

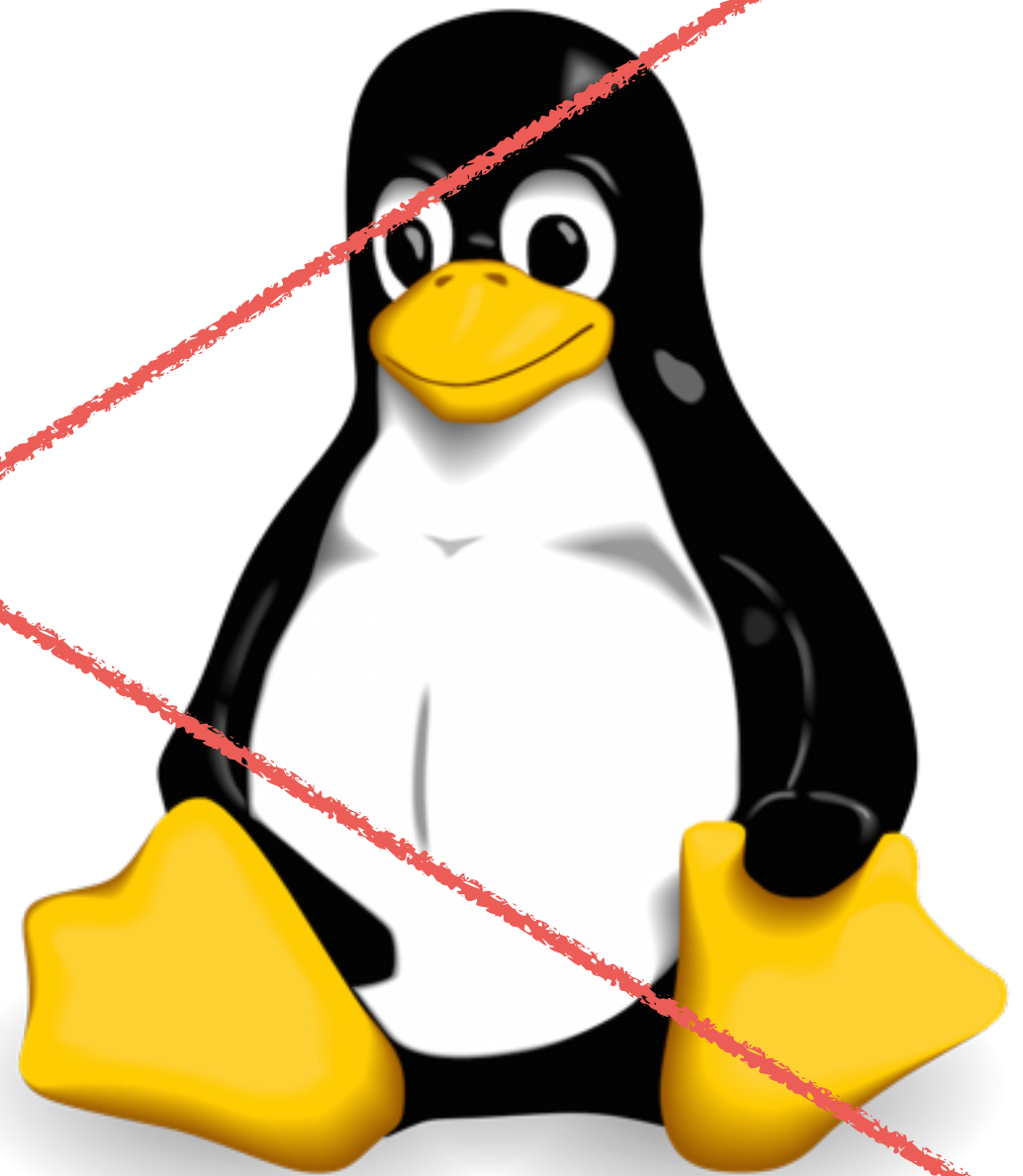
Linux - basic knowledge you need

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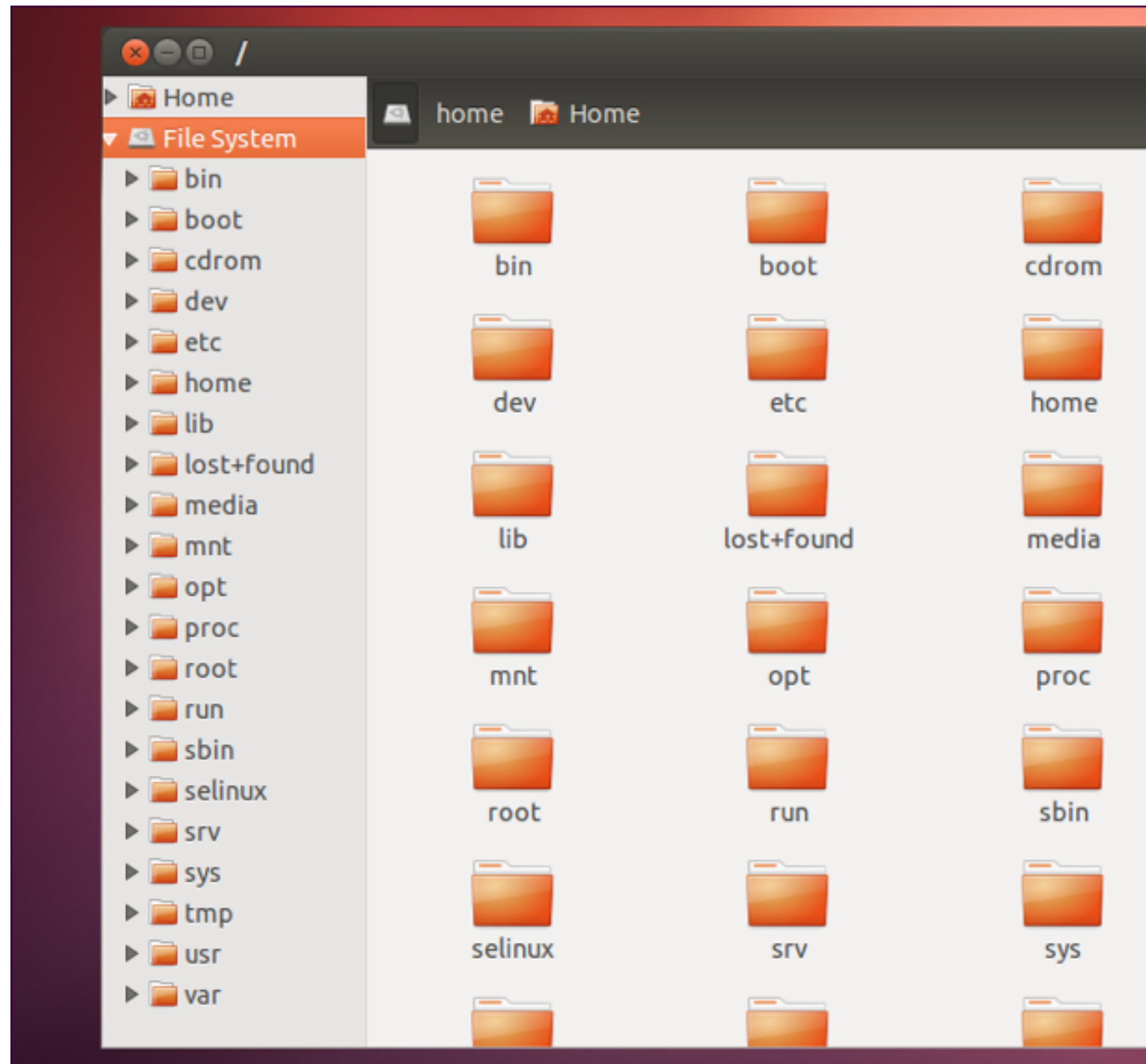
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Linux history

- Based on UNIX OS
- 1st Linux was released October 5, 1999 by Linux Torvalds
- More than 30 distributives
- Free
- Easy to adopt



*nix system structure



*nix system structure

- **/** - root folder (like C: drive in Windows system)
- **/root** - home folder for root user
- **/etc** - configured files
- **/home** - home directory
- **/bin** - system binary files
- **/usr** - user binary files (read only)
- **/tmp** - temporary files
- **/var** - like **/usr** but with write permission
- **/lib** - all libraries sit here
- **/home** - users home directory
- **/dev** - hardware files

Users in Linux

- By default *nix has around 100 users: **root**, **_www**, **cron**, **ftp**, etc
- **root** - the most powerful user



```
nobody:*:-2:-2:Unprivileged User:/var/empty:/usr/bin/false
root:*:0:0:System Administrator:/var/root:/bin/sh
daemon:*:1:1:System Services:/var/root:/usr/bin/false
```

```
account:password:UID:GID:GECOS:directory:shell
```

Most frequently used *nix commands

man

grep

passwd

cd

find

ifconfig

ls

kill

uname -a

cp / mv

ps -ef

tail

pwd

chmod

ssh

whoami

chown

whereis

su / sudo

top

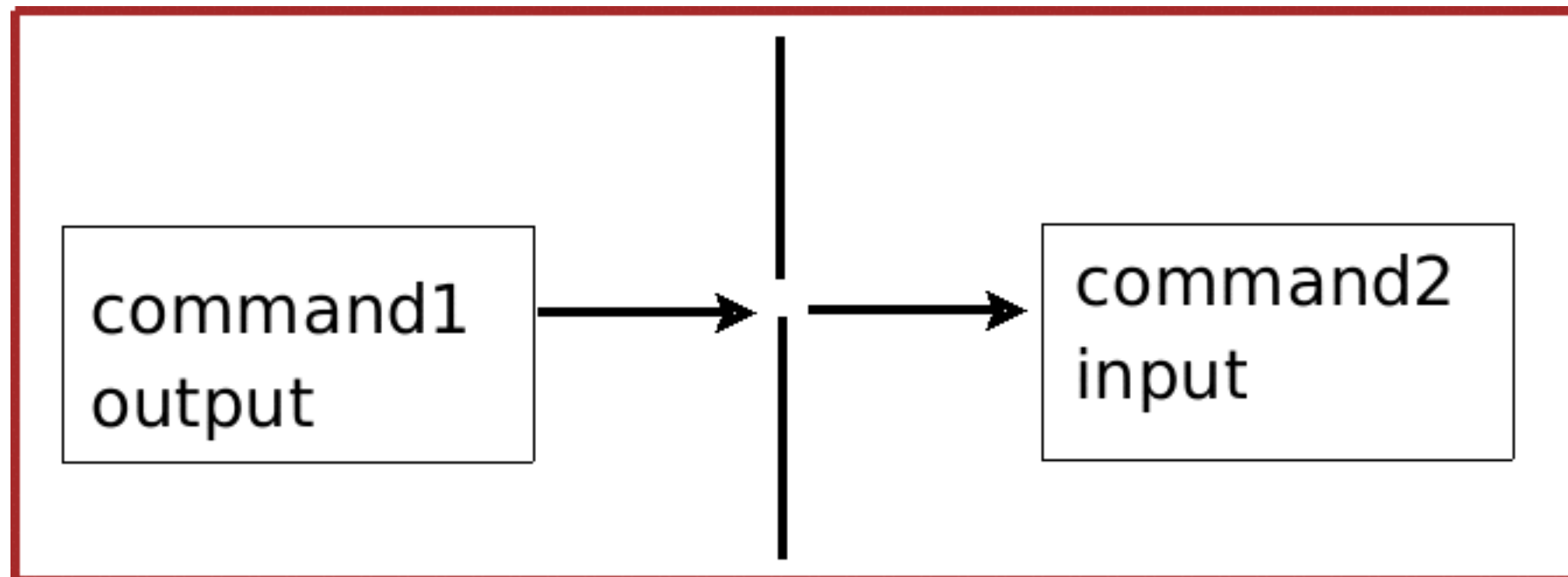
vim / cat

rm

ping

history

Pipes in *nix



```
$ ls -la
```

```
$ ls -la | grep 'opt'
```

```
$ grep 'opt'
```

```
$ ls -la | grep 'opt' | sort -r
```

Understanding *nix data

```
devnet@lostlap ~ $ ls -l
total 32
drwxr-xr-x  4 devnet devnet 4096 2009-09-28 05:13 Desktop
drwxr-xr-x  6 devnet devnet 4096 2009-09-25 07:23 Documents
drwxr-xr-x 49 devnet devnet 4096 2009-09-25 07:23 Music
drwxr-xr-x  2 devnet devnet 4096 2009-09-25 07:11 Network
drwxr-xr-x  2 devnet devnet 4096 2009-09-25 07:04 Pictures
drwxr-xr-x  2 devnet devnet 4096 2009-09-25 07:11 Public
drwxr-xr-x  2 devnet devnet 4096 2009-09-25 07:11 Templates
drwxr-xr-x  2 devnet devnet 4096 2009-09-25 07:11 Videos
```

The diagram illustrates the structure of the 'ls -l' command output. It shows a table with 8 columns. Below the table, color-coded lines connect each column to its corresponding label:

- File Type** (orange line to the first column)
- User Permissions** (green line to the first three characters of the permissions)
- Group Permissions** (blue line to the next three characters of the permissions)
- Other Permissions** (red line to the last character of the permissions)
- # of Hard Links** (white line to the number after the permissions)
- User / Owner** (cyan line to the user name)
- Group** (teal line to the group name)
- Size** (magenta line to the file size)
- Date** (green line to the date and time)
- File or Directory Name** (grey line to the file name)

Legend:

- d - directory
- r - readable
- w - writeable
- x - executable

CHMOD | CHOWN

```
drwx-----  4 teroff  staff    136 Dec  5 22:57 Applications
drwx-----+ 16 teroff  staff    544 May  1 22:10 Desktop
drwx-----+ 19 teroff  staff    646 Apr 25 09:51 Documents
drwx-----+ 53 teroff  staff   1802 May  1 22:10 Downloads
drwx-----@ 22 teroff  staff    748 May  1 21:44 Dropbox
drwx-----@ 59 teroff  staff   2006 Apr 20 14:42 Library
drwx-----+  9 teroff  staff    306 Mar 23 20:47 Movies
drwx-----+  8 teroff  staff    272 Mar 18 13:50 Music
drwx-----+  8 teroff  staff    272 Feb 13 09:56 Pictures
drwxr-xr-x+  5 teroff  staff    170 Oct  5 2014 Public
drwxr-xr-x  11 teroff  staff    374 Apr  8 11:23 Repo
```

Owner | Group | World

Read | Write | Execute

4-R | 2-W | 1-E

CHMOD | CHOWN

COMMAND <OWNER><GROUP><WORLD> PATH

Practical Examples

chmod 400 mydoc.txt - read by owner
chmod 040 mydoc.txt - read by group
chmod 004 mydoc.txt - read by anybody (other)
chmod 200 mydoc.txt - write by owner
chmod 020 mydoc.txt - write by group
chmod 002 mydoc.txt - write by anybody
chmod 100 mydoc.txt - execute by owner
chmod 010 mydoc.txt - execute by group
chmod 001 mydoc.txt - execute by anybody

CHOWN | CHMOD

7 = 4+2+1 (read/write/execute)

6 = 4+2 (read/write)

5 = 4+1 (read/execute)

4 = 4 (read)

3 = 2+1 (write/execute)

2 = 2 (write)

1 = 1 (execute)

```
Stanislavs-MacBook-Pro-3:Desktop teroff$  
Stanislavs-MacBook-Pro-3:Desktop teroff$ chmod 721 tux-base.png  
Stanislavs-MacBook-Pro-3:Desktop teroff$  
Stanislavs-MacBook-Pro-3:Desktop teroff$  
Stanislavs-MacBook-Pro-3:Desktop teroff$ ls -la | grep tux-base.png  
-rwx-w---x@ 1 teroff staff      241863 May  1 21:51 tux-base.png  
Stanislavs-MacBook-Pro-3:Desktop teroff$ |
```

SSH - Secured Shel

- SSH allows us to connect to a *nix machine without a hard access

```
ssh <host>
```

```
ssh <username>@<host>
```

```
ssh -l <username> <host>:<port>
```

SSH connection

```
login - stan
```

```
server: 52.10.191.83
```

Q&A