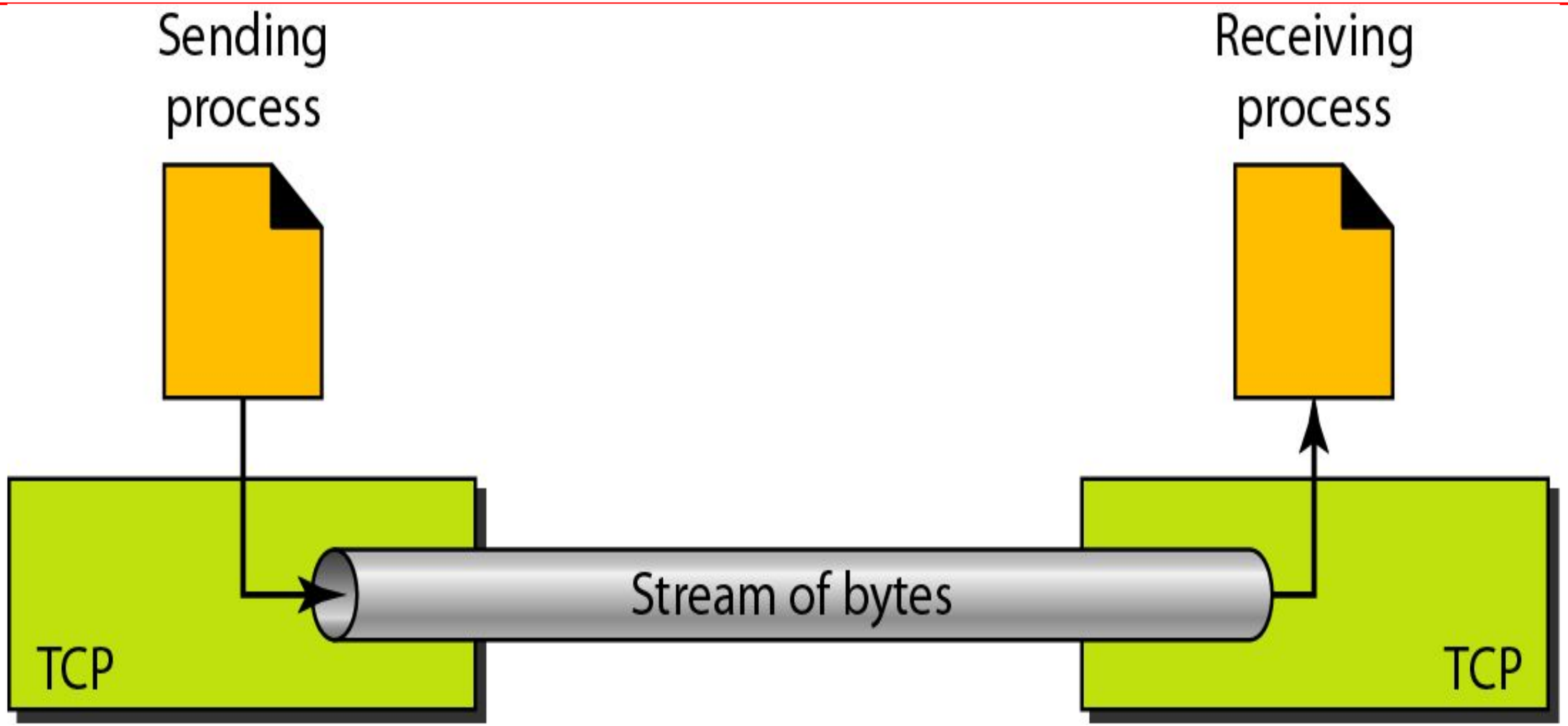
Transmission Control Protocol
[TCP]

TCP is a connection-oriented protocol; it creates a virtual connection between two processes to send data.

Figure 23.13 *Stream delivery*



1. Process-to-Process Communication

Uses port numbers

Table 23.2 *Well-known ports used by TCP*

Port	*Protocol*	*Description*
7	Echo	Echoes a received datagram back to the sender
9	Discard	Discards any datagram that is received
11	Users	Active users
13	Daytime	Returns the date and the time
17	Quote	Returns a quote of the day
19	Chargen	Returns a string of characters
20	FTP, Data	File Transfer Protocol (data connection)
21	FTP, Control	File Transfer Protocol (control connection)
23	TELNET	Terminal Network
25	SMTP	Simple Mail Transfer Protocol
53	DNS	Domain Name Server
67	BOOTP	Bootstrap Protocol
79	Finger	Finger
80	HTTP	Hypertext Transfer Protocol
111	RPC	Remote Procedure Call

TCP offers full duplex communication

TCP offers connection oriented service

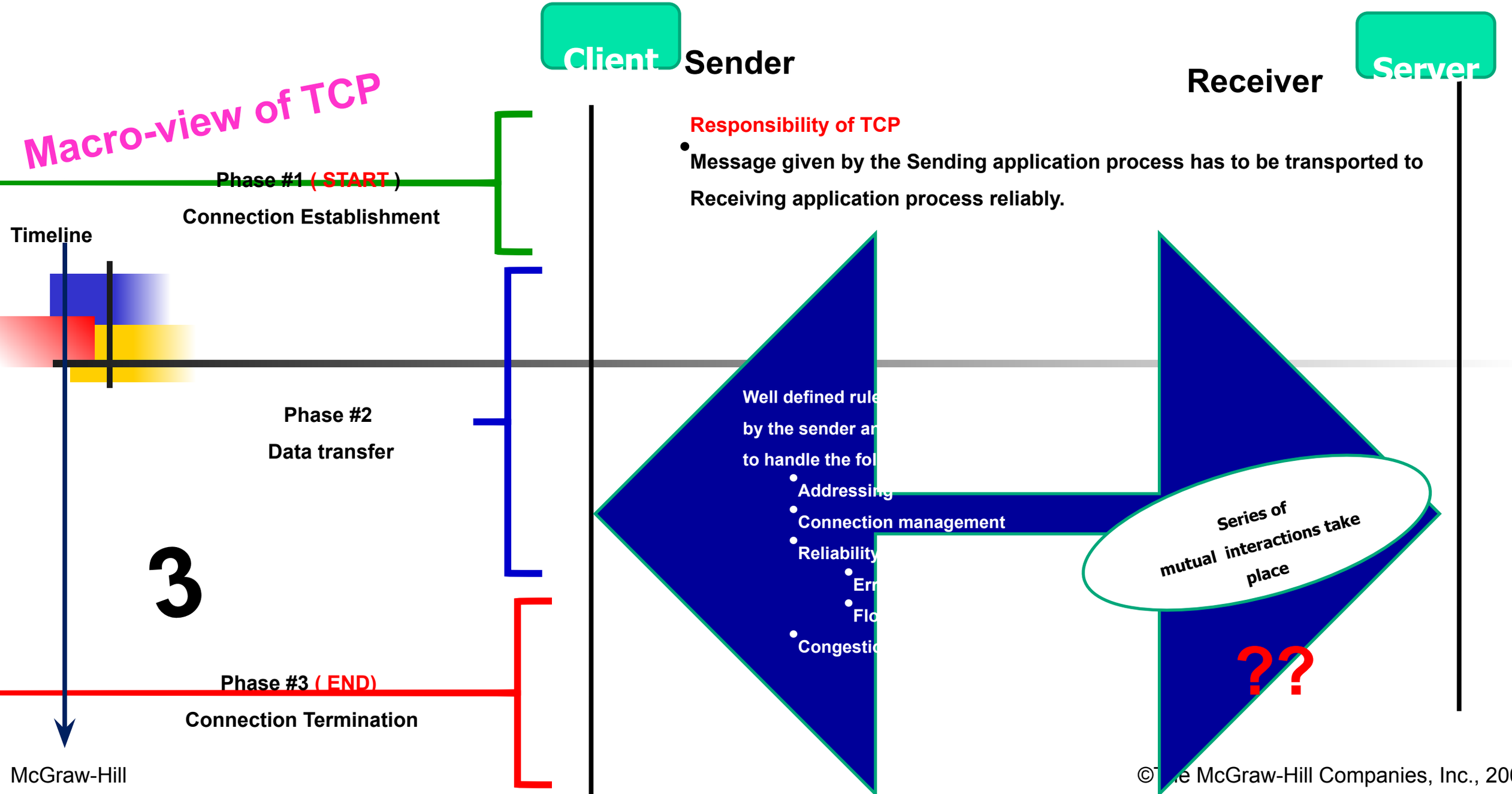
Note :

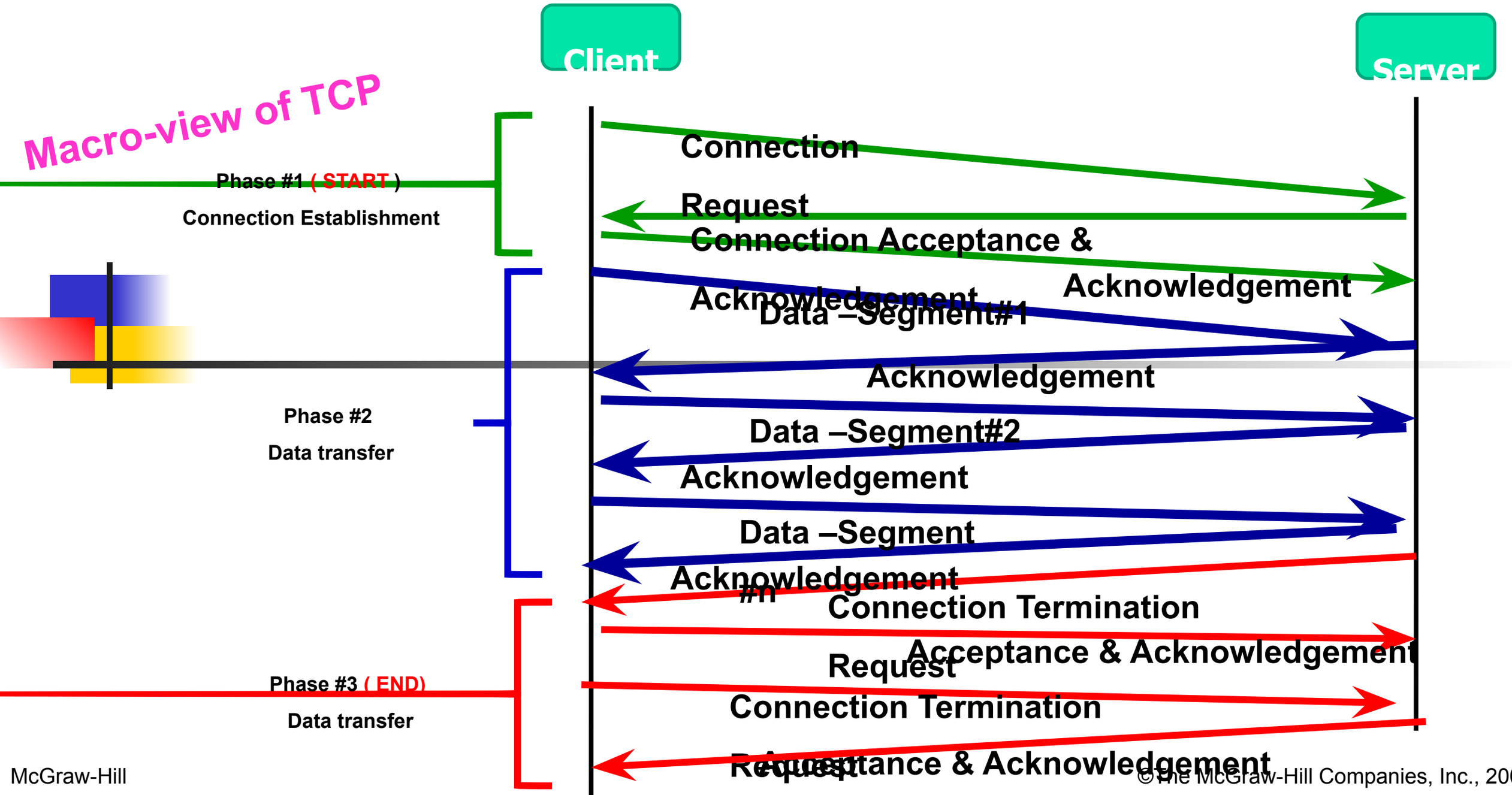
- **It is a virtual connection**
- **TCP segment is encapsulated in an IP datagram**
- **Can be sent out of order or lost or corrupted and then resent**

TCP offers reliable service

Uses acknowledgement mechanism to check the safe and right arrival of the data

Macro-view of TCP





TCP - Segment

Figure 23.16 *TCP segment format*

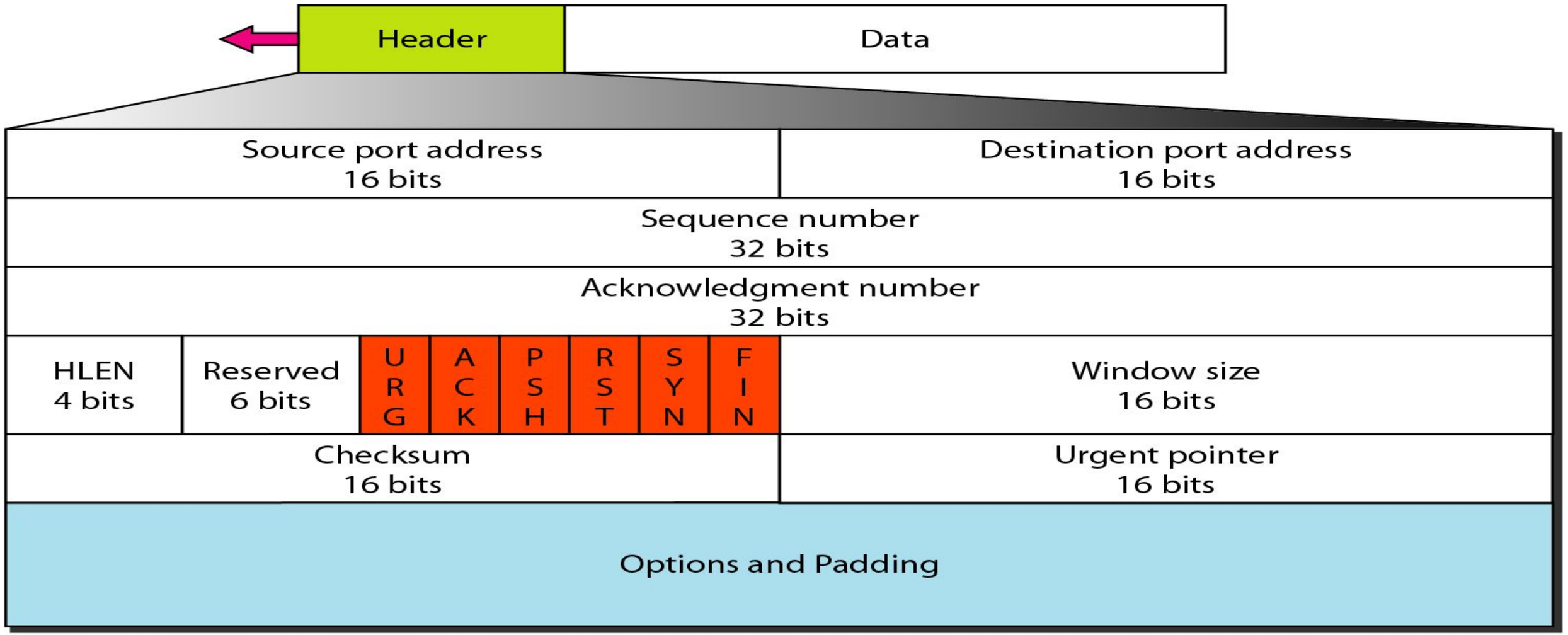


Table 23.3 ***Description of flags in the control field***

Flag	*Description*
URG	The value of the urgent pointer field is valid.
ACK	The value of the acknowledgment field is valid.
PSH	Push the data.
RST	Reset the connection.
SYN	Synchronize sequence numbers during connection.
FIN	Terminate the connection.