Linux Practical Lesson Plan for Beginners

Course Information

Duration: 3 hours
Target Audience: Complete beginners with no prior Linux experience
Prerequisites: Basic computer literacy
Learning Environment: Linux virtual machine or live USB

Learning Objectives

By the end of this lesson, students will be able to:

- Navigate the Linux file system using command line
- Understand basic Linux directory structure
- Create, edit, and manage files and directories
- Use essential Linux commands for daily tasks
- Understand file permissions basics
- Perform basic system information queries

Required Materials

- Linux distribution (Ubuntu 22.04 LTS recommended)
- Terminal access
- Text editor (nano or vim)
- Handout with command reference sheet

Lesson Structure

Part 1: Introduction and Setup (30 minutes)

Opening Discussion (10 minutes)

- What is Linux?
- Why learn Linux?
- Linux vs Windows/macOS
- Different Linux distributions

Environment Setup (20 minutes)

Practical Activity:

1. Boot into Linux environment
2. Open terminal application
3. Verify system with basic commands:

```bash
whoami
date
uname -a
```

Part 2: File System Navigation (45 minutes)

Understanding the Linux Directory Structure (15 minutes)

Key Directories:

- `/` (root directory)
- `/home` (user directories)
- `/bin` (essential binaries)
- `/etc` (configuration files)
- `/tmp` (temporary files)

Navigation Commands (30 minutes)

Hands-on Practice:

1. **Present Working Directory**

```bash
pwd
```

2. **List Directory Contents**

```bash
```

```
ls
ls -l
ls -la
ls -lh
```

3. **Change Directory**

bash

```
cd /
cd ~
cd ..
cd /home
cd -
```

Practice Exercise:

- Navigate to root directory
- List contents with detailed view
- Go to your home directory
- Explore different subdirectories

Part 3: File and Directory Management (45 minutes)

Creating Files and Directories (20 minutes)

Commands to Practice:

bash

```
mkdir practice_folder
mkdir -p deep/nested/directories
touch newfile.txt
touch file1.txt file2.txt file3.txt
```

Copying and Moving Files (15 minutes)

bash

```
cp file1.txt file1_backup.txt
cp -r practice_folder practice_backup
mv file2.txt renamed_file.txt
mv file3.txt practice_folder/
```

Removing Files and Directories (10 minutes)

```bash
rm renamed_file.txt
rm -r practice_backup
rmdir empty_directory
```

Safety Note: Emphasize the importance of double-checking before using `rm` command.

Break (15 minutes)

Part 4: Viewing and Editing Files (30 minutes)

Viewing File Contents (15 minutes)

Commands to Practice:

```bash
cat /etc/passwd
less /etc/passwd
head /var/log/syslog
tail /var/log/syslog
head -n 5 filename.txt
tail -n 10 filename.txt
```

Basic Text Editing with Nano (15 minutes)

Hands-on Activity:

1. Create a new file: `nano my_first_file.txt`
2. Add some text content
3. Save file (Ctrl+O)
4. Exit nano (Ctrl+X)

5. View the created file with `cat`

Nano Key Commands:

- Ctrl+O: Save
- Ctrl+X: Exit
- Ctrl+K: Cut line
- Ctrl+U: Paste

Part 5: File Permissions and Ownership (25 minutes)

Understanding Permissions (15 minutes)

Concept Explanation:

- Read (r), Write (w), Execute (x)
- User, Group, Others
- Numeric representation (755, 644, etc.)

Commands to Explore:

```bash
ls -l
chmod 755 script.sh
chmod u+x filename
chmod g-w filename
chown user:group filename
```

Practical Exercise (10 minutes)

1. Create a script file
2. Make it executable
3. Check permissions before and after
4. Run the script

Part 6: System Information and Process Management (20 minutes)

System Information Commands (10 minutes)

```bash
df -h       # Disk usage
free -h     # Memory usage
top         # Running processes
ps aux      # Process list
uptime      # System uptime
which command  # Command location
man command    # Manual pages
```

Basic Process Management (10 minutes)

```bash
ps aux | grep firefox
kill PID
killall process_name
jobs
bg
fg
```

Note: Emphasize careful use of kill commands.

Part 7: Practical Exercises and Assessment (15 minutes)

Hands-on Challenge

Students complete the following tasks independently:

1. Create a directory structure: `projects/web/html` and `projects/web/css`
2. Create three HTML files in the html directory
3. Copy one file to the css directory and rename it
4. Make a backup of the entire projects directory
5. View the contents of `/etc/hostname`
6. Check current disk usage
7. Find the location of the `ls` command

Quick Quiz (Verbal)

- What command shows your current directory?

- How do you create a directory?
- What's the difference between `cp` and `mv`?
- How do you make a file executable?
- What does `ls -la` show you?

Assessment Criteria

Practical Skills Assessment

- **Navigation:** Can move between directories confidently
- **File Management:** Can create, copy, move, and delete files/directories
- **Text Editing:** Can create and edit simple text files
- **Permissions:** Understands basic permission concepts
- **System Awareness:** Can check system information

Participation Points

- Active engagement in hands-on activities
- Asking relevant questions
- Helping peers when appropriate
- Completion of practical exercises

Additional Resources

Command Reference Sheet

```
Navigation:          File Management:       Viewing Files:
pwd                  mkdir dirname          cat filename
ls                   touch filename         less filename
ls -la               cp source dest         head filename
cd directory         mv source dest         tail filename
cd ..                rm filename
cd ~                 rmdir dirname          System Info:
                     rm -r dirname          df -h
Text Editing:                               free -h
nano filename        Permissions:           ps aux
```

```
chmod 755 file      top
chown user file     man command
```

Homework Assignment

1. Practice all commands learned in class
2. Create a simple directory structure for organizing personal files
3. Write a short text file describing what you learned
4. Research one additional Linux command not covered in class

Next Session Preview

- Advanced file operations (find, grep, pipes)
- Text processing tools
- Shell scripting basics
- Package management

Instructor Notes

Common Student Challenges

- Remembering command syntax
- Understanding file paths (relative vs absolute)
- Fear of breaking the system
- Confusion between similar commands

Teaching Tips

- Emphasize hands-on practice
- Encourage experimentation in safe environment
- Use real-world examples
- Provide command reference sheet
- Create a supportive learning atmosphere

Troubleshooting Common Issues

- Permission denied errors
- Command not found

- Accidental file deletion
- Getting lost in directory structure

Extension Activities for Fast Learners

- Introduction to pipes and redirection
- Basic shell scripting
- Exploring system logs
- Setting up aliases and environment variables