

Dell - Hard Drive Capacity Difference Between Drives

The capacity difference between the two drives is caused by **differing logical block/sector formatting** or **OEM vendor provisioning (HPA / Max LBA limits)**.

Even within the same Western Digital / Ultrastar DC HC520 12TB family, SAS drives are deployed with different low-level format structures:

1. Different Sector Formats (512e vs. 4Kn vs. Enterprise 520/528 Bytes)

- **Standard 12TB:** Typically reports around **11,175.5 GB** (\$11.17\text{ TiB}\$) when formatted with standard 512-byte emulation (**512e**) or 4096-byte native (**4Kn**) sectors.
- **Enterprise SAN/EMC Formats:** Drives pulled from proprietary SAN enclosures (EMC, NetApp, Huawei) often use **520-byte or 528-byte sectors** (or Type 1/2 Data Integrity Field protection). When translated or truncated by a Dell PERC/HBA, the usable LBA count drops, showing up around **10,948.5 GB**.

2. OEM Firmware & Provisioning (HPA / Max LBA)

If one drive came from an OEM vendor (e.g., NetApp, EMC, Cisco, HPE) and the other is a generic Dell/retail drive, the OEM firmware may restrict the drive's total accessible Logical Block Addressing (LBA) count via Host Protected Area (HPA) or factory provisioning.

How to Fix / Match Them

To get disk **0:1:3** to match **0:1:4** at full capacity:

1. Check the Sector Size:

Boot into a Linux live environment (or pass the drive through via HBA/IT-mode) and run:

```
Bash  
■■
```

```
smartctl -i /dev/sdX  
# or  
sg_scan -i
```

Check the `Logical block size` and `Formatted with type 1/2/3 protection` values.

2. **Low-Level Format to Standard 512e / 4Kn:**

Using the `sg3_utils` package in Linux, reformat the drive to standard 512-byte or 4096-byte sectors:

Bash
■ ■

```
# Reformat to standard 512-byte sectors:  
sg_format --format --size=512 /dev/sdX
```

(Note: This is a low-level format that will erase all data on that specific disk and takes several hours for a 12TB drive.)

3. **Reset Max LBA (if sector size is already 512):**

If the drive was already 512 bytes, reset any HPA/LBA clamp:

Bash
■ ■

```
hdparm -N /dev/sdX  
# To restore full native capacity:  
hdparm -N p[max_lba_value] /dev/sdX
```

Once reformatted, the Dell PERC controller will detect `0:1:3` at the full **11175.5 GB** size.

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