



# Community Release Update

Japan LUG 2017

Peter Jones HPDD, Intel

OpenSFS Lustre Working Group

# OpenSFS Lustre Working Group

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

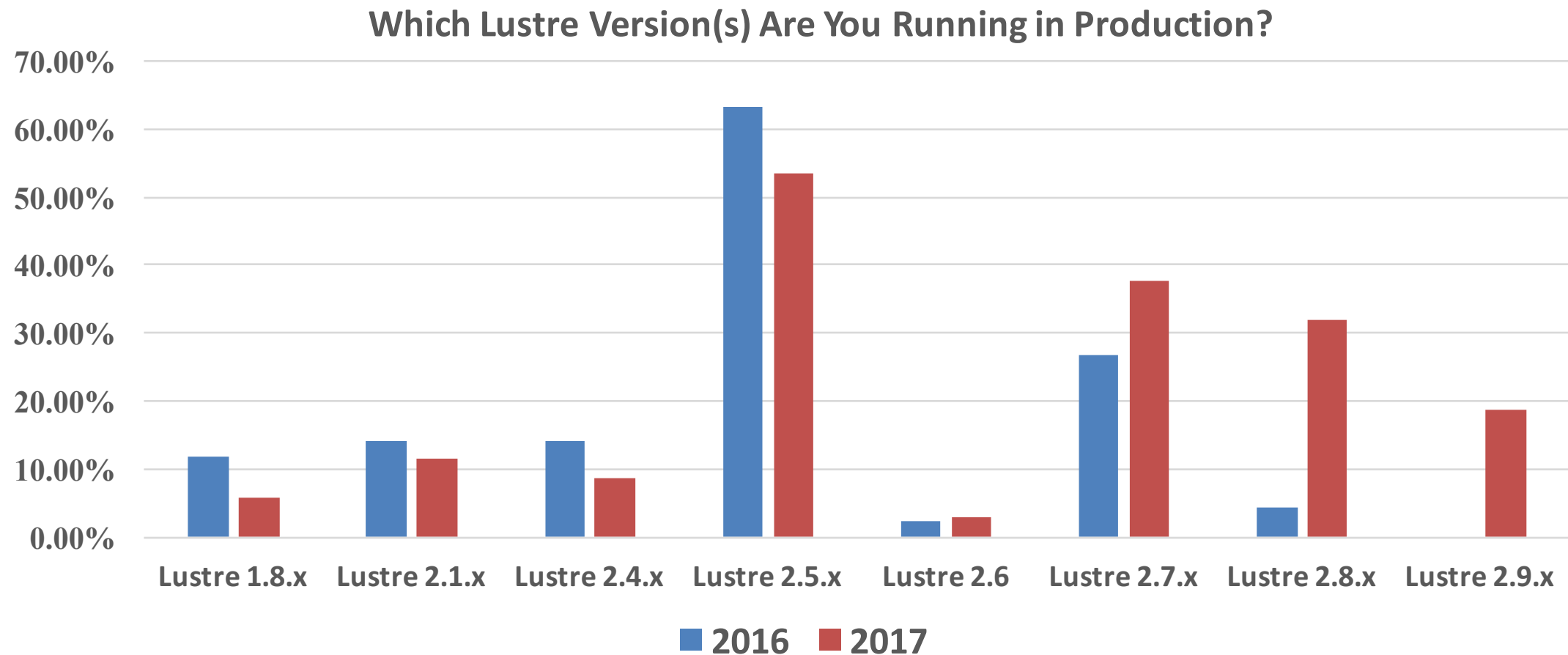
Single forum for all Lustre development matters

- 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](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 13<sup>th</sup> 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 released Oct 2<sup>nd</sup>
  - 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)

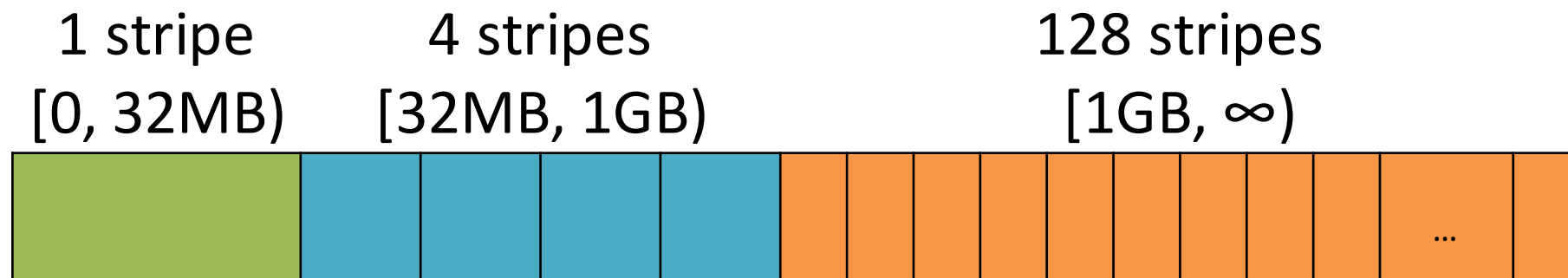
# LTS Releases

- Long Term Support (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 – Progressive File Layouts

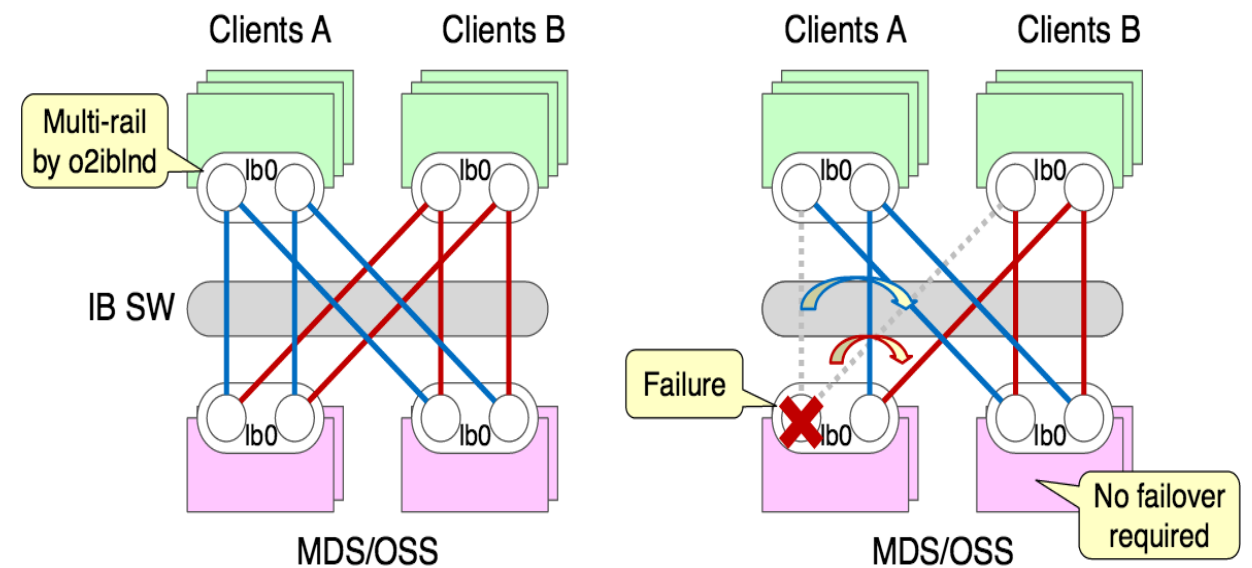
- Progressive File Layout (PFL) simplifies usage for users and admins
  - Optimize performance for diverse users/applications
  - One PFL layout could be used for all files
  - Low stat overhead for small files
  - High IO bandwidth for large files
- Collaboration between Intel and ORNL

Example progressive file layout with 3 components



# 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





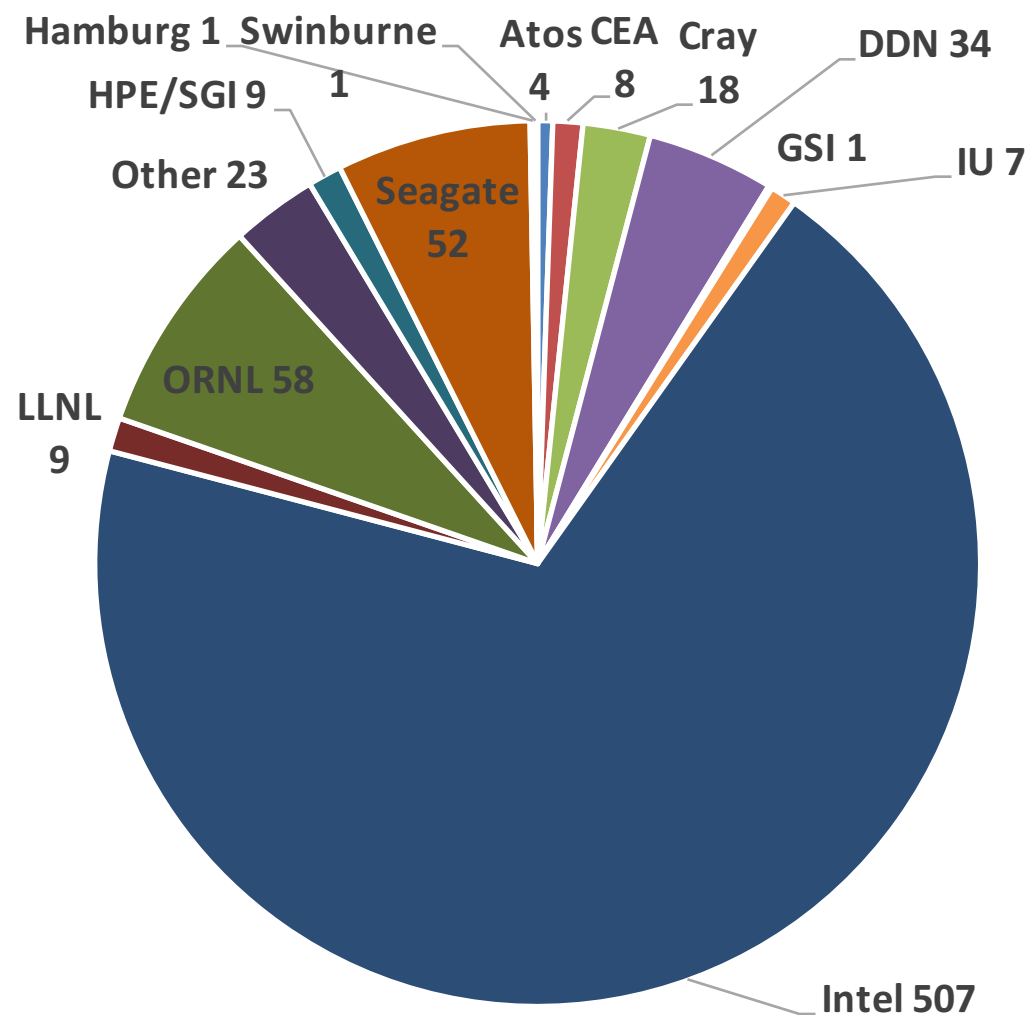
# Lustre 2.10 - Features

- 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

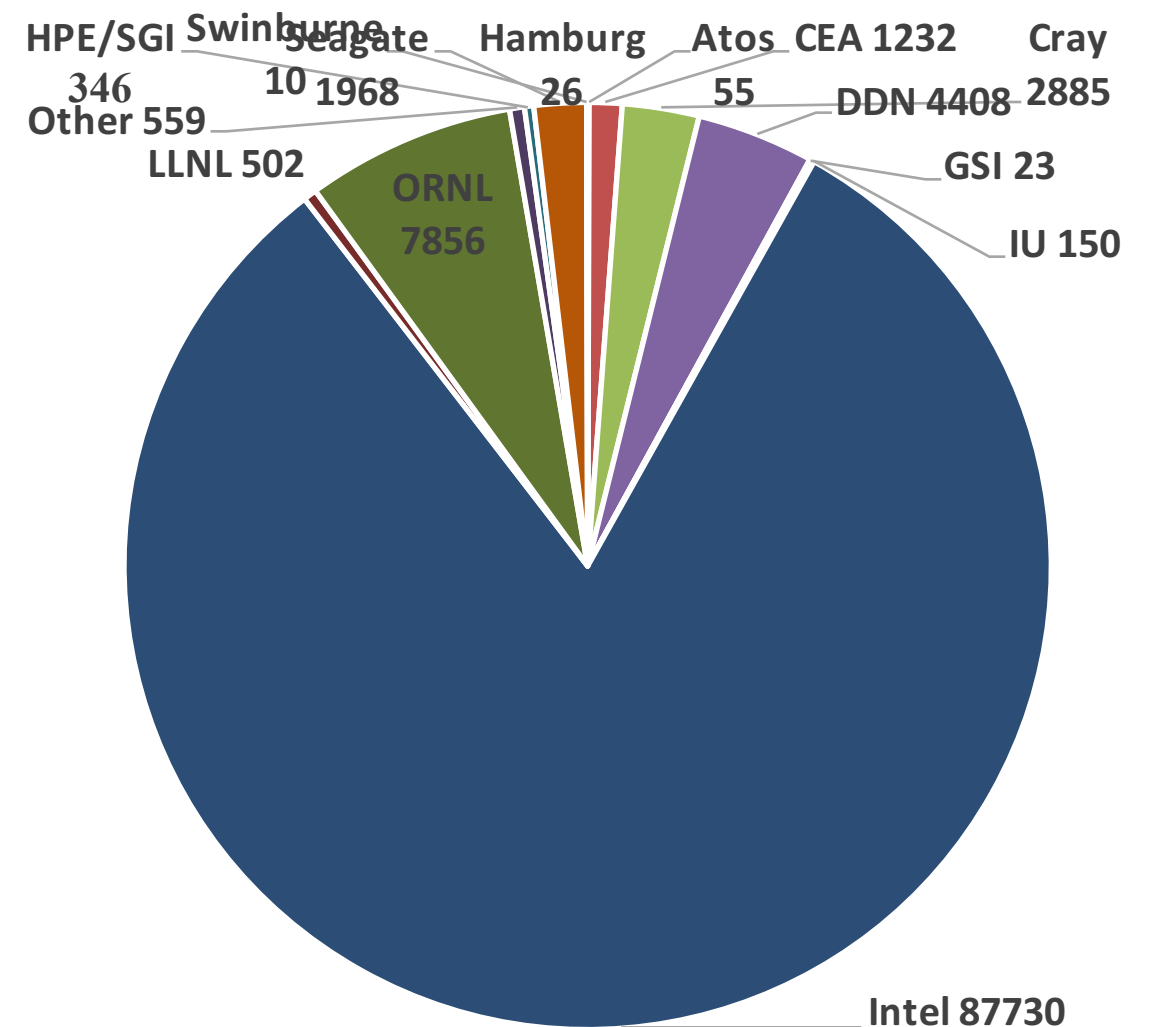


# Lustre 2.10 - Contributions

## Number of Commits



## Lines of Code Changed



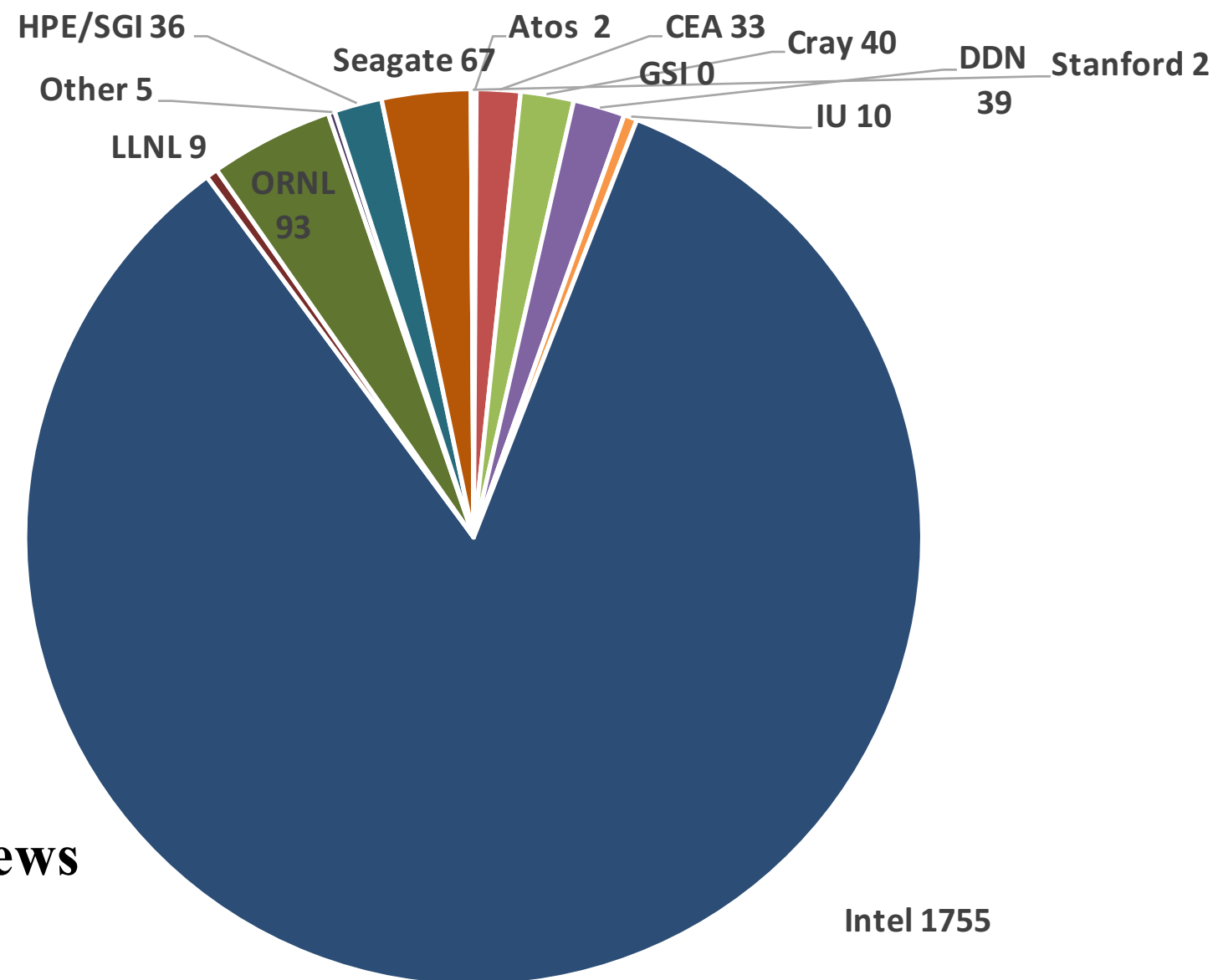
Statistics courtesy of Dustin Leverman (ORNL)

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

# 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

Version	Commits	LOC	Developers	Organizations
1.8.0	997	291K	41	1
2.1.0	752	92K	55	7
2.2.0	329	58K	42	10
2.3.0	586	87K	52	13
2.4.0	1123	348K	69	19
2.5.0	471	102K	70	15
2.6.0	885	147K	76	14
2.7.0	742	201K	65	15
2.8.0	995	147K	92	17
2.9.0	737	74K	121	16
2.10.0	732	108K	85	14

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

Source: <http://git.whamcloud.com/fs/lustre-release.git>

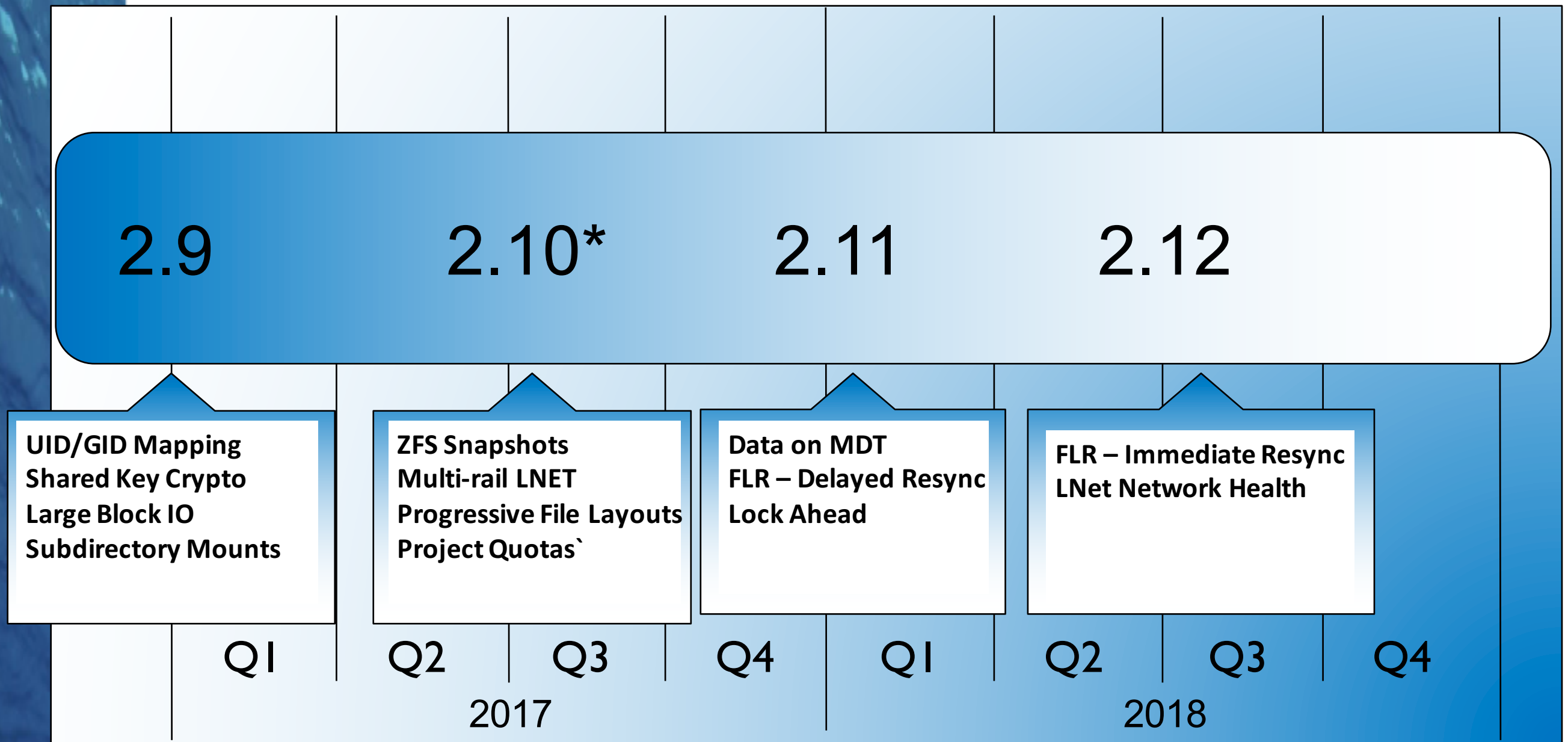
# Lustre 2.10.x Maintenance Releases

- Lustre 2.10.1 maintenance 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
- Lustre 2.10.2 planned for Q4 2017
- Coming in Future 2.10.x maintenance releases
  - Patchless servers (LU-20)
  - Support for 4.12 kernel Lustre clients (LU-9558)
  - Many-core architecture performance improvements (LU-8964)
  - SLES12 SPx server support

# Lustre 2.11

- Targeted for March 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) **LANDED**
  - Data on MDT (LU-3285) **ONGOING**
  - File Level Redundancy – Delayed Resync (LU-9771) **ONGOING**
- [http://wiki.lustre.org/Release\\_2.11.0](http://wiki.lustre.org/Release_2.11.0)

# Community Release Roadmap



\*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>

Last updated: April 20<sup>th</sup> 2017

# IML 4.0

- IML 4.0 GA
- <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
  - <https://github.com/intel-hpdd/intel-manager-for-lustre/wiki/Installing-IML-on-HPC-Storage-Sandbox>



# IML 4.1

- Planned for Q1 2018; content being finalized
  - <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
- Community developer working on localization

# 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](http://wiki.lustre.org/Category:Lustre_Systems_Administration)
  - Lustre Internals content being refreshed

# Summary

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

# Thank you

**Open Scalable File Systems, Inc.**

3855 SW 153rd Drive

Beaverton, OR 97006

Ph: 503-619-0561

Fax: 503-644-6708

[admin@opensfs.org](mailto:admin@opensfs.org)



[www.opensfs.org](http://www.opensfs.org)