Community Release Update

LUG 2017

Peter Jones HPDD, Intel
OpenSFS Lustre Working Group
OpenSFS Lustre Working Group

Lead by Peter Jones (Intel) and Dustin Leverman (ORNL)

Single forum for all Lustre development matters
  – Oversees entire Lustre development cycle
  – Maintains the roadmap
  – Plans major releases
  – Collects requirements for future Lustre features
  – Sets priorities for test matrix

For more information visit the wiki
http://wiki.opensfs.org/Lustre_Working_Group
Community Survey

• Has been running for 6 years
• LWG devises questions
• Useful for tracking trends in Lustre usage
• Drop in respondents compared to 2016 survey (97 to 70)
• Full details available at http://wiki.opensfs.org/Lustre_Community_Survey
Community Survey - Versions

- Lustre 2.5.x remains the most commonly-used version in production
- Strong adoption of more current releases
Community Survey - Linux distros

- RHEL/CentOS 6.x still the most widely used distro
- RHEL/CentOS 7.x now widely used

What Linux distributions do you use in production?

- Ubuntu 16.04
- Ubuntu 14.04
- SLES 12 SP2
- SLES 12 SP1
- SLES 12
- SLES 11 SPx
- RHEL/CentOS 7.x
- RHEL/CentOS 6.x
- RHEL/CentOS 5.x

Clients #

Servers #
Community Survey - Networks

Which kind of networks do you use with Lustre within your organization?

- Many options used but Mellanox and 10 GigE remain the most common
Community Survey – New Features

- DNE and LFSCK usage grew since last year
Community Survey - Support

- Even split between those self-supporting and those using/providing vendor support
Lustre 2.9

• GA December 2016
• Supports RHEL 7.3 servers/clients and SLES12 SP1 clients
• Varied features
  • UID/GID mapping (LU-3291)
  • Shared Secret Key Crypto (LU-3289)
  • Subdirectory Mounts (LU-28)
  • ZFS Metadata Improvements (LU-7895)
  • RPM Kernel Module Weak Updates (LU-5614)
  • Server Side I/O Advise (ladvice) (LU-4931)
  • Large Bulk IO (LU-7990)
• http://wiki.lustre.org/Release_2.9.0
Lustre 2.9 - Contributions

Number of Commits

Lines of Code Changed

Statistics courtesy of Dustin Leverman (ORNL)
Aggregated data by organization between 2.8.50 and 2.9.0 tags
Source: http://git.whamcloud.com/fs/lustre-release.git/shortlog/refs/heads/b2_9
Lustre 2.9 - Reviews

Number of Reviews

Statistics courtesy of Dustin Leverman (ORNL)

Aggregated data by organization between 2.8.50 and 2.9.0 tags
Lustre 2.10

- Targeted GA June 2017
  - Latest status on how this is trending…
- Will support RHEL 7.3 servers/clients and SLES12 SP2 clients
- Interop/upgrades from Lustre 2.9 servers/clients
- Will be designated an LTS Release and have freely available maintenance releases
  - Lustre 2.10.1 targeted for Q3 release
  - Lustre 2.10.x will remain LTS branch for at least 18 months
- [http://wiki.lustre.org/Release_2.10.0](http://wiki.lustre.org/Release_2.10.0)
Lustre 2.10 - Features

• A number of new features included in this release
  • Progressive File Layouts (LU-8998)
  • Multi-Rail LNET (LU-7734)
  • Project Quotas (LU-4017)
  • NRS Delay Policy (LU-6283)
  • ZFS Snapshots (LU-8900)
• [http://wiki.lustre.org/Release_2.10.0](http://wiki.lustre.org/Release_2.10.0)
Lustre 2.10 – Progressive File Layouts

• Progressive File Layout (PFL) simplifies usage for users and admins
  ▪ Optimize performance for diverse users/applications
  ▪ One PFL layout could be used for all files
  ▪ Low stat overhead for small files
  ▪ High IO bandwidth for large files

• Collaboration between Intel and ORNL

Example progressive file layout with 3 components

<table>
<thead>
<tr>
<th>1 stripe</th>
<th>4 stripes</th>
<th>128 stripes</th>
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</thead>
<tbody>
<tr>
<td>[0, 32MB)</td>
<td>[32MB, 1GB)</td>
<td>[1GB, ∞)</td>
</tr>
</tbody>
</table>
Lustre 2.10 – Multi-Rail LNet

• Allow LNet across multiple network interfaces
  ▪ Supports all LNet networks – LNet layer instead of LND layer
  ▪ Allows concurrent use of different LNDs (e.g. both TCP & IB at once)
• Scales performance significantly
• Improves reliability
  ▪ Active-active network links between peers
• Collaboration between Intel and HPE/SGI
Lustre 2.10.x – Additional Content

• Confirmed in 2.10.0
  • ZFS Metadata Improvements (LU-7895)
  • OPA Performance improvements (LU-8943)
  • Pacemaker scripts (LU-8457/8458)
  • Feature/bugfix parity with latest EE 3.x Lustre releases

• Coming in 2.10.x maintenance release
  • Patchless servers (LU-20)
  • Support for 4.9 kernel Lustre clients (LU-9183)
  • Single thread performance improvements (LU-8964)
  • SLES12 SP2 server support
  • Ubuntu 16.04 LTS Lustre client support
  • MOFED 4.x support
Lustre 2.10 - Contributions

Number of Commits

Lines of Code Changed

Statistics courtesy of Dustin Leverman (ORNL)
Aggregated data by organization between 2.9.50 and 2.9.56 tags
Source: http://git.whamcloud.com/fs/lustre-release.git/shortlog/refs/heads/master
Lustre 2.10 - Reviews

Number of Reviews

Source: http://git.whamcloud.com/fs/lustre-release.git/shortlog/refs/heads/master
Aggregated data by organization between 2.9.50 and 2.9.58 tags
Statistics courtesy of Dustin Leverman (ORNL)
# Lustre Version Statistics

<table>
<thead>
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<th>Organizations</th>
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Statistics courtesy of Chris Morrone (LLNL)/ Dustin Leverman (ORNL)

Source: [http://git.whamcloud.com/fs/lustre-release.git](http://git.whamcloud.com/fs/lustre-release.git)

*Data for 2.10 is incomplete and only runs up until 2.9.58
Lustre 2.11 and Beyond

• Many interesting long term features in development
  • File Level Redundancy
  • Data on MDT
  • LNet Network Health
• Full list maintained on lustre.org wiki
  • http://wiki.lustre.org/Projects
• Roadmap kept up to date on lustre.org
  • http://lustre.org/roadmap/
### Community Release Roadmap

<table>
<thead>
<tr>
<th>2.9</th>
<th>2.10*</th>
<th>2.11</th>
<th>2.12</th>
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<tr>
<td><strong>2018</strong></td>
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- **2.9**
  - UID/GID Mapping
  - Shared Key Crypto
  - Large Block IO
  - Subdirectory Mounts

- **2.10***
  - ZFS Snapshots
  - Multi-rail LNET
  - Progressive File Layouts
  - Project Quotas

- **2.11**
  - Data on MDT
  - FLR – Delayed Resync
  - Lock Ahead

- **2.12**
  - FLR – Immediate Resync
  - LNet Network Health

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*LTS Release with maintenance releases provided

Estimates are not commitments and are provided for informational purposes only.

Fuller details of features in development are available at [http://wiki.lustre.org/Projects](http://wiki.lustre.org/Projects)

Last updated: April 20\textsuperscript{th} 2017

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LTS Releases

• Long Term Stable (LTS) releases will remain active for at least 18 months
  • Similar idea to Whamcloud maintenance release streams
  • Updates for bugfixes and to support newer Linux distro releases
  • Will announce details of next release as they become available

• Maintenance releases may also be produced for other community releases but only until next major release
  • i.e. no updates for 2.n when 2.n+1 has been released
  • Will depend upon levels of adoption
Lustre Release Documentation

- Latest version of user documentation dynamically available to download
  - http://lustre.org/documentation/
  - Also links to details on how to contribute
- If you know of gaps then please open an LUDOC ticket
  - If you have not got time to work out the correct format to submit then unformatted text will provide a starting point for someone else to complete
- More dynamic content on http://wiki.lustre.org
Summary

• Lustre 2.10.0 is expected shortly
• Freely available 2.10.x maintenance releases planned
• Plenty of options for those interested in contributing to Lustre
Thank you