MAY 2025

Accelerating Innovation With Dell Disaggregated Infrastructure

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Abstract: Dell's approach to disaggregated infrastructure combines the flexibility of traditional 3-tier architecture with the simplicity of hyperconverged infrastructure (HCI) to address modern IT challenges. The approach features unified full-stack composability across compute, storage, network, and security resources, which enables independent resource scaling, supports both traditional and modern workloads, and offers built-in security while avoiding vendor lock-in. This leverages Dell's comprehensive portfolio, including PowerEdge servers and Dell storage, to deliver enhanced efficiency, automation, and cost optimization.

IT Infrastructures Creak Under the Cumulative Load of Modern Demands

As the IT landscape continues to evolve at breakneck speed, the pressures placed on underpinning infrastructures continue to grow. As a result, organizations are finding themselves facing challenges such as:

- **Growing complexity.** Six in ten organizations surveyed by Enterprise Strategy Group said that their overall IT environment has become more complex in the last two years. This was due to trends such as an evolving cybersecurity landscape, the need to incorporate new and emerging technologies, higher data volumes, and other issues. For one in five organizations, that increase in complexity has been substantial (see Figure 1).[1] Complexity is becoming a barrier to innovation—68% of respondents said that IT infrastructure-related complexity slows their IT operations and digital initiatives.[2]
- **Rapid workload evolution.** As the promise of emerging technologies such as AI begin to bear fruit, organizations are embracing a range of enabling technologies to support those workloads. In particular, they are adopting cloud-native applications running on containers. IT operations teams are tasked with running these services effectively and efficiently, but at the same time, they also have to manage existing mission-critical applications running on bare metal and in virtualized environments.
- **Industry supplier consolidation.** Developments in the virtualization supplier ecosystem and subsequent changes to hypervisor licensing and packaging are prompting many organizations to reconsider their strategic direction. According to Enterprise Strategy Group research, 89% of senior IT decision-makers said that the use or evaluation of multiple hypervisor options is a strategic imperative.[3]
- **Security concerns.** As the global threat landscape continues to evolve, cybersecurity has become the top priority for many organizations.[4] Some are updating their security objectives to frameworks such as zero trust that extend across the entire infrastructure and data environment.
- **Costs.** All of these issues are driving up costs—related to both physical resource requirements and operational management overhead—in an uncertain macroeconomic environment. Organizations need to find ways to increase simplicity and efficiency across the board, without compromising on flexibility.

[1] Source: Enterprise Strategy Group Research Report, *2025 Technology Spending Intentions Survey*, December 2024.
[2] Source: Enterprise Strategy Group Research Report, *Navigating the Cloud and AI Revolution: The State of Enterprise Storage and HCI*, March 2024.
[3] Ibid.
[4] Source: Enterprise Strategy Group Research Report, *2025 Technology Spending Intentions Survey*, December 2024.

Figure 1. Complexity of IT Environments

Source: Enterprise Strategy Group, now part of Omdia

Existing Approaches to Infrastructure Are Flawed

Traditionally, IT organizations have been presented with two stark alternatives when it comes to deploying and managing infrastructure that supports their critical business applications and workloads. The first option is to run a 3-tier architecture comprising separate servers, storage, and network resources. That approach offers flexibility benefits by providing an ability to independently scale hardware resources and tailor them to meet growing and changing requirements. However, 3-tier architectures can be cumbersome to deploy and manage because of the higher number of discrete components, and it requires more knowledge/specialization for deployment and management. It might also be difficult to troubleshoot problems when they occur (due to the need to learn multiple tooling systems), potentially affecting the performance or availability of key services.

Largely in response to these challenges, HCI architectures have evolved over the last decade, promising a simplified alterative. Rather than forcing organizations to buy, install, and manage separate components, HCI solutions combine modified versions of industry-standard servers, loaded up with compute and storage, with clever software to support the environment in a single, easy-to-use solution.

Although the benefits of the HCI approach can be significant in terms of simplifying operations and management, drawbacks exist. For example, the scaling model of HCI is more rigid. That can lead to resource underutilization if storage requirements outpace compute needs, which can reduce its suitability to support dynamic workloads.

The real complication in this underutilization situation is that these underutilized resources are "trapped." In other words, the resources cannot be reallocated to another hypervisor cluster. The inability to reuse or repurpose resources or to share common resources across multiple hypervisor clusters poses a challenge to modern environments.

Introducing Disaggregated Infrastructure—a New Way to Modernize, With Dell

Given the pressures being placed on modern infrastructure environments, it's no surprise that IT leaders are looking for solutions that do not involve compromise. Rather than having to choose between simplicity or flexibility, it's reasonable for them to be asking, "Why can't we have both?"

Combining the flexibility of a traditional 3-tier architecture with the simplicity of HCI is exactly what Dell Technologies is delivering with its approach to disaggregated infrastructure. It is an architectural methodology that enables organizations to deploy Dell's industry-leading portfolio of server, storage, networking, and cyber-resiliency solutions within an open, flexible, highly automated framework. Think of it as a no-compromise solution.

What Is a Disaggregated Infrastructure?

A disaggregated infrastructure refers to a data center design in which compute, storage, and networking are treated as independent pools that can be dynamically allocated/reallocated to meet application needs. It differs from a traditional hyperconverged infrastructure in which those resources are tightly integrated within one appliance.

But it's important to examine this approach in context. Dell is bringing disaggregation to market with a proven history of innovation and market leadership. It has been a long-standing leader in traditional 3-tier architectures. And over the last decade, it has established itself at the forefront of HCI with solutions that simplify operations and shorten time to value.

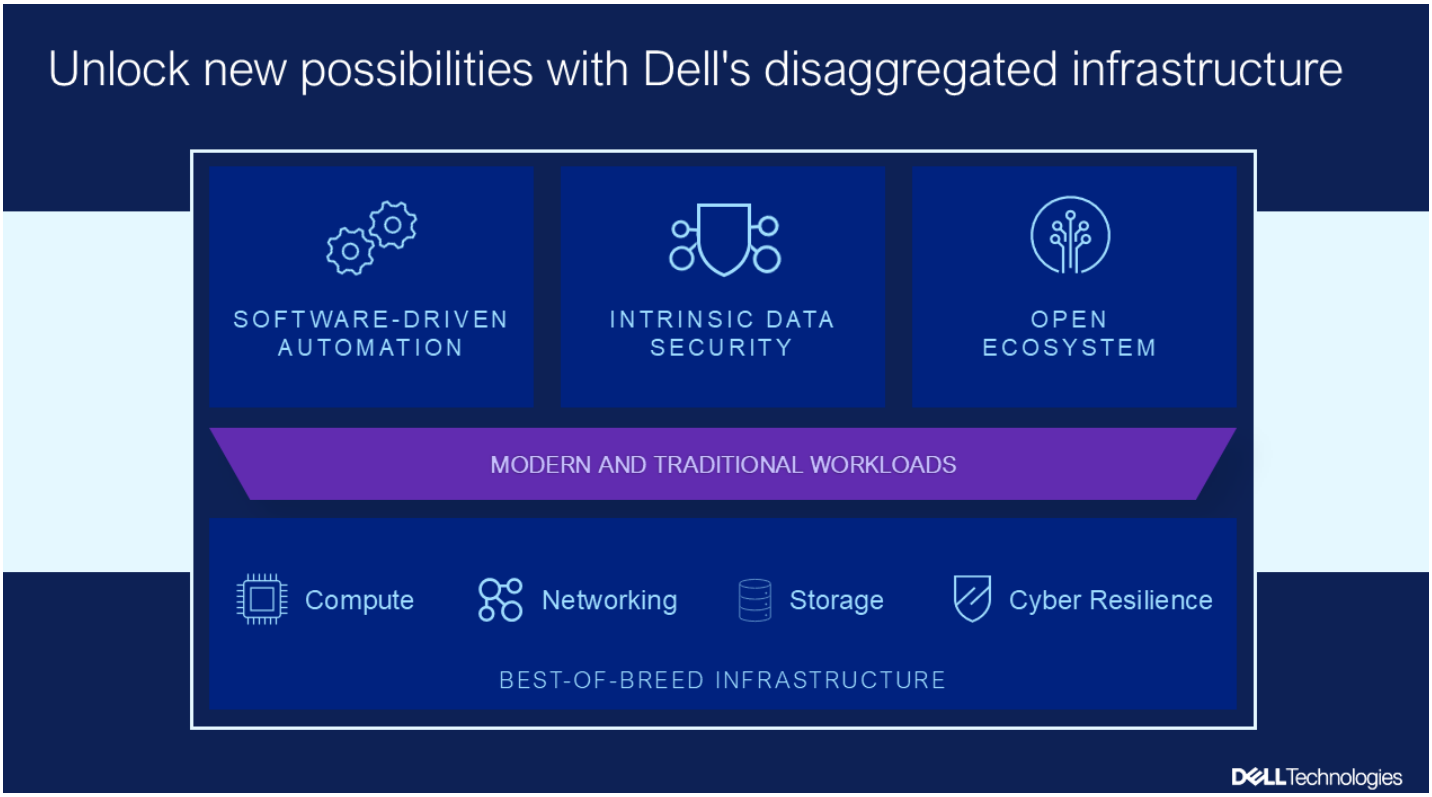
Dell's approach to disaggregated infrastructure is the next logical evolution in that journey. Substantial innovations offer unified, full-stack composability across compute, storage, network, and cyber-resiliency resources. It is a best-of-both-worlds combination, featuring the automation of HCI without compromising on flexibility. Dell is simplifying infrastructure deployment and management, while simultaneously supporting a broad choice of integrations with software ecosystem providers. This enables IT organizations to proceed with their strategic direction at their own pace and without compromise. Disaggregated systems offer dynamic resource allocation from shared pools, seamlessly supporting both traditional and modern workloads, including AI, edge, and cloud-native applications. Overall, this approach offers a high level of value, and it accelerates time to market with characteristics such as:

- Infrastructure integrity, application reliability, and service availability.
- Open ecosystem support optimized for AI, with fewer servers required and lower software licensing costs.
- Higher overall utilization, easier patching, easier lifecycle management, lower storage costs, better storage availability, and reduced siloed stacks.

Components of Dell's Approach

The core philosophy behind Dell's approach to disaggregated infrastructure (see Figure 2) is to be customer-led. The starting point is Dell's comprehensive portfolio of infrastructure solutions, providing simplicity (and customer confidence) across compute, storage, networking, and cyber resiliency. Components include best-in-class Dell PowerEdge servers, Dell PowerStore, and PowerScale storage, as well as Dell PowerProtect backup and Dell PowerSwitch networking. Those hardware resources can be presented as shared resource pools, enabling IT to scale compute, network, and storage independently. This is a key benefit, especially for organizations with workload demands that fluctuate unpredictably.

Figure 2. Dell's Approach to Disaggregated Infrastructure



Source: Dell Technologies

The hardware layer is supported by Dell's monitoring, security, and API-related capabilities, delivered through technologies such as AIOps. These ensure that the entire environment is protected and operating at the highest levels of availability and performance.

Particularly important is the intrinsic security, which is built into all of Dell's products at every level of the stack, and it comes with security features such as data at rest encryption, software-defined Storage Direct protection, and secure onboarding. Dell has also established a secure supply chain and offers professional services for cyber resilience.

Understanding that its customers and prospects are looking for a simplified experience in deploying and managing their infrastructures, Dell also developed Dell Automation Platform. It is the "cherry on top" that provides automation and integration to transform an infrastructure from a collection of disparate elements into an integrated solution.

Organizations can use Dell Automation Platform to deploy outcomes on Dell infrastructure based on validated blueprints that Dell's own experts have curated and tested. These blueprints are tied to specific outcomes that many organizations are focused on achieving—specifically, leveraging an easy-to-deploy and easy-to-manage private cloud without software lock-in using Dell Private Cloud.

Dell Private Cloud can deploy and manage software ecosystems from leading providers, including VMware, Nutanix, and Red Hat. This provides organizations with choice, without being locked into that choice after the infrastructure is purchased. Organizations gain the ability to change, move, or expand operations across a range of operating systems, hypervisors, and even container platforms as their requirements change over time.

For many organizations, this endeavor is a journey. The first step often entails evaluating the current environment and planning out the sequencing and timing of changes to be made. Here, again, Dell offers a range of services such as its Accelerator Workshop to help guide organizations through the discovery process to understand which options might be best for them.

Benefits of Dell's Approach

Dell's disaggregated approach enables organizations that wish to optimize their infrastructure to overcome the complex realities of modern environments. Key advantages include:

- **Holistic integration.** Dell's end-to-end ecosystem enables it to offer a comprehensive approach to disaggregated solutions, contrasting with alternative approaches that might be more piecemeal.
- **Market position.** Dell's long-standing experience and position in the infrastructure market provides customers the assurance that partnering with a top-tier provider affords.
- **Automation and intelligence.** Built-in automation and AI-driven insights from tools such as the Dell Automation Platform empower organizations to streamline IT operations while reducing complexity.
- **Inherent security built into everything across the stack.** Leveraging Dell's data protection portfolio and built-in security, Dell's solutions ensure an organization's most valuable assets are safeguarded—protected with everything from advanced encryption to robust threat detection.

Conclusion

Dell offers best-of-breed solutions, especially PowerEdge and PowerStore, that are capable of supporting both traditional and modern workloads. That's good, considering that even with the advent of AI and containers, virtual machines and databases aren't going anywhere. Organizations need to maintain it all, securely, with software-driven automation.

All of Dell's infrastructure is built with data protection and data security in mind, offering cyber resilience across the whole ecosystem. Yet, it is also an open infrastructure that can pull data from multiple hypervisors and other components to create a shared data-layer experience across the board, eliminating hardware silos and vendor lock-in situations.

The future of IT is always unpredictable, but ways do exist to become more future-ready by leveraging seamless scalability and gaining rapid adaptability to stay competitive. With its disaggregated infrastructure approach, Dell is well positioned to help organizations move themselves into a more confident, future-ready position.

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