### ****1. What is Proxmox VE, and how does it work?****

**Answer:**  
Proxmox Virtual Environment (Proxmox VE) is an open-source **server virtualization platform** that integrates **KVM-based virtual machines (VMs)** and **LXC containers**. It provides **a web-based management interface**, clustering, backup, and enterprise-grade features for virtualization.

### ****2. What are the key features of Proxmox VE?****

**Answer:**

* **KVM & LXC support** – Full virtualization and lightweight containers.
* **Web-based GUI** – Manage everything via a web interface.
* **Clustering & High Availability (HA)** – Cluster multiple Proxmox nodes.
* **Backup & Restore** – Proxmox Backup Server integration.
* **Storage flexibility** – Supports local, NFS, Ceph, iSCSI, and ZFS.

### ****3. What are the differences between KVM and LXC in Proxmox?****

**Answer:**

| Feature | KVM (Kernel-based Virtual Machine) | LXC (Linux Containers) |
| --- | --- | --- |
| Virtualization Type | Full Virtualization | OS-Level Virtualization |
| Performance | Lower due to full emulation | Higher (shares kernel) |
| Isolation | Strong (dedicated resources) | Weaker (shares host kernel) |
| Use Case | Running different OS (Windows, Linux) | Running Linux-based apps/services |

### ****4. How do you install Proxmox VE?****

**Answer:**

1. Download the **Proxmox VE ISO** from the official website.
2. Create a **bootable USB** using Rufus or dd command.
3. Boot the server from USB and follow the installation steps.
4. Configure networking and **login via the web interface** (default: https://<IP>:8006).

### ****5. What are the supported storage types in Proxmox VE?****

**Answer:**

* **Local Storage** – Ext4, XFS, ZFS
* **Network Storage** – NFS, iSCSI, CephFS
* **Object Storage** – Ceph RBD
* **Backup Storage** – Proxmox Backup Server

### ****6. How do you create and manage a VM in Proxmox?****

**Answer:**

1. Go to **Datacenter → Node → Virtual Machines → Create VM**.
2. Choose an **OS image (ISO)** and configure CPU, RAM, and storage.
3. Set up **networking** (bridged or NAT).
4. Start the VM and install the OS.

### ****7. What is High Availability (HA) in Proxmox?****

**Answer:**  
HA ensures that VMs automatically **failover** to another node in a **Proxmox cluster** if a node goes down. It requires:

* **A minimum of 3 nodes** in a cluster
* **Shared storage (Ceph, NFS, or iSCSI)**
* **Corosync and HA Manager** for node coordination

### ****9. How do you back up and restore a VM in Proxmox?****

**Answer:**

* **Backup:**
  1. Go to **Datacenter → Storage → Backup**.
  2. Choose the **VM, backup storage, and schedule**.
  3. Click **Start** to create a backup.
* **Restore:**
  1. Go to **Backup Storage** and select the backup file.
  2. Click **Restore** and choose a target node.

### ****11. How do you configure networking in Proxmox?****

**Answer:**  
Proxmox uses **Linux bridges** for networking. You can configure:

* **Bridged Networking** – Assigns VMs an IP from the LAN.
* **NAT Networking** – Uses Proxmox as a gateway for VMs.
* **VLANs** – Segregates traffic using VLAN IDs.

### ****13. How do you monitor Proxmox performance?****

**Answer:**

* **Web UI:** Shows CPU, RAM, and disk usage.
* **CLI tools:**

top, htop, iostat, vmstat, pvestatd

* **Zabbix/Prometheus:** Can be integrated for advanced monitoring.

### ****14. How do you update Proxmox safely?****

**Answer:**

1. **Backup all VMs** before updating.
2. Update repositories:

apt update && apt upgrade -y

1. Reboot the server if required.

### ****15. How do you troubleshoot a failed VM in Proxmox?****

**Answer:**

* **Check VM logs:**

journalctl -xe

qm status <VMID>

* **Verify storage availability:**

df -h

* **Check network settings** if VM isn’t reachable.