

*Linux Kernel Fundamentals: Chapter 1, Surveying the Linux Kernel*

1. What kernel version is your Linux system running?
2. What is the size of the kernel file that corresponds to the kernel your system is running?
3. How much RAM is available to your running kernel? Note: It may or may not be the amount of physical RAM on your system.
4. The command `strace` will display the system calls that a process makes as it runs. Using the `man` command, determine what option for `strace` will show a summary, with a count, of the number of times a process called each system call. Using that option, what system call is called the most by the command `date`?
5. Can you determine, using `strace`, what system call is used to change the directory?
6. By looking at `include/uapi/asm-generic/unistd.h` determine about how many system calls are defined in your kernel source.
7. Run a `sleep 100` with `&` (to put it in the background). What files does its process have open?
8. Does your system have a PCI Ethernet device?
9. Is the kernel variable `ip_forward` (under `/proc/sys/...`) set to 1 or 0 on your system?
10. According to `/sys/block`, do you have a block device (disk) `sda`? If so, do you have device files for partitions of `sda`? How many? Using `strace`, does the command `fdisk -l` (run it as root), open any files under `/sys/dev/block`?
11. Using `dmesg` and `grep`, do you see the kernel reporting the kernel command line? If not, can you determine if the boot messages from the kernel were lost? Does your system have a log file that recorded the boot messages? You can `grep` for `BOOT_IMAGE` under `/var/log` to look.
12. What other device files are character devices and share the same major number with `/dev/null`?