

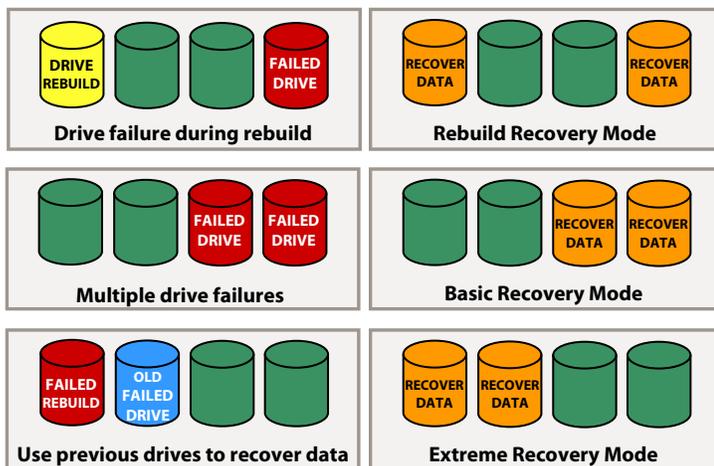
DriveAssure™ Technology

ATTO

ATTO RAID Products help Recover Data from Failed Drives

Your drive has failed, now what?

The capacities available in disk drives are constantly on the rise, with greater capacity comes greater risk of a second or even third drive failure during a RAID Group rebuild. If this is the case most RAID products will fail the RAID Group and mark it offline making your data inaccessible. There are companies that can help you to recover data if this happens to you, but what if your RAID product had this recovery capability built in?



RAID Group Failure States

Blocks on the left are conditions where RAID Groups fail - On the right DriveAssure Data Recovery Mode attempts to allow access to data

Is it really a drive failure?

There are several failure scenarios which are relatively simple for a user to fix, if they have the know-how. In the event that a RAID Group is offline there are three methods that should be tried before any attempt at data recovery:

- 1) Power cycle the drives and the drive chassis
- 2) Check all connectors and reseat cabling
- 3) Verify that the host application and operating system are not causing an issue, reboot your system and attempt to access data

There are other methods to determine if a drive has actually failed, all should be explored before using any data recovery program.

Why does a RAID Group go offline?

- 1) When other drives fails while performing a drive rebuild
- 2) Several drive failures on a parity protected RAID Group
- 3) A media error on a RAID 0 Group, RAID 0 is striping only and offers no parity or redundancy protection
- 4) A cabling or internal connection issue could cause multiple drives to fail forcing a RAID Group offline
- 5) If a user replaces the wrong drive in the event of a drive failure. (Note: using the Identify Drive feature before removing a failed drive will eliminate this common RAID Group failure case)

DriveAssure can recover data

If all attempts at getting a RAID Group back online have failed, ATTO has a solution. The DriveAssure technology suite built into each ATTO FastStream™ and ExpressSAS RAID adapter product features a multifaceted Data Recovery Mode which allows access to data in offline RAID Groups. There are several methods to access your data so you can copy it to a new RAID Group or continue working with it the case of a soft drive failure:

- 1) **Rebuild Recovery Mode** forces a rebuild to continue, even when errors are present. When complete, the RAID Group is placed online and all data can be accessed; however, data needs to be verified to confirm that it is intact as a drive failure may have damaged some portion of data.
- 2) **Basic Recovery Mode** attempts access to a RAID Group using any drive that was a member of that RAID Group - not all data may be recovered from a failed disk. This gives you the ability to attempt to copy a portion of your data to a backup in the event of multiple drive failures.
- 3) **Extreme Recovery Mode** is an advanced mode which allows RAID Group access using any drive that may at some time been part of the RAID Group, in the event of multiple drive failures. Data may be beyond recall depending on the failure mode of the drives in question but attempts will be made to give you access to all remaining RAID Group data.

All recovery modes should be used with care as they are powerful tools which if misused could cause additional problems. Default access is read only, but write access is also available so that file system utilities can be executed.

ATTO DriveAssure with Data Recovery Mode attempts to keep your data protected even when catastrophic events occur with disk drives. Enlist a good data management plan which includes ATTO RAID products to ensure your data is safe.