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Sender Queue Info Option for the SCTP Socket API
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Abstract

This document describes an extension to the SCTP sockets API for querying information about the sender queue.

Status of This Memo

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

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This Internet-Draft will expire on 27 March 2026.

Table of Contents

1. Introduction

This draft describes an extension to the SCTP sockets API (see [4], [6] [3]) which allows an application to query the sender queue utilization per stream. This information is necessary for applications to make efficient use of a mapping of streams to dissimilar paths. A detailed description including simulation results can be found in [7].

In particular, this API extension is useful when using the CMT-SCTP, CMT/RPv1-SCTP, CMT/RPv2-SCTP and MPTCP-like extensions (see [5], [13], [12], [9], [10], [11], [8]) for Concurrent Multipath Transfer (CMT) with SCTP.

2. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [1] [2] when, and only when, they appear in all capitals, as shown here.

3. Sender Queue Info (SCTP_SQINFO)

This socket option obtains the maximum sender queue size (in bytes), the current total sender queue utilization (in bytes) as well as the current utilization per stream (in bytes).

The following structure is used to obtain the sender queue information:

```
struct sctp_sndqueueinfo {
  sctp_assoc_t sq_assoc_id;
  uint32_t     sq_queue_limit;
  uint32_t     sq_total_queued;
  uint32_t     sq_number_of_streams;
  uint32_t     sq_queued_on_stream[];
};
```

sq_assoc_id: This parameter is ignored for one-to-one style sockets. For one-to-many style sockets this parameter indicates which association the user is performing an action upon. It is an error to use SCTP_{CURRENT|ALL}_ASSOC in sq_assoc_id.

sq_queue_limit: This field gives the maximum sender queue size in bytes.

sq_total_queued: This field gives the current total sender queue utilization in bytes.

sq_number_of_streams: This field gives the number of outgoing streams. That is, it will contain the number of valid sq_queued_on_stream entries.

sq_queued_on_stream: This array gives the current number of bytes queued for the streams 0 to sq_number_of_streams-1.

Note, that the caller of getsockopt() MUST provide a sctp_sndqueueinfo structure which can hold at least as many sq_queued_on_stream entries as the association’s number of outgoing streams. Otherwise, the getsockopt() call will fail and return an error.

4. Testbed Platform

A large-scale and realistic Internet testbed platform with support for the multi-homing feature of the underlying SCTP protocol is NorNet. A description of NorNet is provided in [14], [15], some further information can be found on the project website [16].

5. Security Considerations

Security considerations for the SCTP sockets API are described by [4].

6. IANA Considerations

This document does not require IANA actions.

7. Acknowledgments

The authors would like to thank Michael Tuexen and Irene Ruengeler for their support.

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