

ADVANCED RECONSTRUCTION

Advanced Reconstruction is intended to provide a stable system performance even if a few drives are going slow. Technology is applied for reading operations only and is especially effective for sequential workloads.



IMPLEMENTATION AREA

The common rule for all RAIDs is that total array performance is defined by the performance of the slowest drive. In other words, one slow drive can eliminate all achievements of well-performance disks.

The drives get slower due to long operation life, difference in specifications and connectivity issues. Therefore, the presence of such drives in the array creates a natural limit for its total performance.

Advanced Reconstruction is also an effective tool against long-tail latency, which comes as a cumulative effect from full-stripe read operations.

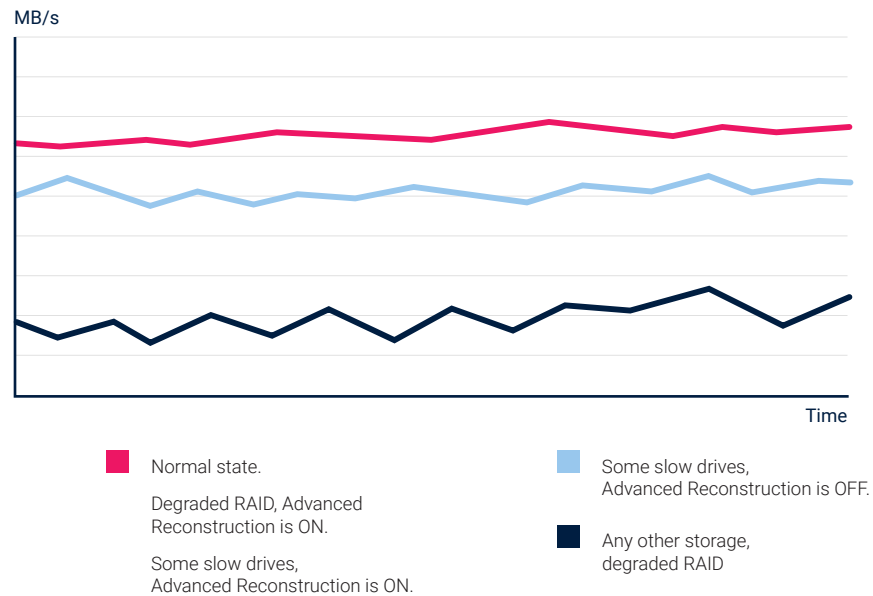


HOW IT WORKS

When Advanced Reconstruction is on, the system monitors the performance of each disk in the array and compares it to the performance of other disks in the same array. Thus the system detects 1, 2 or 3 slowest disks for RAID 5, RAID 6, RAID 7.3 respectively. To keep array performance stable, the system excludes slow disks from reading operations for 5 seconds and calculates the data from the checksums. When the system detects the same disk several times like slow it marks it as "Slow drive" and excludes it from reading operations on the permanent manner.

To heal long-tail latency Advanced Reconstruction skips data blocks when irregular latency occurs during full-stripe reading even from well-operating disks.

Guaranteed array performance even with slow disks and in degraded mode.



Skipped data recovers from RAID checksums. Due to the proprietary RAID engine, checksum calculations takes less time than common read operations from an average physical drive. Therefore, total array performance stays high and stable.



FEATURES

Advanced Reconstruction allows excluding slowest drives from reading operations to keep stable performance of the array.

Technology has the following features in RAIDIX 4.X:

- Disk performance detection and appropriate user notification.
- Guaranteed array performance even with slow disks and in degraded mode.
- Works in the background without system interruption.