

NFS Server Logging

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What is it?

- FTP - Style Logging
 - Transaction Oriented
- Auditing
 - Request Oriented

Motivation

- Internet
 - WebNFS Clients
 - FTP replacement
- Intranet
 - Audit Trail
 - Debug Tool

Requirements

- Compatible with wu-ftpd logging
- Minimal Performance Impact
- Reliability
- Information Filtering
- Information Processing Capabilities

Log Information

- Timestamp
- Hostname of Requestor
- UID/Gid of Requestor
- Operation Requested
- Full Path of Object Accessed
- Result of the Operation
- Exception Condition
 - Invalid Credentials, I/O Error, etc

Interesting Challenges

- **Filehandle to Pathname Mapping**
 - No Pathname stored on vnode
- **Minimal Performance Impact**

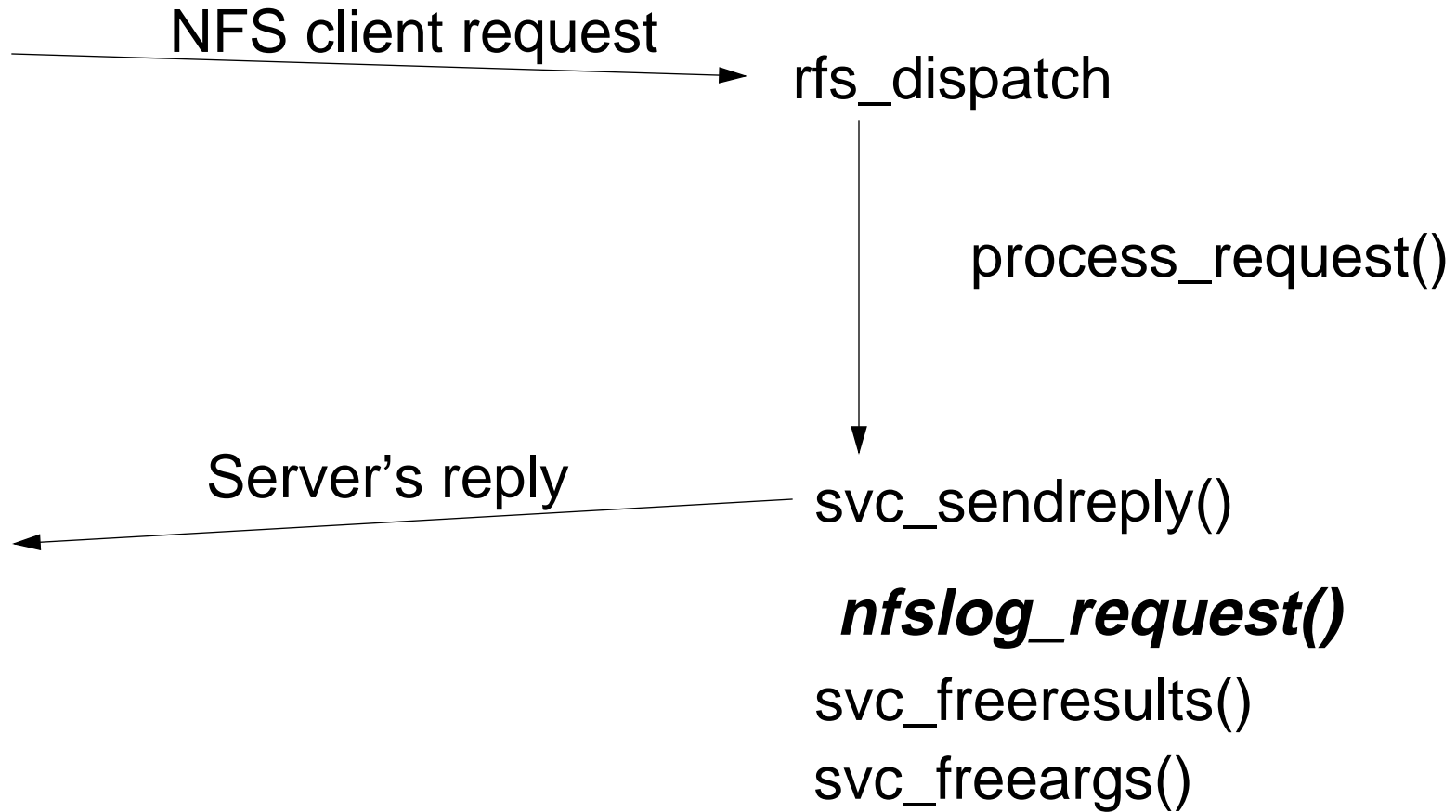
Filehandle Mapping

- DNLC Mapping
 - Cache miss requires alternate method
- Construct Path by Searching the Filesystem
 - Expensive and Unreliable

Filehandle Mapping (continued)

- Reconstruct Path by Inspection of NFS Traffic
 - Ignores local transactions
- New Kernel Filesystem Module which Tracks Pathnames
 - Performance impact even with logging disabled

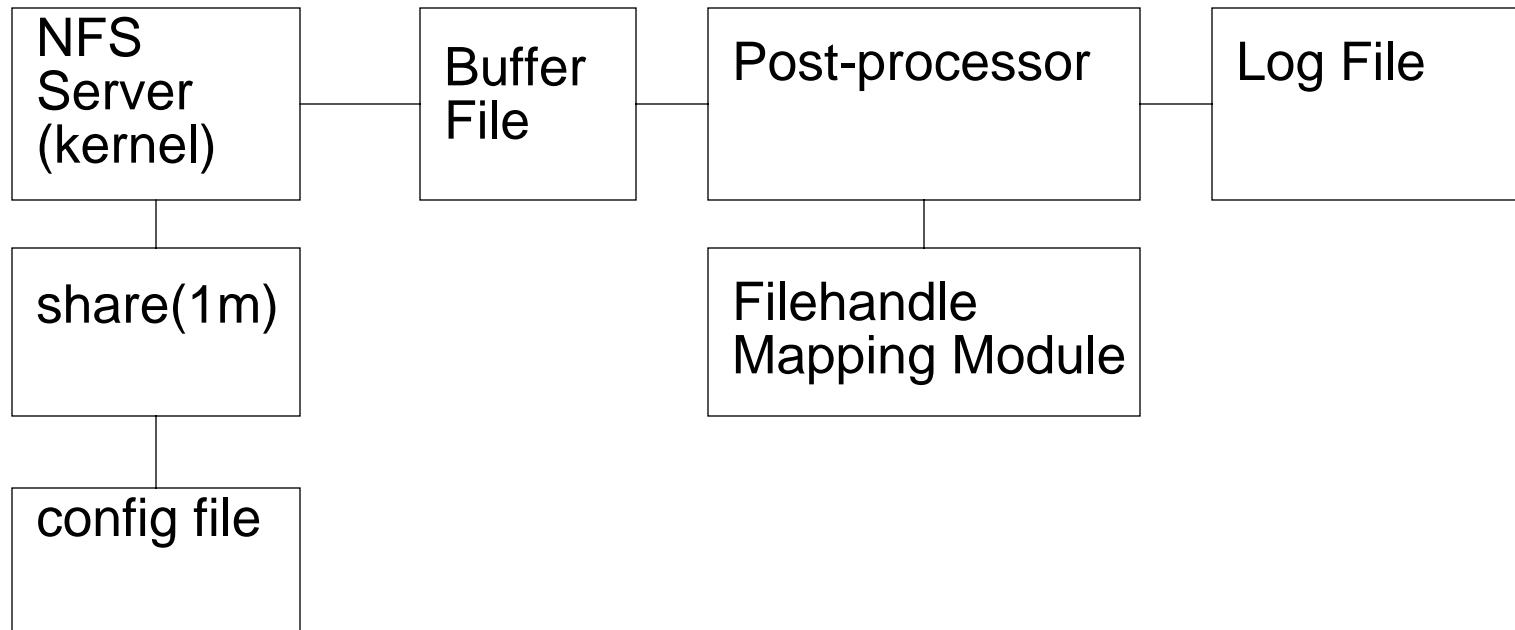
Performance



Performance (continued)

- 2 - Step Logging
 - Record Raw RPC request
 - Post-process working buffer to generate user log

Architecture



Log Format

- WU-ftpd Compatible Log Format
 - Existing Scripts
 - Some Assembly Required
 - Group RPCs into transactions
 - No Anonymous FTP user/passwd equivalent

Log Format (continued)

- W3C Extended Log Format
 - Work in Progress
 - Extensible
 - Existing Tools
 - <http://www.w3.org/pub/WWW/TR>