DELL Technologies

Stop Managing. Start Innovating.

Intelligence designed to drive your innovation engine

Table of Contents

Autonomous compute infrastructure accelerates digital transformation.

When cars do the driving, people are freed to focus on more important matters. It's the same with your infrastructure.

Barely more than a century ago, cars had to be started with a hand crank and operated with a series of levers. Maintaining a vehicle was so time-consuming that it was considered a hobby — one that took up whole weekends — until just a few decades ago.

Today, most cars start at the press of a button and offer adaptive cruise control and built-in navigation systems. Maintenance is required less often and can be completed fairly quickly by highly trained specialists.

In the not too distant future, autonomous vehicles will use powerful systems of onboard sensors and pervasive data analytics and artificial intelligence (AI) to transport passengers and proactively identify and remediate issues — from routine maintenance to emergency measures — with minimal human direction.

This journey is roughly parallel to advances in IT. From punch cards to FORTRAN to AI so advanced it can write its own code, incremental increases in automation have progressed the state of the art for IT — and increasingly freed staff from manual, tedious tasks.

While still at the midway point on the automation continuum, server automation can already liberate resources from some of the day-to-day management and maintenance of server infrastructure, so IT can focus more time and energy on digital transformation that drives innovation and business success.

Digital transformation — with infrastructure automation at its core — is the key to increasing IT efficiency.

Navigating a critical inflection point

Today, organizations need to adapt quickly to keep up with a more connected, data-driven world. The business increasingly relies on IT to drive successful outcomes. This represents both opportunities and challenges for IT leaders.

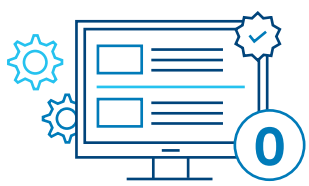
The shift significantly raises its strategic value, but IT still needs to support legacy infrastructure and applications while managing an IT environment that is growing in size and complexity. Infrastructure is increasingly deployed across on-premises data centers, hybrid clouds and edge operating environments. IT needs to manage multiple workloads, respond quickly to business demands, decrease downtime, and contribute to the overall strategic direction of the business.

In this ever-changing and competitive environment, many IT teams find themselves stretched thin trying to drive innovation while still handling day-to-day management tasks — 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 requires.

Digital transformation — with infrastructure automation at its core — is the key to increasing IT efficiency. Modernizing technologies and streamlining processes makes IT more agile, enabling quick deployment and repurposing of resources to better support rapidly shifting business priorities. As infrastructure automation continues to evolve, it can have a significant impact on IT's ability to support business requirements.

Autonomous compute infrastructure is a continuum.

To frame the discussion of autonomous compute infrastructure, Dell Technologies draws parallels to the established levels of vehicle autonomy:



No automation

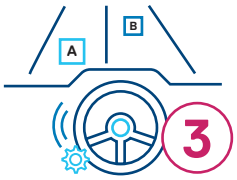
One to one manual management

Hands on: Operator assisted

Use scripts and APIs for lifecycle management

Hands off: Partial automation

Advanced lifecycle automation capabilities with policies executed by the management system itself; an infrastructure level API allows for single control point, automation at scale



Eyes off: Conditional automation

Outcome-based APIs to simplify configuration; additional context awareness allows for some advanced policies that are automatically enforced; cloud connectivity to consume telemetry and achieve at scale monitoring and analytics

Mind off: High automation

Management system enables connection to cloud services, bringing a host of analytics capabilities and connected services; multi-dimensional and self-optimizing based on service-level agreement, workload parameters, and all environmental / ecosystem factors; AI assists many operations

Steering wheel optional: Full automation

Self-optimizing, self-remediating, self-updating; zero maintenance management system after deployment; infrastructure consumers provide SLAs and desired outcome

While many IT organizations already automate some aspects of server management, many still configure, deploy and maintain servers manually. The process of configuring and deploying a single server is complex, time-consuming and prone to human error. Once deployed, servers require ongoing maintenance and updates that must be well-planned and executed flawlessly to avoid extended downtime.

As new levels of automation are incorporated in server infrastructure, previously labor-intensive and error-prone tasks can be shifted to levels 3 and 4 of the automation continuum, increasing agility, efficiency and uptime while freeing IT to focus on more strategic activities.

The Dell Technologies point of view

Autonomous compute infrastructure built to pilot your innovation engine

Dell Technologies believes that autonomous compute infrastructure is the intelligence that drives your innovation engine, helping your organization innovate, adapt and grow.

Innovate.

Managing data across a heterogenous environment of legacy and new equipment, technologies and applications is extremely time-consuming and complex with very few options for integrated management.

Dell Technologies automation results in rapid time to value and the ability to react rapidly to changes, so you can adapt and maintain your infrastructure effortlessly. This helps you unleash innovation with faster time to business value for new infrastructure and faster time to market for new applications and services. It also enables IT staff to focus on higher-value business initiatives.

Adapt.

You are expected to "keep the lights on" and exponentially grow your IT infrastructure with fewer resources than ever before. At the same time, you need to be able to adjust quickly to security threats, business opportunities, market shifts and more — better and faster than the competition.

Dell Technologies autonomous compute infrastructure helps you adapt to overcome challenges effortlessly, by optimizing infrastructure and operations into a well-oiled machine. One that requires less staff to deploy and maintain infrastructure, mitigates human error and other risks to reduce downtime, and makes more intelligent and efficient use of resources.

Grow.

Digital transformation requires systems that can seamlessly shift resources to support increasingly diverse, complex and data-intensive workloads while simplifying management across core, cloud and edge environments.

You can scale and evolve more readily with future-proof, autonomous compute infrastructure that supports growing needs today and prepares you for the future. With Dell Technologies you can scale infrastructure and add new solutions easily without adding staff, and scale out to handle an expanding data footprint from core to cloud to edge — all while you evolve toward full autonomy with a trusted partner.

Innovate, adapt and grow with Dell Technologies.

Dell Technologies helps you innovate, adapt and grow with intelligent systems that work together and autonomously to deliver outcomes aligned with business priorities. Autonomous compute infrastructure helps you adapt to a changing environment, enables rapid digital transformation, and positions you to grow, scale and evolve as you travel the road to fully autonomous infrastructure.

Autonomous compute infrastructure capabilities

Integrated Dell Remote Access Controller (iDRAC) and Dell EMC OpenManage server management software provide reliable and efficient automation for Dell EMC PowerEdge servers.

Innovate: adapt to a changing environment.

Dell Technologies helps you respond to challenge after challenge with effortless efficiency. An example of this capability is the automated security features included in the integrated Dell Remote Access Controller (iDRAC). It delivers secure, advanced, agent-free local and remote server administration to automate a multitude of management tasks, including configuration, update and monitoring. For example, Dell Technologies is the only server vendor to offer dynamic System Lockdown mode, which helps protect the system from unintentional or malicious changes during configuration and firmware updates.[1]

With the latest iDRAC security release, we take this further, enabling you to seamlessly lock the NIC configuration to prevent changes to the firmware from the operating system (OS), so users can't change the firmware versions. With this release we also introduce two-factor authentication (2FA) and RSA SecureID support to further verify user authentication.

Other iDRAC innovations include telemetry streaming, enabling IT to leverage AI operations (AIOps) for all Dell EMC systems. By streaming up to three million data points per day, iDRAC9 telemetry enables sophisticated analytics to rapidly predict and remediate server problems for higher availability. You can also use iDRAC with OpenManage Ansible Modules to simplify multivendor management and automate DevOps.

The Dell EMC OpenManage Enterprise (OME) software portfolio enables you to use policy-based automation to discover, detect, notify, remediate, and act based on your predefined thresholds.

For example, you can choose to automate server discovery, allowing OpenManage Enterprise to configure and provision new servers using policy-based templates that are matched to service tags or node IDs. You can also choose to receive alerts and schedule updates based on compliance reports and policies.

In addition, OpenManage Enterprise can be set to scan for, detect, notify and fix compliance issues based on preset configuration compliance policies.

Dell EMC CloudIQ, coming soon for PowerEdge servers, combines machine and human intelligence for 24x7 insights that help you make better, faster decisions and save significant time and costs. Working in conjunction with iDRAC and OME, CloudIQ will give you the knowledge to expedite troubleshooting and stay ahead of business needs, all in a single-pane-of-glass view.

[1] Dell Technologies is the only vendor to offer the ability to dynamically enable and disable system lockdown once your server is provisioned and in production without having to reboot.

IT can deploy new servers **88% faster** and repurpose servers in **99.7% less time.**[2]

OpenManage Integrations for Microsoft® System Center automate discovery of PowerEdge servers along with dashboard, configuration, deployment, inventory, maintenance and updates. Server deployment and configuration is automated via operational templates including the ability to import and export server profiles.

One size does not fit all, that's why we offer solutions for different environments, such as Ansible, Terraform, ServiceNow® and so on. For example, using OpenManage Ansible Modules to automate server configuration and deployment reduces the time it takes to configure a new server by 72% and cuts 33 steps out of the process.[3] You can also use iDRAC and OME REST APIs to automate server provisioning, deployment and updates using server profiles and templates.

Dell EMC OpenManage Enterprise (OME) enhances your adaptability with automation enabled by plugins and integrations.

- **Update Manager Plugin** automates the refresh of repositories and baselines, provides new update notifications, and downloads update packages so that they are staged for deployment.
- **SupportAssist** speeds resolution of service issues automatically with no tools to download. It delivers an automated, proactive support experience for complete lifecycle management.
- **Power Manager** provides policy-based automation that delivers power optimization as well as increased visibility over thermal events, power consumption, anomalies, and power utilization.
- **OpenManage integration with ServiceNow** automates service and operations management workflows. With auto-incident creation for critical events and alerts, you can streamline IT service administration and reduce risks.

Adapt: achieve rapid enablement.

Automated compute infrastructure helps IT respond quickly to support new business opportunities. For example, with iDRAC9 on Dell EMC PowerEdge servers, IT can deploy new servers 88% faster and repurpose servers in 99.7% less time.[2]

This speed is enabled through iDRAC9 features such as zero-touch deployment including automated server discovery, automated installation and configuration, automated security settings, automated OS deployment and automated update. OME adds to adaptability with automated infrastructure monitoring, alerts and remote management and deployment.

OME can further reduce deployment time and effort with automatic template deployment. OpenManage Integrations for VMware® vCenter® automate tasks such as server detection and cluster deployment, critical event response, updates, patching and upgrades.

[2] A Principled Technologies report, Boost data center staff productivity with OpenManage Enterprise, June 2020.

[3] Dell Technologies solution brief, Dell EMC OpenManage Ansible Modules for PowerEdge Servers, 2020.

Grow: scale and evolve.

As your success grows, so does the need to scale infrastructure and capabilities. Today, that likely includes infrastructure across core, edge and cloud environments.

Dell Technologies gives you the power to manage your sprawling data landscape using iDRAC and OpenManage. This includes our ecosystem of solutions for Microsoft, VMware, Red Hat® Ansible and ServiceNow, which are designed to break down the information silos between vendors for full-stack management of your virtual and cloud infrastructures.

Embedded within every PowerEdge server, the iDRAC enables seamless management through automation of management tasks from deployment to updates to monitoring to maintenance and remediation. As a core pillar of future autonomous innovations, iDRAC9 delivers advanced, agent-free local and remote server administration.

Because iDRAC9 is embedded in every Dell EMC PowerEdge server, there's no additional software to install; iDRAC9 is ready to go as soon as the server is networked and powered on. Even before installing an operating system or hypervisor, IT administrators have a complete set of server management features at their fingertips.

This includes comprehensive remote deployment and management capabilities that enable edge systems to be delivered and installed more efficiently. In fact, IT can leverage AIOps for all iDRAC9 systems wherever they're deployed — enabling a consistent system management experience from edge to core to the cloud. iDRAC9's powerful RESTful API allows you to use standard scripting tools to completely automate the deployment of Dell EMC servers at the scale of even the largest data centers.

As a Software-as-a-Service (SaaS) solution, CloudIQ will provide visibility of your entire Dell EMC connected infrastructure across data centers, branch offices, remote sites and edge locations all in one place. Today, CloudIQ supports all major Dell EMC storage platforms, Connectrix switches, and VxBlock converged infrastructure, and it will continue to expand across the Dell Technologies infrastructure portfolio, including PowerEdge servers, to offer visibility across your infrastructure stack.

Continue on your automation journey.

Dell Technologies recognizes that digital transformation is a journey. We currently offer several autonomous innovations with a roadmap to offer more in the near future.

Automated compute infrastructure can help you overcome the challenges of the digital era, accelerating IT transformation to enhance your ability to innovate, adapt and grow. With the right tools and processes in place, you can save time spent on routine tasks, so IT staff can take on more strategic activities that add value to the organization.

Learn more.

Visit DellTechnologies.com/OpenManage.

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