Dell Telecom Infrastructure Blocks for Red Hat

A fundamentally smarter, flexible and more efficient way to deploy telco clouds and accelerate telecom transformation and realize AI innovation.

Solution Highlights

When it comes to deploying a 5G core telco cloud and distributed and centralized RAN architectures, Dell Technologies has done the hard work up front, simplifying the deployment, management, and maintenance of cloud-native environments. Dell Telecom Infrastructure Blocks for Red Hat help CSPs:

- **Accelerate the adoption of new technology** by providing fully engineered, flexible, systems with built-in automation that streamlines design, testing and deployment processes.
- **Reduce Risk** by performing continuous integration testing with our cloud platform partners to deliver a robust and performant cloud foundation, all backed by single call support for the entire Infrastructure Blocks cloud stack.
- **Simplify Operations** by delivering a fully integrated and engineered system with automation that enables life cycle management of hardware and unlocks the power of zero touch provisioning to streamline Day 0 to Day 2 tasks.

Building your cloud future on a trusted foundation.

The way that telecommunications networks are built is transforming. Instead of proprietary, single-vendor systems and purpose-built appliances, communications service providers (CSPs) are shifting to cloud-native networks to run Operations and Business Support System (OSS/BSS), Core, RAN and edge workloads that mix containerized software and industry-standard servers from a variety of vendors. These cloud-based networks will need to scale effortlessly, automate day-to-day operations, and adapt quickly to new market opportunities while reducing costs.

Although these solutions share many common characteristics with enterprise clouds, telco clouds will continue to have unique requirements around performance, latency, reliability, resiliency, security, and the services they support. To meet these requirements across a variety of use cases, CSPs need to mix and match solutions from different vendors across the edge, core, and RAN. This introduces the potential for complexity and risk, particularly as CSPs look to integrate multivendor solutions and manage them effectively over the solution life cycle. To accelerate the deployment, simplify management, and reduce the risk of multivendor telecom networks, Dell Technologies has partnered with Red Hat®, a global leader in cloud platform software for telecom networks, to create Dell Telecom Infrastructure Blocks for Red Hat.

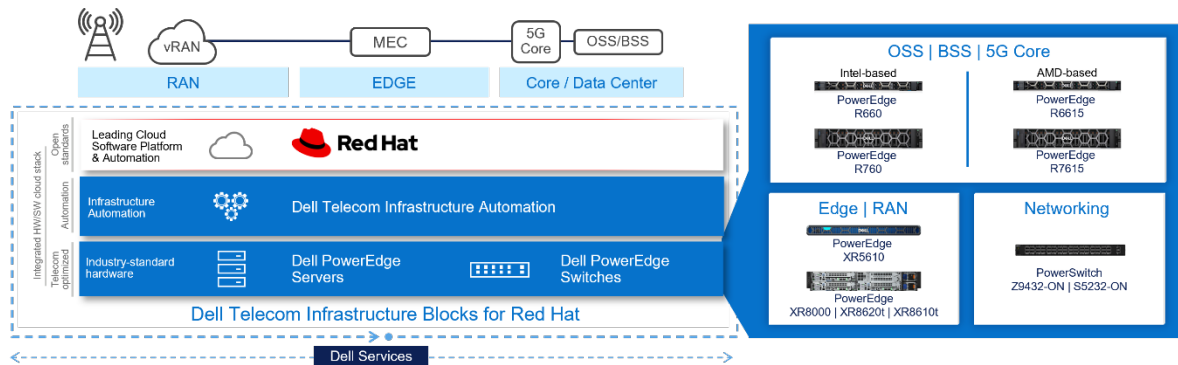## Dell Telecom Infrastructure Blocks for Red Hat.

Figure 1: Dell Telecom Infrastructure Blocks for Red Hat components.

Infrastructure Blocks for Red Hat are an essential foundation for designing, deploying, and managing the life cycle of Red Hat® OpenShift® Clusters used to support 5G Core, OSS/BSS, and virtualized distributed and centralized RAN (vDU/vCU) workloads and telecom 5G network functions. Co-engineered with Red Hat to meet the requirements of specific use cases, Infrastructure Blocks are integrated in Dell's factory. This reduces the time operators must spend planning and designing the infrastructure to meet current and future workload requirements. Infrastructure Blocks also simplify the procurement process by offering pre-packaged, flexible, solutions optimized to meet an operator's use case and scale requirements.

Dell Telecom Infrastructure Block Release Compatibility Matrix

Engineering tested and validated

- Over 231 different HW/SW components, including deployment methods of procedure
- Tested and certified with over 700 use cases
- Pre-integrated factory tested and deployed
- 2 releases per year with additional features and capabilities
- Component level current/backward compatibility matrix
- Solution level product patches, including security fixes
- And more…

Figure 2: Summary of the Dell Telecom Infrastructure Blocks' Engineered Release Compatibility Matrix.

A powerful engineered system.

These engineered systems help CSPs accelerate digital transformation by providing a simple, efficient, and flexible solution for deploying telco clouds. Unlike reference architectures, Infrastructure Blocks for Red Hat offer a complete solution, inclusive of release compatibility matrices (RCM). RCM provides design, architecture, implementation, and upgrade guidelines for the telco cloud, mitigating potential risks, which helps CSPs accelerate their telco cloud implementations. It ensures integration and compatibility across hundreds of components and multiple vendors, delivering a validated end state for Core, Edge, and RAN use cases. Dell continues this meticulous process with every new release and update, reducing the time CSPs spend on integration testing activities so they can focus on strategic initiatives that add customer value.

Infrastructure Blocks also provide an AI-ready cloud stack foundation with NVIDIA L4 and L40S Tensor Core GPU configuration options. CSPs can unlock new AI-driven applications, such as Vision AI for smart video analysis, AI-powered audio tools, and virtual assistants, on a pre-integrated and tested horizontal cloud-native engineered system. Additionally, the GPUs support predictive maintenance, network optimization, and AIOps to streamline telecom operations. Red Hat OpenShift AI and the NVIDIA GPU Operator have also been certified for deployment on Infrastructure Blocks for Red Hat, enabling CSPs to seamlessly integrate cutting-edge AI tools into their ecosystems.

Designed for ultimate flexibility.

Infrastructure Blocks for Red Hat provide CSPs with a highly flexible, AI-ready, engineered telecom cloud solution. Dell has purposely designed Infrastructure Blocks to help CSPs embrace an open ecosystem, ready to support telecom AI use cases. While most engineered solutions limit choice in terms of available configuration options or even how Red Hat software is procured, Infrastructure Blocks for Red Hat empower CSPs to design a Red Hat OpenShift cloud-native network tailored to their specific needs, investments, and strategies.

- **Hardware Choice:**
  - Infrastructure Blocks consist of validated, telco-grade Dell PowerEdge servers with Intel and AMD-based options. There is also a wide variety of network interface cards (NICs) to choose from, allowing you to select and design servers to target your specific use cases.
  - Dell PowerSwitch models S5232-ON and Z9432-ON are optional components in Infrastructure Blocks for Red Hat, simplifying the network configuration of the cloud stack. These switches provide high-density 100/400 GbE connectivity, ensuring optimized network performance for telecom networks. CSPs can leverage these PowerSwitch options to reduce deployment complexity and risks.
- **Red Hat Software Procurement Choice:** CSPs looking for a solid and trusted foundation to support their Red Hat OpenShift cloud deployments may have already invested in this container-as-a-service (CaaS) cloud platform software. For this reason, we enable CSPs to either bring their own subscription or purchase a subscription directly from Dell.
- **Configuration Choice:** One size does not fit all when designing a cloud foundation to support telecom workloads and 5G network functions. With Infrastructure Blocks, you can size your cloud foundation to meet specific requirements across core, edge, and RAN environments. You can tailor the Infrastructure Blocks to meet your use case requirements.

The flexibility provided by Infrastructure Blocks allows you to design and configure a foundation that supports your unique cloud-native 5G telecom network strategy.

Full cloud stack automation.

From infrastructure deployment and life cycle management through to the CaaS, designing an automation strategy for simplicity, efficiency and ease of integration is critical for scalability, longevity, and success. Each CSP may be at a different stage in their transformation and automation strategy, and Infrastructure Blocks for Red Hat are designed to support them every step of the way.

- **Built in infrastructure automation:** The Dell Telecom Infrastructure Automation Suite provides an out-of-the-box automation experience for Infrastructure Blocks. The software uses declarative automation to deploy and manage the life cycle of Infrastructure Blocks' servers, minimizing errors and reducing the need for specialized knowledge. This helps eliminate manual tasks, lower operating costs, and ensure consistent deployment of hardware and software. It includes pre-built workflows for system upgrades and scaling clusters out or in to meet changes in capacity demands. The Automation Suite aggregates telemetry data from Infrastructure Blocks under its management, supporting observability and AIOps (Artificial Intelligence for IT Operations). It also analyzes configuration drift from the desired state and automates remediation to ensure systems remain compliant, reducing manual intervention and minimizing downtime.
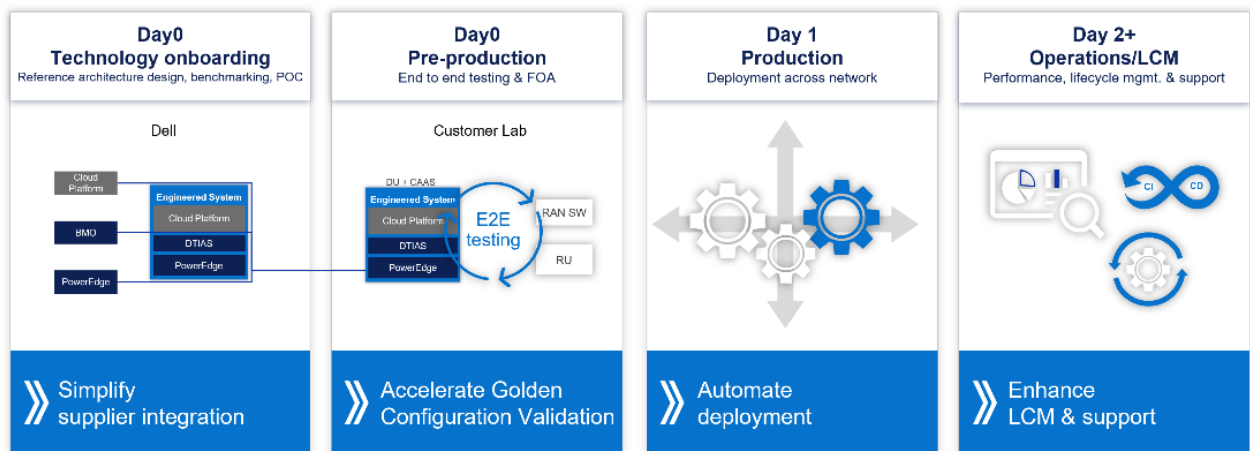

Figure 3: Dell Infrastructure Automation to streamline operations from Day 0 to Day2 and beyond.

- **Extensible automation:** Automation Suite provides northbound APIs for seamless integration with third-party service management and orchestration (SMO) applications. This allows easy integrate the automation suite into any existing SMO applications for the 'best of both worlds' experience. It also allows CSPs to leverage existing investments in automation through plugins for Ansible, Helm and OpenTofu.
- **CaaS layer automation**: Red Hat Advanced Cluster Management for Kubernetes, which is included in the Infrastructure Blocks, provides centralized control over the Kubernetes clusters. Some of the key features include multi-cluster life cycle management, policy-based governance, and advanced application life cycle management. It manages the multiple clusters from a single pane of glass including the cluster deployed on edge, enabling efficient 5G rollouts and edge computing. The platform integrates with Red Hat OpenShift and Ansible Automation Platform to streamline operations, reduce costs, and enhance application availability.

Benefits of Dell Telecom Infrastructure Blocks for Red Hat

18% OpEx savings over 5 years

6% CapEx savings over 5 years

12% TCO saving over 5 years

Figure 4: ACG Research results on potential benefits of deploying telco clouds with Dell Telecom Infrastructure Blocks.

Drive greater operational efficiencies and cost savings.

Infrastructure Blocks for Red Hat can drive greater operational efficiencies resulting in cost savings when deploying Red Hat OpenShift in an operator's network. ACG Research was engaged to develop a TCO model to compare a scenario where a CSP deployed their network using Infrastructure Blocks for Red Hat versus taking a DIY approach to design and deployment using the same PowerEdge servers. The purpose of this model is to demonstrate the savings CSPs could expect to see when deploying a telco cloud from Core to the RAN with Red Hat OpenShift using Infrastructure Blocks for Red hat. According to ACG Research estimates, using Telecom Infrastructure Blocks could result in an 18% OpEx savings, 6% CapEx savings, and a 12% TCO improvement over 5 years.[1]

Everything you need for your cloud to succeed.

A best-of-breed architecture is the best way to build a telco cloud. Yet this can be a challenge for CSPs because it requires the ability to bring together and manage an ecosystem of partners to continuously validate a multitude of hardware and software combinations to support a broad set of use cases. Infrastructure Blocks for Red Hat simplify this process by providing:

- **Comprehensive Telecom Services**: Dell Technologies Services team is standing by to simplify adoption, enabling your teams to focus on innovation. This includes remote or onsite deployment as well as network design, lab validation, integration, telecom cloud advisory and life cycle management services. And all Infrastructure Blocks are backed by a unified support model from Dell Technologies with options that meet carrier grade requirements.
- **Community and Collaboration**: The Open Telecom Ecosystem Community was created by Dell to help foster collaboration in the and accelerate the time-to-market of new telecom services. Complementing the community is the Dell Open Telecom Ecosystem Lab. It provides a secure environment where new solutions can be created, tested, validated, and certified before going to market. By sharing development and knowledge the industry can come together to boost the pace of innovation.
- **Dell Technologies Certification on Dell Telecom Infrastructure Blocks:** This certification program is designed to work with Independ Software Vendors (ISVs) to validate telecom workloads on Infrastructure Blocks to minimize the amount of integration testing CSPs need to perform to deploy their workloads with confidence. This certification program provides a simple and transparent process in our Open Telecom Ecosystem Lab for validating ISV solutions on current and future generations of Infrastructure Blocks.

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[1] Source: ACG Research, "Examining the Impact on Total Cost of Ownership when deploying Telecom Infrastructure Blocks for Red Hat from Core to RAN", February 2024

Build your cloud future today.

Dell Telecom Infrastructure Blocks for Red Hat simplify telecom digital transformation, accelerate AI-driven innovation, and provide a robust foundation for Red Hat OpenShift deployments. With pre-engineered systems, built-in automation and flexible options for configuration, these foundational building blocks empower CSPs to transform their networks with confidence.

Partner with Dell Technologies today and take the next step in building the telecom networks of tomorrow.

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