NFSv4 WG - IETF 67 -07 to -08 Changes for Multi-Server Namespace

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Summary of Trunking Changes

- CREATE_CLIENTID replaced by EXCHANGE_ID
- EXCHANGE_ID returns a server owner, consisting of major and minor parts
- If two server network addresses have a server owner with the same major part, then the servers are coordinating in some fashion, and provide access paths to the same data
  - Verified by the server network addresses sharing the same GSS server principals
- If two server network addresses share the same major and minor parts, then a session created to one network address works on the other network address
  - Verified by the two server network addresses sharing the say secret session verifier (SSV)

Outline of Changes

- Issue 6: Clientid comparison
- Issue 30: Trunking
- Issue 135: Adapt multi-server-namespace to trunking.
- Issue 46: Non-uniform namespace
- Issue 96: Support for transparent split
- Issue 97: Clear requirements on replicas' data equivalence
- Issue 101: fs_locations encoding
- Issue 128: Encoding for server root
- Issue 134: Fix LEASE_MOVED stuff'

Issue 6: Clientid comparison

- The issue is whether a client should attempt to use a clientid obtained from one server against another server whenever a filesystem has migrated
  - Inadvertent matches among servers that don't coordinate state management can cause problems
- The trunking changes proposed in at the Ann Arbor interim meeting have been incorporated
  - If the server owner major ids match, then the client can assume coordination of state management between the two servers
  - Otherwise, the client knows that the clientid must not be used against the new server

Issue 30: Trunking
Issue 135: Adapt multi-server-namespace to trunking.

- If the server owner major id matches among several servers, then even if the minor id mismatches, the client can assume that each server network address addresses the same subset of the multi-server-namespace
- Even if the fs_locations* attribute don't make this explicit.
- E.g. if fs_locations says only server A has a file system with fsid X at location /q/u/v on A, and A and B have the same major id in their server owners, then B also servers X at /q/u/v.
- Saves servers the hassle of updating fs_locations* whenever their network topologies have changed

Issue 46: Non-uniform namespace

- An example is a file system containing binary executable software, and the network administrator wishes to provide a different file system instance for each CPU architecture
- fs_locations_info now has a LIIF_VAR_SUB flag
- If LIIF_VAR_SUB set, then path name may contain variables of form ${domain_name:var_name}
- ${ietf.org:XXX} has standard variables (CPU_ARCH, OS_TYPE, OS_VERSION)
  - Sites can define their own variables, e.g. ${netapp.com:ONTAP_PATCH}

Issue 96: Support for transparent split

- fs_locations_info adds a LIGF_SPLIT flag
- The presence of this flag indicates the filesystem has split
- Client is obligated to issue GETATTRs for fsid to rediscover new file system boundaries

Issue 97: Clear requirements on replicas' data equivalence

- Specification now says that replicas must contain the same data
- When a replica is writeable, a change to one must be immediately visible on all replicas

Issue 101: fs_locations_info encoding

- Now uses opaque arrays which are arrays of unsigned 8 bit units

Issue 128: Encoding for server root

- A pathname with zero components indicates that the location on the server refers to its root