NETWORK PROTOCOLS & SECURITY
23EC2210 R/A/E

Topic:

STCP PROTOCOL

Session - 27

SCTP Protocol

- SCTP stands for Stream Control Transmission Protocol.
- Designed for Internet applications.
- SCTP combines the best features of UDP and TCP.
- SCTP is a reliable message-oriented protocol.
- It preserves the message boundaries, and at the same time, detects lost data, duplicate data, and out-of-order data.
- It also has congestion control and flows control mechanisms.

Features of SCTP

There are various features of SCTP, which are as follows −

- Transmission Sequence Number
- Stream Identifier
- Stream Sequence Number
- Packets
- Flow Control
- Error Control
- Congestion Control

Features of SCTP…

Transmission Sequence Number

- The unit of data in TCP is a byte. Data transfer in TCP is controlled by numbering bytes by using a sequence number.
- On the other hand, the unit of data in SCTP is a DATA chunk that may or may not have a one-to-one relationship with the message coming from the process because of fragmentation.
- Each data chunk is given a transmission sequence number.

Stream Identifier

- In TCP, there is only one stream in each connection.
- In SCTP, there may be several streams in each association.
- Each stream in SCTP needs to be identified by using a stream identifier (SI).
- Each data chunk must carry the SI in its header so that when it arrives at the destination, it can be properly placed in its stream.

Features of SCTP…

Stream Sequence Number

- When a data chunk arrives at the destination SCTP, it is delivered to the appropriate stream and in the proper order.
- This means that, in addition to an SI, each data chunk in each stream carries a stream sequence number (SSN).

Packets

- In TCP, a segment carries data and control information.
- Data is carried as a collection of bytes; control information is defined by six control flags in the header.
- The design of SCTP is totally different.
- In SCTP, data is carried as data chunks; control information is carried as control chunks.

Features of SCTP…

Flow Control

- Like TCP, SCTP implements flow control to avoid overwhelming the receiver.

Error Control

- Like TCP, SCTP implements error control to provide reliability.
- TSN numbers and acknowledgement numbers are used for error control.

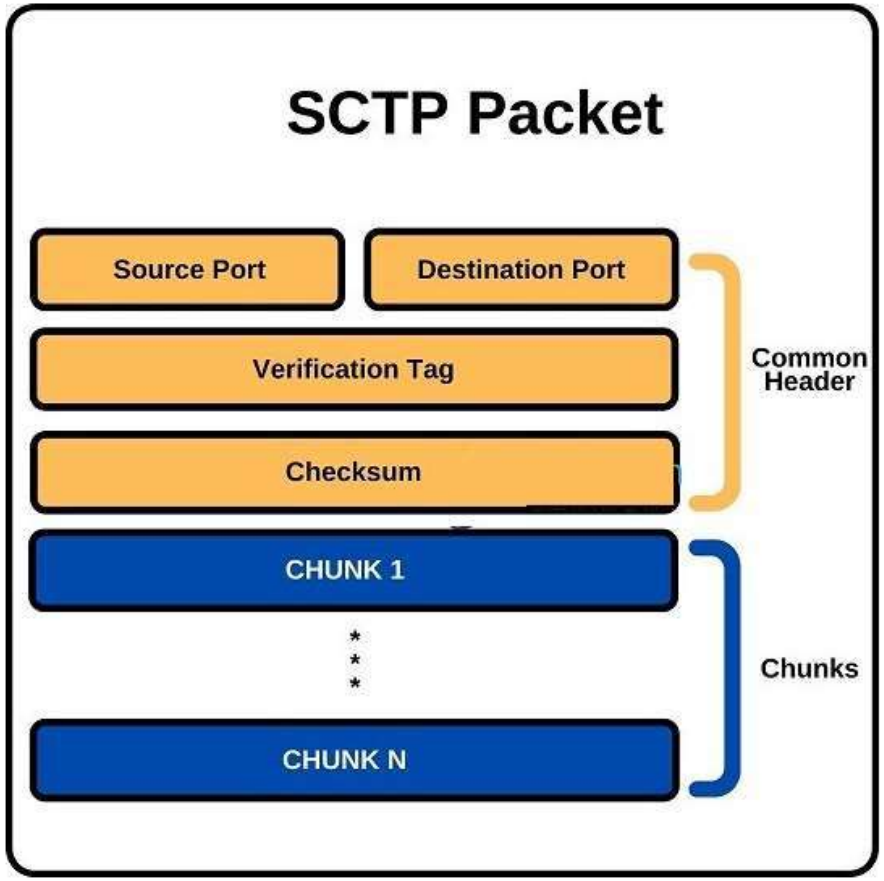
Congestion Control

- Like TCP, SCTP implements congestion control to determine how many data chunks can be injected into the network.

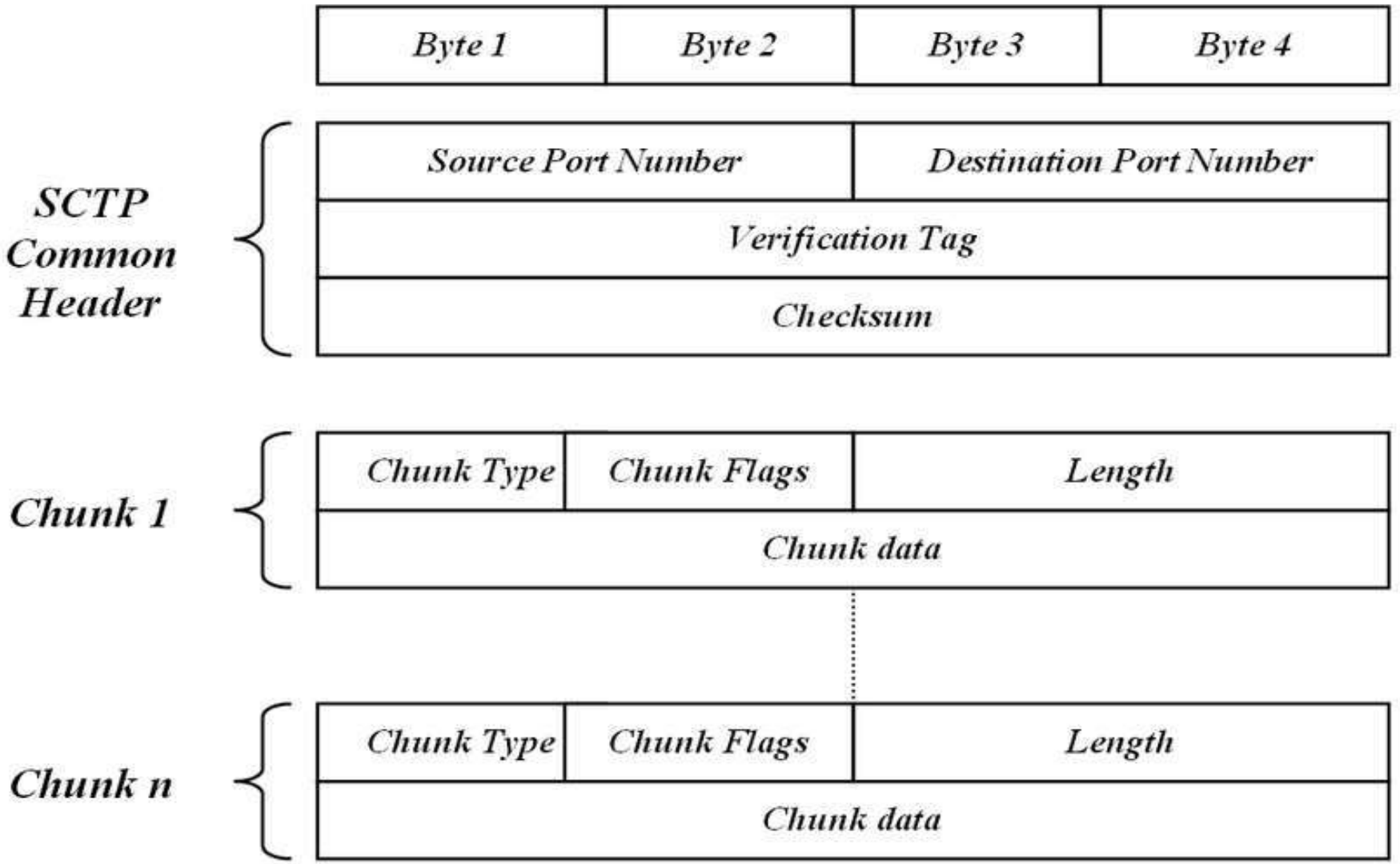
SCTP Packet

- SCTP protocol packet consist of two main parts Header and Payload.
- The Header is common, but Payload have variable chunks.

- The Common SCTP header is 12 byte long and made of the 4 parts.
  - **Port Number (Source):** shows the sending port
  - **Port Number (Destination):** shows the receiving port
  - **Verification tag:** a 32-bit random value which differentiate the packets from the previous connection
  - **Checksum:** a CRC32 algorithm for detection of error.



SCTP Packet…


Byte 1
Byte 2
Byte 3
Byte 4
SCTP Common Header
Source Port Number
Destination Port Number
Verification Tag
Checksum
Chunk 1
Chunk Type
Chunk Flags
Length
Chunk data
Chunk n
Chunk Type
Chunk Flags
Length
Chunk data

Comparison of TCP, UDP and SCTP

	TCP	UDP	SCTP
Type	Byte-oriented	Meesage-oriented	Meesage-oriented
Connection type	Connection-oriented	Connectionless	Connection-oriented
Reliability	Reliable	Unreliable	Reliable
Header	20 bytes	8 bytes	12 bytes
Checksum	16 bits	16 bits	32 bits
Control Information	Part of Header	Part of Header	Separate Control Chunks
Data Unit	Segment	Datagramm	Chunk
Sequence Number	Yes. Maintained in Header	No Sequence number	TSN, SI and SSN for Data chunks. Control chunk has no such numbers
Flow/Congestion Control	Yes	No	Yes

THANK YOU

Team –Network Protocols and Security