

Why Your Organization Should Consider Composable Infrastructure for Greater Flexibility and Agility

IT organizations are looking for ways to deploy cutting-edge infrastructure for exciting use cases, but they want to do it with greater speed and less complexity. One approach that is fast gaining awareness and acceptance is composable infrastructure, which promises improved flexibility, agility and efficiency while enabling organizations to take advantage of best-of-breed hardware components.

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The relentless march toward higher performing infrastructure to support demanding and transformative use cases has driven nearly all enterprises to look for efficient, affordable and reliable ways to upgrade their fundamental hardware. For instance, traditional three-tiered hardware designs—separate layers for compute, storage and networking—first gave way to converged (compute and storage in the same appliance) and then to hyperconverged (integrated compute, storage and networking).

But even though converged and hyperconverged represent notable improvements over legacy hardware designs, enterprises still encounter challenges with integrated hardware solutions. For instance, software and hardware must come from the same vendor, and users are then locked into that vendor and its limited offering.

One exciting option is composable infrastructure, an approach that disaggregates the hardware in order to act in a services-oriented model. Composability promotes greater deployment agility, easier scalability, more cost efficiencies and easier management than even new generations of hyperconvergence. This has made composability a fast-growing and large market segment: Research indicates that more than \$5.1 billion will be spent globally on composable infrastructure in 2023, representing an impressive 52% five-year compound annual growth rate.¹

For enterprise infrastructure architects, composability offers the flexibility to scale infrastructure without having to commit to major expansions of public cloud computing fees or substantial upgrades in on-premises capital equipment outlays. Instead, composability is designed to work with most existing infrastructure, while optimizing current infrastructure capacity to better align with peaks and valleys in infrastructure usage for both legacy and new workloads.

What Is Composable Infrastructure, and Why Does It Matter?

Although composable infrastructure has been around for several years, it has begun gaining attention and momentum more recently as IT leaders and infrastructure decision-makers learn more about its benefits.

Let's start with a basic definition from TechTarget's Search ITOperations content site:

Composable infrastructure is a framework that decouples device resources in order to treat them as services. Physical compute, storage and network fabric resources are some examples of device resources that can be treated as services. The goal of a composable infrastructure is to allow an enterprise data center to use its physical infrastructure while reducing the time it takes to deploy a new application.

Composable infrastructure is important because it promotes agility, flexibility, scalability and cost efficiency by avoiding the overprovisioning of hardware resources while enabling easy access to more hardware resources as situations require. It also improves hardware management; reduces operational expenses such as heating, cooling and physical space; eases configuration; and facilitates hardware provisioning in much the same way as a public cloud service does.

This may sound similar to other infrastructure models, such as infrastructure as a service, software-defined infrastructure or, especially, hyperconverged infrastructure (HCI). While there are some similarities, composable infrastructure differs in that, unlike HCI, there is no vendor lock-in. The ability to mix and match composable infrastructure components from different vendors is a major technical, operational and financial benefit to IT organizations, allowing them to take advantage of the latest technology improvements

¹ "Composable Infrastructure Market by Type: Global Forecast to 2023," MarketsandMarkets, November 2018

without having to jettison what they already have and essentially start over with all new equipment. With composable infrastructure, you just replace and upgrade what makes sense.

The same benefit holds true for organizations that shift from using cloud service providers as the foundation for their hardware infrastructure. Cloud vendor lock-in can significantly hamstring an organization's ability to dynamically—and cost efficiently—upgrade individual hardware components if and when needed.

A Driving Force Toward Composability Standards: The Open Composable Compatibility Lab

Time and experience have taught IT decision-makers that new technology is far easier and simpler and more cost efficient to adopt when it has been augmented with industry standards developed and promoted by credible third-party organizations. Standards give buyers confidence in the stability and long-term investment behind the technology, ensure interoperability, avoid vendor lock-in, promote a long-term value for the solution, and facilitate important service and support requirements.



In recent years, the embrace of composable infrastructure as a reliable technology has been spurred by the excellent work done by the Open Composable Compatibility Lab (OCCL), a service administered by Western Digital.

The OCCL was created to test hardware disaggregation and composability across devices and fabrics, verifying compatibility at several layers to facilitate integration and interoperability of composable hardware components. Among the components available for interoperability testing are CPUs/memory, network fabric, flash storage and network interface cards.

Vendors that submit their equipment for testing and validation to the OCCL can, if compatibility is successfully verified, achieve compatibility at two levels: 1) fabric interoperability demonstrated with other fabric-attached devices and 2) API compatibility.

The OCCL plays an integral and essential role in helping enterprise IT and infrastructure buyers confidently evaluate, select, integrate and manage composable infrastructure across the hardware foundation.

The OCCL's mission and objectives are clear:

-  Create interoperability across the fabric-attached device ecosystem.
-  Enable customers to confidently purchase fabric-attached devices that work together.



Enable composition/orchestration providers to focus on their value-add, as opposed to debugging device and fabric interoperability issues.



Provide an open environment to debug interoperability issues.



Enable ecosystem partners to verify compatibility to open composable APIs.

What to Look for in a Composable Infrastructure Solution

One of the important features of an optimized composable infrastructure solution is fabric drivers that are truly plug and play. Ideally, your fabric drivers should be so seamless that a simple driver installation will get your new equipment up and running; the applications and operating systems don't even see the drivers. The system recognizes it as a device, and it doesn't even know the hardware is disaggregated.

Naturally, you want your solutions to support popular and widely installed hardware components, such as NVMe™ and NVMe over Fabrics (NVMe-oF™) flash drives, as well as Ethernet networking. You'll also want to support open composable APIs, which will be made infinitely easier by purchasing composable infrastructure that has been tested compatible at OCCL.

Additionally, your solution should support fabric-provisioned devices, allowing for separate management and data paths over the same fabric. Finally, be sure you can easily scale your infrastructure simply by adding servers or other devices, such as GPUs, flash storage, hard drives or memory—without being locked into a single vendor.

Bottom line: Buyers no longer need to submit their organizations to a rip-and-replace mentality for hardware upgrades and modernization, helping to extend the economic value of their existing investments.

How Western Digital Enables High-Performance Storage for Composable Infrastructure

As one of the industry's top suppliers of storage solutions for decades, Western Digital claims a place of leadership in the move to composable infrastructure. Western Digital is a staunch supporter of the open composability and offers a number of composable solutions.

For instance, Western Digital's OpenFlex™ F3200 fabric-attached device and the companion E3000 enclosure fully support NVMe and NVMe-oF architectures. They offer fabric-attached solid-state disks with dual ports, high performance and low latency. The enclosure is a 3U configuration with 10 dual-port slots, offering up to 614 TB² of flash storage. Using the same network hardware, storage tiers for flash and hard drives can be accessed via NVMe-oF. These are truly high-bandwidth solutions: The F3200 flash storage supports performance up to 12 GB per second, while the E3000 enclosure can support up to 120 GB per second.

This high-density, low-latency storage supports extremely high read/write rates and offers up to four times the density of typical 2U configurations.

Additionally, Western Digital's OpenFlex Data24 is positioned for organizations that don't need storage performance quite as high as the F3200/E3000 combination but still require superior performance at an attractive price point. It supports the same NVMe/NVMe-oF architecture and open composable API and is a great solution for use cases where direct-attached storage is already in place.

² One terabyte (TB) is equal to one trillion bytes. Actual user capacity may be less due to operating environment.

Conclusion

Composable infrastructure is playing an increasingly important role in how enterprises build and manage their IT hardware foundational layers to promote agility, flexibility, scalability and resiliency. Composable infrastructure also delivers a key benefit valued by IT and business decision-makers alike: economic efficiency. These many benefits, combined with the benefits of OCCL testing as a means to give buyers increased confidence in the future of composable infrastructure, have helped enterprises modernize the foundation of their IT service delivery model.

Western Digital's commitment to developing and delivering state-of-the-art composable infrastructure solutions that are open and compatible makes the company an ideal candidate for enterprises looking for best-of-breed solutions.

For more information on Western Digital's solutions, please visit [**www.westerndigital.com**](http://www.westerndigital.com).