BUILDING A BETTER CLOUD BEGINS WITH BETTER INFRASTRUCTURE

INTRODUCTION – IT'S A MULTI-CLOUD WORLD

The modern enterprise lives in a multi-cloud world, where delivery of infrastructure resources and IT services is expected in real time. Infrastructure and operations teams must, in turn, respond to the needs of the business rapidly. The result, all too often, is infrastructure complexity and "sprawl" – far too many platforms, and management tools that leave IT organizations struggling to maintain daily operations.

To solve for this complexity, this research brief explores what drives operational efficiency and provides a "best of both worlds" infrastructure solution to deliver a consistent hybrid-cloud experience.

We will examine the journey to hybrid cloud and how IT teams can make informed decisions based on organization-specific needs. This brief will also explore how Dell Technologies is well-positioned to enable enterprise IT organizations with its technology portfolio.

HYBRID CLOUD VS MULTI-CLOUD?

With organizations operating in so many cloud environments, the need to drive consistency across all environments has become very important. While seeing the value of hybrid, Moor Insights and Strategy has found that very few IT organizations have achieved any semblance of consistent management across clouds.

The value of cloud-based services is real. DevOps models that more tightly integrate technical resources within the business thrive with the immediacy of IT resources. However, the burden on the IT organization that must support these environments can be crippling. In this environment, multiple cloud stacks require multiple "panes of glass" to provision, deploy, monitor, and manage each environment. The challenges that virtually all IT organizations face in maintaining multi-cloud environments are obvious: complexity, cost, visibility, application, data mobility, and the ability to fully exploit the capabilities of "the cloud."

Hybrid cloud, by contrast, differs from the traditional methods of addressing the complexity of operating in multiple clouds. Hybrid cloud is more than a combination of private cloud and public cloud(s). It is more than the ability to burst a workload from on-

prem to off-prem on demand. Hybrid cloud is the unified provisioning and managing of resources, with services delivered in and consumed in a consistent manner across multiple environments, be it a public cloud, a private cloud or at the edge.

FIGURE 1: THE COMPLEXITIES OF MULTI CLOUD
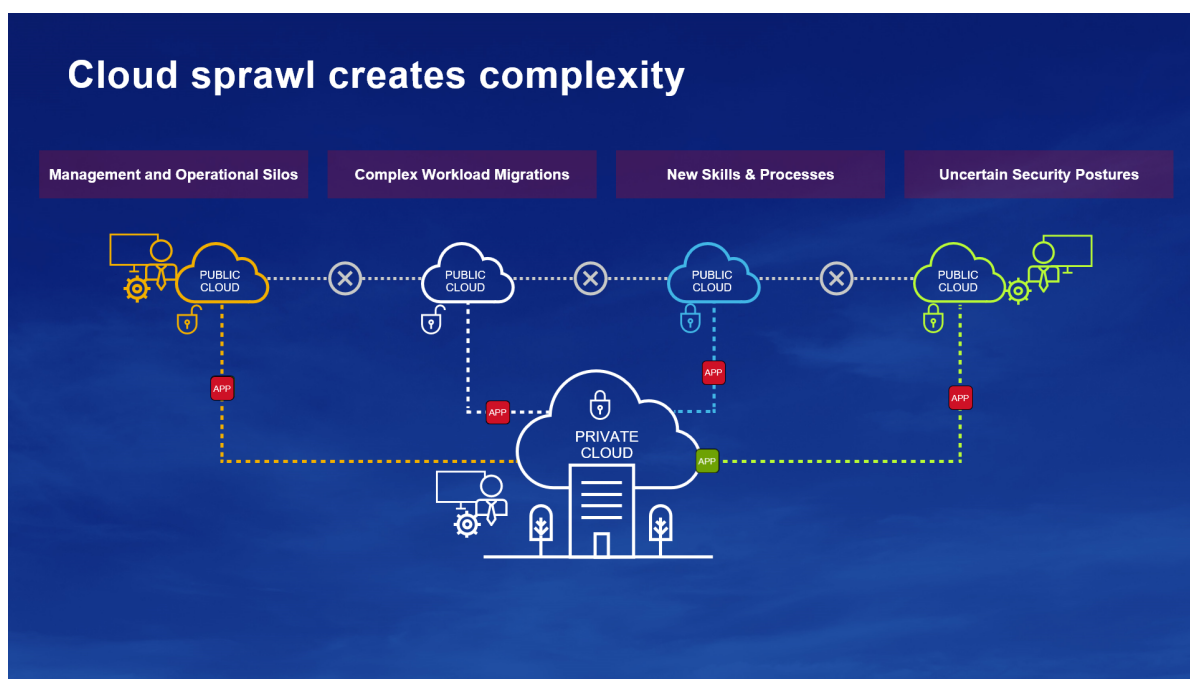
Source: Dell Technologies

DECONSTRUCTING HYBRID CLOUD

In a real hybrid-cloud environment, application developers, data analysts, and consumers of IT services can utilize resources regardless of where those services reside. On-prem? Off-prem? Legacy? Cloud-native? None of these matter in a hybrid environment. With hybrid cloud, all workloads are supported, and resources genuinely are a resource to be consumed where makes the most sense.

An optimized hybrid-cloud environment can deliver on the promise of agility, simplified IT management, resiliency, and ultimately cost. While this operating state may seem too idealistic, it isn't. The old adage "cloud is just someone else's computer" has some truths but also hides the fact that infrastructure does indeed matter. When thinking through your applications and developer experience, utilizing data, and delivering services from edge to core to cloud, the technology solutions deployed will be foundational to the success of a hybrid-cloud deployment.

Understanding the construct of a hybrid cloud should help IT organizations in setting a baseline for evaluating and selecting the right fit for their specific needs. Of the seemingly countless offerings in the market, how can an IT organization find the best fit? Looking beyond the impressive specifications that vendors cite, IT organizations should consider the real-world benefits that can be realized by hybrid cloud. The following questions can be used as guideposts:

1. Does this hybrid-cloud solution simplify IT operations? This is a relatively simple question that should have a straightforward answer. A worthy hybrid-cloud solution should enable an IT organization to reduce the tools and interfaces required to manage operations across clouds.
2. Does the hybrid-cloud solution deliver on agility? Another relatively simple question, albeit with two elements. IT organizations should find that the reduction in infrastructure and operations management frees resources to support the needs of the business. Embedded resources in the business unit should experience better, faster access to IT infrastructure resources.
3. Is the cost of delivering IT services reduced? There are multiple ways for an organization to measure cost or value, and "total cost of ownership" (TCO) can be both subjective and indefinable simultaneously. If the answer to the first question is "yes," it is fair to assume that the hybrid-cloud solution under consideration is going to reduce costs both to IT and to the broader organization.
4. Does this hybrid-cloud solution deliver on openness and flexibility? The trend of multi-cloud adoption for delivery of critical IT services and solutions will continue. If the hybrid-cloud solution evaluated is going to restrict or reduce the ability of an IT organization to adopt "best of breed" services from a variety of cloud providers, it can adversely impact the organization.
5. Does this hybrid-cloud solution provide robust management and orchestration of both my legacy and cloud-native environments? Can capacity be quickly and seamlessly added to infrastructure to meet growing needs? Does the company behind the solution have the product portfolio, services, organization, and ecosystem reach to continue to deliver on each of these elements? Deploying a hybrid-cloud solution is a long-term strategic investment.
6. Is this hybrid-cloud solution easy to buy and scale? Do you have a variety of choice between CapEx and OpEx models that allow you to better align costs with business objectives? A modern hybrid-cloud solution should deliver freedom of choice and maximum flexibility, lowering the barrier to entry for customers to start small and seamlessly scale.

DELL TECHNOLOGIES – A TECHNOLOGY PARTNER WITH A CLEAR PATH TO HYBRID CLOUD

As previously mentioned, the hybrid cloud market is filled with vendors claiming to be "the one." That is the complete solution. In reality, very few vendors have the breadth and depth of portfolio to deliver a complete hybrid solution. And when one considers the level of integration and optimization that must take place between each of the elements of hybrid cloud, one company stands alone. Dell Technologies is currently the only vendor that can claim a portfolio that spans the hardware, software, services, and cloud spaces to deliver a complete solution.

Breaking down the elements that make up a hybrid-cloud solution, Dell Technologies appears to have an answer.

ABSTRACTING THE COMPLEXITY OF MULTIPLE CLOUD ENVIRONMENTS

The promise and benefit of hybrid cloud begins with the ability to automatically and quickly provision the software-defined datacenter (SDDC) and seamlessly integrate with public clouds on demand. This, in essence, is VMware Cloud Foundation (VCF). Built on the familiar VMware tools used by IT organizations, VCF provisions and manages the software stacks that drive cloud operation. MI&S sees VCF as a leader in the market for a number of reasons:

- Integration with existing environments: VMware is the most pervasive virtualization and operating environment in the enterprise. VCF is built on the architecture and tools employed in those environments − from vSphere and vSAN to NSX and vRealize. While plug-and-play would be a stretch, VCF provides the easiest path to a fully integrated and consistent hybrid-cloud platform.
- Tight integration with public cloud: Because of VMware's reach in the market, the company has developed strong partnerships with all of the major cloud providers. This has enabled the VMware team to develop optimizations that are unmatched and couple with the very same VCF instances running in those clouds: VMware Cloud on AWS, Azure VMware Solutions, Google Cloud VMware Solutions, and Dell Technologies Cloud.
- Levels of automation: As previously mentioned, automation is the key to managing hybrid cloud. And in this regard, VCF on VxRail is uniquely positioned. VCF's unique integration with Dell EMC VxRail automates full-stack lifecycle

management, where all software and hardware components are upgraded as one integrated system offering significant operational efficiencies.

For organizations looking for the highest levels of optimization, *VCF on VxRail* should be seriously considered as a total hybrid-cloud solution. This combination is as close to "hybrid-cloud-in-a-box" as can be found in the market today.

VxRail is the first hyperconverged system to be fully integrated with VMware Cloud Foundation SDDC Manager, delivering a simple and direct path to the hybrid cloud with a seamless, automated upgrade experience. The cost savings associated with deploying VCF on VxRail are both direct and indirect.

DELIVERING A BETTER APPLICATION AND DEVELOPER EXPERIENCE

The ability to abstract hardware resources and deliver compute applications as fungible and reusable resources is what makes a cloud environment so appealing to enterprise IT organizations. This capability drives resource utilization and lowers costs. When it comes to building a hybrid cloud, the ability to deliver resources on demand to developers is better enabled by hyperconverged infrastructure (HCI) or integrated infrastructure.

Jointly engineered with VMware, Dell EMC VxRail is the only integrated, pre-configured, and pretested VMware hyperconverged system optimized for VMware HCI software. VxRail combines compute and storage virtualization with its unique VxRail HCI System Software to deliver predictable, high-performance centralized management, orchestration, and full-stack lifecycle management.

PowerOne is a relatively new Dell EMC CI product offering that appears tailor-made for the IT or development team seeking to deliver a cloud experience to the enterprise. PowerOne is enterprise-class hardware system automatically managed. Adding resources is as simple as pulling out chassis, dropping in the component (e.g., CPU, storage), and letting the PowerOne Controller discover and provision the additional capacity.

(MI&S has performed an in-depth review of PowerOne that can be found here). This extensive outcome-oriented automation and the ability to manage PowerOne from a single API or GUI is what sets it apart from other solutions in this arena.

GETTING THE MOST VALUE FROM YOUR DATA

Every IT administrator knows that the explosion in the generation, collection, and analysis of data is real. Data is being generated everywhere and is aggregated, transformed, analyzed, and acted upon at the edge. In addition to data being generated everywhere, data is diverse. Unstructured data has become the crude that is used to drive business intelligence. And the tools used to analyze this data are different than the SQL databases that manage structured data. Storage, like data, is diverse. And not all storage is created equal. Archiving data to cold storage is much different than data being farmed to a large-scale analytics cluster. Not only are the performance requirements different, but the cloud-service provider used may also be different for each task.

As a result, enterprise IT organizations looking for cloud-ready storage should consider Dell Technologies' storage portfolio, as it meets the diverse needs of today's enterprise. Dell EMC Isilon OneFS delivers scale-out NAS capabilities in both all-flash and hybrid configurations. Isilon's strength is in both its performance and its flexibility. From a performance perspective, Isilon is an ideal analytics and deep-learning platform due to its concurrency and ability to scale in a single namespace.

A good demonstration of Isilon's flexibility is with Dell EMC Cloud Storage Services. Through this solution, organizations can access application services across multiple clouds (i.e. AWS, Azure, GCP) connected to a single storage volume. And for a native cloud experience, Cloud Storage Services offers OneFS for Google Cloud. This offering combines the performance, security, and scale of Isilon OneFS with Google Cloud's powerful compute, creating a solution that is fully integrated into the Google Cloud Platform and consumed in an OpEx model. These capabilities speak to the openness and real-world application of Isilon.

Dell EMC Unity XT, Dell Technologies' mid-range offering for unified file and block storage, has performance capabilities that make it a compelling platform. Available as an all-flash or hybrid solution, this product addresses the range of needs experienced by IT organizations tasked with managing data every day. Its unique capabilities go beyond flash-drives and powerful Intel Xeon CPUs for performance.

What makes Dell EMC Unity XT so compelling for an enterprise that is deploying hybrid cloud is the product's multi-cloud readiness. It is also supported with Cloud Storage Services to enable multi-cloud agility as well as Disaster Recovery as a Service (DRaaS) that spans on-prem to VMware Cloud on AWS. Through Dell Technologies-

developed tools, Dell EMC Unity XT is unique in its ability to deliver the connectivity, performance, capacity, and management capabilities that IT organizations face when trying to develop a storage platform that can span the private-to-public cloud environments.

FIGURE 2: DELL TECHNOLOGIES' STORAGE PORTFOLIO
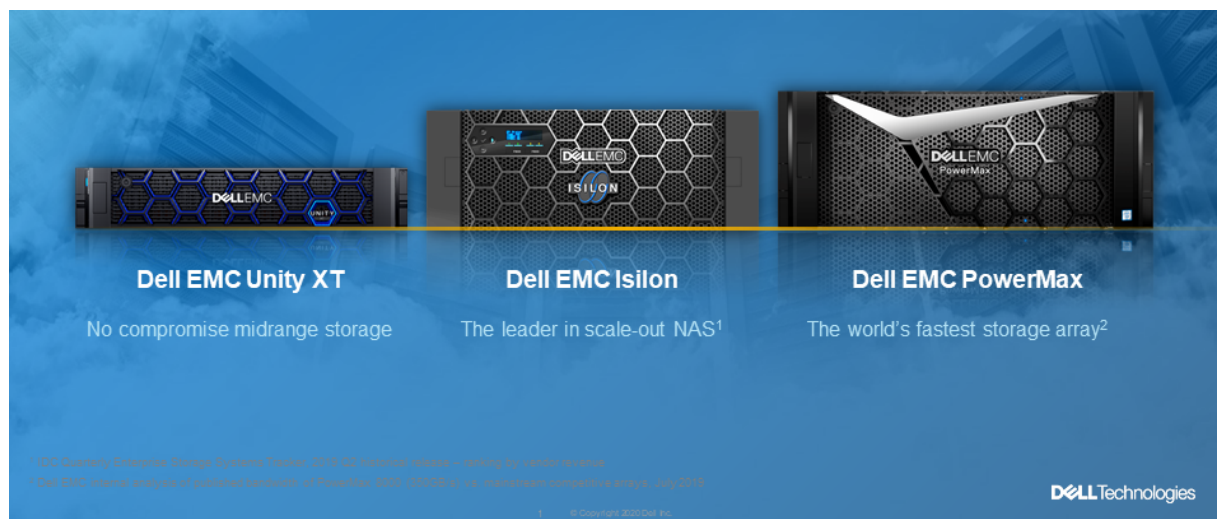
Source: Dell Technologies

At the highest end of the Dell Technologies storage portfolio is Dell EMC PowerMax. Dell Technologies positions PowerMax as the all-in-one array that allows an organization to achieve maximum consolidation. Its integration with Cloud Storage Services enables the centralization of storage across multiple cloud providers and DRaaS to VMware Cloud on AWS. Based on Intel Xeon processors and storage-class memory (SCM), PowerMax can support the mission-critical workloads that drive business. The work Dell Technologies performed with Intel to support Optane memory enables a new level of performance as it removes the bottlenecks associated with caching.

As with Dell EMC Unity XT, the PowerMax tools are what make this array so impressive: built-in machine learning to determine where data should be stored (and on what media); in-line deduplication that offers up to 5:1 reduction without impacting performance; and mission-critical support for reliability and security.

The strength of the Dell Technologies storage portfolio is rooted in its depth and breadth. Regardless of where data is collected, managed, and stored, the Dell

Building A Better Cloud Begins With Better Infrastructure   February 2020
Copyright ©2020 Moor Insights & Strategy

Technologies portfolio has coverage. Further, the company's emphasis on native support for the multi-cloud environment is apparent in each product's capabilities.

DELIVERING DIGITAL SERVICES ANYWHERE

Enterprise IT organizations find secure and high-performance connectivity to be one of the biggest challenges in deploying across cloud environments. Deploying and managing the connectivity for services from on-prem to multiple clouds in a clean and secure manner can seem nearly impossible for networking and IT Operations teams. And when deploying edge environments, the complexity increases exponentially. The ability to abstract the connectivity from the physical plane and deliver levels of automation made possible by network function virtualization (NFV) is critical to delivering a hybrid cloud experience.

Through a series of product innovations such as NSX-T and acquisitions such as VeloCloud, Dell Technologies has simplified the process of deploying, securing, and managing the onramp from private to public cloud, as well as delivering services across clouds and environments, with assurance of service-level adherence.

MI&S is impressed by VMware's holistic strategy. The complexities of networking are equal parts deployment and management. NSX-T greatly simplifies the deployment aspect, while VeloCloud's SD-WAN optimizations address the management side of the equation.

PROTECT YOUR MOST VALUABLE DIGITAL ASSETS

In the multi-cloud world, data resides seemingly everywhere. And that data is the lifeblood of any organization competing in the digital economy. The explosion of IoT and the edge can create even more data-management headaches for IT organizations. Data is only useful if it's present, uncorrupted, and clean. This is why products such as Dell Technologies' PowerProtect portfolio are so important. Built on the Xeon-based PowerEdge platform, PowerProtect solutions provide the data backup management tools that are critical to continuous operations in enterprise and hybrid-cloud environments.

Dell EMC Data Protection accelerates organizations' hybrid-cloud journeys by providing a consistent protection experience with simplified management across heterogeneous cloud environments. This allows organizations to move quickly while ensuring their digital assets are protected. Additionally, data protection workflows remain consistent across your cloud continuum, providing cloud data protection on a global scale.

FIGURE 3: DATA PROTECTION IN THE CLOUD

Source: Dell Technologies

Dell EMC and VMware have jointly engineered data-protection solutions to provide enterprise-grade tools for backup and recovery of DevOps workloads such as cloud-native Kubernetes clusters. Dell EMC Data Protection employs familiar VMware tools (e.g. vRealize) to provision, govern, automate, and orchestrate data protection across multiple cloud-deployment options while optimizing performance and ensuring that business continuity plans meet recovery time objective and recovery point objective (RTO & RPO) at a low cost to protect TCO measurements.

Bringing it all together

The requirements of hybrid cloud span hardware, software, and all aspects of IT management – from infrastructure and networking to storage and software support. It is fair to say that the Dell Technologies portfolio of solutions maps these needs in a way that is currently unmatched in today's market. While the company's hardware portfolio is rich and compelling, the integration of the VMware portfolio, particularly VCF, is what really separates the company from its competition. Because of the familial relationship of companies, the opportunity for optimizations in performance and management is great. And these advantages are realized in the Dell Technologies Cloud Platform.

Enterprise IT organizations also benefit from streamlined support. Any IT organization that has spent days root-causing and resolving issues that neither the server company nor the software company wants to take ownership of should be especially motivated to

consolidate support. Because of the Dell Technologies – VMware relationship, support for VCF on VxRail is accessible via a single phone call and uses a single organization to resolve all issues.

Deciding what your preferred operational and financial model is

To meet the diverse needs of your organization requires flexibility in the way IT infrastructure is consumed for more consistent and transparent cost structures. By making on-premises infrastructure as easy to consume as public clouds, you now have a choice to consume hybrid cloud based on either CapEx or OpEx models, or both.

Together with the industry's broadest portfolio of hybrid cloud solutions, this delivers both flexibility and predictability in the way IT infrastructure is consumed making it easy to align costs with business objectives and growth.

ESTABLISHING A WINNING CLOUD STRATEGY

This research brief started with the statement, "The modern enterprise lives in a multi-cloud world." It is a statement that warrants repeating. Going a step further, this dynamic will continue as emerging trends and technologies required by the business are more easily provided "as a Service" by IT.

Those in the direct chain of IT decision-making often think a consistent hybrid cloud is unattainable, which in actuality isn't the case. The reality is that today, very few organizations have actually achieved it, but those that have are seeing transformational results. The evaluation and selection of hybrid cloud solutions should be completed using the following questions as guideposts:

1. Does the evaluated solution simplify IT operations and reduce the headcount dedicated to deployment and management?
2. Will my internal customers realize greater business agility through this platform? Will my IT organization become more responsive to the needs of the business?
3. Will this hybrid-cloud solution reduce my direct and indirect costs in a meaningful way?
4. Is my organization deploying a hybrid-cloud solution that is open and flexible?
5. Can the hybrid-cloud solution support my IT organization's management and orchestration capabilities across on-prem and off-prem, and across cloud native and legacy?
6. Is it easy to purchase, deploy, and scale the hybrid cloud solution?

If the answer to any of these questions is "no," proceed with caution.

While many technology solutions providers claim to have the best hybrid-cloud solution, one company, in particular, is uniquely positioned: Dell Technologies. The company has a currently unrivaled technology portfolio for supporting hybrid-cloud deployments, including compute, storage, networking, data protection, automation, and lifecycle management solutions.

Since Dell Technologies Cloud is built on VMware Cloud Foundation, it is possible to use its SDDC Manager and native integration with AWS, Azure, Google Cloud, and Dell EMC infrastructure to create a truly consistent hybrid-cloud solution. VCF on VxRail delivers unique integrations with Cloud Foundation to offer a seamless, automated upgrade experience. This should be especially attractive to the IT organization that has deployed VMware in its environment.

Because of these advantages, IT organizations looking to simplify operations, increase agility, and reduce costs through a hybrid-cloud deployment would be well served to consider and evaluate solutions from Dell Technologies.

For more information on Dell Technologies and its hybrid cloud solutions, visit www.delltechnologies.com/cloud

Important Information About This Paper

Contributor
Matt Kimball, Senior Analyst at Moor Insights & Strategy

Publisher
Patrick Moorhead, Founder, President, & Principal Analyst at Moor Insights & Strategy

Inquiries
Contact us if you would like to discuss this report, and Moor Insights & Strategy will respond promptly.

Citations
This paper can be cited by accredited press and analysts but must be cited in-context, displaying author's name, author's title, and "Moor Insights & Strategy". Non-press and non-analysts must receive prior written permission by Moor Insights & Strategy for any citations.

Licensing
This document, including any supporting materials, is owned by Moor Insights & Strategy. This publication may not be reproduced, distributed, or shared in any form without Moor Insights & Strategy's prior written permission.

Disclosures
This paper was commissioned by Dell Technologies. Moor Insights & Strategy provides research, analysis, advising, and consulting to many high-tech companies mentioned in this paper. No employees at the firm hold any equity positions with any companies cited in this document.

Disclaimer
The information presented in this document is for informational purposes only and may contain technical inaccuracies, omissions, and typographical errors. Moor Insights & Strategy disclaims all warranties as to the accuracy, completeness, or adequacy of such information and shall have no liability for errors, omissions, or inadequacies in such information. This document consists of the opinions of Moor Insights & Strategy and should not be construed as statements of fact. The opinions expressed herein are subject to change without notice.

Moor Insights & Strategy provides forecasts and forward-looking statements as directional indicators and not as precise predictions of future events. While our forecasts and forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could cause actual results to differ materially. You are cautioned not to place undue reliance on these forecasts and forward-looking statements, which reflect our opinions only as of the date of publication for this document. Please keep in mind that we are not obligating ourselves to revise or publicly release the results of any revision to these forecasts and forward-looking statements in light of new information or future events.

©2020 Moor Insights & Strategy. Company and product names are used for informational purposes only and may be trademarks of their respective owners.