Community Release Update

LAD 2017

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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 - Versions

- Survey conducted March 2017 (so before 2.10 was available)
- Lustre 2.5.x remains the most commonly-used version in production
- Strong adoption of more current releases
- Full results at [http://wiki.opensfs.org/Lustre_Community_Survey](http://wiki.opensfs.org/Lustre_Community_Survey)
Lustre 2.10

• Went GA July 13th 2017
• Supports RHEL 7.3 servers/clients and SLES12 SP2 clients
• Interop/upgrades from Lustre 2.9 servers/clients
• Designated LTS Release - 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
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)
- Some useful enhancements
  - 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
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

<table>
<thead>
<tr>
<th>Example progressive file layout with 3 components</th>
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<tr>
<td>1 stripe [0, 32MB)</td>
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<td><img src="image-url" alt="Diagram showing file layout with three components" /></td>
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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 - Contributions

Number of Commits

Lines of Code Changed

Statistics courtesy of Dustin Leverman (ORNL)

Aggregated data by organization between 2.9.50 and 2.10.0 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 2.10.0 tags

Statistics courtesy of Dustin Leverman (ORNL)
## Lustre Version Statistics

<table>
<thead>
<tr>
<th>Version</th>
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<th>LOC</th>
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<th>Organizations</th>
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</table>

Statistics courtesy of Chris Morrone (LLNL)/ Dustin Leverman (ORNL)

Source: http://git.whamcloud.com/fs/lustre-release.git
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 further updates for 2.n when 2.n+1 has been released
  • Will depend upon levels of adoption
Lustre 2.10.x Maintenance Releases

• Lustre 2.10.1 maintenance release approaching GA
  • RHEL 7.4 server and client support
  • ZFS 0.7.1 default version of ZFS used
  • MOFED 4.1 support
  • Support for 4.9 kernel Lustre clients (LU-9183)
  • RHEL 6.9 Lustre client support
  • Ubuntu 16.04 LTS Lustre client support

• Coming in Future 2.10.x maintenance releases
  • Patchless servers (LU-20)
  • Support for 4.12 kernel Lustre clients (LU-9558)
  • Single thread performance improvements (LU-8964)
  • SLES12 SPx server support
Lustre 2.11

• Targeted for Feb 2018 release
• Will support
  - RHEL 7.4 servers/clients
  - SLES12 SP3 clients
  - Ubuntu 16.04 clients
• Interop/upgrades from latest Lustre 2.10.x servers/clients
• Several features targeted for this release
  - Lock-ahead (LU-6179)
  - Data on MDT (LU-3285)
  - File Level Redundancy – Delayed Resync (LU-9771)
• http://wiki.lustre.org/Release_2.11.0
Community Release Roadmap

- **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

* 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 20th 2017
IML 4.0

• IML 4.0 approaching GA
• [https://github.com/intel-hpdd/intel-manager-for-lustre/releases](https://github.com/intel-hpdd/intel-manager-for-lustre/releases)
• First open source release of IML
  ▪ Provides intuitive browser-based administration of Lustre filesystems
  ▪ Distributed under an MIT license
  ▪ Compatible with Lustre 2.10.1
• Possible for sites running Intel EE 2.x and 3.x to upgrade
• IML releases are now decoupled from Lustre releases
  ▪ This will mean more flexibility for release timing
• Simple for those interested to setup for demo or development
IML 4.1

• Planned for Q1 2018; content being finalized
  ▪ [https://github.com/intel-hpdd/intel-manager-for-lustre/issues](https://github.com/intel-hpdd/intel-manager-for-lustre/issues)
  ▪ Your input into this process is welcomed!
  ▪ Mechanisms in place for community contributions
• IML is in plans for upcoming extreme scale deployments
  ▪ This will influence roadmap over coming releases
  ▪ Event-driven architectures vs polling
• IML to become more modular
  ▪ Allows users to pick and choose which parts to utilize
• ZED provides interesting opportunities in both scale and scope
  ▪ Leverage to discover pools, datasets and properties
  ▪ Monitoring and alerts
Lustre Release Documentation

- Latest version of manual dynamically available to download
  - http://lustre.org/documentation/
  - Also links for 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
- Large amount of content being added on lustre.org
  - http://wiki.lustre.org/Category:Lustre_Systems_Administration
  - Lustre Internals content being refreshed
Summary

• Lustre 2.10.1 approaching GA; Lustre 2.10.2 targeted for Q4
• Feature freeze for Lustre 2.11 is approaching
• IML 4.0 approaching GA
• There is still time to influence content for IML 4.1
• Plenty of options for contributing to Lustre/IML
Thank you