# Kali Linux, Ubuntu, Red Hat (RHEL), CentOS, and Windows

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**1. Warewulf Technology**

Warewulf is a **high-performance cluster provisioning** and management tool. It is primarily used in **HPC (High-Performance Computing) environments**.

**Installation & Usage**

**On Ubuntu / Debian / Kali Linux**

bash

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sudo apt update

sudo apt install warewulf

**On RHEL / CentOS**

bash

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sudo yum install epel-release

sudo yum install warewulf

**Basic Commands**

- **Initialize Warewulf Database**

bash

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wwinit

- **Check the status of the Warewulf services**

bash

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systemctl status warewulfd

- **List all available compute nodes**

bash

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wwsh node list

**Example Usage**

Provisioning a compute node:

bash

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wwsh node new node01 --netdev eth0 --hwaddr 00:1A:4B:16:01:55 --ipaddr 192.168.1.100

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**2. xCAT (Extreme Cloud Administration Toolkit)**

xCAT is an **open-source cluster management** and provisioning tool for large-scale clusters.

**Installation & Usage**

**On Ubuntu / Debian**

bash

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sudo apt install xcat

**On RHEL / CentOS**

bash

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sudo yum install xCAT

**Basic Commands**

- **List available nodes**

bash

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lsdef -t node

- **Add a new compute node**

bash

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mkdef -t node node01 groups=compute

- **Power on a node**

bash

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rpower node01 on

**Example Usage**

Deploy an OS to a node:

bash

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nodeset node01 osimage=centos8

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**3. RAID (Redundant Array of Independent Disks)**

RAID is a **data storage virtualization technology** that combines multiple disk drives into a single unit for redundancy and performance improvement.

**Installation & Usage**

**On Linux (Ubuntu / Kali / RHEL / CentOS)**

Install the RAID utility:

bash

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sudo apt install mdadm   # Debian-based

sudo yum install mdadm   # RHEL-based

**Basic Commands**

- **Create a RAID 1 (Mirroring) array**

bash

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sudo mdadm --create --verbose /dev/md0 --level=1 --raid-devices=2 /dev/sdb /dev/sdc

- **Check RAID status**

bash

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cat /proc/mdstat

- **Stop RAID array**

bash

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sudo mdadm --stop /dev/md0

**Example Usage**

Create a RAID 5 array with 3 disks:

bash

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sudo mdadm --create --verbose /dev/md0 --level=5 --raid-devices=3 /dev/sdb /dev/sdc /dev/sdd

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**4. Samba**

Samba is used to **share files and printers** between Linux and Windows systems using the SMB/CIFS protocol.

**Installation & Configuration**

**On Ubuntu / Debian / Kali Linux**

bash

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sudo apt install samba -y

**On RHEL / CentOS**

bash

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sudo yum install samba -y

**On Windows**

Enable SMB file sharing via:

nginx

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Control Panel > Programs > Turn Windows features on or off > SMB 1.0

**Basic Commands**

- **Start Samba service**

bash

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sudo systemctl start smbd

- **Enable Samba on boot**

bash

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sudo systemctl enable smbd

- **Check Samba status**

bash

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sudo systemctl status smbd

**Example Usage**

Create a shared directory:

bash

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sudo mkdir -p /srv/samba/shared

sudo chmod 777 /srv/samba/shared

sudo nano /etc/samba/smb.conf

Add the following:

bash

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[Shared]

  path = /srv/samba/shared

  read only = no

  browsable = yes

  guest ok = yes

Restart Samba:

bash

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sudo systemctl restart smbd

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**5. Docker**

Docker is a **containerization platform** used to deploy applications in isolated environments.

**Installation & Usage**

**On Ubuntu / Debian / Kali Linux**

bash

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sudo apt update

sudo apt install docker.io -y

**On RHEL / CentOS**

bash

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sudo yum install -y docker

**On Windows**

Download and install from: Docker Official Site

**Basic Commands**

- **Check Docker version**

bash

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docker --version

- **Start Docker service**

bash

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sudo systemctl start docker

- **Run a container**

bash

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docker run -d -p 80:80 nginx

- **List running containers**

bash

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docker ps

**Example Usage**

Run an Ubuntu container:

bash

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docker run -it ubuntu bash

This starts an interactive shell inside an Ubuntu container.

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**Conclusion**

| Technology | Purpose | Example Command |
|---|---|---|
| **Warewulf** | Cluster provisioning | wwsh node new node01 |
| **xCAT** | Cluster management | mkdef -t node node01 groups=compute |
| **RAID** | Disk redundancy | mdadm --create --level=1 --raid-devices=2 /dev/sdb /dev/sdc |
| **Samba** | File sharing | sudo systemctl start smbd |
| **Docker** | Containerization | docker run -d -p 80:80 nginx |

Would you like additional details on any of these topics? 🚀

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