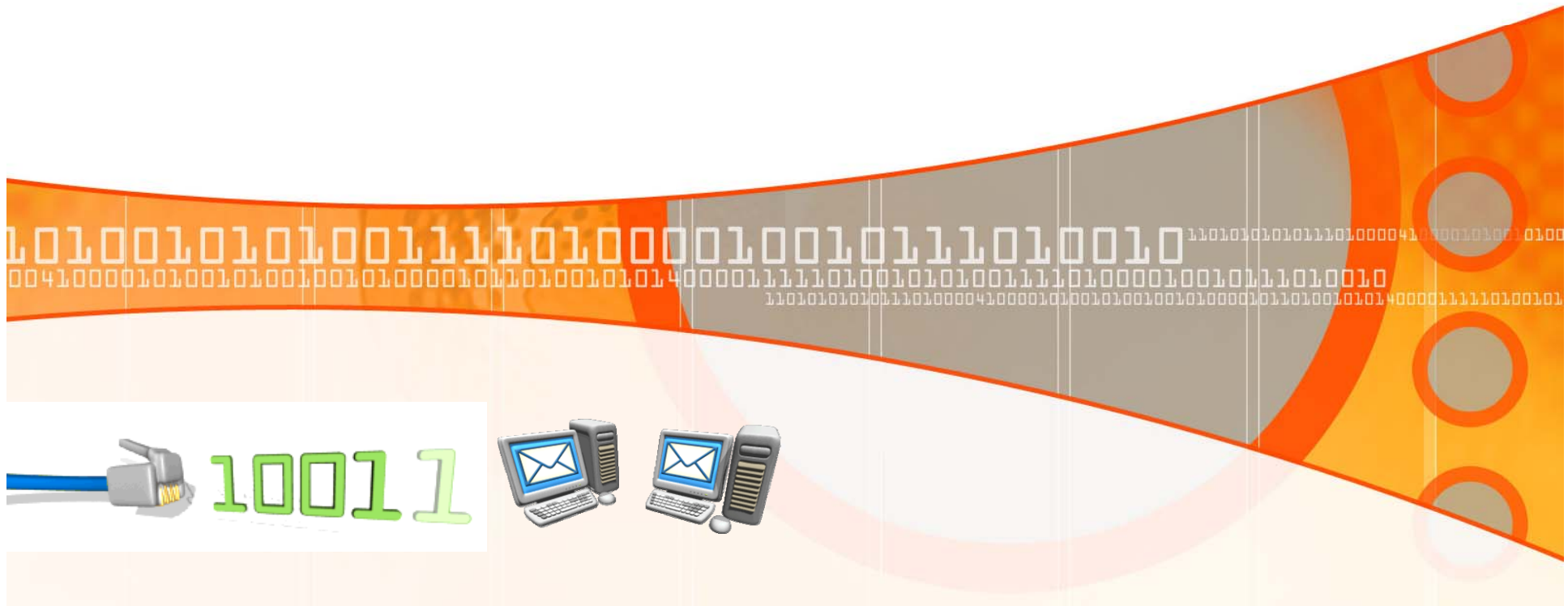
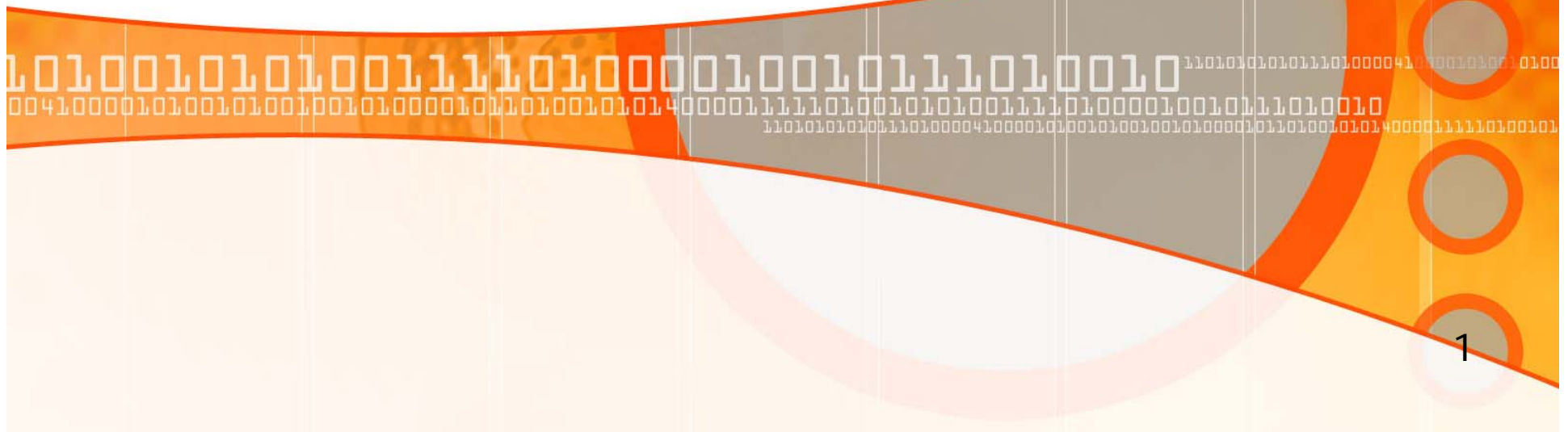


SCTP and its applications

(Stream Control Transmission Protocol)



- Motivation
- Introduction to SCTP
- Similarities to TCP
- Differences from TCP
- Possible Applications over SCTP



Motivations

- Many applications need reliable message delivery
- TCP provides both strict-ordering and reliability
- TCP is relatively vulnerable to DoS attacks

What is SCTP?

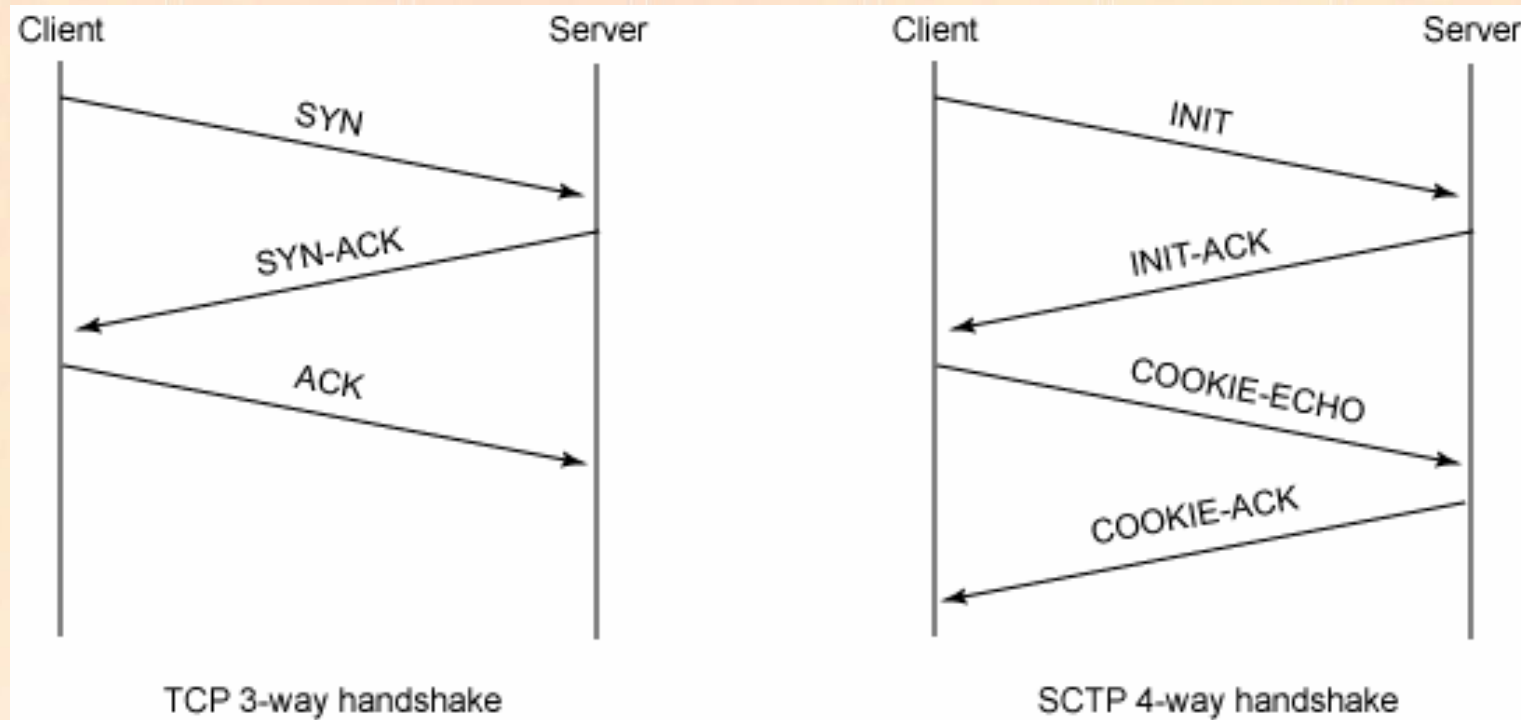


- Stream Control Transmission Protocol
- Originally designed to support Telephone signaling messages over IP Networks
- Reliable transport protocol on top of IP
- Became an RFC in October 2000.

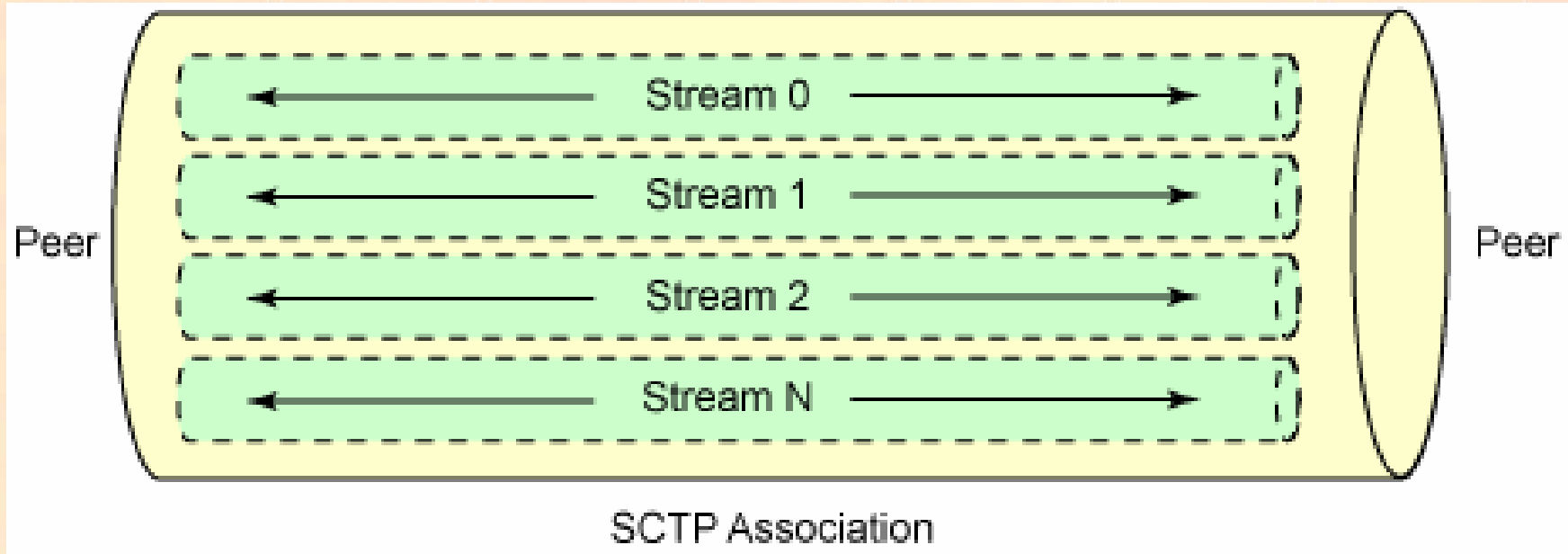
- Similar Flow Control and Congestion Control
 - Slow Start and Congestion Avoidance phases
 - Selective Acknowledgement
 - Fast Retransmit

- SCTP is message oriented
- SCTP has the concept of an association instead of a connection
- SCTP separates reliable transfer of datagrams from the delivery mechanism
- SCTP supports multihoming (*Supports multiple IP addresses in an association*)
- Connection Setup
- Protection against DoS attacks

Connection Establishment: Comparisons

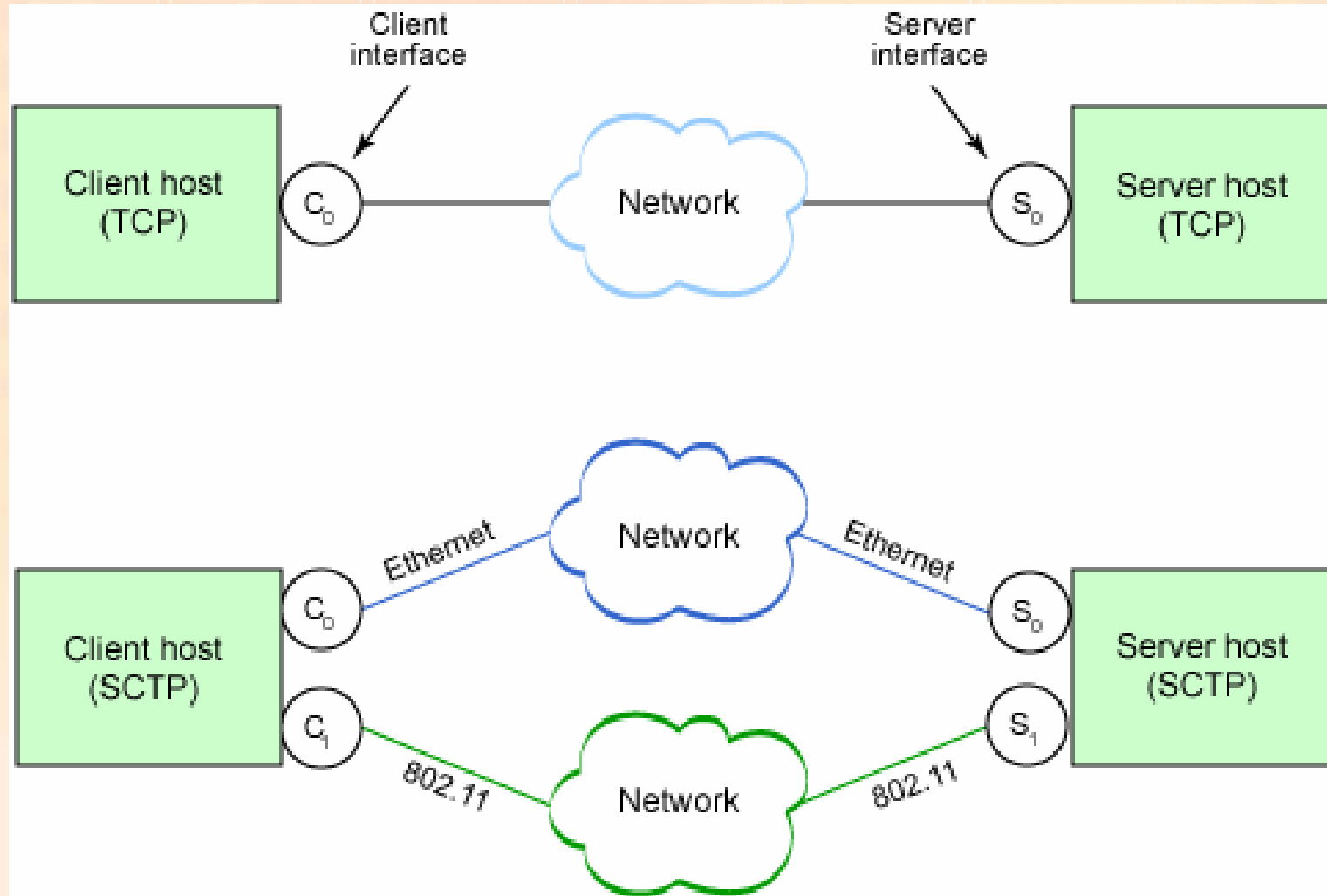


<http://www.ibm.com/developerworks/linux/library/1-sctp/figure4.gif>



<http://www.ibm.com/developerworks/linux/library/1-sctp/figure5.gif>

Multi-Homing



<http://www.ibm.com/developerworks/linux/library/1-sctp/figure6.gif>

Bits	Bits 0 - 7	8 - 15	16 - 23	24 - 31
+0	Source port		Destination port	
32	Verification tag			
64	Checksum			
96	Chunk 1 type	Chunk 1 flags	Chunk 1 length	
128	Chunk 1 data			
...	...			
...	Chunk N type	Chunk N flags	Chunk N length	
...	Chunk N data			

Possible Applications over SCTP



- Available in all major operating systems, including GNU/Linux, BSD, and Solaris.
- Included into the 2.6 Linux kernel
- Also available for the Microsoft® Windows® operating systems as a third-party commercial package.
- Traditional applications such as FTP and HTTP have been built on the features of SCTP.
- Other protocols are using SCTP, such as the Session Initiation Protocol (SIP)
- Can find SCTP in Cisco's IOS.
- Many more applications to come as SCTP can be a replacement for TCP and UDP.

References

- [1] RFC 2960 ,*Stream Control Transmission Protocol*,2000.
- [2] Armando L. Caro Jr., Janardhan R. Iyengar, Paul D. Amer, Sourabh Ladha, Gerard J. Heinz II, Keyur C. Shah, *SCTP: A Proposed Standard for Robust Internet Data Transport* *IEEE Computer*, 36(11):56-63, November 2003
- [3] P. Natarajan, J. Iyengar, P. Amer, R. Stewart, *SCTP: An Innovative Transport Layer Protocol For Web*,*WWW 2006*, Edinburgh, Scotland, May 2006
- [4] J. Iyengar, P. Amer, R. Stewart, *Retransmission Policies For Concurrent Multipath Transfer Using SCTP Multihoming*. *ICON 2004*, Singapore, November 2004.

