Open Transport 1.1: Memory Fragmentation (8/96)

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TOPIC ---

It appears that memory does not get released properly after using some TCP/IP
applications with Open Transport 1.1. Sometimes the Largest Unused Block in
About This Macintosh decreases after quitting TCP/IP applications, but other
times it does not appear to decrease.

I have selected 'Load only when needed' in the TCP/IP control panel.

What could be causing this behavior?

DISCUSSION --

There have been some reports of memory not being released when using TCP/IP
applications with Open Transport. Although the issue is under investigation by
Apple Engineering, it appears this could be a normal condition for the Mac OS
based on the design of the 'Load only when needed' option, especially if non-TCP
applications are launched after a TCP/IP application.

When launching TCP/IP applications, if TCP is not loaded, Open Transport loads
the TCP/IP stack into the application heap (memory reserved for applications
under the Mac OS) after the TCP/IP application. After the last TCP/IP
application is quit, the TCP/IP stack unloads from memory. However, if other
non-TCP/IP applications have been loaded before quiting the TCP/IP application,
memory can be fragmented.

For instance, if you load TCP/IP application A and another non-TCP/IP
application B, memory will be arranged as follows (from top of memory to
bottom):

Free Memory
APP B
TCP/IP STACK
APP A

Then, later you quit Application A, memory will look like:

Free Memory Block 2
APP B

Free Memory Block 1

At this point, the memory is fragmented because the free memory block is split
into two parts by application B. If you looked at About this Macintosh, the
Largest Unused Block would be smaller than it was before launching applications
A and B. The Largest Unused Block is the largest block of contiguous memory, and
with application A in the middle of two free memory blocks, blocks 1 and 2
cannot be joined together to form a larger contiguous block.

The workaround is to deselect the 'Load Only As Needed' option in the TCP/IP
control panel (but leave TCP/IP active). This will force the Mac OS to load
TCP/IP into memory before applications use any of the application heap and
prevent memory fragmentation. The drawback is that memory will always be
allocated to the TCP/IP stack defeating the benefits of the 'Load only as
needed' option.

The TCP/IP stack will unload from memory about 2 minutes after there is NO
TCP/IP activity. With some PPP connections, the stack will not unload. For PPP
users, it is recommended they use the 'load always' option.

Article Change History:
29 Aug 1996 - Added keyword.
22 May 1996 - Change security to Everyone, added TCP/IP stack info.

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