

# Changing Kernel Parameters

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There are several operating environment, or kernel, parameters that can affect the startup and the performance of a region. This section provides information about these kernel parameters.

The parameters governing the UNIX kernel configuration reside in one or more files. Because default values for the parameters vary by hardware platform and might have been previously adjusted, you must review the current settings. If the current setting of a parameter meets or exceeds the Sun<sup>™</sup> Mainframe Transaction Processing (Sun MTP) requirement, do not modify it.

The methods for changing kernel values vary for different systems. For specific details, including the exact location of these parameters and instructions on how to change them, refer to your operating system documentation. There are also many third-party books that cover system administration and kernel tuning.

The following table lists the interprocess communications (IPC) parameters.

**Solaris<sup>™</sup> Platforms:** These parameters might require tuning. On the Solaris 8 and Solaris 9 platforms, this involves modifying the `/etc/system` file and rebooting the system. On Solaris 10 platforms, use the resource control commands for tuning.

**AIX Platforms:** Kernel parameters are dynamic.

**TABLE 1** Interprocess Communications Parameters

Name	Description
MSGTQL	Solaris only. Maximum number of messages outstanding in the system. This must be at least as large as the maximum number of users defined in the VSAM Configuration Table (VCT). If multiple regions are in use, use the total of all users defined.
MSGMNI	Number of message queues system wide. Each Sun MTP region uses (number of transaction processors + number of transaction classes + 11) queues. Set MSGMNI to the total number of message queues needed for all regions running concurrently, plus the Solaris default value for MSGMNI.
SHMMAX	Size of a single shared memory segment. Set this parameter to the maximum Sun MTP segment size. The segment size is discussed in the “Shared Memory” section.
SHMMNI	Maximum number of shared memory segments that can be attached to all processes within a system.
SHMSEG	Solaris 8. Maximum number of segments attached to a process. The maximum is 23.
SEMMNI	Maximum number of semaphore sets. Sun MTP requires three semaphore sets per region.
SEMMNS	Solaris 8 and 9. Maximum number of semaphores. Sun MTP requires 35 semaphores per region.
SEMMSL	Maximum number of semaphores per semaphore set. Sun MTP requires a maximum value of 24 per region.
SEMMNU	Solaris 8 and 9. The system-wide number of semaphore undo structures. Set to the same value as SEMMNS.

The following table lists other kernel parameters.

**TABLE 2** Kernel Parameters

Sun MTP Name	Solaris Name	AIX Name	Description
MAXUP	maxuprc	maxuproc	<p>Maximum number of processes per user. The Sun MTP region initially creates a number of processes as discussed in the “Determining the Number of Sun MTP Processes “ section. The following additional processes can be created:</p> <p>Printing: A maximum of two additional processes are created.</p> <p>Debugging: One additional process is created for each user who uses a separate window for debugging.</p> <p>CMNU: Up to six processes can be started for each active transaction.</p> <p>CTBL: Two additional processes are started for each active transaction.</p> <p>CEMT: Two additional processes are started for each active transaction.</p> <p>CFMS: Two additional processes are started for each active transaction.</p> <p>CRED: Up to six processes can be started for each active transaction.</p> <p>CSGU: Up to six processes can be started for each active transaction.</p> <p>Batch: For each active batch job specified in the VCT, Sun MTP requires a minimum of two additional processes. The user shell script can create additional processes.</p> <p>In general, you must set MAXUP to the maximum number of processes required by the user who requires the most processes on a system. Note that users on X terminals use 10 to 15 processes just for windows.</p> <p><b>Solaris Platforms:</b> You must update the <code>/etc/system</code> file and reboot the system.</p> <p><b>AIX Platforms:</b> Update using SMIT; no reboot is required.</p>
NPROCS	max-nprocs		<p>Maximum number of processes in a system. If more than one region is active at one time, this value must be large enough to accommodate all concurrent regions. See the “Determining the Number of Sun MTP Processes “ section. Multiply the number by the maximum number of regions, then add the number of processes required for users.</p> <p><b>Solaris Platforms:</b> You must update the <code>/etc/system</code> file and reboot the system.</p>

**TABLE 2** Kernel Parameters (*Continued*)

Sun MTP Name	Solaris Name	AIX Name	Description
	rlim-fd-max		Maximum value for the HFNOLIM parameter. <b>Solaris Platforms:</b> You must update the <code>/etc/system</code> file and reboot the system.
NOFILES	rlim-fd-cur		Default value for the SFNOLIM parameter, which is the maximum number of open files for each process. This value must also include all sockets opened for Sun MTP. The <i>Sun Mainframe Transaction Processing Software Troubleshooting and Tuning Guide</i> describes how to calculate the number of files used by a Sun MTP region.

The following table describes the user limits.

**CODE EXAMPLE 2** User Limits

Name	Scope	Description
SCPULIM	CPU time	Soft limit for the maximum combined user and system time in seconds. A SIGXCPU signal is sent to a process that exceeds this limit. Set this to unlimited.
HCPULIM	CPU time	Maximum value of SCPULIM.
SFSZLIM	Maximum file size	Soft limit for the maximum file size in bytes. A SIGXFSX signal is sent to a process that writes to a file that exceeds this limit. The write also fails with an EFBIG error. Set this to unlimited.
HFSZLIM	Maximum file size	Maximum value of SFSZLIM.
SDATLIM	Maximum data size	Soft limit for the maximum size in bytes of a process' heap space. Any process that attempts to extend its heap beyond this limit fails with an ENOMEM. Set this to unlimited.
HDATLIM	Maximum data size	Maximum value of SDATLIM.
SFNOLIM	Maximum open file descriptors	Soft limit for the maximum number of file descriptors. When this limit is reached, the attempt to open the next file fails with an EMFILE. Set to a reasonable value for your application.
HFNOLIM	Maximum open file descriptors	Defines the maximum value of SFNOLIM.