Community testing of Lustre

Contributing to maloo testing, May 2022

James Simmons

Storage Systems Engineer

Oak Ridge National Laboratory

ORNL is managed by UT-Battelle LLC for the US Department of Energy

We need to decentralize testing

- Currently whamcloud does all reported testing
  - RHEL8 servers / clients
  - Sanity + sanity-lnet testing for Ubuntu / SUSE / ARM
  - So many versions tested !!!!
- Redhat + CentoOS crises
- ARM: Linaro nearly completed own Arm64 test cluster setup for full reporting
- Still a work in progress.

Scale of test system

- Rate of turn around for testing
  - 2.5 Hours for sanity.sh testing
  - 36 hours for full testing
- Recommend 5 server nodes + 3 clients for each testing session
  - Double for ZFS + ldiskfs testing
- Normally ~20 patches per day → 160 VM testing sessions
  - 256 GB allocated per VM instances

Jenkins Setup

- Download from https://pkg.jenkins.io + Java JDK and install with rpm/ apt-get
- Create a jenkins user with home directory + password
  - Setup $HOME/.gitconfig with username@email
- Unlock master Jenkins node http://localhost:8080 with admin password
- Systemctl enable jenkins; systemctl start jenkins; systemctl status jenkins
  - Watch out for filewalls

Jenkins slave setup

- Two ways to manage slaves
  - java -jar slave.jar -jnlUrl http://yourbuildserver/computer/yourbuildnodename/slave-agent.jnlp
    - Don’t know how to use pipeline scripts with this approach
  - Manage Jenkins → Manage Nodes → New Node
    - Fill out form
    - On slave select “Create Item”. Goto to Pipeline and add your pipleline script
      - node(“Slavenode”) {
      - stage(“build”) {
        - sh ‘your script to build lustre’
        - }
        - stage(“test”) {
        - sh ‘your script to test lustre’
        - }
        - }

Basic Gerrit setup

- Based on top of git
  - Configure git for whamcloud.com
    - https://wiki.lustre.org/Using_gerrit
- Install gerrit-review
  - apt-get install git-review / yum install git-review
  - easy_install pip; pip install git-review==1.21
  - git config -global gitreview.remote origin
  - git config -global gitreview.username “username”
  - git review -s   in your tree, explore the options

Whamcloud gerrit setup

- Setup build environment for Lustre. Kernels and libraries.
  - Checkout gerrit lustre tree off of git.
- Install python and python-request
- Make sure whamcloud gerrit account is “HTTP password”
- Download from https://github.com/verygreen/lustretest/blob/master/*
  - gerrit_build and test_new.py, run_build.sh, GERRIT_AUTH.example
- Rename GERRIT_AUTH.example and update username and password

Gerrit script setup

- Edit run_build.sh to point to your kernel + lustre source location
- Edit gerrit_buildpath.py
  - CHECKPATH_RUN to point to run_build.sh
  - BUILDER_TYPE to label test type “Ubuntu 22.04”
  - Set REVIEW_HISTORY to current UNIX time
  - Change self.post_enabled to true if you want to post results

Arm64 External Builder and Testing Cluster - By Linaro

Test Infra Needed:

- Self setup Jenkins server and slave(Leverage Whamcloud Jenkins is also OK)
- Use Terraform for hardware management, call Linaro Arm64 OpenStack based cloud to provision the test vm clusters and setup the environment.
- Execute test with Auster locally, then upload the test consequence to Lustre Community Maloo DB
- Test Code Repo: https://github.com/Linaro/lustretest

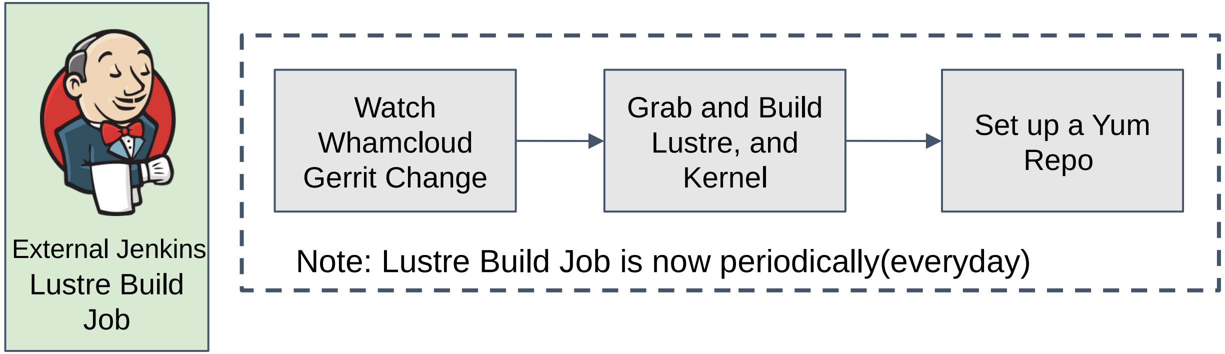
Jenkins Jobs:

- Lustre Build Job(Arm64)
- Lustre Test Job(Arm64)

Test Suites coverage:

- LUSTRE_TEST_SUITE_1 = "sanity sanity-pfl"
- LUSTRE_TEST_SUITE_2 = "ost-pools replay-single conf-sanity"
- LUSTRE_TEST_SUITE_3 = "insanity mmp replay-ost-single sanity-dom sanity-flr sanity-hsm sanity-quota"
- LUSTRE_TEST_SUITE_4 = "lustre-rsync-test recovery-small sanity-scrub sanityn"
- LUSTRE_TEST_SUITE_5 = "mds-survey replay-dual runtests sanity-lfsck sanity-sec"
- LUSTRE_TEST_SUITE_6 = "recovery-small sanity-sec sanity-selinux large-scale"

Arm64 External Builder and Testing Cluster - By Linaro



External Jenkins Lustre Build Job

Watch Whamcloud Gerrit Change → Grab and Build Lustre, and Kernel → Set up a Yum Repo

Note: Lustre Build Job is now periodically(everyday)

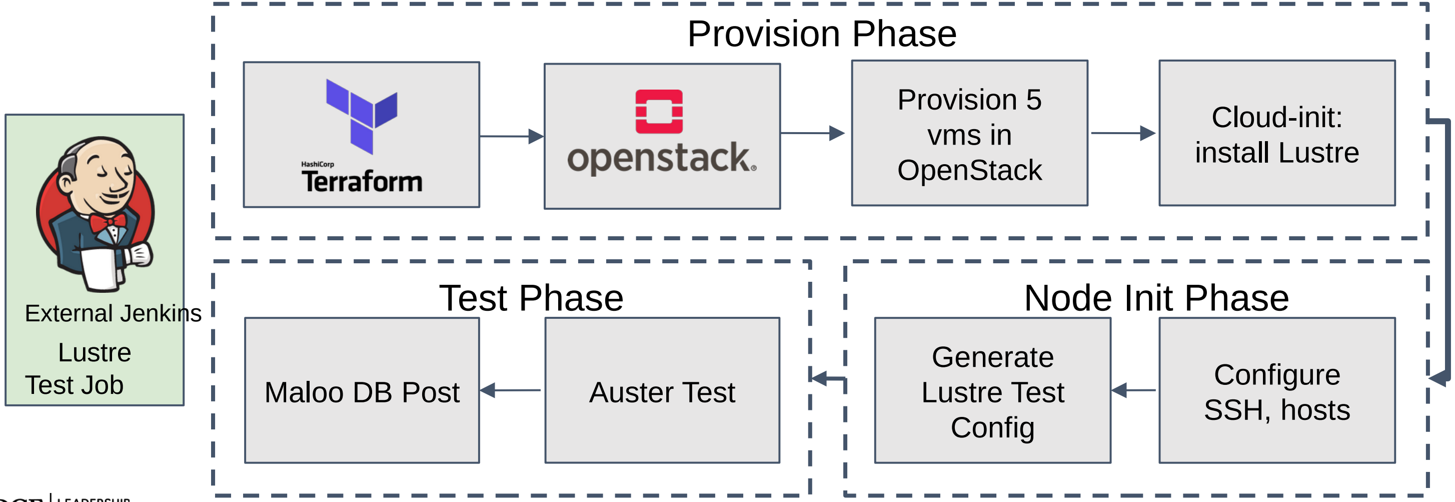
Lustre Build Job:

- Use gerrit_buildpatch.py to watch the change in upstream.
- Trigger the build process in Linaro Arm64 Jenkins Slave.
- Use build-release.sh which leverage Lustre “lbuild” script to execute the build job
- Move the build RPMs to https://uk.linaro.cloud/release as the external Arm64 Lustre repo.

Arm64 External Builder and Testing Cluster - By Linaro

Lustre Test Job:

- Provision: Use Terraform ->OpenStack to provision test clusters, and use cloud-init to install Lustre RPM which is generated from Lustre Build Job, configure the test environment.
- Node Init: configure the ssh, hosts and generate Lustre test config.
- Run Auster and upload the data to Maloo DB.
- All the script and Terraform templates has been published at Linaro github.



Acknowledgements

This work was performed under the auspices of the U.S. DOE by Oak Ridge Leadership Computing Facility at ORNL under contract DE-AC05-00OR22725.