

What Is Scalability and Why Is It Important?

The Adaptec® SmartRAID and SmartHBAs ×100 and ×200 adapters allow for scalability and cost savings in data centers: here's why.



The **storage server** is at the heart of almost every sector in public, private, non-profit and government data centers. In recent years, we have witnessed unprecedented growth and the global market for Internet data centers, estimated at \$59.3 billion in 2020, is expected to reach \$143.4 billion by 2027 according to **Research and Markets**. A large part of this can be attributed to the multitude of services and applications that are hosted in modern data centers such as web search, scientific calculations, social networks and distributed file systems. There are now hundreds of thousands of servers in data centers and managing this growth requires systems and strategies that support scale efficiently and cost effectively.

What Is Scalability?

Scalability is the ability to easily expand or upgrade on demand. It is the capacity of a product, system, team or company to provide services that match growing demand. Providing enough infrastructure to accommodate more demanding IT requirements, such as increasing storage and security while keeping costs low, is a daily struggle for data center operators.



The scalability of storage systems is often measured in terms of capacity and performance. Capacity scalability refers to the amount of capacity the storage system can manage and support while maintaining acceptable performance.

The Capacity and Performance Scalability of Smart Storage Adapters

Our Adaptec adapters offer a wide range of scalable solutions.

For HDDs, our 12Gb/s PCIe® Gen 3 adapters offer:

- Four to 24 SAS/SATA ports
- Connection up to 256 SAS/SATA devices using SAS expanders
- A solid choice for most use cases

For SSDs, our 24Gb/s PCIe Gen 4 tri-mode adapters offer:

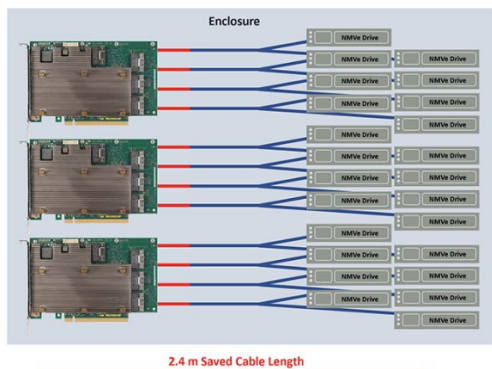
- Eight to 32 tri-mode (SAS/SATA/NVMe™) ports
- Connection up to 256 SAS/SATA devices using SAS expanders or up to 32 (1×) NVMe SSDs
- The industry's highest-performing solution available for demanding workloads

Both Smart Storage adapter series offer a simple way to expand the capacity of a system to store more data.

The Industry's Most Versatile Adapter

When it comes to the **SmartRAID Ultra 3258p-32i/e adapter**, Adaptec adapters currently offer the industry's only 32-port adapter, providing maximum design flexibility and making sure you never run out of options to add more SAS/SATA or NVMe drives.

Our Adaptec adapters also currently offer the only 0.8m NVMe cables. While other brands are manufacturing 1.0m long versions, our compact cables provide the only solution to fit multiple adapters and drives within the same case while still maintaining the proper operating temperature and being able to cleanly close it.



**Example of three Ultra 3258p-32i /e adapters in a system, connected to 24 NVMe drives, showing 0.2m length saved per cable (2.4m cable length saved in total)*

When it comes to smart adapter performance, with a single drive topology, performance should be in line with the data sheet from the drive vendor.

With the addition of drives to the topology, large sequential throughput (MB/s) should scale almost linearly until the topology of the drives, the topology of the links or the limit of the adapter is reached. The protocol efficiency of large I/Os is higher than that of small I/Os since proportionately fewer connections are opened and

closed and fewer commands and responses are sent and received in relation to the amount of data transferred.

For more detailed information on performance scaling, please visit our [Smart Adapter Performance Guide](#), as well as our hardware compatibility list for compatibility questions.

The obtainable scalability through [Adaptec Smart Storage adapter](#) in relation to capacity and performance is currently unmatched in the market. With a wide port count variety and the only 32-port adapter available, our Smart Storage adapters bring unrivaled economical storage scalability without sacrificing performance. The compact cable design of 0.8m also makes it possible to store more hardware within one case, saving on equipment costs and improving air flow.

Learn more about our high-performance [Adaptec® SmartRAID RAID Adapters](#) and [Adaptec® Host Bus Adapters \(HBAs\)](#)