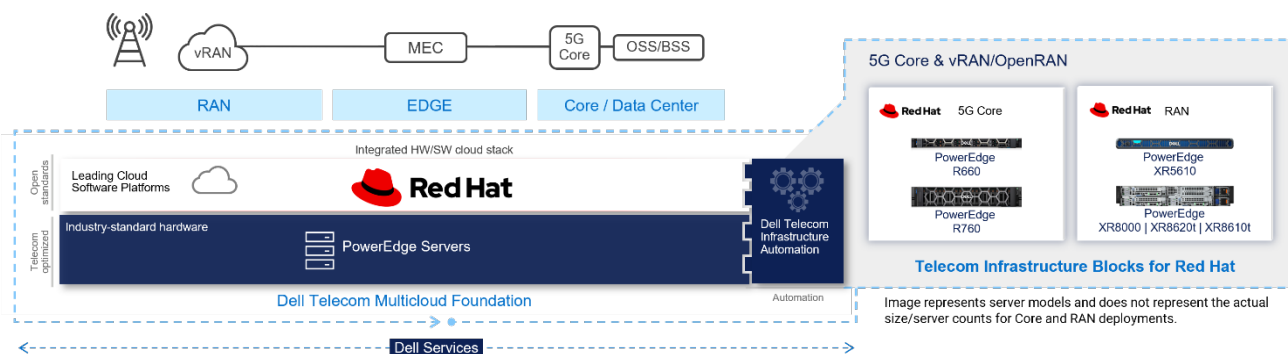# Dell Telecom Infrastructure Blocks for Red Hat r3.0

Featuring Red Hat® OpenShift® Container platform for cloud-native 5G core and RAN networks.

The core and RAN are critical to 5G networks. Dell Technologies, in concert with Red Hat, has developed an integrated, validated, and automated solution that enables CSPs to transition seamlessly from a vertical core architecture to a horizontal, unified cloud environment in their core and extend that architecture to RAN deployments for Red Hat® OpenShift® deployments. Dubbed Dell Telecom Infrastructure Blocks for Red Hat, these engineered systems deliver a complete hardware and software stack optimized for 5G core workloads and edge RAN networks, direct from Dell's factory.

Telecom Infrastructure Blocks for Red Hat are pre-integrated, pre-validated, purpose-built packages of hardware and software designed to support the deployment and lifecycle management of Red Hat OpenShift management and workload clusters on bare metal running 5G core workloads in national and regional data centers. They also extend that management to RAN edge environments, enabling zero touch deployment and orchestration of bare-metal hardware. Dell Telecom Infrastructure Blocks for Red Hat represent the simplest, fastest, and safest way for communications service providers (CSPs) to build and expand their cloud native network from core to RAN.

What is in Telecom Infrastructure Blocks for Red Hat?

In a the 5G telco cloud, Red Hat OpenShift core, distributed core and RAN management and workload clusters are built using Telecom Infrastructure Blocks for Red Hat. The cloud environment configurations are shown in the following diagram.
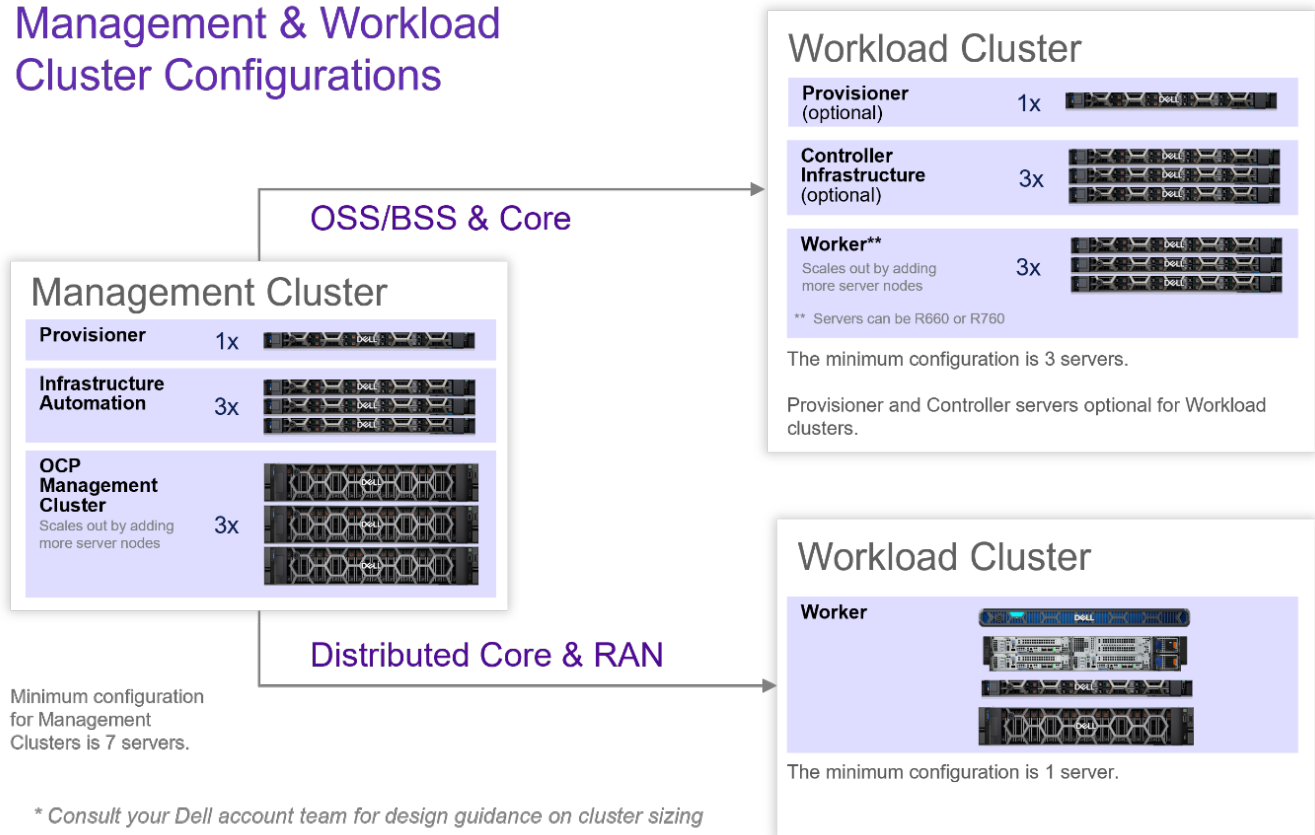
Note: The above image reflects minimum configuration requirements. Regarding maximums:
- The maximum configuration is 504 servers per workload cluster. Design and sizing required.
- For OpenShift edge and RAN workload clusters, one (1) Red Hat Advanced Cluster Management for Kubernetes (ACM) can manage a maximum of 3500 single node. Design and sizing required.

Infrastructure Blocks for Red Hat Components

5G Core

There are five (5) types of nodes that are used to build the Management and Workload 5G core cloud clusters of Infrastructure Blocks for Red Hat. They are the Provisioner, Automation, Red Hat OpenShift Container Platform (OCP) Management Cluster, Controller and Worker Nodes. Each node has all the hardware resources and software licenses needed to build and scale out the management and workload cloud. Each Infrastructure Block also offers various choices for flexible configuration.

5G Core Components and Configuration Quick Links		
Components	**Configuration Options Quick Links**	**Description**
Provisioner Infrastructure Nodes	- PowerEdge R660 - PowerEdge R650	Provisioner Infrastructure Nodes come with Red Hat Enterprise Linux factory installed and includes right to manage licenses for Dell Technologies Infrastructure Automation Suite and right to use licenses for included Red Hat software. The Provision Nodes are responsible for cluster management related tasks. They run the required auxiliary services to bring up the cluster.
Automation Infrastructure Nodes	- PowerEdge R660 - PowerEdge R650	Automation Infrastructure Nodes come with Red Hat Enterprise Linux factory installed and include right to use licenses for Dell Technologies Infrastructure Automation Suite and right to use licenses for the included Red Hat software.
OpenShift Container Platform Management Cluster Nodes	- PowerEdge R760 - PowerEdge R660 - PowerEdge R750	OCP Management Cluster node is a three (3) node hyperconverged OCP cluster that will act as controller/worker/storage node. This node also contains ACM that manages multiple OCP clusters, with right to manage licenses.
Controller Infrastructure Nodes	- PowerEdge R660 - PowerEdge R650	The Controller Infrastructure Nodes include right to manage licenses for Dell Technologies Infrastructure Automation Suite and right to use licenses for Red Hat software. The Cluster Controller which is constructed from three Controller Infrastructure Blocks manages the workloads and schedules them across compute node within the cluster. Kubernetes core components like etcd, API, scheduler etc are running inside Cluster Controller.
Worker Nodes	- PowerEdge R660 - PowerEdge R760 - PowerEdge R750	The Worker Nodes include right to manage licenses for Dell Technologies Infrastructure Automation Suite and Red Hat software.

Distributed 5G Core and RAN

There are five (5) types of Telecom Infrastructure Blocks for Red Hat that are used for the Distributed Core and RAN deployments. They are the Provisioner, Automation, OCP Management Cluster, Controller and Worker Infrastructure Blocks. Each Infrastructure Block has all the hardware resources and software licenses needed to build out and manage edge and RAN cloud environments. Each Infrastructure Block also offers various choices for flexible configuration.

Distributed Core and RAN Components and Configuration Quick Links		
Components	**Configuration Options Quick Links**	**Description**
Provisioner Infrastructure Nodes	• PowerEdge R660 • PowerEdge R650	Provisioner Infrastructure Nodes come with Red Hat Enterprise Linux factory installed and includes right to manage licenses for Dell Technologies Infrastructure Automation Suite and right to use licenses for included Red Hat software. The Provision Nodes are responsible for cluster management related tasks. They run the required auxiliary services to bring up the cluster.
Automation Infrastructure Nodes	• PowerEdge R660 • PowerEdge R650	Automation Infrastructure Nodes come with Red Hat Enterprise Linux factory installed and include right to use licenses for Dell Technologies Infrastructure Automation Suite and right to use licenses for the included Red Hat software.
OpenShift Container Platform Management Cluster Nodes	• PowerEdge R760 • PowerEdge R660 • PowerEdge R650	OCP Management Cluster node is a three (3) node hyperconverged OCP cluster that will act as controller/worker/storage node. This node also contains ACM that manages multiple OCP clusters, with right to manage licenses.
Controller Infrastructure Nodes	• PowerEdge R660 • PowerEdge R650	The Controller Infrastructure Nodes include right to manage licenses for Dell Technologies Infrastructure Automation Suite and for Red Hat software. The Cluster Controller which is constructed from three Controller Infrastructure Blocks manages the workloads and schedules them across compute node within the cluster. Kubernetes core components like etcd, API, scheduler etc are running inside Cluster Controller.
Worker Nodes (vCU/vDU)	• PowerEdge XR8000 / XR8620t • PowerEdge XR8000 / XR8610t • PowerEdge XR5610 • PowerEdge R660 (Compute) • PowerEdge R760 (Compute) • PowerEdge R650 (Compute) • PowerEdge R750 (Compute)	The Worker Nodes include Red Hat software licenses and right to manage licenses for Dell Technologies Infrastructure Automation Suite.

Dell PowerEdge R660

Provisioner Infrastructure Node | Automation Infrastructure Node | OpenShift Container Platform Management Cluster Node | Controller Infrastructure Node | Worker Node

Components	Quantity	Description
Server	1	• PowerEdge R660
CPUs	2	• Intel® Xeon® Gold 6438N 2G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (205W) DDR5-4800 • Intel® Xeon® Gold 6428N 1.8G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (185W) DDR5-4800
Memory	8	• 32GB RDIMM, 4800MT/s Dual Rank
Storage	2	• 3.84TB SSD SAS RI 24Gbps 512e 2.5in Hot-Plug, AG Drive 1DWPD • 1.92TB SSD SAS, RI, up to 24Gbps 512e 2.5in Hot-Plug, AG Drive • 1.6TB SSD SAS Mixed Use up to 24Gbps 512e 2.5in Hot-Plug 3DWPD , AG Drive • 800GB SSD SAS Mixed Use up to 24Gbps 512e 2.5in Hot-Plug, AG Drive
PCIe Riser	1	• Riser Config 3, Full Height, 2x16 FH Slots (Gen5)
NIC / DPU	2	• NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC: Intel E810-XXV Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height (Clifton Channel) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adaptor, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids) • NIC/DPU: Mellanox ConnectX-6 DX Dual Port 100GbE QSFP56 Network Adapter, PCIe Full Height • NIC: Nvidia ConnectX-6 Lx Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height • Broadcom 5720 Dual Port 1GbE Optional LOM
Open Compute Project (OCP) 3.0 Network Adapters	1	• No OCP 3.0 mezzanine NIC card, Blank Filler Only

Dell PowerEdge R660

Provisioner Infrastructure Node | Automation Infrastructure Node | OpenShift Container Platform Management Cluster Node | Controller Infrastructure Node | Worker Node

Components	Quantity	Description
RAID Configuration	1	• C3, RAID 1 for 2 HDDs or SSDs (Matching Type/Speed/Capacity) • C1, No RAID for HDDs/SSDs (Mixed Drive Types Allowed) • T1, RAID 1 + NonRAID + Passthrough
RAID Controller	1	• PERC H755 with rear load Brackets
Embedded System Management	1	• iDRAC9 Datacenter 16G
Power	2	• Dual, Fully Redundant(1+1), Hot-Plug Power Supply,1100W MM(100-240Vac) Titanium
Factory Installed Software	1	• Red Hat Enterprise Linux
Dell Software licenses (3 years)	1	• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)	1	• Red Hat Enterprise Linux (RHEL)

Dell PowerEdge R650

Provisioner Infrastructure Node | Automation Infrastructure Node | OpenShift Container Platform Management Cluster Node | Controller Infrastructure Node | Worker Node

Components	Quantity	Description
Server	1	• PowerEdge R650
CPUs	2	• Intel® Xeon® Gold 6348 2.6G, 28C/56T, 11.2GT/s, 42M Cache, Turbo, HT (235W) DDR4-3200 • Intel® Xeon® Gold 6330N 2.2G, 28C/56T, 11.2GT/s, 42M Cache, Turbo, HT (165W) DDR4-2666
Memory	8	• 32GB RDIMM, 3200MT/s, Dual Rank, 16Gb BASE x8
Storage	4	• 800GB SSD SAS Mixed Use up to 24Gbps 512e 2.5in Hot-Plug, AG Drive
PCIe Riser	1	• Riser Config 0, 2CPU, Half Length, Low Profile, 3 x16 Slots, SW GPU Capable
NIC	1	• NIC: Intel E810-XXV Dual Port 10/25GbE SFP28 Adapter, PCIe Low Profile (Clifton Channel)

Dell PowerEdge R650

Provisioner Infrastructure Node | Automation Infrastructure Node | OpenShift Container Platform Management Cluster Node | Controller Infrastructure Node | Worker Node

Components	Quantity	Description
Open Compute Project (OCP) 3.0 Network Adapters	1	• Intel E810-XXV Dual Port 10/25GbE SFP28, OCP NIC 3.0
RAID Configuration	1	• C3, RAID 1 for 2 HDDs or SSDs (Matching Type/Speed/Capacity) • T1, RAID 1 + NonRAID + Passthrough
RAID Controller	1	• Front PERC H755 Rear Load
Embedded System Management	1	• iDRAC9 Datacenter 15G
Power	1	• Dual, Hot-plug, PSU 1+1
Factory Installed Software	1	• Red Hat Enterprise Linux (RHEL)
Dell Software licenses (3 years)		• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)		• Red Hat OpenShift Container Platform • Red Hat Advanced Cluster Management for Kubernetes • Red Hat Software License for Datacenter ODF Essentials or Ceph

Dell PowerEdge R760

OpenShift Container Platform Management Cluster Node | Worker Node

Components	Quantity	Description
Server	1	• PowerEdge R760
CPUs	2	• Intel® Xeon® Gold 6428N 1.8G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (185W) DDR5-4800 • Intel® Xeon® Gold 6438N 2G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (205W) DDR5-4800
Memory	8	• 32GB RDIMM, 4800MT/s Dual Rank
Storage	2	• 3.84TB SSD SAS RI 24Gbps 512e 2.5in Hot-Plug, AG Drive 1DWPD • 1.92TB SSD SAS, RI, up to 24Gbps 512e 2.5in Hot-Plug, AG Drive • 1.6TB SSD SAS Mixed Use up to 24Gbps 512e 2.5in Hot-Plug 3DWPD, AG Drive • 800GB SSD SAS Mixed Use up to 24Gbps 512e 2.5in Hot-Plug, AG Drive

Dell PowerEdge R760

OpenShift Container Platform Management Cluster Node | Worker Node

Components	Quantity	Description
PCI Riser	1	• Riser Config 3, Half Length, 2x8 FH Slots (Gen4), 2x16 FH Slots (Gen5), 2x16 LP Slots (Gen4)
NIC / DPU	2	• NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC: Intel E810-XXV Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height (Clifton Channel) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adaptor, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids) • NIC/DPU: Mellanox ConnectX-6 DX Dual Port 100GbE QSFP56 Network Adapter, PCIe Full Height • NIC: Nvidia ConnectX-6 Lx Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height • Broadcom 5720 Dual Port 1GbE Optional LOM
Open Compute Project (OCP) 3.0 Network Adapters	1	• No OCP 3.0 mezzanine NIC card, Blank Filler Only
RAID Configuration	1	• C3, RAID 1 for 2 HDDs or SSDs (Matching Type/Speed/Capacity) • C1, No RAID for HDDs/SSDs (Mixed Drive Types Allowed) • T1, RAID 1 + NonRAID + Passthrough
RAID Controller	1	• PERC H755 with rear load Brackets • Front HBA355 Rear Load (for 2.5"x 24 SAS/SATA chassis)
Embedded System Management	1	• iDRAC9 Datacenter 16G
Power	2	• Dual, Fault Tolerant Redundant(1+1),Hot-Plug PSU,1800W MM HLAC(ONLY FOR 200-240Vac)Titanium,C16 Connector
Dell Software licenses (3 years)	1	• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)	1	• Red Hat OpenShift Container Platform • Red Hat Advanced Cluster Management for Kubernetes • Red Hat Software License for Datacenter ODF Essentials or Ceph

Dell PowerEdge R750

OpenShift Container Platform Management Cluster Node | Worker Node

Components	Quantity	Description
Server	1	• PowerEdge R750
CPUs	2	• Intel® Xeon® Gold 6348 2.6G, 28C/56T, 11.2GT/s, 42M Cache, Turbo, HT (235W) DDR4-3200 • Intel® Xeon® Gold 6330N 2.2G, 28C/56T, 11.2GT/s, 42M Cache, Turbo, HT (165W) DDR4-2666
Memory	8	• 32GB RDIMM, 3200MT/s, Dual Rank, 16Gb BASE x8
Storage	2	• 800GB SSD SAS Mixed Use up to 24Gbps 512e 2.5in Hot-Plug, AG Drive
PCIe Riser	1	• Riser Config 2, Half Length, 4x16, 2x8 slots, SW GPU Capable
NIC	1	• NIC: Intel E810-XXV Dual Port 25GbE SFP28 Adapter, PCIe Low Profile (Clifton Channel)
Open Compute Project (OCP) 3.0 Network Adapters	1	• Intel E810-XXV Dual Port 10/25GbE SFP28, OCP NIC 3.0
RAID Configuration	1	• C3, RAID 1 for 2 HDDs or SSDs (Matching Type/Speed/Capacity) • T1, RAID 1 + NonRAID + Passthrough
RAID Controller	1	• Front PERC H755 Rear Load (for 2.5" x24 SAS/SATA chassis)
Embedded System Management	1	• iDRAC9 Datacenter 15G
Power	1	• Dual, Hot-plug, PSU 1+1
Factory Installed Software	1	• Red Hat Enterprise Linux (RHEL)
Dell Software licenses (3 years)		• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)		• Red Hat Enterprise Linux (RHEL) • Red Hat OpenShift Container Platform • Red Hat Advanced Cluster Management for Kubernetes • Red Hat Software License for Datacenter ODF Essentials or Ceph

Dell PowerEdge XR8000r chassis with XR8620t compute sled

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
Chassis Configuration	1	• PowerEdge XR8000r Chassis
Power Supply	1	• Dual, Fully Redundant (1+1), Hot-Plug PSU,1800W MM HLAC (ONLY FOR 200-240Vac) Titanium, C16 Connector, RAF
Server Sleds	1	• PowerEdge XR8620t
RAID Configuration	2	• C30, No RAID for NVME chassis
Memory	4	• 64GB RDIMM, 4800MT/s Dual Rank
Storage	2	• NVMe M.2, PCIE Storage Option with 2x 1.92TB (No RAID)
PCIe Riser	1	• Riser Config 1, 2x16 FHHL + 1x16 FHHL
Embedded System Management	1	• iDRAC9, Datacenter 16G

With 4th Generation Intel® Xeon® Scalable processor (EE)

CPU	2	• Intel® Xeon® Gold 6423N 2G, 28C/56T, 16GT/s, 53M Cache, Turbo, HT (195W) DDR5-4400 • Intel® Xeon® Gold 6433N 2G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (205W) DDR5-4400
NICs / DPU	2	• NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-XXVDA4TGG1 Quad Port 10/25GbE SFP28 Precision Timing Adapter with GNSS, PCIe Full Height (Westport Channel) • NIC: Intel E810-XXVDA4T G1 Quad Port 10/25GbE SFP28 Precision Timing Adapter without GNSS, PCIe Full Height (Westport Channel) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC: Intel E810-CQDA2T GG1 Dual Port 100GbE QSFP28 Precision Timing Adapter with GNSS, PCIe Full Height (Logan Beach) • NIC: Intel E810-CQDA2T G1 Dual Port 100GbE Precision Timing Adapter without GNSS, PCIe Full Height (Logan Beach) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids)

With 4th Generation Intel® Xeon® Scalable processor (SP)

CPU	2	• Intel® Xeon® Gold 6421N 1.8G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (185W) DDR5-4800
NICs	2	• NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids)

Dell PowerEdge XR8000r chassis with XR8620t compute sled

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
		• NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC/DPU: NVIDIA (Mellanox) ConnectX-6 DX Dual Port 100GbE QSFP56 Network Adapter, PCIe Full Height
Dell Software Licenses (3 years)	1	• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)	1	• Red Hat OpenShift Container Platform • Red Hat Advanced Cluster Management for Kubernetes

Dell PowerEdge XR8000r chassis with XR8610t compute sled

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
Chassis Configuration	1	• PowerEdge XR8000r Chassis
Power Supply	1	• Dual, Fully Redundant (1+1), Hot-Plug PSU,1800W MM HLAC (ONLY FOR 200-240Vac) Titanium, C16 Connector, RAF
Server Sleds	2	• PowerEdge XR8610t
RAID Configuration	1	• C30, No RAID for NVME chassis
Memory	8	• 32GB RDIMM, 4800MT/s, Dual Rank
Boot Optimized Storage Cards	1	• BOSS-N1 controller card + with 2 M.2 960GB - RAID 1
PCIe Riser	1	• Riser Config 3, 1x16 FHHL
Embedded System Management	1	• iDRAC9 Datacenter 16G
With 4th Generation Intel® Xeon® Scalable processor (EE)		
CPU	1	• Intel® Xeon® Gold 6433N 2G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (205W) DDR5-4400 • Intel® Xeon® Gold 6423N 2G, 28C/56T, 16GT/s, 53M Cache, Turbo, HT (195W) DDR5-4400

Dell PowerEdge XR8000r chassis with XR8610t compute sled

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
NICs	1	• NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-XXVDA4TGG1 Quad Port 10/25GbE SFP28 Precision Timing Adapter with GNSS, PCIe Full Height (Westport Channel) • NIC: Intel E810-XXVDA4T G1 Quad Port 10/25GbE SFP28 Precision Timing Adapter without GNSS, PCIe Full Height (Westport Channel) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC: Intel E810-CQDA2T GG1 Dual Port 100GbE QSFP28 Precision Timing Adapter with GNSS, PCIe Full Height (Logan Beach) • NIC: Intel E810-CQDA2T G1 Dual Port 100GbE Precision Timing Adapter without GNSS, PCIe Full Height (Logan Beach) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids)

With 4th Generation Intel® Xeon® Scalable processor (SP)

Components	Quantity	Description
CPU	1	• Intel® Xeon® Gold 6421N 1.8G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (185W) DDR5-4800
NICs	1	• NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC/DPU: NVIDIA (Mellanox) ConnectX-6 DX Dual Port 100GbE QSFP56 Network Adapter, PCIe Full Height
Dell Software Licenses (3 years)	1	• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)	1	• Red Hat OpenShift Container Platform • Red Hat Advanced Cluster Management for Kubernetes

Dell PowerEdge XR5610 servers

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
Server	1	• PowerEdge XR5610

Dell PowerEdge XR5610 servers

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
Power Supply	1	• Dual, Fully Redundant(1+1), Hot-Plug Power Supply,1100W MM(100-240Vac) Titanium
RAID Configuration	4	• C20, No RAID with Embedded SATA for SATA HDDs or SATA SSDs (Mixed Drive Types Allowed)
Memory	8 4	• 32GB RDIMM, 4800MT/s Dual Rank • 64GB RDIMM, 4800MT/s Dual Rank
Storage	2	• 960GB SSD SATA Mix Use 6Gbps 512 2.5in Hot-plug AG Drive
PCIe Riser	1	• Riser Config 3, 2x16 FHHL Gen5
Embedded System Management	1	• iDRAC9, Datacenter 16G
Chassis Configuration	1	• Front Port Access Chassis with up to 4 SATA Drives (Onboard SATA), RAF

With 4th Generation Intel® Xeon® Scalable processor (EE)

CPU	2	• Intel® Xeon® Gold 6423N 2G, 28C/56T, 16GT/s, 53M Cache, Turbo, HT (195W) DDR5-4400 • Intel® Xeon® Gold 6433N 2G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (205W) DDR5-4400
NICs	2	• NIC: Intel E810-XXV Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height (Clifton Channel) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-XXVDA4TGG1 Quad Port 10/25GbE SFP28 Precision Timing Adapter with GNSS, PCIe Full Height (Westport Channel) • NIC: Intel E810-XXVDA4T G1 Quad Port 10/25GbE SFP28 Precision Timing Adapter without GNSS, PCIe Full Height (Westport Channel) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC: Intel E810-CQDA2T GG1 Dual Port 100GbE QSFP28 Precision Timing Adapter with GNSS, PCIe Full Height (Logan Beach) • NIC: Intel E810-CQDA2T G1 Dual Port 100GbE Precision Timing Adapter without GNSS, PCIe Full Height (Logan Beach) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids) •

With 4th Generation Intel® Xeon® Scalable processor (SP)

CPU	1	• Intel® Xeon® Gold 6421N 1.8G, 32C/64T, 16GT/s, 60M Cache, Turbo, HT (185W) DDR5-4800 • Intel® Xeon® Gold 6423N 2G, 28C/56T, 16GT/s, 53M Cache, Turbo, HT (195W) DDR5-4400

Dell PowerEdge XR5610 servers

Worker Node (vCU/vDU) (Distributed Core and RAN)

Components	Quantity	Description
NIC / DPU	2	• NIC: Intel E810-XXV Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height (Clifton Channel) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Low Profile, 100GbE max bandwidth (Chapman) • NIC: Intel E810-CQDA2 Dual Port 100GbE QSFP28 Adapter, PCIe Full Height, 100GbE max bandwidth (Tacoma Rapids) • NIC: Intel E810-XXVDA4 Quad Port 10/25GbE SFP28 Adapter, PCIe Full Height (Salem Channel) • NIC/DPU: NVIDIA (Mellanox) ConnectX-6 DX Dual Port 100GbE QSFP56 Network Adapter, PCIe Full Height • NIC: Nvidia ConnectX-6 Lx Dual Port 10/25GbE SFP28 Adapter, PCIe Full Height
Dell Software Licenses (3 years)	1	• Dell Telecom Infrastructure Automation Foundation (includes Bare Metal Orchestrator)
Red Hat Software Subscription (3 years)	1	• Red Hat OpenShift Container Platform • Red Hat Advanced Cluster Management for Kubernetes

Dell Services

Dell Technologies offers a range of services and support options to support Day 0 through Day 2 operations.

While Dell Telecom Infrastructure Blocks provide an engineered system that is ready for deployment out of the box, some operators may require custom configurations to meet specific outcomes. Dell ProDeploy for Telecom Networks enables you to quickly operationalize critical network infrastructure with agility and scale. During Day 0 operations, Dell Services can work with you to develop optimized designs through custom intake that outlines requirements, collaborate in workshops to define outcomes, and fine-tune designs for peak performance, scalability, and cost-effectiveness. Dell Services can also support Day 1 operations by providing tailored integration services from onsite racking and stacking of hardware and network integration, to remote installation and support, to network design and validation. This allows operators to deploy at any scale anywhere in their network. Dell Services can deliver custom configurations direct from Dell factories to streamline operator processes to meet unique requirements.

Every Telecom Infrastructure Block is backed by one call support for the entire hardware and software stack. This eliminates the need for you to determine if it is a hardware or software issue, you just call Dell. And, with Dell's carrier grade support, operators receive guaranteed response times of under 15 minutes and guaranteed service restoration times under four hours.[*]

We are open to innovation

Dell Technologies is committed to open telecom solutions, from OpenStack and Kubernetes to Open RAN. Dell Telecom Infrastructure Blocks for Red Hat allow CSPs to quickly deploy, easily manage, and seamlessly scale OpenShift clusters to support 5G Core, Edge and RAN workloads while driving cost and complexity out of the network. Dell Technologies supports each of our Infrastructure Blocks across the entire stack to eliminate finger-pointing between vendors. There is one trusted source for procurement, deployment, and lifecycle management—backed by a global supply chain and a world-class team of telecom service professionals. When it comes to building telecom clouds, nothing else stacks up to Dell Telecom Infrastructure Blocks for Red Hat.

[*] Availability and terms of Dell Technologies services vary by region and by product. For more information

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