

The TCP/IP Guide

A TCP/IP Reference You Can Understand!

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TCP Message (Segment) Format

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TCP Options and Option Field Values

[Table 157](#) shows the main options currently defined for TCP.

Table 157: TCP Options

Option-Kind	Option-Length	Option-Data	Description
0	—	—	End Of Option List: A single byte option that marks the end of all options included in the header. This only needs to be included when the end of the options doesn't coincide with the end of the header.
1	—	—	No-Operation: A "spacer" that can be included between options to align a subsequent option on a 32-bit boundary if needed.
2	4	Maximum Segment Size Value	Maximum Segment Size: Conveys the size of the largest segment the sender of the segment wishes to receive . Used only in connection request (SYN) messages.
3	3	Window Size Shift Bits	Window Scale: Implements the optional window scale feature, which allows devices to support much larger window sizes than would be possible with the normal <i>Window</i> field. The value of <i>Option-Data</i> specifies the power of two that the <i>Window</i> field should be multiplied by to get the actual window size the sender of the option is using. For example, if the value of <i>Option-Data</i> is 3, it means values in the <i>Window</i> field should be multiplied by 8, assuming both devices agree to use this feature. This allows very large windows to be advertised when needed on high-performance links. See the topic on data transfer for more .
4	2	—	Selective Acknowledgment Permitted: Specifies that this device supports the selective acknowledgment (SACK) feature . This was implemented as a two-byte option with no <i>C</i> field, instead of a single-byte option like <i>End Of Option List</i> or <i>No-Operation</i> . This was not in the original TCP specification, so an explicit option length field was added for backwards compatibility.
5	Variable	Blocks Of Data Selectively Acknowledged	Selective Acknowledgment: Allows devices supporting the optional selective acknowledgment feature to specify non-contiguous blocks of data that have been received so they are not retransmitted if intervening segments do not show up and need to be retransmitted.
14	3	Alternate Checksum Algorithm	Alternate Checksum Request: Lets a device request that a checksum generation algorithm other than the standard TCP algorithm be used for this connection. Both devices must agree to use the alternate algorithm for it to be used.

www.tcpguide.com/free/t_TCPMessageSegmentFormat-4.htm

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Maximum Segment Size, Window Scale, Selective Acknowledgement Permitted and Alternate Checksum Request options above. In Selective Acknowledgment and Alternate Checksum options appear in regular data segments, when used.

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