Abstract

This draft defines a frame type called delayed ack timer. Packet transmission time and retransmission time-out (RTO) timer setup value are included in the frame. The sender can send the frame with the non real-time stream frame within an packet.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at http://datatracker.ietf.org/drafts/current/.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on December 21, 2018.

Copyright Notice

Copyright (c) 2018 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust’s Legal Provisions Relating to IETF Documents (http://trustee.ietf.org/license-info) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.
1. Introduction

QUIC is a multiplexed and secure transport protocol that runs on top of UDP and can provide a flexible set of features that allow it to be a general-purpose transport for multiple applications [1]. In order to provide the secure communication, loss detection and congestion control is defined for QUIC [2]. There can be either real-time traffic or non real-time traffic. In case of real-time traffic, a receiver should transmit an ack frame immediately whenever it receives a packet sent from a sender. The push bit in TCP is defined for this purpose. However, the receiver doesn’t need to send an ack frame immediately per every received packet containing non real-time data stream. The receiver can send an accumulated ack frame for several packet in order to reduce the number of packet containing only an ack frame. In this case, if an ack frame transmitted by the receiver arrives at the sender lately, then RTO timer is expired in the sender which incurs the packet re-transmission. One way to avoid retransmission of packet is to use the static timer for delaying sending ack frame such as TCP. The other way is to use the timer to dynamically adjust based on the transmission time and the retransmission time-out timer value sent by the sender. In this case, if we can know the one-way latency from the receiver to the sender, the it is possible to precisely set the timer value [3].

In this draft, we define the frame called delayed ack containing the packet transmission time and RTO time-out value sent by the sender.
2. Conventions and Terminology

2.1. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [4].

2.2 Terminology

TBD

3. Delayed ack frame

The frame type for delayed ack defined in this draft is as follows.

```
+-------------------+-------------------+-------------------+-------------------+
|                    | packet transmission time |
+-------------------+-------------------+-------------------+-------------------+
|                    | RTO timer value (16) |
+-------------------+-------------------+-------------------+-------------------+
```

The frame can be included in the packet that contains non real-time stream with stream id not equal to 0. The receiver can transmit its ack frame by using the conventional way when the received packet does not contain the delayed ack frame. The packet transmission time and its RTO time-out timer value is included in the delayed ack frame. The type for the frame is TBD. How to setup the value for the delayed ack timer is for further study. When the receiver only receives data stream from the sender, then it cannot know the latency between the receiver and the sender. If the receiver can know the latency, then the receiver can precisely adjust the delayed ack timer value. In order to determine the latency between the receiver and the sender, receiver transmits the timestamp frame including (1) frame transmission time that is included in the delayed ack, (2) frame receive time and (3) frame transmit time that is similar to the ICMP timestamp request and reply packet. Then, the sender can know the round trip time (RTT) and can send the value to receiver.

4. Security Considerations

TBD
5. IANA Considerations

TBD

6. References


Author’s Address

Jaehwoon Lee
Dongguk University
26, 3-ga Pil-dong, Chung-gu
Seoul 100-715, KOREA
Email: jaehwoon@dongguk.edu

Younghan Kim
Soongsil University
369, Sangdo-ro, Dongjak-gu,
Seoul 156-743, Korea
Email: younghak@ssu.ac.kr