Community Release Update

China LUG 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

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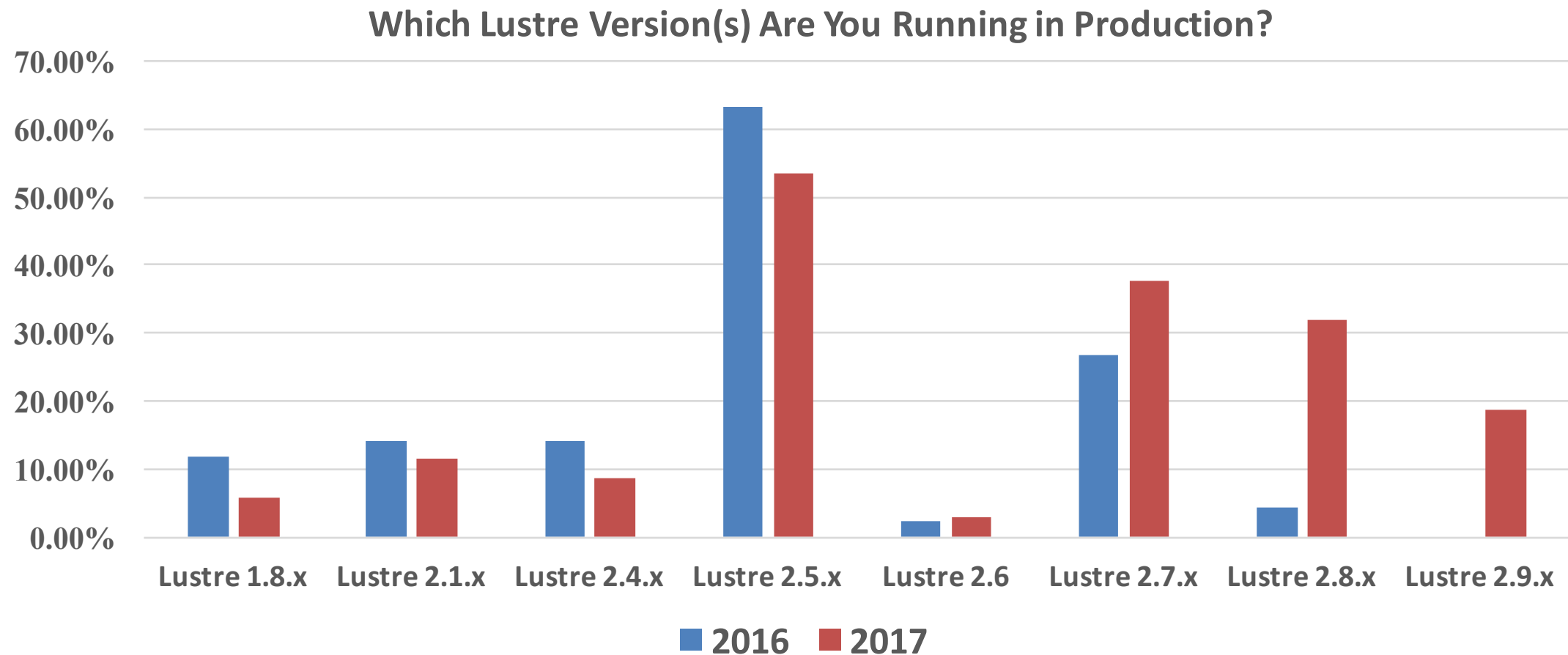
- Survey conducted March 2017 (so before 2.10 was available)
- Lustre 2.5.x remains the most commonly-used version in production
- Strong adoption of more current releases
- Full results at http://wiki.opensfs.org/Lustre_Community_Survey

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 released Oct 2nd
  - Lustre 2.10.x will remain LTS branch for at least 18 months
- 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
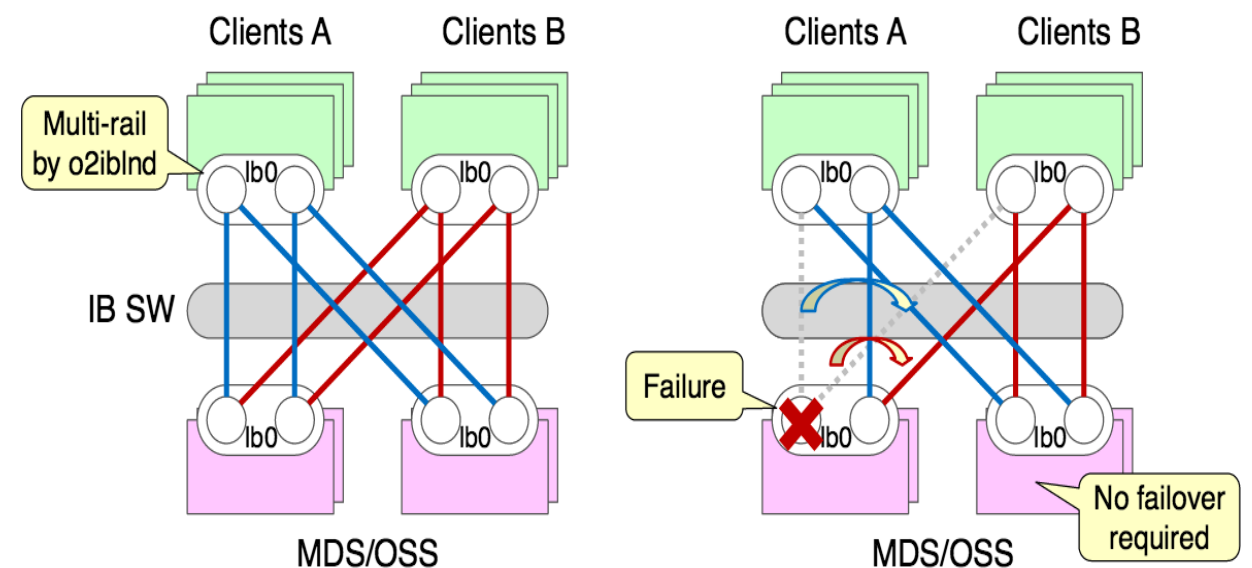
Lustre 2.10 – Progressive File Layouts

- 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

| 1 stripe | 4 stripes | 128 stripes |
| [0, 32MB) | [32MB, 1GB) | [1GB, ∞) |

…
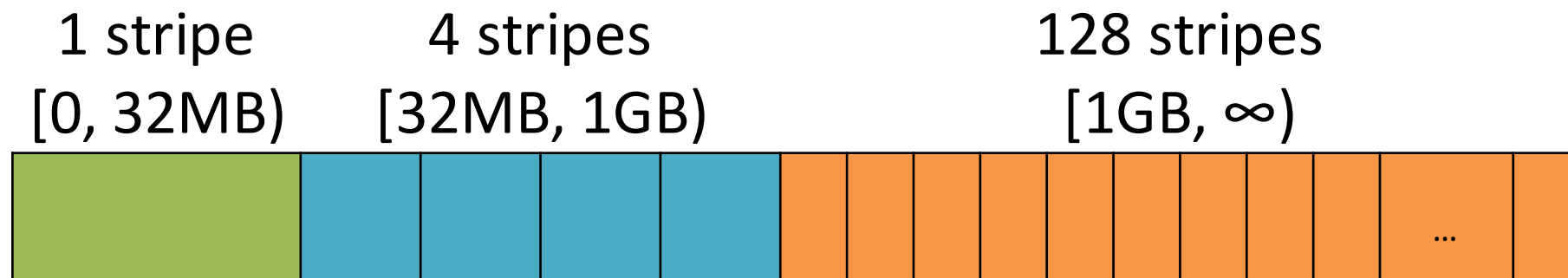
Lustre 2.10 – Multi-Rail LNet

- 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
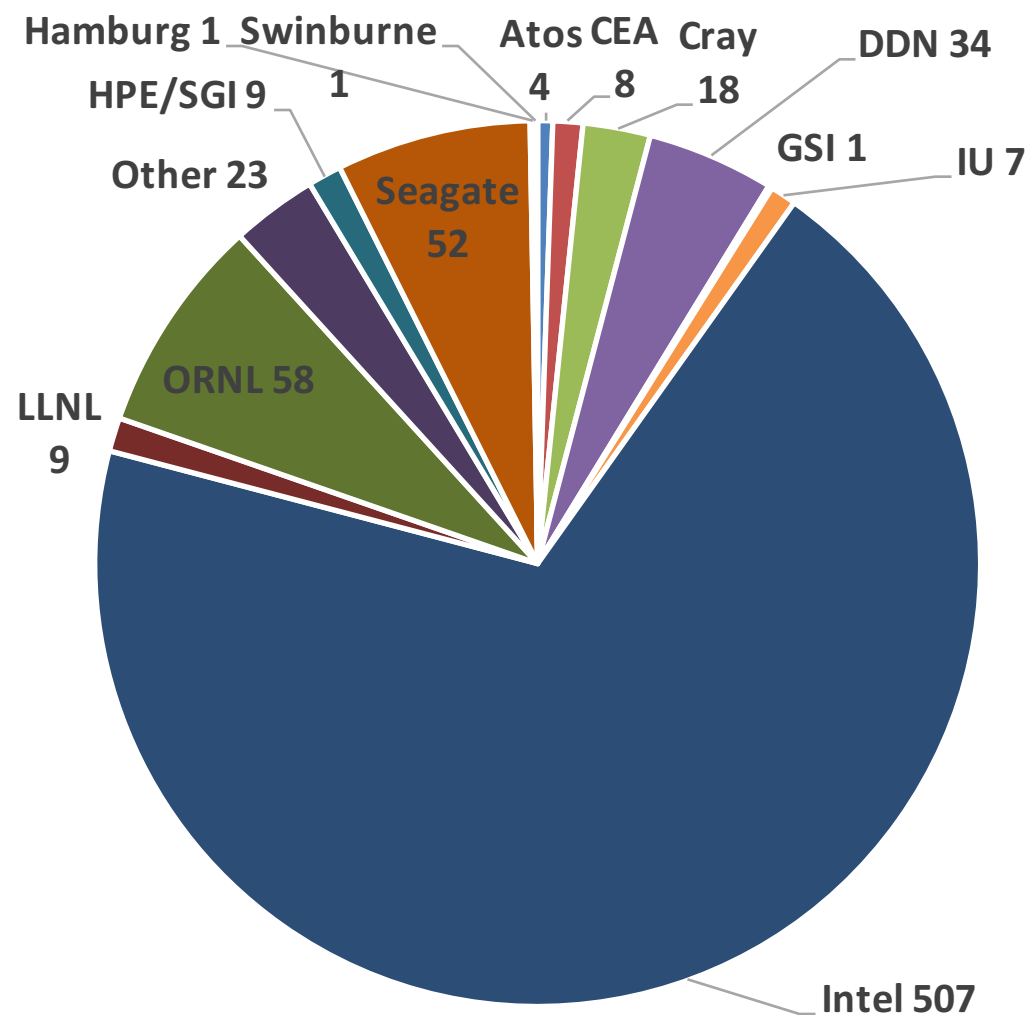- Collaboration between Intel and HPE/SGI

Lustre 2.10 - Features

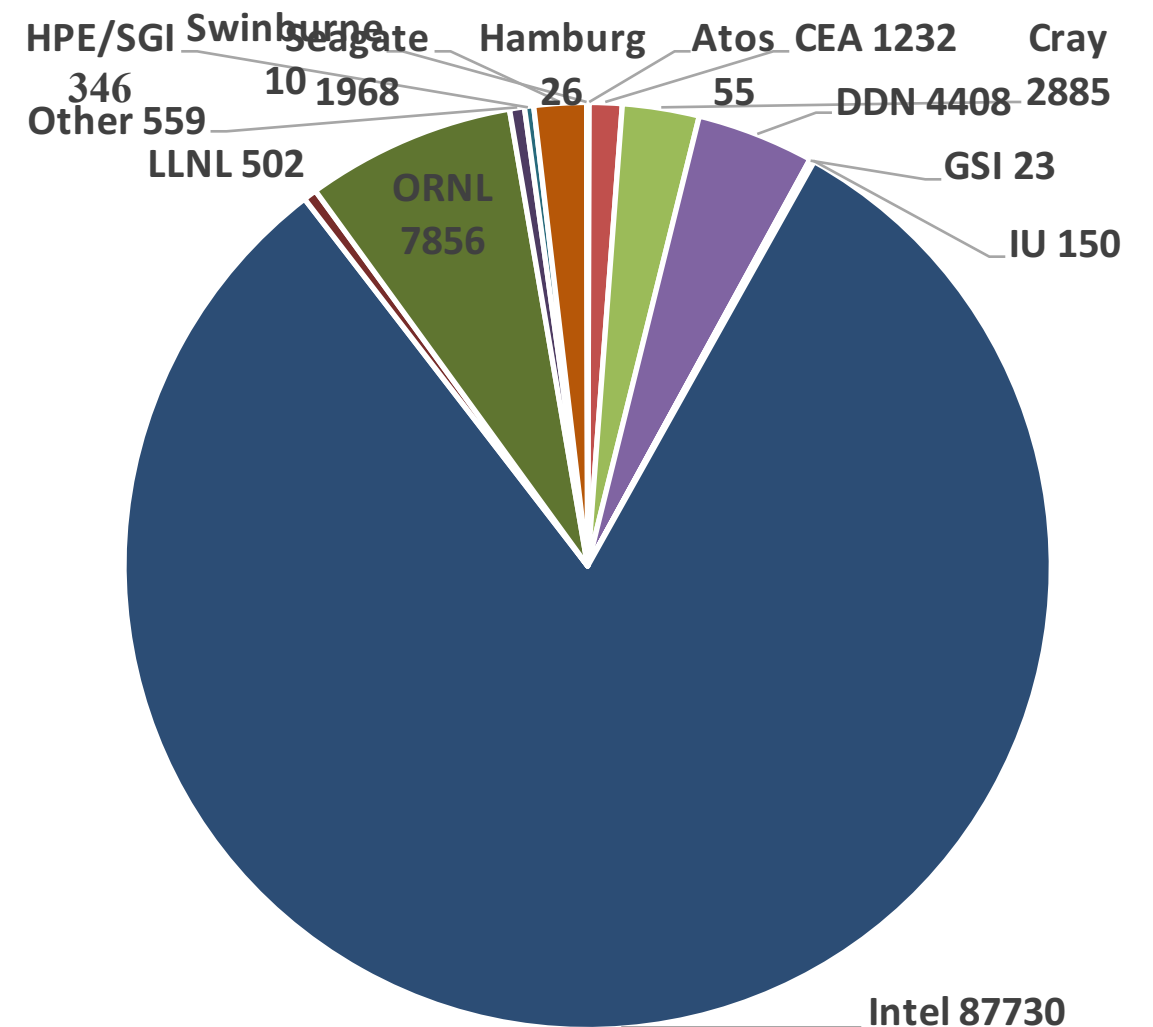- A number of new features included in this release
  - Progressive File Layouts (LU-8998)
  - Multi-Rail LNET (LU-7734)
  - Project Quotas (LU-4017)
  - NRS Delay Policy (LU-6283)
  - ZFS Snapshots (LU-8900)
- Some useful enhancements
  - ZFS Metadata Improvements (LU-7895)
  - OPA Performance improvements (LU-8943)
  - Pacemaker scripts (LU-8457/8458)
  - Feature/bugfix parity with latest EE 3.x Lustre releases

Lustre 2.10 - Contributions

Number of Commits

Hamburg 1   Swinburne 1   Atos 4   CEA 8   Cray 18   DDN 34
HPE/SGI 9   GSI 1   IU 7
Other 23
Seagate 52
ORNL 58
LLNL 9
Intel 507

Lines of Code Changed

HPE/SGI 346   Swinburne 10   Seagate 1968   Hamburg 26   Atos 55   CEA 1232   Cray 2885
Other 559   DDN 4408
LLNL 502   GSI 23
ORNL 7856   IU 150
Intel 87730
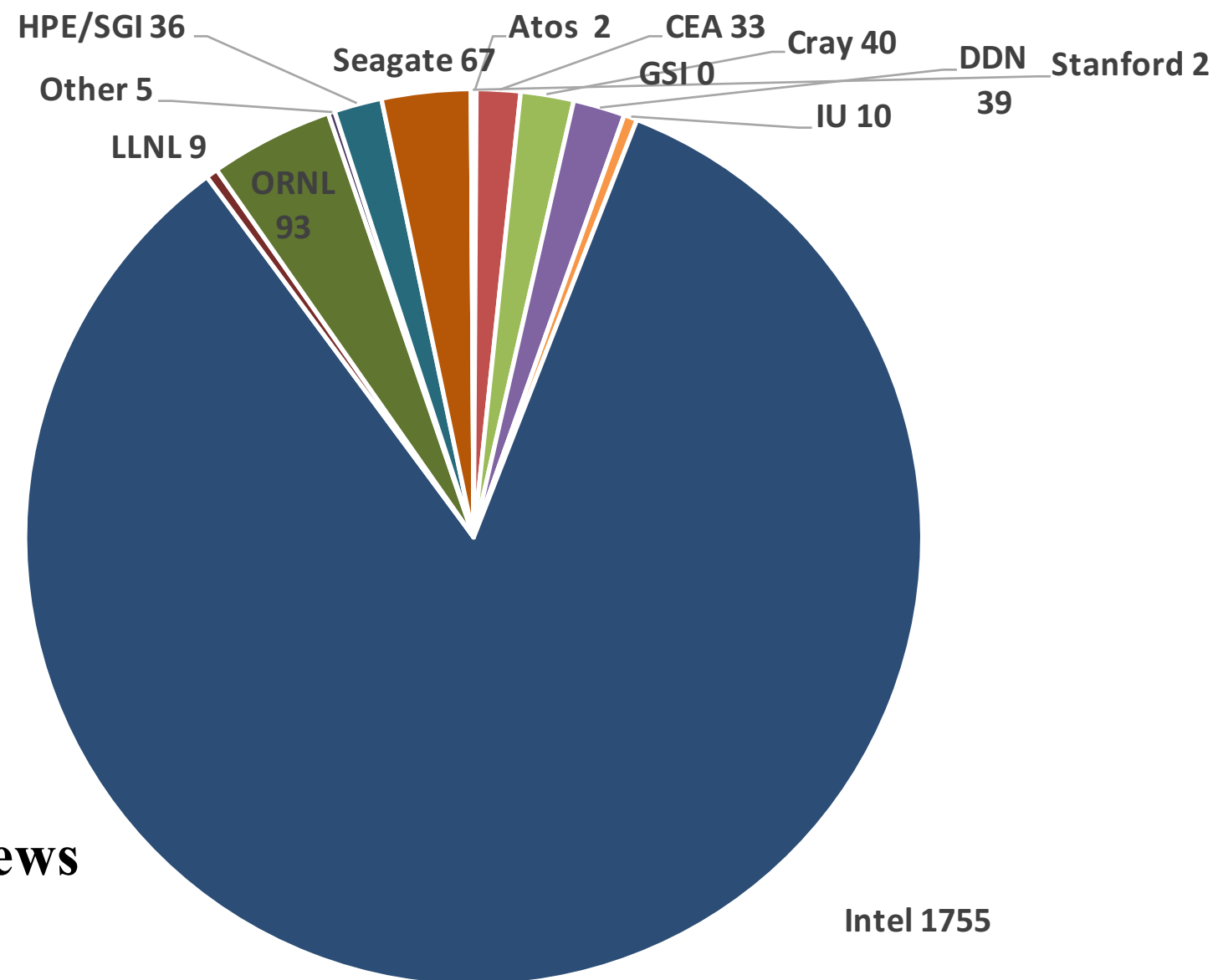
Statistics courtesy of Dustin Leverman (ORNL)

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

Labels on chart:
- HPE/SGI 36
- Other 5
- LLNL 9
- ORNL 93
- Seagate 67
- Atos 2
- CEA 33
- GSI 0
- Cray 40
- DDN 39
- IU 10
- Stanford 2
- Intel 1755

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)

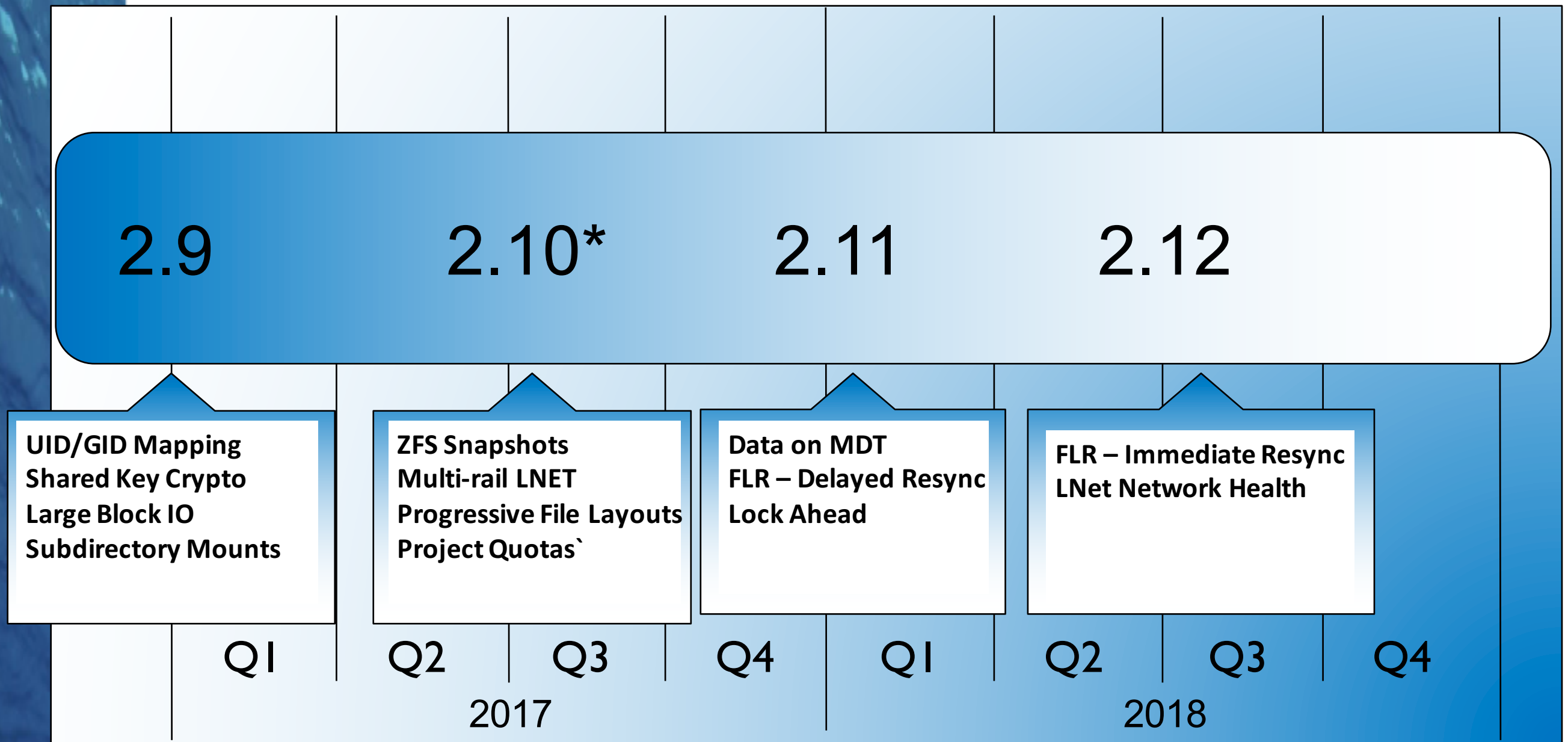Source: http://git.whamcloud.com/fs/lustre-release.git

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

Community Release Roadmap

| 2.9 | 2.10* | 2.11 | 2.12 |

UID/GID Mapping
Shared Key Crypto
Large Block IO
Subdirectory Mounts

ZFS Snapshots
Multi-rail LNET
Progressive File Layouts
Project Quotas`

Data on MDT
FLR – Delayed Resync
Lock Ahead

FLR – Immediate Resync
LNet Network Health

| Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |

2017   2018

*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 20th 2017

OpenSFS

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
  - 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

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