SNA Services/6000 Tuning and Performance Tips

Special Notices

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> **Note:** The information in this document has **not** been verified for AIX 4.1.

About this Document

This document contains tips for network tuning in an SNA environment. It applies to all levels of AIX 3.2. For more information on network tuning in an SNA environment, refer to publication SC31-8094, "SNA Server/6000 & SNA Gateway/6000 Performance Guide".

Communications Buffers (mbufs)

It is recommended that 1/4 of your physical memory be available for communication buffers (mbufs). Setting the upper limit ("thewall") at that point does not eat up your memory because it is not consumed unless it is required. Use the following commands to set values for the mbuf pool parameters, where "X" is the size of memory in KB.

```
no -o thewall=X/4
no -o mb_cl_hiwat=X/32
no -o lowclust=X/64
no -o lowmbuf=X/64
```

For example, if you have 16 MB of memory, then X=16384 and you would use:

```
no -o thewall=4096
no -o mb_cl_hiwat=512
no -o lowclust=256
no -o lowmbuf=256
```

You can use the "no -a" command to get the current values and "netstat -m" to get a snapshot of overall system mbuf usage.

Note: The values set by "no -o" from the command line are temporary. When you reboot, the parameters will return to their default values. You can set the values permanently by using smit to set the value for "thewall" and by putting the other three commands in a initialization file such as rc.net. To change "thewall" in smit, choose the following sequence:

```
System Environments
Change / Show Characteristics of Operating System
Maximum Kbytes of real memory allowed for MBUFS
```

mbuf Usage

Clusters are large mbufs of size 4096 bytes. The small mbufs are 256 bytes long. Clusters are recorded as "mapped pages" in the "netstat -m" output. The number of mapped pages in use will indicate SNA Services/6000 mbuf usage. Let us look at an example of mbuf usage reported by "netstat -m":

```
205 mbufs in use
16/75 mapped pages in use
351 Kbytes allocated to the network (32% in use)
```

The above output indicates that 205 small mbufs of size 256 bytes are in use. Also 16 clusters of size 4096 are in use and 351 KB are allocated to the network. How did they come up with 32% used? 205 mbufs of size 1/4 KB plus 16 clusters of size 4 KB divided by 351 KB allocated to the network gives 32%. Arithmetically,

```
(205/4 + 16*4)/351 = 32/1000.
```

At times you may see 90% or higher used by the network. This is a percentage of what is allocated, not a percentage of the system maximum ("thewall"). Therefore, 90% usage does not necessarily mean congestion. It means that more mbufs should be allocated either by the user or by the system upon demand. The user can increase allocation by setting "lowclust" higher.

SNA DLC Link Parameters

Certain SNA DLC link profile parameters significantly impact throughput of file transfer type applications. For token ring and Ethernet, use the following rule: The Transmit_Window_Count parameter on node A should always be greater than or equal to the Receive_Window_Count on node B for every two nodes A and B that are connected to one another. This holds even if A or B is not a RISC System/6000 machine. Using large values for Transmit_Window_Count and Receive_Window_Count does not enhance throughput. Setting the Transmit_Window_Count to 16 and Receive_Window_Count to an equal or lesser value should be sufficient for peak throughput.

For an SDLC connection, the Receive_Window_Count does not exist. In that respect, SDLC differs from token ring and Ethernet. The Transmit_Window_Count should be set for its maximum value of 7. With

SDLC, the "primary repoll time_out" must allow enough time for your largest frame to travel to and from the secondary station. Otherwise, unnecessary polls will flood the link, eventually bringing it down. If your link speed is X bits per second and your largest frame is Y bits, then your "primary repoll time-out" should be larger than 2*Y/X.

Memory

How much memory do you need to run X number of sessions?

A rough estimate is that adding 1 MB of memory will allow you to support 7 additional sessions. The exact number is dependent on traffic intensity.

For File-Transfer Type Applications

When using file-transfer type applications, you can configure your SNA LU6.2 Mode Profile via SMIT to maximize throughput. Use the following guidelines:

- Larger request/response unit (RU) sizes generally correspond to higher throughput. In SNA Services/6000 version 1, set RU max and min size to 3840. In SNA Server/6000 version 2, set RU size to 32K.
- Larger SEND/RECEIVE session pacing window sizes generally correspond to higher throughput. Try setting the SEND pacing and RECEIVE pacing window sizes to their maximum of 63.

When writing file-transfer type applications, use large buffers in the TP code. A 16K buffer size will speed up the transfer.

Additional Information

Please refer to publication SC31-8094, "SNA Server/6000 & SNA Gateway/6000 Performance Guide" for additional information about network tuning in an SNA environment.

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