Novel RPC Transports

Chuck Lever
<chuck.lever@oracle.com>
RPC-on-MPTCP

- An MP-TCP implementation landed in Linux kernel in v5.4. This is an opportunity for prototyping RPC-on-MPTCP.

- We don’t expect surprises, but do we need standards action to specify:
  - RPC framing
  - Workload distribution on subflows
  - New netids
  - Requirements for endpoint labeling
RPC-on-TLS

- `draft-ietf-nfsv4-rpc-tls` describes a mechanism for TLS clients to recognize when a server is prepared for a TLS handshake.

- First submitted March 2019, now at revision 06. Replaced `draft-cel-nfsv4-rpc-tls`, first submitted November 2018.

- Current WG document is waiting for AD write-up.
Tom Talpey observed that some implementers might want to use certificates for user authentication.

Currently our proposal does not support this. The client presents a certificate that identifies only the client host peer. No changes to user authentication.
In the context of TLS, should the nfsv4 WG consider support for the Extensible Authentication Protocol (in particular, RFC 5216)?

Do we need standards support for special certificate management techniques like key pinning?
RPC-on-TLS

- Rick Macklem has prototyped an NFS client and server that enable the client and a single user identity to be merged.

- Does this require RPC protocol changes, NFS protocol changes, or only changes to implementations?
RPC-on-QUIC

• RPC-on-TLS lays groundwork for the part of QUIC that implements Transport Layer Security.

• In addition, a standards-track document will be needed to specify:
  
  • RPC framing
  
  • New netids
  
  • How to handle multi-pathing and TLS.
RPC-on-QUIC

- Prototyping challenges for NFS:
  - To date, no kernel space QUIC implementations exist
Others?