The Challenge

Larger drive capacities are driving a need for more reliable RAID protection schemes to limit risk while rebuilding one or more of these larger drives. Additionally users want to be able to create a single RAID Group using all available drives in enclosures with greater than 16 drives. It is important to choose a protection scheme that gives you maximum protection from multiple drive failures while keeping pace with performance needs. The current choice for data protection usually starts at RAID 5 and 6, but as drive sizes and RAID Group sizes grow, these protection schemes show weakness. Upgrading to RAID 50 or 60 is an ideal way to increase capacity in a RAID Group while maximizing data protection and performance.

When to Use RAID 50 and 60

Many applications have the need for volumes with large capacities. This can be accommodated by building RAID Groups that include more physical drives or by using drives with larger capacities. In either case, the probability of a disk failure increases. RAID 5 can sustain one failure while RAID 6 can sustain two and still maintain access to the data but with larger volumes in use, the chance of losing access to the data increases significantly.

Improved Reliability and Capacity

ATTO RAID 50 and 60 allows users to create RAID Groups using more drives allowing for larger capacity and improved data protection up to 8x greater than RAID 5 or 6 with a maximum 630TB with RAID 50 or 588TB with RAID 60 when using 6TB hard drives. RAID 50 can tolerate up to 8 drive failures while RAID 60 can tolerate up to 16.

ATTO RAID 50/60 Benefits

- Up to 8 times more resilient than RAID 5/6
- Create RAID Groups up to 700% larger than RAID 5/6
- Migrate on the fly from RAID 5 or RAID 6 Groups
- Dynamically add capacity via axles as needed
- DriveAssure™ drive assessment technology
- Simple GUI driven setup and management

All axles striped with hardware RAID 0

RAID 50 Groups consist of up to 8 RAID 5 axles which can consist of up to 16 drives each. Each axle can sustain a single drive failure per axle. RAID 50 has the best balance of protection, usable capacity and performance.

RAID 60 Groups consist of up to 8 RAID 6 axles which can consist of up to 16 drives each. Each axle can sustain two drive failures per axle. RAID 60 provides the highest reliability among common RAID levels.
Need more capacity? Add an axle

Creating a RAID 50 Group requires at least 6 drives while RAID 60 requires at least 8 drives. RAID 50 consists of multiple RAID 5 axles and RAID 60 consists of multiple RAID 6 axles up to 16 drives each. Once a RAID Group is created, capacity can be effortlessly expanded by adding another set of drives and adding another axle.

All axles striped with hardware RAID 0

Adding capacity is as simple as adding drives to create new axles in the RAID 50 or 60 Group. This example shows the image from the front with the shaded axles added to increase capacity. Each axle must be the same size and can vary from 3-16 drives for RAID 50 and 4-16 drives for RAID 60 with a total of 8 axles supported.

Why ATTO RAID 50 and 60

ATTO’s RAID is a trusted technology that has been fully tested and proven for high performance, low latency applications. ATTO products allow users to migrate RAID 5 or 6 Groups to RAID 50 or 60 without losing data. This allows users to start with a smaller RAID 5 or 6 Group and upgrade to RAID 50 or 60 as capacity needs grow. This reduces the operating expense of transitioning to a different RAID protection scheme.

<table>
<thead>
<tr>
<th>Feature</th>
<th>RAID 5</th>
<th>RAID 50</th>
<th>RAID 6</th>
<th>RAID 60</th>
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<tr>
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<tr>
<td>Max number of axles</td>
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<td>8</td>
<td>NA</td>
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</tr>
</tbody>
</table>

RAID 50/60 Application Fit

These RAID levels provide great protection from drive faults and also optimize capacity to meet several requirements. RAID 50 provides the best performance and data retention balance while RAID 60 provides additional reliability to applications that require higher availability.

Axle - A collection of disk drives which are parity protected and then striped into a larger collection of axles to form a more reliable RAID Group.

Latency - The amount of time it takes for a data request from an application to be answered from storage.

Striping - The spreading of data over multiple disk drives to improve performance. Commonly known as RAID 0.