hdparm ATA drive tuning

CONCEPTS

hdparm talks ATA to SATA and IDE drives and needs root. Always name the whole device (/dev/sdX), not a partition.

Visible disk what the OS sees
- **HPA** -N hides the tail
  - **DCO** vendor-level limits
    - **Native drive** true capacity

Settings such as -B, -S and -W are lost at power-off. Re-apply them at boot via udev or a service.

Options marked dangerous in the man page can destroy data or the drive. Back up, and double-check the device name.

IDENTIFY AND INFO

hdparm -I *<dev>*
Query drive for full identify data

hdparm -i *<dev>*
Show identify data cached at boot

hdparm *<dev>*
Show basic settings (same as -v)

hdparm -g *<dev>*
Show geometry and start offset

hdparm -V
Print hdparm version

hdparm -I *<dev>* **| grep -i model**
Pick out model, serial, firmware

hdparm -z *<dev>*
Re-read partition table

hdparm --fibmap *<file>*
Print physical extents of a file

BENCHMARKS

hdparm -t *<dev>*
Time buffered disk reads

hdparm -T *<dev>*
Time cache reads (CPU and RAM)

hdparm -tT *<dev>*
Run both timings

hdparm -t --direct *<dev>*
Read test bypassing page cache

BENCHMARKS (cont.)

hdparm -t --offset *<GiB>* *<dev>*
Read test at an offset into the disk

hdparm -f *<dev>*
Flush device buffer cache on exit

POWER MANAGEMENT

hdparm -C *<dev>*
Show power mode (active, standby, sleeping)

hdparm -B *<n>* *<dev>*
Set APM level (1-254)

hdparm -B *<dev>*
Show current APM level

hdparm -S *<n>* *<dev>*
Set standby (spin-down) timeout

hdparm -S 0 *<dev>*
Disable the spin-down timer

hdparm -y *<dev>*
Put drive into standby now

hdparm -Y *<dev>*
Put drive to sleep now

hdparm --idle-immediate *<dev>*
Enter a lower power idle state

hdparm -M *<n>* *<dev>*
Set acoustic level (128 quiet, 254 fast)

hdparm -J *<n>* *<dev>*
Set WD idle3 park timer

CACHING AND TUNING

hdparm -W *<dev>*
Show write-cache setting

hdparm -W 0 *<dev>*
Disable write cache

hdparm -W 1 *<dev>*
Enable write cache

hdparm -A 1 *<dev>*
Enable drive read-lookahead

hdparm -a *<n>* *<dev>*
Set filesystem read-ahead (sectors)

hdparm -r 1 *<dev>*
Mark device read-only

hdparm -r 0 *<dev>*
Mark device read-write

HPA AND DCO

hdparm -N *<dev>*
Show current and native max sectors

hdparm -N *<n>* *<dev>*
Set visible sector count

hdparm -N p*<n>* *<dev>*
Set the limit permanently

hdparm --dco-identify *<dev>*
Show DCO-hidden features

SECURITY ERASE

hdparm -I *<dev>* **| grep -A8 Security**
Check lock and erase support

hdparm --security-set-pass *<pwd>* *<dev>*
Set a user password on the drive

hdparm --security-erase *<pwd>* *<dev>*
Erase the whole drive

hdparm --security-erase-enhanced *<pwd>* *<dev>*
Enhanced erase of the drive

hdparm --security-unlock *<pwd>* *<dev>*
Unlock a locked drive

hdparm --security-disable *<pwd>* *<dev>*
Remove the drive password

SECTORS AND SSDS

hdparm --read-sector *<lba>* *<dev>*
Dump one sector in hex

RECIPES

Spin down idle disks after 20 minutes

```
sudo hdparm -B 127 /dev/sdX
sudo hdparm -S 240 /dev/sdX
sudo hdparm -C /dev/sdX
```

Compare disks

```
sudo hdparm -tT /dev/sda
sudo hdparm -t --direct /dev/sda
# repeat 2-3 times, idle system
```

Secure erase a SATA drive

```
sudo hdparm -I /dev/sdX | grep -A8 Security
# must say: not frozen
sudo hdparm --user-master u --security-set-pass p /dev/sdX
sudo hdparm --user-master u --security-erase p /dev/sdX
```