Modual -3 linux server configure local storage assignment

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* **fdisk is used to create, delete, and manage disk partitions.**
* **mkfs (make filesystem) is used to create a file system on a partition. For example, mkfs.ext4 creates an ext4 file system.**
* **mount is used to mount a filesystem onto the Linux directory tree, allowing access to the data.**

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1. **Use fdisk to create a partition:**
   * **Run fdisk /dev/sda (replace /dev/sda with the appropriate disk).**
   * **Create a new partition with size 2048MB.**
   * **Save the partition.**
2. **Verify the partition using lsblk or fdisk -l. It should list the new partition with the correct size.**

**27. Why LVM is required?  
LVM (Logical Volume Manager) is required to manage disk storage more flexibly. It allows for resizing partitions easily, combining multiple physical volumes into a single logical volume, and better handling of storage volumes without reformatting.**

**28. How can you find out how much memory Linux is using?  
You can check memory usage using commands like:**

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* **top or htop (provides real-time memory usage)**
* **vmstat (gives detailed memory statistics)**

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The typical size for a swap partition is usually equal to the amount of RAM, but in practice, it can be anywhere from 1 to 2 times the RAM size, depending on the system's needs. For example, for a system with 8GB of RAM, a swap partition of 8GB to 16GB is common.**

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The maximum file size on ext4 is 16TiB (terabytes), with a filesystem size limit of 1EiB (exabyte).**

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The maximum file size on XFS is 8 exabytes (8EB), which is far beyond typical usage in today's systems.**

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Module: 4- Linux server - Manage user and

**32. Manage users and groups with commands like useradd, userdel, groupadd, and passwd**

* **useradd**: Adds a new user. Example: useradd username.
* **userdel**: Deletes an existing user. Example: userdel username.
* **groupadd**: Adds a new group. Example: groupadd groupname.
* **passwd**: Sets or changes a user's password. Example: passwd username.

**33. Explain different file system types in Linux?**

* **Ext4**: Commonly used for Linux systems; supports journaling and large files.
* **XFS**: High-performance journaling file system, ideal for large files and high-speed environments.
* **Btrfs**: Modern file system with advanced features like snapshots and pooling.
* **FAT32/NTFS**: Used for compatibility with Windows systems.
* **Swap**: Used for virtual memory.
* **ISO9660**: Used for CDs/DVDs.

**34. Explain File Permission groups in Linux?**

1. **Owner**: The user who owns the file.
2. **Group**: A group of users who share access to the file.
3. **Others**: All other users on the system.

**35. How do you switch from one desktop environment to another, such as switching from KDE to GNOME?**

* **During Login**: Select the desktop environment from the session menu in the login screen
* **Using Terminal**:
  1. Install the new desktop environment (e.g., sudo apt install gnome-session).
  2. Log out and choose the new environment from the login screen.

**36. What are the kinds of permissions under Linux?**

1. **Read (r)**: Permission to view the file or list the directory contents.
2. **Write (w)**: Permission to modify the file or directory contents.
3. **Execute (x)**: Permission to execute the file or traverse the directory.

**37. What are the different modes when using the vi editor?**

1. **Command Mode**: Default mode; used for navigation and editing commands.
2. **Insert Mode**: Used to insert or modify text (i to enter this mode).
3. **Visual Mode**: Used for selecting text (v for character, V for line selection).
4. **Ex Mode**: Used for advanced commands (: to enter this mode)

Cloud Computing - Virtualization And Storage Management

**1. What is virtualization and its types?**

* **Virtualization**: A technology that creates virtual instances of physical hardware, such as servers, networks, or storage.
* **Types of Virtualization**:
  + **Hardware Virtualization**: Abstracts hardware resources.
  + **Server Virtualization**: Multiple virtual servers on one physical server.
  + **Storage Virtualization**: Combines multiple storage resources into one.
  + **Network Virtualization**: Creates virtual networks on shared physical infrastructure.

**2. Types of hypervisors and how to manage them?**

* **Type 1 (Bare-Metal)**: Runs directly on the physical hardware (e.g., VMware ESXi, Microsoft Hyper-V).
* **Type 2 (Hosted)**: Runs on top of an operating system (e.g., VirtualBox, VMware Workstation).
* **Management**:
  + Type 1: Managed using tools like VMware vSphere, or Microsoft SCVMM.
  + Type 2: Managed via the host OS GUI or CLI.

**3. Roles of virtualization in cloud computing**

* **Resource Optimization**: Efficient use of hardware resources.
* **Scalability**: Easily scale resources up or down.
* **Isolation**: Secure and independent environments for multiple users.
* **Disaster Recovery**: Simplified replication and recovery processes.

**4. What is a container?**

A lightweight, portable environment that bundles an application and its dependencies, running in isolated user spaces on a shared OS (e.g., Docker, Kubernetes).

**5. What is high availability and live migration in virtualization?**

* **High Availability (HA)**: Ensures services are available without interruption, even if a hardware failure occurs.
* **Live Migration**: Moving a running virtual machine from one host to another without downtime.

**6. Storage Configuration – Block, File, and Object Storage**

* **Block Storage**: Stores data in fixed-size blocks. Ideal for databases (e.g., SAN).
* **File Storage**: Data is stored as files in a directory structure. Ideal for shared file systems (e.g., NAS).
* **Object Storage**: Stores data as objects with metadata and unique identifiers. Ideal for unstructured data (e.g., AWS S3).

**7. DAS, NAS, and SAN**

* **DAS (Direct Attached Storage)**: Storage directly attached to a server. Low cost, limited scalability.
* **NAS (Network Attached Storage)**: Dedicated file storage accessible over a network. Easy to manage, good for shared access.
* **SAN (Storage Area Network)**: High-speed network providing access to block-level storage. Best for enterprise needs.

**8. Storage Allocation and Provisioning**

* **Storage Allocation**: Allocating physical or virtual storage to users or applications.
* **Provisioning**:
  + **Thick Provisioning**: Reserves full capacity upfront.
  + **Thin Provisioning**: Allocates storage as needed, optimizing usage.

Module:7- Linux server -deployment of network services

**57. What is the Difference between LILO and GRUB?**

* **LILO (Linux Loader)**:
  + Older bootloader.
  + Cannot modify boot entries without reinstalling.
  + Limited filesystem support.
* **GRUB (Grand Unified Bootloader)**:
  + Modern bootloader.
  + Dynamic configuration via a menu.
  + Supports multiple OSes and advanced features like splash screens.

**58. How to Recover Linux Password?**

1. Reboot the system and access the **GRUB menu**.
2. Edit the boot entry by pressing e and add init=/bin/bash at the end of the kernel line.
3. Boot into single-user mode.
4. Use passwd username to reset the password.
5. Reboot the system.

**59. Which command is used to format a partition in Linux OS?**

* **Command**: mkfs
  + Example: mkfs.ext4 /dev/sda1

**60. How to enable “quota” in Linux?**

1. Install quota tools: sudo apt install quota.
2. Enable quotas on a filesystem in /etc/fstab.
3. Remount the partition: mount -o remount /dev/sdX.
4. Initialize quotas: quotacheck -cum /.
5. Set quotas: edquota username.

**61. How to Mount a Partition in Linux?**

1. Create a mount point: mkdir /mnt/mydrive.
2. Mount the partition: mount /dev/sdX /mnt/mydrive.
3. For permanent mounting, add it to /etc/fstab.

**62. What is the use of the mdadm Command?**

* **mdadm**: Manages and monitors RAID devices.
  + Example: Create RAID 1:

bash

Copy code

mdadm --create /dev/md0 --level=1 --raid-devices=2 /dev/sda /dev/sdb

**63. How to Configure a Secure Apache Web Server in Linux?**

1. Install Apache: sudo apt install apache2.
2. Enable HTTPS: Install SSL certificate (sudo certbot --apache).
3. Modify configuration: Secure headers in /etc/apache2/apache2.conf.
4. Restart Apache: sudo systemctl restart apache2.

**64. How to Run Windows Software on Linux Operating System?**

* Use **Wine** or **Proton** to run Windows applications.
  + Example: sudo apt install wine
  + Run a .exe file: wine setup.exe

**65. What is the Difference Between Windows and Linux?**

* **Windows**: Closed source, user-friendly GUI, paid licensing.
* **Linux**: Open source, highly customizable, free.

**66. What is the Advantage of Open Source?**

* Cost-effective, customizable, secure, encourages innovation, and has strong community support.

**67. Install and Configure Web Servers like Apache**

1. Install Apache: sudo apt install apache2.
2. Start Apache: sudo systemctl start apache2.
3. Configure settings in /etc/apache2/apache2.conf.

**68. Host a Simple Website and Configure Virtual Hosts**

1. Create a virtual host file: /etc/apache2/sites-available/example.com.conf.
2. Add configurations:

bash

Copy code

<VirtualHost \*:80>

DocumentRoot /var/www/example.com

ServerName example.com

</VirtualHost>

1. Enable it: sudo a2ensite example.com.
2. Restart Apache: sudo systemctl restart apache2.

**69. Install and Manage Databases like MySQL/MariaDB**

1. Install MySQL: sudo apt install mysql-server.
2. Start MySQL: sudo systemctl start mysql.
3. Secure installation: sudo mysql\_secure\_installation.
4. Create a database:

sql

Copy code

CREATE DATABASE mydb;

CREATE USER 'myuser'@'localhost' IDENTIFIED BY 'password';

GRANT ALL PRIVILEGES ON mydb.\* TO 'myuser'@'localhost';

Cloud Computing - System Management And Public Cloud

**1. How to configure, develop, and maintain Security and Privacy in cloud?**

* **Configuration**:
  + Use **identity and access management (IAM)** policies to restrict access.
  + Enable encryption for data at rest (e.g., AWS KMS) and in transit (TLS/SSL).
  + Use firewalls and network security groups.
* **Development**:
  + Build secure applications with secure coding practices.
  + Regularly update and patch systems.
* **Maintenance**:
  + Monitor with tools like AWS CloudTrail or Azure Security Center.
  + Conduct regular audits and compliance checks.

**2. What is Portability in cloud?**

* **Portability**: The ability to move applications, workloads, or data between different cloud providers or environments with minimal effort. It reduces vendor lock-in.

**3. What is Reliability and High Availability in cloud?**

* **Reliability**: Ensures that cloud services operate without interruptions. Achieved through fault-tolerant systems and backups.
* **High Availability (HA)**: Ensures minimal downtime by using techniques like load balancing, failover clusters, and multi-region deployments.

**4. Describe Mobility in Cloud Computing**

* **Mobility in Cloud Computing**:
  + Enables users to access applications and data from any device with internet connectivity.
  + Improves flexibility for remote work and collaboration.

**5. Describe AWS, Azure, and Google Cloud Platforms**

* **AWS (Amazon Web Services)**: Offers compute, storage, and databases with a wide range of global services.
* **Azure**: Microsoft's cloud platform focusing on hybrid and enterprise solutions.
* **Google Cloud Platform (GCP)**: Known for its machine learning and data analytics services.

**6. Accessing AWS, Azure, and Google Cloud Platforms (Example: AWS)**

1. Go to the AWS Management Console
2. Log in with your credentials.
3. Navigate to services like EC2, S3, etc.

**7. Create Compute, Network, and Storage on AWS, Azure, and GCP (Example: AWS)**

* **Compute**: Launch an EC2 instance.
  + Navigate to EC2 → "Launch Instance".
* **Network**: Configure a VPC.
  + Go to VPC → "Create VPC".
* **Storage**: Set up an S3 bucket.
  + Go to S3 → "Create Bucket".

**8. Compare Cloud Pricing of Resources and Services on All Platforms**

* **AWS**: Pay-as-you-go model; offers cost calculators and free tier options.
* **Azure**: Competitive pricing; discounts for reserved instances and hybrid use.
* **GCP**: Sustained use discounts and transparent billing.

For example:

* **Compute (VM)**:
  + AWS EC2: Starts at ~$0.01/hour.
  + Azure VMs: Starts at ~$0.013/hour.
  + GCP VMs: Starts at ~$0.01/hour.
* **Storage (50GB)**:
  + AWS S3: ~$0.023/GB/month.
  + Azure Blob: ~$0.0184/GB/month.
  + GCP Storage: ~$0.02/GB/month.

Prices depend on configurations and regions. Always use the provider’s pricing calculator for accurate comparisons.