UNIVERSITY OF SOUTHERN MAINE

Department of Computer Sciences

Unix/Linux Commands

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General Syntax

Command [Options] [Arguments]

Command: — The actual command you want to execute

Options: — Modifies the behavior of a command. Begins with a hyphen '-' or double hyphen '–'

Arguments: — The objects that the command operates on. Can be file names, directories, or other data

Bash Scripting Basics

#!/bin/env bash — the 'shebang' used to tell the operating system the path it should use to interpret the file

bash *file*.sh — run the bash script in terminal

./ *file*.sh — run the bash script in terminal if set to executable

$ — prefix to all variables throughout the script

— used to make comments throughout script

|| — logical OR

&& — logical AND

$# — number of arguments that were passed into the script

$0 — refer back to the script name

$1, $2, etc. — refer to user input (parameters) that user can add when running script, separated by a space

exit [0-255] — exit script and return number from 0 to 255. 0 means everything worked as intended, but other values can be used to denote errors that the script ran into

File Management

ls — list items in your current directory

ls -a — list all items and hidden files in your current directory

ls -l — list items, including their size and permissions, in your current directory

pwd — prints path of current working directory

File Management (cont)

cd — change directory to home directory

cd *dir* — change directory to *dir*

cd .. — go up one directory

cp *file1* *file2* — copy *file1* to *file2*

cp -r *dir1* *dir2* — copy *dir1* to *dir2*, recursively

mv *file1* *file2* — move *file1* to *file2*, or just change file name

rm *file* — remove *file*

rm -r *dir* — remove directory *dir*, recursively

echo *text* — outputs *text* to standard output

touch *file* — create *file*, such as an empty txt or zip

cat *file* — concatenate *file* and print to standard output

head *file* — output first 10 lines of *file*

tail *file* — output last 10 lines of *file*

less *file* — view *file* instead of opening in an editor, allowing page navigation

sort *file* — used to sort a file, arranging the records in a particular order

mkdir *dir* — create directory *dir*

vim *file* — open *file* in vim text editor

nano *file* — open *file* in nano text editor

File Searching

find — search for a file or directory on your file system

find /home -name *.jpg — find all *.jpg* files in the */home* and sub-directories

grep — searches through *files* for a particular pattern of characters, and displays all lines that contain that pattern

grep -r *pattern* *dir* — search recursively for pattern in *dir*

locate *file* — locate a file

Help/Info Commands

help — provide information related to Shell built-in commands

type — provides the command type

whatis — a one-line description

man — manual or 'man pages' for a given command, plain text

info — in-depth document for a given command, hypertext

apropos — find a command's name

which — in-depth document for a given command, hypertext

Redirection/Pipes

"<" - Input redirection — Redirects the standard input of a command to a file.

">" - Output redirection — Redirects the standard output of a command to a file, if it already exists, it will be overwritten

"|" Pipe - Chaining commands — Sends the output of one command as input for another

System

htop — allows user to monitor many different system statistics

du — display disk usage statistics

df — display free disk space

free — display amount of free and used memory in the system

kill — get rid of a command in the background

shutdown now — shutdown machine

Download and Unpack

curl -o *file-name* *file-url* — download the file with the name provided

wget *file-url* — download a file

tar -xzf *tar-file* — extract a tar file

Programs

BS Computer Science
MS Data Science

Cheat Sheet

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Process Management

ps — show a snapshot of all processes

top — shows real time processes

kill *pid* — kill process with id *pid*

pkill *name* — kill process with name *name*

killall *name* — kill all processes with name starting with *name*

Important Directories

/ — root directory

/**bin** — the most essential Unix commands (such as *ls*)

/**boot** — location where the kernel and other files used during booting are sometimes stored

/**dev** — contains device files, the interface between the filesystem and the hardware

/**etc** — contains configuration files, which can generally be edited by hand in a text editor

/**home** — contains a home folder for each user

/**lib** — contains libraries needed by the essential binaries in the */bin* and */sbin* folder

/**opt** — contains subdirectories for optional software packages

/**proc** — the interface between the filesystem and the running processes, the CPU and memory

/**root** — the home directory of the root user

/**sbin** — very common commands used by the superuser for system administration

/**tmp** — temporary files stored by applications

/**usr** — contains applications and files used by users

/**usr/bin** — application/distribution binaries meant to be accessed by locally logged in users

/~ or /**home/$USER** — home directory

Ownership and Permissions

sudo — log in or run program as root user

adduser — create a user account (as root)

passwd *account* — set password for *account* (as root)

userdel -r *account* — delete an account and account's home directory (as root)

chown — change owner of a file

chown *userid* /home/*userid*/ — make user account owner of home directory (as root)

chgrp — change group

chmod ugo *file* — change the user, group, and others permissions for *file* (ugo given in base 8, where u is the user, g is the group, and o is others)

chmod [ugo][+-=][rwx] *file* — give, take away, or set the read, write, and/or execute permissions for user, group and/or others for *file*

7 — read, write and execute permissions

4 — read permissions

2 — write permissions

1 — execute permissions

0 — no permissions

chmod 644 *file* — standard permissions for files

chmod 755 *dir* — standard permissions for directories

Environment Variables

printenv — list all current environment variables

$PATH — the directories where the shell will look for the command binaries

$HOME — your home directory

$UID — user ID for the current user

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Environment Variables (cont)

$USER — the user that is currently logged in

$EDITOR — the system's default editor

$SHELL — the current shell being used

$PWD — the current directory

Secure Shell

ssh — gives *ssh* command information

ssh *username@ip-address* — log into remote system

ssh-keygen — generate public/private key pair

ssh-add — command for adding SSH private keys into the SSH authentication agent for implementing single sign-on with SSH

ssh-keyscan — for retrieving public keys from servers

scp *file-path username@ip-address*: — copy a file from your local system to remote system

scp *username@ip-address*:*file-path* — copy a file from the remote system to your own system

scp -r *username@ip-address*:*directory* — copy a directory from the remote system to your own system

exit — terminate the shell

~ + Ctrl-Z — suspend the remote login session

System Logs

who — produce information on who is logged in

journalctl — view the log of the entire system

dmesg — view all kernel messages from the last boot of the machine

last — display last user logins

history — list previous commands used

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