

## First Look

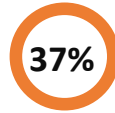
# Simplifying DPU Implementation with Dell Technologies VxRail using VMware

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## Network Architecture Challenges:<sup>1</sup>



The percentage of organizations that believe that their *network environments are equally, if not more, complex*, than two years ago.



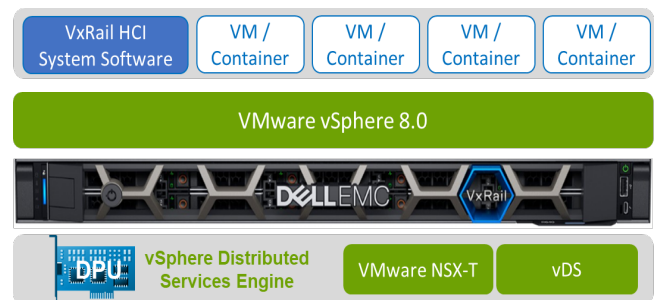
The percentage of organizations that consider *new technology deployments* to be a **top reason** why their network environments are more complex.

As modern applications become more distributed across multiple and diverse data centers, public cloud, and edge environments, maximizing performance becomes critical. To speed up response to changes in application requirements, organizations have leveraged hyperconverged infrastructure (HCI) for deploying and scaling server and storage resources where needed, while decreasing the burden of additional engineering and operational effort. However, the available CPU capacity must not only process that data but also perform other distributed services, particularly those related to networking the diverse platforms supporting these modern applications. This can easily lead to sub-optimal application performance.

Data-processing units (DPUs) have emerged as a viable way to offload these necessary infrastructure services, so that CPU capacity is dedicated to application processing. Organizations could opt to deploy an appliance equipped with DPUs in the same network path as the HCI solution, yet the additional box would add latency. Organizations could also attempt to integrate the DPU within the HCI solution itself. However, either approach expends time and resources spent on engineering and testing to ensure that the desired performance is achieved. Time to value suffers, and application performance thus cannot keep up with meeting business demands.

## Integrated DPU Support with Dell Technologies VxRail and VMware

Dell Technologies and VMware have jointly developed a solution that integrates third-party DPUs from NVIDIA (acquired from Mellanox) or AMD Pensando into the Dell Technologies VxRail HCI solution. Organizations can deploy and manage this pre-integrated HCI solution using VMware vSphere 8.0. Organizations can leverage the advantages of DPUs within existing vSphere environments.



With this integrated solution, organizations with modern application environments can conduct those networking services—such as routing, packet processing, switching—required for distributed application components and data to communicate with each other. A lightweight version of VMware ESXi, the vSphere Distributed Services Engine, is installed onto the DPU to enable VMware NSX-T services and virtualized distributed switches (VDSs). Ongoing management and monitoring of services offloaded to the DPU, and the DPU itself, can be conducted via VMware vCenter.

Dell Technologies VxRail with integrated DPU support benefits organizations by:

- Delivering pre-engineered, pre-tested, and pre-validated hardware and software, removing the need to integrate DPUs into existing IT infrastructures.
- Maximizing CPU usage to focus on data processing functions (e.g., encryption, compression, and decompression) and application processes, thus optimizing performance so that business needs are met with minimal delay.
- Automating DPU lifecycle management with VxRail HCI System Software to simplify daily operations.
- Providing the necessary visibility into services supported by the integrated DPU to minimize time to identify and resolve service-impacting issues.

<sup>1</sup> Source: ESG Research Report, [Network Modernization in Highly Distributed Environments](#), November 2021.

- Offering a single vendor—Dell Technologies—to coordinate global support and services when issues arise.

## ESG Highlights

Based on our initial investigation into the Dell Technologies VxRail solution with integrated DPU support, ESG noted that:

- Both NVIDIA's Bluefield-2 (with 25GbE support) and AMD Pensando (with 25GbE and 100GbE support) are supported. These have been fully engineered, validated, and tested prior to customer delivery, eliminating any additional required engineering and integration effort. Deployment of the joint solution immediately shortens time to value.
- DPU support will be available for the Dell Technologies VxRail E660F, P670N, and V670F.
- Organizations can manage and monitor the DPU, along with the offloaded services, using separate tabs on the vCenter vSphere 8.9 interface.
- Organizations can optimize application performance without deploying additional hardware appliances, thus decreasing network complexity. Deploying Dell Technologies VxRail with integrated DPU support in data centers minimizes overall footprint, translating into lower power and cooling costs. For locations in which space is at a premium, specifically edge locations, organizations can leverage these solutions, eliminating the need to install additional DPU-based appliances next to server resources.
- Because DPU visibility is integrated into VMware vCenter, administrators do not need to refer to a separate system interface when managing the DPU device and the supported networking and security services. Not only is operational overhead minimized, but also organizations do not need to update their skill sets if they are already familiar with working with VMware vCenter.
- The VxRail HCI System Software automates non-disruptive DPU upgrades, patches, node additions, and retirement with lifecycle management and native integration with vCenter. This simplifies operations from the time the solution is deployed in a production network.
- Other functions, such as network monitoring, telemetry, and observability, as well as additional security functions to establish zero trust architectures, are planned for future release.

## First Impressions

Optimizing performance for distributed applications remains a challenge, as both the application processes and the supporting data can reside on diverse platforms supported by on-premises, public cloud, and edge IT infrastructure. Organizations can deploy DPUs to address this challenge in order to offload networking and security services, but the result is additional network complexity to be managed, as well as time spent unnecessarily on engineering, testing, and validating solutions. Time spent on integrating DPUs into existing environments reduces time to value significantly.

Dell Technologies and VMware's joint HCI solution with DPU support enables organizations to deploy and leverage new technology designed to offload the networking functions required for supporting distributed applications with relative ease. We can see how this solution can support the delivery and performance of modern distributed applications, while utilizing the simplicity in deployment, management, and operations that Dell Technologies VxRail has already enabled.

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