

Dell Technologies

Bare Metal Orchestrator

Automate the deployment and lifecycle management of network infrastructure at massive scale

Business Challenge

- 5G transformation across Core, Edge, and RAN requires Communications Service Providers (CSPs) to deploy, configure, and lifecycle manage thousands of multi-vendor network infrastructure devices across geographically dispersed locations, while reducing costs and increasing agility

Solution | Bare Metal Orchestrator

- Automate and orchestrate multi-vendor network infrastructure at massive scale from deployment to decommissioning
- Reduce OpEx costs by automating manual tasks
- Centralize hardware lifecycle management on a single screen
- Meet SLAs consistently through policy alignment, enforcement, and drift detection

Communications Service Providers (CSPs) recognize the opportunity ahead of them as 5G gains momentum and enables new services, especially at the enterprise edge. To capitalize on the growing demand for high bandwidth, low latency services, such as factory automation, autonomous mining operations, and smart healthcare, CSPs need to both scale out their networks and increase network efficiency to minimize costs and meet sustainability goals. What's more, they need to do it with increased business agility, flexibility and openness to innovation. The path forward lies in moving to virtual and cloud native functions (VNFs/CNFs) running on industry standard hardware across Core, Edge, and RAN environments.

With virtualized, cloud-native network infrastructure, CSPs can easily and quickly combine best-in-class software and hardware from multiple vendors to develop and deliver innovative services that drive revenue growth. But there is a challenge: deploying, configuring, orchestrating, and updating potentially thousands of servers and switches across thousands of geographically dispersed sites can be costly, time-consuming, and prone to human error.

A singular solution for multi-vendor networks

To help CSPs meet the challenge of lifecycle managing distributed multi-vendor infrastructure at scale, Dell Technologies has developed Bare Metal Orchestrator (BMO), a simple, seamless automation and orchestration solution for telecom networks. With BMO, CSPs can centrally and remotely deploy, configure, and lifecycle manage thousands of servers and other hardware devices from a single screen that shows a consolidated view of all infrastructures. This dramatically simplifies and accelerates deployment time, eliminates manual configuration errors, detects and corrects for configuration drift, and ensures that network availability, reliability, and performance meet even the most stringent Service Level Agreements (SLAs).

Centralize to expand cost-savings and monitor your infrastructure

Network disaggregation is critical to enabling rapid technology adoption and the development and deployment of new services, but staying on top of infrastructure across vast, multi-vendor networks is no easy task. Bare Metal Orchestrator solves this challenge by replacing manual, local hardware management with centralized automation, an approach that has been shown to reduce OpEx costs by as much as 57 percent (source: ACG Research).

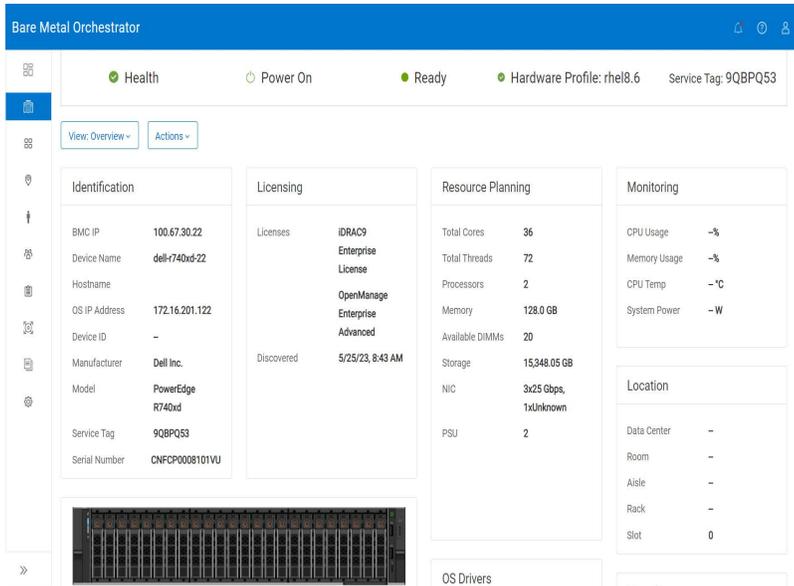


Figure 1 A graphical intuitive interface makes it simple to manage individual servers and more

At the same time, BMO optimizes CapEx spend by monitoring hardware utilization to ensure that all your resources are being fully utilized. Even before you deploy a single piece of new hardware, BMO delivers value to your business through automatic discovery and inventory of all servers and network nodes in your network. Over time, BMO's dashboard quickly identifies the health of your infrastructure to enable you to improve network performance, plan network capacity, and identify new service opportunities for the future. With BMO, you can automate the network of tomorrow with the skills and resources you have today by using simple, intuitive, unified automation controls to ensure that every single server is working optimally.

Bare Metal Orchestrator is your best choice for your infrastructure network devices

Accelerate outcomes with declarative automation

- Leverage declarative automation to deploy workload-ready, virtualized infrastructure stacks
- Eliminate hardware configuration errors with simple, declarative automation tools and blueprints
- Program and configure your hardware for optimal performance without having to rely on highly specialized domain expertise

Declare your network a busywork-free zone

The traditional manual process for configuring infrastructure is time-consuming, costly, and prone to human error. Bare Metal Orchestrator changes the game by leveraging declarative automation, which enables administrators to state the outcome they want and let BMO automatically determine the optimal configuration. BMO can:

- Boot-strap the CPU with the right BIOS configuration, firmware, and host OS/hypervisor
- Connect the hosts via the correct network topology
- Attach storage volumes to the hardware
- Deploy virtual machines into a production-ready state

In addition, BMO automatically detects and re-mediates configuration drift, while aligning any changes to a centralized security model for consistent policy enforcement. These same capabilities can be used to accelerate greenfield deployments or support brownfield deployments without disruption of production workloads.

Reduce OpEx and boost revenue

- Reduce operational expenses by automating and orchestrating infrastructure software deployment and lifecycle management
- ACG Research has shown significant financial benefits
- Achieve TCO and OpEx savings of up to 57% while increasing revenue by 2%

Research shows BMO cuts TCO

ACG research developed a Total Cost of Ownership (TCO) model to identify the business impact Bare Metal Orchestrator could have on small, medium, and large CSPs. The following chart shows the savings for telecom operators with BMO implemented:

Financial Metric	Small	Medium	Large
OpEx Savings	39%	49%	57%
TCO Savings	33%	42%	53%
Revenue Improvement	2%	2%	2%
ROI	88%	139%	255%

The results reveal that BMO provides significant Day 1 OpEx savings. Two factors stand out: (1) BMO enables labor savings on complex server management and operations tasks and (2) BMO reduces labor expenses for individual server provisioning, including NFVI and VIM installation, by 99%.

To learn more, download the ACG Research report at: ACG Research, "The Economic Benefits of the Dell Technologies Bare Metal Orchestrator", sponsored by Dell Technologies, 2021.

Consistently slay your SLAs

A network is only as good as its promised performance. SLAs provide a contractual basis for meeting customer expectations, but they can quickly become the bane of network administrators who must constantly monitor and measure network performance. BMO simplifies the process of consistently meeting SLAs by automatically detecting performance issues and remediating those issues through configuration changes. BMO can apply your gold configuration settings across different multi-vendor hardware devices to ensure SLAs never slip below acceptable levels. Dell Technologies also offers its ProSupport service option to provide live monitoring and remediation resources where carrier-grade SLAs require them.

DMTF Redfish compliance

Bare Metal Orchestrator aligns with the DMTF's [Redfish® Industry Standards](#) to ensure interoperability with the servers that comply with Redfish standards. Dell Technologies is committed to complying with Redfish standards to support multi-vendor environments.

Red Hat OpenShift Container Platform 4.12 enhancement

With Red Hat OpenShift Container Platform (OCP) 4.12 enhancement, Bare Metal Orchestrator supports "agent-based" installation. By leveraging Red Hat OCP 4.12 capabilities, customers will now have an IP-based or agent-based installation method to deploy their Red Hat OCP cloud infrastructure along with Advanced Cluster Management (ACM) 2.7. In addition, BMO provides automation support for the necessary physical infrastructure prerequisites as per Red Hat OCP guidelines.

Discover the benefits of Bare Metal Orchestrator

- Reduce costs to increase efficiency by automating and orchestrating infrastructure across thousands of sites and tens of thousands of network devices
- Unify multi-vendor lifecycle management to drive simplicity by leveraging a unified, multitenant user interface that provides centralized telemetry, metering, and lifecycle management of distributed network resources
- Meet SLAs consistently to assure performance by automating deployments and upgrades in accordance with approved configuration policies and consistent policy alignment without service disruptions

Bare Metal Orchestrator feature summary:

<p>Scope</p> <ul style="list-style-type: none"> • Federated architecture • Industry-standard Redfish interface • Multi-vendor hardware support • Compute and network devices • Multitenant user interface • Environmental awareness • Metering and chargeback • Usage-based billing <p>Heterogeneous Cloud Platforms</p> <ul style="list-style-type: none"> • VMware TCP • Red Hat OCP • Wind River Cloud Platform • AWS EC 2 <p>Automation</p> <ul style="list-style-type: none"> • Auto-Discovery • Inventory reconciliation • Zero-touch deployment • Provisioning • Upgrade • Config personality management • VIM/stack deployment 	<p>Hardware Management</p> <ul style="list-style-type: none"> • Firmware management • BIOS setting • Health and utilization • Out-of-band management <p>Security</p> <ul style="list-style-type: none"> • Identity and Access Management (IAM) with single sign-on • Certificate management • Secure data erasure <p>Self Service</p> <ul style="list-style-type: none"> • Common portal • Composability • By location, workload, platform <p>Programmability</p> <ul style="list-style-type: none"> • Declarative automation • API-first strategies • Infrastructure as Code <p>Federation</p> <ul style="list-style-type: none"> • Entire fleet under one umbrella • Single API entry point 	<p>Scale</p> <ul style="list-style-type: none"> • Tens of thousands of sites • Globally distributed • Single node to multi-rack • Scaling to 75K devices support <p>Multi-vendor Hardware Support</p> <ul style="list-style-type: none"> • Dell, HPE, and Supermicro servers • Dell and Cisco switches • SONiC Network Operating System <p>Log Management</p> <ul style="list-style-type: none"> • Detailed logging • Event monitoring back-up/restore • Configuration • Firmware back-up and rollback <p>Day-2 Operations</p> <ul style="list-style-type: none"> • Drift management • User activity logging • Brownfield on-boarding <p>16G Server support</p> <ul style="list-style-type: none"> • PowerEdge R760 and R660
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You can find a comprehensive list of documentation for this solution at [Info Hub](#).



Learn more about Dell [Bare Metal Orchestrator] solutions



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