Kernel Parameters

The following is a consolidated list of the kernel parameters as implemented (mostly) by the __setup() macro and sorted into English Dictionary order (defined as ignoring all punctuation and sorting digits before letters in a case insensitive manner), and with descriptions where known.

Module parameters for loadable modules are specified only as the parameter name with optional '=' and value as appropriate, such as:

```
modprobe usbcore blinkenlights=1
```

Module parameters for modules that are built into the kernel image are specified on the kernel command line with the module name plus '.' plus parameter name, with '=' and value if appropriate, such as:

```
usbcore.blinkenlights=1
```

Hyphens (dashes) and underscores are equivalent in parameter names, so

```
log_buf_len=1M print-fatal-signals=1
```

can also be entered as

```
log-buf-len=1M print_fatal_signals=1
```

This document may not be entirely up to date and comprehensive. The command "modinfo -p ${modulename}" shows a current list of all parameters of a loadable module. Loadable modules, after being loaded into the running kernel, also reveal their parameters in /sys/module/${modulename}/parameters/. Some of these parameters may be changed at runtime by the command "echo -n ${value} > /sys/module/${modulename}/parameters/${parm}".

The parameters listed below are only valid if certain kernel build options were enabled and if respective hardware is present. The text in square brackets at the beginning of each description states the restrictions within which a parameter is applicable:

```
ACPI    ACPI support is enabled.
AGP     AGP (Accelerated Graphics Port) is enabled.
ALSA    ALSA sound support is enabled.
APIC    APIC support is enabled.
APM     Advanced Power Management support is enabled.
AVR32   AVR32 architecture is enabled.
AX25    Appropriate AX.25 support is enabled.
BLACKFIN Blackfin architecture is enabled.
DRM     Direct Rendering Management support is enabled.
EDD     BIOS Enhanced Disk Drive Services (EDD) is enabled
EFI     EFI Partitioning (GPT) is enabled
EIDE    EIDE/ATAPI support is enabled.
FB      The frame buffer device is enabled.
GCOV    GCOV profiling is enabled.
HW      Appropriate hardware is enabled.
IA-64   IA-64 architecture is enabled.
IMA     Integrity measurement architecture is enabled.
IOSCHED More than one I/O scheduler is enabled.
IP_PNP  IP DHCP, BOOTP, or RARP is enabled.
```

IPV6 IPv6 support is enabled.
ISAPNP ISA PnP code is enabled.
ISDN Appropriate ISDN support is enabled.
JOY Appropriate joystick support is enabled.
KGDB Kernel debugger support is enabled.
KVM Kernel Virtual Machine support is enabled.
LIBATA Libata driver is enabled
LP Printer support is enabled.
LOOP Loopback device support is enabled.
M68k M68k architecture is enabled.
These options have more detailed description inside of
Documentation/m68k/kernel-options.txt.
MCA MCA bus support is enabled.
MDA MDA console support is enabled.
MOUSE Appropriate mouse support is enabled.
MSI Message Signaled Interrupts (PCI).
MTD MTD (Memory Technology Device) support is enabled.
NET Appropriate network support is enabled.
NUMA NUMA support is enabled.
GENERIC_TIME The generic timeofday code is enabled.
NFS Appropriate NFS support is enabled.
OSS OSS sound support is enabled.
PV_OPS A paravirtualized kernel is enabled.
PARIDE The ParIDE (parallel port IDE) subsystem is enabled.
PARISC The PA-RISC architecture is enabled.
PCI PCI bus support is enabled.
PCIE PCI Express support is enabled.
PCMCIA The PCMCIA subsystem is enabled.
PNP Plug & Play support is enabled.
PPC PowerPC architecture is enabled.
PPT Parallel port support is enabled.
PS2 Appropriate PS/2 support is enabled.
RAM RAM disk support is enabled.
S390 S390 architecture is enabled.
SCSI Appropriate SCSI support is enabled.
A lot of drivers has their options described inside of
Documentation/scsi/.
SECURITY Different security models are enabled.
SELINUX SELinux support is enabled.
SERIAL Serial support is enabled.
SH SuperH architecture is enabled.
SMP The kernel is an SMP kernel.
SPARC Sparc architecture is enabled.
SWSUSP Software suspend (hibernation) is enabled.
SUSPEND System suspend states are enabled.
FTRACE Function tracing enabled.
TPM TPM drivers are enabled.
TS Appropriate touchscreen support is enabled.
UMS USB Mass Storage support is enabled.
USB USB support is enabled.
USBHID USB Human Interface Device support is enabled.
V4L Video For Linux support is enabled.
VGA The VGA console has been enabled.
VT Virtual terminal support is enabled.
WDT Watchdog support is enabled.
XT IBM PC/XT MFM hard disk support is enabled.

```
        X86-32  X86-32, aka i386 architecture is enabled.
        X86-64  X86-64 architecture is enabled.
                More X86-64 boot options can be found in
                Documentation/x86/x86_64/boot-options.txt .
        X86     Either 32bit or 64bit x86 (same as X86-32+X86-64)
```

In addition, the following text indicates that the option:

```
        BUGS=   Relates to possible processor bugs on the said processor.
        KNL     Is a kernel start-up parameter.
        BOOT    Is a boot loader parameter.
```

Parameters denoted with BOOT are actually interpreted by the boot
loader, and have no meaning to the kernel directly.
Do not modify the syntax of boot loader parameters without extreme
need or coordination with <Documentation/x86/boot.txt>.

There are also arch-specific kernel-parameters not documented here.
See for example <Documentation/x86/x86_64/boot-options.txt>.

Note that ALL kernel parameters listed below are CASE SENSITIVE, and that
a trailing = on the name of any parameter states that that parameter will
be entered as an environment variable, whereas its absence indicates that
it will appear as a kernel argument readable via /proc/cmdline by programs
running once the system is up.

The number of kernel parameters is not limited, but the length of the
complete command line (parameters including spaces etc.) is limited to
a fixed number of characters. This limit depends on the architecture
and is between 256 and 4096 characters. It is defined in the file
./include/asm/setup.h as COMMAND_LINE_SIZE.

```
        acpi=           [HW,ACPI,X86]
                        Advanced Configuration and Power Interface
                        Format: { force | off | strict | noirq | rsdt }
                        force -- enable ACPI if default was off
                        off -- disable ACPI if default was on
                        noirq -- do not use ACPI for IRQ routing
                        strict -- Be less tolerant of platforms that are not
                                strictly ACPI specification compliant.
                        rsdt -- prefer RSDT over (default) XSDT
                        copy_dsdt -- copy DSDT to memory

                        See also Documentation/power/pm.txt, pci=noacpi

        acpi_apic_instance=     [ACPI, IOAPIC]
                        Format: <int>
                        2: use 2nd APIC table, if available
                        1,0: use 1st APIC table
                        default: 0

        acpi_backlight= [HW,ACPI]
                        acpi_backlight=vendor
                        acpi_backlight=video
                        If set to vendor, prefer vendor specific driver
```

```
                (e.g. thinkpad_acpi, sony_acpi, etc.) instead
                of the ACPI video.ko driver.

acpi.debug_layer=       [HW,ACPI,ACPI_DEBUG]
acpi.debug_level=       [HW,ACPI,ACPI_DEBUG]
                Format: <int>
                CONFIG_ACPI_DEBUG must be enabled to produce any ACPI
                debug output.  Bits in debug_layer correspond to a
                _COMPONENT in an ACPI source file, e.g.,
                    #define _COMPONENT ACPI_PCI_COMPONENT
                Bits in debug_level correspond to a level in
                ACPI_DEBUG_PRINT statements, e.g.,
                    ACPI_DEBUG_PRINT((ACPI_DB_INFO, ...
                The debug_level mask defaults to "info".  See
                Documentation/acpi/debug.txt for more information about
                debug layers and levels.

                Enable processor driver info messages:
                    acpi.debug_layer=0x20000000
                Enable PCI/PCI interrupt routing info messages:
                    acpi.debug_layer=0x400000
                Enable AML "Debug" output, i.e., stores to the Debug
                object while interpreting AML:
                    acpi.debug_layer=0xffffffff acpi.debug_level=0x2
                Enable all messages related to ACPI hardware:
                    acpi.debug_layer=0x2 acpi.debug_level=0xffffffff

                Some values produce so much output that the system is
                unusable.  The "log_buf_len" parameter may be useful
                if you need to capture more output.

acpi_display_output=    [HW,ACPI]
                acpi_display_output=vendor
                acpi_display_output=video
                See above.

acpi_irq_balance [HW,ACPI]
                ACPI will balance active IRQs
                default in APIC mode

acpi_irq_nobalance [HW,ACPI]
                ACPI will not move active IRQs (default)
                default in PIC mode

acpi_irq_isa=   [HW,ACPI] If irq_balance, mark listed IRQs used by ISA
                Format: <irq>,<irq>...

acpi_irq_pci=   [HW,ACPI] If irq_balance, clear listed IRQs for
                use by PCI
                Format: <irq>,<irq>...

acpi_no_auto_ssdt       [HW,ACPI] Disable automatic loading of SSDT

acpi_os_name=   [HW,ACPI] Tell ACPI BIOS the name of the OS
                Format: To spoof as Windows 98: ="Microsoft Windows"
```

```
        acpi_osi=       [HW,ACPI] Modify list of supported OS interface strings
                        acpi_osi="string1"      # add string1 -- only one string
                        acpi_osi="!string2"     # remove built-in string2
                        acpi_osi=               # disable all strings

        acpi_pm_good    [X86]
                        Override the pmtimer bug detection: force the kernel
                        to assume that this machine's pmtimer latches its value
                        and always returns good values.

        acpi_sci=       [HW,ACPI] ACPI System Control Interrupt trigger mode
                        Format: { level | edge | high | low }

        acpi_serialize  [HW,ACPI] force serialization of AML methods

        acpi_skip_timer_override [HW,ACPI]
                        Recognize and ignore IRQ0/pin2 Interrupt Override.
                        For broken nForce2 BIOS resulting in XT-PIC timer.

        acpi_sleep=     [HW,ACPI] Sleep options
                        Format: { s3_bios, s3_mode, s3_beep, s4_nohwsig,
                                  old_ordering, s4_nonvs, sci_force_enable }
                        See Documentation/power/video.txt for information on
                        s3_bios and s3_mode.
                        s3_beep is for debugging; it makes the PC's speaker beep
                        as soon as the kernel's real-mode entry point is called.
                        s4_nohwsig prevents ACPI hardware signature from being
                        used during resume from hibernation.
                        old_ordering causes the ACPI 1.0 ordering of the _PTS
                        control method, with respect to putting devices into
                        low power states, to be enforced (the ACPI 2.0 ordering
                        of _PTS is used by default).
                        nonvs prevents the kernel from saving/restoring the
                        ACPI NVS memory during suspend/hibernation and resume.
                        sci_force_enable causes the kernel to set SCI_EN
directly
                        on resume from S1/S3 (which is against the ACPI spec,
                        but some broken systems don't work without it).

        acpi_use_timer_override [HW,ACPI]
                        Use timer override. For some broken Nvidia NF5 boards
                        that require a timer override, but don't have HPET

        acpi_enforce_resources= [ACPI]
                        { strict | lax | no }
                        Check for resource conflicts between native drivers
                        and ACPI OperationRegions (SystemIO and SystemMemory
                        only). IO ports and memory declared in ACPI might be
                        used by the ACPI subsystem in arbitrary AML code and
                        can interfere with legacy drivers.
                        strict (default): access to resources claimed by ACPI
                        is denied; legacy drivers trying to access reserved
                        resources will fail to bind to device using them.
                        lax: access to resources claimed by ACPI is allowed;
                        legacy drivers trying to access reserved resources
                        will bind successfully but a warning message is logged.
```

no: ACPI OperationRegions are not marked as reserved,
no further checks are performed.

ad1848= [HW,OSS]
Format: <io>,<irq>,<dma>,<dma2>,<type>

add_efi_memmap [EFI; X86] Include EFI memory map in
kernel's map of available physical RAM.

advansys= [HW,SCSI]
See header of drivers/scsi/advansys.c.

aedsp16= [HW,OSS] Audio Excel DSP 16
Format: <io>,<irq>,<dma>,<mss_io>,<mpu_io>,<mpu_irq>
See also header of sound/oss/aedsp16.c.

agp= [AGP]
{ off | try_unsupported }
off: disable AGP support
try_unsupported: try to drive unsupported chipsets
(may crash computer or cause data corruption)

aha152x= [HW,SCSI]
See Documentation/scsi/aha152x.txt.

aha1542= [HW,SCSI]
Format: <portbase>[,<buson>,<busoff>[,<dmaspeed>]]

aic7xxx= [HW,SCSI]
See Documentation/scsi/aic7xxx.txt.

aic79xx= [HW,SCSI]
See Documentation/scsi/aic79xx.txt.

alignment= [KNL,ARM]
Allow the default userspace alignment fault handler
behaviour to be specified. Bit 0 enables warnings,
bit 1 enables fixups, and bit 2 sends a segfault.

amd_iommu= [HW,X86-84]
Pass parameters to the AMD IOMMU driver in the system.
Possible values are:
fullflush - enable flushing of IO/TLB entries when
they are unmapped. Otherwise they are
flushed before they will be reused, which
is a lot of faster
off - do not initialize any AMD IOMMU found in
the system

amijoy.map= [HW,JOY] Amiga joystick support
Map of devices attached to JOY0DAT and JOY1DAT
Format: <a>,<b>
See also Documentation/kernel/input/joystick.txt

analog.map= [HW,JOY] Analog joystick and gamepad support
Specifies type or capabilities of an analog joystick

connected to one of 16 gameports
Format: <type1>,<type2>,..<type16>

apc= [HW,SPARC]
Power management functions (SPARCstation-4/5 + deriv.)
Format: noidle
Disable APC CPU standby support. SPARCstation-Fox does
not play well with APC CPU idle - disable it if you have
APC and your system crashes randomly.

apic= [APIC,X86-32] Advanced Programmable Interrupt Controller
Change the output verbosity whilst booting
Format: { quiet (default) | verbose | debug }
Change the amount of debugging information output
when initialising the APIC and IO-APIC components.

autoconf= [IPV6]
See Documentation/networking/ipv6.txt.

show_lapic= [APIC,X86] Advanced Programmable Interrupt Controller
Limit apic dumping. The parameter defines the maximal
number of local apics being dumped. Also it is possible
to set it to "all" by meaning -- no limit here.
Format: { 1 (default) | 2 | ... | all }.
The parameter valid if only apic=debug or
apic=verbose is specified.
Example: apic=debug show_lapic=all

apm= [APM] Advanced Power Management
See header of arch/x86/kernel/apm_32.c.

arcrimi= [HW,NET] ARCnet - "RIM I" (entirely mem-mapped) cards
Format: <io>,<irq>,<nodeID>

ataflop= [HW,M68k]

atarimouse= [HW,MOUSE] Atari Mouse

atascsi= [HW,SCSI] Atari SCSI

atkbd.extra= [HW] Enable extra LEDs and keys on IBM RapidAccess,
EzKey and similar keyboards

atkbd.reset= [HW] Reset keyboard during initialization

atkbd.set= [HW] Select keyboard code set
Format: <int> (2 = AT (default), 3 = PS/2)

atkbd.scroll= [HW] Enable scroll wheel on MS Office and similar
keyboards

atkbd.softraw= [HW] Choose between synthetic and real raw mode
Format: <bool> (0 = real, 1 = synthetic (default))

atkbd.softrepeat= [HW]
Use software keyboard repeat

```
autotest        [IA64]

baycom_epp=     [HW,AX25]
                Format: <io>,<mode>

baycom_par=     [HW,AX25] BayCom Parallel Port AX.25 Modem
                Format: <io>,<mode>
                See header of drivers/net/hamradio/baycom_par.c.

baycom_ser_fdx= [HW,AX25]
                BayCom Serial Port AX.25 Modem (Full Duplex Mode)
                Format: <io>,<irq>,<mode>[,<baud>]
                See header of drivers/net/hamradio/baycom_ser_fdx.c.

baycom_ser_hdx= [HW,AX25]
                BayCom Serial Port AX.25 Modem (Half Duplex Mode)
                Format: <io>,<irq>,<mode>
                See header of drivers/net/hamradio/baycom_ser_hdx.c.

boot_delay=     Milliseconds to delay each printk during boot.
                Values larger than 10 seconds (10000) are changed to
                no delay (0).
                Format: integer

bootmem_debug   [KNL] Enable bootmem allocator debug messages.

bttv.card=      [HW,V4L] bttv (bt848 + bt878 based grabber cards)
bttv.radio=     Most important insmod options are available as
                kernel args too.
bttv.pll=       See Documentation/video4linux/bttv/Insmod-options
bttv.tuner=     and Documentation/video4linux/bttv/CARDLIST

BusLogic=       [HW,SCSI]
                See drivers/scsi/BusLogic.c, comment before function
                BusLogic_ParseDriverOptions().

c101=           [NET] Moxa C101 synchronous serial card

cachesize=      [BUGS=X86-32] Override level 2 CPU cache size detection.
                Sometimes CPU hardware bugs make them report the cache
                size incorrectly. The kernel will attempt work arounds
                to fix known problems, but for some CPUs it is not
                possible to determine what the correct size should be.
                This option provides an override for these situations.

capability.disable=
                [SECURITY] Disable capabilities.  This would normally
                be used only if an alternative security model is to be
                configured.  Potentially dangerous and should only be
                used if you are entirely sure of the consequences.

ccw_timeout_log [S390]
                See Documentation/s390/CommonIO for details.

cgroup_disable= [KNL] Disable a particular controller
```

Format: {name of the controller(s) to disable}
{Currently supported controllers - "memory"}

checkreqprot [SELINUX] Set initial checkreqprot flag value.
Format: { "0" | "1" }
See security/selinux/Kconfig help text.
0 -- check protection applied by kernel (includes
any implied execute protection).
1 -- check protection requested by application.
Default value is set via a kernel config option.
Value can be changed at runtime via
/selinux/checkreqprot.

cio_ignore= [S390]
See Documentation/s390/CommonIO for details.

clock= [BUGS=X86-32, HW] gettimeofday clocksource override.
[Deprecated]
Forces specified clocksource (if available) to be used
when calculating gettimeofday(). If specified
clocksource is not available, it defaults to PIT.
Format: { pit | tsc | cyclone | pmtmr }

clocksource= [GENERIC_TIME] Override the default clocksource
Format: <string>
Override the default clocksource and use the clocksource
with the name specified.
Some clocksource names to choose from, depending on
the platform:
[all] jiffies (this is the base, fallback clocksource)
[ACPI] acpi_pm
[ARM] imx_timer1,OSTS,netx_timer,mpu_timer2,
pxa_timer,timer3,32k_counter,timer0_1
[AVR32] avr32
[X86-32] pit,hpet,tsc,vmi-timer;
scx200_hrt on Geode; cyclone on IBM x440
[MIPS] MIPS
[PARISC] cr16
[S390] tod
[SH] SuperH
[SPARC64] tick
[X86-64] hpet,tsc

clearcpuid=BITNUM [X86]
Disable CPUID feature X for the kernel. See
arch/x86/include/asm/cpufeature.h for the valid bit
numbers. Note the Linux specific bits are not
necessarily
stable over kernel options, but the vendor specific
ones should be.
Also note that user programs calling CPUID directly
or using the feature without checking anything
will still see it. This just prevents it from
being used by the kernel or shown in /proc/cpuinfo.
Also note the kernel might malfunction if you disable
some critical bits.

```
        cmo_free_hint=  [PPC] Format: { yes | no }
                        Specify whether pages are marked as being inactive
                        when they are freed.  This is used in CMO environments
                        to determine OS memory pressure for page stealing by
                        a hypervisor.
                        Default: yes

        code_bytes      [X86] How many bytes of object code to print
                        in an oops report.
                        Range: 0 - 8192
                        Default: 64

        com20020=       [HW,NET] ARCnet - COM20020 chipset
                        Format:

<io>[,<irq>[,<nodeID>[,<backplane>[,<ckp>[,<timeout>]]]]]

        com90io=        [HW,NET] ARCnet - COM90xx chipset (IO-mapped buffers)
                        Format: <io>[,<irq>]

        com90xx=        [HW,NET]
                        ARCnet - COM90xx chipset (memory-mapped buffers)
                        Format: <io>[,<irq>[,<memstart>]]

        condev=         [HW,S390] console device
        conmode=

        console=        [KNL] Output console device and options.

                tty<n>  Use the virtual console device <n>.

                ttyS<n>[,options]
                ttyUSB0[,options]
                        Use the specified serial port.  The options are of
                        the form "bbbbpnf", where "bbbb" is the baud rate,
                        "p" is parity ("n", "o", or "e"), "n" is number of
                        bits, and "f" is flow control ("r" for RTS or
                        omit it).  Default is "9600n8".

                        See Documentation/serial-console.txt for more
                        information.  See
                        Documentation/networking/netconsole.txt for an
                        alternative.

                uart[8250],io,<addr>[,options]
                uart[8250],mmio,<addr>[,options]
                        Start an early, polled-mode console on the 8250/16550
                        UART at the specified I/O port or MMIO address,
                        switching to the matching ttyS device later.  The
                        options are the same as for ttyS, above.

                If the device connected to the port is not a TTY but a braille
                device, prepend "brl," before the device type, for instance
                        console=brl,ttyS0
                For now, only VisioBraille is supported.
```

consoleblank= [KNL] The console blank (screen saver) timeout in seconds. Defaults to 10*60 = 10mins. A value of 0 disables the blank timer.

coredump_filter=
[KNL] Change the default value for /proc/<pid>/coredump_filter.
See also Documentation/filesystems/proc.txt.

cpcihp_generic= [HW,PCI] Generic port I/O CompactPCI driver
Format:
<first_slot>,<last_slot>,<port>,<enum_bit>[,<debug>]

crashkernel=nn[KMG]@ss[KMG]
[KNL] Reserve a chunk of physical memory to hold a kernel to switch to with kexec on panic.

crashkernel=range1:size1[,range2:size2,...][@offset]
[KNL] Same as above, but depends on the memory in the running system. The syntax of range is start-[end] where start and end are both a memory unit (amount[KMG]). See also Documentation/kdump/kdump.txt for a example.

cs89x0_dma= [HW,NET]
Format: <dma>

cs89x0_media= [HW,NET]
Format: { rj45 | aui | bnc }

dasd= [HW,NET]
See header of drivers/s390/block/dasd_devmap.c.

db9.dev[2|3]= [HW,JOY] Multisystem joystick support via parallel port (one device per port)
Format: <port#>,<type>
See also Documentation/input/joystick-parport.txt

debug [KNL] Enable kernel debugging (events log level).

debug_locks_verbose=
[KNL] verbose self-tests
Format=<0|1>
Print debugging info while doing the locking API self-tests.
We default to 0 (no extra messages), setting it to 1 will print _a lot_ more information - normally only useful to kernel developers.

debug_objects [KNL] Enable object debugging

no_debug_objects
[KNL] Disable object debugging

debugpat [X86] Enable PAT debugging

decnet.addr= [HW,NET]
Format: <area>[,<node>]
See also Documentation/networking/decnet.txt.

default_hugepagesz=
[same as hugepagesz=] The size of the default HugeTLB page size. This is the size represented by the legacy /proc/ hugepages APIs, used for SHM, and default size when mounting hugetlbfs filesystems. Defaults to the default architecture's huge page size if not specified.

dhash_entries= [KNL]
Set number of hash buckets for dentry cache.

digi= [HW,SERIAL]
IO parameters + enable/disable command.

digiepca= [HW,SERIAL]
See drivers/char/README.epca and Documentation/serial/digiepca.txt.

disable= [IPV6]
See Documentation/networking/ipv6.txt.

disable_ipv6= [IPV6]
See Documentation/networking/ipv6.txt.

disable_mtrr_cleanup [X86]
The kernel tries to adjust MTRR layout from continuous to discrete, to make X server driver able to add WB entry later. This parameter disables that.

disable_mtrr_trim [X86, Intel and AMD only]
By default the kernel will trim any uncacheable memory out of your available memory pool based on MTRR settings. This parameter disables that behavior, possibly causing your machine to run very slowly.

disable_timer_pin_1 [X86]
Disable PIN 1 of APIC timer
Can be useful to work around chipset bugs.

dmasound= [HW,OSS] Sound subsystem buffers

dma_debug=off If the kernel is compiled with DMA_API_DEBUG support, this option disables the debugging code at boot.

dma_debug_entries=<number>
This option allows to tune the number of preallocated entries for DMA-API debugging code. One entry is required per DMA-API allocation. Use this if the DMA-API debugging code disables itself because the architectural default is too low.

```
dma_debug_driver=<driver_name>
                With this option the DMA-API debugging driver
                filter feature can be enabled at boot time. Just
                pass the driver to filter for as the parameter.
                The filter can be disabled or changed to another
                driver later using sysfs.

dscc4.setup=    [NET]

dtc3181e=       [HW,SCSI]

dynamic_printk  Enables pr_debug()/dev_dbg() calls if
                CONFIG_DYNAMIC_PRINTK_DEBUG has been enabled.
                These can also be switched on/off via
                <debugfs>/dynamic_printk/modules

earlycon=       [KNL] Output early console device and options.
        uart[8250],io,<addr>[,options]
        uart[8250],mmio,<addr>[,options]
                Start an early, polled-mode console on the 8250/16550
                UART at the specified I/O port or MMIO address.
                The options are the same as for ttyS, above.

earlyprintk=    [X86,SH,BLACKFIN]
                earlyprintk=vga
                earlyprintk=serial[,ttySn[,baudrate]]
                earlyprintk=ttySn[,baudrate]
                earlyprintk=dbgp[debugController#]

                Append ",keep" to not disable it when the real console
                takes over.

                Only vga or serial or usb debug port at a time.

                Currently only ttyS0 and ttyS1 are supported.

                Interaction with the standard serial driver is not
                very good.

                The VGA output is eventually overwritten by the real
                console.

ekgdboc=        [X86,KGDB] Allow early kernel console debugging
                ekgdboc=kbd

                This is desgined to be used in conjunction with
                the boot argument: earlyprintk=vga

eata=           [HW,SCSI]

edd=            [EDD]
                Format: {"off" | "on" | "skip[mbr]"}

eisa_irq_edge=  [PARISC,HW]
                See header of drivers/parisc/eisa.c.
```

```
elanfreq=       [X86-32]
                See comment before function elanfreq_setup() in
                arch/x86/kernel/cpu/cpufreq/elanfreq.c.

elevator=       [IOSCHED]
                Format: {"anticipatory" | "cfq" | "deadline" | "noop"}
                See Documentation/block/as-iosched.txt and
                Documentation/block/deadline-iosched.txt for details.

elfcorehdr=     [IA64,PPC,SH,X86]
                Specifies physical address of start of kernel core
                image elf header. Generally kexec loader will
                pass this option to capture kernel.
                See Documentation/kdump/kdump.txt for details.

enable_mtrr_cleanup [X86]
                The kernel tries to adjust MTRR layout from continuous
                to discrete, to make X server driver able to add WB
                entry later. This parameter enables that.

enable_timer_pin_1 [X86]
                Enable PIN 1 of APIC timer
                Can be useful to work around chipset bugs
                (in particular on some ATI chipsets).
                The kernel tries to set a reasonable default.

enforcing       [SELINUX] Set initial enforcing status.
                Format: {"0" | "1"}
                See security/selinux/Kconfig help text.
                0 -- permissive (log only, no denials).
                1 -- enforcing (deny and log).
                Default value is 0.
                Value can be changed at runtime via /selinux/enforce.

erst_disable    [ACPI]
                Disable Error Record Serialization Table (ERST)
                support.

ether=          [HW,NET] Ethernet cards parameters
                This option is obsoleted by the "netdev=" option, which
                has equivalent usage. See its documentation for details.

failslab=
fail_page_alloc=
fail_make_request=[KNL]
                General fault injection mechanism.
                Format: <interval>,<probability>,<space>,<times>
                See also /Documentation/fault-injection/.

fd_mcs=         [HW,SCSI]
                See header of drivers/scsi/fd_mcs.c.

fdomain=        [HW,SCSI]
                See header of drivers/scsi/fdomain.c.

floppy=         [HW]
```

See Documentation/blockdev/floppy.txt.

force_pal_cache_flush
[IA-64] Avoid check_sal_cache_flush which may hang on buggy SAL_CACHE_FLUSH implementations. Using this parameter will force ia64_sal_cache_flush to call ia64_pal_cache_flush instead of SAL_CACHE_FLUSH.

ftrace=[tracer]
[FTRACE] will set and start the specified tracer as early as possible in order to facilitate early boot debugging.

ftrace_dump_on_oops[=orig_cpu]
[FTRACE] will dump the trace buffers on oops. If no parameter is passed, ftrace will dump buffers of all CPUs, but if you pass orig_cpu, it will dump only the buffer of the CPU that triggered the oops.

ftrace_filter=[function-list]
[FTRACE] Limit the functions traced by the function tracer at boot up. function-list is a comma separated list of functions. This list can be changed at run time by the set_ftrace_filter file in the debugfs tracing directory.

ftrace_notrace=[function-list]
[FTRACE] Do not trace the functions specified in function-list. This list can be changed at run time by the set_ftrace_notrace file in the debugfs tracing directory.

ftrace_graph_filter=[function-list]
[FTRACE] Limit the top level callers functions traced by the function graph tracer at boot up. function-list is a comma separated list of functions that can be changed at run time by the set_graph_function file in the debugfs tracing directory.

gamecon.map[2|3]=
[HW,JOY] Multisystem joystick and NES/SNES/PSX pad support via parallel port (up to 5 devices per port) Format: <port#>,<pad1>,<pad2>,<pad3>,<pad4>,<pad5> See also Documentation/input/joystick-parport.txt

gamma= [HW,DRM]

gart_fix_e820= [X86_64] disable the fix e820 for K8 GART
Format: off | on
default: on

gcov_persist= [GCOV] When non-zero (default), profiling data for kernel modules is saved and remains accessible via debugfs, even when the module is unloaded/reloaded.

When zero, profiling data is discarded and associated
debugfs files are removed at module unload time.

gdth= [HW,SCSI]
See header of drivers/scsi/gdth.c.

gpt [EFI] Forces disk with valid GPT signature but
invalid Protective MBR to be treated as GPT.

gvp11= [HW,SCSI]

hashdist= [KNL,NUMA] Large hashes allocated during boot
are distributed across NUMA nodes. Defaults on
for 64bit NUMA, off otherwise.
Format: 0 | 1 (for off | on)

hcl= [IA-64] SGI's Hardware Graph compatibility layer

hd= [EIDE] (E)IDE hard drive subsystem geometry
Format: <cyl>,<head>,<sect>

hest_disable [ACPI]
Disable Hardware Error Source Table (HEST) support;
corresponding firmware-first mode error processing
logic will be disabled.

highmem=nn[KMG] [KNL,BOOT] forces the highmem zone to have an exact
size of <nn>. This works even on boxes that have no
highmem otherwise. This also works to reduce highmem
size on bigger boxes.

highres= [KNL] Enable/disable high resolution timer mode.
Valid parameters: "on", "off"
Default: "on"

hisax= [HW,ISDN]
See Documentation/isdn/README.HiSax.

hlt [BUGS=ARM,SH]

hpet= [X86-32,HPET] option to control HPET usage
Format: { enable (default) | disable | force |
verbose }
disable: disable HPET and use PIT instead
force: allow force enabled of undocumented chips (ICH4,
VIA, nVidia)
verbose: show contents of HPET registers during setup

hugepages= [HW,X86-32,IA-64] HugeTLB pages to allocate at boot.
hugepagesz= [HW,IA-64,PPC,X86-64] The size of the HugeTLB pages.
On x86-64 and powerpc, this option can be specified
multiple times interleaved with hugepages= to reserve
huge pages of different sizes. Valid pages sizes on
x86-64 are 2M (when the CPU supports "pse") and 1G
(when the CPU supports the "pdpe1gb" cpuinfo flag)
Note that 1GB pages can only be allocated at boot time

using hugepages= and not freed afterwards.

hvc_iucv= [S390] Number of z/VM IUCV hypervisor console (HVC)
terminal devices. Valid values: 0..8

hvc_iucv_allow= [S390] Comma-separated list of z/VM user IDs.
If specified, z/VM IUCV HVC accepts connections
from listed z/VM user IDs only.

i2c_bus= [HW] Override the default board specific I2C bus speed
or register an additional I2C bus that is not
registered from board initialization code.
Format:
<bus_id>,<clkrate>

i8042.debug [HW] Toggle i8042 debug mode
i8042.direct [HW] Put keyboard port into non-translated mode
i8042.dumbkbd [HW] Pretend that controller can only read data from
keyboard and cannot control its state
(Don't attempt to blink the leds)
i8042.noaux [HW] Don't check for auxiliary (== mouse) port
i8042.nokbd [HW] Don't check/create keyboard port
i8042.noloop [HW] Disable the AUX Loopback command while probing
for the AUX port
i8042.nomux [HW] Don't check presence of an active multiplexing
controller
i8042.nopnp [HW] Don't use ACPIPnP / PnPBIOS to discover KBD/AUX
controllers
i8042.panicblink=
[HW] Frequency with which keyboard LEDs should blink
when kernel panics (default is 0.5 sec)
i8042.reset [HW] Reset the controller during init and cleanup
i8042.unlock [HW] Unlock (ignore) the keylock

i810= [HW,DRM]

i8k.ignore_dmi [HW] Continue probing hardware even if DMI data
indicates that the driver is running on unsupported
hardware.
i8k.force [HW] Activate i8k driver even if SMM BIOS signature
does not match list of supported models.
i8k.power_status
[HW] Report power status in /proc/i8k
(disabled by default)
i8k.restricted [HW] Allow controlling fans only if SYS_ADMIN
capability is set.

ibmmcascsi= [HW,MCA,SCSI] IBM MicroChannel SCSI adapter
See Documentation/mca.txt.

icn= [HW,ISDN]
Format: <io>[,<membase>[,<icn_id>[,<icn_id2>]]]

ide-core.nodma= [HW] (E)IDE subsystem
Format: =0.0 to prevent dma on hda, =0.1 hdb =1.0 hdc
.vlb_clock .pci_clock .noflush .nohpa .noprobe .nowerr
.cdrom .chs .ignore_cable are additional options

See Documentation/ide/ide.txt.

ide-pci-generic.all-generic-ide [HW] (E)IDE subsystem
Claim all unknown PCI IDE storage controllers.

idle= [X86]
Format: idle=poll, idle=mwait, idle=halt, idle=nomwait
Poll forces a polling idle loop that can slightly
improve the performance of waking up a idle CPU, but
will use a lot of power and make the system run hot.
Not recommended.
idle=mwait: On systems which support MONITOR/MWAIT but
the kernel chose to not use it because it doesn't save
as much power as a normal idle loop, use the
MONITOR/MWAIT idle loop anyways. Performance should be
the same as idle=poll.
idle=halt: Halt is forced to be used for CPU idle.
In such case C2/C3 won't be used again.
idle=nomwait: Disable mwait for CPU C-states

ignore_loglevel [KNL]
Ignore loglevel setting - this will print /all/
kernel messages to the console. Useful for debugging.

ihash_entries= [KNL]
Set number of hash buckets for inode cache.

ima_audit= [IMA]
Format: { "0" | "1" }
0 -- integrity auditing messages. (Default)
1 -- enable informational integrity auditing messages.

ima_hash= [IMA]
Format: { "sha1" | "md5" }
default: "sha1"

ima_tcb [IMA]
Load a policy which meets the needs of the Trusted
Computing Base. This means IMA will measure all
programs exec'd, files mmap'd for exec, and all files
opened for read by uid=0.

in2000= [HW,SCSI]
See header of drivers/scsi/in2000.c.

init= [KNL]
Format: <full_path>
Run specified binary instead of /sbin/init as init
process.

initcall_debug [KNL] Trace initcalls as they are executed. Useful
for working out where the kernel is dying during
startup.

initrd= [BOOT] Specify the location of the initial ramdisk

```
inport.irq=     [HW] Inport (ATI XL and Microsoft) busmouse driver
                Format: <irq>

intel_iommu=    [DMAR] Intel IOMMU driver (DMAR) option
        on
                Enable intel iommu driver.
        off
                Disable intel iommu driver.
        igfx_off [Default Off]
                By default, gfx is mapped as normal device. If a gfx
                device has a dedicated DMAR unit, the DMAR unit is
                bypassed by not enabling DMAR with this option. In
                this case, gfx device will use physical address for
                DMA.
        forcedac [x86_64]
                With this option iommu will not optimize to look
                for io virtual address below 32 bit forcing dual
                address cycle on pci bus for cards supporting greater
                than 32 bit addressing. The default is to look
                for translation below 32 bit and if not available
                then look in the higher range.
        strict [Default Off]
                With this option on every unmap_single operation will
                result in a hardware IOTLB flush operation as opposed
                to batching them for performance.

inttest=        [IA64]

iomem=          Disable strict checking of access to MMIO memory
        strict  regions from userspace.
        relaxed

iommu=          [x86]
        off
        force
        noforce
        biomerge
        panic
        nopanic
        merge
        nomerge
        forcesac
        soft
        pt      [x86, IA64]

io7=            [HW] IO7 for Marvel based alpha systems
                See comment before marvel_specify_io7 in
                arch/alpha/kernel/core_marvel.c.

io_delay=       [X86] I/O delay method
        0x80
                Standard port 0x80 based delay
        0xed
                Alternate port 0xed based delay (needed on some systems)
        udelay
                Simple two microseconds delay
```

none
No delay

ip= [IP_PNP]
See Documentation/filesystems/nfs/nfsroot.txt.

ip2= [HW] Set IO/IRQ pairs for up to 4 IntelliPort boards
See comment before ip2_setup() in
drivers/char/ip2/ip2base.c.

ips= [HW,SCSI] Adaptec / IBM ServeRAID controller
See header of drivers/scsi/ips.c.

irqfixup [HW]
When an interrupt is not handled search all handlers
for it. Intended to get systems with badly broken
firmware running.

irqpoll [HW]
When an interrupt is not handled search all handlers
for it. Also check all handlers each timer
interrupt. Intended to get systems with badly broken
firmware running.

isapnp= [ISAPNP]
Format: <RDP>,<reset>,<pci_scan>,<verbosity>

isolcpus= [KNL,SMP] Isolate CPUs from the general scheduler.
Format:
<cpu number>,...,<cpu number>
or
<cpu number>-<cpu number>
(must be a positive range in ascending order)
or a mixture
<cpu number>,...,<cpu number>-<cpu number>

This option can be used to specify one or more CPUs
to isolate from the general SMP balancing and scheduling
algorithms. You can move a process onto or off an
"isolated" CPU via the CPU affinity syscalls or cpuset.
<cpu number> begins at 0 and the maximum value is
"number of CPUs in system - 1".

This option is the preferred way to isolate CPUs. The
alternative -- manually setting the CPU mask of all
tasks in the system -- can cause problems and
suboptimal load balancer performance.

iucv= [HW,NET]

js= [HW,JOY] Analog joystick
See Documentation/input/joystick.txt.

keepinitrd [HW,ARM]

kernelcore=nn[KMG] [KNL,X86,IA-64,PPC] This parameter

specifies the amount of memory usable by the kernel
for non-movable allocations. The requested amount is
spread evenly throughout all nodes in the system. The
remaining memory in each node is used for Movable
pages. In the event, a node is too small to have both
kernelcore and Movable pages, kernelcore pages will
take priority and other nodes will have a larger number
of kernelcore pages. The Movable zone is used for the
allocation of pages that may be reclaimed or moved
by the page migration subsystem. This means that
HugeTLB pages may not be allocated from this zone.
Note that allocations like PTEs-from-HighMem still
use the HighMem zone if it exists, and the Normal
zone if it does not.

kgdbdbgp= [KGDB,HW] kgdb over EHCI usb debug port.
Format: <Controller#>[,poll interval]
The controller # is the number of the ehci usb debug
port as it is probed via PCI. The poll interval is
optional and is the number seconds in between
each poll cycle to the debug port in case you need
the functionality for interrupting the kernel with
gdb or control-c on the dbgp connection. When
not using this parameter you use sysrq-g to break into
the kernel debugger.

kgdboc= [KGDB,HW] kgdb over consoles.
Requires a tty driver that supports console polling,
or a supported polling keyboard driver (non-usb).
Serial only format: <serial_device>[,baud]
keyboard only format: kbd
keyboard and serial format: kbd,<serial_device>[,baud]

kgdbwait [KGDB] Stop kernel execution and enter the
kernel debugger at the earliest opportunity.

kmac= [MIPS] korina ethernet MAC address.
Configure the RouterBoard 532 series on-chip
Ethernet adapter MAC address.

kmemleak= [KNL] Boot-time kmemleak enable/disable
Valid arguments: on, off
Default: on

kstack=N [X86] Print N words from the kernel stack
in oops dumps.

kvm.ignore_msrs=[KVM] Ignore guest accesses to unhandled MSRs.
Default is 0 (don't ignore, but inject #GP)

kvm.oos_shadow= [KVM] Disable out-of-sync shadow paging.
Default is 1 (enabled)

kvm-amd.nested= [KVM,AMD] Allow nested virtualization in KVM/SVM.
Default is 0 (off)

kvm-amd.npt= [KVM,AMD] Disable nested paging (virtualized MMU)
for all guests.
Default is 1 (enabled) if in 64bit or 32bit-PAE mode

kvm-intel.bypass_guest_pf=
[KVM,Intel] Disables bypassing of guest page faults
on Intel chips. Default is 1 (enabled)

kvm-intel.ept= [KVM,Intel] Disable extended page tables
(virtualized MMU) support on capable Intel chips.
Default is 1 (enabled)

kvm-intel.emulate_invalid_guest_state=
[KVM,Intel] Enable emulation of invalid guest states
Default is 0 (disabled)

kvm-intel.flexpriority=
[KVM,Intel] Disable FlexPriority feature (TPR shadow).
Default is 1 (enabled)

kvm-intel.unrestricted_guest=
[KVM,Intel] Disable unrestricted guest feature
(virtualized real and unpaged mode) on capable
Intel chips. Default is 1 (enabled)

kvm-intel.vpid= [KVM,Intel] Disable Virtual Processor Identification
feature (tagged TLBs) on capable Intel chips.
Default is 1 (enabled)

l2cr= [PPC]

l3cr= [PPC]

lapic [X86-32,APIC] Enable the local APIC even if BIOS
disabled it.

lapic_timer_c2_ok [X86,APIC] trust the local apic timer
in C2 power state.

libata.dma= [LIBATA] DMA control
libata.dma=0 Disable all PATA and SATA DMA
libata.dma=1 PATA and SATA Disk DMA only
libata.dma=2 ATAPI (CDROM) DMA only
libata.dma=4 Compact Flash DMA only
Combinations also work, so libata.dma=3 enables DMA
for disks and CDROMs, but not CFs.

libata.ignore_hpa= [LIBATA] Ignore HPA limit
libata.ignore_hpa=0 keep BIOS limits (default)
libata.ignore_hpa=1 ignore limits, using full disk

libata.noacpi [LIBATA] Disables use of ACPI in libata suspend/resume
when set.
Format: <int>

libata.force= [LIBATA] Force configurations. The format is comma

separated list of "[ID:]VAL" where ID is PORT[.DEVICE]. PORT and DEVICE are decimal numbers matching port, link or device. Basically, it matches the ATA ID string printed on console by libata. If the whole ID part is omitted, the last PORT and DEVICE values are used. If ID hasn't been specified yet, the configuration applies to all ports, links and devices.

If only DEVICE is omitted, the parameter applies to the port and all links and devices behind it. DEVICE number of 0 either selects the first device or the first fan-out link behind PMP device. It does not select the host link. DEVICE number of 15 selects the host link and device attached to it.

The VAL specifies the configuration to force. As long as there's no ambiguity shortcut notation is allowed. For example, both 1.5 and 1.5G would work for 1.5Gbps. The following configurations can be forced.

* Cable type: 40c, 80c, short40c, unk, ign or sata. Any ID with matching PORT is used.

* SATA link speed limit: 1.5Gbps or 3.0Gbps.

* Transfer mode: pio[0-7], mwdma[0-4] and udma[0-7]. udma[/][16,25,33,44,66,100,133] notation is also allowed.

* [no]ncq: Turn on or off NCQ.

* nohrst, nosrst, norst: suppress hard, soft and both resets.

* dump_id: dump IDENTIFY data.

If there are multiple matching configurations changing the same attribute, the last one is used.

memblock=debug [KNL] Enable memblock debug messages.

load_ramdisk= [RAM] List of ramdisks to load from floppy
See Documentation/blockdev/ramdisk.txt.

lockd.nlm_grace_period=P [NFS] Assign grace period.
Format: <integer>

lockd.nlm_tcpport=N [NFS] Assign TCP port.
Format: <integer>

lockd.nlm_timeout=T [NFS] Assign timeout value.
Format: <integer>

lockd.nlm_udpport=M [NFS] Assign UDP port.
Format: <integer>

logibm.irq= [HW,MOUSE] Logitech Bus Mouse Driver
Format: <irq>

loglevel= All Kernel Messages with a loglevel smaller than the console loglevel will be printed to the console. It can also be changed with klogd or other programs. The loglevels are defined as follows:

0 (KERN_EMERG)	system is unusable
1 (KERN_ALERT)	action must be taken immediately
2 (KERN_CRIT)	critical conditions
3 (KERN_ERR)	error conditions
4 (KERN_WARNING)	warning conditions
5 (KERN_NOTICE)	normal but significant condition
6 (KERN_INFO)	informational
7 (KERN_DEBUG)	debug-level messages

log_buf_len=n Sets the size of the printk ring buffer, in bytes.
Format: { n | nk | nM }
n must be a power of two. The default size
is set in the kernel config file.

logo.nologo [FB] Disables display of the built-in Linux logo.
This may be used to provide more screen space for
kernel log messages and is useful when debugging
kernel boot problems.

lp=0 [LP] Specify parallel ports to use, e.g,
lp=port[,port...] lp=none,parport0 (lp0 not configured, lp1 uses
lp=reset first parallel port). 'lp=0' disables the
lp=auto printer driver. 'lp=reset' (which can be
specified in addition to the ports) causes
attached printers to be reset. Using
lp=port1,port2,... specifies the parallel ports
to associate lp devices with, starting with
lp0. A port specification may be 'none' to skip
that lp device, or a parport name such as
'parport0'. Specifying 'lp=auto' instead of a
port specification list means that device IDs
from each port should be examined, to see if
an IEEE 1284-compliant printer is attached; if
so, the driver will manage that printer.
See also header of drivers/char/lp.c.

lpj=n [KNL]
Sets loops_per_jiffy to given constant, thus avoiding
time-consuming boot-time autodetection (up to 250 ms per
CPU). 0 enables autodetection (default). To determine
the correct value for your kernel, boot with normal
autodetection and see what value is printed. Note that
on SMP systems the preset will be applied to all CPUs,
which is likely to cause problems if your CPUs need
significantly divergent settings. An incorrect value
will cause delays in the kernel to be wrong, leading to
unpredictable I/O errors and other breakage. Although
unlikely, in the extreme case this might damage your

hardware.

ltpc= [NET]
Format: <io>,<irq>,<dma>

mac5380= [HW,SCSI] Format:
<can_queue>,<cmd_per_lun>,<sg_tablesize>,<hostid>,<use_tags>

machvec= [IA64] Force the use of a particular machine-vector
(machvec) in a generic kernel.
Example: machvec=hpzx1_swiotlb

machtype= [Loongson] Share the same kernel image file between different
yeeloong laptop.
Example: machtype=lemote-yeeloong-2f-7inch

max_addr=nn[KMG] [KNL,BOOT,ia64] All physical memory greater
than or equal to this physical address is ignored.

maxcpus= [SMP] Maximum number of processors that an SMP kernel
should make use of. maxcpus=n : n >= 0 limits the
kernel to using 'n' processors. n=0 is a special case,
it is equivalent to "nosmp", which also disables
the IO APIC.

max_loop= [LOOP] Maximum number of loopback devices that can
be mounted
Format: <1-256>

max_luns= [SCSI] Maximum number of LUNs to probe.
Should be between 1 and 2^32-1.

max_report_luns=
[SCSI] Maximum number of LUNs received.
Should be between 1 and 16384.

mcatest= [IA-64]

mce [X86-32] Machine Check Exception

mce=option [X86-64] See Documentation/x86/x86_64/boot-options.txt

md= [HW] RAID subsystems devices and level
See Documentation/md.txt.

mdacon= [MDA]
Format: <first>,<last>
Specifies range of consoles to be captured by the MDA.

mem=nn[KMG] [KNL,BOOT] Force usage of a specific amount of memory
Amount of memory to be used when the kernel is not able
to see the whole system memory or for test.
[X86-32] Use together with memmap= to avoid physical
address space collisions. Without memmap= PCI devices

could be placed at addresses belonging to unused RAM.

mem=nopentium [BUGS=X86-32] Disable usage of 4MB pages for kernel memory.

memchunk=nn[KMG]
[KNL,SH] Allow user to override the default size for per-device physically contiguous DMA buffers.

memmap=exactmap [KNL,X86] Enable setting of an exact E820 memory map, as specified by the user. Such memmap=exactmap lines can be constructed based on BIOS output or other requirements. See the memmap=nn@ss option description.

memmap=nn[KMG]@ss[KMG]
[KNL] Force usage of a specific region of memory Region of memory to be used, from ss to ss+nn.

memmap=nn[KMG]#ss[KMG]
[KNL,ACPI] Mark specific memory as ACPI data. Region of memory to be used, from ss to ss+nn.

memmap=nn[KMG]$ss[KMG]
[KNL,ACPI] Mark specific memory as reserved. Region of memory to be used, from ss to ss+nn. Example: Exclude memory from 0x18690000-0x1869ffff
memmap=64K$0x18690000
or
memmap=0x10000$0x18690000

memory_corruption_check=0/1 [X86]
Some BIOSes seem to corrupt the first 64k of memory when doing things like suspend/resume. Setting this option will scan the memory looking for corruption. Enabling this will both detect corruption and prevent the kernel from using the memory being corrupted. However, its intended as a diagnostic tool; if repeatable BIOS-originated corruption always affects the same memory, you can use memmap= to prevent the kernel from using that memory.

memory_corruption_check_size=size [X86]
By default it checks for corruption in the low 64k, making this memory unavailable for normal use. Use this parameter to scan for corruption in more or less memory.

memory_corruption_check_period=seconds [X86]
By default it checks for corruption every 60 seconds. Use this parameter to check at some other rate. 0 disables periodic checking.

memtest= [KNL,X86] Enable memtest
Format: <integer>

default : 0 <disable>
Specifies the number of memtest passes to be performed. Each pass selects another test pattern from a given set of patterns. Memtest fills the memory with this pattern, validates memory contents and reserves bad memory regions that are detected.

meye.*= [HW] Set MotionEye Camera parameters
See Documentation/video4linux/meye.txt.

mfgpt_irq= [IA-32] Specify the IRQ to use for the Multi-Function General Purpose Timers on AMD Geode platforms.

mfgptfix [X86-32] Fix MFGPT timers on AMD Geode platforms when the BIOS has incorrectly applied a workaround. TinyBIOS version 0.98 is known to be affected, 0.99 fixes the problem by letting the user disable the workaround.

mga= [HW,DRM]

min_addr=nn[KMG] [KNL,BOOT,ia64] All physical memory below this physical address is ignored.

mini2440= [ARM,HW,KNL]
Format:[0..2][b][c][t]
Default: "0tb"
MINI2440 configuration specification:
0 - The attached screen is the 3.5" TFT
1 - The attached screen is the 7" TFT
2 - The VGA Shield is attached (1024x768)
Leaving out the screen size parameter will not load the TFT driver, and the framebuffer will be left unconfigured.
b - Enable backlight. The TFT backlight pin will be linked to the kernel VESA blanking code and a GPIO LED. This parameter is not necessary when using the VGA shield.
c - Enable the s3c camera interface.
t - Reserved for enabling touchscreen support. The touchscreen support is not enabled in the mainstream kernel as of 2.6.30, a preliminary port can be found in the "bleeding edge" mini2440 support kernel at http://repo.or.cz/w/linux-2.6/mini2440.git

mminit_loglevel=
[KNL] When CONFIG_DEBUG_MEMORY_INIT is set, this parameter allows control of the logging verbosity for the additional memory initialisation checks. A value of 0 disables mminit logging and a level of 4 will log everything. Information is printed at KERN_DEBUG so loglevel=8 may also need to be specified.

mousedev.tap_time=
[MOUSE] Maximum time between finger touching and

leaving touchpad surface for touch to be considered
a tap and be reported as a left button click (for
touchpads working in absolute mode only).
Format: <msecs>

mousedev.xres= [MOUSE] Horizontal screen resolution, used for devices
reporting absolute coordinates, such as tablets

mousedev.yres= [MOUSE] Vertical screen resolution, used for devices
reporting absolute coordinates, such as tablets

movablecore=nn[KMG] [KNL,X86,IA-64,PPC] This parameter
is similar to kernelcore except it specifies the
amount of memory used for migratable allocations.
If both kernelcore and movablecore is specified,
then kernelcore will be at *least* the specified
value but may be more. If movablecore on its own
is specified, the administrator must be careful
that the amount of memory usable for all allocations
is not too small.

mpu401= [HW,OSS]
Format: <io>,<irq>

MTD_Partition= [MTD]
Format: <name>,<region-number>,<size>,<offset>

MTD_Region= [MTD] Format:
<name>,<region-number>[,<base>,<size>,<buswidth>,<altbuswidth>]

mtdparts= [MTD]
See drivers/mtd/cmdlinepart.c.

onenand.bdry= [HW,MTD] Flex-OneNAND Boundary Configuration

Format:
[die0_boundary][,die0_lock][,die1_boundary][,die1_lock]

boundary - index of last SLC block on Flex-OneNAND.
The remaining blocks are configured as MLC
blocks.
lock - Configure if Flex-OneNAND boundary should be
locked.
Once locked, the boundary cannot be changed.
1 indicates lock status, 0 indicates unlock
status.

mtdset= [ARM]
ARM/S3C2412 JIVE boot control

See arch/arm/mach-s3c2412/mach-jive.c

mtouchusb.raw_coordinates=
[HW] Make the MicroTouch USB driver use raw coordinates
('y', default) or cooked coordinates ('n')

mtrr_chunk_size=nn[KMG] [X86]

used for mtrr cleanup. It is largest continuous chunk
that could hold holes aka. UC entries.

mtrr_gran_size=nn[KMG] [X86]
Used for mtrr cleanup. It is granularity of mtrr block.
Default is 1.
Large value could prevent small alignment from
using up MTRRs.

mtrr_spare_reg_nr=n [X86]
Format: <integer>
Range: 0,7 : spare reg number
Default : 1
Used for mtrr cleanup. It is spare mtrr entries number.
Set to 2 or more if your graphical card needs more.

n2= [NET] SDL Inc. RISCom/N2 synchronous serial card

NCR_D700= [HW,SCSI]
See header of drivers/scsi/NCR_D700.c.

ncr5380= [HW,SCSI]

ncr53c400= [HW,SCSI]

ncr53c400a= [HW,SCSI]

ncr53c406a= [HW,SCSI]

ncr53c8xx= [HW,SCSI]

netdev= [NET] Network devices parameters
Format: <irq>,<io>,<mem_start>,<mem_end>,<name>
Note that mem_start is often overloaded to mean
something different and driver-specific.
This usage is only documented in each driver source
file if at all.

nf_conntrack.acct=
[NETFILTER] Enable connection tracking flow accounting
0 to disable accounting
1 to enable accounting
Default value depends on CONFIG_NF_CT_ACCT that is
going to be removed in 2.6.29.

nfsaddrs= [NFS]
See Documentation/filesystems/nfs/nfsroot.txt.

nfsroot= [NFS] nfs root filesystem for disk-less boxes.
See Documentation/filesystems/nfs/nfsroot.txt.

nfs.callback_tcpport=
[NFS] set the TCP port on which the NFSv4 callback
channel should listen.

nfs.cache_getent=

[NFS] sets the pathname to the program which is used to update the NFS client cache entries.

nfs.cache_getent_timeout=
[NFS] sets the timeout after which an attempt to update a cache entry is deemed to have failed.

nfs.idmap_cache_timeout=
[NFS] set the maximum lifetime for idmapper cache entries.

nfs.enable_ino64=
[NFS] enable 64-bit inode numbers.
If zero, the NFS client will fake up a 32-bit inode number for the readdir() and stat() syscalls instead of returning the full 64-bit number.
The default is to return 64-bit inode numbers.

nmi_debug= [KNL,AVR32,SH] Specify one or more actions to take when a NMI is triggered.
Format: [state][,regs][,debounce][,die]

nmi_watchdog= [KNL,BUGS=X86] Debugging features for SMP kernels
Format: [panic,][num]
Valid num: 0,1,2
0 - turn nmi_watchdog off
1 - use the IO-APIC timer for the NMI watchdog
2 - use the local APIC for the NMI watchdog using a performance counter. Note: This will use one performance counter and the local APIC's performance vector.
When panic is specified, panic when an NMI watchdog timeout occurs.
This is useful when you use a panic=... timeout and need the box quickly up again.
Instead of 1 and 2 it is possible to use the following symbolic names: lapic and ioapic
Example: nmi_watchdog=2 or nmi_watchdog=panic,lapic

netpoll.carrier_timeout=
[NET] Specifies amount of time (in seconds) that netpoll should wait for a carrier. By default netpoll waits 4 seconds.

no387 [BUGS=X86-32] Tells the kernel to use the 387 maths emulation library even if a 387 maths coprocessor is present.

no_console_suspend
[HW] Never suspend the console
Disable suspending of consoles during suspend and hibernate operations. Once disabled, debugging messages can reach various consoles while the rest of the system is being put to sleep (ie, while debugging driver suspend/resume hooks). This may not work reliably with all consoles, but is known

to work with serial and VGA consoles.

noaliencache [MM, NUMA, SLAB] Disables the allocation of alien caches in the slab allocator. Saves per-node memory, but will impact performance.

noalign [KNL,ARM]

noapic [SMP,APIC] Tells the kernel to not make use of any IOAPICs that may be present in the system.

nobats [PPC] Do not use BATs for mapping kernel lowmem on "Classic" PPC cores.

nocache [ARM]

noclflush [BUGS=X86] Don't use the CLFLUSH instruction

nodelayacct [KNL] Disable per-task delay accounting

nodisconnect [HW,SCSI,M68K] Disables SCSI disconnects.

nodsp [SH] Disable hardware DSP at boot time.

noefi [X86] Disable EFI runtime services support.

noexec [IA-64]

noexec [X86]
On X86-32 available only on PAE configured kernels.
noexec=on: enable non-executable mappings (default)
noexec=off: disable non-executable mappings

noexec32 [X86-64]
This affects only 32-bit executables.
noexec32=on: enable non-executable mappings (default)
read doesn't imply executable mappings
noexec32=off: disable non-executable mappings
read implies executable mappings

nofpu [SH] Disable hardware FPU at boot time.

nofxsr [BUGS=X86-32] Disables x86 floating point extended register save and restore. The kernel will only save legacy floating-point registers on task switch.

noxsave [BUGS=X86] Disables x86 extended register state save and restore using xsave. The kernel will fallback to enabling legacy floating-point and sse state.

nohlt [BUGS=ARM,SH] Tells the kernel that the sleep(SH) or wfi(ARM) instruction doesn't work correctly and not to use it. This is also useful when using JTAG debugger.

no-hlt [BUGS=X86-32] Tells the kernel that the hlt instruction doesn't work correctly and not to

use it.

no_file_caps Tells the kernel not to honor file capabilities. The only way then for a file to be executed with privilege is to be setuid root or executed by root.

nohalt [IA-64] Tells the kernel not to use the power saving function PAL_HALT_LIGHT when idle. This increases power-consumption. On the positive side, it reduces interrupt wake-up latency, which may improve performance in certain environments such as networked servers or real-time systems.

nohz= [KNL] Boottime enable/disable dynamic ticks
Valid arguments: on, off
Default: on

noiotrap [SH] Disables trapped I/O port accesses.

noirqdebug [X86-32] Disables the code which attempts to detect and disable unhandled interrupt sources.

no_timer_check [X86,APIC] Disables the code which tests for broken timer IRQ sources.

noisapnp [ISAPNP] Disables ISA PnP code.

noinitrd [RAM] Tells the kernel not to load any configured initial RAM disk.

nointremap [X86-64, Intel-IOMMU] Do not enable interrupt remapping.

nointroute [IA-64]

nojitter [IA64] Disables jitter checking for ITC timers.

nolapic [X86-32,APIC] Do not enable or use the local APIC.

nolapic_timer [X86-32,APIC] Do not use the local APIC timer.

noltlbs [PPC] Do not use large page/tlb entries for kernel lowmem mapping on PPC40x.

nomca [IA-64] Disable machine check abort handling

nomce [X86-32] Machine Check Exception

nomfgpt [X86-32] Disable Multi-Function General Purpose Timer usage (for AMD Geode machines).

nopat [X86] Disable PAT (page attribute table extension of pagetables) support.

norandmaps Don't use address space randomization. Equivalent to echo 0 > /proc/sys/kernel/randomize_va_space

noreplace-paravirt [X86-32,PV_OPS] Don't patch paravirt_ops

noreplace-smp [X86-32,SMP] Don't replace SMP instructions with UP alternatives

noresidual [PPC] Don't use residual data on PReP machines.

noresume [SWSUSP] Disables resume and restores original swap space.

no-scroll [VGA] Disables scrollback.
This is required for the Braillex ib80-piezo Braille reader made by F.H. Papenmeier (Germany).

nosbagart [IA-64]

nosep [BUGS=X86-32] Disables x86 SYSENTER/SYSEXIT support.

nosmp [SMP] Tells an SMP kernel to act as a UP kernel, and disable the IO APIC. legacy for "maxcpus=0".

nosoftlockup [KNL] Disable the soft-lockup detector.

noswapaccount [KNL] Disable accounting of swap in memory resource controller. (See Documentation/cgroups/memory.txt)

nosync [HW,M68K] Disables sync negotiation for all devices.

notsc [BUGS=X86-32] Disable Time Stamp Counter

nousb [USB] Disable the USB subsystem

nowb [ARM]

nox2apic [X86-64,APIC] Do not enable x2APIC mode.

nptcg= [IA64] Override max number of concurrent global TLB purges which is reported from either PAL_VM_SUMMARY or SAL PALO.

nr_cpus= [SMP] Maximum number of processors that an SMP kernel could support. nr_cpus=n : n >= 1 limits the kernel to supporting 'n' processors. Later in runtime you can not use hotplug cpu feature to put more cpu back to online. just like you compile the kernel NR_CPUS=n

nr_uarts= [SERIAL] maximum number of UARTs to be registered.

numa_zonelist_order= [KNL, BOOT] Select zonelist order for NUMA.
one of ['zone', 'node', 'default'] can be specified
This can be set from sysctl after boot.
See Documentation/sysctl/vm.txt for details.

ohci1394_dma=early [HW] enable debugging via the ohci1394 driver.
See Documentation/debugging-via-ohci1394.txt for more

```
                info.

olpc_ec_timeout= [OLPC] ms delay when issuing EC commands
                Rather than timing out after 20 ms if an EC
                command is not properly ACKed, override the length
                of the timeout.  We have interrupts disabled while
                waiting for the ACK, so if this is set too high
                interrupts *may* be lost!

omap_mux=       [OMAP] Override bootloader pin multiplexing.
                Format: <mux_mode0.mode_name=value>...
                For example, to override I2C bus2:
                omap_mux=i2c2_scl.i2c2_scl=0x100,i2c2_sda.i2c2_sda=0x100

opl3=           [HW,OSS]
                Format: <io>

oprofile.timer= [HW]
                Use timer interrupt instead of performance counters

oprofile.cpu_type=      Force an oprofile cpu type
                This might be useful if you have an older oprofile
                userland or if you want common events.
                Format: { arch_perfmon }
                arch_perfmon: [X86] Force use of architectural
                        perfmon on Intel CPUs instead of the
                        CPU specific event set.

osst=           [HW,SCSI] SCSI Tape Driver
                Format: <buffer_size>,<write_threshold>
                See also Documentation/scsi/st.txt.

panic=          [KNL] Kernel behaviour on panic
                Format: <timeout>

parkbd.port=    [HW] Parallel port number the keyboard adapter is
                connected to, default is 0.
                Format: <parport#>
parkbd.mode=    [HW] Parallel port keyboard adapter mode of operation,
                0 for XT, 1 for AT (default is AT).
                Format: <mode>

parport=        [HW,PPT] Specify parallel ports. 0 disables.
                Format: { 0 | auto | 0xBBB[,IRQ[,DMA]] }
                Use 'auto' to force the driver to use any
                IRQ/DMA settings detected (the default is to
                ignore detected IRQ/DMA settings because of
                possible conflicts). You can specify the base
                address, IRQ, and DMA settings; IRQ and DMA
                should be numbers, or 'auto' (for using detected
                settings on that particular port), or 'nofifo'
                (to avoid using a FIFO even if it is detected).
                Parallel ports are assigned in the order they
                are specified on the command line, starting
                with parport0.
```

```
        parport_init_mode=      [HW,PPT]
                        Configure VIA parallel port to operate in
                        a specific mode. This is necessary on Pegasos
                        computer where firmware has no options for setting
                        up parallel port mode and sets it to spp.
                        Currently this function knows 686a and 8231 chips.
                        Format: [spp|ps2|epp|ecp|ecpepp]

        pas2=           [HW,OSS] Format:

<io>,<irq>,<dma>,<dma16>,<sb_io>,<sb_irq>,<sb_dma>,<sb_dma16>

        pas16=          [HW,SCSI]
                        See header of drivers/scsi/pas16.c.

        pause_on_oops=
                        Halt all CPUs after the first oops has been printed for
                        the specified number of seconds.  This is to be used if
                        your oopses keep scrolling off the screen.

        pcbit=          [HW,ISDN]

        pcd.            [PARIDE]
                        See header of drivers/block/paride/pcd.c.
                        See also Documentation/blockdev/paride.txt.

        pci=option[,option...]  [PCI] various PCI subsystem options:
                earlydump       [X86] dump PCI config space before the kernel
                                changes anything
                off             [X86] don't probe for the PCI bus
                bios            [X86-32] force use of PCI BIOS, don't access
                                the hardware directly. Use this if your machine
                                has a non-standard PCI host bridge.
                nobios          [X86-32] disallow use of PCI BIOS, only direct
                                hardware access methods are allowed. Use this
                                if you experience crashes upon bootup and you
                                suspect they are caused by the BIOS.
                conf1           [X86] Force use of PCI Configuration
                                Mechanism 1.
                conf2           [X86] Force use of PCI Configuration
                                Mechanism 2.
                noaer           [PCIE] If the PCIEAER kernel config parameter is
                                enabled, this kernel boot option can be used to
                                disable the use of PCIE advanced error
reporting.
                nodomains       [PCI] Disable support for multiple PCI
                                root domains (aka PCI segments, in ACPI-speak).
                nommconf        [X86] Disable use of MMCONFIG for PCI
                                Configuration
                check_enable_amd_mmconf [X86] check for and enable
                                properly configured MMIO access to PCI
                                config space on AMD family 10h CPU
                nomsi           [MSI] If the PCI_MSI kernel config parameter is
                                enabled, this kernel boot option can be used to
                                disable the use of MSI interrupts system-wide.
                noioapicquirk   [APIC] Disable all boot interrupt quirks.
```

Safety option to keep boot IRQs enabled. This should never be necessary.

ioapicreroute [APIC] Enable rerouting of boot IRQs to the primary IO-APIC for bridges that cannot disable boot IRQs. This fixes a source of spurious IRQs when the system masks IRQs.

noioapicreroute [APIC] Disable workaround that uses the boot IRQ equivalent of an IRQ that connects to a chipset where boot IRQs cannot be disabled. The opposite of ioapicreroute.

biosirq [X86-32] Use PCI BIOS calls to get the interrupt routing table. These calls are known to be buggy on several machines and they hang the machine when used, but on other computers it's the only way to get the interrupt routing table. Try this option if the kernel is unable to allocate IRQs or discover secondary PCI buses on your motherboard.

rom [X86] Assign address space to expansion ROMs. Use with caution as certain devices share address decoders between ROMs and other resources.

norom [X86] Do not assign address space to expansion ROMs that do not already have BIOS assigned address ranges.

irqmask=0xMMMM [X86] Set a bit mask of IRQs allowed to be assigned automatically to PCI devices. You can make the kernel exclude IRQs of your ISA cards this way.

pirqaddr=0xAAAAA [X86] Specify the physical address of the PIRQ table (normally generated by the BIOS) if it is outside the F0000h-100000h range.

lastbus=N [X86] Scan all buses thru bus #N. Can be useful if the kernel is unable to find your secondary buses and you want to tell it explicitly which ones they are.

assign-busses [X86] Always assign all PCI bus numbers ourselves, overriding whatever the firmware may have done.

usepirqmask [X86] Honor the possible IRQ mask stored in the BIOS $PIR table. This is needed on some systems with broken BIOSes, notably some HP Pavilion N5400 and Omnibook XE3 notebooks. This will have no effect if ACPI IRQ routing is enabled.

noacpi [X86] Do not use ACPI for IRQ routing or for PCI scanning.

use_crs [X86] Use PCI host bridge window information from ACPI. On BIOSes from 2008 or later, this is enabled by default. If you need to use this, please report a bug.

nocrs [X86] Ignore PCI host bridge windows from ACPI. If you need to use this, please report a bug.

routeirq Do IRQ routing for all PCI devices. This is normally done in pci_enable_device(),

so this option is a temporary workaround
for broken drivers that don't call it.

skip_isa_align [X86] do not align io start addr, so can handle more pci cards

firmware [ARM] Do not re-enumerate the bus but instead just use the configuration from the bootloader. This is currently used on IXP2000 systems where the bus has to be configured a certain way for adjunct CPUs.

noearly [X86] Don't do any early type 1 scanning. This might help on some broken boards which machine check when some devices' config space is read. But various workarounds are disabled and some IOMMU drivers will not work.

bfsort Sort PCI devices into breadth-first order. This sorting is done to get a device order compatible with older (<= 2.4) kernels.

nobfsort Don't sort PCI devices into breadth-first order.

cbiosize=nn[KMG] The fixed amount of bus space which is reserved for the CardBus bridge's IO window. The default value is 256 bytes.

cbmemsize=nn[KMG] The fixed amount of bus space which is reserved for the CardBus bridge's memory window. The default value is 64 megabytes.

resource_alignment=
Format:
[<order of align>@][<domain>:]<bus>:<slot>.<func>[; ...]
Specifies alignment and device to reassign aligned memory resources.
If <order of align> is not specified, PAGE_SIZE is used as alignment.
PCI-PCI bridge can be specified, if resource windows need to be expanded.

ecrc= Enable/disable PCIe ECRC (transaction layer end-to-end CRC checking).
bios: Use BIOS/firmware settings. This is the the default.
off: Turn ECRC off
on: Turn ECRC on.

pcie_aspm= [PCIE] Forcibly enable or disable PCIe Active State Power Management.

off Disable ASPM.

force Enable ASPM even on devices that claim not to support it.
WARNING: Forcing ASPM on may cause system lockups.

pcie_pme= [PCIE,PM] Native PCIe PME signaling options:
Format: {auto|force}[,nomsi]

auto Use native PCIe PME signaling if the BIOS allows the kernel to control PCIe config registers of root ports.

force Use native PCIe PME signaling even if the BIOS refuses to allow the kernel to control the relevant PCIe config registers.

nomsi Do not use MSI for native PCIe PME signaling (this makes all PCIe root ports use INTx for everything).

pcmv= [HW,PCMCIA] BadgePAD 4

pd. [PARIDE]
See Documentation/blockdev/paride.txt.

pdcchassis= [PARISC,HW] Disable/Enable PDC Chassis Status codes at boot time.
Format: { 0 | 1 }
See arch/parisc/kernel/pdc_chassis.c

percpu_alloc= Select which percpu first chunk allocator to use.
Currently supported values are "embed" and "page".
Archs may support subset or none of the selections.
See comments in mm/percpu.c for details on each allocator. This parameter is primarily for debugging and performance comparison.

pf. [PARIDE]
See Documentation/blockdev/paride.txt.

pg. [PARIDE]
See Documentation/blockdev/paride.txt.

pirq= [SMP,APIC] Manual mp-table setup
See Documentation/x86/i386/IO-APIC.txt.

plip= [PPT,NET] Parallel port network link
Format: { parport<nr> | timid | 0 }
See also Documentation/parport.txt.

pmtmr= [X86] Manual setup of pmtmr I/O Port.
Override pmtimer IOPort with a hex value.
e.g. pmtmr=0x508

pnp.debug [PNP]
Enable PNP debug messages. This depends on the CONFIG_PNP_DEBUG_MESSAGES option.

pnpacpi= [ACPI]
{ off }

pnpbios= [ISAPNP]
{ on | off | curr | res | no-curr | no-res }

pnp_reserve_irq=
[ISAPNP] Exclude IRQs for the autoconfiguration

pnp_reserve_dma=
[ISAPNP] Exclude DMAs for the autoconfiguration

pnp_reserve_io= [ISAPNP] Exclude I/O ports for the autoconfiguration
Ranges are in pairs (I/O port base and size).

```
pnp_reserve_mem=
                [ISAPNP] Exclude memory regions for the
                autoconfiguration.
                Ranges are in pairs (memory base and size).

ports=          [IP_VS_FTP] IPVS ftp helper module
                Default is 21.
                Up to 8 (IP_VS_APP_MAX_PORTS) ports
                may be specified.
                Format: <port>,<port>....

print-fatal-signals=
                [KNL] debug: print fatal signals

                If enabled, warn about various signal handling
                related application anomalies: too many signals,
                too many POSIX.1 timers, fatal signals causing a
                coredump - etc.

                If you hit the warning due to signal overflow,
                you might want to try "ulimit -i unlimited".

                default: off.

printk.time=    Show timing data prefixed to each printk message line
                Format: <bool>  (1/Y/y=enable, 0/N/n=disable)

processor.max_cstate=   [HW,ACPI]
                Limit processor to maximum C-state
                max_cstate=9 overrides any DMI blacklist limit.

processor.nocst [HW,ACPI]
                Ignore the _CST method to determine C-states,
                instead using the legacy FADT method

profile=        [KNL] Enable kernel profiling via /proc/profile
                Format: [schedule,]<number>
                Param: "schedule" - profile schedule points.
                Param: <number> - step/bucket size as a power of 2 for
                        statistical time based profiling.
                Param: "sleep" - profile D-state sleeping (millisecs).
                        Requires CONFIG_SCHEDSTATS
                Param: "kvm" - profile VM exits.

prompt_ramdisk= [RAM] List of RAM disks to prompt for floppy disk
                before loading.
                See Documentation/blockdev/ramdisk.txt.

psmouse.proto=  [HW,MOUSE] Highest PS2 mouse protocol extension to
                probe for; one of (bare|imps|exps|lifebook|any).
psmouse.rate=   [HW,MOUSE] Set desired mouse report rate, in reports
                per second.
psmouse.resetafter=     [HW,MOUSE]
                Try to reset the device after so many bad packets
                (0 = never).
psmouse.resolution=
```

[HW,MOUSE] Set desired mouse resolution, in dpi.

psmouse.smartscroll=
[HW,MOUSE] Controls Logitech smartscroll autorepeat.
0 = disabled, 1 = enabled (default).

pss= [HW,OSS] Personal Sound System (ECHO ESC614)
Format:
<io>,<mss_io>,<mss_irq>,<mss_dma>,<mpu_io>,<mpu_irq>

pt. [PARIDE]
See Documentation/blockdev/paride.txt.

pty.legacy_count=
[KNL] Number of legacy pty's. Overwrites compiled-in
default number.

quiet [KNL] Disable most log messages

r128= [HW,DRM]

raid= [HW,RAID]
See Documentation/md.txt.

ramdisk_blocksize= [RAM]
See Documentation/blockdev/ramdisk.txt.

ramdisk_size= [RAM] Sizes of RAM disks in kilobytes
See Documentation/blockdev/ramdisk.txt.

rcupdate.blimit= [KNL,BOOT]
Set maximum number of finished RCU callbacks to process
in one batch.

rcupdate.qhimark= [KNL,BOOT]
Set threshold of queued
RCU callbacks over which batch limiting is disabled.

rcupdate.qlowmark= [KNL,BOOT]
Set threshold of queued RCU callbacks below which
batch limiting is re-enabled.

rdinit= [KNL]
Format: <full_path>
Run specified binary instead of /init from the ramdisk,
used for early userspace startup. See initrd.

reboot= [BUGS=X86-32,BUGS=ARM,BUGS=IA-64] Rebooting mode
Format: <reboot_mode>[,<reboot_mode2>[,...]]
See arch/*/kernel/reboot.c or arch/*/kernel/process.c

relax_domain_level=
[KNL, SMP] Set scheduler's default relax_domain_level.
See Documentation/cgroups/cpusets.txt.

reserve= [KNL,BUGS] Force the kernel to ignore some iomem area

reservetop= [X86-32]
Format: nn[KMG]
Reserves a hole at the top of the kernel virtual address space.

reset_devices [KNL] Force drivers to reset the underlying device during initialization.

resume= [SWSUSP]
Specify the partition device for software suspend

resume_offset= [SWSUSP]
Specify the offset from the beginning of the partition given by "resume=" at which the swap header is located, in <PAGE_SIZE> units (needed only for swap files). See Documentation/power/swsusp-and-swap-files.txt

retain_initrd [RAM] Keep initrd memory after extraction

rhash_entries= [KNL,NET]
Set number of hash buckets for route cache

riscom8= [HW,SERIAL]
Format: <io_board1>[,<io_board2>[,...<io_boardN>]]

ro [KNL] Mount root device read-only on boot

root= [KNL] Root filesystem

rootdelay= [KNL] Delay (in seconds) to pause before attempting to mount the root filesystem

rootflags= [KNL] Set root filesystem mount option string

rootfstype= [KNL] Set root filesystem type

rootwait [KNL] Wait (indefinitely) for root device to show up. Useful for devices that are detected asynchronously (e.g. USB and MMC devices).

rw [KNL] Mount root device read-write on boot

S [KNL] Run init in single mode

sa1100ir [NET]
See drivers/net/irda/sa1100_ir.c.

sbni= [NET] Granch SBNI12 leased line adapter

sched_debug [KNL] Enables verbose scheduler debug messages.

scsi_debug_*= [SCSI]
See drivers/scsi/scsi_debug.c.

scsi_default_dev_flags=
[SCSI] SCSI default device flags

Format: <integer>

scsi_dev_flags= [SCSI] Black/white list entry for vendor and model
Format: <vendor>:<model>:<flags>
(flags are integer value)

scsi_logging_level= [SCSI] a bit mask of logging levels
See drivers/scsi/scsi_logging.h for bits. Also
settable via sysctl at dev.scsi.logging_level
(/proc/sys/dev/scsi/logging_level).
There is also a nice 'scsi_logging_level' script in the
S390-tools package, available for download at

http://www-128.ibm.com/developerworks/linux/linux390/s390-tools-1.5.4.html

scsi_mod.scan= [SCSI] sync (default) scans SCSI busses as they are
discovered. async scans them in kernel threads,
allowing boot to proceed. none ignores them, expecting
user space to do the scan.

security= [SECURITY] Choose a security module to enable at boot.
If this boot parameter is not specified, only the first
security module asking for security registration will be
loaded. An invalid security module name will be treated
as if no module has been chosen.

selinux= [SELINUX] Disable or enable SELinux at boot time.
Format: { "0" | "1" }
See security/selinux/Kconfig help text.
0 -- disable.
1 -- enable.
Default value is set via kernel config option.
If enabled at boot time, /selinux/disable can be used
later to disable prior to initial policy load.

serialnumber [BUGS=X86-32]

shapers= [NET]
Maximal number of shapers.

show_msr= [x86] show boot-time MSR settings
Format: { <integer> }
Show boot-time (BIOS-initialized) MSR settings.
The parameter means the number of CPUs to show,
for example 1 means boot CPU only.

sim710= [SCSI,HW]
See header of drivers/scsi/sim710.c.

simeth= [IA-64]
simscsi=

slram= [HW,MTD]

slub_debug[=options[,slabs]] [MM, SLUB]
Enabling slub_debug allows one to determine the

culprit if slab objects become corrupted. Enabling slub_debug can create guard zones around objects and may poison objects when not in use. Also tracks the last alloc / free. For more information see Documentation/vm/slub.txt.

slub_max_order= [MM, SLUB]
Determines the maximum allowed order for slabs. A high setting may cause OOMs due to memory fragmentation. For more information see Documentation/vm/slub.txt.

slub_min_objects= [MM, SLUB]
The minimum number of objects per slab. SLUB will increase the slab order up to slub_max_order to generate a sufficiently large slab able to contain the number of objects indicated. The higher the number of objects the smaller the overhead of tracking slabs and the less frequently locks need to be acquired. For more information see Documentation/vm/slub.txt.

slub_min_order= [MM, SLUB]
Determines the mininum page order for slabs. Must be lower than slub_max_order.
For more information see Documentation/vm/slub.txt.

slub_nomerge [MM, SLUB]
Disable merging of slabs with similar size. May be necessary if there is some reason to distinguish allocs to different slabs. Debug options disable merging on their own.
For more information see Documentation/vm/slub.txt.

smart2= [HW]
Format: <io1>[,<io2>[,...,<io8>]]

smp-alt-once [X86-32,SMP] On a hotplug CPU system, only attempt to substitute SMP alternatives once at boot.

smsc-ircc2.nopnp [HW] Don't use PNP to discover SMC devices
smsc-ircc2.ircc_cfg= [HW] Device configuration I/O port
smsc-ircc2.ircc_sir= [HW] SIR base I/O port
smsc-ircc2.ircc_fir= [HW] FIR base I/O port
smsc-ircc2.ircc_irq= [HW] IRQ line
smsc-ircc2.ircc_dma= [HW] DMA channel
smsc-ircc2.ircc_transceiver= [HW] Transceiver type:
0: Toshiba Satellite 1800 (GP data pin select)
1: Fast pin select (default)
2: ATC IRMode

snd-ad1816a= [HW,ALSA]

snd-ad1848= [HW,ALSA]

snd-ali5451= [HW,ALSA]

snd-als100=	[HW,ALSA]

snd-als4000=	[HW,ALSA]

snd-azt2320=	[HW,ALSA]

snd-cmi8330=	[HW,ALSA]

snd-cmipci=	[HW,ALSA]

snd-cs4231=	[HW,ALSA]

snd-cs4232=	[HW,ALSA]

snd-cs4236=	[HW,ALSA]

snd-cs4281=	[HW,ALSA]

snd-cs46xx=	[HW,ALSA]

snd-dt019x=	[HW,ALSA]

snd-dummy=	[HW,ALSA]

snd-emu10k1=	[HW,ALSA]

snd-ens1370=	[HW,ALSA]

snd-ens1371=	[HW,ALSA]

snd-es968=	[HW,ALSA]

snd-es1688=	[HW,ALSA]

snd-es18xx=	[HW,ALSA]

snd-es1938=	[HW,ALSA]

snd-es1968=	[HW,ALSA]

snd-fm801=	[HW,ALSA]

snd-gusclassic=	[HW,ALSA]

snd-gusextreme=	[HW,ALSA]

snd-gusmax=	[HW,ALSA]

snd-hdsp=	[HW,ALSA]

snd-ice1712=	[HW,ALSA]

snd-intel8x0=	[HW,ALSA]

snd-interwave=	[HW,ALSA]

snd-interwave-stb=
[HW,ALSA]

snd-korg1212= [HW,ALSA]

snd-maestro3= [HW,ALSA]

snd-mpu401= [HW,ALSA]

snd-mtpav= [HW,ALSA]

snd-nm256= [HW,ALSA]

snd-opl3sa2= [HW,ALSA]

snd-opti92x-ad1848=
[HW,ALSA]

snd-opti92x-cs4231=
[HW,ALSA]

snd-opti93x= [HW,ALSA]

snd-pmac= [HW,ALSA]

snd-rme32= [HW,ALSA]

snd-rme96= [HW,ALSA]

snd-rme9652= [HW,ALSA]

snd-sb8= [HW,ALSA]

snd-sb16= [HW,ALSA]

snd-sbawe= [HW,ALSA]

snd-serial= [HW,ALSA]

snd-sgalaxy= [HW,ALSA]

snd-sonicvibes= [HW,ALSA]

snd-sun-amd7930=
[HW,ALSA]

snd-sun-cs4231= [HW,ALSA]

snd-trident= [HW,ALSA]

snd-usb-audio= [HW,ALSA,USB]

snd-via82xx= [HW,ALSA]

snd-virmidi= [HW,ALSA]

```
snd-wavefront=  [HW,ALSA]

snd-ymfpci=     [HW,ALSA]

softlockup_panic=
                [KNL] Should the soft-lockup detector generate panics.

sonypi.*=       [HW] Sony Programmable I/O Control Device driver
                See Documentation/sonypi.txt

specialix=      [HW,SERIAL] Specialix multi-serial port adapter
                See Documentation/serial/specialix.txt.

spia_io_base=   [HW,MTD]
spia_fio_base=
spia_pedr=
spia_peddr=

sscape=         [HW,OSS]
                Format: <io>,<irq>,<dma>,<mpu_io>,<mpu_irq>

st=             [HW,SCSI] SCSI tape parameters (buffers, etc.)
                See Documentation/scsi/st.txt.

stacktrace      [FTRACE]
                Enabled the stack tracer on boot up.

sti=            [PARISC,HW]
                Format: <num>
                Set the STI (builtin display/keyboard on the HP-PARISC
                machines) console (graphic card) which should be used
                as the initial boot-console.
                See also comment in drivers/video/console/sticore.c.

sti_font=       [HW]
                See comment in drivers/video/console/sticore.c.

stifb=          [HW]
                Format: bpp:<bpp1>[:<bpp2>[:<bpp3>...]]

sunrpc.min_resvport=
sunrpc.max_resvport=
                [NFS,SUNRPC]
                SunRPC servers often require that client requests
                originate from a privileged port (i.e. a port in the
                range 0 < portnr < 1024).
                An administrator who wishes to reserve some of these
                ports for other uses may adjust the range that the
                kernel's sunrpc client considers to be privileged
                using these two parameters to set the minimum and
                maximum port values.

sunrpc.pool_mode=
                [NFS]
                Control how the NFS server code allocates CPUs to
                service thread pools.  Depending on how many NICs
```

you have and where their interrupts are bound, this
option will affect which CPUs will do NFS serving.
Note: this parameter cannot be changed while the
NFS server is running.

auto — the server chooses an appropriate mode automatically using heuristics
global — a single global pool contains all CPUs
percpu — one pool for each CPU
pernode — one pool for each NUMA node (equivalent to global on non-NUMA machines)

sunrpc.tcp_slot_table_entries=
sunrpc.udp_slot_table_entries=
[NFS,SUNRPC]
Sets the upper limit on the number of simultaneous
RPC calls that can be sent from the client to a
server. Increasing these values may allow you to
improve throughput, but will also increase the
amount of memory reserved for use by the client.

swiotlb= [IA-64] Number of I/O TLB slabs

switches= [HW,M68k]

sym53c416= [HW,SCSI]
See header of drivers/scsi/sym53c416.c.

sysrq_always_enabled
[KNL]
Ignore sysrq setting - this boot parameter will
neutralize any effect of /proc/sys/kernel/sysrq.
Useful for debugging.

t128= [HW,SCSI]
See header of drivers/scsi/t128.c.

tdfx= [HW,DRM]

test_suspend= [SUSPEND]
Specify "mem" (for Suspend-to-RAM) or "standby" (for
standby suspend) as the system sleep state to briefly
enter during system startup. The system is woken from
this state using a wakeup-capable RTC alarm.

thash_entries= [KNL,NET]
Set number of hash buckets for TCP connection

thermal.act= [HW,ACPI]
-1: disable all active trip points in all thermal zones
<degrees C>: override all lowest active trip points

thermal.crt= [HW,ACPI]
-1: disable all critical trip points in all thermal
zones
<degrees C>: override all critical trip points

thermal.nocrt= [HW,ACPI]
Set to disable actions on ACPI thermal zone
critical and hot trip points.

thermal.off= [HW,ACPI]
1: disable ACPI thermal control

thermal.psv= [HW,ACPI]
-1: disable all passive trip points
<degrees C>: override all passive trip points to this
value

thermal.tzp= [HW,ACPI]
Specify global default ACPI thermal zone polling rate
<deci-seconds>: poll all this frequency
0: no polling (default)

tmscsim= [HW,SCSI]
See comment before function dc390_setup() in
drivers/scsi/tmscsim.c.

topology= [S390]
Format: {off | on}
Specify if the kernel should make use of the cpu
topology informations if the hardware supports these.
The scheduler will make use of these informations and
e.g. base its process migration decisions on it.
Default is off.

tp720= [HW,PS2]

tpm_suspend_pcr=[HW,TPM]
Format: integer pcr id
Specify that at suspend time, the tpm driver
should extend the specified pcr with zeros,
as a workaround for some chips which fail to
flush the last written pcr on TPM_SaveState.
This will guarantee that all the other pcrs
are saved.

trace_buf_size=nn[KMG]
[FTRACE] will set tracing buffer size.

trace_event=[event-list]
[FTRACE] Set and start specified trace events in order
to facilitate early boot debugging.
See also Documentation/trace/events.txt

trix= [HW,OSS] MediaTrix AudioTrix Pro
Format:

<io>,<irq>,<dma>,<dma2>,<sb_io>,<sb_irq>,<sb_dma>,<mpu_io>,<mpu_irq>

tsc= Disable clocksource-must-verify flag for TSC.
Format: <string>

[x86] reliable: mark tsc clocksource as reliable, this
disables clocksource verification at runtime.
Used to enable high-resolution timer mode on older
hardware, and in virtualized environment.

turbografx.map[2|3]= [HW,JOY]
TurboGraFX parallel port interface
Format:
<port#>,<js1>,<js2>,<js3>,<js4>,<js5>,<js6>,<js7>
See also Documentation/input/joystick-parport.txt

u14-34f= [HW,SCSI] UltraStor 14F/34F SCSI host adapter
See header of drivers/scsi/u14-34f.c.

uart401= [HW,OSS]
Format: <io>,<irq>

uart6850= [HW,OSS]
Format: <io>,<irq>

uhash_entries= [KNL,NET]
Set number of hash buckets for UDP/UDP-Lite connections

uhci-hcd.ignore_oc=
[USB] Ignore overcurrent events (default N).
Some badly-designed motherboards generate lots of
bogus events, for ports that aren't wired to
anything. Set this parameter to avoid log spamming.
Note that genuine overcurrent events won't be
reported either.

unknown_nmi_panic
[X86]
Set unknown_nmi_panic=1 early on boot.

usbcore.autosuspend=
[USB] The autosuspend time delay (in seconds) used
for newly-detected USB devices (default 2). This
is the time required before an idle device will be
autosuspended. Devices for which the delay is set
to a negative value won't be autosuspended at all.

usbcore.usbfs_snoop=
[USB] Set to log all usbfs traffic (default 0 = off).

usbcore.blinkenlights=
[USB] Set to cycle leds on hubs (default 0 = off).

usbcore.old_scheme_first=
[USB] Start with the old device initialization
scheme (default 0 = off).

usbcore.use_both_schemes=
[USB] Try the other device initialization scheme
if the first one fails (default 1 = enabled).

usbcore.initial_descriptor_timeout=
[USB] Specifies timeout for the initial 64-byte USB_REQ_GET_DESCRIPTOR request in milliseconds (default 5000 = 5.0 seconds).

usbhid.mousepoll=
[USBHID] The interval which mice are to be polled at.

usb-storage.delay_use=
[UMS] The delay in seconds before a new device is scanned for Logical Units (default 5).

usb-storage.quirks=
[UMS] A list of quirks entries to supplement or override the built-in unusual_devs list. List entries are separated by commas. Each entry has the form VID:PID:Flags where VID and PID are Vendor and Product ID values (4-digit hex numbers) and Flags is a set of characters, each corresponding to a common usb-storage quirk flag as follows:
a = SANE_SENSE (collect more than 18 bytes of sense data);
b = BAD_SENSE (don't collect more than 18 bytes of sense data);
c = FIX_CAPACITY (decrease the reported device capacity by one sector);
h = CAPACITY_HEURISTICS (decrease the reported device capacity by one sector if the number is odd);
i = IGNORE_DEVICE (don't bind to this device);
l = NOT_LOCKABLE (don't try to lock and unlock ejectable media);
m = MAX_SECTORS_64 (don't transfer more than 64 sectors = 32 KB at a time);
o = CAPACITY_OK (accept the capacity reported by the device);
r = IGNORE_RESIDUE (the device reports bogus residue values);
s = SINGLE_LUN (the device has only one Logical Unit);
w = NO_WP_DETECT (don't test whether the medium is write-protected).
Example: quirks=0419:aaf5:rl,0421:0433:rc

userpte=
[X86] Flags controlling user PTE allocations.

nohigh = do not allocate PTE pages in HIGHMEM regardless of setting of CONFIG_HIGHPTE.

vdso= [X86,SH]
vdso=2: enable compat VDSO (default with COMPAT_VDSO)
vdso=1: enable VDSO (default)
vdso=0: disable VDSO mapping

vdso32= [X86]
vdso32=2: enable compat VDSO (default with COMPAT_VDSO)
vdso32=1: enable 32-bit VDSO (default)
vdso32=0: disable 32-bit VDSO mapping

vector= [IA-64,SMP]
vector=percpu: enable percpu vector domain

video= [FB] Frame buffer configuration
See Documentation/fb/modedb.txt.

vga= [BOOT,X86-32] Select a particular video mode
See Documentation/x86/boot.txt and
Documentation/svga.txt.
Use vga=ask for menu.
This is actually a boot loader parameter; the value is
passed to the kernel using a special protocol.

vmalloc=nn[KMG] [KNL,BOOT] Forces the vmalloc area to have an exact
size of <nn>. This can be used to increase the
minimum size (128MB on x86). It can also be used to
decrease the size and leave more room for directly
mapped kernel RAM.

vmhalt= [KNL,S390] Perform z/VM CP command after system halt.
Format: <command>

vmpanic= [KNL,S390] Perform z/VM CP command after kernel panic.
Format: <command>

vmpoff= [KNL,S390] Perform z/VM CP command after power off.
Format: <command>

vt.cur_default= [VT] Default cursor shape.
Format: 0xCCBBAA, where AA, BB, and CC are the same as
the parameters of the <Esc>[?A;B;Cc escape sequence;
see VGA-softcursor.txt. Default: 2 = underline.

vt.default_blu= [VT]
Format: <blue0>,<blue1>,<blue2>,...,<blue15>
Change the default blue palette of the console.
This is a 16-member array composed of values
ranging from 0-255.

vt.default_grn= [VT]
Format: <green0>,<green1>,<green2>,...,<green15>
Change the default green palette of the console.
This is a 16-member array composed of values
ranging from 0-255.

vt.default_red= [VT]
Format: <red0>,<red1>,<red2>,...,<red15>
Change the default red palette of the console.
This is a 16-member array composed of values
ranging from 0-255.

vt.default_utf8=
[VT]
Format=<0|1>
Set system-wide default UTF-8 mode for all tty's.
Default is 1, i.e. UTF-8 mode is enabled for all
newly opened terminals.

vt.global_cursor_default=
[VT]
Format=<-1|0|1>
Set system-wide default for whether a cursor
is shown on new VTs. Default is -1,
i.e. cursors will be created by default unless
overridden by individual drivers. 0 will hide
cursors, 1 will display them.

waveartist= [HW,OSS]
Format: <io>,<irq>,<dma>,<dma2>

wd33c93= [HW,SCSI]
See header of drivers/scsi/wd33c93.c.

wd7000= [HW,SCSI]
See header of drivers/scsi/wd7000.c.

watchdog timers [HW,WDT] For information on watchdog timers,
see Documentation/watchdog/watchdog-parameters.txt
or other driver-specific files in the
Documentation/watchdog/ directory.

x2apic_phys [X86-64,APIC] Use x2apic physical mode instead of
default x2apic cluster mode on platforms
supporting x2apic.

x86_mrst_timer= [X86-32,APBT]
Choose timer option for x86 Moorestown MID platform.
Two valid options are apbt timer only and lapic timer
plus one apbt timer for broadcast timer.
x86_mrst_timer=apbt_only | lapic_and_apbt

xd= [HW,XT] Original XT pre-IDE (RLL encoded) disks.
xd_geo= See header of drivers/block/xd.c.

xirc2ps_cs= [NET,PCMCIA]
Format:

<irq>,<irq_mask>,<io>,<full_duplex>,<do_sound>,<lockup_hack>[,<irq2>[,<irq3>[,<irq4>]]]

TODO:

Add documentation for ALSA options.
Add more DRM drivers.