SCTP Sendbuffer Advertising

CS4089 Project
End Semester Evaluation

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Outline

Introduction

- Stream Control Transmission Protocol (SCTP):
  - Supports multiple logical channels called streams
  - Multi-homing
- Sendbuffer Advertising:
  - each segment will carry the amount of backlogged data present in the sender's buffer.

Problem Statement

- To propose a scheme to
  - advertise sendbuffer occupancy information in SCTP
  - implement it in the Linux kernel and
  - study the performance and security implications of the same.

Prerequisite Terms

- **SCTP Chunk** is a unit of information within an SCTP packet, consisting of a chunk header and chunk-specific content.

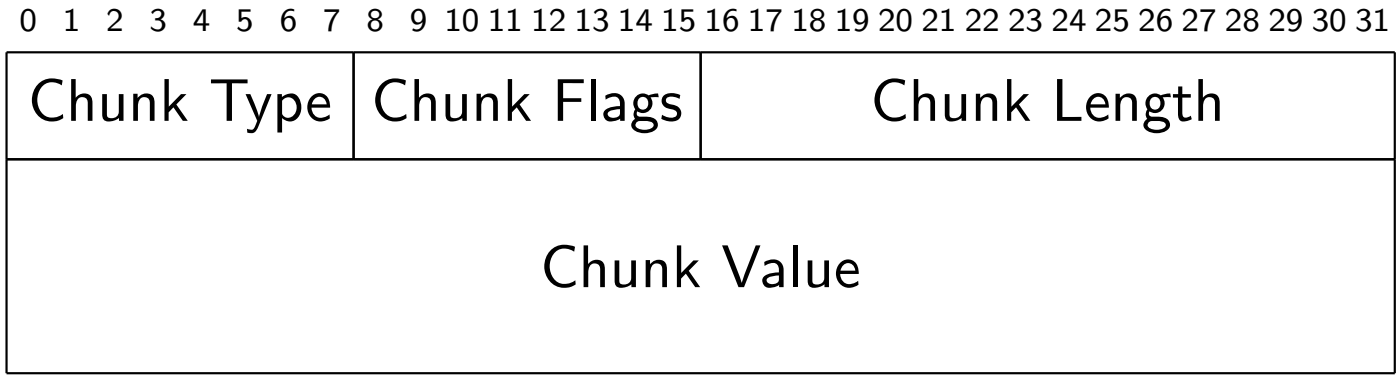

Figure: SCTP Chunk Format [1]

- **SCTP Packet** consists of a common header followed by one or more chunks.
- **Heartbeat Chunk** is used to probe the reachability of a particular destination transport address.

Work Done

- Modified kernel module `sctp_probe` to measure sendbuffer.
- Explored Linux kernel SCTP implementation
- Identified parameter to be advertised

Attempted Solution

- Encode the sendbuffer information as a variable length parameter in the Heartbeat chunk.
- Problems:
  - Can be disabled by Upper layer.
  - Is only sent to idle destination addresses.

Design

- New chunk type with Chunk Type value between 128 to 190.
- Highest order 2 bits determine action to be taken if Chunk Type is unknown.
- This ensures that unmodified hosts won't send a Unrecognized Chunk Type Error chunk upon reception.

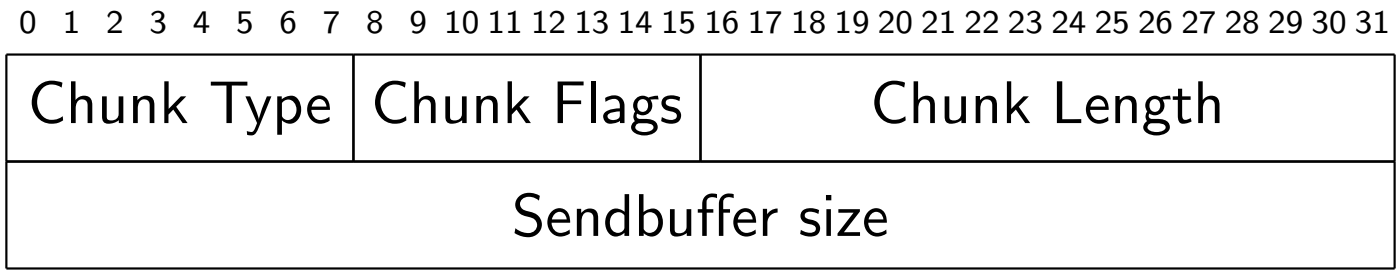

Figure: Proposed Chunk for sendbuffer advertisement

Future Work

- Working prototype in Linux kernel.
- To build a small testbed with few nodes and SDN routers.

References I

[1] R. Stewart. *Stream Control Transmission Protocol*. RFC 4960. RFC Editor, Sept. 2007, pp. 1–152. URL: http://www.rfc-editor.org/rfc/rfc4960.txt.