NFSv4 Version Management

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Talk Overview

• Documents to be discussed:
  – draft-ietf-nfsv4-versioning-00
  – draft-dnoveck-nfs-extension-02

• Why are we where we are?

• How did we get there?

• How can we move forward in this area?
  – Need to understand work that’s been done.
  – Come to agreement on direction we want to go
• Working group document
  – Want to turn it into an RFC, ASAP
    • But no sooner :-)
    • On some issues we need to build consensus first :-(
• Has four major elements (details addressed later):
  – Concept of XDR Extension is the basis
  – Feature de-batching through extensible versions
  – Addresses the issue of correcting protocol XDR
    • Since we can make mistakes :-(
  – Definitive list of minor versioning rules
    • Based on those in RFC5661
Based on the expired -01 (from a year ago)
  - NFS Protocol Extension: Retrospect and Prospect

Reflects changes over the last year
  - Many needed changes are now in WG document
  - Need to focus on putting those into an RFC

Also, one big discovery about NFSv4.1
  - Non-XDR-based changes
    • Version management has to address them, somehow
    • A matter the working group needs to decide
Why are we where we are?
Current best-guess

• We needed a protocol that could grow
  – We knew major versioning wouldn’t work
  – Someone came up with XDR extension idea
  – Was overshadowed by “minor versioning”
• Never put adequate effort into version mgmt.
• Making NFSv4 better seemed more important
• Issue of spec size was not on our radar
  – And it should have been
How Did We Get Here?

• RFC3530 was 300 pages.
  – Was a major version, so stayed with one big doc
• RFC5661 was 600 pages
  – But the protocol was separate (and presumed) better
    • “is considered a separate protocol”
    • “NFS minor version 1 is deemed superior to NFS minor version 0”
  – Then decided minor versions had to be smaller
• V4.2 spec was under 100 pages
  – And it still took around four years
  – Had to take version management more seriously
Concept of XDR Extension

• Core idea of the original minor version rules
  – Allowed incremental protocol extension
• Extension tied to creation of minor versions
  – And production of large documents
• Now in the long process of digging out.
• Idea of NFSv4 Version Management RFC:
  – Retain the XDR extension concept
  – Untie it from minor version creation and large documents
Address Batching of Features

• Created concept of extensible versions
• To address minor versions like NFSv4.2 more expeditiously
  – Make Specs even shorter
    • Ten 10-page feature specs vs. one 100-page mv spec
  – Prevent premature decisions as to content
  – Make decisions only after
    • Feature has a clear design
    • Sufficient implementation work has been done
Protocol Correction Issues

- Fixing protocol bugs is hard.
  - Need to accommodate old and new clients and servers
  - To do that:
    - Can make old and new server behaviors alternative features
    - Client can test for presence of support
  - Good fit for XDR extension model
    - If you are willing to extend the XDR
Minor Versioning Rules

• Currently based on those in RFC 5661
• Some lingering issues of detail
  – Confusion about RECOMMENDED/recommended features
  – Uncertainty about “infrastructural” features
  – Feature maturation model never realized
• Structural issues:
  – Features vs. change elements
  – Deal with minor versions only
  – Rules need to deal with non-XDR-based changes.
Basic Decision to be Made

• NFSv4.2 is our model for routine minor versions
  – Want to do the same sorts of things
  – Only better and quicker
• NFSv4.1 is the “100-year flood” of minor versions
• Where do we want to draw the line?
  – Need to discuss and come to consensus.
  – Prohibition of respecifying entire protocol
    • It’s needed but are additional restrictions necessary as well?
Individual Decisions to be Made

• Look at things done in 4.1 and not in 4.2
  – Introduced required features
  – Changed feature statuses, including making features mandatory to not implement.
  – Non-XDR-based changes

• For each of the above, can
  – Disallow
  – Allow
  – Allow with restrictions
New Versioning Rules

• Need major re-organization of rules:
  – To reflect the changes already made in the existing version management document.
  – To reflect the consensus of the working group about the proper limits of minor versioning

• One possible re-organization is set forth in draft-dnoveck-nfs-extension-02.
  – Need working group comments and suggestions.