

The Lenovo logo, consisting of the word "Lenovo" in white sans-serif font on a red rectangular background.

What to Look for When Considering Storage and HCI

Thinking of adding storage or hyper-converged infrastructure (HCI) to your environment?

Over the past decade or so, an important question facing IT decision-makers is whether to add storage or HCI as HCI has gained traction as a more turnkey type of solution for various types of workloads and applications.

Here is a relatively simple, but accurate, answer to the question: It depends.



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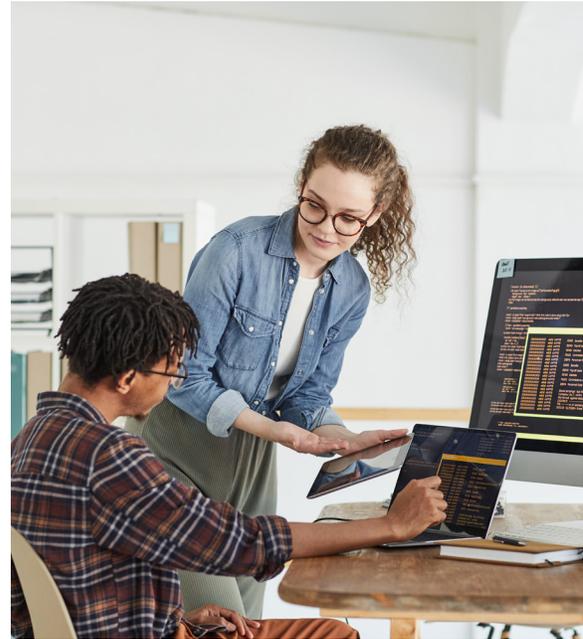
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On what does it depend? On the use case, the workload, the application, the experience of your IT team, the type of storage required, the level of performance, the interactions and interdependencies with other applications, the need for big data analytics and AI, the size of the deployment.

Not quite the definitive answer you were seeking? Well, this is the world of IT, and, as definitive as we'd like to be, there is always some level of give and take.

When it comes to deciding between storage and HCI, the reality is that each offers strengths in certain areas that make it worth considering one model vs. the other. For instance, HCI is typically simpler to manage and faster to deploy. Meanwhile, externally integrated compute and storage typically delivers better overall performance, especially for business-critical applications such as SAP, Oracle or SQL Server. For some workloads, the answer will be that both can complement each other in an integrated stack.

This white paper breaks down the strengths of each model to provide a basic overview of what factors to consider when choosing a solution. The paper also explores what to look for in a partner so you have flexibility to leverage both options based on the specific needs defined by your IT teams, workloads, applications and use cases.



The Strengths of HCI

Hyper-converged infrastructure is an integrated platform that includes servers, storage and networking, along with virtualization software and unified software-defined management.

Because the package from compute to data management is integrated by the vendor, it is typically easier to deploy and manage, allowing general-purpose IT admins to handle installation and operations. Also, because it is one purchase order, procurement is usually simpler and faster.

Simplicity and speed to deployment often make HCI suitable for small businesses and remote offices/branch offices. HCI is also typically a good choice for DevOps teams, because

they can spin up the infrastructure they need quickly and be less reliant on storage specialists or other experts within IT. Developers can easily use HCI to support app containerization and continuous integration/continuous delivery (CI/CD) pipelines.

Virtual desktop infrastructure (VDI) is another targeted use case for HCI. VDI is a compute-intensive workload. As more virtual desktops are added, additional HCI nodes can be added in a linear fashion.

The Strengths of External Storage

External storage technology has been driven by rapid advances during the cloud era, leading to solutions that provide simplicity and flexibility in delivering performance *and* capacity while being easier to manage, deploy and scale than ever before.

During the past decade, all-flash arrays have become the platform of choice for a majority of production environments because they deliver high performance that is easy to manage and scale. This capability with integration into VMware and containers is powering important business initiatives such as cloud computing, big data analytics, AI and digital transformation.

Most organizations will continue to rely on external storage for their business-critical applications when they require:



- High performance for databases and business-critical applications.
- The ability to scale storage separately from compute, to maximize storage investment.
- The ability to manage mixed data types, including file, block and object, and share between applications or tiers.

Either-Or?

Often the choice comes down to what is best for your particular organization and the intended use case. If you are a small business with limited IT resources, you may prefer the simplicity of HCI. You might also choose HCI if you are building a hybrid cloud solution for a relatively self-contained use case, such as web content management or VDI.

The size of the deployment is also a factor. In most cases, for example, you would lean toward a traditional integrated server/storage model for a larger SAP HANA deployment because of the need for both performance and scale. However, if it is a smaller deployment where performance is not a priority, HCI might be well suited. DevOps is another area where deployment size and scale may well be the deciding factor.

Cost is always a consideration. For these more limited use cases such as VDI, HCI may require less upfront capital expenses and probably less ongoing operational expenses. However, if the applications become more data heavy, or if they scale beyond expectations, over time the cost differential between HCI and external storage will narrow and can cross over to the point where external storage ends up being a wiser investment.

It's important to examine your organization's overall capabilities and skills and the particular use case. If you anticipate the use case may expand well beyond initial capacity or performance expectations, you might want to look at external storage. If your IT team is primarily server-based, you may choose HCI, for the familiarity and ability to repurpose or expand for other use cases.

There will also likely be some use cases where using external storage will be a relatively simple decision because the workloads are more data- and storage-



intensive. This is where HCI may not deliver a payback because it is not cost effective to scale compute and storage in tandem. These would include use cases such as content repositories or video surveillance.

Big data analytics is another area where external storage typically makes more sense because of the performance benefits it delivers, as well as the need for tight integration and storage management agility among a variety of applications across the entire enterprise.

The Best Choice: Working With Lenovo

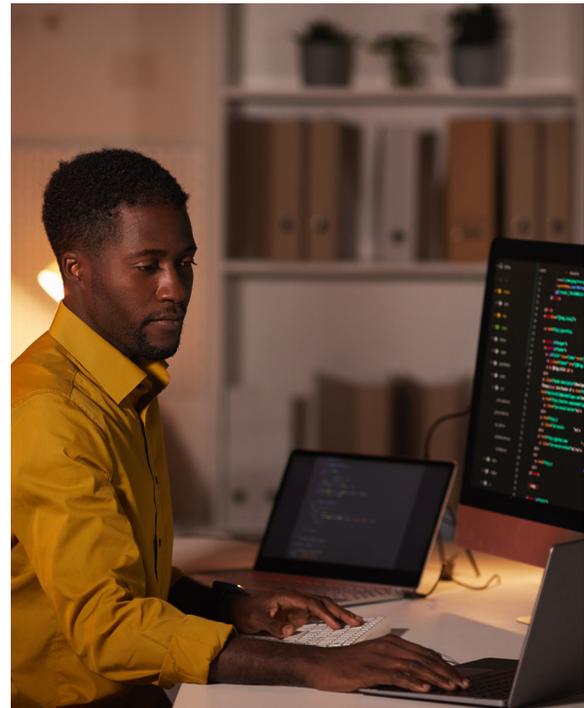
The best choice is to work with a provider that offers HCI solutions as well as integrated compute and storage solutions powered by a modern data management platform. Among the select few vendors that have both types of solutions, Lenovo offers advantages that other vendors are hard-pressed to match. In fact, with capabilities such as unified storage and end-to-end NVMe-oF, Lenovo has moved to the front of the field.

Why a vendor that can offer both HCI and external storage, and why Lenovo?

With a single vendor, you can more easily mix and match solutions to meet the needs of your specific applications and workloads so that you can deploy an end-to-end, integrated solution that minimizes the risk that data or applications will be siloed.

The end-to-end model is a particular benefit of working with Lenovo, because its offerings also include best-of-breed servers and networks. For example, NVMe is one of the important trends in enterprise storage, bringing new levels of performance to all-flash arrays.

Lenovo is the only provider that offers a complete line of NVMe solutions that extends from storage to networks to servers. This means your applications can benefit from performance gains on the order of 52% lower latency



and more than double the IOPS and throughput.

Because Lenovo offers independent but integrated storage and compute solutions as well as HCI, it can be agnostic in helping you decide which solution is the best fit for your particular use case. Lenovo offers a full suite of consultation services, including assessments and design services.

Your IT teams can work with its consultants to evaluate your environment and make decisions based on your budgets, personnel issues, use cases, workloads, applications, etc. Once the choice is made, Lenovo can optimize the solution to meet the needs of your business.

Lenovo is also agnostic when it comes to supporting multiple platforms in hyper-converged infrastructure as well as cloud. IT choices are not limited and tend not to be locked in. For example, Lenovo ThinkAgile HCI solutions work with all the leading platforms: Nutanix, Microsoft and VMware.

When it comes to cloud, Lenovo offers a one-stop solution for hybrid cloud management and, again, supports all the leading cloud platforms. With Lenovo ThinkSystem DM Storage, you can easily tier or move data to the cloud of your choice, including Amazon, Azure, Google, IBM and Alibaba.

By partnering with Lenovo for data center solutions such as HCI and external storage, IT teams get the broad benefits of working with a \$51 billion leader in delivering end-to-end IT products, services and support. These benefits include:

- **Technology innovation** such as end-to-end NVMe and ThinkSystem servers, which are the leader in data center performance with more than 150 world-record benchmark results.
- **Storage leadership** with leadership in unified management of file, block and object storage as well as extensive use of artificial intelligence and machine learning to drive automation and simplify operations.



- **Integrated solutions** with the ability to deliver HCI and truly integrated compute and storage solutions, so you can leverage optimized solutions no matter which architecture you choose.
- **Opex deployment** that enables IT to buy external storage or HCI as operating expenditures and not just as Capex. Lenovo TruScale is a complete end-to-end data-center-as-a-service solution that enables a monthly pay-for-what-you-use consumption model.
- **World-class service and support** with the knowledge and expertise to do thorough assessments of your workloads and applications and recommend the best solution for your needs, without a specific loyalty to either external storage or HCI.

Taking the Next Step

When it comes to choosing storage, data management or hyper-converged infrastructure solutions for your applications and workloads, you don't want to be limited. You want flexibility to choose the best solution for each use case, whether that is HCI or external storage.

The best choice is a vendor that gives you choice, so you can choose the solution that works best in your environment without making concessions or compromises you don't want to make. That choice is Lenovo.

Please visit [Lenovo](#) for more information on how to meet your data center needs for now and the future.