

Scope Statement For UID/GID Mapping in Lustre 2.X

Revision History

Date	Revision	Author
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Scope Statement

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Scope Statement

Introduction

The following scope statement applies to the UID/GID mapping project within the SFS-DEV-002 contract/SOW.

Problem Statement

The Lustre filesystem is used by many sites as a common work filesystem for high performance computing and storage. Currently, sites are either required to have a common UID/GID namespace to maintain file ownership and permissions or maintain a Kerberos infrastructure and require expiring authentication credentials. UID Mapping is a lightweight alternative that will allow the file system administrators to maintain a one-to-one map of remote NID:UIDs/GIDs to file system UIDs/GIDs to allow clients with a disparate UID/GID namespace to mount the file system while maintaining POSIX ownership, permissions and quotas.

Project Goals

1. Modify the Lustre code to maintain UID/GID maps from a partitioned set of NID ranges to a canonical set on the file system and update component subsystems with the latest revision of the UID/GID map upon alteration.
2. Modify the Lustre code to support mapping the UID and GID on incoming requests from the remote client to the mapped canonical values and mapping the UID and GID of outgoing responses from the canonical values to the remote values.
3. Modify or add userspace tools to manage the UID/GID map on the MGS.

In-Scope

- UID/GID mapping code taking place against WC-Lustre 2.X <Development Branch>.
- Interoperability with clients of one minor revision prior to release.
- Support trusted NID ranges for which no mapping of UIDs/GIDs (except for possible root squash) is performed.
- Support for administrative NID ranges for which UID 0 is not root squashed.
- Provide unit tests of UID/GID mapping to be included in the Lustre test directory.
- Documentation in the form of additions or creation of man pages detailing new features.
- Documentation in the form of additions to the WC-Lustre 2.X manual to be included upon owner's approval.

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Out of Scope

- Kerberos integration with new UID/GID map.
- Tools for remote sites or users to update their UID mapping.

Project Constraints

None known.

Project Assumptions

- Landing is dependent on availability of Lustre tree maintainers to assist with integrating code into the release tree.
 - Test hardware on the OpenSFS Test Cluster will be made available.
 - Quotas are preserved and maintained
 - Preservation of POSIX ACLs
 - Does not supersede Kerberos principle mapping.

Key Deliverables

The key deliverables for this project are:

- Signed Milestone documents for project phases:
 - Solution Architecture
 - High-Level Design
- Test Plan
- Source code that meets feature requirements and runs with WC-Lustre 2.X
- Source code for new test cases
- Documentation in the form of additions or creation of man pages and additions to the Lustre Operations Manual
- UID/GID Mapping code landed in Master WC-Lustre 2.X

Key Milestones

Milestone Chart: ID Mapping Project 1 Development

Contractor Milestone- Task	Elapsed Time (weeks)	Completion
Scope Statement	4	Week 4
Solution Architecture	5	Week 9
Design	5	Week 14

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Milestone Chart: ID Mapping Subproject 1.1: ID Mapping Kernel Module

Contractor Milestone-Task	Elapsed Time (weeks)	Completion
Implementation	4	Week 18
Test & Fix	4	Week 22
Demonstration	2	Week 24

Milestone Chart: ID Mapping Subproject 1.2: Map Synchronization

Contractor Milestone-Task	Elapsed Time (weeks)	Completion
Implementation	6	Week 30
Test & Fix	4	Week 34
Demonstration	4	Week 38

Milestone Chart: ID Mapping Subproject 1.3: ID Map Synchronization

Contractor Milestone-Task	Elapsed Time (weeks)	Completion
Implementation	6	Week 44
Test & Fix	4	Week 48
Demonstration	4	Week 52

Milestone Chart: ID Mapping Project 1: Delivery

Contractor Milestone-Task	Elapsed Time (weeks)	Completion
Delivery		
Project Acceptance	4	Week 56
Version Release	12	Week 68

Glossary

- GID (group id): a number representing a group on either a local or a locally-mounted remote filesystem
- Kerberos: a network authentication protocol
- MGS: Lustre Management Server

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- MDS: Lustre Metadata Server
- MDT: Lustre Metadata Target
- NID (network id): a number globally representing each user or group of a Lustre filesystem
- OSS: Lustre Object Storage Server
- OST: Lustre Object Storage Target
- POSIX ACL (access control list): a table of individual users or groups with access to a specific filesystem object
- principal: in Kerberos parlance, an entity that authenticates or is authenticated to, such as a user, host, or service
- UID (user id): a number representing a user on either a local or a locally-mounted remote filesystem