Paging Space Tips for AIX 3.2 & 4.1

Special Notices

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About this Document

This document contains tips for paging space in AIX 3.2 and 4.1 on a RISC System 6000. This document is based on HONE item HQ657906.

Rules of Thumb for Paging Space Size

There is no "right" amount of paging space for a system. Paging space requirements are unique for each system, depending on such things as which applications are running and/or the number of active users.

There are several "rules of thumb" which can be used to determine how much paging space is needed:

Rule 1

The install process will create paging space equal to two times memory (2X) for systems with less than 64MB of RAM. For systems with 64MB of RAM or more, but not greater than 256MB, the paging space will be RAM size + 16MB. The following equation will be used for systems with more than 256MB of RAM:

```
Page Space = 512 + ( RAM - 256 ) * 1.25
```

Please note that while this may be applicable to some computing environments, it may either be too much or too little paging space for others.

Rule 2

Systems with large amounts of memory typically do not need such large amounts of paging space. If the machine is in a "persistent storage environment", meaning that it has a few small programs and a large amount of data, it may not need even as much as one times RAM for paging space. For example, a 1GB database server running on a RISC System/6000 with 256MB of RAM and only running about 50MB of "working" storage does not need 512MB of paging space, or even 256MB of paging space. It only needs the

amount of paging space that will allow all the working storage to be paged out to disk. This is because the 1GB database is mostly "persistent storage" and will require little or no paging space. So, keep in mind that more paging space is not necessarily good, since any unused paging space is simply wasted disk space. *BUT*, if you do not have enough paging space, a variety of unpleasant symptoms can occur on your system.

Rule 3

The "two times RAM" rule is a good starting point for systems with 256MB of RAM or less. Use the following equation for systems with more than 256MB of RAM:

```
Page Space = 512 + ( RAM - 256 ) * 1.25
```

Rule 4

If a disk drive containing an active paging space logical volume is removed from the system, the system will crash.

Things to Consider When Creating or Enlarging Paging Space

- Do not put more than one paging space logical volume on a physical volume.

  All processes that are started during the boot process are allocated paging space on the default paging space logical volume (hd6). After the additional paging space logical volumes are activated, paging space is allocated in a "round robin" manner in 4KB "chunks". If you have paging space on multiple physical volumes and you put more than one paging space on one physical volume, you will no longer be spreading your paging activity over multiple physical volumes.

- Avoid putting a paging space logical volume on the same physical volume as a heavily active logical volume, such as that used by a database.

- It is not necessary to put a paging space logical volume on each physical volume.

- Make each paging space logical volume roughly equal in size.

  If you have paging spaces of different sizes, when the smaller ones become full, you will no longer be spreading your paging activity across all of your physical volumes.

- Do not extend a paging space logical volume onto multiple physical volumes.

  If a paging space logical volume is spread over multiple physical volumes, you will not be spreading your paging activity across all of your physical volumes. If you want to allocate space for paging on a physical volume that does not already have a paging space logical volume, create a new paging space logical volume on that physical volume.

- For best system performance, put paging space logical volumes on physical volumes which are each attached to a different disk controller.

How Will You Know If You Need More Paging Space?

- If any of the following messages appear on the console or in response to a command on any terminal:

  "INIT: Paging space is low"

  "ksh: cannot fork no swap space"

  "Not enough memory"

  "Fork function failed"

  "fork () system call failed"

  "Unable to fork, too many processes"

  "Fork failure - not enough memory available"

  "Fork function not allowed. Not enough memory available."

  "Cannot fork: Not enough space"

- If the average of the "%Used" column of the "lsps -a" output is greater than 80.
- If the "%Used" column of the "lsps -s" output is greater than 80.
- Use the following commands to help you determine if you need to make changes regarding paging space logical volumes:

  ```
  iostat
  vmstat
  lsps
  ```

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