

Architectural Overview



Configuration Overview

Managing Cluster Membership

Adding a node

```
gluster peer probe <node name>
```

Removing a node

```
gluster peer detach <node name>
```

Querying status of the cluster (2 options)

```
gluster peer status
gluster pool list
```

Configuring Bricks

Bricks should be configured with the LVM for future flexibility and enhanced management. The following steps prepare an empty disk for use as a gluster brick, using /dev/sdb as an example device.

1. `pvcreate /dev/sdb`

```
2. vgcreate <vg_name> /dev/sdb
3. lvcreate -n <lv_name> -l 100%PVS \
     <vg_name> /dev/sdb
4. mkfs.xfs -i size=512 <lv_path>
```

Once the LV is prepared, update fstab. Additional steps may be necessary if the disk device is a RAID LUN to ensure the device is aligned with the geometry of the underlying RAID group.

Managing Volumes

The process for creating a volume

1. Ensure bricks are available
2. gluster vol create <vol-name> ...
3. gluster vol set <vol-name> <key> <value>
4. gluster vol start <vol-name>

Use "gluster `vol help`" for the complete syntax

Expanding a volume

Distributed volumes may be expanded by any number of bricks, but replicated volumes must be expanded in units of the replication factor (i.e. if volume is a replica 2, expansion must be in multiples of 2 bricks/nodes)

```
[root@node ~]# gluster
gluster> vol add-brick VOLNAME BRICK(S)
```

Shrinking a volume

To remove bricks from a volume you must use the '**start**' parameter to avoid data loss!

```
> vol remove-brick <vol-name> <brick> start
```

Replacing a Brick

```
gluster vol add-brick VOLNAME NEW-BRICK
gluster vol remove-brick VOLNAME BRICK start
gluster vol remove-brick VOLNAME BRICK status
gluster vol remove-brick VOLNAME BRICK commit
```

Server Mount Options (fstab)

Filesystem	Option
xfs	allocsize=4096,inode64,logbufs=8,logbsize=256K,noatime

Client Mount Options (fstab)

fstype	Option	Req'd
glusterfs	_netdev	•
	backupvolfile-server=<node> enable-ino32	
cifs	_netdev,credentials=<file>	•
nfs	_netdev,vers=3,proto=tcp	•

Common Tuning Options

The following parameters are set via;

`volume set <vol name> <key> <value>`

Key	Value and Action
nfs.disable	'on' turns NFS off
auth.allow or auth.reject	Supply IP addresses to permit or explicitly deny access to a volume
Cluster.min-free-disk	% of free space to maintain across bricks
network.ping-timeout	Secs to wait before a node is declared 'dead'
user.cifs	'disable' turns Samba off
storage.owner-uid **x** ***or*** storage.owner-gid **x**	Where 'x' is 36 ... oVirt/RHEV 161 ... OpenStack Glance 165 ... OpenStack Cinder
cluster.eager-lock	**on (*default*)| off** Set to on to optimise lock useful for high write workloads
nfs.enable-ino32	**on | off (*default*)** Set to 'on' for 32bit nfs access to a gluster nfs volume

Use "`gluster vol set help`" for a more complete list of available options

Using xattr's

Which bricks is my file stored on?

```
getfattr -d -e text -m . -n \
trusted.glusterfs.pathinfo <file_path_name>
```

Reusing a brick (after the volume is deleted)

```
setattr -x trusted.gfid <brick path>
setfattr -x trusted.glusterfs.volume-id \ <brick path>
```

Cross Protocol Data Access

Although a gluster trusted pool can be configured to support multiple protocols simultaneously, a single volume can not be freely accessed by different protocols due to differences in locking semantics. The table below defines which protocols may safely access the same volume concurrently.

	SMB	NFS	Native	Object
SMB		✗	✗	✗
NFS	✗		✓	✓
Native	✗	✓		✓
Object	✗	✓	✓	

Firewall Ports

Port	Type	Description
24007	tcp	glusterd communications
49152-59153	tcp	glusterfsd ports (one per brick)
111	tcp & udp	portmapper for NFS access
38465-38466	tcp	gluster nfs
11211	tcp & udp	memcached port for Swift
6000-6002	tcp	Swift Object, Container and Account server ports
443, 8080	tcp	Swift Proxy server