

STATEMENT OF WORK

Project 1. Lustre PTLRPC Protocol Documentation

Objective

The Lustre file system contains two main protocols: LNET and PTLRPC. PTLRPC is an RPC protocol layered over LNET. In addition to LNET and PTLRPC, Lustre must also interact with external protocols for communication such as IB and TCP/IP. The scope of the work in this project will be focused on creating documentation for PTLRPC as described in the Deliverable section.

Deliverable

A document that provides a comprehensive description of the PTLRPC protocol, and will include the following information (the “Deliverable”):

1. The Deliverable shall describe the Lustre messages that traverse the network using PTLRPC.
2. The Deliverable shall describe the message flows for each file operation.
3. The Deliverable shall describe the state machines for each file operation.
4. All sources for the Deliverable shall be contained in a stand-alone single Git repository dedicated to the Deliverable. The document repository shall not be an extension of, or dependent on, the Lustre source code repository.
5. The Deliverable sources shall be convertible into common presentation formats (e.g. html, pdf) using tools available under Linux, with Open Source and/or freely available tools strongly preferred.
6. The text portion of the Deliverable sources shall be in a human readable (text based) format (e.g., asciidoc).
7. The Deliverable sources shall be licensed under the Creative Commons Attribution-ShareAlike 4.0 International Public License (CC BY-SA 4.0).
8. The Deliverable shall clearly define terms involved either explicitly or in the context.
9. The Deliverable shall describe high and/or low-level concepts adequately and try to be as self-contained as possible.
10. The Deliverable shall provide an overview to describe its interconnected components and how it fits in the system view of the Lustre file system.

11. The Deliverable Git repository shall be open to the Lustre community and the OpenSFS review committee from the beginning of the project so the Lustre community and the OpenSFS review committee can provide regular and timely feedback.

Estimated Schedule for Deliverable

1. **Document the Client-MDS RPCs for POSIX namespace operations** (mount, unmount, create, open, close, unlink, rmdir, rename, link, symlink, getattr, setattr, statfs, etc.) (Estimated* 3 months for completion)
2. **Document the Client-MDS RPCs for internal state management** (connect, disconnect, FLD, SEQ, PING, LDLM, etc.) (Estimated 1 month for completion)
3. **Document the Client-OSS RPCs for IO operations** (read, write, truncate, setattr, grant, etc.) (Estimated 1 month for completion)
4. **Document the MDS-OSS RPCs for internal state management** (object precreation, orphan recovery, UID/GID change, unlink, etc.) (Estimated 1 month for completion)
5. **Document the MDS-OSS RPCs for quota management** (Estimated 1 month for completion)
6. **Document the MDS-OSS OUT RPCs for distributed updates** (DNE1 remote directories, DNE2 striped directories, LFSCCK2/3 verification and repair) (Estimated 1 month for completion)

*These estimations indicate the rough order of magnitude (ROM) estimates for definitions and message flows documentation work to be performed and the order of work to be performed. These time periods are successive time periods. An estimate for the state machine documentation will be provided when more information is available out of definition and message flow documentation. The first milestone is expected to take longer as negotiations in final formatting and content will take place early in the project. These estimates are provided as a guideline and are not commitments for completion.