

Three Ways SSDs Reduce Total Cost of Ownership

Overview

Solid state drives (SSDs) can offer lower total cost of ownership (TCO) compared to legacy hard disk drives (HDDs). Many companies are moving quickly to implement solid state data centers. Others are staying with legacy infrastructures of HDDs. Why is that?

Survey Says

One of the reasons legacy HDD infrastructures persist was revealed in a recent Forrester Research/Micron survey of IT decision makers and influencers. According to the survey, nearly 48 percent of those who have not adopted SSDs stated that the main barrier to SSD adoption was cost.

In the same survey, organizations that decided to move to SSDs said they wanted to:

- Improve application performance (the number one reason)
- Modernize the data center with a technology refresh and new technology initiatives
- Improve storage capacity

The survey also reported that the organizations who have already adopted SSDs are now able to use IT resources more efficiently. Their administrators supported four times as much data after SSD adoption and their power consumption (an indirect cost) decreased by an average of nine percent.

This paper uses an example platform deployment (your results may vary) to show three ways SSDs can help you achieve these same kind of benefits, reducing your TCO. Micron's [Move2SSD TCO Tool](#) can help you estimate your results.

1. Reduced Drives, Simplified Designs

If you are scoping a new HDD-based platform and need IOPS performance, you would probably choose 2.5-inch, 15,000 RPM HDDs. A lot of them. Since you'd also want to balance rack space used (by using fewer HDDs, each with higher capacity) with potential array rebuild time (by using more, lower-capacity HDDs to shorten it), you might use mid-range capacity HDDs like 600GB. If you were also considering SSDs, you might choose an enterprise-grade, mixed-IO workload drive with a mid-range capacity like 960GB.

The increased storage capacity and application capability of SSDs can help reduce the number of systems needed, reducing cluster size and complexity while making clusters easier to manage and support. SSDs enabled the following:

- **Higher per-node capacity:** SSDs can enable higher per-node capacity compared to mid-range performance HDDs. In our example, capacity per server increased from about 14TB with HDDs to just over 22TB with SSDs.



Simplify complex designs



Reduce license costs



Use less energy

- **Fewer nodes:** Since each SSD node has greater capacity, we needed fewer of them to store our current and forecasted data, making our SSD design simpler.
- **Better IOPS:** While validating IOPS performance improvement based on your application and workload is important, our [Move2SSD TCO Tool](#) can show you how big that difference could be.
- **Potentially lower costs:** While the purchase costs of SSDs may be higher per drive, fewer SSDs means fewer nodes. This simplicity can cost less to purchase and support.

2. Reduced Software License Costs

SSDs offer more IOPS per node and higher bandwidth. This can help fully utilize the nodes you have, and in some cases let you do the same work with fewer nodes. An all-SSD design can use fewer nodes to store the same data set and manage the application workload. If you license software per node, overall software license costs can be reduced.

The total license cost for each design can be calculated as:

- **Total Software Cost = (Cost per node) x (Number of Nodes)**

Fewer nodes means fewer software licenses and lower software costs. Learn more in Micron's [How To Simplify and Shrink Your High-Performance Cassandra Cluster](#) technical brief.

3. Reduced Energy Costs

Although power varies among HDD and SSD model and capacity, our example 600GB HDD consumed about 7.5 watts when active while our example SSD consumed about 5 watts. The difference may seem small, but it is per drive, for every drive in our design. Therefore, the HDD nodes drew about 60 watts more — for every node! And every watt requires cooling, which costs even more.

SSDs can improve energy efficiency by completing tasks faster than legacy media, so your processing finishes sooner, using less energy for both power and cooling than HDDs. Learn more in the [Micron 5100 ECO SSD: Turn Massive SQL Data Into Real Insights 13X Faster](#) technical brief.

Are You Ready? Get Started Now!

Accurate TCO will help you make better decisions and provide compelling details for executive overview. Results will vary based on your applications, your workloads and the drives you choose. Are you ready to see what SSDs can do for your TCO? A quick, 3-minute online analysis can help get you answers. Use [Move2SSD TCO Tool](#) to get started today!

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