NFS Version 4

Brent Callaghan & Mike Eisler

Sun Microsystems, Inc

brent@eng.sun.com

mre@eng.sun.com

NFS v4 @ IETF Status

- **37th IETF BOF @ San Jose December 96**

    - **Good attendance (~70)**

    - **Much interest in v4**

- **Change Control Agreement**

    - **IETF must have change control**

    - **Agreement based on RFC 1790 (ONCRPC)**

    - **Expect to be signed "soon"**

- **Memphis IETF April 7-11**

    - **BOF or WG ?**

- **Mailing list**

    - `nfs4-wg@sunroof.eng.sun.com`

Draft WG Charter

"The objective of this working group is to advance the state of NFS technology by producing a specification for NFS version 4 which will also be submitted as an Internet Standard. NFS version 4 will emphasize the following features:"

- **Improved access and good performance on the Internet**

- **Strong security with negotiation built into the protocol**

- **Better cross-platform interoperability**

- **Designed for protocol extensions**

- **Others that may be proposed**

Goals and Milestones

- **Feb 97: Meet to discuss strawman proposal at Connectathon**

- **Mar 97: Submit a strawman Internet Draft of the protocol**

- **Apr 97: First meeting of WG at Memphis IETF**

- **Aug 97: Second meeting of WG at Munich IETF**

- **Dec 97: Submit Proposed Draft**

- **Jun 98: Submit Draft Standard**

Wish List

- **Internationalization**

  - **Unicode ? UTF-8 ?**

- **Facilitate Operation on Internet**

  - **Single connection, single protocol**
    - **No "sideband" protocols**
    - **Incorporate File locking, mounting, security negotiation**
    - **Multi-component LOOKUP**

  - **Compound requests**
    - **Reduce round trips**
    - **Simplify protocol**

- **File/Filesystem Attributes**

    - **Attributes for multiple platforms**

    - **Extensible attributes**

    - **Access Control Lists (ACLs)**
        - **POSIX, DCE/DFS, WinNT ?**

- **MOUNT protocol equivalents**

    - **Lists of exports and properties**

    - **Lists of clients**

    - **mount/unmount notification**

- **File Locking**

    - **What kind of locking - POSIX or PC share ?**

    - **Used for cache consistency**

    - **Callbacks vs leases**

    - **Scalability**

- **Identifying users & groups**

    - **UID & GID: integers or strings or ... ?**

- **Non-Unix Systems**

    - **PC mandatory locking**

    - **File attributes "hidden" and "archive"**

    - **NTFS extended attributes: name/value**

    - **Case sensitivity**

        - **Case preserving**
        - **Case sensitive**
        - **Unicode ?**

- **Minor Versioning**

    - **Add new procedures, attributes, filetypes**

    - **Avoid protocol "hacks"**

    - **Standard process**

Compound Request

Request

| Op + args | Op + args | Op + args | ... |

Reply

| Results | Results | Results | ... |
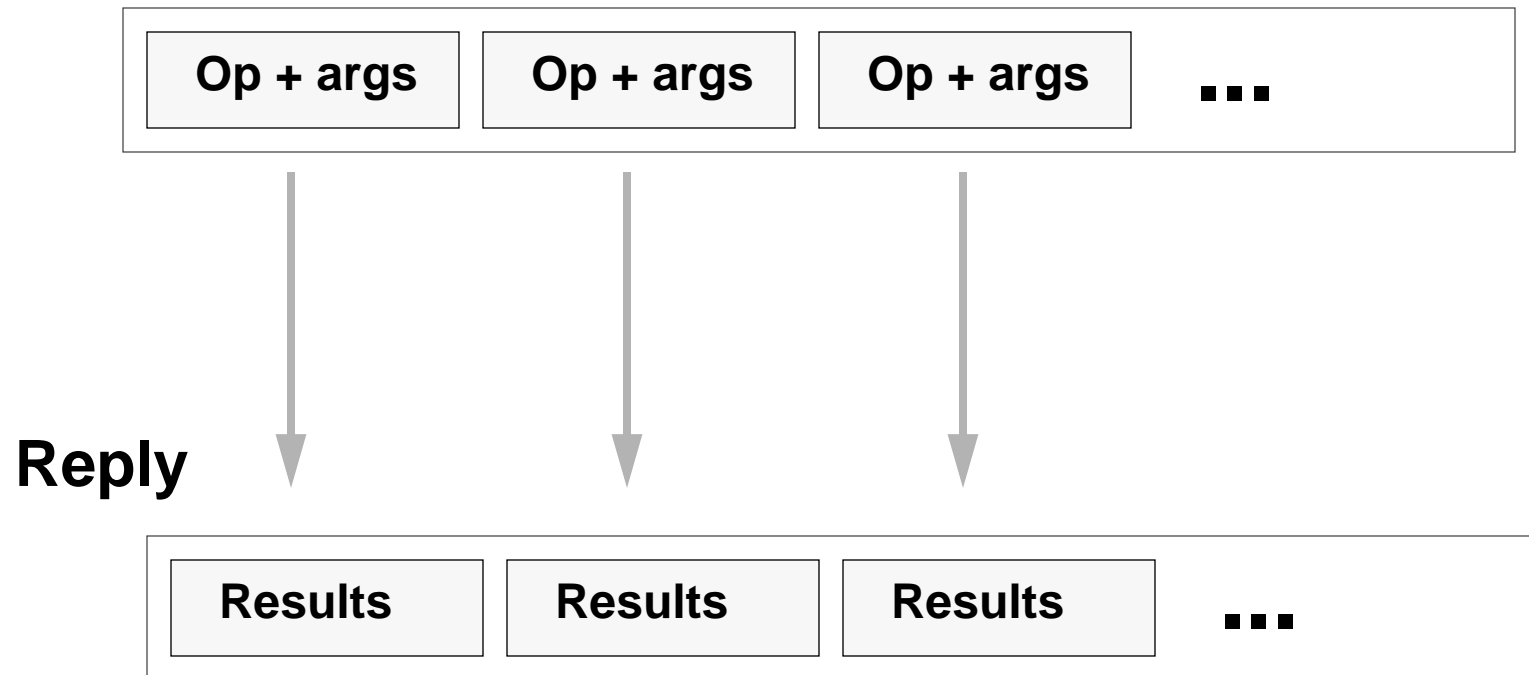
Compound Request (cont)

- **Small number of primitive operations**

- **Build arbitrarily complex requests**

  - PUTFH 0x1234, LOOKUP "foo", READ 0 32768

  - PUTFH 0x1234, LOOKUP "foo", LOOKUP "bar"

  - PUTFH 0x1234, LOOKUP "foo", GETATTR, READ 0 32768, GETATTR

  - PUTFH 0x1234, LOCK 0 4096, READ 0 4096

  - PUTFH 0x1234, WRITE 0 4096, UNLOCK 0 4096

- **Meet needs of different kinds of clients**

- **Address Internet latency problem**

Attributes

- **Currently fattr3 = POSIX**

- **Options:**

  - **POSIX as extended attribute**

  - **Name/value, e.g. "FILESIZE"**

  - **Number/value, e.g. "15"**

  - **Bitmap/values**

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Connectathon 97

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