

-D

Switch option when  
using useradd to view  
default settings.

**-0**

The command switch  
to output data to a file  
with the truss and  
strace commands.

/bin and /usr/bin

Contains executable  
programs (binaries)  
used at the command  
line.

/dev

Contains block and  
device files.



/etc

Contains all files that  
are configurable.

/etc/bash

# Default location of Bourne Again shell

/etc/inetd.conf

Internet daemon set-  
up file.

/etc/init.d

Where master copies  
of the start up scripts  
(rc) reside.



/etc/inittab

Read by the inittab  
daemon to execute all  
run-control scripts.

/etc/inittab format

Label name (two character  
unique identifier): run-  
level field: action:  
command (or pointer to  
command scripts)

/etc/nsswitch\*

Configuration file for  
name devices (LDAP,  
NIS, NISPLUS)

/etc/profile

# Default location of Bourne shell



`/etc/syslog.conf`

# Configuration file for Solaris syslog

*/etc/system*

Contains settings that  
configure the kernel in  
Solaris.

*/proc/sys*

Where all tunable  
parameters are located  
on Linux

/sbin/rc\*.d

File where all run control scripts are located for system boot process.



~/.profile

# How Bourne shell is defined to the user

666

# Default permissions for a file

*777*

# Default permissions for a directory

# Address space

Virtual view of memory storage that is presented to the process while virtual memory manages movement of memory between RAM and the hard drive.



# Administrator

Sent by root; a kill  
command to get  
desired results

# Binary

An ordinary file that  
contains both  
printable and non-  
printable characters.

# Block

A basic file allocation unit for ExtX; its size is determined by the superblock.

# Block

Files for devices such  
as CD-ROMS and  
floppy drives.



# Boot block (bootblk)

The primary boot program, run in the Boot prom phase.

# Boot programs phase

Phase (2) Executed by the boot block, which in turn loads the secondary boot program, ufsboot.

# Boot prom phase

Phase (1) where self diagnostics and verification of system's hardware and memory is performed.

# Bourne Again shell (bash)

# Default Linux shell



# Bourne shell

# Default Solaris shell

# Change

Time the file's inode  
was last altered.

# Character

"Raw" device file for  
devices like the  
terminal, tape drive,  
and printer.

close()

System call for low-level file I/O. Close a file when its process terminates.



creat()

System call for low-level file I/O. Create and open a file.

# Default Solaris run-level

Run-level 3 (multi-  
user mode)

# Device driver

A low-level program that  
allows the kernel to  
communicate with a  
specific piece of hardware.

# Device file

Does not contain any data but has attributes associated with it (that define its purpose).



df

The command in SOLARIS  
to report file system disk  
space usage and logical  
mount (mapping) points.

df -h

Shows all file systems,  
disk space usage, and  
logical mapping points in  
blocks. In human form.

# Difference between Solaris run-level 1 and S

Run-level S is read  
only.

# Directory entry

Contains the file name  
and inode address  
where the file's  
metadata can be found.



# Directory file

Contains other files and directories; does not contain data but will maintain information about files within it.

dmesg

Displays diagnostic  
messages about  
devices.

dumpe2fs

Used to restore a  
damaged primary  
superblock.

exec1()

System call for process control. Initiate a program within a program.



exit()

System call for process control. Used to terminate the current process.

fdisk -l

Used to view the disk's  
physical partitioning  
scheme.

fork()

System call for process control. Used to create a child process in the image of the parent process.

# Four phases of the Solaris boot process

Boot prom phase, boot  
programs phase,  
kernel phase, and init  
phase.



free

The command in LINUX  
to display the amount of  
free and used memory  
on a Linux system.

getty

Monitors a Linux  
console for login  
requests.

# Group descriptor table

Used to describe a block group layout. Points to where the information is in the block group.

groupadd

Used to create a new  
group.



# Hard link

Pointer to a file's  
inode.

# Hardware address translation (HAT)

Controls the hardware  
that manages  
mapping of virtual-to-  
physical memory.

# Hardware Interface Modules

Allows for process scheduling, memory management, and interrupt handling (all functions that are executed using the hardware)

# Hardware Layer

Includes system  
memory, the CPU,  
disks, the terminal,  
CD-ROM, and the NIC.



# How to add a path to your path

PATH=\$PATH:  
[absolute path you  
want here]

# How to change tunable parameters in Solaris

vi the `/etc/system` file

# How to find your shell

```
$ echo $SHELL
```

init

Linux/Solaris  
command used to  
change your current  
run-level



# Inode

Contains information that processes need to access a file. One is given to every file and directory.

# Inode table of contents

Lists the block on the disk where the data is stored. Each inode stores addresses for 12 blocks, then will use pointers to map to where data is stored.

Instance device name

What the kernel uses  
to refer to devices on  
the system.

# Interrupt

Sent by the hardware when  
it wants the processor's  
attention. Event that occurs  
externally to the current  
process.



# Interrupt Signals

# Terminal, Administrator, Kernel

# Kernel

When a process  
commits an infraction  
(such as divide by  
zero)

# Kernel (aka the Manager)

The primary functions of this is to manage the hardware and perform system services.

# Kernel Layer

Contains hardware interface modules that enable functions to be executed using the hardware.



# Kernel phase

Phase (3) of the boot process where the /sbin/init daemon is initialized.

# Kernel space

Region in memory  
where all kernel  
services are provided.

kill()

System call for process control. Sends a signal to another process to terminate it.

# Library function

Built upon and around  
system calls to allow  
for the perception of  
access to devices.



# Linux run-level 1

All processes  
terminated and the  
machine comes to a  
halt.

# Linux run-level 1

Single user mode:  
system administration

# Linux run-level 2

Multi-user mode:  
allows users access to  
the system without file  
systems.

# Linux run-level 3

Multi-user mode with  
Network Services.  
Boots the system in  
text mode, no GUI.



# Linux run-level 4

Undefined.

# Linux run-level 5

# Multi-user mode with Network Services and GUI.

# Linux run-level 6

# Reboot.

ln

Used to create a hard  
link between files.



ln -s

Used to create a  
symbolic link.

# Loadable kernel modules (LKM)

Allows a device driver, or any other kernel service, to be linked into and removed from the kernel while it is running.

Logical device name

How the system administrator refers to a device. Symbolically linked from the `/dev/dsk` directory to the actual device files in `/devices`.

lsmod

Shows the status of  
currently loaded  
LKMs on Linux



# Memory Management Unit (MMU)

Hardware device responsible for handling memory accesses requested by the main processor. Also implements low-level trap handlers to manage page faults.

mmap()

System call. Allows files to be memory mapped, allowing the contents of the file to be made available to a process.

# Modification

Time when the files  
data layer was last  
altered.

modinfo

Command that lists  
the modules that are  
current loaded in  
Solaris.



`munmap()`

System call. Unmaps  
pages from memory.

mv

Unix command to  
move files to rename  
files and directories.

newgrp

Used to login to a new  
group.

O

# Running process state



open()

System call for low-level file I/O. Open existing files.

# Ordinary file

Contains data only as  
a stream of characters

# Paging

Process of saving inactive virtual memory pages to disk and restoring them to RAM when they are required.

passwd -l

Used to lock down or  
remove built in  
accounts.



Physical device name

Represents the full device pathname for  
a device. Example:

/devices/iommu@fe,0000000/sbus@fe ...

prstat

Command; shows  
current running  
processes in Solaris, and  
is updated in real time.

prtconf

Displays system config  
info, including total  
amount of memory.

ps -elf

Process statistics  
(comparable to task  
manager in windows).



R

# Executable process state

**rc**

A script that controls  
the automatic boot  
process after being  
called by init.

read()

System call for low-level file I/O. Read data from an entry.

# Restricted shell

Used to restrict the  
activities of users;  
cannot change  
directories or shells



# Rings of protection

The outer ring is the  
user space and the  
inner ring is the kernel  
space.

# Root File System

Contains the basic tools and utilities needed to keep the system going.

S

# Sleeping process state

sched

The very first process  
that begins running on a  
\*NIX machine and has a  
PID and PPID of 0.



# Shell

Provides the user a way to interface with the kernel.

# SIGHUP

Hangup - restarts a  
daemon (signal 1)

**SIGINT**

Terminal interrupt -  
user hits interrupt key  
(signal 2)

**SIGKILL**

Surest kill (signal 9)



SIGQUIT

Quit from terminal  
(signal 3)

**SIGTERM**

Default termination  
signal used by kill  
(signal 15)

# Solaris kernel

Configured at boot  
time with settings  
found in the  
`/etc/system` file.

Solaris run-level 0

Terminate the OS (to  
power down)



# Solaris run-level 1

Single-user mode/system  
administration mode: used  
for system maintenance  
(file systems are read AND  
write)

# Solaris run-level 2

Multi-user mode with  
most daemons started.

# Solaris run-level 3

Multi-user mode with most daemons started (/sbin/rc2 and /sbin/rc3) and other network services started.

# Solaris run-level 4

Undefined.



# Solaris run-level 5

Brings the system to a state where it is safe to power down, then powers down automatically.

# Solaris run-level 6

# Reboot.

# Solaris run-level S

Single-user  
mode/system  
administration mode.  
Read only.

strace

Command used to view  
system calls accessed  
during the execution of  
a command on Linux.



SUID/SGID

Allows anyone to run a program with the same privileges as either the owner or the group.

# Superblock

Located 1024 bytes from the start of the file system and is 1024 bytes in size. Essentially a table of contents of an entire block group.

# Symbolic link

File that contains the  
name of another file.

sysctl

# How to view or change kernel parameters in Linux



sysctl -p

To make changes made  
to the kernel parameters  
persistent (still available  
after reboot).

`sysctl -w`

How to change kernel  
parameters in Linux  
while the system is  
running.

sysdef

Command in Solaris used to display the names of the kernel parameters and their current values (states).

# System Call

Converts a process  
running into user  
mode to a protected  
mode process.



# System call

Routine invoked by  
the C program to  
access system  
resources.

# System call

Provides an interface to allow user programs to access kernel functions (aka, middle man) such as memory, disk storage. Basically any system resource.

# System Call Interface

Handles the mapping  
between user requests and  
device driver actions.

Converts user system calls  
into kernel system calls.

# System calls

Date (provides the  
date) and uname  
(provides the name of  
the OS)



T

# Stopped process

# Terminal interrupt signal

Ctl + C or Ctl +Z

Text

A type of ordinary file  
that only contains  
printable characters

top

Command; shows  
current running  
processes in Linux and  
is updated in real time.



# Trap

Software interrupt that occurs within a process after it executes an instruction.

truss

Command used to view  
system calls accessed  
during the execution of a  
command on Solaris.

ttymon

Monitors a Solaris  
console for login  
requests.

ufsboot

The program which loads the kernel into memory during the Solaris boot process.



umask

Removes permissions  
(by subtracting from  
default permissions)

uname()

System call. Returns  
system information  
about the OS.

unlink()

System call for low-level file I/O. Removes a directory entry.

# User Layer

Consists of processes that are running.  
Examples: shells, UNIX commands, and  
user applications.



# User Layer

Processes running in this protection layer are protected from other users' processes also running.

# User process to kernel process

When a user process  
executes a system call  
and beings executing  
in kernel mode.

# User space

The area in memory where user processes are run and consists of memory starting above the kernel and includes the rest of available memory.

# Virtual Memory

Computer system technique that gives a process the impression it has contiguous working memory.



wait()

System call for process control. Blocks the calling process until its child process exists or it receives a signal.

When is the kernel  
loaded into memory?

At system boot  
(because it is the core  
of the OS).

write()

System call for low-level file I/O. Write data to a file.

*Z*

# Zombie process state