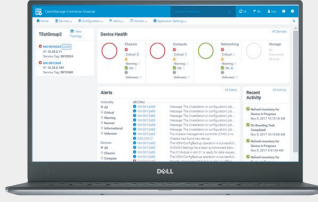# DELL EMC PowerEdge

DELLTechnologies

POWEREDGE MODULAR INFRASTRUCTURE

Dell EMC PowerEdge Modular Infrastructure is built from the ground up for the software defined data center. The PowerEdge platform is designed to support the right balance of density, capacity, and flexibility to meet the needs of both traditional and cloud-native workloads. The Dell EMC kinetic infrastructure extends the benefits of modular design benefits to individual storage devices with built-in future-proofing to easily support configurations down to memory-centric devices. Shared pools of disaggregated compute, storage and fabric resources can be dynamically configured, and reconfigured, for workload and infrastructure optimization. Reduce over provisioning and stranded assets, and boost performance and efficiency by creating on-the-fly capacity. And the OpenManage portfolio delivers innovative systems management that makes you more efficient and your infrastructure more productive and reliable. Choose PowerEdge Modular Infrastructure for worry free IT that is secure and scalable - without compromises.

Dell EMC offers a range of modular solutions to meet the needs of any environment or workload.

PowerEdge MX	PowerEdge FX	PowerEdge VRTX
PowerEdge MX kinetic infrastructure, designed for the modern software-defined data center, delivers optimal utilizaiton, productivity and efficiency. With an industy-leading no midplane and scalable fabric architecture, PowerEdge MX will support new processor technologies, new storage types, and new connectivity innovations well into the future. This modular 7U integrated solution designed for enterprise data center density with easy deployment and management is ideal for a variety of workloads including dense virtualization, software-defined workloads, including SDS and HCI, and big data environments.	PowerEdge FX2 is the foundation for an extremely flexible and efficient platform that precisely fits your computing needs. Drive IT transformation with the PowerEdge FX architecture to scale workloads quickly, as needed, adding resources incrementally with efficient chassis management. The FX2 chassis is a hybrid 2U rack integrated solution with the scalable, compact performance and efficiencies of compute sleds, combined with the flexibility and simplicity of racks.	PowerEdge VRTX modular infrastructure solution offers "under your desk" dimensions, ease of management and quiet acoustics so you can operate non-disruptively. Features such as Fresh Air validated configurations and standard power options help keep your operating expenses in check. Address a wide variety of workloads with compute, storage and networking options within a single chassis. The VRTX chassis is a single tower, rack-capable, integrated solution optimized for greater simplicity, versatility and efficiency for small, remote/branch offices.

Dell EMC PowerEdge servers and OpenManage systems management solutions deliver intelligent automation directly into your data center.

Embedded Management

Dell EMC PowerEdge servers feature powerful, built-in embedded management for modular infrastructures. Embedded management enables IT Pros to effortlessly deploy, update, manage and monitor everything within the chassis – servers, storage and switches. These management solutions work seamlessly with the agent-free integrated Dell Remote Access Controller (iDRAC) and Lifecycle Controller (LC).

OpenManage Enterprise – Modular Edition (OME- Modular)	Chassis Management Controller (CMC)
OME-Modular helps you transform how you manage the infrastructure and enable the business quickly. A unified web/RESTful API interface manages all nodes including compute, storage and networking. This helps reduce costs, learning curve and consolidates multiple tools for ease of access and monitoring. Simplified administration helps deploy and monitor at scale, from one to many chassis, with support for remote management. Agile, intelligent automation drives faster hardware rollouts and reduces repetitive tasks for accelerated lifecycle management. Advantages: • Manage servers across multiple MX chassis • Deploy faster with auto-chassis and node discovery • Comprehensive RESTful API helps automate multiple tasks and integrate to third party tools • Enhance management with redundant OME-Modular module, Touchscreen LCD and Quick Sync 2 options for remote access • Expand management across all PowerEdge servers with OpenManage Enterprise	The CMC is an embedded systems management solution that combines robust management of hardware and software to help IT Pros manage Dell EMC PowerEdge FX, VRTX and M1000e systems. Easily deploy and manage servers, storage and networking within a simple browser-based console and CLI interface.

PowerEdge Architecture	PowerEdge MX	PowerEdge FX2/PowerEdge FX2S	PowerEdge VRTX
Form factor	7U enclosure with 8 slots	Full-width, 2U enclosure	Tower or 5U rack modular chassis
Description	Modular chassis that accommodates a variety of compute and storage sled combinations, connected by high-speed fabrics, sharing power, cooling and managed by embedded OpenManage Enterprise – Modular Edition systems management	An industry standard 2U rack-mount chassis that supports shared, redundant power and cooling, I/O fabric and management infrastructure and accommodates compact, customizable blocks of server storage and networking.	Integrates servers, storage, networking and management into a quiet data center under your desk
I/O slots	2 USB 2.0 Type A or KVM control (keyboard and mouse only) 1 Mini Display Port connector for video	FX2s: Supports up to 8 low-profile/half-length PCIe 3.0 modules	Up to 8 PCIe slots
Server Sleds	Up to 8 PowerEdge MX740c Up to 4 PowerEdge MX840c	Up to 8 FC430 Up to 4 FC640 Up to 2 FC830 Up to 1 FC830 mixed with up to 2 FC640	Up to 4 M640 Up to 2 M830
Storage Sleds	Up to 7 PowerEdge MX5016s	FX2S: Up to 2 FD332 mapped to 4 FC430 Up to 3 FD332 mapped to 1 FC640 Up to 2 FD332 mapped to 2 FC640 Up to 2 FD332 mapped to 1 FC830	Internal: Up to 12 x 3.5" or 25 x 2.5" drives (SED available) External: Up to four MD1200 (12 x 3.5" drives) or MD1220 (24 x 2.5" drives)
Power Supplies	Up to 6 PSUs; Platinum rated – 3000W output with high line AC input; N+1 or Grid redundancy support	Hot-plug PSUs: Platinum rated – 2400 W, 2000 W, or 1600WAC in 1+1 redundant or ROA or 2+0 non-redundant configurations	Supports up to four 1100 W or 1600 W AC power supply units (PSU) in 3+1 and 2+2 redundant configurations
Fans	5 80 mm rear and 4 60mm front hot-swap fans	8 hot-swappable fans provide cooling to the I/O components in the system	6 hot-pluggable, redundant fan modules and 4 blower modules
I/O and Ports	Up to 2 pairs of redundant general-purpose switch or pass-through modular bays (Fabrics A and B); redundant pair of storage specific switch bays (Fabric C) Up to 25Gbps Ethernet, 32Gbps Fibre Channel, 12Gbps SAS	Choice of 3 Dell EMC modules: FN410s 4-ports SFP+, FN410t 4-port 10Gb Base-T, FN2210s 4-port Combination of 2 Fibre Channel and 2 Ethernet ports, or 2 pass-through modules.	Internal 1GbE 24-port switch Internal 10GbE switch Internal 1GbE 8-port pass-through module
Embedded Management	OpenManage Enterprise – Modular Edition (OME-Modular); running on up to 2 redundant MX9002m management modules Quick Sync 2 Bluetooth Low Energy (BLE)/ wireless module option	One Chassis Management Controller (CMC)	Chassis Management Controller (CMC)

PowerEdge MX Components	MX750c	MX740c	MX840c	MX5016s
Form factor	Single-width, 2-socket server sled	Single-width, 2-socket server sled	Double-width, 4-socket server sled	Single-width, direct-attached storage sled
Description	High-performance modular compute sled with exceptional scale	Efficient, feature-rich modular server for modern data center	Scalable, high-performance modular server for modern data center	Dense, scale-out storage sled with flexible performance and capacity options
Ideal workloads	Virtualization, power, thermal, system management, and usability workloads	Virtualization, software-defined, collaborative workloads	Software-defined and demanding, database-driven workloads	SDS (vSAN), SQL, ERP and dense virtualization
Chassis enclosure	Up to 8 sleds per MX7000 7U chassis	Up to 8 sleds per MX7000 7U chassis	Up to 4 sleds per MX7000 7U chassis	Up to 7 sleds per MX7000 7U chassis Requires a minimum 1 compute node in a chassis with storage sleds
Processor	2 x 3rd Generation Intel Xeon Scalable processors with up to 40 cores per processor	Up to two 2nd Generation Intel® Xeon® Scalable processors, with up to 28 cores per processor; TDP 70-205W	Two or four 2nd Generation Intel® Xeon® Scalable processors, with up to 28 cores per processor; TDP 70-205W	Not Applicable
Memory	32 DDR4 DIMM slots, supports RDIMM max 2TB or LRDIMM max 4TB, speeds up to 3200 MT/s. Up to 16 Intel Persistent Memory 200 series (BPS) slots, max 8TB	24 DIMMs in total; supports DDR4 RDIMMs, LRDIMMs, NVDIMM-Ns Maximum capacity: (RDIMM): 1.5TB (LRDIMM): 3TB (NVDIMM-N): 192GB DDR4 speeds up to 2933 MT/s	48 DIMMs in total; supports DDR4 RDIMMs, LRDIMMs, NVDIMM-Ns Maximum capacity: (RDIMM): 3TB (LRDIMM): 6.1TB (NVDIMM-N): 192GB DDR4 speeds up to 2933 MT/s	Not Applicable
Disk	4 x 2.5-inch or 6 x 2.5-inch SAS/SATA (HDD/SSD)	Up to 6 x 2.5" SAS/SATA (HDD/SSD) or NVMe PCIe SSD drives plus optional M.2 boot	Up to 8 x 2.5" SAS/SATA (HDD/SSD) or NVMe PCIe SSD drives plus optional M.2 boot	Up to 16 x 2.5" SAS (HDD/SSD) per storage sled
NVMe	Up to 6 Express Flash NVMe PCIe SSD drives	Optional support for up to 6 Express Flash NVMe PCIe SSD drives	Optional support for up to 8 Express Flash NVMe PCIe SSD drives	Not Applicable
PCIe slots	1 x16 PCIe Gen4 slot for Mezz A 1 x16 PCIe Gen4 slot for Mezz B 1 x16 PCIe Gen4 slot for mini-Mezz card 1 x16 PCIe Gen4 slot for PERC 2 x8 PCIe Gen4 connectors for NVMe drive connected to processor 1 1 x8 PCIe Gen4 connector for NVMe drive connected to processor 2 2 x4 PCIe Gen3 slots for BOSS M.2 HW RAID card	2 PCIe 3.0 x16 mezzanine slots (Fabric A and B) 1 PCIe 3.0 x16 mini-mezzanine slot (Fabric C)	4 PCIe 3.0 x16 mezzanine slots (Fabric A and B) 2 PCIe 3.0 x16 mini-mezzanine slot (Fabric C)	Not Applicable
Security	TPM 1.2/2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ, Digitally Signed Firmware, Chassis Intrusion Alert, Secure Boot, Secure Erase, Silicon Root of Trust, System Lockdown (requires iDRAC Enterprise or Datacenter)	TPM 1.2/2.0 optional Cryptographically signed firmware Silicon Root of Trust, Secure Boot, System Lockdown (requires iDRAC Enterprise or Datacenter), Secure Erase		Not Applicable

PowerEdgeFX Components	PowerEdge FC830	PowerEdge FC640	PowerEdge FC430	PowerEdge FD332
Form factor	Full-width, 1U, 4-socket server sled	Half-width, 1U, 2-socket server sled	Quarter-width, 1U, 2-socket server sled	Half-width, 1U, storage sled
Description	Powerhouse with dense compute, memory scalability and extensive storage	Flexibility and performance with best-in-class density	Right balance of performance, memory and I/O	Ultimate dense direct-attached storage with unprecedented flexibility
Ideal workloads	Virtualized database – SAN, dense performing compute and performance database	Dense virtualization, rack server consolidation, software defined storage, business computing (CRM, ERP), enterprise HPC, big data analytics, database, private and hybrid cloud environments	Data centers that seek dense virtualization, software defined storage, dense HPC and small Hadoop clusters	Dense software defined storage, Hadoop Clusters, local database and dense DAS
Chassis enclosure	Up to 2 sleds per PowerEdge FX2/FX2S 2U rack-mount chassis	Up to 4 sleds per PowerEdge FX2/FX2S 2U rack-mount chassis	Up to 8 sleds per PowerEdge FX2/FX2S 2U rack-mount chassis	Up to 3 sleds per PowerEdge FX2S 2U rack-mount chassis. Requires at minimum 1 compute sled.
Processor	Up to four Intel® Xeon® processor E5-4600 v4 product family processor, with up to 22 cores per processor	Up to two 2nd generation Intel Xeon Scalable processors, with up to 28 cores per processor	Up to two Intel Xeon processor E5-2600 v4 processors, with up to 18 cores per processor	Not Applicable
Memory	48 DDR4 DIMM slots, 1.5TB max. Speeds up to 2400MT/s	16 DDR4 DIMMs slots, 2TB max. Supports RDIMM / LRDIMM, speeds up to 2933MT/s	8 DDR4 DIMMs slots, 512GB max, with speeds up to 2400MT/s	Not Applicable
Disk	Front drive bays: Up to 8 x 2.5" SAS/SATA/ (HDD/SSD)	Front drive bays: Up to 2 x 2.5" SAS/SATA/ (HDD/SSD)	Front drive bays: Up to 2 x 1.8" SATA SSDs	Up to 16 x SFF storage devices per FD332 SATA/SAS (HDD/SDD)
NVMe	Optional support for up to 2 Express Flash NVMe SSD	Optional support for up to 2 Express Flash NVMe SSD	Not Applicable	Not Applicable
PCIe slots	Access up to 8 PCIe 3.0 expansion slots in FX2S chassis	Access up to 8 PCIe 3.0 expansion slot in FX2S chassis	Access up to 2 PCIe 3.0 expansion slot in FX2S chassis	Not Applicable
Security	TPM 1.2/2.0 optional Cryptographically signed firmware Secure Boot	TPM 1.2/2.0 optional Cryptographically signed firmware Hardware root of trust Secure Boot System Lockdown (requires iDRAC Enterprise or Datacenter) System Erase	TPM 1.2/2.0 optional Cryptographically signed firmware Secure Boot	Not Applicable

PowerEdge VRTX and M1000e Components	PowerEdge M830	PowerEdge M640	PS - M4110
Form factor	Full-height blade, 4-socket server sled	Half-height blade 2-socket server sled	Double-wide, half-height blade storage
Description	Designed to boost application performance,consolidation and time-to-value in data center or remote office applications	Designed for high performance with best-in-class density for exceptional scalability	Enables a fully virtualized solution integrating storage, servers and networking within one blade chassis
Ideal workloads	Ideal for memory-intensive, I/O-intensive or heavy-use workloads in exceptionally demanding databases, technical computing and virtualized environments	Virtualization, software defined storage, HPC applications	Offers multiple configurations to address mission-critical, high-performance workloads and high-capacity workloads
Chassis enclosure	2 sleds per PowerEdge VRTX 8 sleds per PowerEdge M1000e	4 sleds per PowerEdge VRTX 16 sleds per PowerEdge M1000e	4 PS-M4110 arrays per M1000e chassis
Processor	Up to two Intel Xeon processor E5-4600 v4 processors with up to 22 cores per processor	Up to two 2nd generation Intel Xeon Scalable Processors, up to 28 cores per processor	Processors included within the array
Memory	48 DIMMs in total; Supports RDIMM/ LRDIMM, speeds up to 2400MT/s, 3TB max	16 DDR4 DIMMs in total; Supports RDIMM /LRDIMM, speeds up to 2933MT/s, 2TB Max ECC Registered DDR4	Dual controllers with 2GB non-volatile memory per controller
Disk	Up to 12 x 1.8" SSD, up to 4 x 2.5" SAS/SATA (HDD/SSD), up to 2 x 2.5" SAS/SATA (HDD/SSD)	Up to 2 x 2.5" SAS/SATA (HDD/SSD)	Up to 14 x 2.5" SAS/SATA HDD or up to 9 x 2.5" SAS HDD and up to 6 SSD
NVMe	Optional support for up to 2 x 2.5" Express Flash NVMe SSD	Optional support for up to 2 x 2.5" Express Flash NVME SSD	Not Applicable
PCIe slots	2 x PCIe 3.0	2 x PCIe 3.0	Not Applicable
Security	TPM 1.2/2.0 optional Cryptographically signed firmware Secure Boot	TPM 1.2/2.0 optional Cryptographically signed firmware Hardware root of trust Secure Boot System Lockdown (requires iDRAC Enterprise or Datacenter) System Erase	CHAP authentication; access control for iSCSI; access control for management interfaces including RADIUS support; IPSEC and SED

PowerEdge XR4000 Components	PowerEdge XR4510c	PowerEdge XR4520c	PowerEdge XR4000w
Form factor	1U, single-width, 1-processor server sled	2U, single-width, 1-processor server sled	2U, single-width 1-processor witness sled
Description	The smallest form-factor compute sled for the XR4000, perfect for adding compute density into small spaces.	The larger form-factor compute sled adding 2 PCIe risers to the 1U sled. These PCIe slots are FHFL and allow for the addition of storage, GPUs, and/or networking cards.	Enables a fully virtualized solution integrating storage, servers and networking within one blade chassis
Ideal workloads	vSAN, video surveillance, point-of-sale, digital signage, and data compression.	vSAN, video surveillance, point-of-sale, digital signage, and data compression.	VDI, vSAN or VM
Chassis enclosure	Up to 4 sleds per PowerEdge XR4000r and up to 2 sleds per XR000z chassis.	Up to 2 sleds per PowerEdge XR4000r and one sled per XR000z chassis.	One optional witness sled per PowerEdge XR4000r and XR000z.
Processor	One 3rd Generation Intel Xeon D Scalable processor with up to 20 cores	One 3rd Generation Intel Xeon D Scalable processor with up to 20 cores	One Intel Atom C3508 series processor
Memory	4 x DDR4 DIMM slots, supports RDIMM 256 GB max and LRDIMM 512 GB max, with speeds up to 3200 MT/s	4 x DDR4 DIMM slots, supports RDIMM 256 GB max and LRDIMM 512 GB max, with speeds up to 3200 MT/s	16GB DDR4 ECC DIMMs (soldered on system board)
Disk	Not Applicable	Not Applicable	Not Applicable
NVMe	2 x M.2 NVMe SSDs on BOSS-N1 card	2 x M.2 NVMe SSDs on BOSS-N1 card 4 x M.2 NVMe SSDs on M.2 riser module 8 x M.2 NVMe SSDs on PCIe Add-in card	1 x M.2 NVMe SSD
PCIe slots	Not Applicable	Up to 2 x 16 PCIe (Gen 4) Full height, full length	Not Applicable
Security	Cryptographically signed firmware Secure Boot Secure Erase Silicon Root of Trust System Lockdown (requires iDRAC9 Enterprise or Datacenter) TPM 2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ	Cryptographically signed firmware Secure Boot Secure Erase Silicon Root of Trust System Lockdown (requires iDRAC9 Enterprise or Datacenter) TPM 2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ	Not Applicable

Dell EMC Solutions

When you buy a Dell EMC server, you get more than just hardware. You get access to IT solutions end-to-end. Dell and EMC together bring industry-leading expertise into a common platform to help you transform your data center. Dell EMC can deliver PowerEdge technology at any level of integration – from a best-in-breed platform, to a pre-integrated fully turnkey hybrid cloud implementation or any step in-between. Combining the PowerEdge server infrastructure with Dell Services and Financial Solutions allows you to modernize your data center faster, more affordably and with less risk.

Dell EMC Data Center Infrastructure

Dell EMC Data Center Infrastructure (DCI) simplifies and manages critical infrastructure in and around the data center serving the needs of your business. A complete portfolio of racks, power and cooling solutions lets you scale as your data center needs grow.

Dell EMC Services

To fully implement a modern infrastructure, organizations require reliable, comprehensive IT services to drive IT transformations,

accelerate adoption of new technologies and maximize productivity.

Architect: Get started with our IT Transformation Workshop to accelerate your transformation to becoming an agile business partner and broker of services to the business.

Implement: The ProDeploy Enterprise Suite and Residency help you get more out of your new technology starting day one. Trust Dell EMC experts to lead deployments from basic hardware installations through planning, configuration and complex integrations.

Manage: The ProSupport Enterprise Suite ensures 24x7 access to elite ProSupport engineers along with automated proactive and predictive service enabled by SupportAssist. Our personalized service and preventative measures help you get ahead of problems before they happen.

Systems Management

Spend less time on routine maintenance and stay focused on your business-critical priorities, thanks to the intelligent automation capabilities of PowerEdge servers. OpenManage™ System Management means your servers can take care of themselves, with zero touch configuration, proactive support notification and easy system erase when it is time for systems to be retired or redeployed. With iDRAC's agent-free server management, you can utilize consistent methods to manage servers regardless of the installed OS and workloads. You can remotely manage PowerEdge servers via scripts with the new, Redfish-compliant iDRAC Restful API, Dell EMC and third-party consoles, or legacy APIs.

The Chassis Management Controller (CMC) efficiently manages servers, storage and networking within PowerEdge modular infrastructure in a single console.
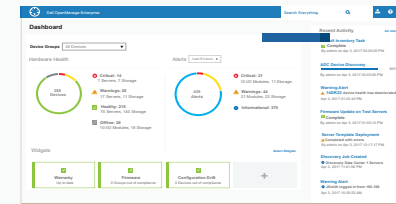
"Dell EMC PowerEdge servers are the foundation of the work we do here. They provide the automation, the security, the flexibility, and the reliability to make sure that we can continue to focus on what we do best as a company."
— Ryan Gariepy Co-founder and Chief Technology Officer, OTTO Motors

"Anana has seen the costs of infrastructure scaling fall around 30 percent through the combined power of the Dell EMC FX architecture and VSAN."
— Gareth Evans, Head of infrastructure, Anana

"PowerEdge FX2 provided us with a lot of performance and functionality. It was the right time for us to transition from a client-server model to a server-based computing model."
— Niels Vogels, IT Manager, Govers
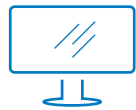
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