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13G MLK Launch

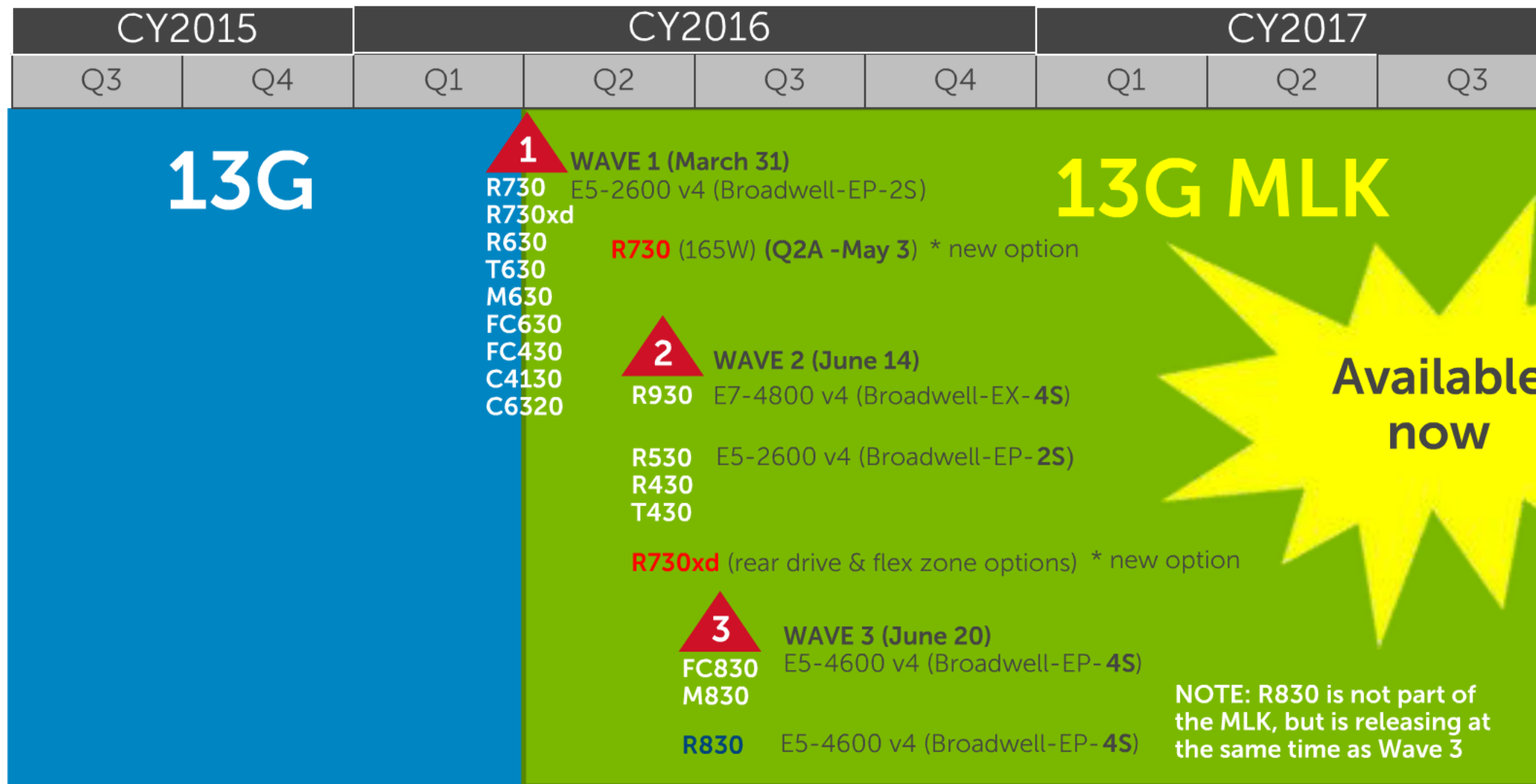
Introducing 4S Server Portfolio

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13G MLK timeline - Phased release over 3 "waves"



Mid-life Kicker (MLK) guidance

The basic facts



E5 processor family update from v3 to v4:

- E5 v4 is named "Broadwell" (v3 was "Haswell")
- Maximum **# of cores has increased to 22** (previously 18)
- Processor **die size has decreased to 14nm**. (previously 22nm.)
(can be dropped-in to existing Socket R3 with BIOS update only)
- **Top processor bin available has increased to 145W**
(There will be a limited bin of **165W available on the R730 post-RTS**)
- Cache processor size has **increased to 55MB**. (previously 45MB)
(note: also referred to as "last-level cache" or "LLC")
- This processor can provide up to roughly **20% performance improvement** in some cases.



Performance goal
(see Performance slide for details)



Memory:

- Maximum **processor** memory **speed** for E5-2600 v4 platforms has **increased to 2400MTs** – that translates to **13% more memory bandwidth**
- This does NOT impact **platform** memory **capacities**.
- options from 4GB to 64GB
- Transition to 8Gb DRAM – 8GB and higher DIMMS will have only 8Gb DRAM.
(4GB DIMM will continue with 4Gb DRAM)
- 3DPC (DIMMs per Channel) RDIMM and LDIMM support



Introducing: **PowerEdge R830**



Customer inspired design

R810

2010, Dell responded to customer requirements of computational density and access to more memory

- ✓ First 4 socket server in a 2U form factor
- ✓ Introduction of Flex-Memory bridge, enabling 2 CPU's to access all available memory

R920

2012, Dell was first to enable optimized licensed core expense and engineer the most redundant enterprise hypervisor.

- ✓ First to introduce PCIe SSD's, hot swappable, front accessible
- ✓ First and only offering of dual embedded hypervisors and fault resilient memory
- ✓ 24 internal drives, up to 8 PCIe SSD's
- ✓ M820, first with 48 DIMMS in a 1U blade

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

FC830

2015, Dell created FX2 and FC830, the most innovative and dense four socket design. Two 1U 4 sockets servers in a 2U chassis

- ✓ Dell's revolutionary approach to converged infrastructure for enterprise computing
- ✓ Amazing density, 8 Intel Xeon E5 v4 in only 2U of rack space, 176 cores
- ✓ First and only HTML 5 systems management across all 13G platforms

PowerEdge R830

Four socket foundation providing the best balance of compute, scalability and value for database, scale-out virtualization and VDI deployments



Overview

- The PE R830 is a powerhouse four-socket rack server designed for database applications, dense virtualization deployments and VDI environments. With it's 2U rack server form factor it is ideal for mainstream and mid-market customers standardized on a rack form factor.

Benefits

- High performance memory density with balanced I/O
- Balanced combination of processing density, high memory capacity, low power consumption and value
- Easy lifecycle manageability with innovative management tools
- Ideal for space constrained data centers



PowerEdge R830 target customer

Positioning Statement

- The PE R830 is a powerhouse four-socket rack server designed for database applications, scale-out virtualization and VDI environments. With it's 2U rack server form factor it is ideal for mainstream and mid-market customers standardized on a rack form factor.

Why are we developing this product for our customer?

- Dell pioneered the four-socket 2U rack server and 90% of Dell's 4S server sales are rack servers.
- The 2U rack form factor is ideal for mid-market and mainstream use where Dell excels
- With four sockets and up to 48 DIMMs the R830 is the essential workhorse to provide optimized application performance across database, scale-out virtualization deployments and VDI.
- Innovative systems management to further simplify and automate management through the full server lifecycle

Target Usages

- Customers running computational/transactional SQL or Oracle databases standardized on rack form factors and needing the best balance across compute, memory and overall cost.
- With four processors and up to 48 DIMMS the R830 provides the optimum balance of scalability and flexibility for both scale-out virtualization deployments as well as VDI deployments



Most comprehensive four socket portfolio

Innovative, scalable platforms featuring consistent management across all platforms



R930

Ideal choice for the most demanding and data-intensive applications

- Mission-critical applications demanding the highest performance, reliable data intensive resources, available in a rack server
- ERP, CRM, BI, large memory databases (SAP)
- Consolidation and virtualization

FC830

*Unprecedented density, expandability and flexibility
Ready for the converged infrastructures of the future*

- Flexible, highly dense compute and memory resources
- Highest storage scaling for a 4S rack
- Unprecedented IO options
- Ideal for large customers who want convergence and density
- Oracle RAC, ESXi hosting

R830

Best value mainstream/mid-market 4S 2U rack server for database, scale-out virtualization, VDI

- Traditional 2U rack form factor for mainstream and mid-market customers, providing great balance of compute, memory & storage for great value.
- Ideal for customers that have standardized on a rack form factor.
- Test and development
- Remote branch locations

M830

Maximized data-center consolidation delivering vast amounts of compute and lowest in chassis latencies

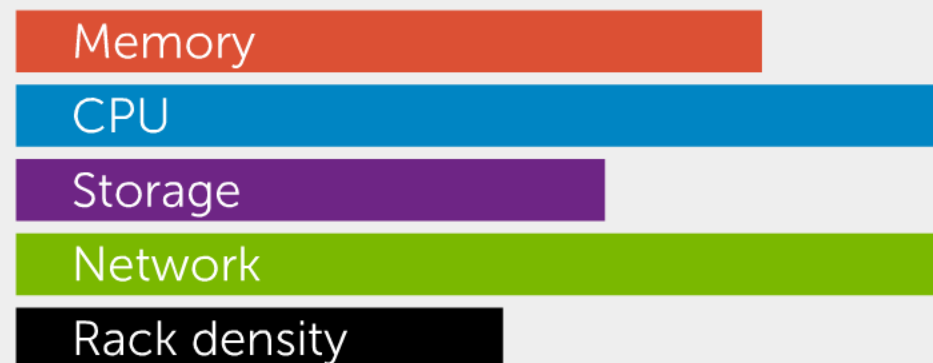
- Virtualization, Database, and Workload consolidation
- Massive pools of dense compute and memory resources
- Feed IO intensive workloads with up to 240Mbits of throughput, low latency fabrics

Business processing workloads

Workload characteristics

- SQL and Oracle database
- ERP and CRM data
- Structured data
- Online Transaction Processing
- Data warehousing

OLTP requirements



Data warehousing requirements



Big Data and analytics workloads

Workload characteristics

- The four V's: volume, variety, velocity, veracity
- Resource ratio important
- Requires fine tuning and customization for environment

Hardware requirements

Memory

CPU

Storage

Network

Rack density



HPC workloads

Workload characteristics

- Intensive calculations
- Genomic sequencing, oil and gas, modeling, high frequency trading
- Processing spread across multiple nodes

Hardware requirements

Memory

CPU

Storage

Network

Rack density



Server virtualization workloads

Workload characteristics

- Consolidation of workloads onto fewer physical machines
- High availability and recovery
- Improved CPU utilization
- Resource sharing

Hardware requirements

Memory

CPU

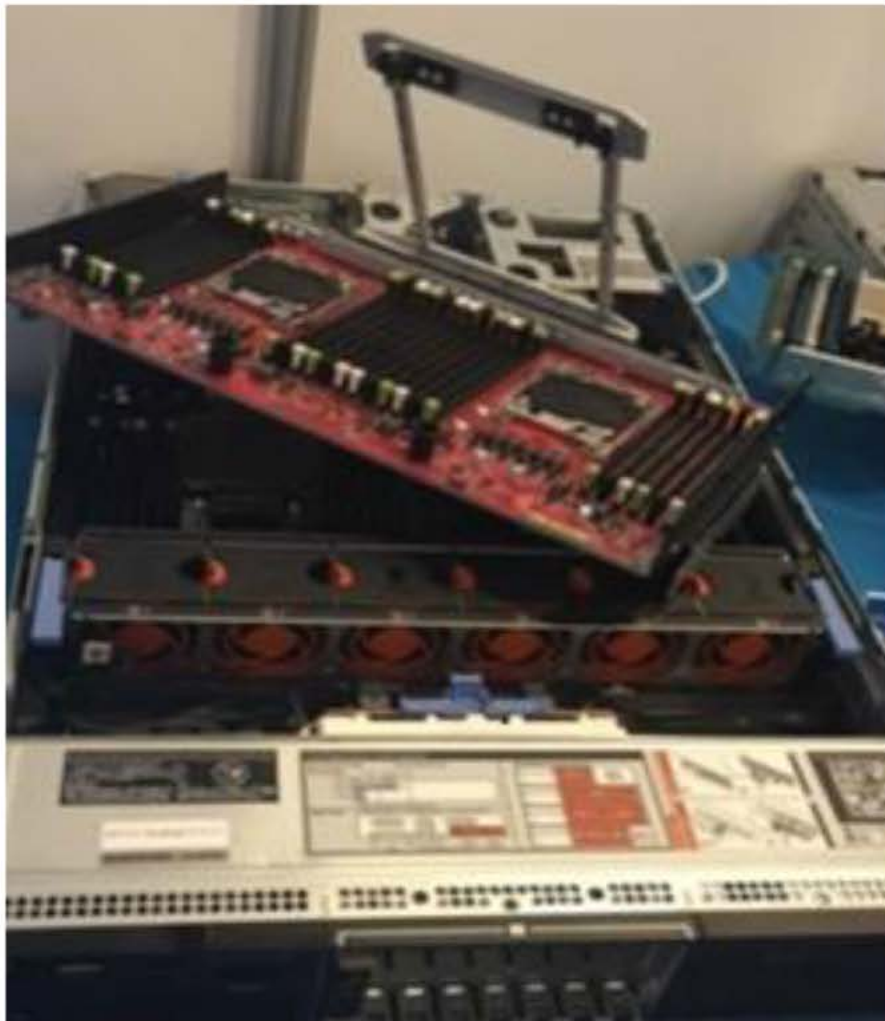
Storage

Network

Rack density



PowerEdge R830

Four socket foundation providing the best balance of compute, scalability and value for database, scale-out virtualization and VDI deployments



Performance	Availability, Manageability	Expandability, I/O, Storage
<ul style="list-style-type: none"> 4S Intel Xeon E5-4600 v4 (Broadwell) Up to 48 DDR4 DIMMs 6 x PCIe Gen 3 enabled, plus 1 dedicated PERC 	<ul style="list-style-type: none"> PERC9/SAS HBA/Chipset SATA Hot-plug, redundant power/cooling (chassis) Dual SD cards for redundant hypervisor iDRAC8 Enterprise w/ Lifecycle Controller 	<ul style="list-style-type: none"> Quad port 1Gb Dual port 10Gb SNAs Up to 16 x 2.5 HDD/SSD Supports PCIe Flash SSD cards

R820 – 830 comparison

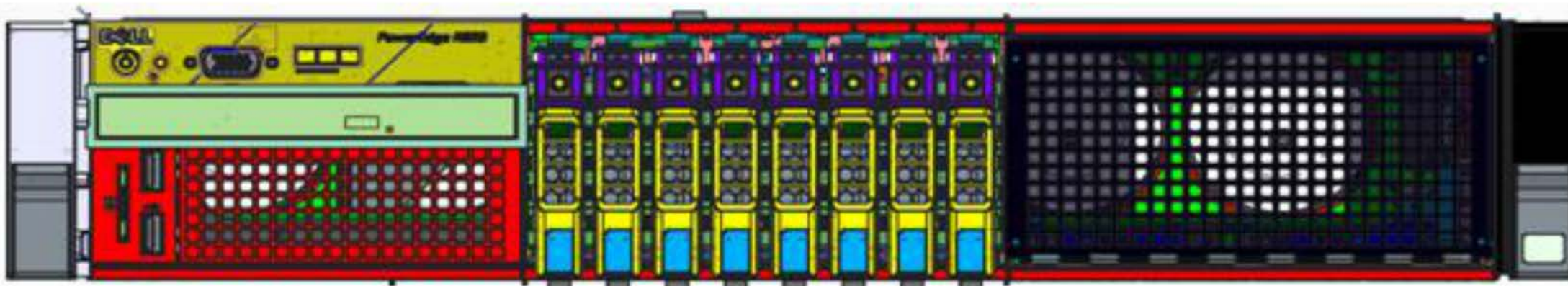
Features	R820 (Icon) 	R830 (Ironhide) 
Processor	Intel Sandy Bridge EP-4S (each QPI at 8GT/s) 4-socket	Intel Broadwell EP-4S (each QPI 9.6GT/s) 4-socket up to 135W
Memory	48 RDIMMs, UDIMMs, LR-DIMMs (DDR3)	DDR4 48 RDIMMs, LR-DIMMs (DDR4) 64GB RTS+
Disk Drives	Up to 16 x 2.5" HDDs	Up to 16 x 2.5" HDDs
PCI-e SSD	4 x PCI-e SSDs	PCIe SSD card support
PCI slots	6 + 1 PCI-e Gen3 (one slot used for PERC)	6 + 1 PCI-e Gen3 (one slot used for PERC)
Onboard NICs	12G NDC	13G NDC: 4x1GB, 2x 10Gb
Power Supplies	Platinum 1100W and 750W PSU. Hot Plug Redundant. 1100W DC supply	13G Platinum 750W and 1600W PSU. Hot Plug Redundant. 1100W PSU RTS+
Management	OpenManage; DMC, LC2.x, Digital License Key	13G OpenManage; OME, LC, Digital License Key
Chassis	Rack 2U - 12G	New planar tray, PEM tray & thermal shroud
iDRAC	iDRAC7	13G iDRAC8
Backplane	Leverage R720 with PERC8	Leverage R730 SS X8 /X16 BP+EXP design w/PERC 9
TPM, IDSDM	12G	13G TPM 1.2 and 2.0 TPM
Support for Internal GPU	Support for Q2000	HIC support to C4130 - TBD

R830 2.5" Chassis Implementation

External View (Front)



With 2.5" x16 Configuration



With 2.5" x8 Configuration

When to choose the PowerEdge R830



Comparing Two Platforms for Different Customer Needs

**Best for enterprise apps
(database, BI,
virtualization, etc)
needing large,
scale-up servers**



Intel® Xeon® processor E7 family

- Top of the line enterprise performance
Richest Xeon RAS feature set to support mission critical applications
- Highest memory capacity
- Scales 2S, 4S

**Best for dense
4-socket designs,
4-socket HPC apps,
and entry
4-socket servers**



Intel Xeon processor E5-4600v4 product family

- Optimized for higher density
- Lower system price points¹
- Excellent floating point performance and performance per watt (PPW)¹



4-Socket PowerEdge 13G Portfolio

Intra-line Positioning Comparison

	R930	R830	FC830	M830
Positioning	Max Performance, large memory footprint 4S 4U E7 Rack Server	Dense 4S/2U rack server emphasizing performance and reliability	Highest Density 1U 4S Modular Server	Max IO Performance 4S Full-height Single Width Blade Server
Target Workloads	Medium/large general-purpose and mission-critical applications, greatest VM density and medium/large databases	Best value mainstream/mid-market; Dense virtualization, Consolidation, Computations, and Scale-out databases	Density optimized, mission-critical applications, mainstream virtualization, memory & compute intensive applications and medium/large databases	Database, CRM, ERP, Collaboration, and Technical Computing workloads that require high speed network and redundant IO fabrics and mission critical redundancies.
Target Audience	Performance-driven customers needing maximum reliability, performance and memory scalability	Great entry 4S platform with lower system price points for value conscious markets	Performance-driven customers needing maximum density, performance and flexibility.	Customers seeking maximum performance with lowest latency, redundant fabrics.
Great For	Mission-critical applications in data centers needing the highest performance, reliability, and PCIe/Memory scalability available in a rack server	Designed for mid-size to large data centers requiring high memory capacity and performance	Corporate data centers seeking 4S server density and I/O flexibility for databases, mainstream virtualization, and other highly threaded, Mission-critical applications	Corporate data centers seeking high value, high IO speed/throughput server for medium/large databases, virtualization, and other highly threaded, Mission-critical applications

Four Socket feature layout

	Traditional 2U Volume workloads R830	Future ready Converged infrastructure FC830	Mission Critical Workloads R930	Comment
Up to 6TB of memory (96 DIMMs)			✓	R930 is positioned for mission critical in-memory database, scale up database, OLTP, or Unix to Linux, SAP HANA
Up to 3TB of memory (48 DIMMs)	✓	✓		
E7 / EX processor			✓	Intel E7 on R930 is designed for mission critical implementations and features additional RAS capabilities.
E5-4600 processor	✓	✓		Ideal for scale up and scale out database and dense virtualization with four processors and 48 DIMMS, Speed sensitive workloads such as database and virtualized workloads
16 x 2.5" drives	✓		✓	Flexible internal storage for stand alone workloads
Express Flash (PCIe SSD drives)	PCIe SSD card support	✓	✓	Maximize application performance and processor utilization with PCIe SSD's, minimize licensing costs



Four Socket feature layout cont.

	Traditional 2U Volume workloads R830	Future ready Converged infrastructure FC830	Mission Critical Workloads R930	Comment
1.8" SSD support		✓		Density and speed
13G System Management	✓	✓	✓	Throughout the entire lifecycle of a server no company provides the capabilities or integration that Dell provides
Compute density		✓		FX chassis and FC830 is the ideal dense, four socket datacenter solution such as Oracle RAC
Price/performance value	✓			Traditional 2U rack form factor that customers are very familiar with, less innovation in the chassis equals less cost
IO Convergence		✓		Simplifies network deployment and integration enabling LAN/SAN convergence in the datacenter
High Availability / Highest Performance			✓	Intel E7 RAS features along with R930 built in redundancy make the R930 ideal for mission critical workloads

Available assets



Available assets - PowerEdge R830

Title	Details	Link
13G Marketing Guide	Guide with available 13g specific marketing material to be used for joint Dell/Partner marketing campaigns	Link
R830 Sales Card	One pager showing key talking points and benefits with the R830	Link
R830 Spec sheet	Details technical specifications of the R830 including MLK updates	Link
Easy Matrix	Overview of all products, new version will be available shortly incl. all MLK's and new products	Link

