````````````````````````````````````````RAID 0````````````````````````````````````````````

Here’s a detailed guide to setting up **RAID 0 (Striping)** on a Linux system. RAID 0 combines multiple disks to form a single, faster storage unit. This guide also includes verification steps for each stage of the process.

### **Creating a RAID 0 Setup on Linux**

RAID 0 provides increased speed by splitting data into smaller parts and writing them to multiple drives simultaneously. However, it does **not** offer redundancy, so if one disk fails, all data will be lost. Below are the steps to create a RAID 0 array on Linux.

### **Pre-requisites:**

* A Linux system (Ubuntu, CentOS, etc.)
* At least two unformatted disks (e.g., /dev/sdb, /dev/sdc).
* A root or sudo user to execute commands.

### **Steps to Create a RAID 0 Array:**

#### **1. Install mdadm (RAID Management Tool):**

mdadm is the utility used to manage RAID arrays on Linux. Install it using the following commands:

**On Ubuntu/Debian:**

sudo apt update

sudo apt install mdadm

**On CentOS/RHEL:**

sudo yum install mdadm

#### **2. Prepare the Disks:**

Make sure the disks are unformatted. You can list available disks with:

sudo lsblk

Identify the disks you want to use for the RAID array (e.g., /dev/sdb and /dev/sdc).

#### **3. Create the RAID 0 Array:**

You can now create the RAID 0 array using mdadm. For example, to create a RAID 0 array named my\_raid0 with two disks /dev/sdb and /dev/sdc, use the following command:

sudo mdadm --create /dev/md0 --level=0 --raid-devices=2 /dev/sdb /dev/sdc

* --create /dev/md0: Creates the RAID array and names it /dev/md0.
* --level=0: Specifies RAID 0.
* --raid-devices=2: Defines the number of devices (disks) in the RAID array.

**Verify RAID Array Creation:**

sudo mdadm --detail /dev/md0

This command provides details about the RAID array, including its status, number of disks, and size.

#### **4. Check RAID Array Status:**

You can also monitor the status of the RAID array creation by checking /proc/mdstat:

cat /proc/mdstat

This shows the current status of all RAID arrays and whether they are synchronizing.

#### **5. Create a Filesystem on the RAID Array:**

After creating the RAID array, you need to format it with a filesystem. For example, to create an ext4 filesystem on the RAID array /dev/md0, run:

sudo mkfs.ext4 /dev/md0

**Verify Filesystem Creation:**

sudo blkid /dev/md0

This command shows the filesystem type of the RAID array (e.g., ext4).

#### **6. Mount the RAID Array:**

To use the RAID array, you need to mount it. First, create a mount point:

sudo mkdir /mnt/my\_raid0

Now, mount the RAID array:

sudo mount /dev/md0 /mnt/my\_raid0

**Verify Mount:**

df -h

This will display disk usage for mounted filesystems, confirming that the RAID 0 array is successfully mounted.

Alternatively, use:

mount | grep /mnt/my\_raid0

This checks if the RAID array is mounted at the desired mount point.

#### **7. Make the Mount Persistent:**

To automatically mount the RAID array after a reboot, add an entry to the /etc/fstab file:

sudo nano /etc/fstab

Add the following line:

/dev/md0 /mnt/my\_raid0 ext4 defaults 0 0

**Verify fstab Entry:**

cat /etc/fstab

Ensure the RAID array is listed in /etc/fstab for automatic mounting.

#### **8. (Optional) Monitor the RAID Array:**

You can check the health and status of your RAID array periodically with:

sudo mdadm --detail /dev/md0

This will provide detailed information about the RAID array, such as its current status, devices, and RAID level.

### **Summary of Commands:**

**Install mdadm:** sudo apt install mdadm # On Ubuntu/Debian

sudo yum install mdadm # On CentOS/RHEL

**Create RAID 0 Array:** sudo mdadm --create /dev/md0 --level=0 --raid-devices=2 /dev/sdb /dev/sdc

**Verify RAID Array:** sudo mdadm --detail /dev/md0

**Create Filesystem on RAID Array:** sudo mkfs.ext4 /dev/md0

**Mount RAID Array:** sudo mount /dev/md0 /mnt/my\_raid0

**Make Mount Persistent:** sudo nano /etc/fstab # Add /dev/md0 /mnt/my\_raid0 ext4 defaults 0 0

### **Example Workflow with Verification:**

**Create RAID 0 Array:** sudo mdadm --create /dev/md0 --level=0 --raid-devices=2 /dev/sdb /dev/sdc

sudo mdadm --detail /dev/md0 # Verify RAID creation

**Create Filesystem:** sudo mkfs.ext4 /dev/md0

sudo blkid /dev/md0 # Verify filesystem type

**Mount RAID Array:** sudo mount /dev/md0 /mnt/my\_raid0

sudo df -h # Verify mount

**Make Mount Persistent (Verify fstab):** sudo nano /etc/fstab # Verify fstab entry for persistent mount

**Monitor RAID Array Health (Optional):** sudo mdadm --detail /dev/md0 # Check RAID array health

### **Additional Notes:**

* **RAID 0 does not offer redundancy**—if one drive fails, all data will be lost. It's suitable for performance, but not recommended for critical data without backup.
* You can extend the RAID array by adding more disks, but this can be a complex process and may require reconfiguration of the array.
* Always monitor the health of RAID arrays to avoid unexpected failures.