



Why Should
Enterprises Move to
a True Composable
Infrastructure Solution?



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IT Infrastructure needs are constantly fluctuating in a world where powerful emerging software applications such as artificial intelligence can create, transform, and remodel markets in a few months or even weeks. While the public cloud is a flexible solution, it doesn't solve every data center need—especially when businesses need to physically control their data on premises. This leads to overspend—purchasing servers and equipment to meet peak demand at all times. The result? Expensive equipment sitting idle during non-peak times.

For years, companies have wrestled with overspend and underutilization of equipment, but now businesses can reduce cap-ex and rein in operational expenditures for underused hardware with software-defined composable infrastructure. With a true composable infrastructure solution, businesses realize optimal performance of IT resources while improving business agility. In addition, composable infrastructure allows organizations to take better advantage of the most data-intensive applications on existing hardware while preparing for future, disaggregated growth.

What is Composable Infrastructure?

Composable infrastructure is a way to increase resource utilization and assign resources to an application from disaggregated pools of compute, storage, and networking, with more sophisticated offerings delivering GPU, FPGA, and storage memory accelerators that can also be provisioned as needed. A single programmable API manages all of IT through one single pane-of-glass application. This software defined management layer is used to discover, assign, and manage the pools of disaggregated data center devices, ensuring that the right resources are in the right place at the right time.

A true composable infrastructure offers faster deployment across multiple fabrics without vendor-lock, keeps up with future business needs, and optimizes resource utilization.

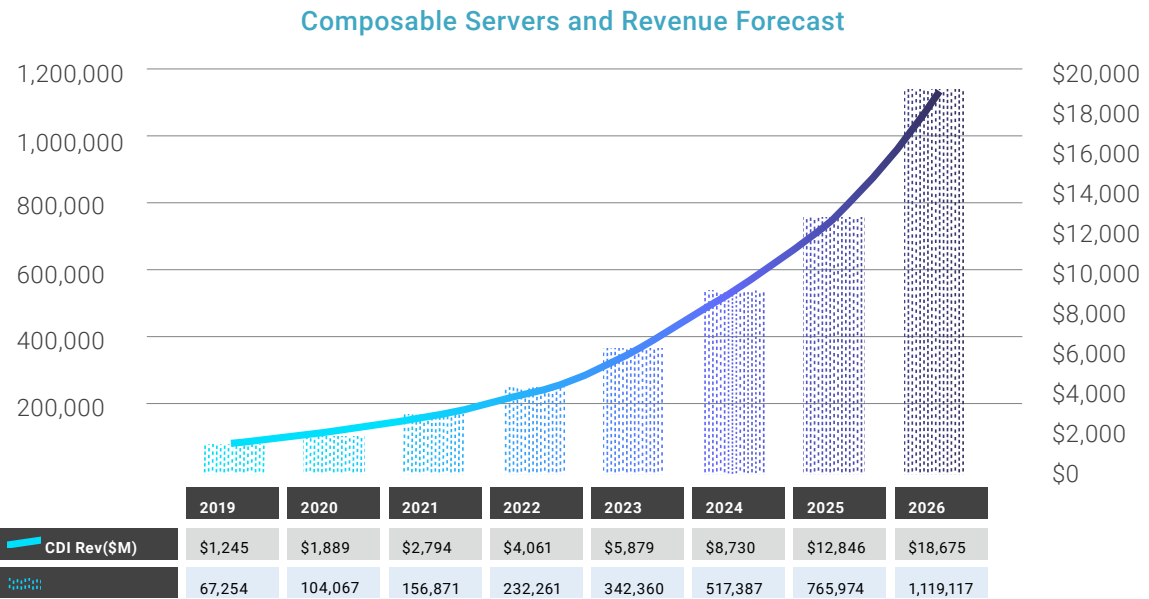
What Does Composable Infrastructure Look Like in the Future?

As there is an increased need to bridge the gap between traditional and new IT infrastructures with the high scalability required to handle massive workloads, it makes sense that the Composable Infrastructure market will only continue to grow.



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Disaggregated composability had 118.46% CAGR from 2016-2019, and it’s one of the fastest growth segments inside the overall datacenter server marketplace where many parts of the server market are flat to down.



Source: [Liquid](#)

It is Liquid’s view that the traditional hyperconverged systems of the future will be deployed on top of CDI. We believe that the marriage of these technologies will accelerate the adoption of composable infrastructure in the future.

Careful analysis of various industry reports combined with the trends we’re seeing in the overall server market informed our prediction that composable infrastructure will continue to increase every year, with a forecasted growth of \$18.5 billion by 2026.

What are the Benefits of a True Composable Infrastructure?

Faster Deployment:

Composable infrastructure offers benefits for streamlining and accelerating IT in nearly every business category. Instead of overprovisioning infrastructure to meet compute needs, pools of resources like storage, network and compute are automatically composed in near real-time. In one use case, for example, according to CIO.com, “at the HudsonAlpha Institute for Biotechnology, simplifying IT with composable infrastructure has led to fewer IT service calls and faster deployments of IT resources for conducting scientific and clinical research.”¹



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A true composable infrastructure solution goes above and beyond the storage, network, and compute pooling that many OEMs offer. A true composable infrastructure solution can compose services from pools of CPU, GPU, FPGA, NVMe, and NICs regardless of underlying fabric type.

Vendor & Technology Lock:

Most people think that Composable IT is all about speeds and feeds, but that's only a small part of the equation. Composability—even as it's defined by major OEMs—is about flexibility. But there is nothing flexible about locking a business into

a single server vendor offering or a single technology, and then limiting the capabilities of the entire infrastructure from both a provisioning and fabric standpoint.

Composable IT should provide enterprise IT teams with the ability to use equipment vendors of their choice, however, many OEMs require an enterprise to adopt their software and hardware.

“Now, IT departments can continue to use their traditional rack server infrastructure to build a composable environment and reap the benefits of the cloud without having to invest in new hardware.”

MATTHEW KIMBALL, SENIOR ANALYST OF DATA CENTER TECHNOLOGIES AT MOOR INSIGHTS & STRATEGY. DATACENTERKNOWLEDGE.COM. NOVEMBER, 2018

True composable infrastructure solutions are vendor-agnostic and fabric-agnostic; they do not obligate the user to put any drivers, agents, or software modules on the compute nodes themselves. They manipulate resources across bare metal compute nodes through composable infrastructure software, so an enterprise can run any higher-order applications on any hardware, using any fabric.

In short, true composable infrastructure will provide the enterprise IT team with the flexibility to leverage the equipment they wish, and then orchestrate that equipment to fit business needs.

Keep up with the Future-State of Business:

Given the velocity of business, the acceleration of data, and the dynamic nature of today's applications, IT administrators, DB administrators, and SAN administrators are finding it increasingly difficult to plan for their future infrastructure needs,

¹Thome, Gary. "How Composable Infrastructure is Making IT Simpler and Faster for Any Workload." *CIO.com*, 26 September 2018.



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especially as organizations look to prepare their infrastructure to manage massive workloads associated with AI and other increasingly ubiquitous applications that need to automate processes to adapt to uneven workloads.

Today's composable infrastructures can easily scale to meet unforeseen infrastructure needs with a few clicks of a mouse. But some solutions can be limited to storage, network, and compute, creating frustration when other resources are needed for a specific software application, but remain static, and cannot be provisioned on-demand.

Composable infrastructure systems
"...will become the predominant approach to computing" in the software-defined data center of the future.

FICHERS, GARDENER, O'DONNELL, ET AL. "THE SOFTWARE-DEFINED DATA CENTER COMES OF AGE." FORRESTER. (2017).

This frustration is largely eliminated with a truly composable infrastructure built with an eye for the future. Administrators are able to dynamically configure and provision everything from bare metal servers and network resources, to FPGAs and GPUs to entire racks of equipment in a matter of seconds to adapt to the dynamic applications that require additional resources.

Resource Utilization:

In order for a business to grow in a sustainable manner, effective resource utilization is a must, and composable platforms will lead the way.

According to the 451 Research VotE Compute Infrastructure Report from Q1, 2019, "Without further virtualization, more efficient server utilization will depend on adoption of next-generation technologies, including containers and composable platforms."

When an enterprise migrates from static infrastructure to a composable, dynamic infrastructure, the resource utilization advantages become clear:



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Waste Reduction: In a typical enterprise, utilization of resources is estimated to be in the 12-18% range.² With composable infrastructure, an enterprise can double or triple that utilization. This immediately translates into business and bottom-line benefits.

Rapid Provisioning: A major advantage is that composable infrastructure is an autonomous infrastructure that auto-configures. When an enterprise wants to run an application that is not tuned to its current ecosystem, IT generally has to send an employee to the data center to un-cable and power down gear to add additional storage or change the networking. In just a few clicks, composable solutions assimilate the provisioning of those physical network, storage and compute resources through software and policy-based management to fit the needs of relevant applications—quickly making the vision of software-defined infrastructure a reality.

However, in addition to these benefits, a true composable infrastructure solution can go above and beyond, where enterprises may realize up to 4x resource utilization, and even faster provisioning with more pools of composable resources, including FPGA and GPU, across multiple fabrics.

A True Composable Infrastructure Solution has Arrived

Liquid's composable infrastructure platform addresses the needs a business has to keep up with ever-changing markets. It provides a flexible solution that allows IT to control data on premise by turning static servers into dynamic servers. The advantages of Liquid include faster deployment, no vendor lock, a flexible way to keep up with ever-changing business needs and an increase in resource utilization.

Here is how Liquid's approach to Composable Infrastructure benefits enterprise data centers.

Fast Deployment with Multi-Fabric Support and Adaptivity:

Like other composable infrastructure vendors, Liquid's solution offers the fast deployment benefits that streamline and accelerate IT in nearly every business category. However, it goes above and beyond the limitations of many OEM solutions because it also allows administrators to compose simultaneously across all major fabric types including: PCIe Gen 3, PCIe Gen 4, Ethernet, InfiniBand.

² NRDC. "Scaling Up Energy Efficiency Across the Data Center Industry: Evaluating Key Drivers and Barriers." (2014).



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Furthermore, Liquid composable infrastructure deploys GPU, FPGA, and storage memory accelerators, in addition to compute and network. These resources can be quickly deployed across the data center as needed, via GUI, command line, or

API, across multiple fabrics to instantly adjust to the performance requirements of a given application.

“The maturity of newer low-latency and high-bandwidth fabrics and interconnects will accelerate the development of newer CDI products and solutions.”

ASHISH NADKANI, GROUP VP FOR IDC'S WORLDWIDE INFRASTRUCTURE PRACTICE. IDC AUG 2018 MARKET FORECAST

With Liquid composable infrastructure, administrators can dynamically configure and provision everything from bare metal servers and network resources to entire racks of equipment in a matter of seconds.

No Vendor & Technology Lock:

There is a reason that Liquid is referred to as the most comprehensive and adaptive composable infrastructure platform in the marketplace. Liquid offers unified multi-fabric support for composability across all major fabric types, and Liquid Command Center Software enables users to dynamically compose services across the appropriate fabric from pooled data accelerator and networking devices. The comprehensive, flexible nature of the Liquid platform ensures businesses will not be locked into a single server vendor or technology. The solution offers enterprise IT teams the flexibility to utilize equipment vendors of their choice. The Liquid composable infrastructure solution does not obligate the user to put any drivers, agents, or software modules on the compute nodes themselves, instead deploying resources across intelligent fabrics, enabling enterprise organizations to run any software on disaggregated hardware.

This vendor-agnostic and technology-agnostic approach enables the entire infrastructure, in terms of deployments and devices, to be flexible so IT teams can leverage the equipment they want and then orchestrate that equipment to fit the business needs.



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Easily Scaling to Meet Future Business Needs:

Considering the velocity of business, the acceleration of data, and the dynamic nature of applications, IT will need to adopt new and innovative approaches to datacenter management and rapid deployment to keep up with the ever-evolving, high-value applications driving business decisions and innovation. With many organizations turning to automated applications like artificial intelligence, edge computing, and other applications that demand massive amounts of resources, IT needs a flexible and agile solution to effectively manage their data center on premise while delivering the flexibility often associated with the cloud.

The Liquid platform offers the agility datacenters need to scale and adapt as resource demands change. Utilizing the power of Liquid, administrators can dynamically manage, scale, configure and provision everything from bare metal servers and network resources, to FPGAs and GPUs, to entire racks of equipment in a matter of seconds, and reallocate core data center devices on-demand as workflows and business needs evolve.

Better Resource Utilization:

Liquid Command Center software is purpose-built to enable dynamic, bare-metal composability utilizing pools of off-the-shelf hardware connected across intelligently managed fabrics. With the ability to compose across PCIe, Ethernet, and InfiniBand, Liquid is dramatically increasing the utilization, flexibility, and ease of use of valuable data center resources.

In fact, when a business taps into Liquid Composable Infrastructure, they realize, on average, an increase of 2- to 4x Data Center Resource Utilization.

A dramatic increase in utilization reduces waste, increases ease of use, and enables the deployment of next-generation software solutions. All of these advantages ultimately translate into business and bottom-line benefits. Liquid is changing the statically configured data center to dynamically configurable.



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“New data-intensive workloads, including artificial intelligence and edge computing, often rely heavily on automation to achieve their compute goals”, said John Abbott, distinguished analyst at 451 Research. **“The current generation of static hardware imposes severe limitations on customers hoping to run these workloads without massive over provisioning to cover unpredictable peak demands. Liquid’s software-defined and fabric-independent composable infrastructure platform promises to turn static hardware dynamic, enabling more flexible IT expansion across an array of vertical markets.”**

JOHN ABBOTT, FOUNDER & DISTINGUISHED ANALYST, 451 RESEARCH

About Liquid

Liquid provides the world’s most-comprehensive software-defined composable infrastructure platform. The Liquid Composable platform empowers users to manage, scale, and configure physical, bare-metal server systems in seconds and then reallocate core data center devices on-demand as workflows and business needs evolve. Liquid Command Center software enables users to dynamically right size their IT resources on the fly.

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