

Which of the following are true about RAID levels 1, 3, 4, 5, and 6?

1. RAID systems rely on redundancy to achieve high availability.

This is true for all of the above RAID levels. RAID 1 is clearly the most redundant, as it is essentially a duplicate system; however, RAID levels 3, 4, 5, and 6 also rely on storing enough redundant information so that data is not lost in the event of a disk failure. High uptime and minimal loss of data corresponds to high availability.

2. RAID 1 (mirroring) has the highest check disk overhead.

This is true, as RAID 1 involves having a duplicate of each disk. Thus, if there are four data disks, there are four redundant check disks. The other RAID levels listed only use a single redundant parity disk (levels 3, 4, and 5) or two redundant disks (level 6).

3. For small write, RAID 3 (bit-interleaved parity) has the worst throughput.

This is true, because for RAID 3 all I/O requests require access to all disks in the protection group. Thus, only a single read or write can occur at any given time. RAID 4 improves upon this by utilizing block-interleaved parity and requiring just two disk reads and two disk writes on just two disks. This allows simultaneous I/O function for small accesses. RAID 5 further improves this by fixing the parity-write bottleneck. For RAID 6, the small-write shortcut highlighted in the text for RAID 4 is still applicable. Thus, RAID 3 has the worst throughput for small write function.

4. For large writes, RAID 3, 4, and 5 have the same throughput.

This is false, because for RAID 3 and 4 which have a dedicated parity disk, the writing to the parity disk serves as a bottleneck. In RAID 5, the parity is split between each disk. This allows better write performance. Thus, the throughput is not the same.