

## 2. Student Handout

# Linux Package Management and Disk Management: Student Handout

## Overview

This handout provides a concise overview of two fundamental Linux concepts: **Package Management** and **Disk Management**. Understanding these topics is crucial for effectively managing a Linux system.

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## 1. Package Management in Linux

### What is a Package?

- A package is a compressed file containing all necessary files, libraries, and metadata required to install and run software on a Linux system.

### What is a Package Manager?

- A package manager is a tool that automates the process of installing, updating, and removing software packages.

### Common Package Managers:

- **APT (Advanced Package Tool):** Used in Debian-based distributions like Ubuntu.
- **YUM (Yellowdog Updater Modified):** Used in Red Hat-based distributions like CentOS and Fedora.

## APT (Debian-based Package Management System)

### Basic APT Commands:

1. Installing a package:

```
sudo apt install <package_name>
```

- Example: `sudo apt install firefox`

## 2. Updating the package list:

```
sudo apt update
```

## 3. Upgrading installed packages:

```
sudo apt upgrade
```

## 4. Removing a package:

```
sudo apt remove <package_name>
```

- Example: `sudo apt remove gimp`

# YUM (Red Hat-based Package Management System)

## Basic YUM Commands:

### 1. Installing a package:

```
sudo yum install <package_name>
```

- Example: `sudo yum install httpd`

### 2. Updating the package list:

```
sudo yum check-update
```

### 3. Upgrading installed packages:

```
sudo yum update
```

### 4. Removing a package:

```
sudo yum remove <package_name>
```

- Example: `sudo yum remove nginx`
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## 2. Disk Management in Linux

### What is Disk Management?

- Disk management involves organizing and managing storage space on a hard drive, including creating, modifying, and deleting disk partitions and file systems.

### What is a Disk Partition?

- A disk partition is a logical division of a hard drive used to organize different types of data.

### Types of Partitions:

1. **Primary Partition:** Bootable partition that can contain an operating system. Up to four primary partitions are allowed on a disk.
2. **Extended Partition:** Can contain multiple logical partitions if more than four partitions are needed.
3. **Logical Partition:** Partitions within an extended partition.

### What is a File System?

- A file system is a method used by the operating system to organize and store files on a disk partition.

### Common Linux File Systems:

1. **ext4 (Fourth Extended File System):** Most commonly used, supports large files.
2. **XFS:** High-performance, often used in enterprise environments.
3. **Btrfs (B-tree File System):** Supports advanced features like snapshots and data compression.

### Examples of Disk Management:

### 1. Creating a Partition:

- Use tools like `fdisk` or `gparted` to create a new partition on a disk.

### 2. Formatting a Partition with ext4:

```
sudo mkfs.ext4 /dev/sdXn
```

- Replace `/dev/sdXn` with the appropriate partition identifier.

### 3. Mounting a Partition:

```
sudo mount /dev/sdXn /mnt
```

- Mounts the partition to the `/mnt` directory.

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## Conclusion

Understanding package management and disk management is essential for effectively managing a Linux system. Package managers like APT and YUM simplify software installation and maintenance, while disk management tools help organize and optimize storage space.