

Using Flash to Lower TCO

Follow Three Companies' Journeys Using SSDs for Cost-Effective Storage

If you follow storage technology, you probably know that solid state drive (SSD) performance¹ is inarguably higher than legacy hard disk drives (HDDs). However, some reluctance to adopting SSDs remains, due in part to the perception that SSD cost per GB is too high for better total cost of ownership (TCO) than that of legacy storage.

That's conventional wisdom, but is it true, or is price only half the picture? Can you estimate SSD TCO using the specifics of your environment, your applications and your workloads? You can, and the results may surprise you.

In this brief, we'll look at three hypothetical companies, each with different applications, workloads and challenges. We'll look at their options, their decisions and their results. Although the companies and situations shown are hypothetical, their storage, application and TCO analyses reflect common, real concerns of IT Managers, Database Administrators and Storage Architects.

1. Throughout this document, performance is defined as input/output operations per second (IOPS).

Anna: IT Manager



Anna was losing patience with the legacy storage systems she inherited when she came onboard six months ago; they'd been running unchanged for years.

Working at a startup serving web content was tough enough, but managing her company's migration from on-premises storage to renting rack space in a colocation environment made her job tougher. She took this opportunity to look at flash in her data center.

She was happy with the performance from the legacy storage, but the age of the hardware and the amount of unused space had her ready to make a change. The company's planned migration to a collocated environment meant saving space was imperative.

Hideo: Database Administrator



Hideo kept hearing that users were not happy with their application's responsiveness. His team have spent hours updating, patching, tuning and optimizing the underlying database, which runs on legacy HDDs, but the results weren't good enough.

He'd given serious thought to a new approach: short stroking the HDD arrays he already had (he knows he would have to justify another set of arrays to make up for the lost capacity). But, Hideo didn't think that would provide enough improvement to his customers' experience or create a real solution. He wanted to move to SSDs, but needed a solid TCO to make his case.

John: Storage Architect (Big Data Specialist)



John, a specialist in big data, needed to design a new big data platform that could easily and quickly ingest incoming data, manage immense existing data lakes, run queries faster and handle unforecasted demand.

His prior big data projects had used legacy HDD storage, but John thought that flash might be a better option. He would need high capacity and high performance to satisfy data ingest and query requirements.

Why Anna, Hideo and John Chose SSDs

Anna, Hideo and John each chose SSDs for different reasons: moving to a collocated environment, wanting to save rack space; improving database response so the applications built on that database also respond more quickly; reducing complexity, improving ingest and getting more detailed query results fast.

What they had in common was the need to prove that SSDs were the right choice. For that, they turned to TCO analysis based on accurate, consistent, lab-measured data.



Anna

Position IT Manager
 Company Start-up, serving web content
 Application Web content distribution
 Wants Reliable, affordable, scalable storage and a clear choice
 Needs Reduced rack space, improved performance (if possible)

TCO input: Anna compared the 10K RPM, 300GB platforms she inherited with an NVMe-based SSD platform offering similar performance for her application and workload. Since her legacy system had a lot of unused space, matching capacity wasn't her main concern.

TCO estimate: She could move to SSDs for about \$15,000 TCO over 5 years with a tremendous IOPS improvement, drastic rack space reduction and right-sizing the company's storage space.

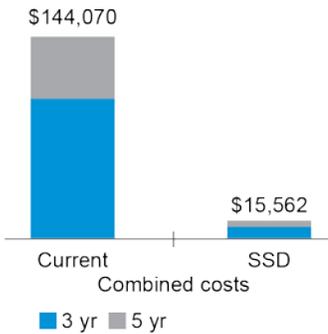


Figure 1: Anna's TCO

Anna's Solution	Current Configuration	SSD Configuration
Number of drives	100	1
Usable capacity	24.3TB	3.2TB
Performance (IOPS)	45,911	>500,000
5 year TCO	\$144,070	\$15,562

Table 1: Details of Anna's choice



Hideo

Position Database Administrator
 Company Insurance agency, central office
 Application Multiple (each with database back end)
 Wants Improved application responsiveness
 Needs To create next-generation database platform for digital transformation

TCO input: Hideo compared the TCO of the 15K RPM, 600GB HDDs currently hosting his company's database to newer, higher capacity SSDs. He suspected his other option – buying a second HDD array and combining it with his current one, then short-stroking both (to maintain capacity) was a patch at best, not a solution.

TCO estimate: He found that moving to 4TB mixed-use SSDs showed about 2.5x improved 5-year TCO compared to installing a second HDD array.

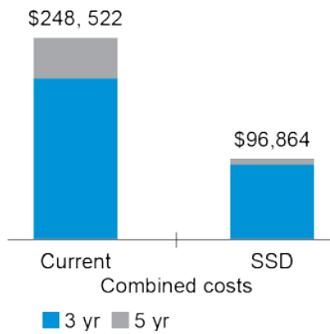


Figure 2: Hideo's TCO

Hideo's Solution	Current Configuration	SSD Configuration
Number of drives	240	34
Usable capacity	64.9TB	65.2TB
Performance (IOPS)	94,550	1,555,821
5 year TCO	\$248,522	\$96,864

Table 2: Details of Hideo's choice



John

Position Storage Architect
Company Contractor (Big Data Specialist)
Application Big data
Wants Improved application responsiveness
Needs To create next-generation database platform for digital transformation

TCO input: John compared the TCO of the 10K RPM 1.8TB HDDs he's used on prior projects to 4TB read-centric SSDs. His case was unique — he was interested in faster processing than he'd achieved on HDD clusters and the simplicity smaller clusters could bring, simplifying support and moving his project forward.

TCO estimate: His analysis showed that he could do this by migrating to 4TB read-centric SSDs. While the TCO was similar, the benefits (more than 2X the IOPS) were compelling.

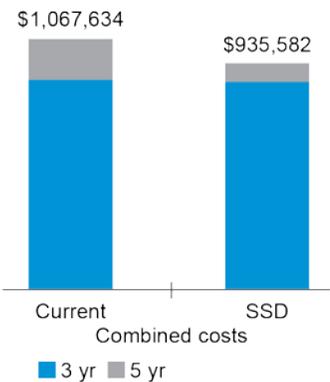


Figure 3: John's TCO

John's Solution	Current Configuration	SSD Configuration
Number of drives	960	405
Usable capacity	1555TB	1566TB
Performance (IOPS)	273,600	656,064
5 year TCO	\$1,067,634	\$935,582

Table 3: Details of John's choice

Accurate TCO Is A Must and You Can Find It In 3 Minutes

Accurate TCO can help you make a case for flash in the data center with your execs and budget review teams. 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 free, 3-minute online analysis can help get you answers. Use [Micron's Move2SSD TCO Tool](#) to get started today!

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