

Dell PowerEdge 13th generation: Future-Ready IT



Boosting application performance

Bringing storage closer to compute and enabling software defined storage

- Accelerates mission critical databases
- Increases the number of concurrent users and transactions
- Makes much larger data sets possible
- Doubles data throughput
- Optimizes data placement thru tiering
- Enables software defined storage



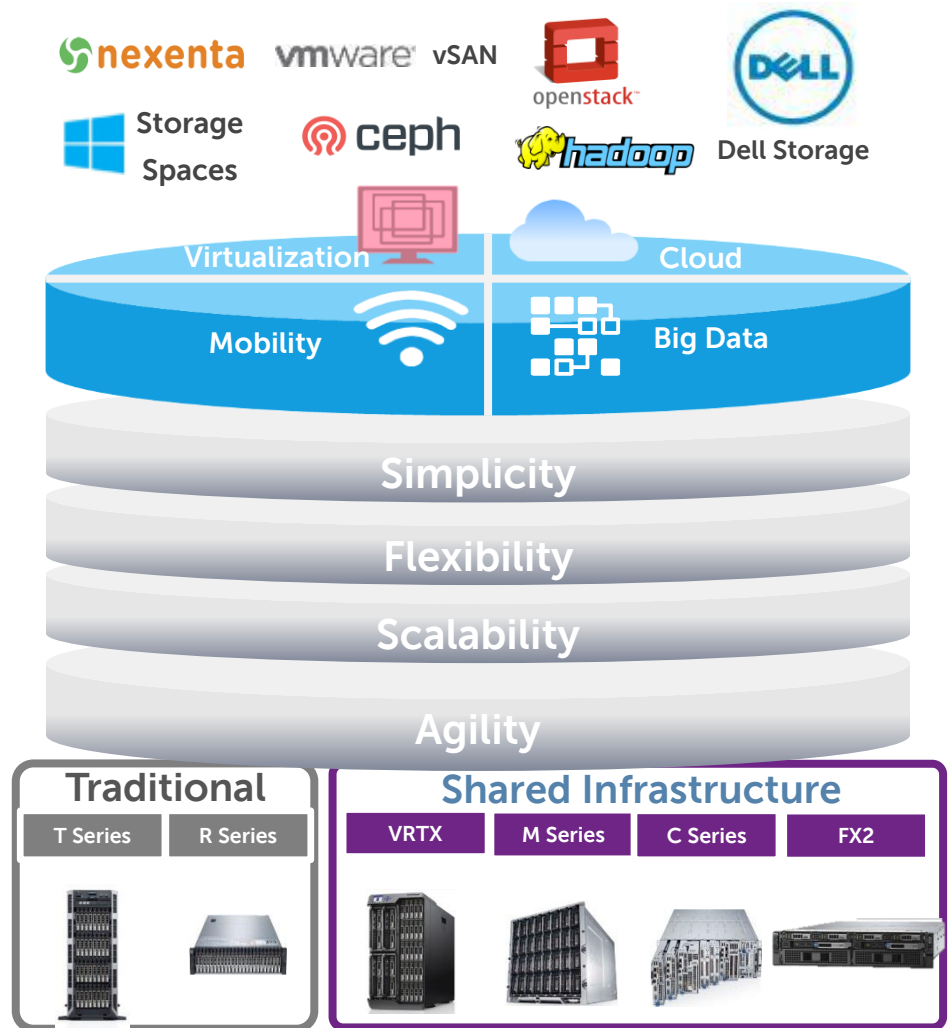
Storage enhancements

- Express Flash - industry's first and only hot plug PCIe SSDs
- Cost effective 1.8" SATA flash – 2.4 times faster
- Increased local storage capacities
- Storage tiering within the server
- High performance RAID and dual RAID zoning
- High performance caching (DAS & SAN)



Software Defined Storage PowerEdge Servers

- ❑ **Simplify** your IT with the convergence of server, networking, and storage for higher efficiency
- ❑ Combine compute, storage, and I/O blocks for greater **flexibility** and **agility**
- ❑ Historically storage solutions have been sold primarily as appliances that are difficult to **address dynamic workloads**
- ❑ **Adaptability** and **scalability** of SDS allows for expansion of storage similar to adding a VM versus the process of extending physical storage
- ❑ Protect your investment with open standards platforms



Flash storage leadership

Dense 1.8" SSD and 2.5" NVMe PCIe SSD

Delivering high performance, durability and flexibility



- **SSD optimized** server configurations to accelerate your database performance

- OLTP workloads
- Online analytics
- CRM



- **Unsurpassed performance-** High IOPS and Ultra Low Latency

- **\$ per 1000 IOPS** vs Fusion I/O solution



- **Building blocks** for Dell Fluid Cache for SAN and the new SanDisk DAS Cache



- **Front access**, hot plug to simplify management
-

PowerEdge Express Flash NVMe PCIe SSDs

Drive the storage performance of your applications



*400GB, 800GB and 1.6TB Capacity points
High Endurance (life) MLC based devices*

- **Unsurpassed Performance**- High IOPS and Ultra Low Latency
- **Innovation** – First to Market with Front access, hot-plug NVMe PCIe-SSDs
- **Technology Leadership** - Driving Industry Standards – NVMe, 2.5" form factor drive
- Device-based flash management
- **Wide range of applications** including:
 - › Online transactional processing (OLTP)
 - › Online analytical processing (OLAP)
 - › Collaborative (SharePoint) environments
 - › Virtualization (Hyper-V)

For more information: www.dell.com/poweredge/expressflash

Common slot backplane technology

Maximize the flexibility of server storage

Available for both the R630 10 x 2.5" and R730xd 24 x 2.5" backplanes



4 Common Slots can support either SAS/SATA drives or NVMe PCIe SSD



- Four common slots support any enterprise storage media
- Solution in 1U or 2U for Dell Caching Acceleration
- Provides maximum storage tiering flexibility*
- Cache options to support Dell Fluid Cache for SAN and SanDisk DAS Cache
- Mix and match flexibility
 - PERC controller knows if common slots have SAS/SATA drives or PCIe SSD
 - No setting to adjust. Plug and go!

*tiering supported with applications such as Microsoft Storage Spaces

High performance PERC option: H730P

Drive the storage performance of your applications

Supports 3Gb/s, 6Gb/s & 12Gb/s SAS and SATA hard disk drives (HDD) and solid state devices (SSD) and leverages 2GB NV Cache for optimal RAID performance.



- 12Gbps SAS Capable
- Doubling of performance (IOPs): PERC8-375K → PERC9-750K
- *2GB NV Cache*
- Dual Mode capable – RAID & Pass-Thru
- Support for SAS Zoning – Dual PERCs at the server

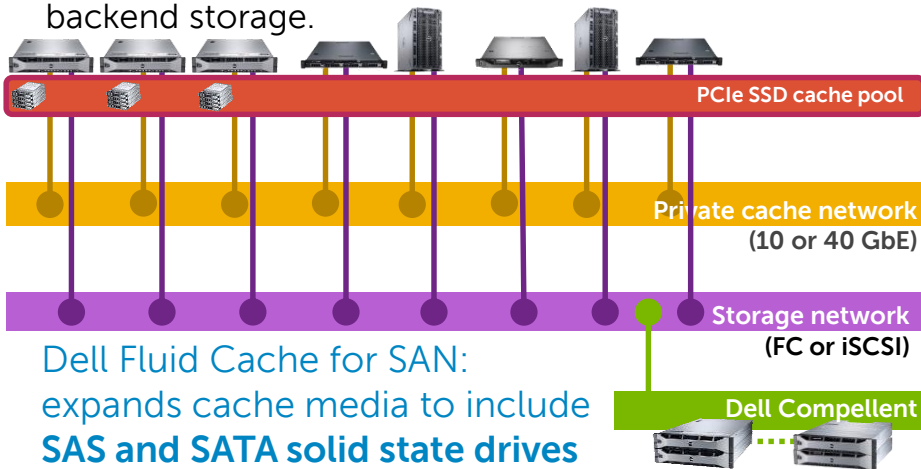
PowerEdge solutions: turbocharge application performance

Flash storage & caching options

Designs across the PowerEdge portfolio offer a variety of density and drive options including new, disruptive flash technology: 1.8 inch SAS and SATA SSDs & hot plug PowerEdge Express Flash NVMe PCIe SSDs.

Dell Fluid Cache for SAN

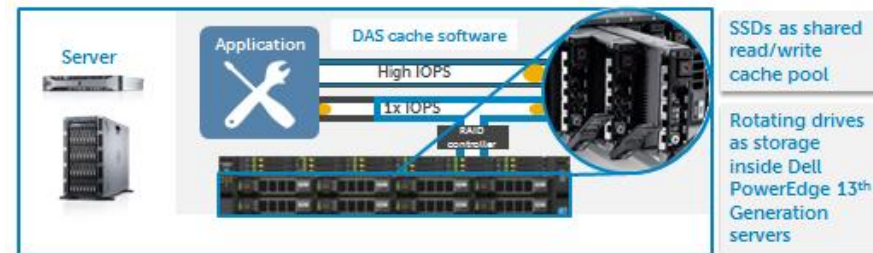
- Delivers extraordinary application response time for database and virtualization workloads.
- Allows performance scaling on the fly by adding Dell PowerEdge Express Flash NVMe PCIe SSDs or server nodes – even in a live cache pool.
- Ensures data integrity with write-back caching technology and full coherency to Compellent backend storage.



Dell Fluid Cache for SAN:
expands cache media to include
SAS and SATA solid state drives
with next gen servers!

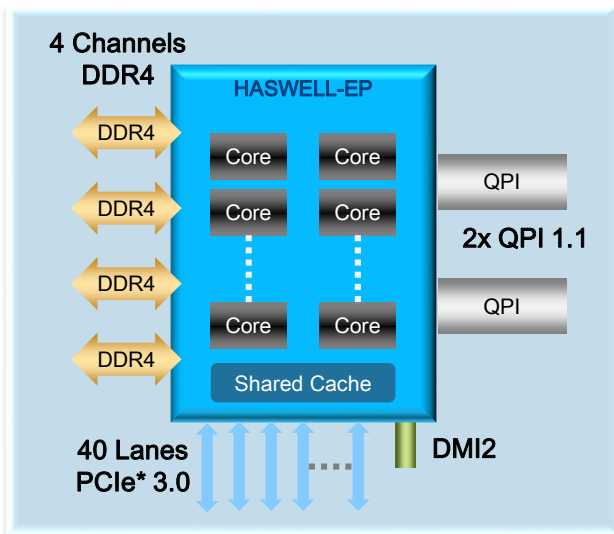
SanDisk DAS Cache

- Server-level, DAS (direct attached storage) I/O application acceleration solution brought to you by Dell, for use with next generation PowerEdge Servers
- Enables remarkable performance for workloads such as OLTP, OLAP, and Business Analytics.
- Supports both Linux and Windows OS
- Versatile, supporting a multitude of devices for cache: SATA, SAS and PCIe SSDs; PowerEdge Express Flash NVMe PCIe SSDs; and PCIe-based cards such as Fusion IO.
- Rotating storage is internal to the server, external using select Dell PowerVault storage.



- Dell Fluid Cache for SAN: **Expanded cache media to also support SAS and SATA SSDs** with next gen servers
- SanDisk DAS Cache: Great for **accelerating OLTP, OLAP, and Business Analytics** workloads

Intel® Xeon® processor E5-2600 v3 Product Family



- New Haswell microarchitecture with AVX 2.0
- 22nm processor for server/workstations
- Brings several new capabilities in the areas of virtualization, security and power efficiency
- DDR4 memory support to scale performance

| Feature | Xeon® processor E5-2600 v2 product family | Xeon® processor E5-2600 v3 product family |
|---------------------------------|---|--|
| Cores/Threads per socket | Up to 12 Cores / 24 Threads | Up to 18 Cores / 36 Threads |
| Last-level Cache (LLC) | Up to 30 MB | Up to 45 MB |
| Max Memory Speed (MT/s) | Up to 1866 | Up to 2133 |
| QPI Speed (GT/s) | 2x QPI 1.1 channels 6.4, 7.2, 8.0 | 2x QPI 1.1 channels 6.4, 8.0, 9.6 |
| Max DIMM Capacity | Up to 12 Slots/Processor | |
| PCIe* Lanes / Controllers/Speed | Up to 40 / 10 / PCIe* 3.0 (2.5, 5, 8 GT/s) | |
| TDP (W) | 150 (WS only), 130, 115, 95, 80, 70, 60W | 160 (WS only), 145, 135, 120, 105, 90, 85, 65W, 55W † |
| AVX | AVX 1.0 | AVX 2.0 |

† Higher TDP on Haswell driven by integration of voltage regulator for increased platform flexibility. System power expected to be relatively same.

All products, computer systems, dates and figures specified are preliminary based on current expectations, and are subject to change without notice. Intel may make changes to specifications and product descriptions at any time, without notice.

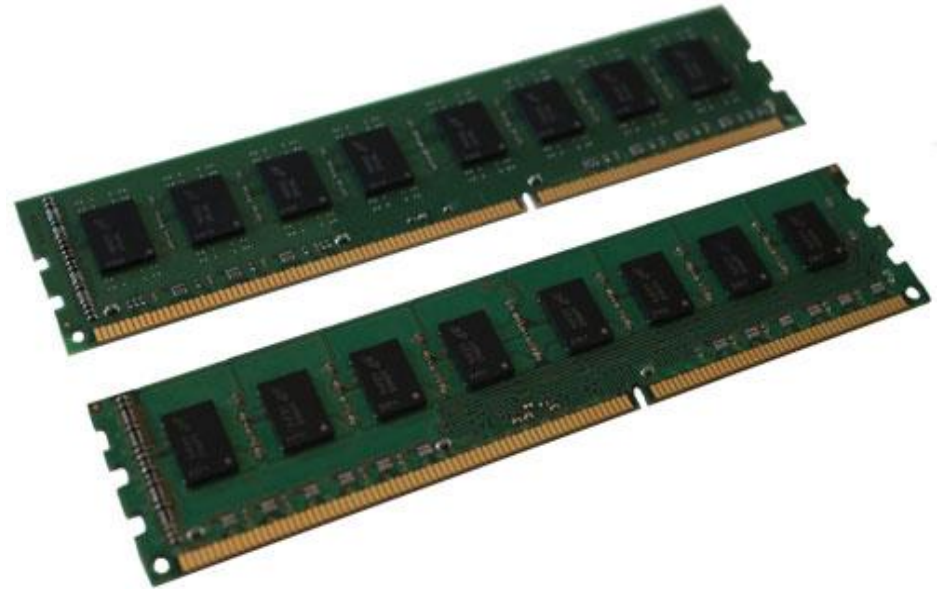
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Dell PowerEdge Memory – DDR4

13G with DDR4 Memory on Grantley Provides:

- **Increased bandwidth over DDR3**
 - 15% higher bandwidth than DDR3
 - Higher speeds to come
- **Lower Power than DDR3**
 - 30% lower active power
 - 50% lower standby power
- **Same capacities as DDR3**
 - 2X increase with 128GB DIMM via future release
- **LRDIMM Performance approximately same as RDIMM performance**
 - DDR3 LRDIMM lagged in speed
- **Continuation of the flexible memory model and the PowerEdge Memory and CPU Selector**



For more information:
www.dell.com/poweredge/memory



Harness state-of-the-art innovations to accelerate workloads

"The idea is around flexibility – dialing in what you need, based on your use case - the relationship between servers and storage is changing, and PowerEdge designs are optimized around the emerging ways of computing."



Optimizing the most intensive workloads

Future-ready solutions today

Desktop Virtualization

for centralized management and better data security.



Customer Relationship Management system

with a larger database and faster access to SAN.



R730xd
& Fluid Cache
for SAN



R630
All-flash
databases



T630
w/ 4GPUs



Engineering research projects performing data analysis with denser computing in a smaller footprint

Fit the infrastructure to the workload & environment



Data I/O Starved Applications



R630

Users continue to ask for dense flash storage optimized platforms

IOP starved applications like OLTP (I.e., E-Commerce, Electronic Exchanges) and Decision Support Systems

13th Generation PowerEdge brings the first 1U server with high flash spindle count and hot plug PCIe SSD capability

Choice of 24 x all flash spindles (1.8”) or 2.5” form factor supporting SAS/SATA SSD or HDD plus up to four PCIe SSD

- Flash storage tied with Fluid Cache for SAN is ideal for increasing OLTP transactions and concurrent usage where applications are highly latency sensitive (i.e., E-Commerce, Financial trading, etc.)
- R630 with 24 x 1.8” SSDs provides 240% local storage performance at roughly the same cost
- Ideal for 85 – 90% Oracle RAC environments
 - Better server utilization by eliminating data I/O bottleneck.
 - Utilize backend storage for capacity rather than performance.
 - Double the rack density with reduced power, cooling and space costs given 1U density.
- Increase concurrent users by 6x with Fluid Cache for SAN and improve system response over 90%

Server Side Storage Tiering - Flash & Capacity



R730xd

Users Continue to Ask for tiered storage combining flash capability integrated with large local Storage Capacity

Need for workloads like Big Data (Hadoop), Microsoft SQL Databases, and DataMart

13th Generation PowerEdge brings the first 2U server with the right mix of flash and high-capacity local storage

R730xd is designed for workloads like standalone database that require a mix of flash and high capacity local storage

- Up to 18 x 1.8" SATA SSD
- The low latency IOPs that SSD's support better enables the virtualization of Microsoft SQL and can speed transaction by 3-10x
- Hadoop takes advantage of flash and capacity storage for I/O intensive map- reduce applications (I.e., Sorting). Using flash can outperform traditional disks by 3x
- Excellent for tiered storage at the server side using Dell Flash Cache technology balanced with traditional hard drive and SATA Flash insuring data is where it's needed for the application
- Up to 48TB of NLSAS / SATA HDD means no JBOD required for small to mid-sized database – equals faster performance without data fetches to connected storage
- Increase SQL performance by up 5x with tiered storage (depends on workload) at best performance/\$

Balanced Storage - Ideal for UC&C



R730xd

**Users continue to ask for
balanced local storage
capacity**

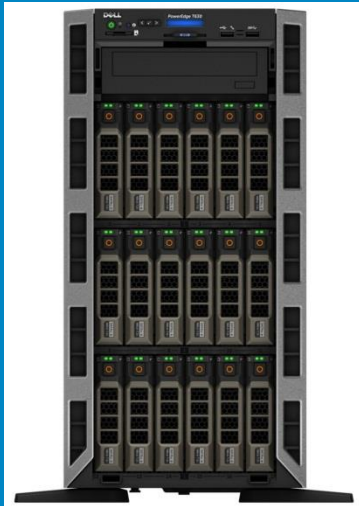
Need for storage-hungry
workloads like Exchange,
SharePoint

13th Generation PowerEdge brings the first 2U server with 100TB of local storage

R730xd is designed for storage-centric workloads like UC&C

- 100TB of local storage within a fully featured 2U rack server
- Capacity is a primary design point for Microsoft Exchange with little consideration for performance. Flash make sense for actively used email and can address “spike” usage. The capacity-based storage is ideal for archiving
- 33% more capacity and spindles (16)
- One R730xd can
 - Host 100 thousand 1GB mailboxes
 - Host multiple SharePoint instances
- Deliver increased Microsoft Exchange performance with Flash based storage by 30% or more

Tower Versatility – Performance & Storage



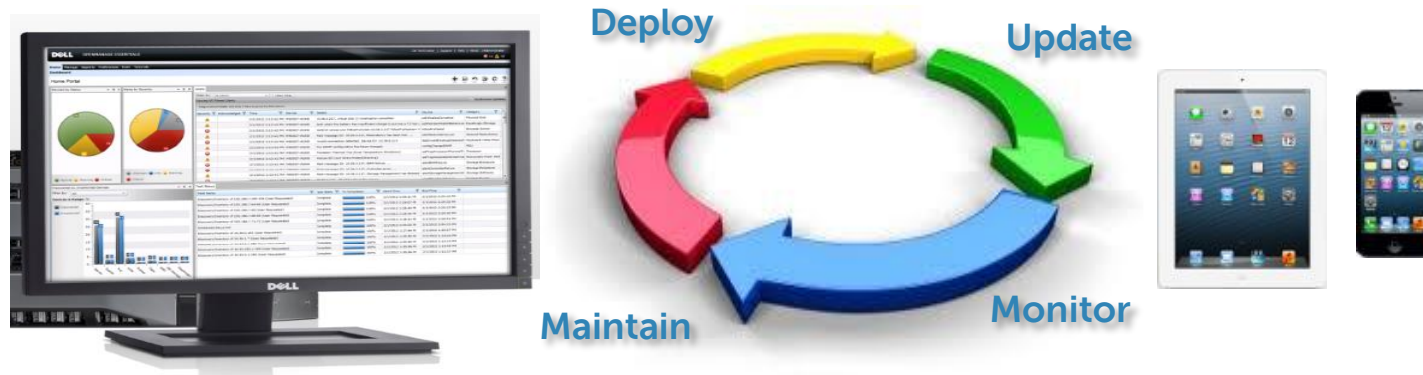
T630

High Performance, large storage,
Scalable Tower server

Ideal for workloads like Exchange,
File/Print, VDI, and database for
Small & Medium businesses.

13th Generation PowerEdge brings the high performance Tower server with 4 GPUs and 100TB of local storage

- 4 high performance GPUs to process the digital images faster in environments like Medical research and diagnostics.
- Two processors along with GPUs & PCIe-SSD for Graphics rendering CAD/CA for a workgroup
- Large storage capacity to archive the images for PACS medical images and a clinic
- Easily scales for workgroup collaboration and email and shared files
- Ideal VDI solution – balanced performance (cores) and storage options to support capacity and large numbers of users.
- Large storage capacity easily supports small to midsize businesses email and workgroup needs



Leverage innovative systems management to simplify and automate

"We've designed for management flexibility. One-to-one management with iDRAC, managing an entire chassis – server, storage and networking – using Chassis Management Controller, and one-to-many provided through OpenManage Essentials."



Saving significant management cost

Reducing TCO with simplified and streamlined lifecycle management processes

Automation

"ZeroTouch" automated deployment

Rack, cable and walk away!
No special technician training required

Automated server updates

Latest updates are always staged in the server, ready to be applied, reducing maintenance windows

Automated technical support

Greatly reduces time to identify and resolve server issues

Simplification

Enhanced agent-free solution

Real-time server performance monitoring and SAS storage health monitoring

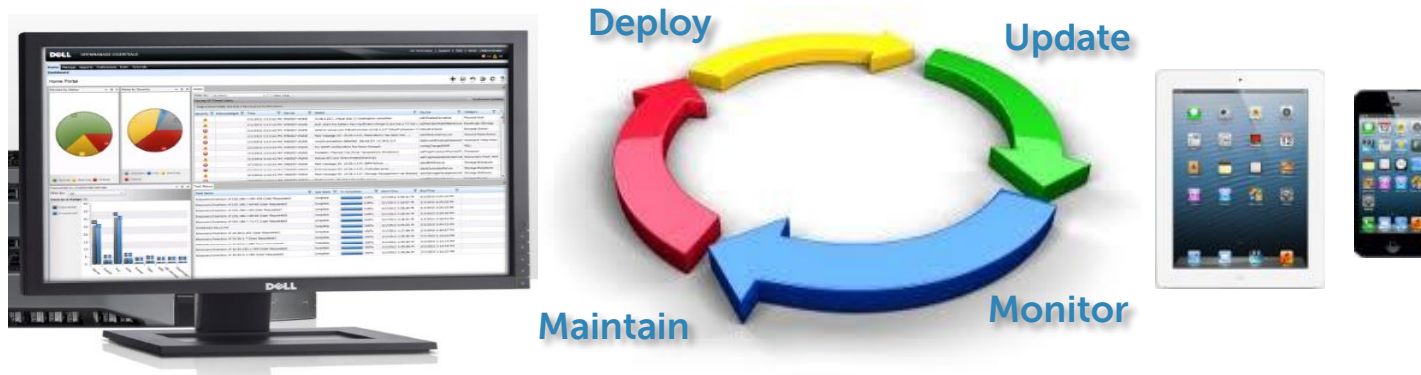
Simplified management "at-the-box"

Deploy, configure and troubleshoot servers with all the information you need at your fingertips

OpenManage Essentials

Automated lifecycle management with a 1-to-many console, and profile based configuration capabilities





**Leverage innovative systems management
to automaté everything**

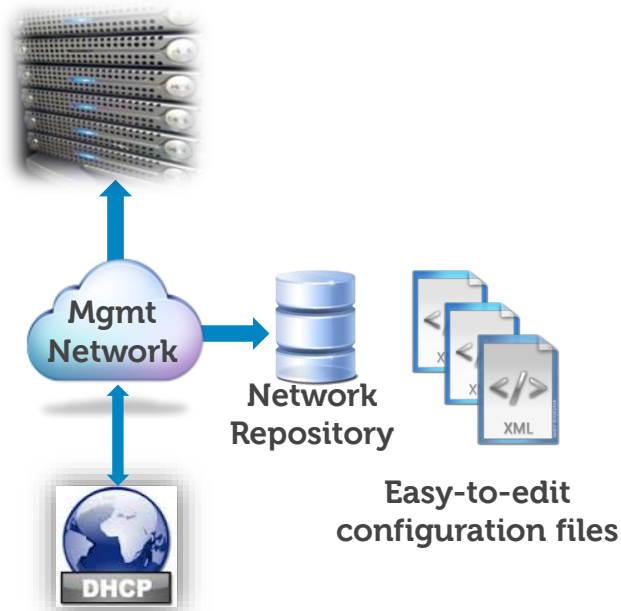


“Zero Touch” Automatic Configuration

Based on configuration profiles stored in a repository

Rack and cable and then walk away. Everything else is automated!

Enhanced
in the 13th
generation



- *Deploys servers faster.*
- *Scales to 1000s of servers*
- Uses easy-to-edit configuration files
- Automatically retrieves the server’s entire configuration
 - BIOS, iDRAC, RAID and LOM/NIC configuration settings

Automatic Server Firmware Updates

iDRAC "Auto-Syncs" with new updates

New in
the 12th
generation
Q4 release

Keep your production servers in-synch and updated automatically

- **Firmware is synched via network repositories**

- IT adds new updates to repository
- Each server iDRAC downloads, then stages the appropriate updates on customer-defined schedule
- iDRAC downloads only the needed updates for its host server

- **Applies updates per customer preference**

- At next reboot, remaining staged in iDRAC memory until then
- At time and schedule defined by customer
- Immediately, rebooting server in process



Servers auto-sync firmware on customer schedule

Automated Server Support

Continuously updated health and status report

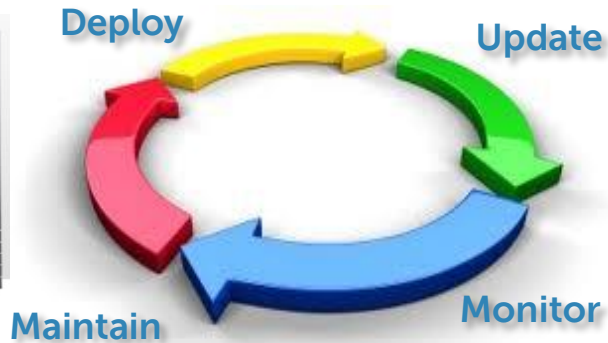
Enhanced
in the 13th
generation

Your time is valuable, why waste it on troubleshooting server problems?



- Continuously updated support report monitors over 5,000 key system parameters
- Speeds problem diagnosis and resolution
- Report delivery options
 - Save and email via iDRAC GUI
 - Automatically sent as part of Dell ProSupport

Eliminate the need to manually install and run diagnostic programs



**Leverage innovative systems management
to simplify your day**



iDRAC Direct via USB cable and Laptop

New in
the 13th
generation

Connect to iDRAC GUI via Local Laptop

Get rid of your crash cart! Connect directly and conveniently, at-the-box to perform advanced management tasks.



- Connect to a Laptop via a USB cable to access the iDRAC GUI
- Interact directly with iDRAC GUI for advanced server management and servicing (even if iDRAC networking has not been configured)
- Inspect detailed log files for faster server remediation
- Convenient front USB port access
- Robust iDRAC credentials enforced for secure access

No special software or drivers needed!

iDRAC Direct via USB key

Use iDRAC Direct for easy configuration

New in
the 13th
generation

No need for cables and laptops when you use a USB key for easy server setup right at the system



XML
Configuration
File

- Use convenient standard USB keys to install new configurations on your Dell 13G Server
- Uploads configuration of BIOS, iDRAC, PERC and NICs to iDRAC in less than a second

iDRAC Quick Sync

Connect to iDRAC via NFC with your smart device

New in
the 13th
generation

Get and set vital server information with your mobile smart device using iDRAC Quick Sync



- Just swipe your phone to quickly get critical server information and error logs
- Can also configure key settings in seconds
- Available with R630, R730, and R730XD servers
- Uses the OpenManage Mobile app and an optional NFC-enabled bezel

Industry's first server with integrated Near Field Communication (NFC) support!

Agent-free monitoring and management

Monitor servers even if they go off-line



Intelligent hardware

No agent required to install or maintain

Lets you manage faster

Lets you manage smarter

OS agnostic

Consistent monitoring across multiple OS types

Out of Band Monitoring

Monitor PERC and Direct attached storage

Monitor NIC and CNA health, inventory, link status, and performance

Temperature, voltage, intrusion, iDRAC state, SEL log size, and battery charge

Informative Email alerting, even if the OS is down

New in 13G

Agent-free performance monitoring

Agent-free RAID management

Agent-free SAS controller monitoring



Dell OpenManage Essentials (OME) v2.0

An easy to install and simple to use solution

A systems management solution optimized for monitoring and managing enterprise-class hardware through a single console.



New

New

- Use a simple and consistent, agent-free process to update BIOS, firmware and OS drivers across PowerEdge 11G - 13G servers
- Improve operational efficiency, compliance and security with automated PowerEdge server deployments and rapid replication of profile and policy-based hardware and OS configurations
- Monitor and manage datacenter hardware through a mobile device anytime, anywhere
- Use a single console solution to remotely discover, inventory, and monitor Dell servers, storage, networking, business clients, and firewall systems as well as 3rd party hardware
- Maintain all-time system uptime by scheduling a one-touch Dell AppAssure server backups through OME
- Speed support-case generation and issue resolution through Dell SupportAssist and SupportAssist Plus



13th generation PowerEdge Wave 1 Platforms

Boost productivity with breakthrough processing power, massive memory capacity and highly flexible and scalable internal storage. Improve efficiency, ease of use and availability with advanced systems management technologies.



Dell PowerEdge R630 offer overview

The 1U server with 2U features

Best in class dense virtualization, database engine, monolithic standard for Webtech and Software Defined Storage



- EXPANDED ULTRAFAST STORAGE UP TO **24 x 1.8" SSD** IN A 1U, SUPPORT FOR PCIe SSD
UP TO 4 NVME PCIe SSD GEN3. 100% MORE THAN R620
- MAXIMUM SCALABILITY 768GB DDR4 MEMORY (1.5TB POST RTS), 3+1 PCIe, UP TO 24 DRIVES,
- CUTTING EDGE I/O FLEXIBILITY: UP TO 2x10GbE FLEXIBLE LOMs (2x40GbE POST RTS)

- **Compute:** 2xCPU (up to 18 Cores), full server & workstation stack
- **Memory:** 24xDIMMs 768GB DDR4 (1.5TB post RTS)
- **I/O:** up to 3xPCIe Gen 3 plus dedicated PERC slot
- **Storage**
 - Up to 24 x 1.8", 10 x 2.5", 8 x 2.5" (with LCD, DVD)
 - SW RAID, PERC9 12Gb SAS, 6Gb SATA
- **Flexible LOMs Choice:**
 - 4x1GbE, 2x10GbE, 2x40GbE (post RTS)
- **Local Health & Management:**
 - iDRAC Quick Sync (NFC)
 - Interactive LCD & VFlash
- **Remote & OOB Management:**
 - Lifecycle Controller 3.0
 - iDRAC8 Enterprise with Auto Configuration, Automatic Updates, Tech Support Report
- **RAS (Hot Plug):** PSU, HDD & Fans
- **Scale out storage** ready (MSFT SS, VMware vSAN, RHSS, Dell HVS)

Density without compromise

PowerEdge R730 offer overview

The corporate IT standard to adapt to any workload, I/O optimized for VDI, and 2:1 GPU applications



- **MAXIMUM SCALABILITY:** 768GB OF DDR4 MEMORY, 7+1 PCIe, UP TO 16 DRIVES
- **CUTTING EDGE I/O FLEXIBILITY:** UP TO 2x40GbE FLEXIBLE LOMs + SEVEN PCIe SLOTS
- **BEST FOR CLIENT AND SERVERS VIRTUALIZATION:** LARGE MEMORY FOOTPRINT, WITH 2 X DW GPUS, HIGH SPEED EMBEDDED HYPERVISOR, MAKES IT THE SERVER OF CHOICE FOR VDI AND SERVER VIRTUALIZATION

- **Compute:** 2xCPU (up to 18 Cores), full server & workstation stack
- **Memory:** 24xDIMMs 768GB DDR4 (1.5TB post RTS)
- **I/O:** up to 7xPCIe Gen 3 plus dedicated PERC slot
- **Storage**
 - Up to 16 x 2.5" , 8 x 3.5"
 - SW RAID, PERC9 12Gb SAS, 6Gb SATA
- **Flexible LOMs Choice:**
 - 4x1GbE, 2x10GbE, 2x40GbE (post RTS)
- **Local Health & Management:**
 - iDRAC Quick Sync
 - Interactive LCD & VFlash
- **Remote & OOB Management:**
 - Lifecycle Controller 3.0
 - iDRAC8 Enterprise with Auto Configuration, Automatic Updates, Tech Support Report
- **RAS (Hot Plug):** PSU, HDD & Fans
- **GPUS:** 2 x DW, 4 x SW
- **Scale out storage** ready (MSFT SS, VMware vSAN, RHSS, Dell HVS)

Simplify IT, The R730, unprecedented scalability to meet all your needs

PowerEdge R730xd offer overview

The ultimate virtual storage platform For scale out efficiency, tiering & caching performance



- LEADING SCALE OUT STORAGE PERFORMANCE:
- 1 MILLION IOPS, 40+TB IN A 2U
- BEST STORAGE DENSE SERVER

BEST NAS – FILE SERVER SERVER WITH **18 x 1.8"** + 8 x 3.5"

BEST FOR DATABASE WITH 24+2 x 2.5" WITH **DUAL PERC9 ZONING AND PCIe SSD**

BEST FOR EXCHANGE, UC&C WITH **16 x 3.5"** + 2x2.5" = 100TB IN A 2U

- **Compute:** 2xCPU (up to 18 Cores),
- **Memory:** 24xDIMMs 768GB DDR4 (1.5TB post RTS)
- **I/O:** up to 6xPCIe Gen 3 plus dedicated PERC slot
- **Storage**
 - Up to 24x2.5" with 4xPCIe SSD, 16+2 3.5", up to 8x3.5" + 18 x 1.8" SSD
 - SW RAID, PERC9 12Gb SAS, 6Gb SATA
 - NVME PCIe SSD Gen3
- **Flexible LOMs Choice:** 4x1GbE, 2x10GbE, 2x40GbE(post RTS)
- **Local Health & Management:**
 - iDRAC Quick Sync
 - VFlash
- **Remote & OOB Management:**
 - Lifecycle Controller 3.0
 - iDRAC8 Enterprise with Auto Configuration, Automatic Updates, Tech Support Report
- **RAS (Hot Plug):** PSU, HDD & Fans
- **Scale out storage** ready (MSFT SS, VMware vSAN, RHSS, Dell HVS)

The new industry reference 2S 2U server for scale out storage deployments

PowerEdge T630



Most versatile server for single deployment in remote and small offices

- **BEST SERVER FOR THE OFFICE :** LIBRARY QUIET, SHORT CHASSIS, INTUITIVE
- **MAXIMUM FLEXIBILITY:** EXTREME PERFORMANCE WITH HIGH END PROCESSORS, PCIe SSD TIER STORAGE, 32 DRIVES, MULTIPLE INTERNAL GPU AND STORAGE CONTROLLERS

- **Compute:** 2xCPU (up to 18 Cores)
- **Memory:** 24xDIMMs 768GB DDR4 (1.5TB post RTS)
- **I/O:** 7xPCIe slots plus dedicated PERC slot
- **2x1GbE LOM**
- **Storage:**
 - Up to 32x2.5" for performance
 - Up to 18x3.5" for capacity
 - Support 4x2.5" NVMe PCIe SSD for extreme performance
 - Multiple Internal RAID Controllers
- **Local Health & Management:**
 - Interactive LCD, VFlash
- **Remote & OOB Management:**
 - Lifecycle Controller 3.0
 - DRAC8 Enterprise
- **RAS (Hot Plug):** PSU, HDD & Fans
- **GPGPU Support:**
 - Up to 4x Double Wide with true PCIe Gen3 x16

Simplify IT, The T630, most versatile server for office and retail environment

13th generation PowerEdge server solutions

Empower your business with the latest innovations



Harness state-of-the-art innovations to accelerate workloads

- **Flash** - Speed critical workloads with groundbreaking in-server Flash designs
- **Tiering** - Optimize application performance and disk utilization with internal data-tiering and hybrid storage
- **Software Defined Storage** - Realize the advantages of software-defined storage with platforms optimized for both throughput and capacity.



Leverage innovative management to simplify and automate

- **At-the-box** - Accelerate time-to-production with express local deployment using iDRAC Direct
- **Smart devices** - Monitor your datacenter securely from your smartphone anytime, anywhere with OpenManage Mobile and OpenManage Essentials
- **Auto-everything** - Improve IT productivity using automated processes that reduce maintenance windows and time spent on daily tasks



Address widest range of applications with versatile configurations

- **Scale-out** - Deploy infrastructures incrementally delivering agile performance without overprovisioning
- **Tailored for workloads** - Meet peak performance profiles with scalable platforms using selectable and upgradable components tailored for specific workloads
- **Consolidate** - now the server platforms have the real power and flexibility to consolidate the most demanding workloads.

