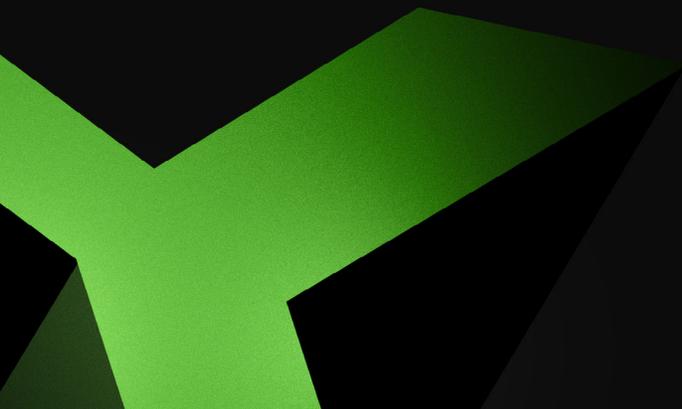


WHITE PAPER

COMPOSABLE CLOUD

**Rethinking Resource Distribution
in the Data Age**



CONTENTS

- 3** INTRODUCTION
- 3** CONSIDERING THE CURRENT CLOUD LANDSCAPE
- 4** DEFINING THE COMPOSABLE CLOUD
- 5** WHY COMPOSABLE CLOUD MATTERS
- 6** HOW COMPOSABLE CLOUDS CAN HELP
- 8** GETTING COMPOSABLE RIGHT THE FIRST TIME
- 10** RETHINKING RESOURCE REALITIES





Introduction

Companies that have adopted a composable approach to infrastructure over the next three years may outpace the competition by as much as 80% percent. This transition is especially critical as data becomes the driving factor in enterprise success. As volume, velocity, and variety increase across the datasphere, companies need composable solutions and services that deliver both on-demand and ongoing value.

For many businesses, cloud service providers (CSPs) offer a solid starting point for data storage — a way to aggregate and access data and create a single source of truth. But as true multicloud moves into the mainstream, both challenges and opportunities have emerged. A single all-purpose public or private cloud — or even the two working in tandem — is no longer sufficient to monitor, manage, and activate data at scale. Composable cloud solutions offer a way to bridge the gap by providing enterprises with a way to customize the ideal multicloud combination. In today's data-intensive environment, a composable cloud solution is a competitive advantage.

Considering the Current Cloud Landscape

Traditional CSPs are ubiquitous in the cloud landscape because of their ability to integrate solutions. Companies select a public, private, or hybrid cloud provider that owns and operates a data center and supplies them with integrated, end-to-end solutions for storage, network, computing, and applications. This aggregated approach ensures that cloud technologies work well in tandem, in turn reducing total complexity and the amount of time IT teams must spend managing these solutions.

But these integrated efforts also come with natural limitations, including the potential to overspend on services that aren't needed but are packaged as part of CSP offerings. While most CSPs are no longer inclined to pursue data lock-in policies, enterprises may still face challenges when it comes to cross-cloud data interoperability. It's also worth noting that solutions and services not offered under the CSP umbrella don't always work well with integrated offerings. Although it's possible to request new additions, there are no guarantees on acceptance or timelines on delivery.



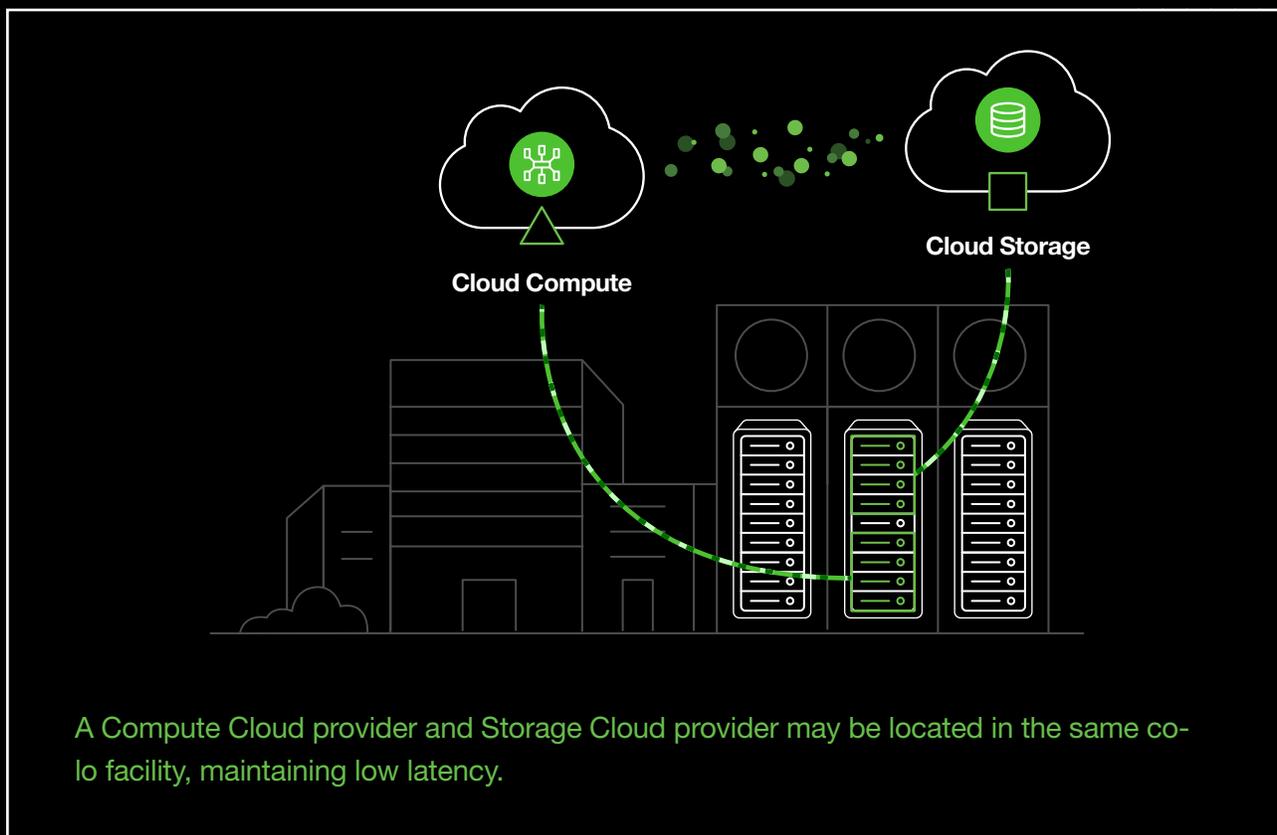
Defining the Composable Cloud

The composable cloud offers an alternative.

While composable constructs aren't new, they've thus far been applied largely to infrastructure applications within a given data center. By disaggregating and decoupling common resources—such as compute, storage, and network devices—and instead treating them as service pools that can be provisioned on demand, it's possible for companies to get more from their IT environments while simultaneously reducing spend.

Recent advancements in IT architecture, however, have made it possible to take this approach a step further and apply it to the cloud at scale. Rather than selecting a single cloud provider who supplies all-in solutions for storage, compute, networking, and applications, organizations now have the option to leverage colocated (co-lo) data centers that host multiple CSPs, thereby allowing them to select best-of-breed solutions for computing, storage, and networking needs.

In effect, this empowers enterprises to create the cloud that best fits their needs rather than paying for generalized cloud services that may over deliver in some areas and underperform in others.



Why Composable Cloud Matters

Composable cloud architecture is naturally disruptive. Much like the shift to CSP-driven resource provision and the rise of mobile devices, making best use of composable solutions requires a shift in thinking.

Here, familiarity with existing frameworks often frustrates meaningful change. Henry Ford said it best in his most famous—and possibly apocryphal—quote: “If I had asked people what they wanted, they would have said faster horses.” For many organizations, the faster horse of improved access to CSP resources or improved service-level agreements (SLAs) is often seen as the path to cloud success despite the availability of an entirely new class of cloud services.

In practice, composable clouds create meaningful change in three areas:

Cost

While the OpEx nature of common cloud services made them appealing choices for companies looking to control costs, the continual nature of this service spending is beginning to catch up with many organizations. From unexpected cloud data sprawl to unmonitored application and service use, the catch-all nature of CSPs is now driving significant C-suite discussions around spending.

Composable clouds take a different approach. By empowering enterprises to choose each aspect of their cloud deployment under the auspices of a larger co-lo data center, it’s possible to reduce total spending without sacrificing speed or scale.

Choice

Traditional service providers offer a modicum of choice when it comes to resource use and distribution by allowing companies to scale consumption up or down on demand. When it comes to infrastructure, however, businesses are bound by the resource pools currently offered.

Composable solutions change this paradigm by allowing enterprises to choose the infrastructure approach that best suits business needs—and to incorporate new solutions as these needs evolve.

Compatibility

Under an integrated infrastructure model, solutions and services offered by CSPs are designed to work in concert. Tools and technologies outside this walled garden, however, offer no guarantee of interoperability.

Composable clouds remove these barriers by making the co-lo data center—rather than the CSP—the cornerstone of compatibility. Services offered by CSPs hosted in co-lo data centers can be combined as needed to deliver specific outcomes without increasing overall complexity.



How Composable Clouds Can Help

Manageability

Using a composable model offers companies the option to get best-of-breed services from multiple providers, including network and compute services, because they aren't relying on a single CSP. This open architecture enables enterprises to leverage innovations from multiple industry players simultaneously. Specialized providers may innovate much more quickly in their own field than generalized CSPs.

Consider storage. While hyperscale providers offer the benefit of storage volume, and on-premises options come with the advantages of low transmission latency, specialized storage solutions designed to work in composable, co-lo clouds offer the best of both worlds to deliver scalable storage at speed.

Economics

As recent survey data shows, total cost of ownership (TCO) is now a primary driver in storage decisions. For many companies, this focus on cost has prompted a move to the cloud. Over time, however, general storage services contribute to steadily rising costs, even as growing data volumes contribute to latency and bandwidth challenges. Specialized storage cloud solutions, meanwhile, can deliver reduced TCO by leveraging dedicated data-handling strategies purpose-built for increased storage efficacy.

Economies of scale also play a role in the composable cloud. As services achieve greater scale and deliver parity with popular public cloud options, it's possible for companies to recognize cost savings driven by both framework and infrastructure innovations.

Specificity

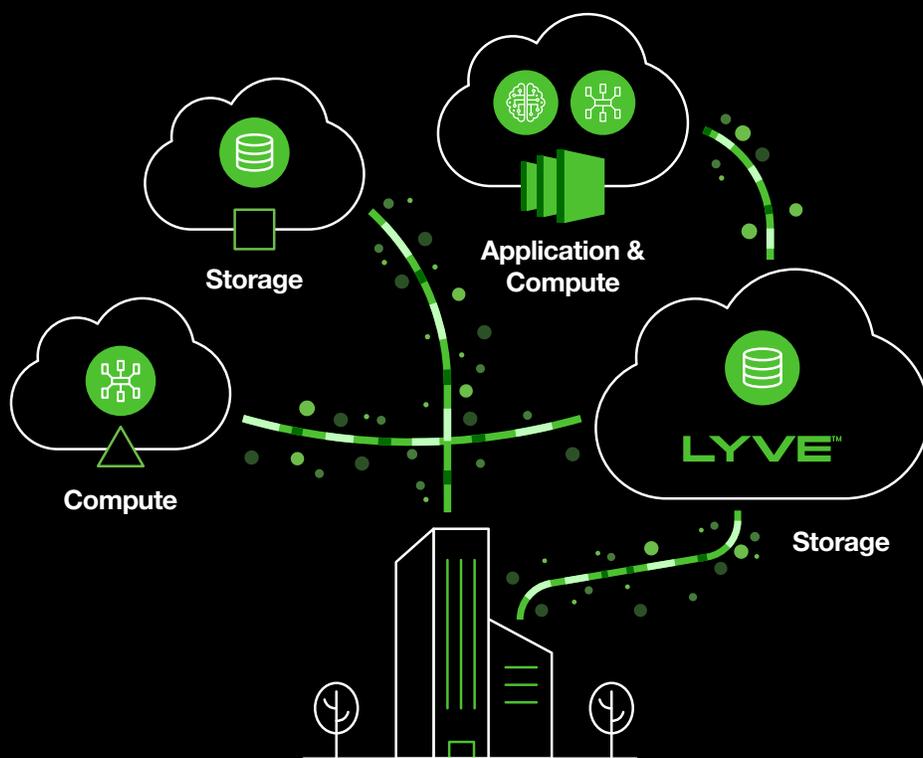
Companies can build specific cloud frameworks to suit their needs, rather than waiting for services or solutions to become available via CSPs. As a result, they can compose whatever type of cloud works best for them—public, private, or hybrid—and align its function to key business objectives.

By contrast, CSPs offer generalized services that are theoretically one-size-fits-all—but may fall short as businesses look to leverage more specialized applications.



As volume and importance of data grows, location becomes a critical facet of effective function. Evolving compliance and regulatory obligations now compel companies to ensure reasonable protective processes are deployed—no matter where their data is stored. For many organizations, this means hard conversations about which data belongs in the cloud and which resources are better stored on-site.

Movement also makes a difference. While data stored on hyperscale servers should work seamlessly with CSP-regulated services, the rapid uptake of specialized solutions creates a potential roadblock. Colocated, composable clouds remove this barrier by empowering enterprises to build the cloud they want, where they want it.



A truly composable multi cloud gives customers choices that empower them to optimize their data economics.



Getting Composable Right the First Time

Much like the initial uptake of now common cloud services came with significant hype—many providers appended cloud to every offering regardless of their actual interaction with true cloud services—the term composable cloud is often used as a tagline for any configurable architecture.

To ensure composable cloud solutions deliver on the promise of improved resource management, data movement, and TCO, five factors are critical:

End-to-end security

Security is a shared responsibility. This is especially true in the composable cloud. While colocated data centers typically offer some measure of protection for data stored on-site, this isn't enough in isolation.

Instead, companies must take an end-to-end approach that vets security on a solution-by-solution basis and determines where each application fits its needs. For example, compute service provision for commonly used apps may not require the same level of security as sensitive customer data stored in the cloud. From runtime application protection to data encryption and intrusion prevention tools, organizations must consider the composable cloud as a whole, as well as its component parts, to ensure effective security

Upfront data architecture

CSPs offer the key benefit of scalable compute resources, allowing businesses to scale usage up or down on demand. In practice, however, this benefit can quickly become a drawback if compute costs and data needs don't align.

By deploying data-centric rather than service- or resource-centric approaches to compute architecture, composable clouds make it possible for enterprises to better track, manage, and apply their most valuable asset on demand. As a result, IT decision makers are best served viewing the composable cloud through the lens of streamlined data management rather than sheer compute performance.

Data policy and ownership

With multiple applications, services, and providers all operating under the banner of corporate composable clouds, data policy and ownership are critical. To ensure data is effectively managed as it moves across disparate service offerings, organizations must create robust data access and ownership policies that are visible, enforceable, and adaptable. This defensive data approach often includes solutions such as two-factor authentication (2FA), zero-trust policies, and the deployment of cloud-based identity and access management (IAM) tools to protect data anywhere in the cloud.

High-level visibility

As volume and velocity increased, data sets were supplanted by data lakes. Now, information is best understood as part of a larger datasphere that allows movement across multiple dimensions, including into and out of corporate clouds, laterally within existing networks, and both forward and



backward through time—thanks to the application of historical analysis and predictive modeling.

To account for the increasing size and complexity of this expanding datasphere, visibility is key. In the composable cloud, this requires companies to think holistically at a higher level and prioritize tools and services that allow complete data visibility anytime, anywhere, to ensure data is never hidden from sight.

Education

Training is also a critical component of the effective adoption of composable cloud architecture. Under traditional CSP deployments, providers handled the bulk of any behind-the-scenes operation. This made it easy for companies to onboard new cloud services but more difficult to drill down and adjust specific aspects of solutions at scale.

In a composable framework, meanwhile, the ability to mix and match services based on best-of-class offerings makes it possible for companies to build their ideal cloud environment—provided they have the expertise to effectively manage, monitor, and maintain it. As a result, employee education and training are key. Staff must be equipped with the knowledge and tools to streamline service interactions and effectively evaluate new offerings to ensure they align with corporate goals. While this additional education and training comes with up-front costs, they are usually outweighed by the long-term benefits of composable clouds.



Rethinking Resource Realities

In an era of truly diverse, data-driven multicloud services, the compute frameworks offered by CSPs are familiar and functional, relying on integrated and largely immobile infrastructure to deliver standardized service.

Composable clouds, however, offer a way to rethink resource realities by framing the discussion of compute, network, storage, and application operations in the context of enterprise data. By aligning services and solutions with specific data needs, composable architecture makes it possible for companies to create customized cloud environments that minimize waste, optimize efficiency, and maximize performance.

As IT environments continue to evolve, the status quo is no longer satisfactory. For enterprises that don't invest in new storage solutions, standing still means falling behind. Composable clouds offer the potential to recombine familiar resources under a data-driven, colocated umbrella that empowers enterprises to enhance operational output, streamline service delivery, and reduce TCO.

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