

Extensible Provisioning Protocol (EPP) Transport over QUIC

draft-yao-regext-epp-quic

Jiakang Yao
yaojk@cnnic.cn
IETF-119 REGEXT Working Group

Everything is on QUIC?

- QUIC[RFC9000] is a network protocol that is based on UDP and incorporates native encryption support using TLS [RFC9001].
- HTTP over QUIC
- DNS over QUIC
- Media Over QUIC

.....

It is time to have EPP over QUIC (EoQ)

Benefits of QUIC

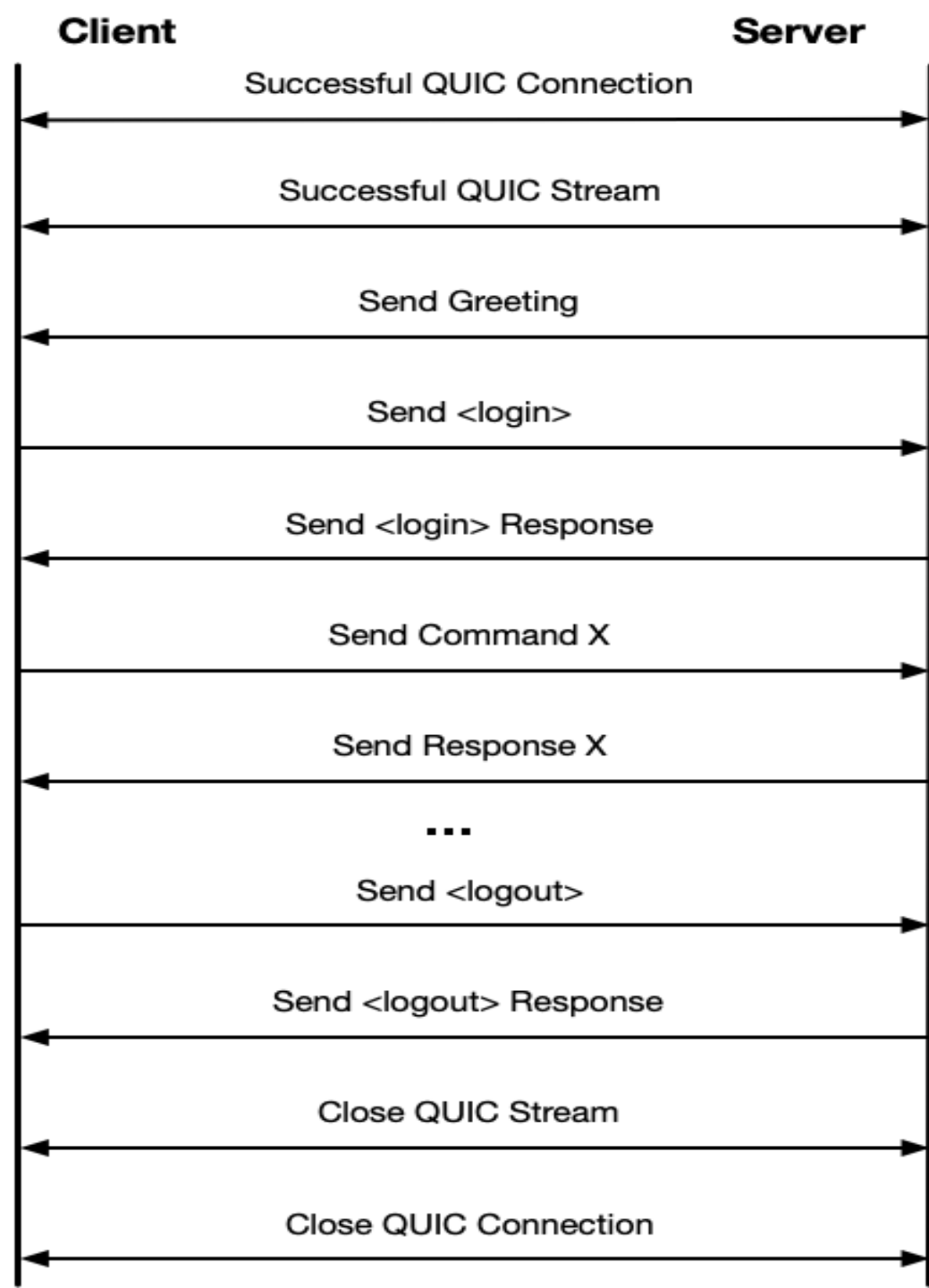
- QUIC (Quick UDP Internet Connections) offers several benefits compared to traditional TCP (Transmission Control Protocol) connections:
 - **Faster Connection Establishment**
 - QUIC significantly reduces connection establishment latency by allowing 0-RTT (Zero Round-Trip Time) connections.
 - **Improved Performance**
 - QUIC supports multiplexing multiple streams over a single connection. This allows for parallel transmission of data streams.
 - **Enhanced Congestion Control**
 - QUIC utilizes a more modern congestion control mechanism compared to TCP, which allows it to better adapt to changing network conditions and avoid congestion-related performance degradation.
 - **Improved Security**
 - QUIC incorporates encryption by default, providing data confidentiality, integrity, and authenticity.
 - **Better Connection Mobility**
 - QUIC is designed to support connection migration between different network interfaces or IP addresses without interrupting the ongoing communication.

Session Management

- Mapping EPP session management facilities onto the QUIC service is accomplished with a combination of a QUIC connection and QUIC streams.
- An EPP session first requires creation of a QUIC connection between two peers, one that initiates the connection request and one that responds to the connection request.
- A QUIC stream corresponds to an EPP connection and an authenticated QUIC stream, via a successful EPP <login>, corresponds to an EPP session. This can also be referred to as a EoQ session.
- A single QUIC connection may allow multiple QUIC streams. This means that a single EoQ connection may support multiple EoQ sessions. A server MAY limit the life span of an established EoQ session.

Message Exchange

- EoQ connection is created over QUIC stream
- Server returns Greeting
- EoQ session created with <login>
- EPP commands and responses sent over EoQ session
- EoQ session closed with <logout>
- EoQ connection closed



Transport Considerations

- ✓ Command Order: QUIC guarantees ordered processing of data within each stream.
- ✓ Session Mapping: EPP session management utilizes QUIC streams.
- ✓ Stateful Nature: QUIC supports stateful communications between endpoints via connection IDs and long-lived streams within each connection.
- ✓ Frame Data Units: QUIC uses frames as one of its units of information when sending data over a stream.
- ✓ Congestion Avoidance: QUIC provides various mechanisms to help achieve congestion avoidance.
- ✓ Reliability: QUIC uses message acknowledgement, packet retransmission, and other features to ensure reliability.
- ✓ Pipelining: Pipelining is allowed in EoQ. QUIC streams support sending multiple frames without waiting for responses from the other peer. This does not change the basic single command, single response operating mode of the core EPP protocol.

Summary

- EoQ provides an EPP transport choice with:
 - a) Enhanced EPP transport security and performance
 - b) Full compliant with RFC 5730
 - c) Full pluggable transport with EPP over TCP (EoT)
- Please review the draft and provide feedback on the mailing list