



➔ **Lenovo** for

SAP
HANA



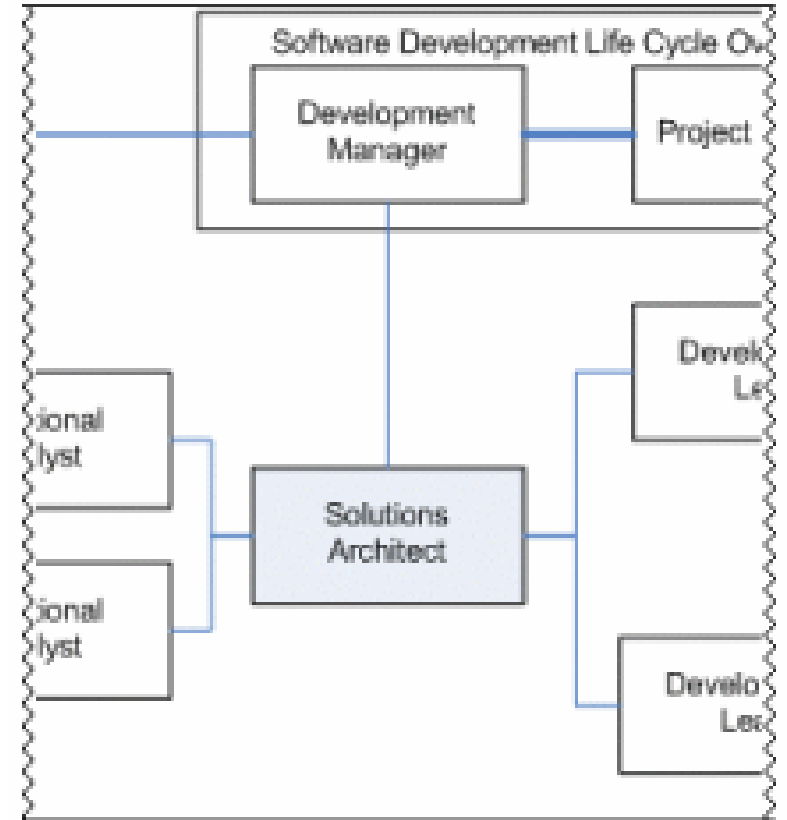
What is a solutions architect

the opinion of a 'marketing' guy follows

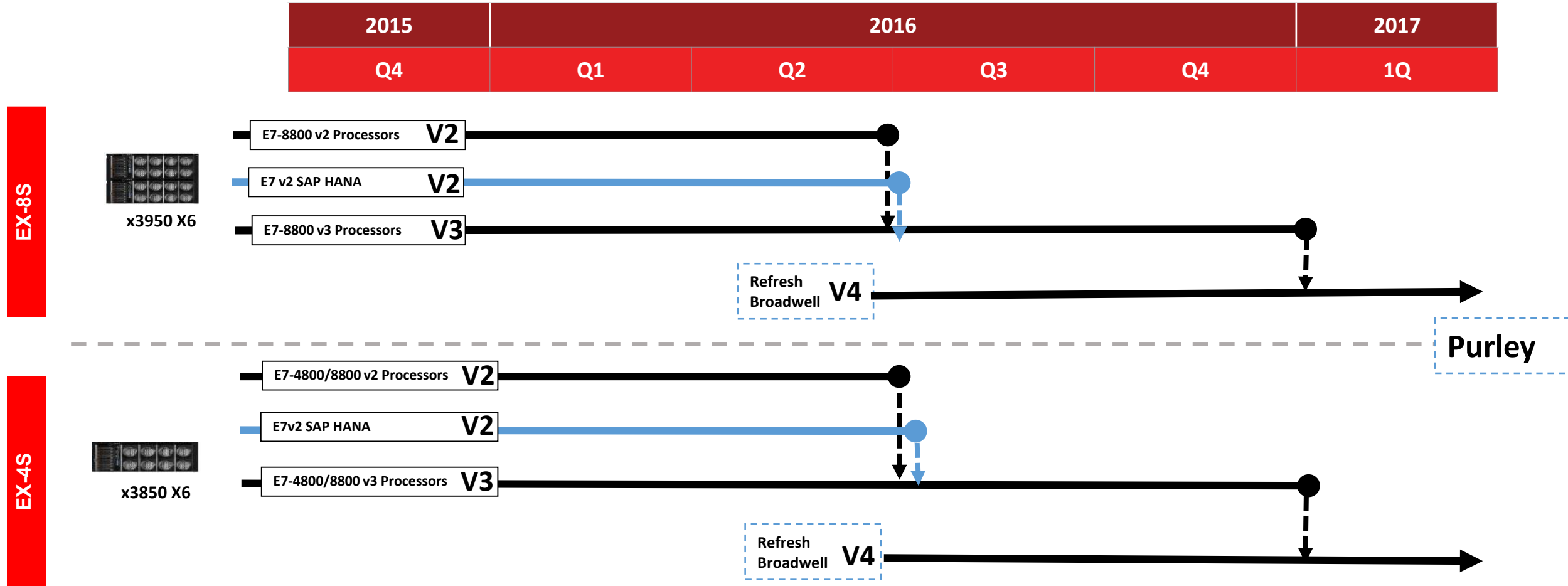
.....responsible for the vision that underlies the solution and the execution of that vision into the solution.

.....the conversion of the requirements into an architecture and design that will become the blueprint for the solution being created.

.....the role of solution architect is the motivation and guidance of the development leads. Development leaders need to buy into and accept the architecture, to know how the pieces will fit together at a high level



Roadmap (Calendar Year) & Key Dates



Project	POR/MTM Creation	Cost Tape Published	MSRR	MTM Price Ready	CTO Price Ready	Announce Date	SS	SGA
x3850/3950 X6 Broadwell	2/16/2016	02/20/2016	3/8/2016	Handled by GEO Finance	Handled by GEO Finance	5/3/2016*	5/20/2016	6/3/2016

* ODT date is shown. Per Intel, current announce window is mid-May to the end of June. ODT will update project schedule when 4 week window is received from Intel.

x3850 X6 Broadwell Performance 4S4U Rack Server

Fast *Shift business services into high gear*

- Actionable information delivered faster
- A system that is up to 26% faster – which means more work in less time

Agile *Ensure flexibility to grow with your business*

- Scale seamlessly as your analytic workloads increase
- Avoid the cost and disruption of rip-and-replace
- Realize maximum flexibility: Run different workloads simultaneously

Resilient *Create a business-aware architecture*

- Maximize application uptime
- Reduce support costs with easier maintenance



	x3850 X6
Processors	Up to 4 Intel E7-4800 v4 series processors
Form factor	4U Rack
Memory Slots Max Memory	Up to 96 DIMM slots Up to 6 TB DDR4 - 8GB/16GB/32GB RDIMM, 64GB LRDIMM, Up to 2133 MHz
Disk Drive type	SAS/SATA/SSD/NVMe
HDD bays	Up to 8 2.5" SAS/SATA/SSD Up to 16 1.8" SSDs Up to 4 NVMe PCIe SSDs
RAID	12 Gb SAS/SATA RAID 0, 1, or 10, Upgrades to RAID 5, 6, 50 and 60 1 GB non-backed cache; 1 GB or 2 GB flash-backed cache)
PCIe (x16/x8)	Up to 11 PCIe slots plus dedicated Mezzanine LOM slot.
Power	900W Platinum PSU, 1400W Platinum PSU, 750W DC PSU
Ports	Front: Two USB 3.0, one USB 2.0, and one DB-15 video ports. Rear: Four USB 2.0, one DB-15 video, one DB-9 serial, and one 1 GbE RJ-45 systems management. Internal: USB 2.0 port for embedded hypervisor.
Fan Design	10x HS redundant single rotor fans, five fan zones, N+1 design
System MGMT	IMM2.1, One IMM dedicated port
Operating temp.	Up to 40 °C
Warranty	3 years (parts/labor)

Important Dates

Announce	05/03/16
GA	06/03/16

x3950 X6 Broadwell Performance 8S8U Rack Server

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2015 LENOVO INTERNAL. ALL RIGHTS RESERVED.

	x3950 X6
Processors	Up to 8 Intel E7- 8800 v4 series processors
Form factor	8U Rack
Memory Slots Max Memory	Up to 192 DIMM slots Up to 12TB DDR4 - 8GB/16GB/32GB RDIMM, 64GB LRDIMM; Up to 2133 MHz
Disk Drive type	SAS/SATA/SSD/NVMe
HDD bays	Up to 16 2.5" SAS/SATA/SSD Up to 32 1.8" SSDs Up to 8 NVMe PCIe SSDs
RAID	12 Gb SAS/SATA RAID 0, 1, or 10, Upgrades to RAID 5, 6, 50 and 60 1 GB non-backed cache; 1 GB or 2 GB flash-backed cache)
PCIe (x16/x8)	Up to 22 PCIe slots plus two dedicated Mezzanine LOM slots.
Power	900W Platinum PSU, 1400W Platinum PSU, 750W DC PSU
Ports	Front: Four USB 3.0, two USB 2.0, and one DB-15 video ports. Rear: Eight USB 2.0, one DB-15 video, one DB-9 serial, and one 1 GbE RJ-45 IMM2 systems management. Internal: two USB 2.0 port for embedded hypervisor. The second video IMM2 and internal USB hypervisor ports are used only when the server is partitioned into two four-socket servers.
Fan Design	Up to 20 x HS redundant single rotor fans, ten fan zones, N+1 design
System MGMT	IMM2.1, One IMM dedicated port
Operating temp.	Up to 40 °C
Warranty	3 years (parts/labor)

Important Dates

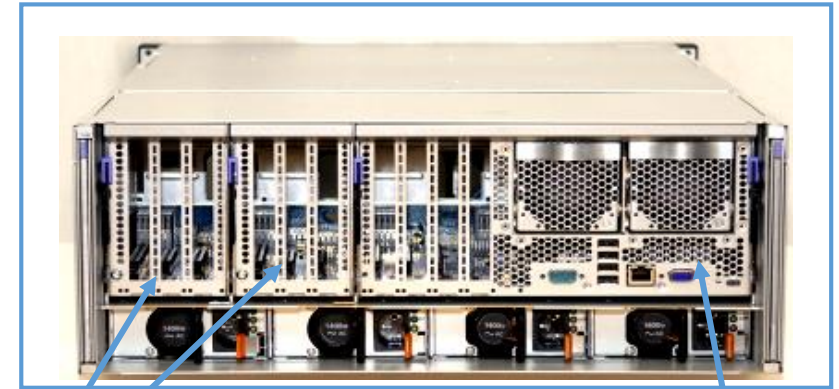
Announce	05/03/16
GA	06/03/16

x3850 X6 Haswell to x3850 X6 Broadwell Comparison

	x3850 X6 (HSW)	x3850 X6 (BDW)	Benefits
Processor	<ul style="list-style-type: none"> Intel® Xeon® E7-4800/8800 v3 115W, 140W, 165W 4C, 8C, 10C, 12C, 14C, 16C, 18C, Up to 45M cache 	<ul style="list-style-type: none"> Intel® Xeon® E7-4800/8800 v4 115W, 140W, 165W 8C, 10C, 14C, 14C, 16C, 18C, 20C, 22C, 24C; Up to 60M cache 	<ul style="list-style-type: none"> Up to 26% higher performance from previous generation
Memory	<ul style="list-style-type: none"> 96 DIMM slots 6 TB max memory DDR3 - 8GB/16GB/RDIMM, 32GB/64GB LRDIMM DDR4 - 8GB/16GB/32GB RDIMM, 64GB LRDIMM 	<ul style="list-style-type: none"> 96 DIMM slots 6 TB max memory DDR4 - 8GB/16GB/32GB RDIMM, 64GB LRDIMM 	<ul style="list-style-type: none"> DDR4 provides higher bus speeds and lower memory power
Internal Storage	<ul style="list-style-type: none"> 2.5" HDD – 8 SAS/SATA/SSD 1.8" SSD – 16 SSDs 2.5" NVMe – 4 SSDs Up to 32 eXFlash DDR3 DIMM (up to 12.8TB) 	<ul style="list-style-type: none"> 2.5" HDD – 8 SAS/SATA/SSD 1.8" SSD – 16 SSDs 2.5" NVMe – 4 SSDs 	<ul style="list-style-type: none"> Delivering high storage throughput Low Latencies – delivering higher speed NVMe provides faster SSD read capabilities
Ethernet	<ul style="list-style-type: none"> Two 1GbE Management Port Mezz LOM Dedicated Socket, choice of ML2 cards: <ul style="list-style-type: none"> 4 x 1GbE Copper 2 x 10GbE SFP+ or 2 x 10GbE 10BaseT 4 x 10GbE SFP+ 2 x 40GbE 	<ul style="list-style-type: none"> Two 1GbE Management Port Mezz LOM Dedicated Socket, choice of ML2 cards: <ul style="list-style-type: none"> 4 x 1GbE Copper 2 x 10GbE SFP+ or 2 x 10GbE 10BaseT 4 x 10GbE SFP+ 2 x 40GbE 	<ul style="list-style-type: none"> Selectable LOM technology to allow flexibility and choice as networking requirements change or grow. New cards provide higher capacity
PCIe	<ul style="list-style-type: none"> 11 PCIe slots (2 front, 9 rear) Primary IO Book with two x16 and one x8 FH/HL Half-Length IO Book with one x16 and two x8 FH/HL Full-Length IO Book with two x16 and one x4 FH/FL Support up to two 300W cards 	<ul style="list-style-type: none"> 11 PCIe slots (2 front, 9 rear) Primary IO Book with two x16 and one x8 FH/HL Half-Length IO Book with one x16 and two x8 FH/HL Full-Length IO Book with two x16 and one x4 FH/FL Support up to two 300W cards 	<ul style="list-style-type: none"> Flexibility and choice to deliver the right networking infrastructure Ability to support the most demanding virtual desktop or graphics capabilities
Systems Mgmt	<ul style="list-style-type: none"> XClarity 	<ul style="list-style-type: none"> XClarity 	<ul style="list-style-type: none"> Simple and improved systems management
Other	<ul style="list-style-type: none"> Modular rack design 	<ul style="list-style-type: none"> Modular rack design 	<ul style="list-style-type: none"> Ability to host multiple generations of technology in a single package

X6 Modular Design – Continues in Broadwell

X6



Storage Book

The Storage Book holds up to 8 x 2.5" SDD/HDDs.



4 Compute Books

Each Compute Book includes 1 processor and 24 DIMM slots



Up to 2 types of I/O Books, (Half-Length and Full-Length)

Each I/O Book delivers an additional 3 PCIe slots

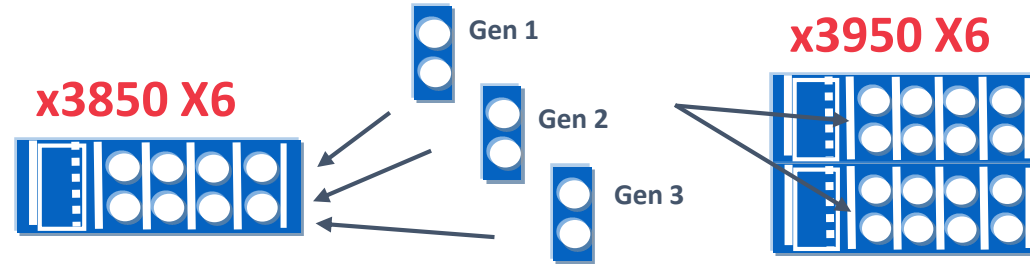


The Primary I/O Book hosts the IMM, PCIe slots, and the dedicated Mezz-LOM solution

Lenovo X6: More Agility Features

Long-term TCO savings

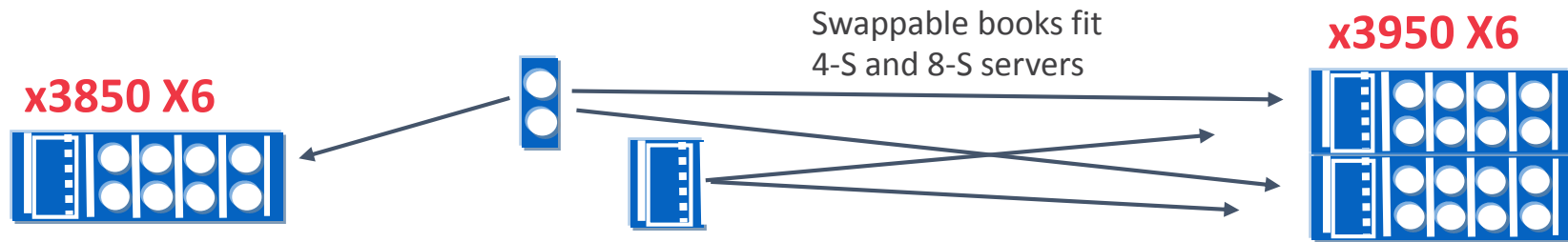
Accommodation for multiple generations of processors in one system



Simply swap the compute book rather than buying a new server

Innovation and Business value

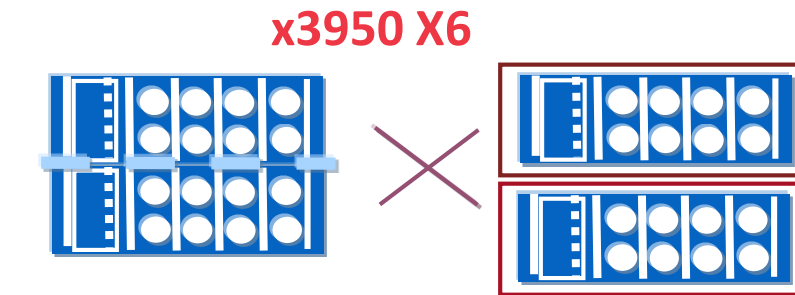
Differentiated modular design



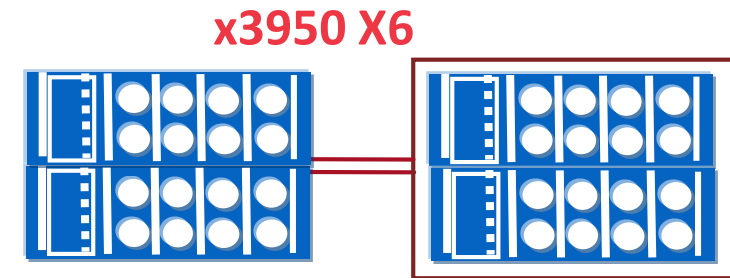
Flexibility

Unique Flexnode Capability

HANA



FlexNode multiple x3950 X6 servers into a cluster of 4-way servers



Or FlexNode x3950 X6 servers into scale-up 8-way servers

What is SAP HANA

The Platform for Next-Generation Applications and Analytics

SAP HANA is an in-memory database and application platform, which is for many operations 10-1000x faster than a regular database like Oracle on much slower spinning hard drives attached to the same hardware.

Customers can finally begin to reduce IT complexity by removing the need for separate and multiple Application Servers, Operational Data Stores, Datamarts and complex BI Tool implementations.

One database....One source of the truth.

For the HANA dance – it's a packed house

Lenovo



IBM Power is still not a viable option for HANA

in this 'marketing' guy's opinion

- IBM Power unit sales are down more than 80% since 2005¹
- Xeon family value and leadership is still clear –
 - 4S Xeon® E7 v3 offers up to 4x the perf/\$ driving up to a 60% lower TCO vs 4S POWER8 servers on the SPECint*rate2006 base benchmark²
 - 4S Xeon E7 v3 offers up to 2.7x the perf/watt/\$ and 2S Xeon E5 v3 up to 10x the perf/watt/\$ of 2S POWER8 servers on the SPECint*rate2006 base benchmark³
 - 8S Xeon® E7 v3 offers up to 10x the perf/\$ driving up to a 85% lower TCO vs 8S POWER8 servers on the SPECint*rate2006 base benchmark⁴
- Similar uptime reported between Xeon/Linux-based solutions and POWER-based solutions⁵.
- The broadest, open industry ecosystem is available on Intel® Xeon® processor platform:
 - ~1000s of applications supported on the Linux on Xeon versus ~73 little endian Linux applications on IBM Power* platforms.⁶

SAP HANA & Lenovo System x Momentum

More than
4800 SAP HANA
systems shipped

Largest SAP HANA system
in the world:
100TB

400TB
of System x Systems in SAP
HANA Enterprise Cloud

**World Record
Performance**
BW-EML and SAP SD 2-tier¹

**SAP CRM
and HR systems**
in production:
4TB Lenovo HANA system

**Investment
protection:**
Add X6 to
existing eX5 clusters
CPU Upgrades thru 3 generations

Learn More:
www.lenovo.com/sap/hana

¹ SAP Benchmark information posted on www.sap.com/benchmark Lenovo benchmark information posted on <http://www-03.ibm.com/systems/x/resources/benchmarks/results/index.html>

Building Blocks for Lenovo SAP HANA “Appliance”

- To support single node configurations and scale out clusters

x3850 X6



HW

- 2 to 8 E7-8880v3 processors
- 128 GB – 6 (12) TB main memory DDR3, DDR4
- Sufficient persistent internal storage according to SAP’s KPIs
10k SAS HDD, Flash Cache, RAID5
- Network 4 x 10 Gbit E, 4 x 1 Gbit E

SW

- GPFS (**or XFS for single node configurations**)
- VMware ESX 5.5 (optional)
- Novell *SLES for SAP Applications* or *RHEL for SAP HANA*
- SAP HANA Software Stack



x3950 X6

Lenovo's SAP HANA Scalability



- Simple

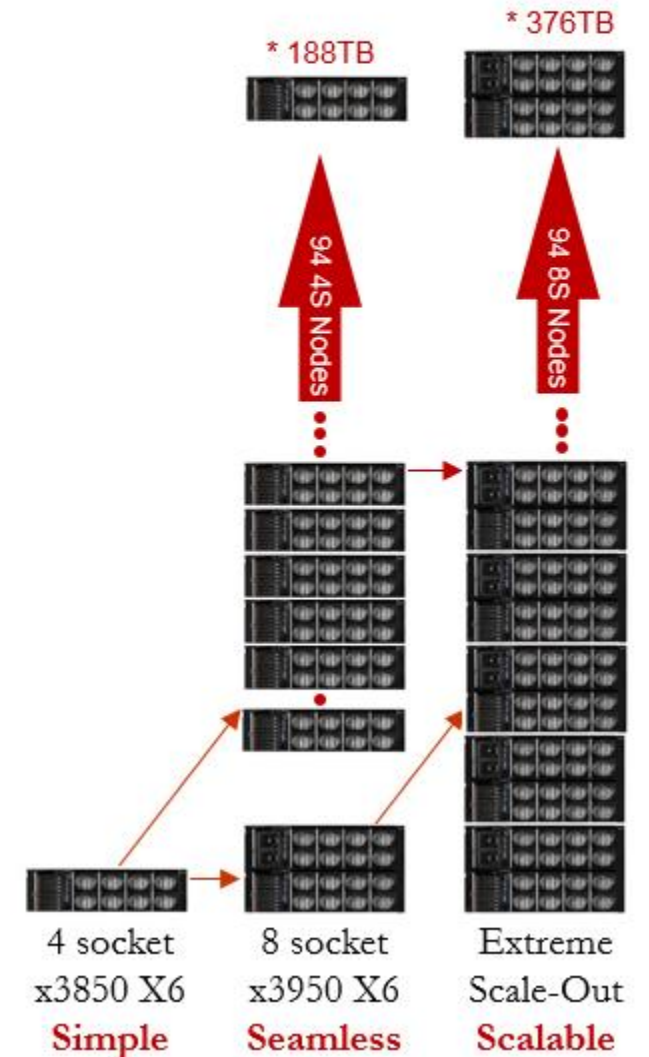
- No SAN required
- Same building block
- XFS certified for single node

- Seamless

- Highly Available through GPFS
- Installation and managed services

- Scalable

- Scale out to industry leading **94 4S or 8S nodes** and larger using GPFS *
- Certified by SAP!



Protect your initial investment with Scale Up / Scale Out options !

Changes from Haswell to Broadwell Models

- CTO (Configurable)
 - Updated templates based on SAP certifications
 - Upgrade processor to E7-8880v4
- SEO Models (Predefined configs)
 - Maintain same model configurations with 8GB, 16GB and 32GB DIMMs
 - Maintain Topseller models for NA
 - Upgrade processor to E7-8880v4
 - Other component updates:
 1. Pick up Mellanox ConnectX-3 10 GbE Adapter (already used in CTO configs)
 2. M5120 RAID Adapter to M5225 RAID Adapter (PN 00AE938) – Used on Haswell EX models 6241-HV* & 6241-HQ*
 3. 400GB SSD in the X6 server from S3700 to S3710
 4. 1.2TB 2.5" 10K HDD from 6Gb to 12Gb (0WG700)

SAP HANA MTMs (SEO) for the Channel



Model	Sockets	Memory	Max
x3950 X6 6241-HB* 6241-HE* 6241-EIY 6241-HH* 6241-EJY 6241-8G* 6241-ELY	4/8 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v3 E7-8880v3 E7-8880v4 E7-8880v4	512GB (32x16GB) DDR3 DDR3 DDR3 DDR4 DDR4 DDR4 DDR4	3TB (192x16GB) 8*CPU Top Seller Top Seller Top Seller
x3950 X6 6241-HC* 6241-HF* 6241-HI* 6241-8H*	4/8 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v4	1024GB (32 x 32GB) DDR3 DDR3 DDR4 DDR4	6TB (192x32GB) 8*CPU
x3950 X6 6241-HD* 6241-HG* 6241-HJ* 6241-8J*	8/8 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v4	2048GB (64 x 32GB) DDR3 DDR3 DDR4 DDR4	6TB (192x32GB) 8*CPU

Model	Sockets	Memory	Max
x3850 X6 6241-H2* 6241-HZ* 6241-HU* 6241-8A*	2/4 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v4	128GB (16 x 8GB) DDR3 DDR3 DDR4 DDR4	768GB (96x8GB) 4*CPU
x3850 X6 6241-H3* 6241-HY* 6241-EGY 6241-HT* 6241-EHY 6241-8B* 6241-EKY	2/4 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v3 E7-8880v3 E7-8880v4 E7-8880v4	256GB (16 x 16GB) DDR3 DDR3 DDR3 DDR4 DDR4 DDR4 DDR4	1.5TB (96x16GB) 4*CPU Top Seller Top Seller Top Seller
x3850 X6 6241-H4* 6241-HX* 6241-HS* 6241-8C*	2/4 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v4	512GB (16 x32GB) DDR3 DDR3 DDR4 DDR4	3TB (96x32B) 4*CPU
x3850 X6 6241-H5* 6241-HW* 6241-HR* 6241-8D*	4/4 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v4	512GB (32 x 16GB) DDR3 DDR3 DDR4 DDR4	1.5TB (96x16GB) 4*CPU
x3850 X6 6241-H6* 6241-HV* 6241-HQ* 6241-8F*	4/4 E7-8880v2 E7-8880v3 E7-8880v3 E7-8880v4	1024GB (32 x 32GB) DDR3 DDR3 DDR4 DDR4	3TB (96x32GB) 4*CPU

Note:
GPFS Single Server licenses are **not** included with E7-8880v3 (Haswell EX) or E7-8880v4 (Broadwell EX) HANA models

Use SSCT with LETS templates to create configurations

Add GPFS Single Server, Server, or FPO license

Learn More: www.lenovo.com/sap/hana

HANA Sales Kit: [Wiki](#) [Lenovo](#) [BP](#)
LETS Repository: [Lenovo](#) [BP](#)

New Press

LENOVO EXPANDS PARTNERSHIP WITH SAP

Lenovo™

Lenovo and SAP Expand Partnership for Data Center Innovation

Lenovo is expanding its critical strategic alliance with SAP, the world's leading enterprise software provider. The two companies will deepen collaboration in sales, marketing and development, which promises to broaden and strengthen Lenovo's portfolio of data center offerings.

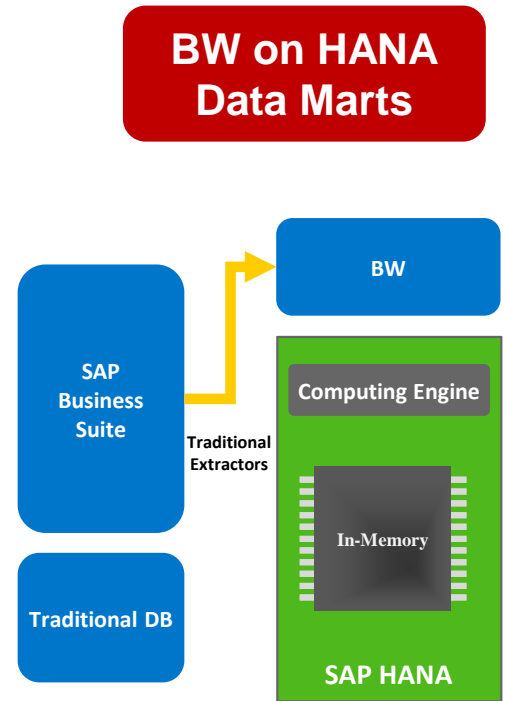
Read more on [Lenovo Central](#).



Lenovo X6 on stage for keynote at SAP TechEd

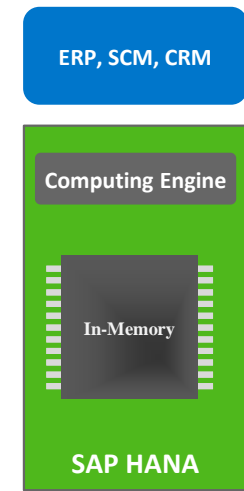


SAP HANA Deployment Options/Different Use Cases



1

Suite on HANA



2

SAP Business Warehouse on HANA \$6B 10K Customers

Deployment Options

- Single node
- Scale-out

SAP Business Suite in HANA \$18B 27K Customers

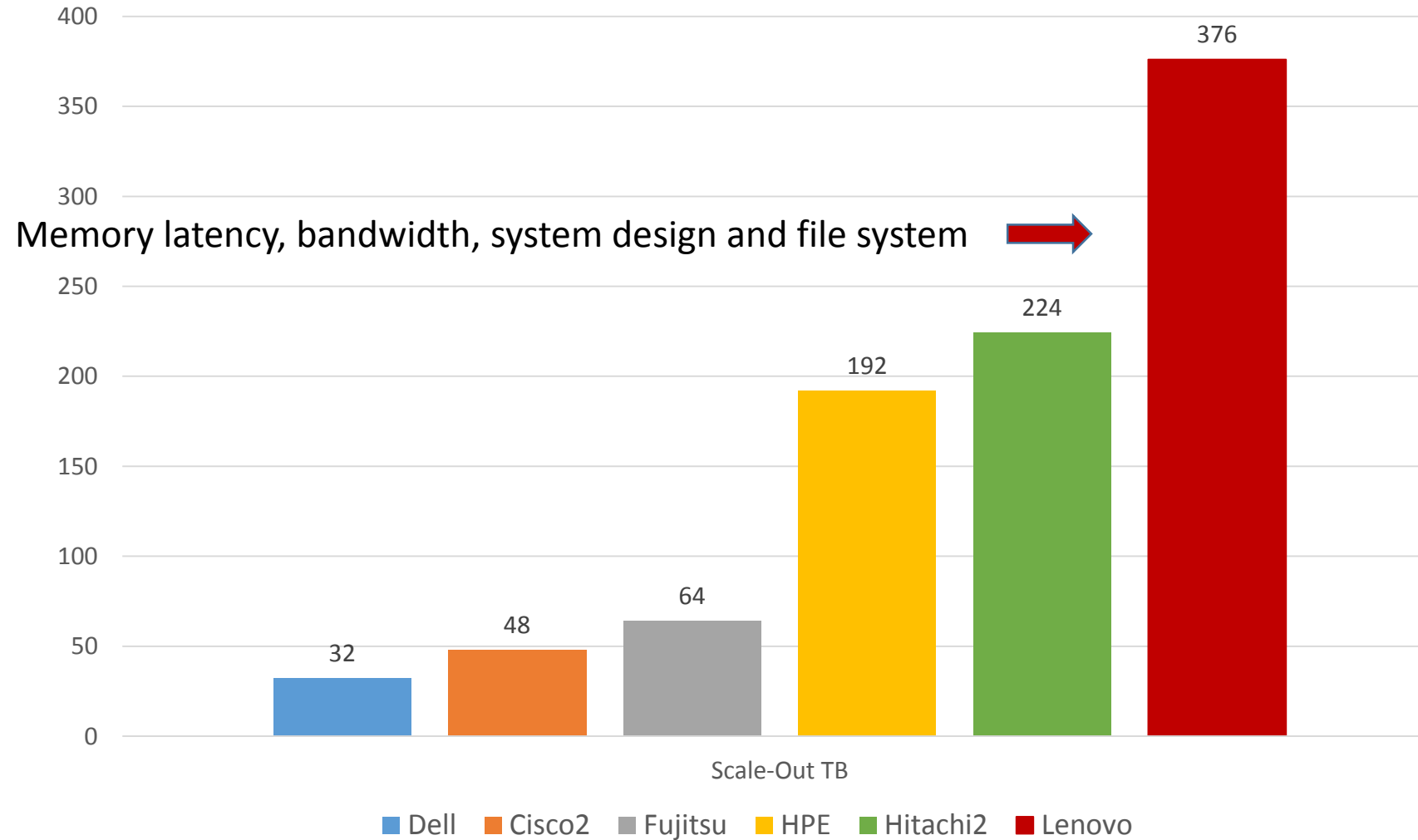
Deployment Options

- Single node
- Scale-out (requires SAP approval)

Scale Out Supremacy means?



SAP HANA Vendor sər-tə-fə-'kā-shən



<https://global.sap.com/community/ebook/2014-09-02-hana-hardware/enEN/appliances.html>

What's behind the numbers?

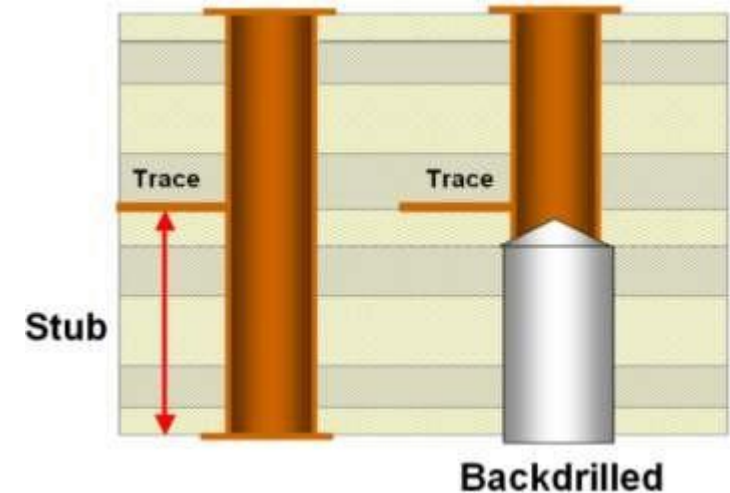
Great engineering that includes

- Signal Quality Simulation
- Careful board layout using quality board materials,
- Backdrilling Vias

and

working with memory vendors/Intel to get the best possible margins.

- Optimizing Memory Performance of Intel Xeon E7 v3-based Servers
<https://lenovopress.com/lp0048-optimizing-memory-performance-intel-xeon-e7-v3>
- Optimizing Memory Performance of Intel Xeon E7 v2-based Servers
<http://lenovopress.com/redp5223>



Competitive Analysis: Business Warehouse on HANA Scale-out

Advantages

- Common building block for single node and scale-out
- GPFS HA auto host failover
- Sync or Async DR



- Cisco resells Fujitsu's 8S server
- Dell resells SGI's 4S server

HP forces move from Rack to expensive Blade from 4S to 8S Scale-out
Cisco does the same

Single Node BW	4 Socket 1.0TB	4 Socket 1.5TB	4 Socket 2TB	8 Socket 3TB	8 Socket 4TB	Total V3 Certs
Lenovo	94	94	94	94	94	22
HP	34	34	48 _{8S}	48		8
Fujitsu	16	16		16	16	16
NEC						0
Cisco*	16	16	16			12
Dell*		16				2
Huawei	16	16		16	16	18
Hitachi	16	16		56		12
SGI						0

No Scale-out certs from SGI

Competitive Analysis: Suite on HANA Single Node

- Advantages
 - Common building block for single node and scale-out
 - GPFS HA auto host failover
 - Sync or Async DR



Dell & Cisco limited to 3TB!

Converged System 500
DL580

SoH	4 Socket 2TB	4 Socket 3TB	8 Socket 4TB	8 Socket 6TB	16 Socket 12TB	32 Socket 24TB
Lenovo						
HP		Rack			Blade	
Fujitsu						
NEC						
Cisco						
Dell						
Huawei						
Hitachi						
SGI					?	?

HP ConvergedSystem 900 is an extremely expensive and complex Blade based solution

Competitive Analysis: Suite on HANA Single Node

- Advantages
 - Common building block for single node and scale-out
 - GPFS HA auto host failover
 - Sync or Async DR



Dell & Cisco limited to 3TB!

SoH	4 Socket 2TB	4 Socket 3TB	8 Socket 4TB	8 Socket 6TB	16 Socket 12TB	32 Socket 24TB
Lenovo						
HP		Rack			Blade	
Fujitsu						
NEC						
Cisco						
Dell						
Huawei						
Hitachi						
SGI					?	?

Competitive Analysis: Single Node

- Advantages
 - Common building block for single node and scale-out
 - GPFS HA auto host failover
 - Sync or Async DR



- Cisco limited to 1.5TB
- Dell limited to 2TB
- HP limited to 3TB

SoH	4 Socket 2TB	4 Socket 3TB	8 Socket 4TB
Lenovo			
HP			
Fujitsu			
NEC			
Cisco			
Dell			
Huawei			
Hitachi			
SGI			

HP Fiction vs Fact vs X6

10 Months late to market
Proprietary technology
Expensive – 2X vs X6 6TB
Very Complex
18U Blade Chassis

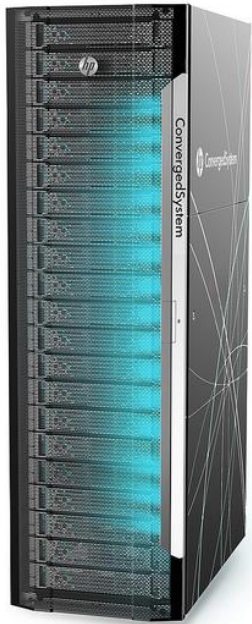
Say What?

**HP ConvergedSystem
900 for SAP HANA
Scale-up
Configurations**

Call for Availability

Superdome X BL920s Gen9;

HP ConvergedSystem 900 for SAP HANA Scale-up Configurations



Fiction



HP ConvergedSystem 900 for SAP HANA 8s/6TB; optimized for SOH

HP ConvergedSystem 900 for SAP HANA 16s/12TB; optimized for SoH

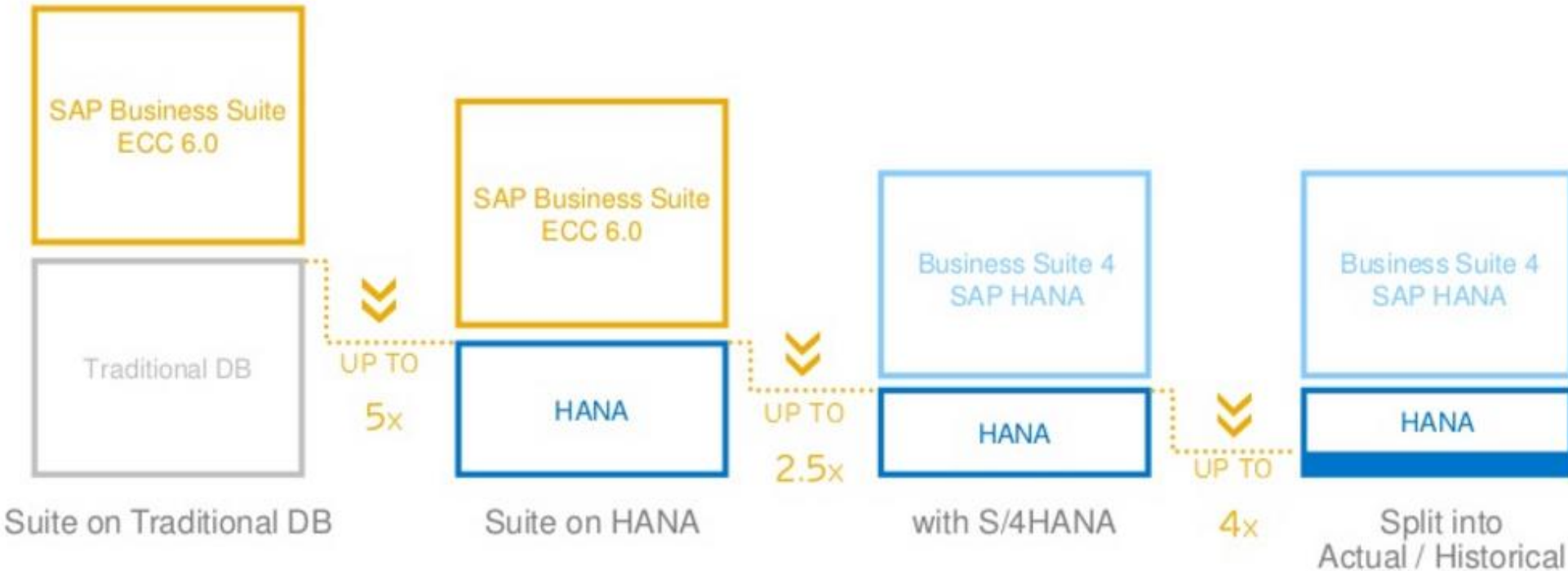
Fact



X3950 X6

Lenovo

Footprint Reduction Big Picture for On-premise



10x
smaller data footprint

7x
higher throughput

1800x
faster analytics & reporting

4x
less process steps

SAP S/4HANA

Simplified Finance Module (Feb 2015) - SAP Accounting powered by HANA

Simple Logistics Module (Soon) - SAP Inventory management and supply chain powered by HANA

Never have your customer ask - 'is this bad? That I chose someone other than Lenovo for HANA?'



+ Backup



+ X6 Mission Critical Enterprise System

Scalable, high-performance system with industry-leading RAS features for running the crucial workloads customers require to be in business

- **Reduce cost** – An ideal platform to migrate from RISC to take advantage of better price to performance and lower TCO
- **Leadership** – SAP HANA market leader at >50% share
- **Mission Critical** - Five 9's of Reliability – 99.999% uptime from Xeon E7 Run Sure technology combined with unique X6 RAS features
- **Innovative** – Modular design supports transitioning to multiple generations of processors and memory in the same chassis

Target Large Workloads:

OLTP & Enterprise Databases

Business Analytics

High Performance/ Low Latency Apps

ERP, CRM & Business Logic

Enterprise Virtualization

Databases That Require Fast I/O



+ X6 Mission Critical Enterprise System

The only **Modular Design x86 Enterprise Rack**

System x® x3850 X6



System x® x3950 X6



Sell when customer needs ...

- A platform for large, **mission-critical applications** with superior RAS features for high availability
- To implement large **in-memory databases** for real-time Big Data business analytics

Competitive advantage ...

- **Beats RISC based systems on performance** with superior value (SPEC.org and SAP), optimal price to performance and overall lower TCO
- Only vendor with a **“modular, lid-less” design** to simplify serviceability and offer up to 8 sockets in a 8U form factor
- Up to **12TB memory & 144 cores** for increased database/app performance

Sell against ...



Cisco C460



Dell R930



HP DL580



Fujitsu Primequest 10U
2400/2800E2



+ Lenovo Certified SAP HANA Appliances

Simple, Seamless, Same Building Block Approach for Scale-up or Scale-out that ensures our customer's never lose their initial investment in either strategy



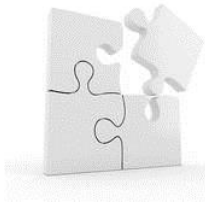
Simple

- No SAN required because of a unique shared nothing architecture
- Expand database by adding nodes
- Single part number ordering for integrated server



Seamless

- Highly Available (HA)
- Intelligent Cluster integrated packaging and assembly
- Installation and managed services



Scalable

- Scale out to 94 nodes and larger
- Certified by SAP

Target Workloads:

Business Analytics

Lenovo x3950 X6



8P

Large



4P

Medium

Lenovo x3850 X6



2P

Small



+ Lenovo X6 for SAP HANA

Unique Modular Appliance that scales with the same building block

X6



Lenovo x3850 X6



Lenovo x3950 X6

Sell when customer needs ...

- **Best in class market share leading** platform for SAP's in-memory database that uses a same building block approach for Scale-out or Scale-up use cases

Competitive advantage ...

- **Simple** - No SAN required
- **Seamless** – Same Building Block for Scale-up or Scale-out
- **Scalable** – Scale-out to market leading 94 4TB nodes using GPFS
- **Highly Available** - GPFS enabled / Installation and managed services

Sell against ...



SGI 4U Rack
UV300H



Cisco 4U Rack
C460 M4



Dell 4U Rack
R930



HPE 4U Rack
DL580



HPE **18U** Blade
CS900



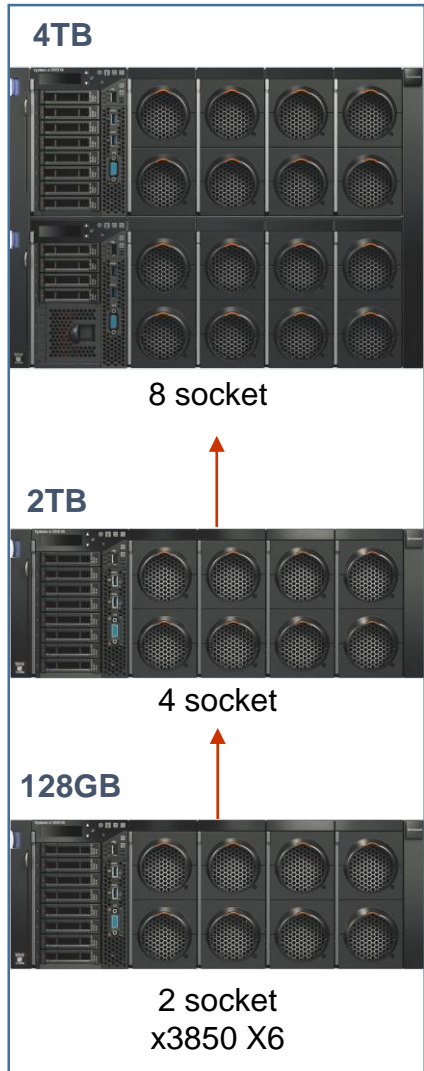
Fujitsu **10U** Rack
PQ2800

The following charts are intended to showcase the uniquely simple approach that only Lenovo takes in our Scalability roadmap. So whether the customer needs Scale-out or Scale-up for SAP HANA – if they choose Lenovo they can take advantage of our same building block approach.

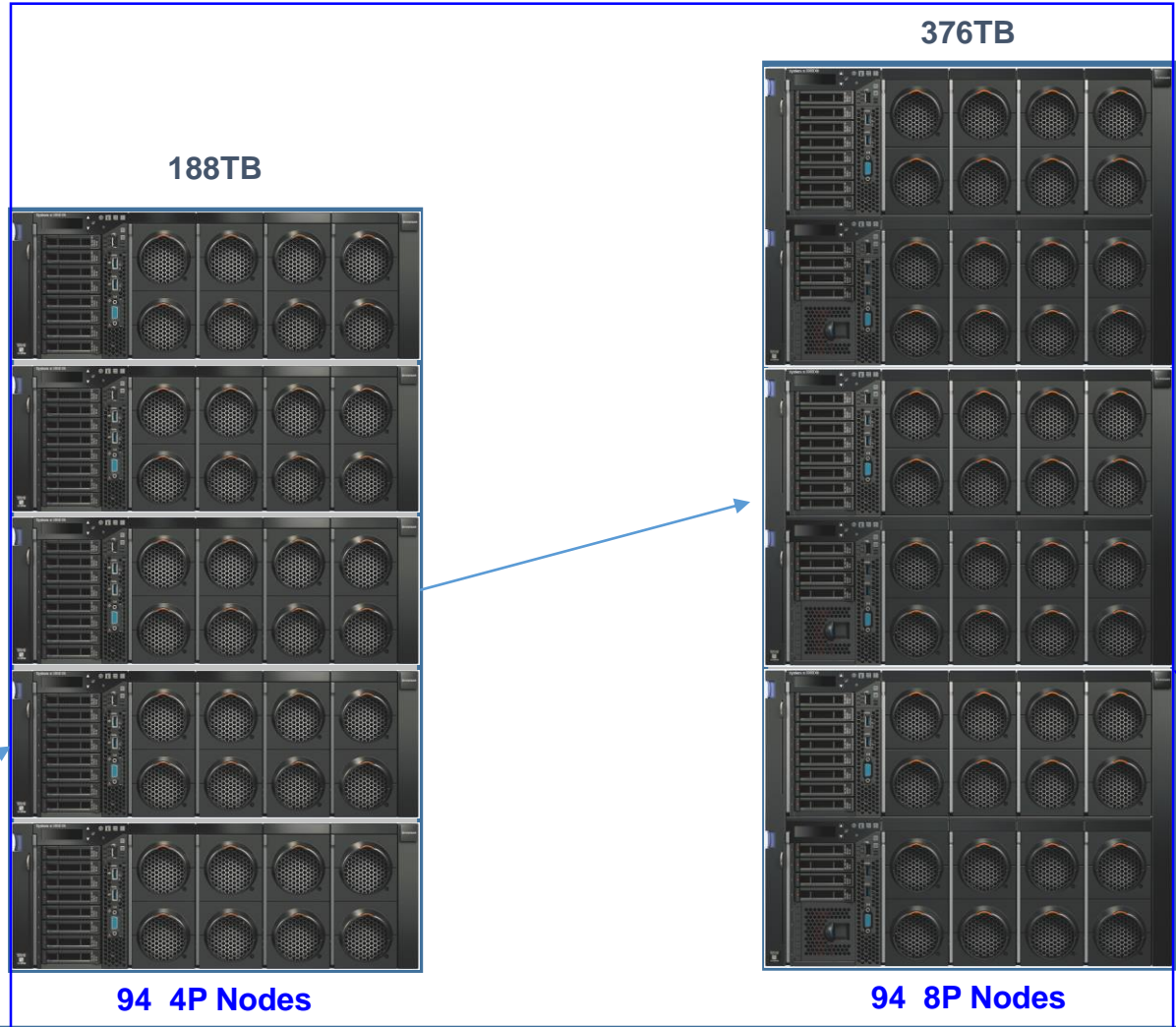
If they choose HPE – well that's a different story

Lenovo

Rack



Scale-up Single Node BWoH

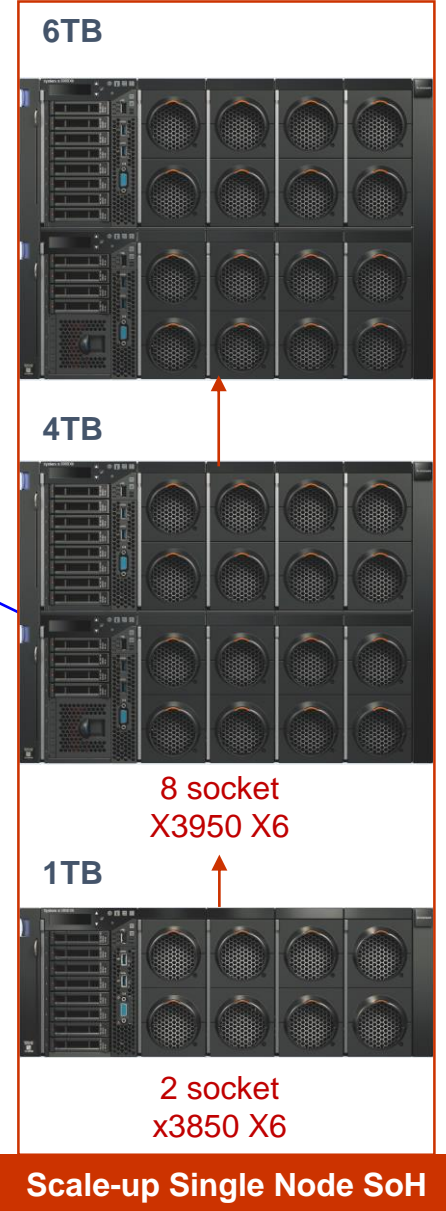


Scale-Out BWoH

Simple
Seamless
Scalable

Same Building Block Approach

Rack



Scale-up Single Node SoH

4P

8P



Converged System 500 For Scale-out

Rack

Rack

DL580's
3PAR StoreServe SAN
File System Management Node
Quorum Nodes for redundancy
TOR Switching

68TB



34 4P Nodes

Scale-Out BWoH

~~Simple~~
~~Seamless~~
~~Scalable~~

~~Same Building Block Approach~~

2TB
4P

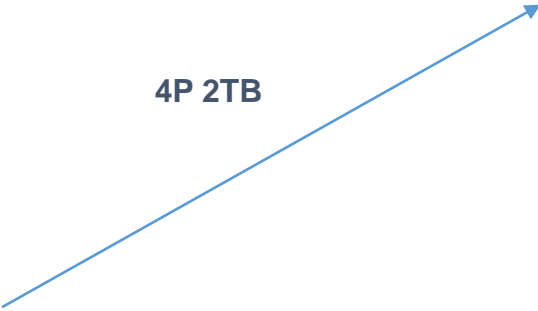


HPE ConvergedSystem 500 for SAP HANA
Scale-up Storage



HPE ConvergedSystem 500 for SAP HANA Compute
Node

4P 2TB



3TB
4P



HPE ConvergedSystem 500 for SAP HANA
Scale-up Storage



HPE ConvergedSystem 500 for SAP HANA Compute
Node

128GB
2P

4P

Scale-up Single Node BWoH

1.5TB
2P

Scale-up Single Node SoH

8P



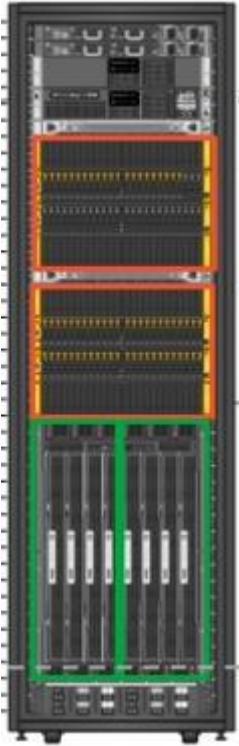
Converged System 900
For Scale-up
& Scale-Out

Converged System 900
For Scale-Out

Blade

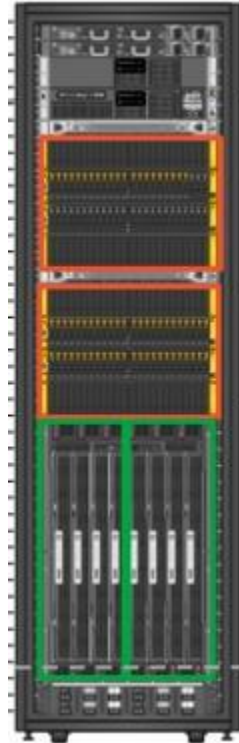
Blade

2TB
8P



2-4TB
8P

192TB



48 Nodes

Redundant Switches

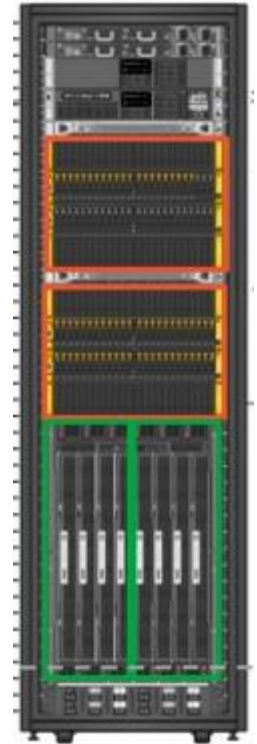
3PAR StoreServe SAN
8 Nodes

File System Management
2 Nodes

BL 920 2way Blades
x8

2-4TB
8P

12TB
16P



1TB
2P

Scale-Out BWoH

~~Simple~~
~~Seamless~~
~~Scalable~~

~~Same Building Block Approach~~

Scale-up Single Node BWoH

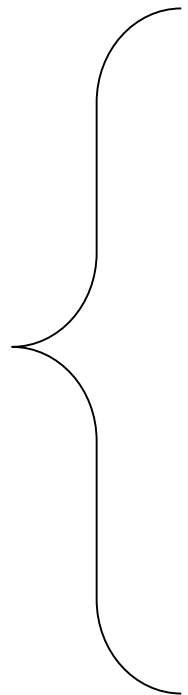
Scale-up Single Node SoH

4P

8P

HPE

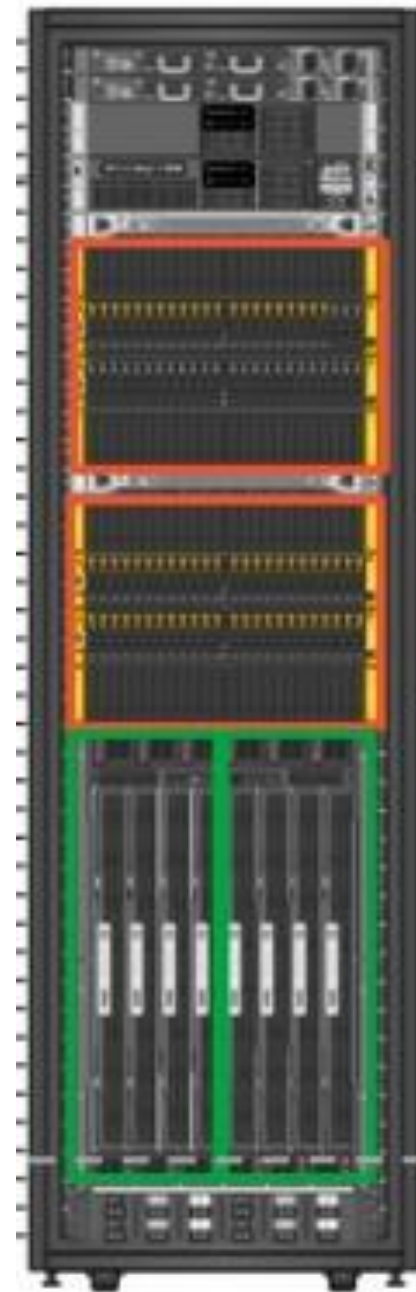
Minimum 2TB Scale-out Config with CS900 vs X6



4 socket
4U
x3850 X6

2TB

THIS or THAT



8 socket
30U
Converged System 900

18U:
Unique chassis

HPE With SGI

Converged System 500
For Scale-out

DL580's
3PAR StoreServe SAN
File System Management Node
Quorum Nodes for redundancy
TOR Switching

Converged System 500
For Scale-out

Rack

2TB
4P



HPE ConvergedSystem 500 for SAP HANA Scale-up Storage



HPE ConvergedSystem 500 for SAP HANA Compute Node

128GB
2P



UV300H

4TB
8P

512GB
8P



68TB



34 4P Nodes

Scale-Out BWoH

Simple
Seamless
Scalable

Same Building Block Approach

Rack

3TB
4P



HPE ConvergedSystem 500 for SAP HANA Scale-up Storage



HPE ConvergedSystem 500 for SAP HANA Compute Node

1.5TB
2P



4TB
8P

512GB
8P



UV300H

Scale-up Single Node SoH

8P

4P

Scale-up Single Node BWoH

Dell With SGI

Dell PowerEdge R930

Rack

32TB

Rack

2TB
4P

4P 2TB

3TB
4P

128GB
2P

2TB
4P

2TB
4P

1TB
2P

4TB
8P



256GB
4P

UV300H

16 4P Nodes

6TB
8P

2TB
4P

UV300H

Scale-Out BWoH

~~Simple~~
~~Seamless~~
~~Scalable~~

Scale-up Single Node SoH

4P

Scale-up Single Node BWoH

~~Same Building Block Approach~~

8P



Cisco

Rack

2TB
4P



Cisco UCS C460 M4
2TB 4P
4U Rack

128GB
2P

Blade

2TB
4P



+5100 Series 6U Blade Chassis

1TB
4P



Cisco UCS B460 M4 Blade

768GB
2P

128GB
2P

Cisco UCS B260 M4 Blade

4P

Scale-up Single Node BWoH

Cisco UCS C460 M4
2TB 4P 4U Rack
Or
2TB B460 M4 Blade in 6U Chassis

32TB



4P 2TB

4P 2TB

16 4P Nodes

Scale-Out BWoH

Simple
Seamless
Scalable

Same Building Block Approach

Rack

3TB
4P



Cisco UCS C460 M4
2TB 4P
4U Rack

1TB
2P

Blade

3TB
4P



+5100 Series 6U Blade Chassis

2TB
4P



Cisco UCS B460 M4 Blade

1.5TB
2P

1TB
2P

Cisco UCS B260 M4 Blade

Scale-up Single Node SoH

8P



Cisco With Fujitsu

Fujitsu PrimeQuest 2800 OEM
8P 10U

OEM Rack

OEM Rack

48TB



8P 3TB



2TB
8P

256GB
8P



UCS C880 M4
Fujitsu PrimeQuest 2800
10U

6TB
8P

4TB
4P



UCS C880 M4
Fujitsu PrimeQuest 2800
10U

16 4P Nodes

Scale-Out BWoH

~~Simple~~

~~Seamless~~

~~Scalable~~

~~Same Building Block Approach~~

4P

Scale-up Single Node BWoH

Scale-up Single Node SoH

8P

No other competitors can offer all of these features....but X6 can!

- ✓ Both DDR3 and DDR4
- ✓ Up to 12TB memory
- ✓ Ability to scale from 2 to 8 Sockets
- ✓ Seven #1 Benchmarks with Intel E7 v3 processors
- ✓ NVMe PCIe SSDs for lower latency storage



x3850 X6



x3950 X6

X6 Systems Crush Competitors In Intel EX Benchmarks

Intel Posts #1's on E7 v3 4P & 8P platforms by vendor and Lenovo is on top

- Lenovo had more than HPE & Dell *combined!* (and almost as many as HPE + Cisco)
- We had #1's across multiple categories: SPEC, SAP, TPC & STAC
- X6 systems- #1 in Performance
 - [Link](#) to the Intel site
- Lenovo Systems- #1 in Quality
 - [Link](#) to the ITIC report
- Read the [blog](#) and share with your customers



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