
Dell PowerEdge Server

Q3/2010



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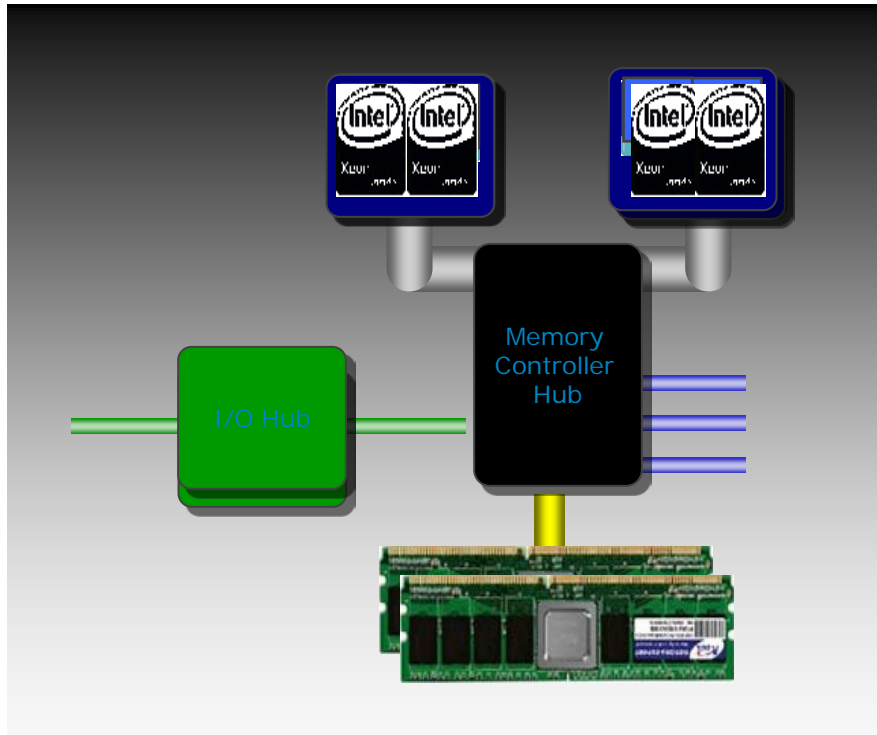
Fakten zum Energieverbrauch von Informationstechnologie

- IT verbraucht mehr als 10% des deutschen Stroms
- Der Leistungsbedarf von Rechenzentren verdoppelte sich von 2000 – 2010; Greenpeace erwartet für 2020 das Dreifache
- Ein Watt Stromverbrauch in einem Server erfordert 2 – 3 Watt im RZ für Stromverteilung, Kommunikation, Kühlung ...
Ein Watt Verbrauch kostet bei $7 * 24$ ca. 1 – 1,5 Euro/Jahr
- 2008: 90 % der Server auf der Welt laufen in einem CPU-Nutzungsgrad $< 10\%$
- 2009: Ca. 18% der Server weltweit sind virtualisiert
- 2010: Die durchschnittliche Konsolidierungsrate bei der Virtualisierung beträgt 1 : 15 und mehr

Intel – AMD Technologie Vergleich

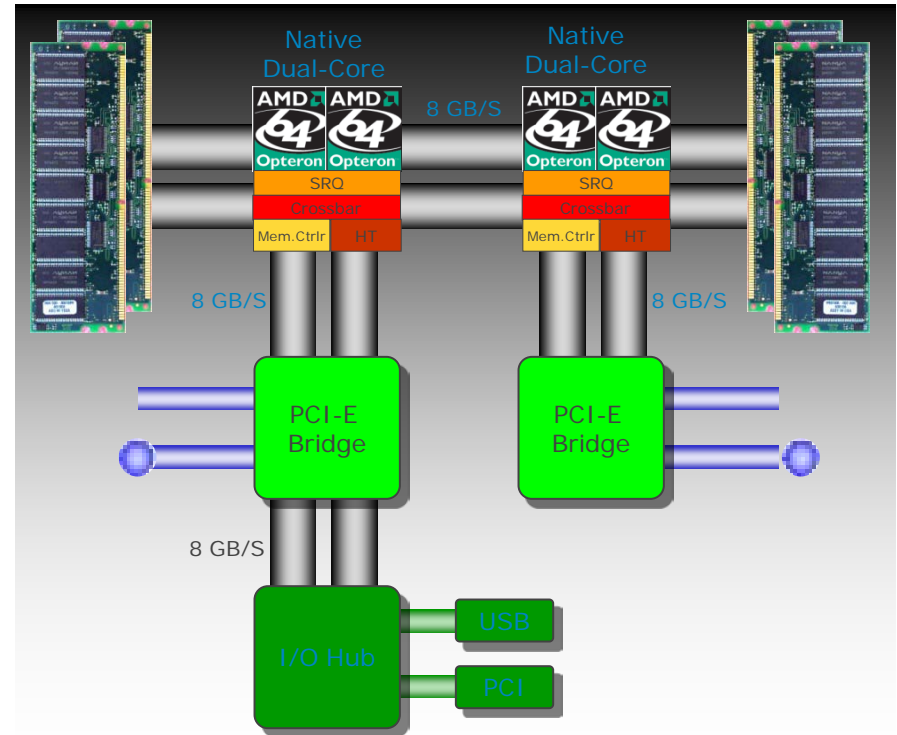


AMD- versus Intel-Architektur (Dual-Prozessor vor Mai 2009)



Intel Technology and FSB Architecture

- Industry-standard 64-bit technology
- Dual independent FSB, up to 1333MHz
- 4MB of shared L2 cache
- High-bandwidth FBD memory, high power cons.



AMD Technology with Direct Connect Architecture

- Industry-standard AMD64 technology
- AMD's Direct Connect Architecture eliminates bottlenecks in memory and I/O access
- HyperTransport™ technology interconnect for high bandwidth and low latency

Intel® Architektur

Dual Processor (55xx/56xx) ab Mai 2009

Performance

- 4- & 6- Core Intel® Westmere- EP™ Processors
- 8 – 12 MB Shared L3 Cache
- 32nm Process Technology
- Triple- Channel DDR-3 Memory Interface
- DDR3 1333 GHz @ 6.4 GT/sec
- Intel® Quickpath- Technology
- TurboBoost
- Hyperthreading

Power Management

- C1E (enhanced sleep state)

Virtualization

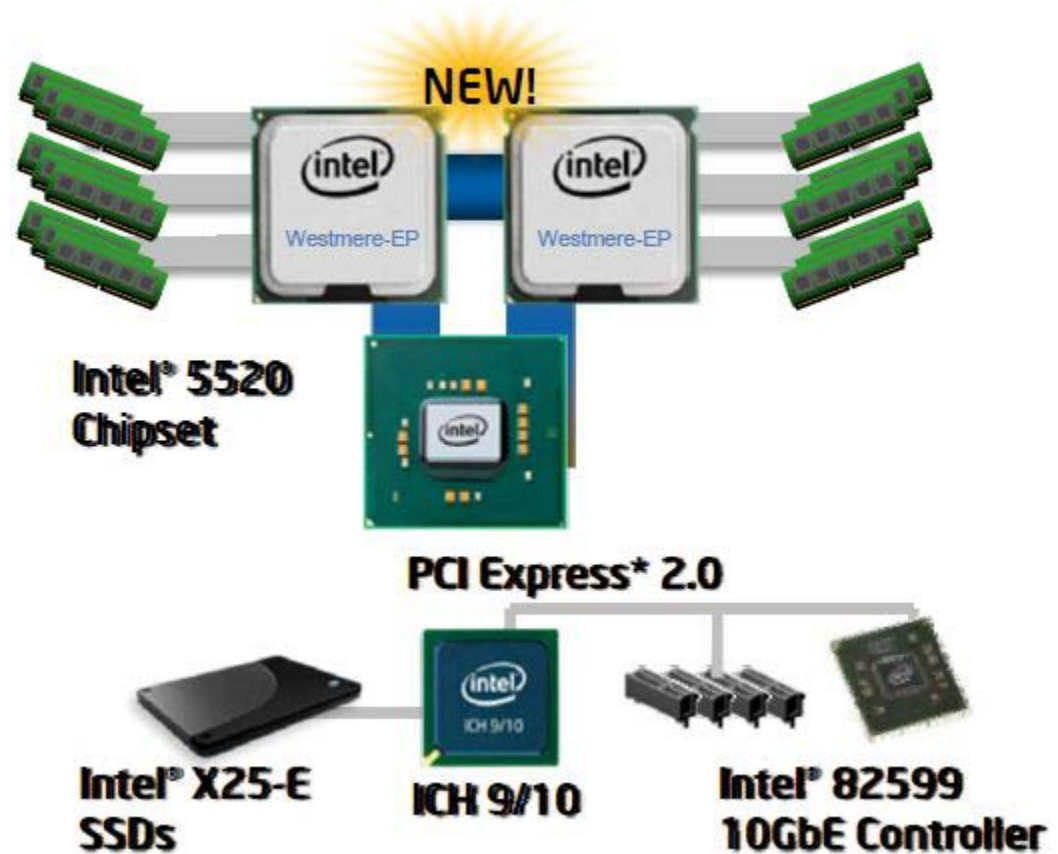
- Intel® Virtualization Technology

Reliability/ Availability/ Security

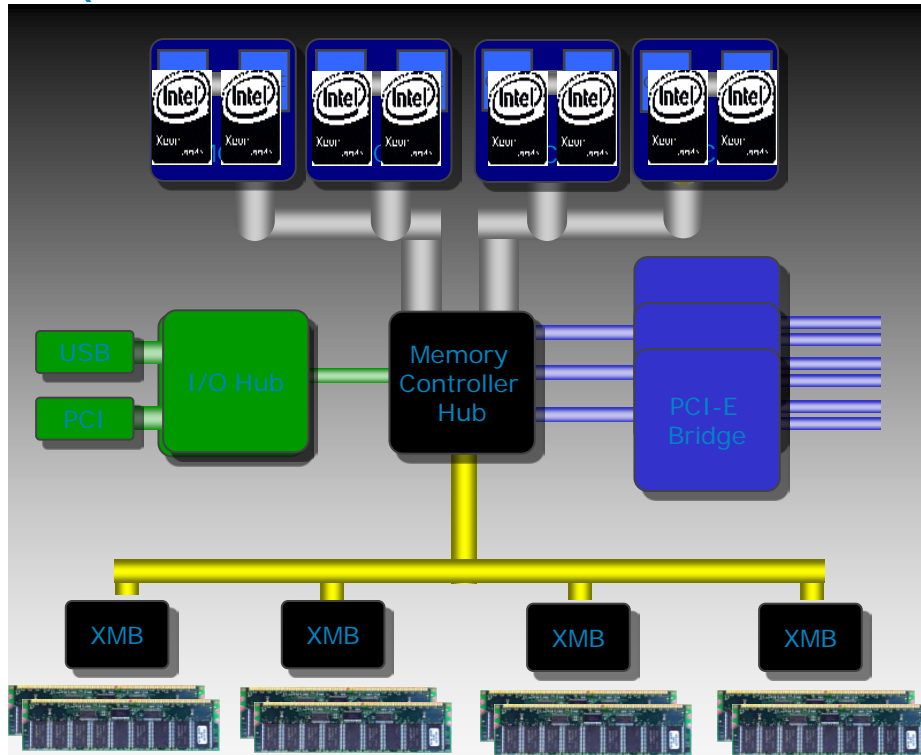
- Intel® Trusted Execution Technology
- Intel® Advanced Encryption Security

Manageability

- APM Management Link

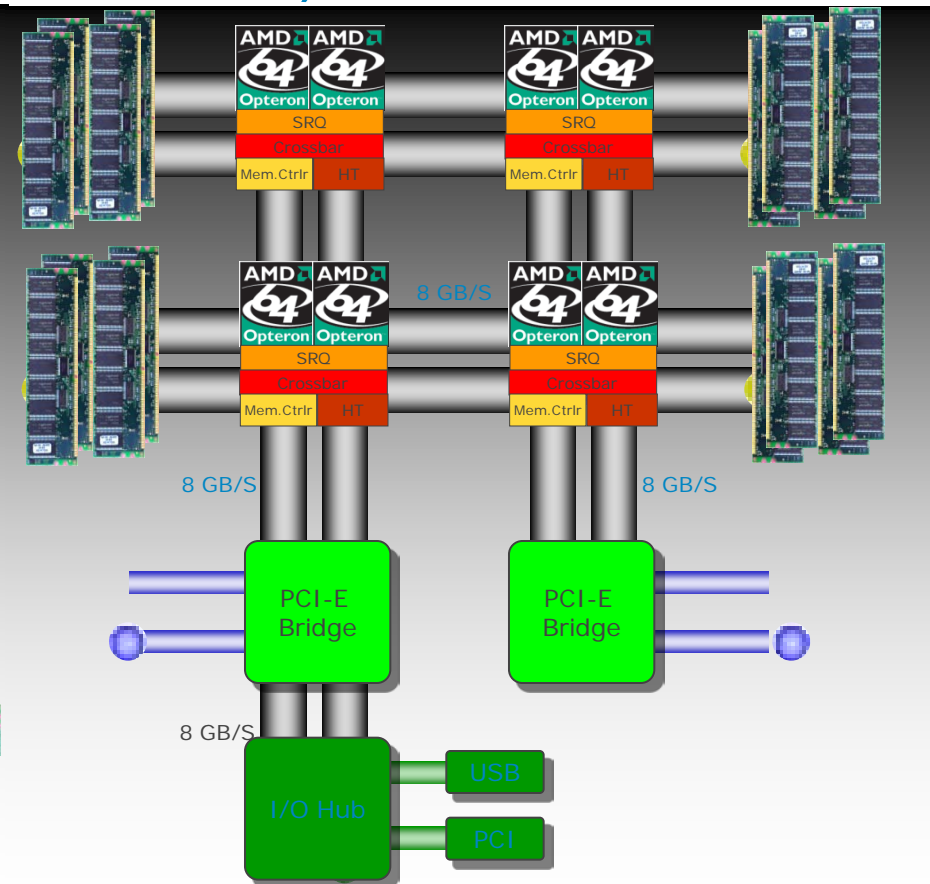


AMD- versus Intel-Architektur (Quad-Prozessor vor März 2010)



Intel Technology and FSB Architecture

- Industry-standard 64-bit technology
- Two independent FSB, at 800MHz
- Up to 16MB of shared L3 cache
- Low power consumption DDR-2 memory



AMD Technology Direct Connect Archit.

- Industry-standard AMD64 technology
- AMD's Direct Connect Architecture
- HyperTransport™ technology interconnect for high bandwidth and low latency

Intel® Architektur

Quad Prozessor (75xx) ab April 2010

Performance

- 4 – 8 - Core Intel® Nehalem-EX™ Prozessoren
- 18 – 24 MB Shared L3 Cache
- 45nm Process Technology
- Quad-Channel DDR-3 Memory Interface
- DDR3 1066 GHz @ 5.8 GT/sec
- Up to 64 DIMMs
- Intel® Quickpath-Technology
- Hyperthreading

Power Management

- C1E (enhanced sleep state)

Virtualization

- Intel® Virtualization Technology

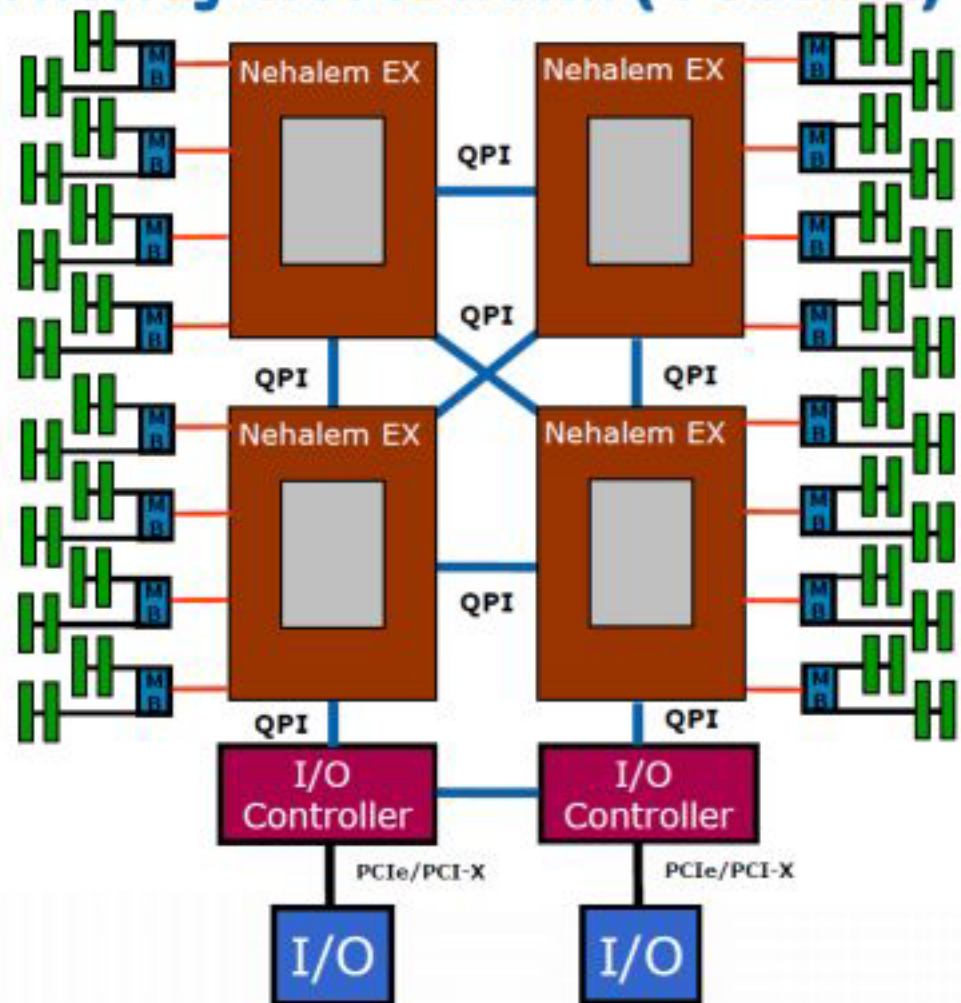
Reliability/ Availability/ Security

- Intel® Trusted Execution Technology
- Intel® Advanced Encryption Security

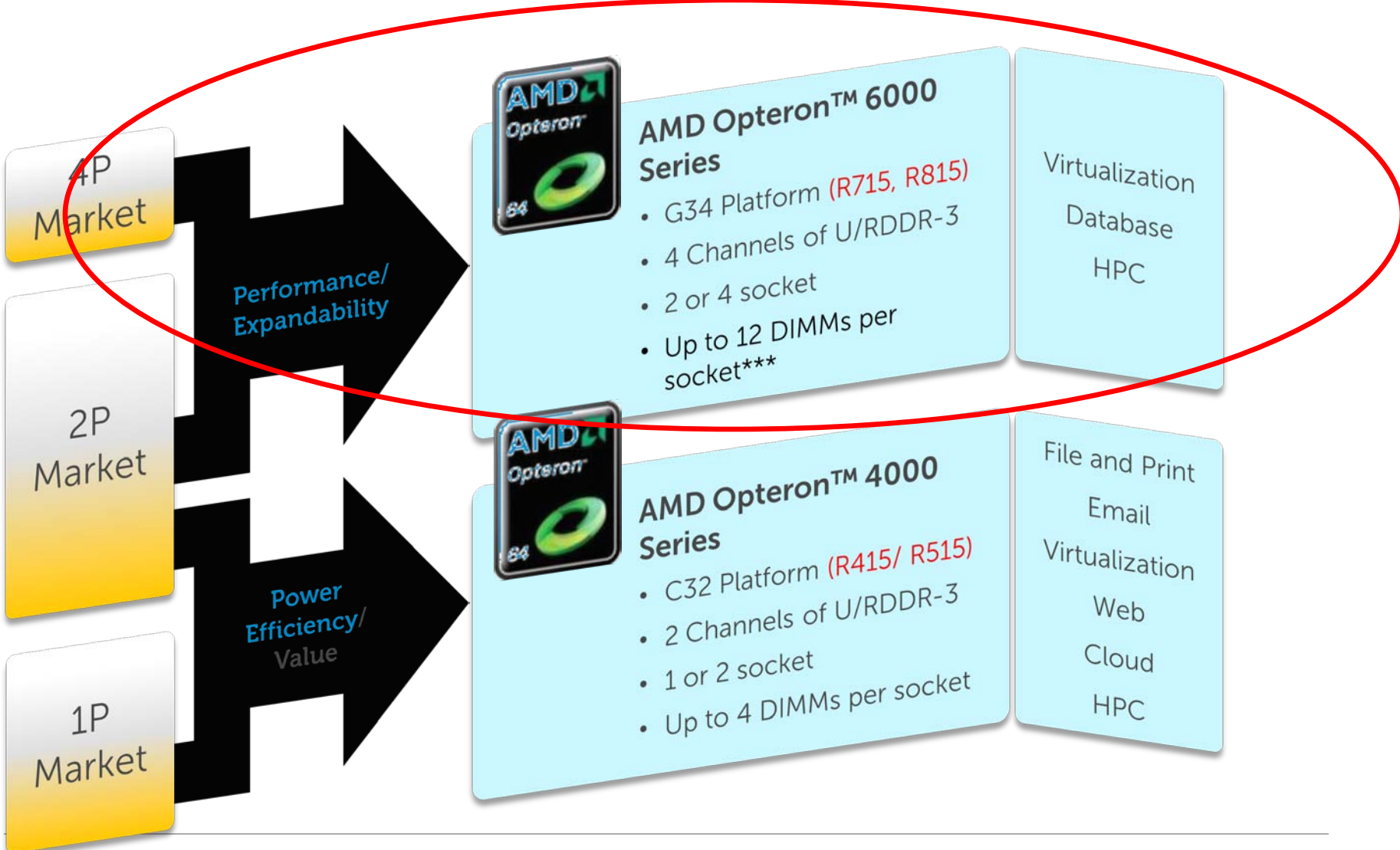
Manageability

- APML Management Link

Thurley EX Platform (4 socket)



Customer Value Shift Is Changing The Market



Dell PowerEdge Server



Dell PowerEdge Server „11. Generation“

DESIGN

Besseres Handling



MANAGEMENT

Optimierte Verwaltung



ENERGIE

Ressourcenfreundliche
Technologien



VIRTUALISIERUNG

Maximale Leistung



Dell PowerEdge – Neue Nomenklatur

PowerEdge R710

T: Tower
R: Rack
M: Modular

0: Intel
5: AMD

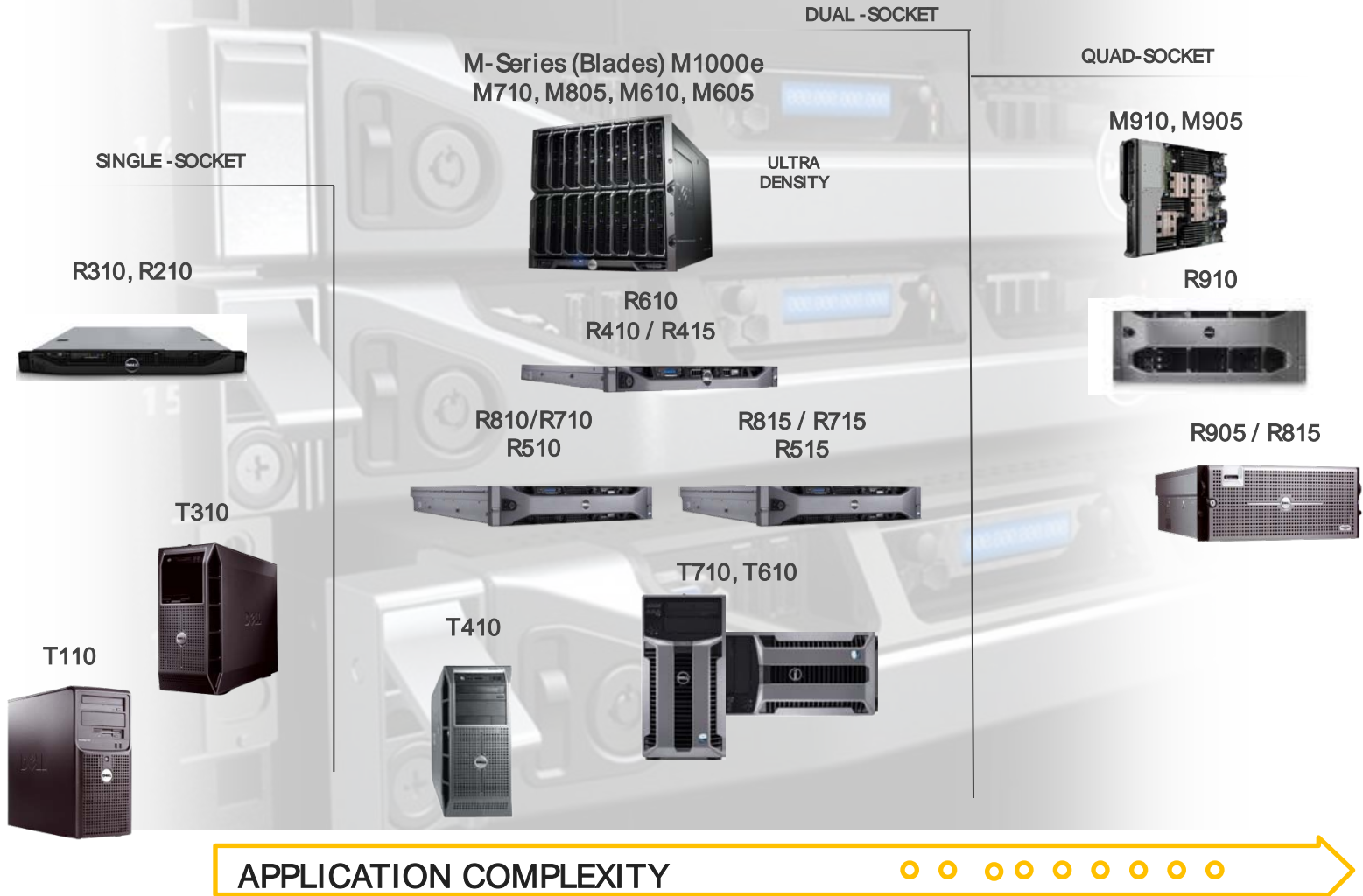
Capability Descriptor

1: 1S Low	5: 2S Low
2: 1S Medium	6: 2S Medium
3: 1S High	7: 2S High
4: 2S Value	8: 2S Special
9: 4S Server	

0: 10th
1: 11th
Generation

Übersicht Dell PowerEdge Server

EXPANDABILITY | DENSITY



PowerEdge R710

Prozessoren	Bis zu 2 Prozessoren Intel Serie 5500/5600
Cache	Bis zu 4 MB L2 und 8 MB L3 (je nach CPU)
Chipset	Intel 5520
Memory	18 DIMM Sockel mit bis zu 288 GB ECC DDR3 RAM (18x 16 GB DIMM)
Festplatten	6x 3,5" Hot Plug (SATA/SAS) 8x 2,5" Hot Plug (SATA/SAS/SSD)
RAID	PERC6/i PERC6E SAS6/iR
I/O Slots	Bis zu 4 PCIe Slots 2x PCIe x4 1x PCIe x16 oder 2x PCIe x8
Baugröße	2 HE
Netzteile	2x 570 Watt Energy Smart 2x 870 Watt High Output
Onboard Netzwerk	Zwei Dual Port Broadcom NetXtreme II Gigabit Ethernet 5709S mit TOE und iSCSI Offload
Management	Dell OpenManage iDRAC6 Enterprise Remote Management Dell LifeCycle Controller
Sonstiges	SD Card Reader



PowerEdge R715

Prozessoren	2 x AMD Opteron 6100 (Magny-Cours)
Core/Cache	8 / 12 - Core / 12M L3 Cache
Chipset	2 Socket G34 „Maranello“
Memory	16 DIMM Sockel mit bis zu 256GB RAM Quad Channel U/RDDR3 / 8 DIMMs per CPU
Festplatten	6x 2,5" Hot Plug (SATA/SAS/SSD)
RAID	H800 H700 H200
I/O Slots	6x PCIe Slots
Baugröße	2 HE
Netzteile	2x 750 Watt (2x 1100 Watt)
Onboard Netzwerk	Zwei Dual Port Broadcom NetXtreme II Gigabit Ethernet 5709S mit TOE und iSCSI Offload
Management	Dell OpenManage iDRAC 6 Enterprise Remote Management Dell LifeCycle Controller (LCC)
Sonstiges	SD Card Reader



Built for real-world workloads

PowerEdge R715

an ideal server for consolidation, virtualization and general business applications.



PowerEdge R810

Prozessoren	2/4 Intel Xeon Serie 7500 4/6/8 Core CPUs 2 Intel Xeon Serie 6500 CPUs
Cache	Bis zu 4 MB L2 / 24 MB L3 (je nach CPU)
Chipset	Intel 7500 (Boxboro-EX)
Memory	32 DIMM Socket mit bis zu 512 GB ECC DDR3 RAM (32x 16 GB DIMM)
Festplatten	6x 2,5" Hot Plug (SATA/SAS/SSD)
RAID	H200 RAID H700 RAID H800 RAID
I/O Slots	6 PCIe Slots 2x PCIe x8 Low Profile 3x PCIe x8 1x PCIe x4
Baugröße	2 HE
Netzteile	2x 1100 Watt Hot-Plug
Onboard Netzwerk	Zwei Dual Port Broadcom NetXtreme II Gigabit Ethernet 5709S mit TOE & iSCSI Offload
Management	Dell OpenManage iDRAC6 Enterprise Remote Management Dell LifeCycle Controller
Sonstiges	Redundanter SD Card Reader Optional Flex-Mem Bridge



PowerEdge R815

Prozessoren	4 AMD Opteron Serie 6100 8/12 Core CPUs
Cache	Bis zu 6 MB L2 / 12 MB L3 (je nach CPU)
Chipset	2 oder 4 Socket G34 / AMD SR5690 und SP5100
Memory	32 DIMM Sockel mit bis zu 512 GB ECC DDR3 RAM (32x 16 GB DIMM)
Festplatten	6x 2,5" Hot Plug (SATA/SAS/SSD)
RAID	H200 RAID H700 RAID H800 RAID
I/O Slots	6 PCIe Slots 2x PCIe x8 Low Profile 3x PCIe x8 1x PCIe x4
Baugröße	2 HE
Netzteile	2x 1100 Watt Hot-Plug
Onboard Netzwerk	Zwei Dual Port Broadcom NetXtreme II Gigabit Ethernet 5709S mit TOE & iSCSI Offload
Management	Dell OpenManage iDRAC6 Enterprise Remote Management Dell LifeCycle Controller
Sonstiges	Redundanter SD Card Reader



4-socket performance
for 2-socket budgets

The **PowerEdge R815** server: up to 48 cores of AMD Opteron processing power in a slim 2U form factor.



PowerEdge R910

Prozessoren	2/4 Intel Xeon Serie 7500 4/6/8 Core CPUs
Cache	Bis zu 6 MB L2 / 12 MB L3 (je nach CPU)
Chipset	Intel 7500 (Boxboro-EX)
Memory	64 DIMM Sockel mit bis zu 1024 GB ECC DDR3 RAM (64x 16 GB DIMM)
Festplatten	4x oder 16x 2,5" Hot Plug (SAS/SSD)
RAID	H200 RAID H700 RAID H800 RAID
I/O Slots	7 oder 10 PCIe Slots 2x PCIe x4 4x PCIe x8 1x PCIe x16 oder 4x PCIe x4
Baugröße	4 HE
Netzteile	4x 1100 Watt Hot-Plug
Onboard Netzwerk	Zwei Dual Port Broadcom NetXtreme II Gigabit Ethernet 5709S mit TOE & iSCSI Offload
Management	Dell OpenManage iDRAC6 Enterprise Remote Management Dell LifeCycle Controller
Sonstiges	Redundanter SD Card Reader



Performance Vergleich



Xeon 5500 (Nehalem-EP) and Xeon 5600 (Westmere-EP)

Benchmark	Description	R710 "Nehalem" X5570 (2.93/4C/8M)	R710 "Westmere" X5680 (3.33/6C/12M)	% Gain
SPECint_rate2006	Mainstream integer processing performance	237 base 257 peak	355 base 379 peak	47-49%
SPECfp_rate2006	Floating point/HPCC processing performance	191 base 197 peak	248 base 256 peak	30%
SPECpower_ssj2008	Performance/watt	1918 ssj_ops/w (L5530)	2818 ssj_ops/w (X5670)	47%
VMmark	VMware ESX virtualization performance	24.27 @ 17 tiles	31.93 @ 25 tiles	32%
SPECjbb2005	Java in-memory DB transactions	573,825 bops	911,230 bops	59%
Linpack	Linear equation solving performance	85.35 GFLOPS	144.5 GFLOPS	69%



R900 Xeon 7400 (Dunnington) and R910 Xeon 7500 (Nehalem-EX)

Benchmark	Description	R900 “Dunnington” X7460 (2.66/6C/16M)	R910 “Nehalem-EX” X7560 (2.26/8C/24M)	% Gain
SPECint_rate2006	Mainstream integer processing performance	268 base 291 peak	708 base 760 peak	161-164%
SPECfp_rate2006	Floating point/HPCC processing performance	142 base 155 peak	539 base 554 peak	257-280%
SPECpower_ssj2008	Performance/watt	575 ssj_ops/w (L7455)	1762 ssj_ops/w (X7560)	206%
SPECjbb2005	Java in-memory DB transactions	628,291 bops	2,001,136 bops	219%
TPC-E	MS SQL Server DB performance	671.35 tpsE	~1850 tpsE	176%
STREAM	Memory bandwidth	11 GB/sec	75 GB/sec	582%
VMmark	VMware ESX virtualization performance	19.99 @ 14 tiles (84 VMs)	TBD	TBD



2 Socket Performance Quick Reference Summary

■ Good
 + Better
 ▲ Great
 ● Max

PowerEdge Server	R710 X5670	R810 X6550	R810 X7560	R815 6174	R910 X7560
Positioning	Max VM Perf.	Good VM Perf.	Great VM Perf.	Max Raw Perf.	Great VM Perf.
Raw Performance	▲	■	+	●	+
Price Per Performance	▲	+	+	●	■
Price Performance per Watt	●	+	+	▲	■
Performance Per VM	●	+	▲	■	▲
Optimized VM Performance	6	8	8	12	8
Scalability (Memory, HD, PCI Slots)	■	▲	▲	+	●



4 Socket Performance Quick Reference Summary

■ Good
 + Better
 ▲ Great
 ● Max

PowerEdge Server	R810 L7555	R810 E7540	R815 6174	R910 X7560
Positioning	Better VM Perf.	Good VM Perf.	Max Raw Perf.	Max VM Perf.
Raw Performance	+	■	●	▲
Price Per Performance	+	■	●	▲
Price Performance per Watt	+	■	●	▲
Performance Per VM	+	▲	■	●
Optimized VM Performance	16	12	24	16
Scalability (Memory, HD, PCI Slots)	+	+	+	●



Fazit

Virtualization will rise to around 50% of x86 architecture server workloads by the end of 2012.

Source: Tom Bittman, vice president and distinguished analyst at Gartner.
Gartner Symposium/ITxpo, October 18-22-2009 , in Orlando

Dell bietet mit den aktuellen PowerEdge Server Modellen alle Vorteile der beiden x86 Prozessor Welten – nicht nur für Virtualisierung !

AMD 

intel 

Vielen Dank!

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