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**Additional Policies for the Partial Delivery Extension of the Stream  
Control Transmission Protocol  
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Abstract

This document defines policies for the Partial Reliability Extension of the Stream Control Transmission Protocol (PR-SCTP) allowing to limit the number of retransmissions or to prioritize user messages for more efficient send buffer usage.

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## [1.](#) Introduction

### [1.1.](#) Overview

The SCTP Partial Reliability Extension (PR-SCTP) defined in [\[RFC3758\]](#) provides a generic method for senders to abandon user messages. The decision to abandon a user message is sender side only and the exact condition is called a PR-SCTP policy. [\[RFC3758\]](#) also defines one particular PR-SCTP policy, called Timed Reliability. This allows the sender to specify a timeout for a user message after which the SCTP stack abandons the user message.

This document specifies two additional PR-SCTP policies:

Limited Retransmission Policy: Allows to limit the number of retransmissions.

Priority Policy: Allows to discard lower priority messages if space for higher priority messages is needed in the send buffer.

## [2.](#) Additional PR-SCTP Policies



### **2.1. Limited Retransmissions Policy**

Using the Limited Retransmission Policy allows the sender of a user message to specify an upper limit for the number retransmissions for each DATA chunk of the given user messages. The sender must abandon a user message if the number of retransmission of any of the DATA chunks of the user message would exceed the provided limit. Please note that the number of retransmissions includes the fast and the timer based retransmissions.

Limiting the number of retransmissions to 0 is allowed. This provides a service similar to UDP, which also doesn't do any retransmissions.

The Limited Retransmissions Policy is used for data channels in the RTCWeb protocol stack. See [[I-D.ietf-rtcweb-data-channel](#)] for more information.

### **2.2. Priority Policy**

Using the Priority Policy allows the sender of a user message to specify a priority. When storing a user message in the send buffer and there is not enough available space, the SCTP stack may abandon other user messages with a priority lower than the provided one.

This allows to transfer message with high priority without blocking the send() call, if it is acceptable to abandon lower priority messages.

The Priority Policy can be used in the IPFIX protocol stack. See [[RFC5101](#)] for more information.

## **3. Socket API Considerations**

This section describes how the socket API defined in [[RFC6458](#)] is extended to support the newly defined PR-SCTP policies and to provide some statistical information.

Please note that this section is informational only.

### **3.1. Support for Added PR-SCTP Policies**

As defined in [[RFC6458](#)], the PR-SCTP policy is specified and configured by using the following sctp\_prinfo structure:

```
struct sctp_prinfo {
    uint16_t pr_policy;
    uint32_t pr_value;
```



```
};
```

When the Limited Retransmission Policy described in [Section 2.1](#) is used, `pr_policy` has the value `SCTP_PR_SCTP_RTX` and the number of retransmissions is given in `pr_value`.

For using the Priority Policy described in [Section 2.2](#), `pr_policy` has the value `SCTP_PR_SCTP_PRI0`. The priority is given in `pr_value`. The value of zero is the highest priority and larger numbers in `pr_value` denote lower priorities.

The following table summarizes the possible parameter settings defined in [\[RFC6458\]](#) and this document:

pr_policy	pr_value	Specification
SCTP_PR_SCTP_NONE	Ignored	<a href="#">[RFC6458]</a>
SCTP_PR_SCTP_TTL	Lifetime in ms	<a href="#">[RFC6458]</a>
SCTP_PR_SCTP_RTX	Number of retransmissions	<a href="#">Section 2.1</a>
SCTP_PR_SCTP_PRI0	Priority	<a href="#">Section 2.2</a>

### **[3.2.](#) Socket Option for Getting the PR-SCTP Status (SCTP\_GET\_PR\_STATUS)**

This socket option uses `IPPROTO_SCTP` as its level, `SCTP_GET_PR_STATUS` as its name and can only be used with `getsockopt()`. The socket option value uses the following structure:

```
struct sctp_prstatus {
    sctp_assoc_t sprstat_assoc_id;
    uint32_t sprstat_abandoned_unsent;
    uint32_t sprstat_abandoned_sent;
};
```

`sprstat_assoc_id`: This parameter is ignored for one-to-one style sockets. For one-to-many style sockets this parameter indicates for which association the user wants the information. It is an error to use `SCTP_{CURRENT|ALL|FUTURE}_ASSOC` in `sprstat_assoc_id`

`sprstat_abandoned_unsent`: The number of user messages which are abandoned, but no part of it has been sent.

`sprstat_abandoned_sent`: The number of user messages which are abandoned, but at least part of it has been sent.



If more detailed information about abandoned user messages is required, the subscription to the SCTP\_SEND\_FAILED\_EVENT is recommended.

Please note that sctp\_opt\_info() needs to be extended to support SCTP\_GET\_PR\_STATUS.

#### **4. IANA Considerations**

This document requires no actions from IANA.

#### **5. Security Considerations**

This document does not add any additional security considerations in addition to the ones given in [[RFC4960](#)], [[RFC3758](#)], and [[RFC6458](#)].

#### **6. Acknowledgments**

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#### **7. References**

##### **7.1. Normative References**

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##### **7.2. Informative References**

- [RFC5101] Claise, B., "Specification of the IP Flow Information Export (IPFIX) Protocol for the Exchange of IP Traffic Flow Information", [RFC 5101](#), January 2008.
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