



NetApp®

Go further, faster®

Jenkins NFS and Fault Injection

Bryan Schumaker
bjschuma@netapp.com



Jenkins

- Continuous integration server
- Easy to tell what happened at a glance

Configuration Matrix			basic				general				special				locking			
Configuration Matrix			2	3	4	4.1	2	3	4	4.1	2	3	4	4.1	2	3	4	4.1
nfs1-fed1	config.arch	nfs2-fed1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		nfs2-rhel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	config.fedora	nfs2-fed1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		nfs2-rhel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nfs1-fed2	config.arch	nfs2-fed1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		nfs2-rhel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	config.fedora	nfs2-fed1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		nfs2-rhel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nfs1-rhel	config.arch	nfs2-fed1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		nfs2-rhel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	config.fedora	nfs2-fed1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		nfs2-rhel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Changes since the June Bakeathon

- Fewer manual filters
 - Ask if server supports fault injection
 - Ask what NFS protocols server supports
 - Autodetect if client is 32 bit or 64 bit
- Less risk of other jobs interfering
 - Exclusion plugin
- Timeouts + ssh
- Distcc



Git Bisect

NetApp®

This build requires parameters:

ACTION

GOOD

Last known good commit (only needed if ACTION == "start")

SRC_DIR

```
Started by user anonymous
Building in workspace /export/nfs
[nfs] $ /bin/sh -xe /tmp/hudson8681108176854408507.sh
+ '[' retry == good ']'
+ '[' retry == bad ']'
+ '[' retry == start ']'
+ '[' retry == reset ']'
+ echo 'Retrying previous commit'
Retrying previous commit
+ git log -n 1
commit c7add9a9720ff5be4715f7a0bb0d9578b2e8534e
Author: Stanislav Kinsbursky <skinsbursky@parallels.com>
Date: Thu Jan 26 15:11:49 2012 +0400
```

```
NFS: search for client session id in proper network namespace
```

```
Network namespace is taken from request transport and passed as a part of
cb_process_state structure.
```

```
Signed-off-by: Stanislav Kinsbursky <skinsbursky@parallels.com>
```

```
Signed-off-by: Trond Myklebust <Trond.Myklebust@netapp.com>
```

```
Waiting for the completion of Compile
```

```
Compile #26 completed. Result was FAILURE
```

```
Build step 'Trigger/call builds on other projects' marked build as failure
```

```
Sending e-mails to: bjschuma@netapp.com
```

```
Triggering a new build of Cleanup #24
```

```
Finished: FAILURE
```

Bugs Found

- Compile errors
- Client test_stateid() and free_stateid() used wrong stateid
- Kernel oops during reboot / unmount
- NFSD delegation list corruption

```
[ 366.745161] NFSD Fault Injection: recall_delegations (all)
[ 366.745169] NFSD: Recalled 2 delegations
[ 366.832036] -----[ cut here ]-----
[ 366.832043] WARNING: at ../../../../../../faults/lib/list_debug.c:53 __list_del_entry+0xa1/0xd0()
[ 366.832044] Hardware name: VMware Virtual Platform
[ 366.832046] list_del corruption. prev->next should be ffff88032ae232f0, but was ffff88032ae22a50
[ 366.832047] Modules linked in: nfsd nfs_acl auth_rpcgss bnep bluetooth rfkill lockd sunrpc ip6t_REJECT nf_contra
ip6table_filter ip6_tables ppdev e1000 i2c_piix4 i2c_core vmw_balloon parport_pc parport microcode pcspkr shpchp ipv
[ 366.832073] Pid: 1145, comm: nfsd Not tainted 3.2.0-faults+ #1
[ 366.832075] Call Trace:
[ 366.832080] [<ffffffff8105701f>] warn_slowpath_common+0x7f/0xc0
[ 366.832082] [<ffffffff81057116>] warn_slowpath_fmt+0x46/0x50
[ 366.832085] [<ffffffff812e6367>] ? idr_remove+0x187/0x1f0
[ 366.832087] [<ffffffff812f9d91>] __list_del_entry+0xa1/0xd0
[ 366.832095] [<ffffffffa028407f>] unhash_delegation+0x5f/0xc0 [nfsd]
[ 366.832101] [<ffffffffa0287660>] nfsd4_delegreturn+0x70/0xb0 [nfsd]
[ 366.832107] [<ffffffffa02772a5>] nfsd4_proc_compound+0x1b5/0x5b0 [nfsd]
[ 366.832112] [<ffffffffa026642b>] nfsd_dispatch+0xeb/0x230 [nfsd]
[ 366.832121] [<ffffffffa01689d4>] svc_process_common+0x344/0x640 [sunrpc]
[ 366.832125] [<ffffffff8108cca0>] ? try_to_wake_up+0x2c0/0x2c0
[ 366.832129] [<ffffffffa0266a90>] ? nfsd_svc+0x1e0/0x1e0 [nfsd]
[ 366.832136] [<ffffffffa0169002>] svc_process+0x102/0x150 [sunrpc]
[ 366.832140] [<ffffffffa0266b45>] nfsd+0xb5/0x150 [nfsd]
[ 366.832144] [<ffffffffa0266a90>] ? nfsd_svc+0x1e0/0x1e0 [nfsd]
[ 366.832146] [<ffffffff810794ee>] kthread+0x9e/0xb0
[ 366.832150] [<ffffffff815d52a4>] kernel_thread_helper+0x4/0x10
[ 366.832152] [<ffffffff81079450>] ? kthread_freezable_should_stop+0x70/0x70
[ 366.832154] [<ffffffff815d52a0>] ? gs_change+0x13/0x13
[ 366.832155] ---[ end trace 9869809729f23868 ]---
```

Exiting due to error: 1



Fault Injection

- Easy way to trigger rare errors
- Good for testing client state recovery
- Control through “driver” script

```
1 #!/bin/bash
2 # Fault injection driver for linux servers
3 #
4
5 # Is server reboot supported?
6 export SERVER_REBOOT_SUPPORTED="true"
7
8 # List of supported faults
9 export SUPPORTED_FAULTS="forget_clients forget_delegations recall_delegations forget_locks forget_openowners"
10
11 # Function called to trigger a fault on the server
12 # Usage: server_inject_fault SERVER FAULT
13 function server_inject_fault
14 {
15 >-----run_cmd $1 "sudo su -c \"echo 0 > /sys/kernel/debug/nfsd/$2\""
16 }
17
18 # Function called to trigger a reboot on the server
19 # Usage: server_inject_reboot SERVER
20 function server_inject_reboot
21 {
22 >-----reboot $1
23 }
24
```



Admin – Add Driver

This build requires parameters:

NAME

What is the name of this driver?

FORGET_CLIENTS

Does this server support forgetting client state?

FORGET_LOCKS

Does this server support forgetting locks?

FORGET_OPENOWNERS

Does this server support forgetting openowners?

FORGET_DELEGATIONS

Does this server support forgetting delegations?

RECALL_DELEGATIONS

Does this server support recalling delegations?

INJECT_FAULT

Enter the command(s) that the Jenkins server (the machine hosting this page) will use to inject faults on test servers using this driver. Note that this is just the body of the "server_inject_fault" function, I'll wrap it as a function for you. You can leave this blank if all of the above faults are not supported. Parameters: \$1 = Server, \$2 = Fault.

REBOOT

Does this server support remote reboots?

INJECT_REBOOT

Enter the command(s) that the Jenkins server (the machine hosting this page) will use to trigger reboots on test servers using this driver. Note that this is just the body of the "server_inject_reboot" function, I'll wrap it as a function for you. You can leave this blank if rebooting is not supported. Parameters: \$1 = Server.

Build



Questions?

`git://git.linux-nfs.org/projects/bjschuma/jenkins-nfs.git`

