RAID Levels Explained on One Page

RAID 0 · RAID 1 · RAID 5 · RAID 6 · RAID 10 — Drives, Capacity, Redundancy, Use Case

RAID 0
Striping

Min drives	2
Usable	N × size
Fault tol.	0 drives
Read	Fast
Write	Fast

NO REDUNDANCY

Use case
Temp scratch space, video editing cache. Never for primary storage.

RAID 1
Mirroring

Min drives	2
Usable	1 × size
Fault tol.	1 drive
Read	Fast
Write	Moderate

50% OVERHEAD

Use case
2-bay NAS, critical data mirror. Simple and resilient.

RAID 5
Striping + Parity

Min drives	3
Usable	(N−1) × size
Fault tol.	1 drive
Read	Fast
Write	Moderate

HIGH REBUILD RISK

Use case
4-bay home NAS. Good capacity. Vulnerable during rebuild.

RAID 6
Double Parity

Min drives	4
Usable	(N−2) × size
Fault tol.	2 drives
Read	Fast
Write	Moderate

REBUILD SAFE

Use case
Business data, large drives. Survives 2nd failure during rebuild.

RAID 10
Mirror + Stripe

Min drives	4
Usable	N/2 × size
Fault tol.	1/mirror pair
Read	Fastest
Write	Fast

FAST REBUILD

Use case
Performance + redundancy. Databases, high IOPS. 50% overhead cost.

SHR — SYNOLOGY HYBRID RAID

SHR ≈ RAID 5 with mixed drive support. With identical drives, SHR and RAID 5 produce the same usable capacity. With mixed sizes, SHR creates tiers — more usable space than standard RAID 5 with mixed drives. **SHR-2 ≈ RAID 6.** Synology-only.

UNRAID — DIFFERENT MODEL

UnRAID is **not standard RAID**. One or two parity drives protect all data drives. Data drives can be different sizes. Rebuild time = parity drive size (not data drive count). Slower random I/O than traditional RAID — optimised for media streaming.

KEY RULES — ALL RAID TYPES

RAID is not a backup — it protects uptime, not data
CMR drives only — SMR drives fail during RAID rebuild
Capacity ≠ labelled TB — binary overhead = ~6–7% less
Rebuild = risk window — any 2nd failure = total loss (RAID 5)
Larger drives = longer rebuild = wider risk window

CALCULATE YOUR EXACT USABLE CAPACITY

Accounts for binary conversion, NAS system overhead, filesystem metadata, snapshot reserves, and recommended headroom.

needtoknowit.com.au/tools/raid-calculator/

RAID Calculator

MORE FREE NAS PLANNING TOOLS
needtoknowit.com.au/tools — RAID Calculator · RAID Rebuild Estimator · Drive Failure Risk
NAS Sizing Wizard · Power Calculator · Backup Calculator

Need to Know IT
Independent Australian storage guidance
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