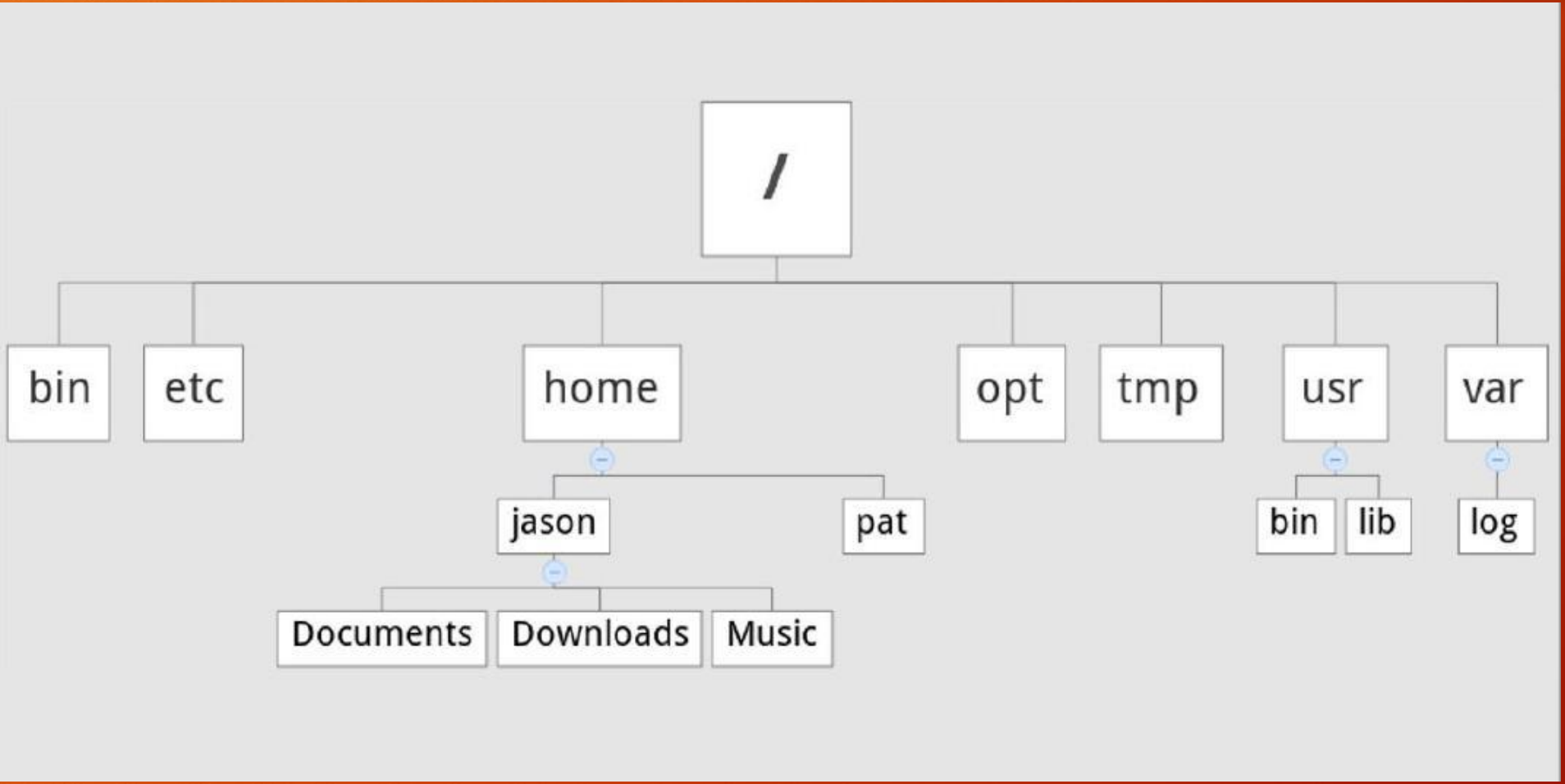
Linux Basics

Common Directory

Common Directories

- / "Root," the top of the file system hierarchy.
- /bin Binaries and other executable programs.
- /etc System configuration files.
- /home Home directories.
- /opt Optional or third party software.
- /tmp Temporary space, typically cleared on reboot.
- /usr User related programs.
- /var Variable data, most notably log files.

Common Directory



Task: See the common directory in Linux

Any common directory missing in Ubuntu version?

Comprehensive Directory Listing

- / "Root," the top of the file system hierarchy.
- /bin Binaries and other executable programs.
- /boot Files needed to boot the operating system.
- /cdrom Mount point for CD-ROMs.
- /cgroup Control Groups hierarchy.
- /dev Device files, typically controlled by the operating system and the system administrators.
- /etc System configuration files.

Comprehensive Directory Listing

- /export Shared file systems.
- /home Home directories.
- /lib System Libraries.
- /lib64 System Libraries, 64 bit.
- /lost+found Used by the file system to store recovered files after a file system check has been performed.
- /media Used to mount removable media like CD-ROMs.

Summary

- The most common directories to know are:
  - /
  - /bin
  - /etc
  - /home
  - /opt
  - /tmp
  - /usr
  - /var

- Applications that are not part of the base OS can be installed in:
  - /usr/local
  - /opt

Shell

What Is the Shell?

- The default interface to Linux
- A program that accepts your commands and executes those commands
- Also called a command line interpreter

Command Line Interface vs a GUI

- The command line is more powerful.
- There will always be a command line.
- Server distributions do not include GUIs.
- Desktop distributions have GUIs and CLIs.

Root, the Superuser

- Root is all powerful.
- Normal accounts can only do a subset of the things root can do.

Root, the Superuser

- Root access is typically restricted to system administrators.
- Root access may be required to to install, start, or stop an application.
- Day to day activities will be performed using a normal account.

Basic Linux Commands

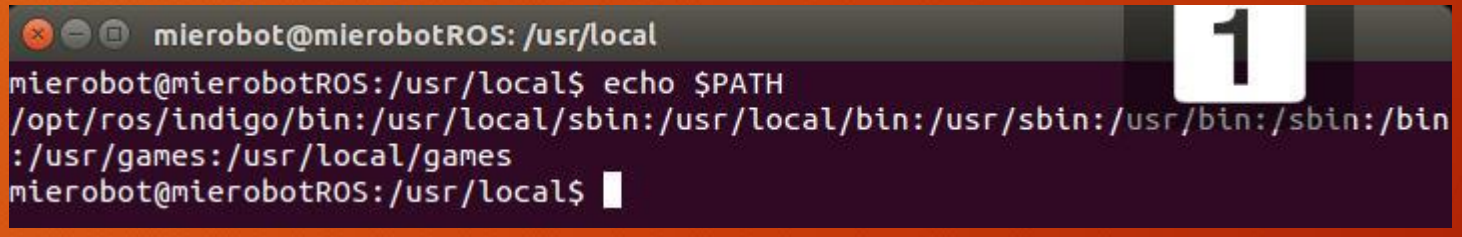
- `ls` - Lists directory contents.
- `cd` - Changes the current directory.
- `pwd` - Displays the present working directory.
- `cat` - Concatenates and displays files.
- `echo` - Displays arguments to the screen.
- `man` - Displays the online manual.
- `exit` - Exits the shell or your current session.
- `clear` - Clears the screen.

Environmental Variables

- Storage location that has a name and a value
- Typically uppercase
- Access the contents by executing:
  - `echo $VAR_NAME`

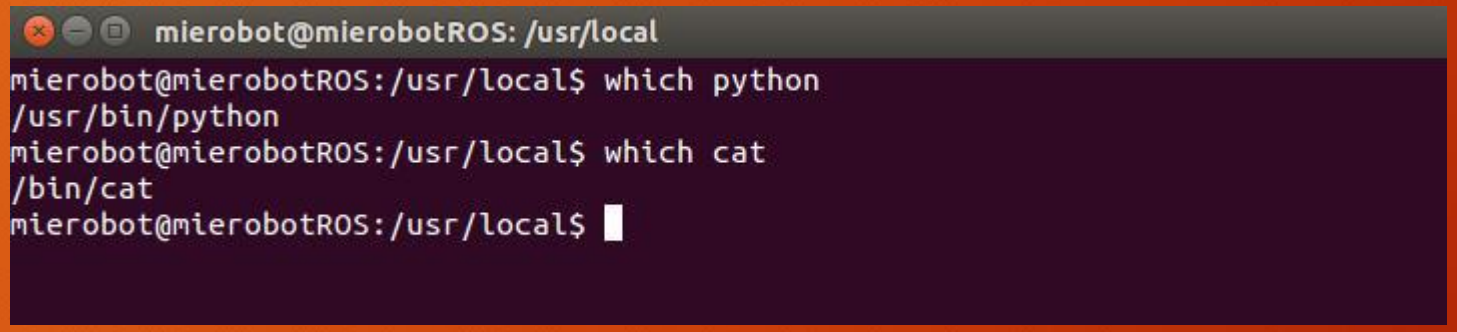
PATH

- An environment variable
- Controls the command search path
- Contains a list of directories



Which Command Exactly?

`which` Locate a command



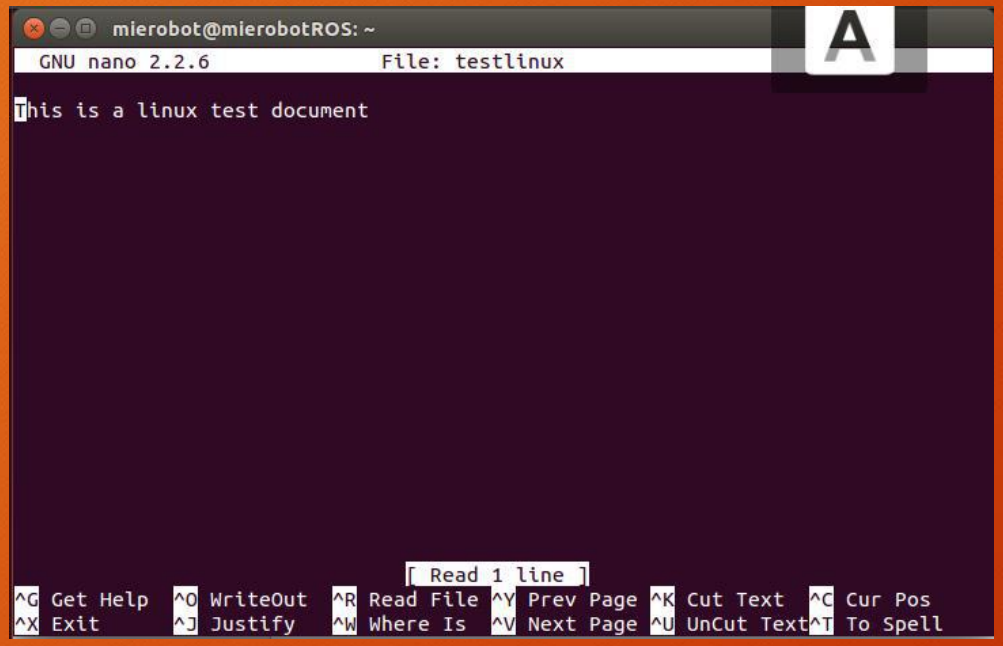
Creating and Removing Directories

mkdir [-p] directory - Create a directory.

rmdir [-p] directory - Remove a directory.

rm -rf directory - Recursively removes directory.

Using Nano editor
Move into Home/MieRobot & sudo nano testlinux
Add a new line and Ctrlx AND Y



Decoding ls -l Output

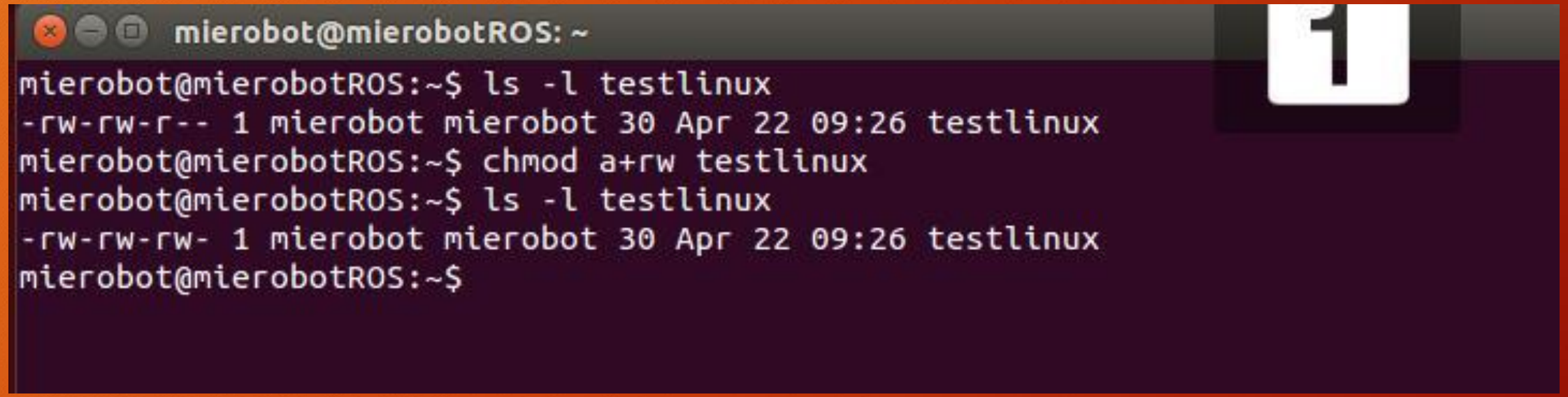
```
$ ls -l
-rw-rw-r-- 1 jason users 10400 Sep 27 08:52 sales.data
```

Permissions	-rw-rw-r--
Number of links	1
Owner name	jason
Group name	users
Number of bytes in the file	10400
Last modification time	Sep 27 08:52

Listing All Files, Including Hidden Files

- Hidden files begin with a period.
  - Sometimes called "dot files."
- Hidden files are not displayed by default.
- To show hidden files with `ls`, use `ls -a`.
- Command options can be combined.
  - `ls -l -a` is the same as `ls -la` and `ls -al`.

Try this now


mierobot@mierobotROS: ~
mierobot@mierobotROS:~$ ls -l testlinux
-rw-rw-r-- 1 mierobot mierobot 30 Apr 22 09:26 testlinux
mierobot@mierobotROS:~$ chmod a+rw testlinux
mierobot@mierobotROS:~$ ls -l testlinux
-rw-rw-rw- 1 mierobot mierobot 30 Apr 22 09:26 testlinux
mierobot@mierobotROS:~$

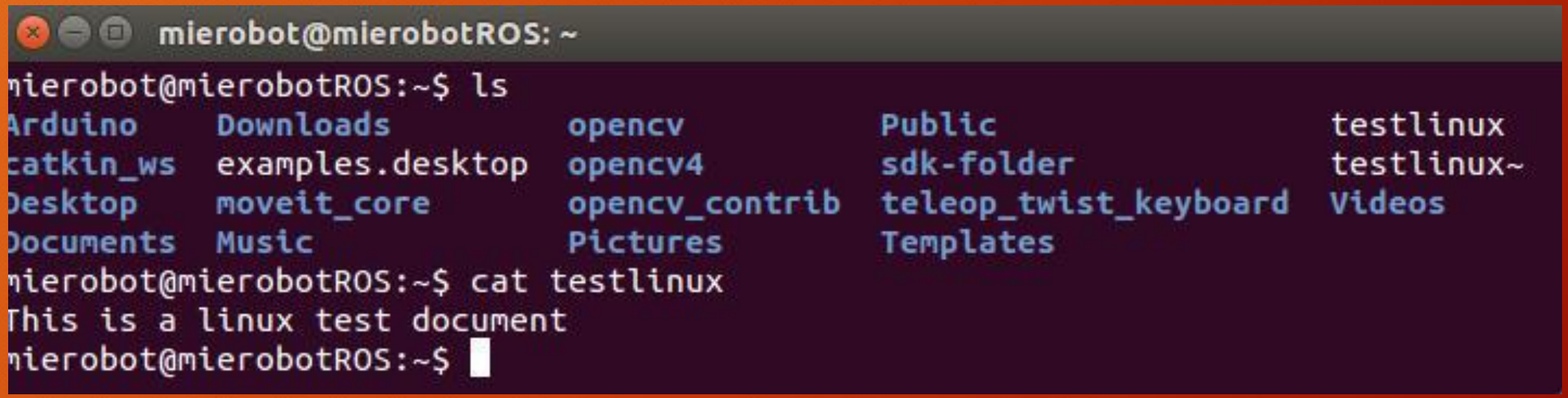
Listing Files by Time and in Reverse

`ls -t`	List files by time.
`ls -r`	Reverse order.
`ls -latr`	Long listing including all files reverse sorted by time.

Displaying the Contents of Files

`cat file`	Display the contents of file.
`more file`	Browse through a text file.
`less file`	More features than more.
`head file`	Output the beginning (or top) portion of file.
`tail file`	Output the ending (or bottom)

Try this


mierobot@mierobotROS: ~
mierobot@mierobotROS:~$ ls
Arduino Downloads opencv Public testlinux
catkin_ws examples.desktop opencv4 sdk-folder testlinux~
Desktop moveit_core opencv_contrib teleop_twist_keyboard Videos
Documents Music Pictures Templates
mierobot@mierobotROS:~$ cat testlinux
This is a linux test document
mierobot@mierobotROS:~$

Aliases

- Shortcuts
- Use for long commands
- Use for commands you type often

Creating Aliases

```
alias [name[=value]]
```

List or create aliases.

Use name=value to create a new alias.

```
mierobot@mierobotROS:~$ alias cls=clear
mierobot@mierobotROS:~$ cls
```

GREP (SOURCE geeksforgeeks)

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. The pattern that is searched in the file is referred to as the regular expression (grep stands for globally search for regular expression and print out).

```
mierobot@mierobotROS:~$ ls
Arduino     Downloads         opencv          Public                testlinux
catkin_ws   examples.desktop  opencv4         sdk-folder            testlinux~
Desktop     moveit_core       opencv_contrib  teleop_twist_keyboard Videos
Documents   Music             Pictures        Templates
mierobot@mierobotROS:~$ grep -i "linux" testlinux
This is a linux test document
```

Options Description

-c : This prints only a count of the lines that match a pattern
-h : Display the matched lines, but do not display the filenames.
-i : Ignores, case for matching
-l : Displays list of a filenames only.
-n : Display the matched lines and their line numbers.
-v : This prints out all the lines that do not matches the pattern
-e exp : Specifies expression with this option. Can use multiple times.
-f file : Takes patterns from file, one per line.
-E : Treats pattern as an extended regular expression (ERE)
-w : Match whole word
-o : Print only the matched parts of a matching line,
with each such part on a separate output line.