
Tuning the RS/6000 Server to Improve Performance

If an AIX system administrator suspects that the Infoprint Manager RS/6000 server is either limiting overall print throughput or contributing to excessive print job response times, they can use this section to tune the server. However, administrators should use caution when modifying default configuration values: they could improve Infoprint Manager performance while degrading the performance of another application running on the same Infoprint Manager RS/6000 server. Any tuning changes should be evaluated for effectiveness after they have been applied.

The performance of an Infoprint Manager RS/6000 server can differ, depending upon the environment they have been configured to support. This topic describes how the Infoprint Installer modifies the configuration defaults for both a basic server configuration and an advanced server configuration. In addition, this section provides tuning recommendations for Input Manager, Infoprint Manager's utility for processing input from tape, file, or standard input that must be processed and printed.

Basic Server Configuration

During the install of a Basic Infoprint Manager 3.2 configuration, the Infoprint Installer sets the Infoprint Manager RS/6000 tuning parameters for large print-on-demand documents that contain compressed images and are printed on high-speed printers, such as the Infoprint 4000 IR3/IR4 printer. These performance options are contained in the `/etc/rc.net.ipr` file.

Note that if you have a pre-configured Model 4161-002 RS/6000 server, the Infoprint Installer will not perform any additional performance tuning. Because the serial storage architecture (SSA) disk array performance within this model is dependent upon the vmtune settings, IBM does not recommend modifying tuning parameters on a Model 4161-002 RS/6000 server for any other applications.

Advanced Server Configuration

During the install of an Advanced Infoprint Manager 3.2 configuration, the Infoprint Installer does not make any changes to the tuning parameters for a general RS/6000 environment. If system administrators decide to tune parameters, they should use the System Management Interface Tool (SMIT) to make changes.

1. Logon to the AIX system as **root**.
2. From the AIX command line, type either **smit** or **smitty** and take the following path: **Infoprint Printing Systems**→**Infoprint Utilities**→**Tune System Performance**→**Optimize Infoprint Performance**
 - This option sets system tuning parameters that affect TCP/IP memory and disk I/O characteristics that are contained in the `/etc/rc.net.ipr` script.
3. From an AIX window, specify:
 - a. `pdshutdown -w now servername` where *servername* is the name of the Infoprint AIX server.
 - b. Shutdown `-Fr` to shut down and subsequently restart the AIX operating system so these values can take effect.

Tuning Input Manager

Input Manager is Infoprint Manager's internal component for processing input from a variety of sources. The following section provides tuning suggestions for some of Input Manager's key components:

- File Sync Parameter
- Segment Size Parameter
- Work Area Allocation
- Tuning Input Manager through SMIT

File Sync Parameter

In Infoprint Manager 3.2, the **File Sync THRESHOLD LIMIT (K Bytes)** is set to 0 to disable it. The `/etc/rc.net.ipr` file performance settings help sequential disk I/O performance. However, if your installation does not call the **vmtune** options from this file, you may need to specify a file sync setting to improve the performance of some print applications.

Segment Size Parameter

The **Default SEGMENT SIZE** parameter affects the disk I/O performance of the `/var/psf/segments` file system. This parameter determines the maximum size of any temporary file created by the Input Manager component that is stored in `/var/psf/segments`. This setting determines the number of temporary files that Input Manager requires for all print jobs submitted to Infoprint Manager: the smaller the setting, the more files required to process the AFP input data.

For Basic Server configurations, the default setting of 5000 KB per segment can be raised to reduce the disk I/O usage associated with reading and writing data to the `/var/psf/segments` file system.

For Advanced Server configurations, the default setting of 1000 KB per segment can be raised to reduce the disk I/O usage associated with reading and writing data to the `/var/psf/segments` file system; however, the default setting usually works well with most AFP production applications.

Work Area Allocation

The SMIT field **PERCENTAGE of work area for retained jobs** determines how much of the `/var/psf/segments` file system is allocated for retained segment files. The lower this number, the better Input Manager's performance. The default setting is 50 percent, but you may want to lower the setting to 5 percent.

Tuning Input Manager through SMIT

Use the following procedure to tune Input Manager settings with SMIT:

1. Logon to the AIX system as **root**.
2. From the AIX command line, type either `smit` or `smitty` and take the following path: **Infoprint Printing Systems > Miscellaneous Configuration > Customize the Input Manager**

From the **Customize the Input Manager** panel, set the following values as indicated in the table below.

Field	Variable
PATH used for work area & percentage usage	threshold /var/psf/segments
Work area MANAGEMENT	automatic

PERCENTAGE of work area for retained jobs	5
File Sync THRESHOLD LIMIT (K Bytes)	0
Default SEGMENT SIZE (K Bytes)	5000 for Basic Server Configuration 1000 for Advanced Server Configuration

Contents of the /etc/rc.net.ipr Script

This script modifies three AIX commands that are necessary to set network, memory, and I/O tuning parameters: **chdev**, **vmtune**, and **no**. The **chdev** command acts upon the system device (in this case, sys0) to enable pacing. The **vmtune** command options are optimal for sequential I/O operations, especially the **-c4** setting, which enables the memory-to-disk write behind algorithm. This **-c** parameter keeps memory from being over committed to large sequential files, reducing the potential for real memory thrashing.

The **no** commands help improve system-wide network performance for all network devices. If you have Ethernet devices at 1,492 bytes Maximum Transmission Unit (MTU) size (both 10 BaseT and 100 BaseT), Token-Ring devices at 4,096 bytes MTU, or FDDI devices at 4,352 bytes MTU, the settings shown below are helpful:

```
# TCP/IP PERFORMANCE TUNING
if [ -f /usr/sbin/no ] ; then
/usr/sbin/no -o rfc1323=1
/usr/sbin/no -o thewall=16384
/usr/sbin/no -o sb_max=262144
/usr/sbin/no -o tcp_sendspace=131072
/usr/sbin/no -o tcp_recvspace=131072
/usr/sbin/no -o udp_sendspace=65536
/usr/sbin/no -o udp_recvspace=65536
/usr/sbin/no -o tcp_keepidle=240
/usr/sbin/no -o tcp_keepintvl=60
fi

# VMTUNE MEMORY MANAGEMENT PERFORMANCE TUNING
if [ -f /usr/samples/kernel/vmtune ] ; then
/usr/samples/kernel/vmtune -r 2 -R 16 -f 120 -F 200 -c 4
fi

# I/O PACING TO HELP TUNE READ AND WRITE I/O PERFORMANCE
if [ -f /usr/sbin/chdev ] ; then
/usr/sbin/chdev -l sys0 -a maxpout=41 -a minpout=16
fi
```