

Open Source at LLNL



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2020-08-17



LLNL-PRES-796969

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344. Lawrence Livermore National Security, LLC



Open Source

LAWRENCE LIVERMORE NATIONAL LABORATORY



Science & Technology Review – Jan/Feb 2018

Commentary by Bruce Hendrickson



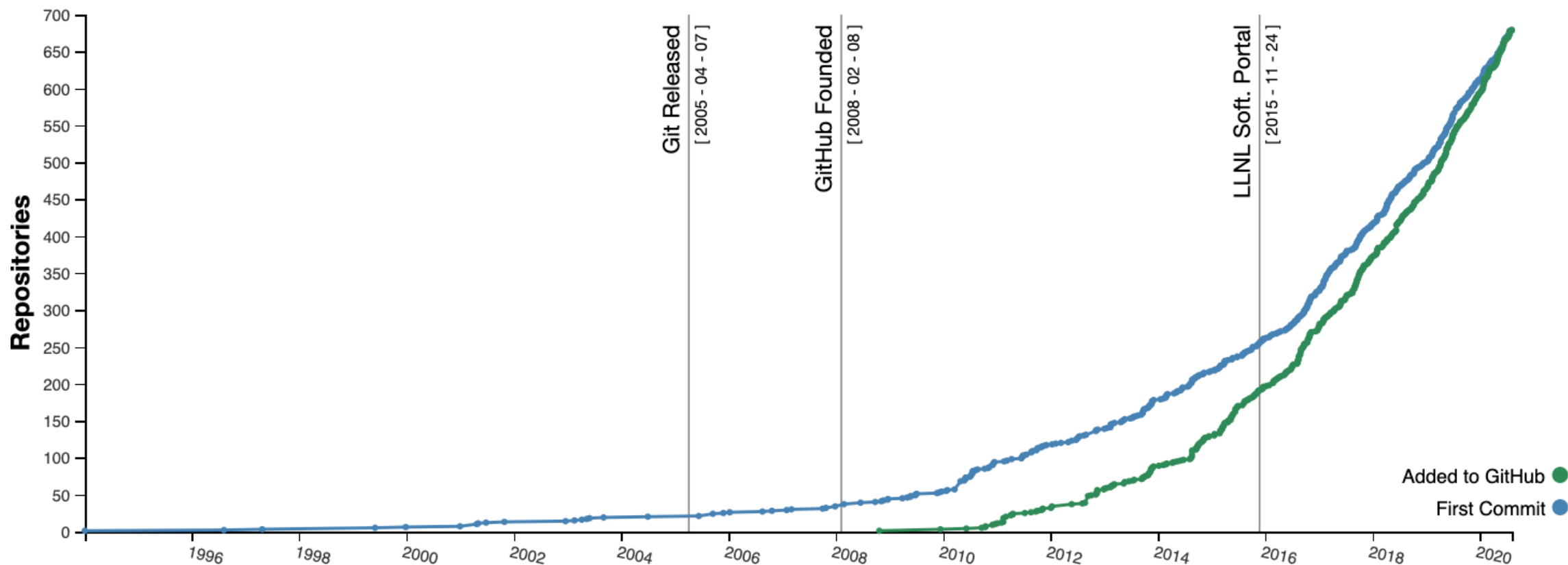
The High Value of Collaborative Software

“Our large collection of software is a precious Laboratory asset, one that benefits both Lawrence Livermore, and in many cases, the public at large.”

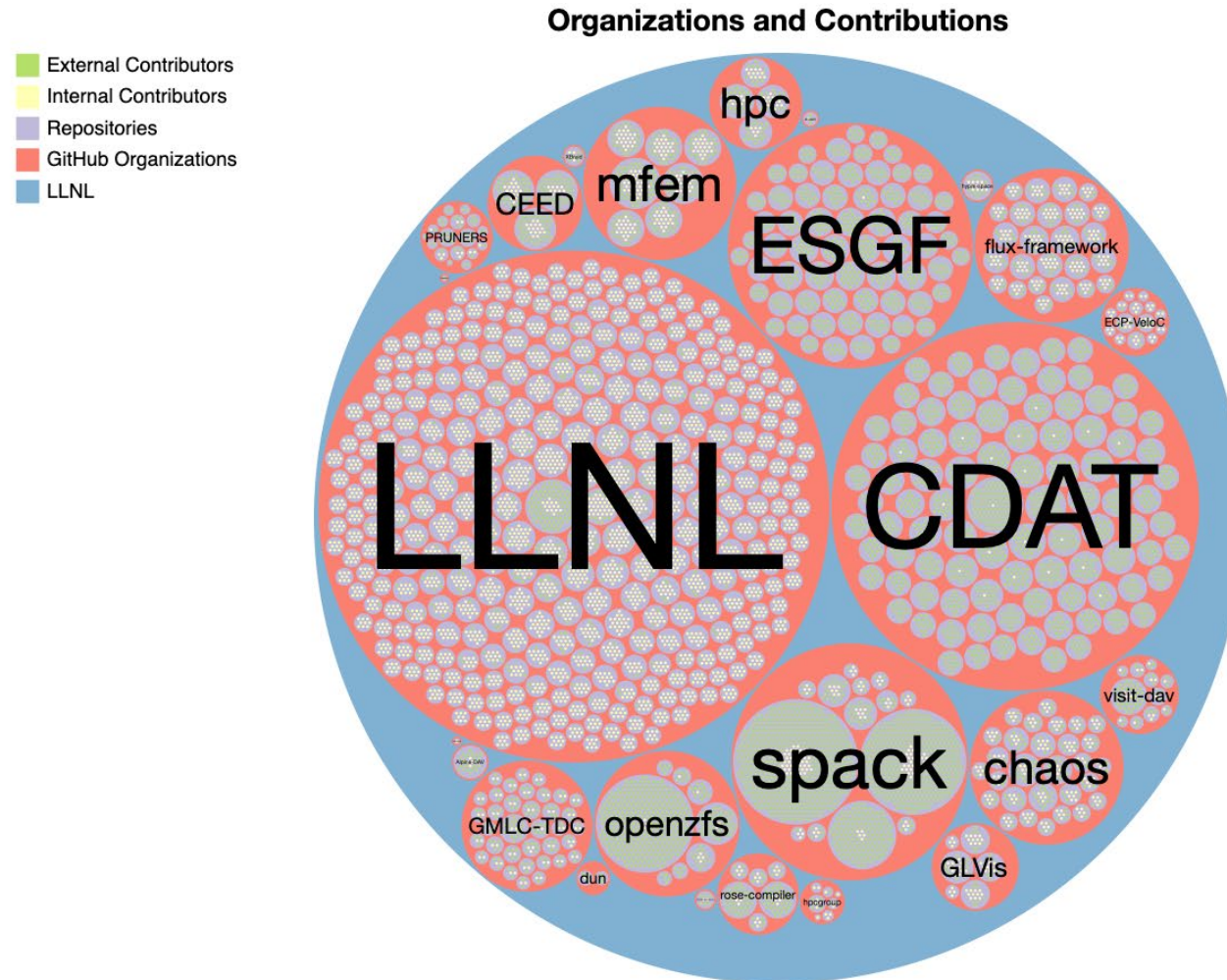
- Bruce Hendrickson
Associate Director, Computing

LLNL Open Source Presence

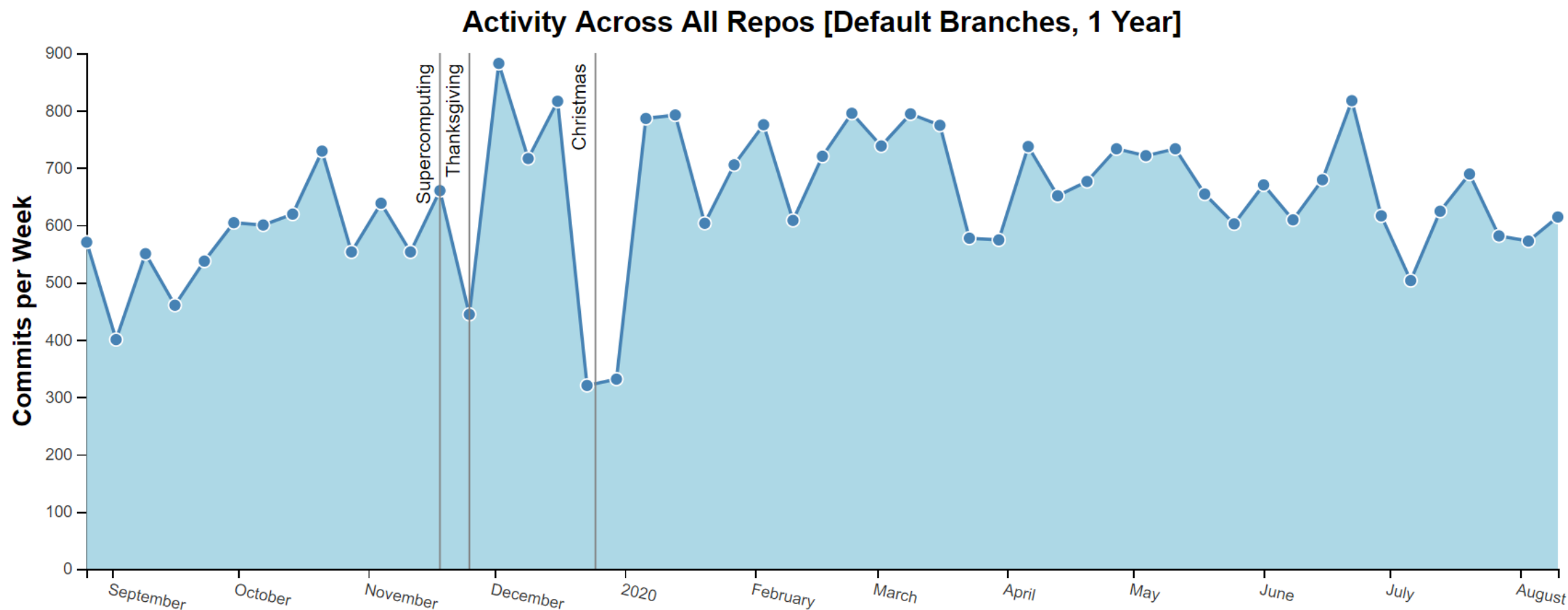
Repo Creation History



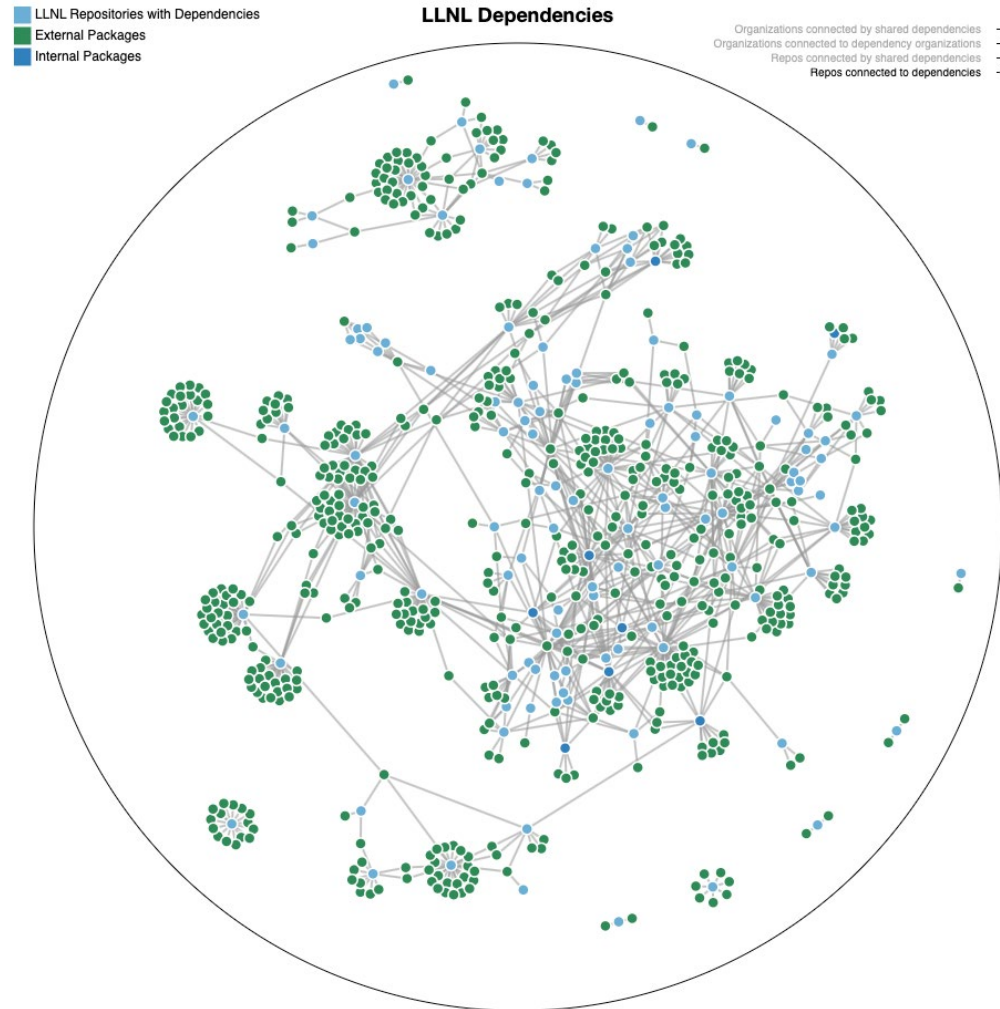
LLNL Open Source Engagement



LLNL Open Source Activity



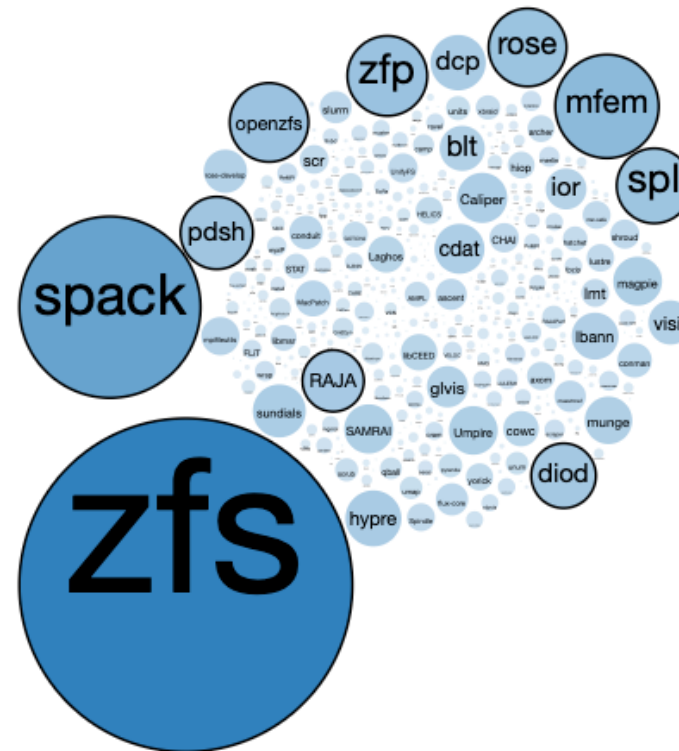
LLNL Open Source Interaction with the World



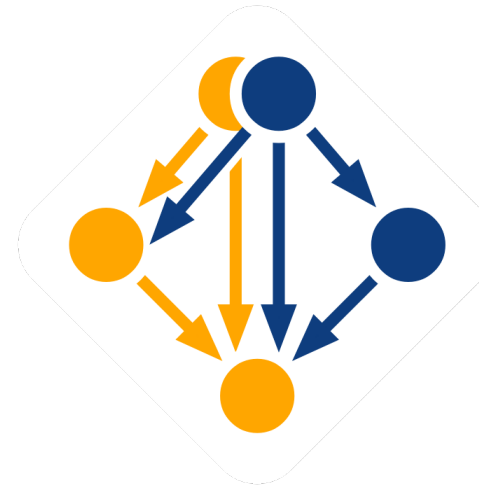
LLNL Open Source Popular Repositories

Repo Popularity by Stars

- | | | | | |
|---------------------------------------|--------------------------------|-------------------------------|-------------------------------|------------------------------------|
| 1. openzfs/zfs | 2. spack/spack | 3. mfem/mfem | 4. LLNL/zfp | 5. openzfs/openzfs |
| 6. rose-compiler/rose | 7. openzfs/spl | 8. chaos/pdsh | 9. chaos/diod | 10. LLNL/RAJA |



2019 R&D 100 Award Winners



LLNL / `scr` Watch 18 Star 43 Fork 16

[Code](#) [Issues 33](#) [Pull requests 4](#) [Actions](#) [Projects 1](#) [Security](#) [Insights](#) [Settings](#)

SCR caches checkpoint data in storage on the compute nodes of a Linux cluster to provide a fast, scalable checkpoint / restart capability for MPI codes. <http://computing.llnl.gov/projects/sc...> [Edit](#)

[scalable](#) [checkpoint](#) [mpi](#) [radiuss](#) [data-management](#) [Manage topics](#)

[388 commits](#) [46 branches](#) [10 releases](#) [1 environment](#) [11 contributors](#) [View license](#)

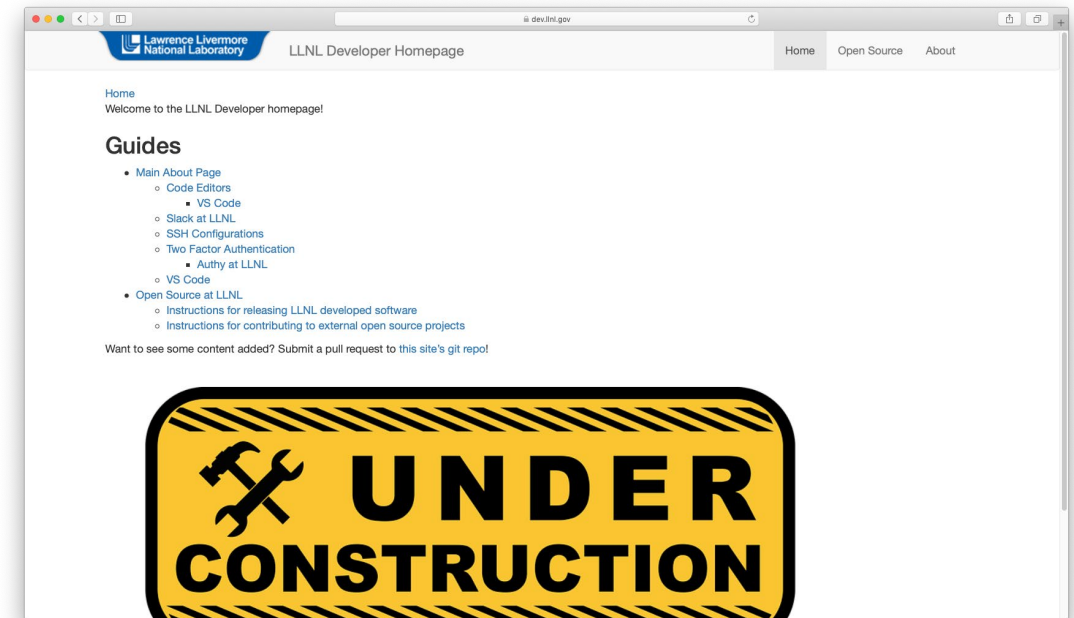
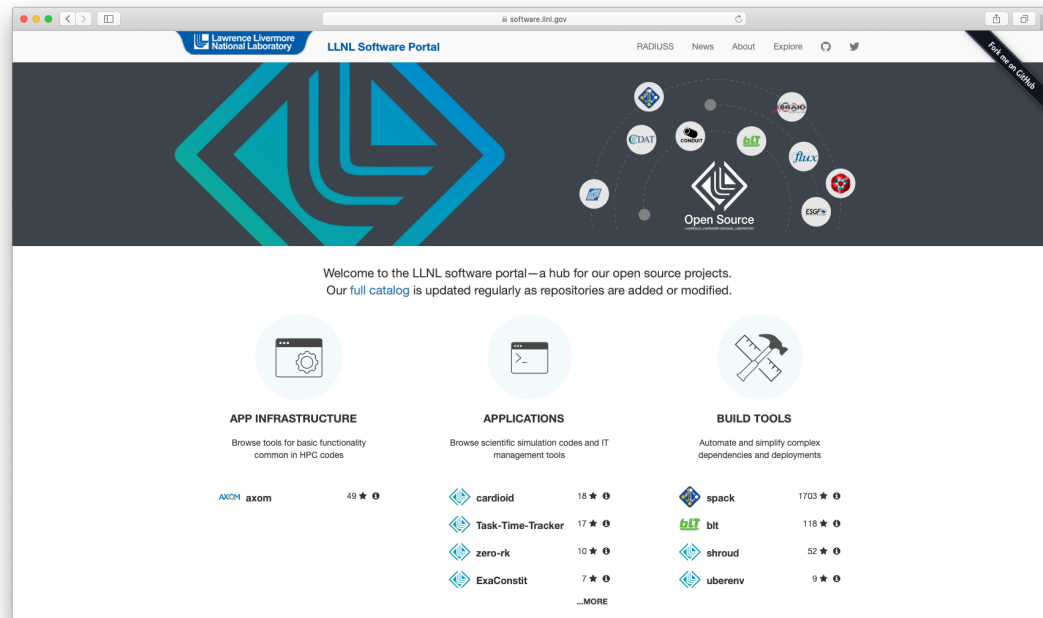
LLNL Open Source Communication



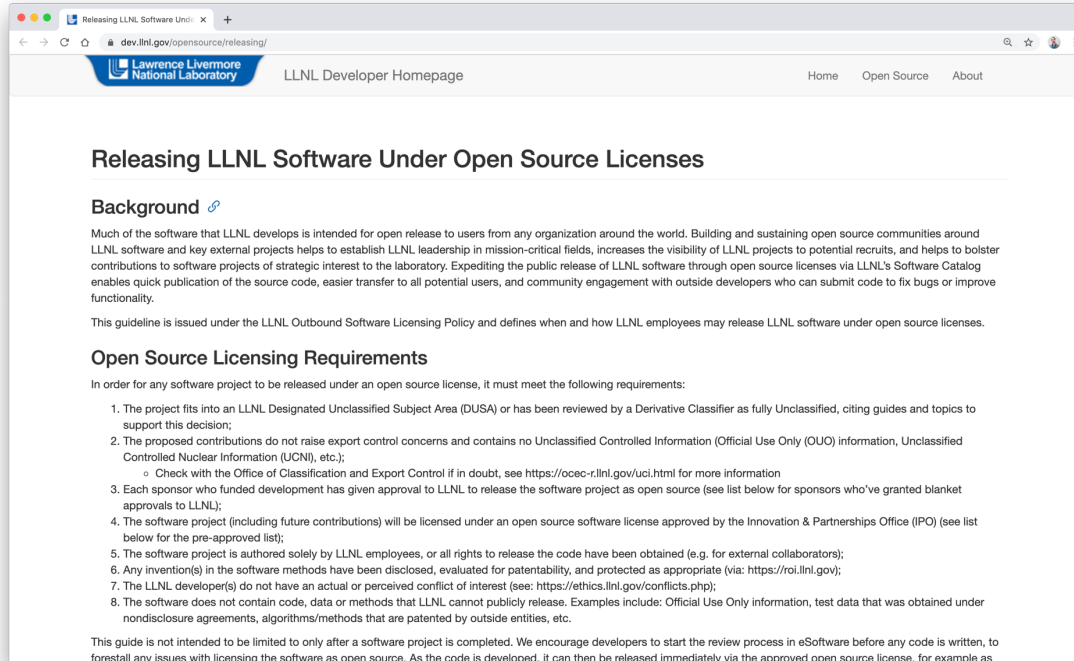
<https://llnl.slack.com>

Websites

Pull Requests Welcome!



Open Source Policy & Guidelines (May 2019)



dev.llnl.gov/opensource/releasing/

Lawrence Livermore National Laboratory

LLNL Developer Homepage

Home Open Source About

Releasing LLNL Software Under Open Source Licenses

Background

Much of the software that LLNL develops is intended for open release to users from any organization around the world. Building and sustaining open source communities around LLNL software and key external projects helps to establish LLNL leadership in mission-critical fields, increases the visibility of LLNL projects to potential recruits, and helps to bolster contributions to software projects of strategic interest to the laboratory. Expediting the public release of LLNL software through open source licenses via LLNL's Software Catalog enables quick publication of the source code, easier transfer to all potential users, and community engagement with outside developers who can submit code to fix bugs or improve functionality.

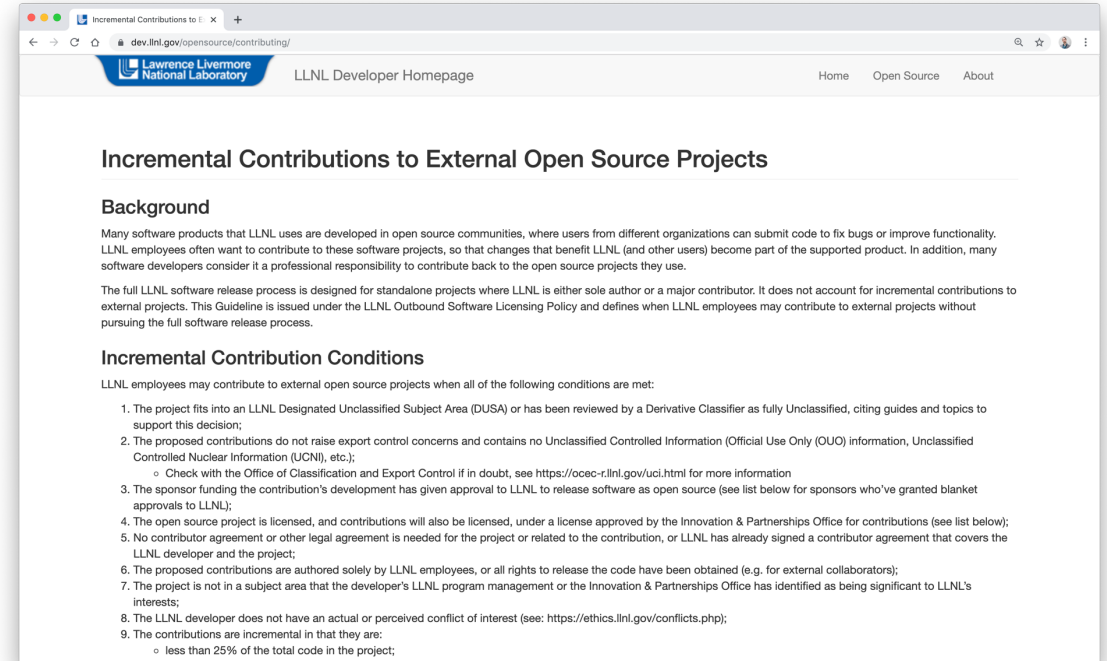
This guideline is issued under the LLNL Outbound Software Licensing Policy and defines when and how LLNL employees may release LLNL software under open source licenses.

Open Source Licensing Requirements

In order for any software project to be released under an open source license, it must meet the following requirements:

1. The project fits into an LLNL Designated Unclassified Subject Area (DUSA) or has been reviewed by a Derivative Classifier as fully Unclassified, citing guides and topics to support this decision;
2. The proposed contributions do not raise export control concerns and contains no Unclassified Controlled Information (Official Use Only (OUO) information, Unclassified Controlled Nuclear Information (UCNI), etc.);
 - Check with the Office of Classification and Export Control if in doubt, see <https://ocec-rl.llnl.gov/uci.html> for more information
3. Each sponsor who funded development has given approval to LLNL to release the software project as open source (see list below for sponsors who've granted blanket approvals to LLNL);
4. The software project (including future contributions) will be licensed under an open source software license approved by the Innovation & Partnerships Office (IPO) (see list below for the pre-approved list);
5. The software project is authored solely by LLNL employees, or all rights to release the code have been obtained (e.g. for external collaborators);
6. Any invention(s) in the software methods have been disclosed, evaluated for patentability, and protected as appropriate (via: <https://roi.llnl.gov/>);
7. The LLNL developer(s) do not have an actual or perceived conflict of interest (see: <https://ethics.llnl.gov/conflicts.php>);
8. The software does not contain code, data or methods that LLNL cannot publicly release. Examples include: Official Use Only information, test data that was obtained under nondisclosure agreements, algorithms/methods that are patented by outside entities, etc.

This guide is not intended to be limited to only after a software project is completed. We encourage developers to start the review process in eSoftware before any code is written, to forestall any issues with licensing the software as open source. As the code is developed, it can then be released immediately via the approved open source license, for example as



dev.llnl.gov/opensource/contributing/

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Incremental Contributions to External Open Source Projects

Background

Many software products that LLNL uses are developed in open source communities, where users from different organizations can submit code to fix bugs or improve functionality. LLNL employees often want to contribute to these software projects, so that changes that benefit LLNL (and other users) become part of the supported product. In addition, many software developers consider it a professional responsibility to contribute back to the open source projects they use.

The full LLNL software release process is designed for standalone projects where LLNL is either sole author or a major contributor. It does not account for incremental contributions to external projects. This Guideline is issued under the LLNL Outbound Software Licensing Policy and defines when LLNL employees may contribute to external projects without pursuing the full software release process.

Incremental Contribution Conditions

LLNL employees may contribute to external open source projects when all of the following conditions are met:

1. The project fits into an LLNL Designated Unclassified Subject Area (DUSA) or has been reviewed by a Derivative Classifier as fully Unclassified, citing guides and topics to support this decision;
2. The proposed contributions do not raise export control concerns and contains no Unclassified Controlled Information (Official Use Only (OUO) information, Unclassified Controlled Nuclear Information (UCNI), etc.);
 - Check with the Office of Classification and Export Control if in doubt, see <https://ocec-rl.llnl.gov/uci.html> for more information
3. The sponsor funding the contribution's development has given approval to LLNL to release software as open source (see list below for sponsors who've granted blanket approvals to LLNL);
4. The open source project is licensed, and contributions will also be licensed, under a license approved by the Innovation & Partnerships Office for contributions (see list below);
5. No contributor agreement or other legal agreement is needed for the project or related to the contribution, or LLNL has already signed a contributor agreement that covers the LLNL developer and the project;
6. The proposed contributions are authored solely by LLNL employees, or all rights to release the code have been obtained (e.g. for external collaborators);
7. The project is not in a subject area that the developer's LLNL program management or the Innovation & Partnerships Office has identified as being significant to LLNL's interests;
8. The LLNL developer does not have an actual or perceived conflict of interest (see: <https://ethics.llnl.gov/conflicts.php>);
9. The contributions are incremental in that they are:
 - less than 25% of the total code in the project;
 - not substantially changing the external project's code;

Open Source Policy & Guidelines (May 2019)

■ Releasing

- eSoftware: esw.llnl.gov
 - No more DVDs!
 - Getting ready for phase 2 development
- Expedited Approvals
 - Specific broad subject areas
 - Not an “application” that could have IP value
 - Not part of a CRADA or other IP agreement
 - Sponsor provided blanket approval for OSS
 - Currently: NNSA ASC & DOE Office of Science
 - Approved open source license
 - MIT, BSD-3, LGPL-2.1, GPL-2.0 are easiest

■ Contributing

- Email to: open-source-notify@llnl.gov
- Provide details about the project:
 - Unclassified? Export Controlled?
 - Funding source (sponsor) OK with open source?
 - Approved License?
 - Requires a CLA?
 - Conflict of Interest?
 - Business need?
 - Contributions are “incremental” ?

Leave things better than you found them.

Thank You!

lee1001@llnl.gov



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