

## OS/400 TCP/IP Tuning: MTU AND WINDOW SIZES

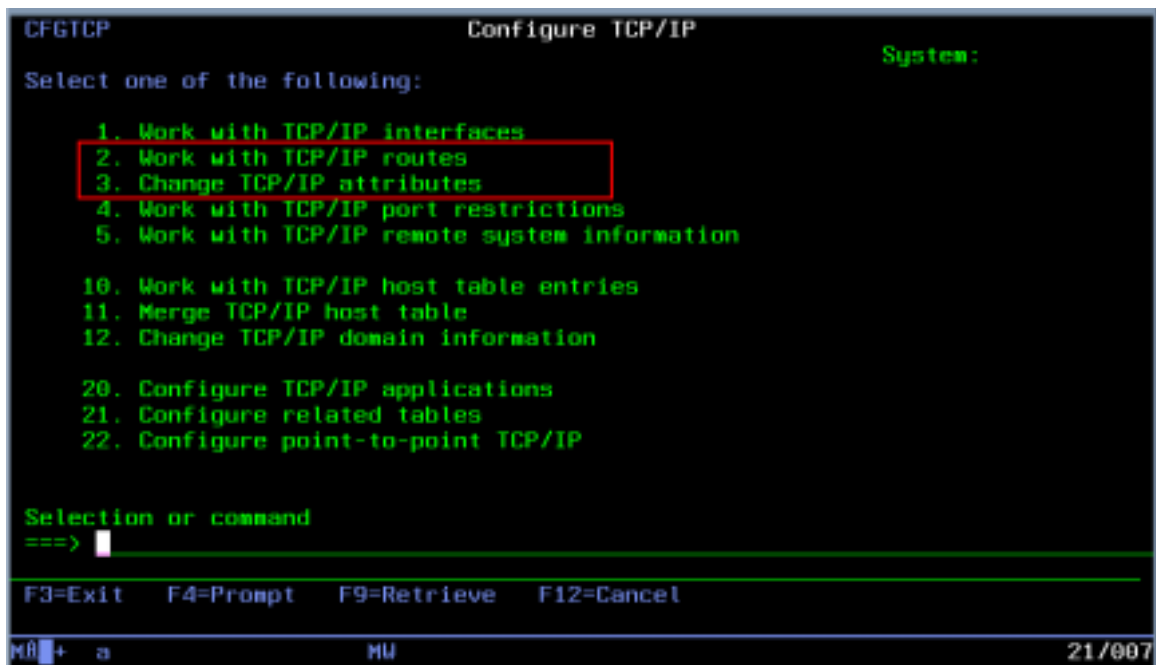
Your AS/400 may be running TCP/IP at a disadvantage unless you've changed some IBM default settings:

### Minimum Transfer Unit (MTU) size TCP/IP window size

**MTU** limits the size of the largest packet transmitted by your AS/400. *The default MTU size of 576 bytes* is designed to be effective over dial-up connections.

Alas, it is much lower than the most efficient values for Ethernet and Token-Ring, which can handle 1500 and 2000 bytes, respectively.

The result is that your AS/400 must chop data up into three times as many packets to send it - very wasteful and a huge performance sink on today's fast LAN and Internet networks.

A screenshot of the OS/400 CFGTCP (Configure TCP/IP) menu. The screen is black with green text. At the top, it says 'CFGTCP' on the left and 'Configure TCP/IP' in the center. On the right, it says 'System:'. Below this, it prompts 'Select one of the following:'. A list of options is shown, with options 1 through 5 enclosed in a red rectangular box. The options are: 1. Work with TCP/IP interfaces, 2. Work with TCP/IP routes, 3. Change TCP/IP attributes, 4. Work with TCP/IP port restrictions, and 5. Work with TCP/IP remote system information. Below the list, options 10 through 22 are also visible. At the bottom, there is a prompt 'Selection or command' followed by '==>' and a cursor. At the very bottom, there are function key shortcuts: F3=Exit, F4=Prompt, F9=Retrieve, and F12=Cancel. The bottom right corner shows '21/007'.

Matching the MTU size to the best one for a particular physical interface will improve network efficiency markedly. You do this by editing each TCP/IP route in your OS/400's routing table (usually there is just one, the default route, but you may have more):

1. GO CFGTCP
2. Select option 2, *Work with TCP/IP routes*
3. Edit the desired route - \*DFTRROUTE for example
4. Change the Maximum Transmission Unit to \*IFC

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Change TCP/IP Route (CHGTCP RTE)

Type choices, press Enter.

Route destination . . . . . > '*DFTRROUTE'   Character value, *DFTRROUTE...
Subnet mask . . . . . > '*NONE'           Character value, *NONE, *HOST
Type of service . . . . . > *NORMAL      *MINDELAY, *MAXTHRPUT...
Next hop . . . . . > '152.112.0.1'
Preferred binding interface . . . > '152.112.0.10'
Maximum transmission unit . . . > *IFC       576-16388, *SAME, *IFC
Route metric . . . . . > 1                1-16, *SAME
Route redistribution . . . . . > *NO        *SAME, *YES, *NO
Duplicate route priority . . . . > 5         1-10, *SAME

F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys

Bottom
M8 a MU 10/037

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This sets the MTU to the most efficient value for the interface supporting that route. For example, if your default route is an Ethernet port leading to your Internet gateway, the \*IFC value will automatically change the MTU for packets on that path from 576 to 1500.

The other default value to change is the **TCP/IP window size**, which governs how much data can be "in the air" waiting for an acknowledgment. Here again IBM has been overly conservative - the *window size defaults to just 8 K*, when today's reliable networks can easily juggle much more. Fixing this will have a noticeable effect on performance - the larger the window, the better the performance. Too large a window size results in buffer overruns, which can cause retransmissions and degraded performance, so you may have to experiment a bit. **A good bet is to start with 32 K or 64 K.** Here's how to do it:

1. GO CFGTCP
2. Select option 3, *Change TCP/IP attributes*
3. Change the send and receive buffer sizes
4. Restart TCP/IP

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Change TCP/IP Attributes (CHGTCPA)
Type choices, press Enter.
TCP keep alive . . . . . 120 1-40320, *SAME, *DFT
TCP urgent pointer . . . . . *BSD *SAME, *BSD, *RFC
TCP receive buffer size . . . . . 16384 512-8388608, *SAME, *DFT
TCP send buffer size . . . . . 16384 512-8388608, *SAME, *DFT
UDP checksum . . . . . *YES *SAME, *YES, *NO
Path MTU discovery:
  Enablement . . . . . *YES *SAME, *DFT, *NO, *YES
  Interval . . . . . 10 5-40320, *DNCE
IP datagram forwarding . . . . . *NO *SAME, *YES, *NO
IP source routing . . . . . *YES *SAME, *YES, *NO
IP reassembly time-out . . . . . 10 5-120, *SAME, *DFT
IP time to live . . . . . 64 1-255, *SAME, *DFT
ARP cache timeout . . . . . 15 1-1440, *SAME, *DFT
Log protocol errors . . . . . *YES *SAME, *YES, *NO

F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys

Bottom
M8 + a MW 05/037
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