Configurable Kernel Parameters

Certain kernel operating parameters can be configured to fit specific system needs, resulting in better performance or more effective allocation of resources. The ideal value for each parameter is often determined by the system's particular hardware configuration, the specific mix of applications the system runs, and the trustworthiness of system users; factors that vary widely from system to system.

HP attempts to provide reasonable default parameter settings, but you may find it necessary or beneficial to modify these settings to better suit the needs of your particular system's users. Use the list below to obtain detailed information about each configurable kernel parameter.

Note that individual parameters usually pertain to a specific subsystem; some are independent, but others are interrelated or interact with each other. The following list of online help topics for each parameter is grouped according to subsystem.

Warning

Changing kernel parameters to improper or inappropriate values or combinations of values can cause data loss, system panics, or other (possibly very obscure and/or difficult to diagnose) operating anomalies, depending on which parameters are set to what values.

- Before altering the value of any configurable kernel parameter, be sure you know the implications of making the change.
- Never set any system parameter to a value outside the allowable range for that parameter (SAM refuses to store values outside of the allowable range).
- Many parameters interact, and their values must be selected in a balanced way.

Discrepancies

As technological advances expand system size and capabilities, it is not uncommon for maximum and/or default values of certain parameters to change between releases or to vary between 32-bit and 64-bit processors. The information provided in the documents associated with this web page are believed to be accurate as of the time they were produced. However, system changes may occasionally result in discrepancies between the document and what is actually present on your system.

If you encounter any such discrepancies in any stated default or limit values, consult the files in `/etc/conf/master.d` on your system to determine the actual values for your machine.

Accounting Subsystem

- Overview of Accounting Suspend and Resume
  - Configurable Parameters for Accounting:

    `acctsuspend`

suspend accounting

`acctresume`

resume accounting

❍ Tutorial: Specifying an Accounting Threshold Value

Asynchronous I/O Subsystem

● Asynchronous I/O Parameters Overview

`aio_listio_max`

Max number of AIO operations that can be specified in a `lio_list()` call

`aio_max_ops`

Maximum number of AIO operations that can be queued at any time

`aio_physmem_pct`

Maximum number of AIO operations that can be specified in a `lio_list()` call

`aio_prio_delta_max`

Maximum slowdown factor; greatest priority reduction allowed in `aiocb`'s `aio_reqprio` field

Dump Parameters

● Kernel-panic dump parameters overview

`alwaysdump`

Bit-mask of kernel memory pages included in dumps

`dontdump`

Bit-mask of kernel memory pages excluded from dumps

`initmodmax`

Maximum number of kernel modules saved by system-crash dump

`modstrmax`

Maximum size of the kernel-module savecrash table

Fiber Channel Subsystem

● Overview of Fiber Channel Kernel Parameters

`num_tachyon_adapters`

Number of Tachyon adapters installed in the system

`max_fcp_reqs`

Maximum number of concurrent FCP requests allowed on a Tachyon FCP adapter

Mass-Storage Subsystem

- [Overview](#) of File System Kernel Parameters
- [List](#) of File System Kernel Parameters
- Configurable File System Buffer-Cache Parameters:

  [bufpages](#)

  Pages of static buffer cache

  [dbc_min_pct](#)

  Minimum dynamic buffer cache

  [dbc_max_pct](#)

  Maximum dynamic buffer cache

  [nbuf](#)

  Number of static buffer headers
- Configurable Open or Locked Files Parameters:

  [maxfiles](#)

  soft limit for open files

  [maxfiles_lim](#)

  hard limit for open files

  [nfile](#)

  system-wide open-files limit

  [nflocks](#)

  system-wide file-lock limit

  [ninode](#)

  Maximum open inodes in memory
- Configurable Asynchronous Write Parameter:

  [fs_async](#)

  Enable/disable asynchronous disk writes
- Configurable VxFS (Journaled) File-System Parameter:

  [vx_ncsize](#)

  Memory space reserved for VxFS directory path-name cache

Logical Volume Manager (LVM)

- [Overview of LVM Operation](#)
  - [Configurable Parameters for Logical Volume Manager](#)

    [maxvgs](#)

    > maximum volume groups on system

    [no_lvm_disks](#)

    > no volume groups on system (Series 700 only)

Memory Swap Subsystem

- [Overview of Memory Paging Parameters](#)
  - [Configurable Parameters for Memory Paging](#):

    [allocate_fs_swapmap](#)

    > fixed or dynamic swap-data-structure allocation

    [maxswapchunks](#)

    > maximum swap space configurable on the system

    [nswapdev](#)

    > number of available swap devices

    [nswapfs](#)

    > number of file systems available for swap

    [remote_nfs_swap](#)

    > enable/disable swap to remote NFS

    [swapmem_on](#)

    > enable/disable pseudo-swap reservation

    [swchunk](#)

    > client swap-chunk size

  - Variable-Page-Size Parameters:

    [vps_ceiling](#)

    > Maximum system-selected page size in Kbytes

    [vps_chatr_ceiling](#)

    > Maximum chatr-selected page size in Kbytes

    [vps_pagesize](#)

    > Default user page size in Kbytes

Process Management Subsystem

- [Overview of Process Management Parameters](#)
  - [Configurable Parameters for Process Management](#):

    maxdsiz

    > maximum process data segment size

    maxssiz

    > maximum process storage segment size

    max_thread_proc

    > maximum number of threads that one process can create

    maxtsiz

    > maximum process text segment size

    maxuprc

    > maximum number of processes per user

    nkthread

    > maximum number of kernel threads allowed on the system at same time

    nproc

    > maximum number of processes system-wide

    timeslice

    > time slice allocation between competing processes

Character-Mode I/O Streams Parameters

- [Overview](#) of Character-Mode I/O Streams Parameters

  NSTRBLKSCHED

  > Factory use only. Do not change value.

  NSTREVENT

  > Maximum number of outstanding streams bufcalls that are allowed to exist at any given time on the system.

  NSTRPUSH

  > Maximum number of streams modules that are allowed to exist in any single stream at any given time on the system.

  NSTRSCHED

  > Maximum number of streams scheduler daemons that are allowed to run at any given time on the system.

  STRCTLSZ

Maximum number of control bytes allowed in the control portion of any streams message on the system.

STRMSGSZ

Maximum number of bytes that can be placed in the data portion of any streams message on the system.

nstrpty

System-wide maximum number of streams-based PTYs that are allowed on the system.

streampipes

Force All Pipes to be Streams-Based

System V IPC Shared-Memory Subsystem

- System V Inter-Process Communication Mechanisms
  - Overview of Message Queue Operation
    - Allocating Memory Space for Messages
    - Configurable IPC Message Parameters:

      mesg

      Enable/disable IPC messages (Series 700 only)

      msgmap

      message free-space map size

      msgmax

      maximum message size

      msgmnb

      maximum bytes in message queue

      msgmni

      maximum message queues on system

      msgseg

      number of segments in message queue

      msgssz

      message segment size

      msgtql

      maximum total messages on system
  - Overview of Semaphore Parameters
    - Configurable IPC Semaphore Parameters:

      sema

Enable/disable semaphores (Series 700 only)

semaem

Semaphore value-change limit

semmap

Size of free-semaphore resource map

semmni

Maximum semaphores system-wide

semmns

Maximum user-accessible semaphores system-wide

semmnu

Maximum undos per semaphore

semume

Maximum semaphore undos per process

semvmx

Maximum allowed semaphore value

❍ Overview of Shared Memory Operation

■ Configurable IPC Shared Memory Parameters:

shmem

Enable/disable shared memory (Series 700 only)

shmmax

Maximum shared memory segment size

shmmni

Maximum segments on system

shmseg

Maximum segments per process

VME I/O Subsystem Parameters

● VME optional I/O subsystem parameters

vmebpn_public_pages

Number of Kernel I/O Space Pages Needed by VME

vmebpn_sockets

Socket Domain AF_VME_LINK is Active (Boolean)

vmebpn_tcp_ip

Maximum Number of DLPI PPAs

vmebpn_tcp_ip_mtu

> Maximum PPA transmission unit size in Kbytes

vmebpn_total_jobs

> Maximum Number of VME Ports Open Concurrently

vme_io_estimate

> Number of 4-Kbyte kernel I/O space pages needed by VME

Miscellaneous Parameters

- Overview of Miscellaneous Parameters
    - Miscellaneous Configurable Parameters:

clicreservedmem

> Bytes of system memory to reserve for cluster interconnect

create_fastlinks

> Create fast symbolic links

default_disk_ir

> Immediate reporting for disk I/O

dst

> Enable/disable daylight-savings time

eqmemsize

> Size of equivalently mapped memory pool

ksi_alloc_max

> System-wide limit of queued signals that can be allocated

ksi_send_max

> Maximum number of queued signals that a process can send and have pending at one or more receivers

max_async_ports

> System-wide maximum number of ports to the asynchronous disk I/O driver that processes can have open at any given time

maxusers

> Maximum expected simultaneous system users

ncallout

> Maximum number of timeouts allowed

ncdnode

> Maximum number of open CD-ROM FS nodes

nclist

Maximum number of cblocks available for tty/pty I/O

[ndilbuffers](#)

Maximum open files for Device I/O Library

[npty](#)

Maximum ptys allowed system-wide

[nstrtel](#)

Number of Telnet Session Device Files

[o_sync_is_o_dsync](#)

Enable or disable translation of O_SYNC to O_DSYNC in open() and fcntl() system calls

[pfail_enabled](#)

Enable power-fail recovery

[public_shlibs](#)

Allow public protection IDs on shared libraries

[rtsched_numpri](#)

Number of real-time scheduling priority levels

[scroll_lines](#)

ITE scroll buffer size

[sendfile_max](#)

Special parameter for web-servers

[Spinlock Parameters](#) (undocumented)

[timezone](#)

Specify timezone offset from Universal Coordinated Time

[unlockable_mem](#)

Memory size reserved for system use

Undocumented Parameters

Some parameters are [not documented](#) for any of various reasons. Some are obsolete, some are associated with independent software subsystems, some can result in severe system malfunctions if they are altered without proper understanding, and some are not supported by SAM.