DELL EMC POWERONE ACCELERATES IT TRANSFORMATION THROUGH AUTONOMOUS INFRASTRUCTURE

INTRODUCTION – AUTONOMY ENABLES TRANSFORMATION

This paper will explore the dynamics driving automation in enterprise IT organizations and demonstrate how new products like Dell EMC's PowerOne meet evolving business needs by delivering cloud-like services to the business while freeing IT resources from the mundane tasks that bog down productivity.

THE IT RUT – IT ALL STARTS HERE

If there is one universal truth in enterprise IT, it is this – there are too few people available to handle the day-to-day management of infrastructure - from deploying to provisioning to workload placement and application optimization to performance monitoring. This cycle of managing legacy environments leaves enterprise IT organizations little time to be the change agent that the business partner requires.

Unless change occurs, the dynamic of the business bypassing internal IT resources for external partners will continue to devolve with increasing speed, resulting in organizational and data management issues that will haunt the business in the long term.

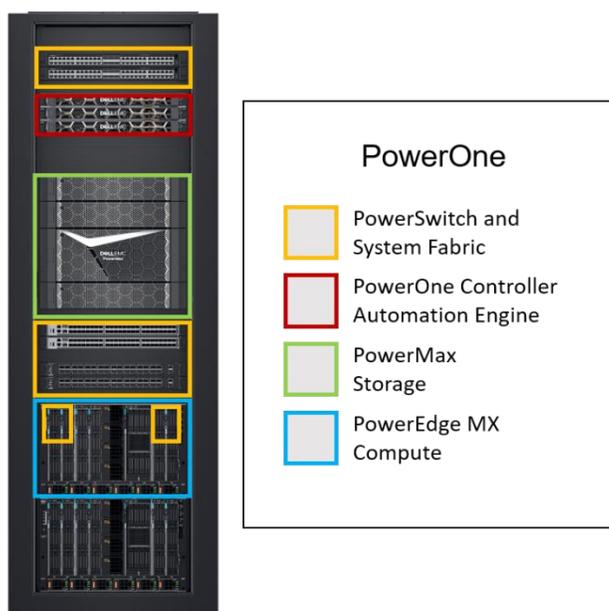## IN THE SOFTWARE-DEFINED WORLD, INFRASTRUCTURE HAS NEVER MATTERED MORE

While the focus in today's DevOps, cloud-native driven world is software-defined everything, infrastructure has never been more critical. Delivering a cloud-like experience to business users requires cloud-like infrastructure and cloud-like operations. That is, elastic and interchangeable compute, storage and networking provisioned, allocated and reallocated dynamically based on the needs of the application. To reach full operational efficiency, the ability to independently scale compute, storage and networking resources is a must.

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Deploying a software-defined environment can be powerful. However, many organizations have found that the management tools and processes can be complex and require high degrees of customization by a specialized IT resource. For example, deploying and managing a software-defined networking solution requires a specialized tool managed by a highly specialized networking engineer. So, while some efficiencies are gained with regards to serving the needs of the business, the drain on IT staff is perhaps equal or greater.

Dell EMC's PowerOne is well suited for the enterprise IT organization aspiring to fully realize the promise of "software-defined" everything without the complexity associated with deploying and managing infrastructure in the software-defined environment. PowerOne has taken best-of-breed solutions around compute, storage and networking and integrated them into a single platform to power the software-defined environment with "point-and-click" simplicity for managing.

If this sounds familiar, there's probably a reason. It appears Dell EMC intends to deliver the public cloud experience to the enterprise − a platform driven by automation that quickens time-to-value for the business while freeing up IT resources from the rut of the day-to-day tasks that stifle transformation.

FIGURE 1: POWERONE CHASSIS VIEW

Source: Moor Insights & Strategy

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POWERONE – DELL EMC AUTOMATES IT OPERATIONS

With the introduction of PowerOne, Dell EMC has begun to deliver on the vision of autonomous computing. PowerOne is a combination of hardware and software designed to provide best-of-breed, interchangeable resources through intelligent automation. The key is the tight integration between hardware and software. The result is highly utilized infrastructure and greater operational efficiency.

IS POWERONE AUTONOMOUS INFRASTRUCTURE?

Dell EMC describes PowerOne as an autonomous infrastructure platform. But is it really autonomous? In short, the answer is yes. However, a little more context is required.

Utopia in IT Operations is one in which infrastructure is entirely self-deployed, self-provisioned, self-managed and self-healing. That utopian state has not been achieved. But the market has evolved along the autonomous compute "continuum." No hardened standards exist for measuring autonomous, but Moor Insights draws parallels to the accepted levels of autonomous vehicles. There are six levels of autonomy ranging from "no automation" to "steering wheel optional."

FIGURE 2: POWERONE ON THE AUTONOMY SCALE
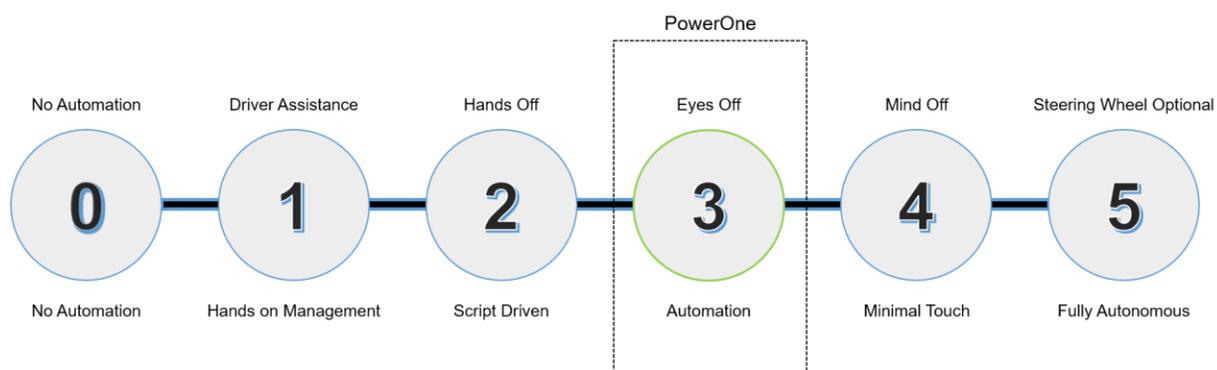
Source: Moor Insights & Strategy

Autonomy is a journey, or a continuum – as described above. We find current IT organizations operate between levels one and two with multiple tools that are fixed in function, lacking interoperability and performed in a silo without regard for other dependencies within the datacenter.
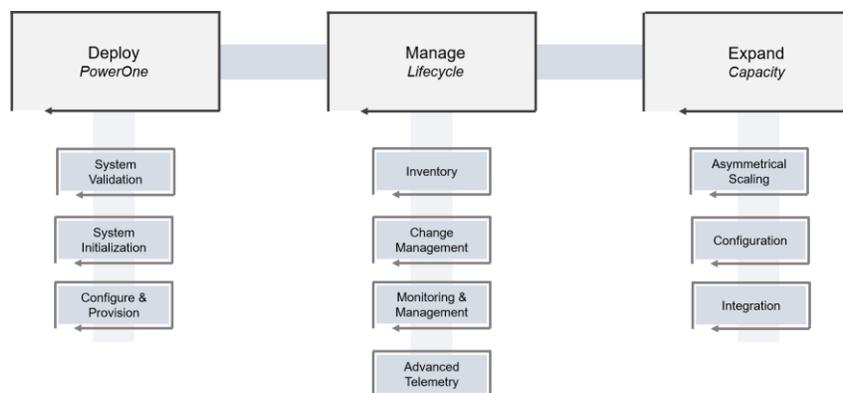
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As shown in Figure 2, Moor Insights & Strategy sees PowerOne as well along the journey to full autonomy – slotting between **level 2 "Hands-off" and level 4 "mind off" -** given the ability to orchestrate such a wide variety of tasks across the infrastructure stack. As the company continues to develop its automation around conditional tuning based on workloads, applications and real-time conditions, PowerOne should move further towards becoming a level 5 fully autonomous infrastructure.

POWERONE CONTROLLER – TURNING INFRASTRUCTURE INTO A CLOUD

While the individual hardware elements of PowerOne are impressive, the lifecycle management capabilities of the PowerOne Controller are what makes this solution stand out. Simply put, PowerOne Controller is the automation engine that connects and controls everything from one place. The result of the automation achieved through this engine is an IT organization that is able to shift its collective focus from maintaining to innovating.

The PowerOne Controller ships as a built-in, preconfigured automation appliance for the system. It is built on a Kubernetes platform with a microservices architecture and uses Ansible workflows to simplify the deployment of datacenter services. It has a rich system-level API (PowerOne API) which users can integrate into existing portals, CMDB's and other API driven tools. That same API is used to drive the PowerOne Navigator – a native GUI with wizards to walk customers through initialization and lifecycle tasks.

FIGURE 3: POWERONE CONTROLLER FUNCTIONS

Source: Moor Insights & Strategy

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DIGGING DEEPER ON MANAGEMENT

Infrastructure management can be described as "death by a thousand cuts," meaning a lot of little tasks that, when added up, seem to slowly kill the ability for an IT organization to support the needs of the business proactively. From initial deployment to version control to resource allocation and optimization – this critical function can quickly become an overwhelming task for even the most mature and governed IT organizations.

With PowerOne, Dell EMC appears to have focused its attention on the three areas of infrastructure management that most frequently bog down an IT organization – deployment, monitoring and management, and adding capacity to meet the growing data needs of an organization. Additionally, the company seems focused on simplicity, abstracting very complicated management functions into templated interfaces that can be executed by IT generalists.

To illustrate Dell EMC's focus on simplicity and reducing time-to-value through automation, consider the deployment process for PowerOne versus deploying traditional infrastructure consisting of compute, storage and networking equipment.

If deployed using traditional IT methods and processes, deployment of each of these platforms would look something like this:

- An IT engineering effort is kicked off to determine the selection of infrastructure. This process can be lengthy as it includes several variables including performance, cost and interoperability.
- Each component is procured individually, potentially by different IT buyers, and from various sources with varying dates of delivery.
- Once received, each component requires a specialist to configure for deployment. This includes the racking & stacking, cabling and labeling, and ensuring firmware, drivers, and software is at the correct version.
- Once configured, some level of integration testing will have to occur to ensure the complex process of configuration was successful. This phase can be more challenging, as it may require interfacing with engineering to address interoperability challenges.
- After any remediation required to resolve issues found in the configuration process, the underlying operating system is installed. Once again, testing will be necessary to ensure a clean install and full interoperability.
- Finally, a VMware specialist will be required to configure the vSphere environment.

FIGURE 4: THE COMPLEXITIES OF MANUAL IT OPERATIONS
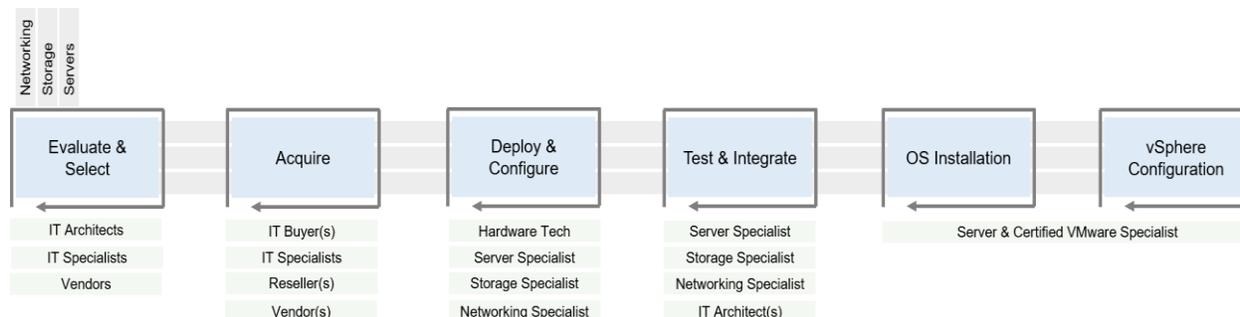
Source: Moor Insights & Strategy

If this scenario sounds overly complicated, it is. Unfortunately, it's also a scenario that rings true for many. And, as referenced, the same necessary steps must be followed for each platform (compute, storage, networking) with nuances per platform. Additionally, each solution requires scheduling the time of very busy specialists to drive the configuration process. In the real world, the process of standing up this environment in a "piecemeal" fashion would take months of person-hours to complete. Further, the number of "moving pieces" associated with such a project increases the risk of errors – from ordering to configuring to deploying.

In an internal study, Dell EMC estimated that the configuration of a cluster containing 16 blade servers across four chassis took 442 steps to complete. This assumes each stage was executed without error. That is four hundred forty-two actions that must be coordinated across multiple teams and specialists. Further, this does NOT consider the initial effort in evaluating, selecting and procuring technology.

Contrast the above with deploying PowerOne as an integrated solution delivering Infrastructure-as-a-Service through a cloud-like experience:

- The selection of components is not required. PowerOne is delivered as a complete solution.
- Ordering is simplified – a single SKU purchased from a single vendor by a single buyer.
- Dell EMC readies the physical integration of PowerOne through cabling and labeling and other configuration settings that simplify the deployment process.
- When IT receives a PowerOne System, physical integration includes plugging in and cabling the cluster to the network.

- Once plugged into power and network, the user launches the PowerOne Navigator to kick off Launch Assist.
  - Launch Assist is a templated process by which all components are configured, validated and deployed.
  - Launch Assist contains 11 steps for configuration – each of which initiates routines and scripts through the PowerOne API.
- Setting up PowerOne is complete.
  - Compute, storage and networking functions are available resources, and VMware clusters are deployed.

FIGURE 5: POWERONE AUTOMATION EFFICIENCY GAINS
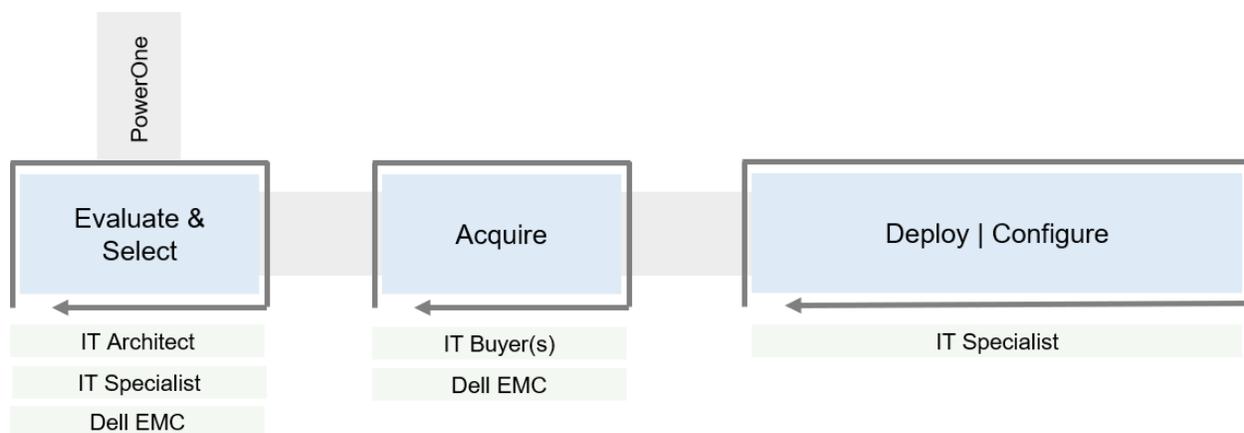
Source: Moor Insights & Strategy

If this sounds overly *easy*, it is. PowerOne represents a reduction in the complexity associated with procuring, deploying and managing infrastructure. Deploying that 16-node cluster that required 442 steps and months of person-hours to deploy takes **11 steps with PowerOne**. This represents a 98% reduction in the steps. This also represents effectively removing the "human factor" when it comes to configuration and deployment of infrastructure – scheduling issues, interoperability challenges and significantly reducing the chance of errors in execution. While some of these efficiencies are hard to quantify, they are real nonetheless.

While the above sounds compelling, it considers a fairly small environment. To truly appreciate the agility that can be gained by deploying PowerOne, extend this example

across an enterprise that deploys thousands of nodes across many datacenters around the globe. The value of a solution such as PowerOne, at scale, is almost immeasurable.

Moor Insights believes this example alone makes PowerOne worthy of consideration by enterprise IT organizations looking to better serve business units and internal customers looking to utilize technology to gain a competitive edge in the digital economy.

LIFECYCLE AND EXPANSION MANAGEMENT

As demonstrated, Dell EMC's PowerOne can greatly assist enterprise IT organizations in delivering value to the business by enabling cloud services in the matter of a "few clicks." But as any IT professional knows, managing infrastructure doesn't end at deployment. An excessive amount of time is spent on the day-to-day monitoring and management of infrastructure.

PowerOne's **Lifecycle Assist** (via the PowerOne Navigator) is designed to assist with just this. Lifecycle Assist ensures infrastructure is performing as it should through intelligent automation and advanced and aggregated telemetry, including scanning for firmware and driver "drift" that can occur in large, unmanaged environments. The automatic nature of PowerOne, once again, frees IT resources to attack the high-value projects that fuel the business.

FIGURE 6: POWERONE POINT-AND-CLICK CLUSTER CREATION

Source: Moor Insights & Strategy
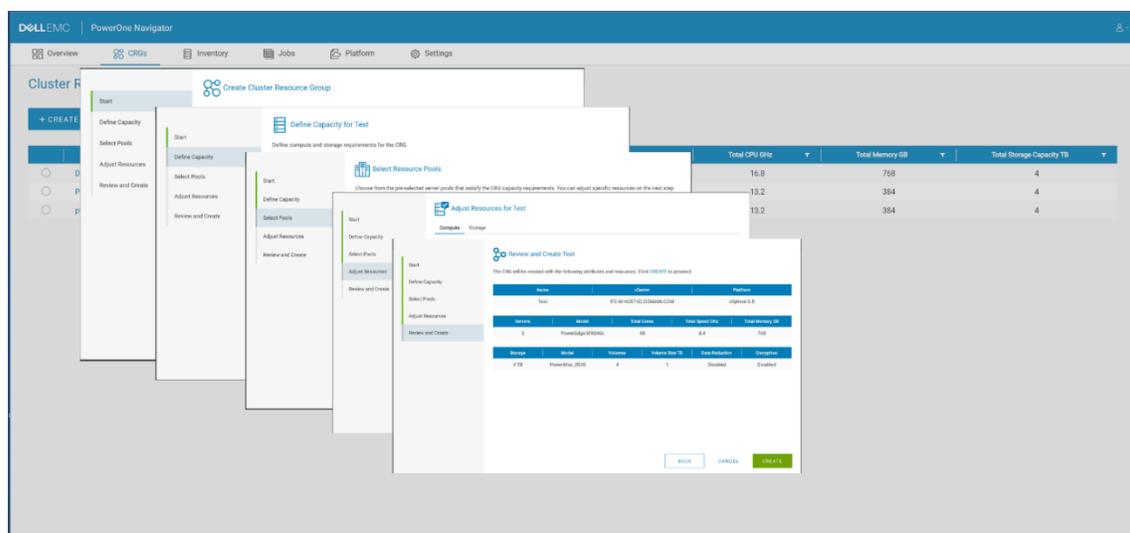
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Every company has an insatiable hunger for resources. More compute. More storage. More networking. To this end, it can sometimes feel that IT is in a perpetual state of managing and expanding capacity. One of the features of PowerOne that should prove to be invaluable is its ***Expansion Assist*** functionality. Through Expansion Assist, IT generalists can quickly and easily manage the capacity assigned to PowerOne clusters. Need more storage? Simply add more storage; the discovery and provisioning of that new storage is managed automatically through the PowerOne Controller.

As previously mentioned, Moor Insights sees PowerOne Controller as the special ingredient that makes PowerOne both unique and compelling. The functionality of the product can deliver real-world benefits that can have an immediate impact on IT organizations. The three elements described above can truly relieve many of the burdens that tie down IT organizations of all sizes.

HARDWARE THAT LEAVES NO COMPROMISE

Software-defined infrastructure is nothing without an underlying hardware platform that enables the benefits of software-defined to be realized. PowerOne's value is the collective power of these underlying hardware components, connected by a high-speed fabric and automatically configured and managed by PowerOne Controller.

Dell EMC's PowerEdge MX server platform provides the compute element of PowerOne. This Kinetic infrastructure (as Dell EMC has branded it) provides the agility, resiliency and efficiency to optimize a wide variety of traditional and new, emerging datacenter workloads. Equally important, it dynamically configures compute, storage and fabric. Kinetic infrastructure is about optimizing the cost and performance of infrastructure as well as delivering innovation and longevity to customers of all sizes for their IT and digital business transformations.

PowerEdge MX is complemented by Dell EMC's ***PowerMax*** storage solution. Positioned as the fastest storage array on the market at 15 million input-output operations per second (IOPs), the PowerMax also delivers on reliability. While these capabilities are impressive, the robustness of the PowerOne Controller makes this product even more compelling.

For enterprise IT, this means versatility without compromise. With PowerMax, enterprise IT organizations can meet the needs of their mission-critical workloads, and, when deployed and managed as part of PowerOne, the complexity and time associated with managing an enterprise storage area network (SAN) are removed.

When providing autonomous infrastructure that is dynamically provisioned and re-provisioned, connectivity matters − connectivity between resources within a cluster *and* connectivity from the cluster to everything else. For these needs, PowerOne runs on its own system fabric incorporating PowerSwitch and Smart Fabric to enable secure, high-speed connectivity.

PowerOne system fabric is as it implies - the underlying mesh interconnect that brings PowerOne resources together over a high-speed fabric (100GBs). PowerSwitch is what ties the PowerOne cluster to the "everything else." Why is this important? Many solutions don't consider the inherent complexity created between the software-defined layer and the underlying physical infrastructure. This can lead to provisioning and configuration errors and even hamper network performance. When adding the "human factor" to provisioning and configuration, the room for error grows. The PowerOne Controller, on the other hand, provides full Visibility and Lifecycle Management of the complete system fabric making sure that physical underlay is finely tuned for the software defined overlays.

CALL TO ACTION

The role of IT has changed in the modern enterprise. The days of "maintain and repair" have been replaced with a charter that focuses on being an actual services organization that is driving value to the business as it competes in the digital economy. In short, IT is intellectual property (IP).

However, the transformation of IT is being inhibited by the every-day tasks of IT management. Deploying and managing infrastructure can be all-consuming. It's this dynamic that forces the business to look to the public cloud and other "as a Service" providers to enable new initiatives. This, in turn, drives up the cost through shadow IT activities. Without real IT transformation, this dynamic may spiral out of control. The result? IT functions and budget moving to the business units.

The ideal scenario is an on-premises cloud environment in every sense - fully capable "as-a-Service" functions that power the business on the front end, highly automated infrastructure deployment and management on the back end. With this capability, IT organizations can satisfy the needs of the company, becoming a real partner in leading organization-wide transformation.

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IT transformation begins with transforming infrastructure. Moor Insights recommends IT organizations begin to explore ways to evolve operations through intelligent automation in the deployment and support of the environments that support the business.

Dell EMC's PowerOne is a solution worthy of serious consideration. The combination of best-of-breed hardware intelligently managed through the PowerOne Controller begins to realize autonomous compute.

For more information on PowerOne, visit: www.dellemc.com/PowerOne

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