

Dell PowerEdge mit AMD Prozessoren

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MARKUS WOLFRAM
SENIOR SYSTEMS ENGINEER
DELL TECHNOLOGIES



Prozessortechnologien

Die neuesten AMD und Intel CPUs

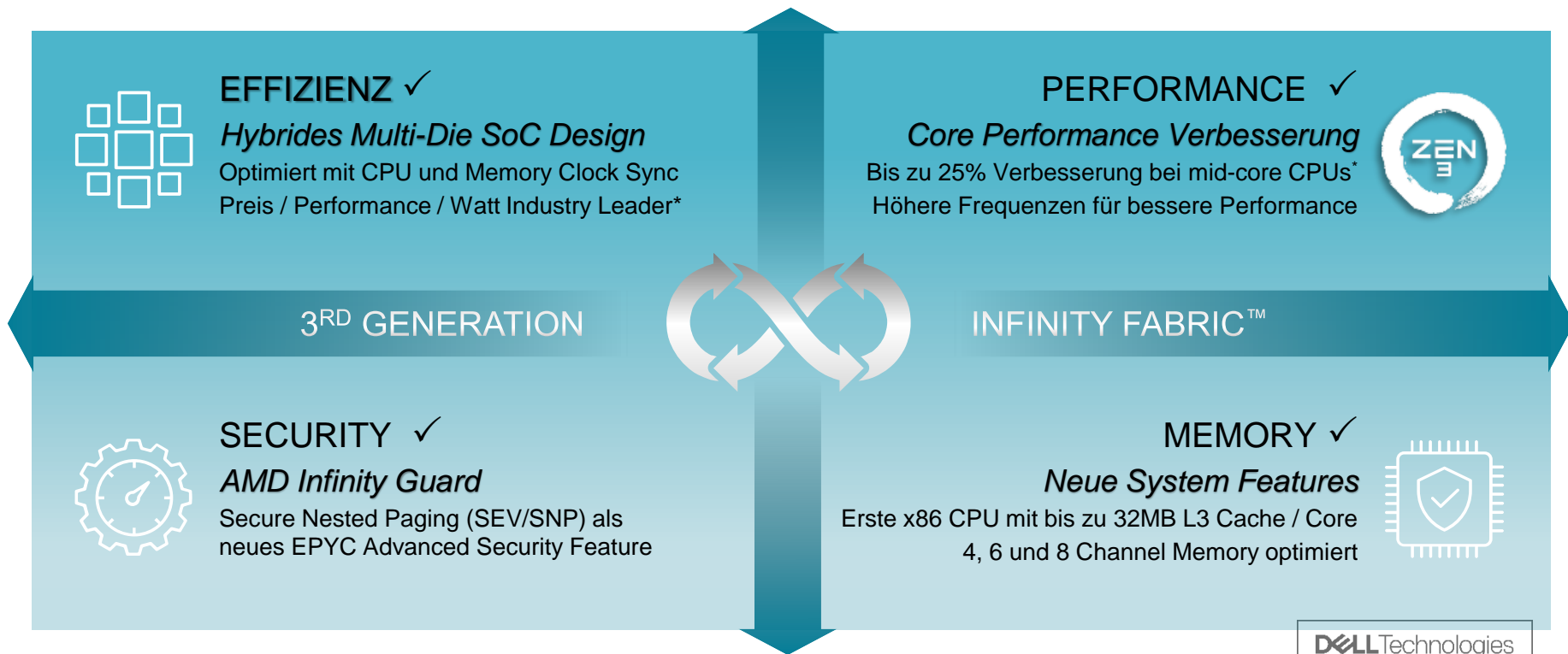
AMD EPYC™3

“Milan”



3. Generation AMD EPYC™ Architektur

AMD Infinity Architecture – Führendes Design für Data Center Server

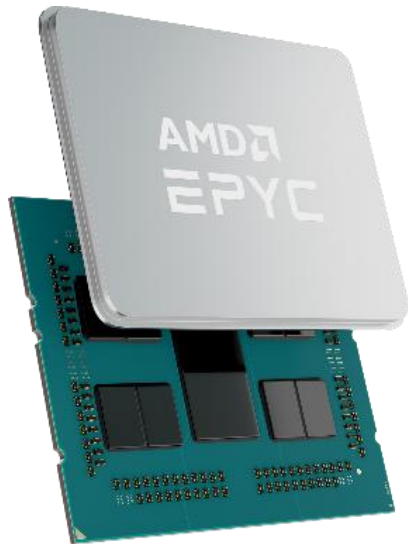


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* Based on AMD internal projections. Subject to change with actual testing.

AMD EPYC™ 7003 Prozessoren - “Milan”



**Weltweit beste
Performance einer
x86 CPU***

* Projected performance based on AMD internal testing and subject to change.

“Zen3” Core mit nochmals
verbesserter Performance

Keine neue Hardware – Klassisches Plug-In
nur BIOS Update nötig

Mehr Security Features

Optimiert für 4, 6 oder 8 Memory Channel Configs

Beschleunigter RAM Zugriff
Infinity Fabric™ und synchrone Memory Clock
Größter L3 Cache bei x86 – bis zu 32 MB / Core

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AMD EPYC™ 7003 “Milan” Übersicht

COMPUTE

AMD “Zen3” x86 Cores (bis zu 64 Cores / 128 Threads)

Bis zu 32 MB L3 Cache / Core, shared auf jedem Chipllet

Flachere NUMA Domain, niedrigere Latenz und kleinerer System-Diameter

TDP Spanne: 120 W – 280 W

MEMORY

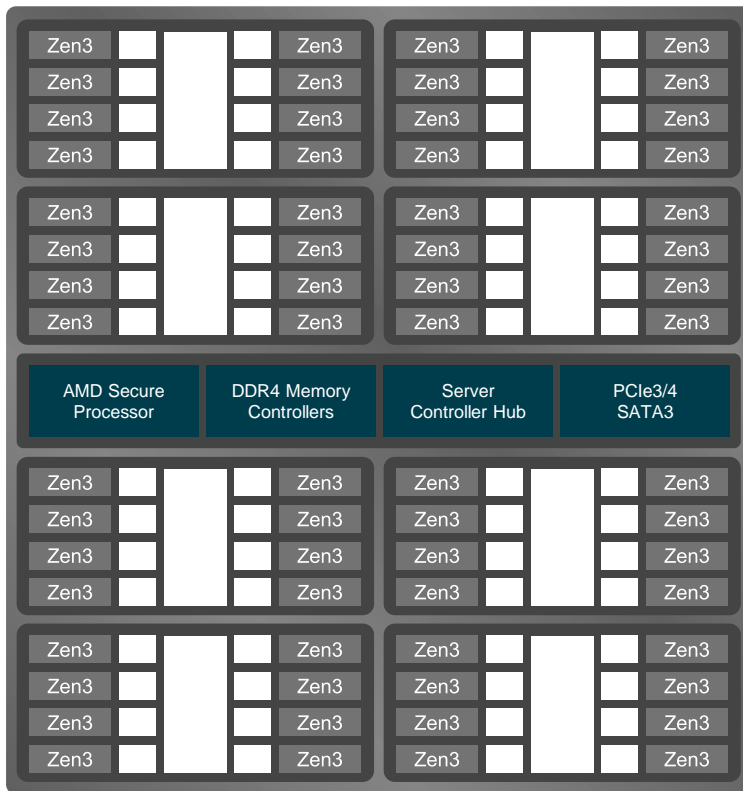
8 Channel DDR4 mit ECC und bis zu 3200 MHz

Spezielle CPUs mit 4 oder 6 Channel Memory Interleaving¹

RDIMM, LRDIMM, 3DS, (NVDIMM-N)

2 DIMMs/Channel mit bis zu 4 TB/Sockel (256 GB DIMMs)

¹ With certain DIMM population rules.



PERFORMANCE

+Verbesserte Performance/Sockel, Performance/Core, Single Threaded Performance, Performance/Core/Watt ²

Infinity Fabric™ Gen 2 (xGMI-2)

INTEGRIERTES I/O – KEIN CHIPSET

128 Lanes PCIe® Gen3/4

- Nutzbar für PCIe, SATA und Coherent Interconnect
- Bis zu 32 SATA oder NVMe™ Direct Connect
- 162 Lane Option (2 CPU Config)

Server Controller Hub (USB, UART, SPI, LPC, I2C, etc.)

SECURITY FEATURES

Dezidiertes Security Subsystem

Secure Boot, Hardware Root-of-Trust

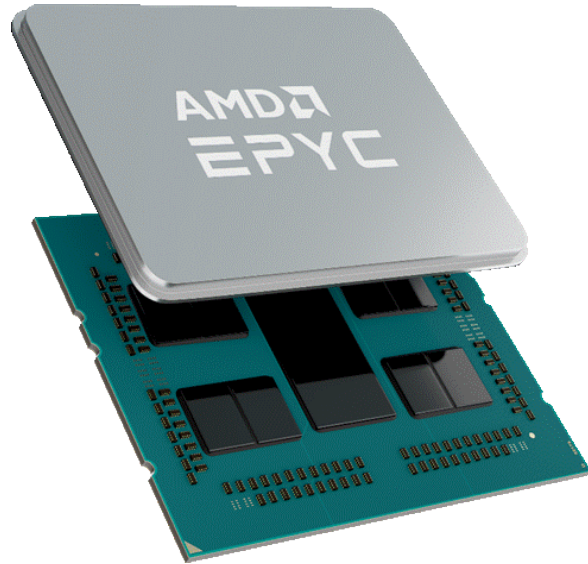
SME (Secure Memory Encryption)

SEV-ES (Secure Encrypted Virtualization & Register Encryption)

SEV-SNP (Secure Nested Paging)

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AMD EPYC™ 7003 mit 3D V-Cache – “Milan X”



Bis zu **64**
Cores pro Socket

Leadership Dichte and Durchsatz

Für groß angelegte Virtualisierung, HPC und Dense Computing
Für cache-intensive Anwendungen wie EDA, CFD, FEA und Wetter-Workloads

“Zen 3”

Leadership core performance

Entscheidend für Single-Thread-Anwendungen oder zur Maximierung der Pro-Kern-Lizenzierung

128
PCIe®4 Lanes

Leadership I/O Bandbreite

Ermöglicht hocheffiziente und leistungsstarke E/A-Konfigurationen

Bis zu **768MB**
L3 cache

Leadership x86 L3 Cache; bis zu 96MB / Core

Erlaubt eine superlineare Skalierung von EDA- und CFD-Anwendungen

Verbesserte Leistung durch Verringerung der Cache-Misses

Security

Leadership AMD Infinity Guard Features*

Sicherheitsfunktionen, die von gängigen Linux®-Distributionen, VMware®, GCP und Azure unterstützt werden

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* AMD Infinity Guard features vary by EPYC™ Processor generations. Infinity Guard security features must be enabled by server OEMs and/or Cloud Service Providers to operate.

AMD EPYC™ 7003 mit 3D V-Cache – Geeignete Workloads

Leistungssteigerungen für HPC-Workloads, die sich auf hohe IOPS konzentrieren

Electronic Design Automation (EDA)

Bis zu 66 % Leistungssteigerung vom Standard-EPYC 7003 zum EPYC 7003 mit 3D-V-Cache bei Schaltungsdesign-Software wie Synopsys VCS¹

Computational Fluid Dynamics (CFD)

Bis zu 54% durchschnittlicher Leistungsanstieg vom Standard-EPYC 7003 zum EPYC 7003 mit 3D V-Cache auf ANSYS® CFX® und bis zu 30% durchschnittlicher Leistungsanstieg auf ANSYS Fluent Software Suites^{2,3}

Finite Element Analysis (FEA)

Bis zu 26% durchschnittliche Leistungssteigerung vom Standard-EPYC 7003 zum EPYC 7003 mit 3D V-Cache auf ANSYS LS-DYNA® und bis zu 12% auf ANSYS® Mechanical® Software Suites^{4,5}

Performance based on AMD performance testing

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AMD EPYC™ 7003 Series Processor mit 3D V-Cache

Model #	Cores	Threads	Base Freq (GHz)	Max Boost Freq (GHz)	Default TDP (w)	L3 Cache (MB)	DDR Channels & Max Memory / CPU	Max DDR Freq (1DPC)	Per-Socket Memory Bandwidth (GB/s)	PCIe®4	2P/1P	Workload Affinity
7773X	64	128	2.2	3.5	280w	768	8 / 4TB	3200	204.8	x128	2P	CFD, FEA (Explicit)
7573X	32	64	2.8	3.6	280w	768	8 / 4TB	3200	204.8	x128	2P	EDA (RTL Simulation), CFD, FEA (Explicit, Implicit)
7473X	24	48	2.8	3.7	240w	768	8 / 4TB	3200	204.8	x128	2P	EDA (RTL Simulation), CFD
7373X	16	32	3.05	3.8	240w	768	8 / 4TB	3200	204.8	x 128	2P	EDA (RTL Simulation)

AMD EPYC™ CPU Namenskonvention

Generation

- 3 = 3rd Gen 7003

EPYC™ **7573X** CPU

Product Family

Product Series

- 7xxx – High Performance Server CPU/SOC
- 1st Gen 7001, 2nd Gen 7002, 3rd Gen 7003 'Milan'

Modifier (Features)

- P = 1P Only
- X = AMD 3D V-Cache

Product Model

- Indicates Core Count within the Series

100s Digit	2	3	4	5	6	7
Cores	8	16	24-28	32	48-56	64

Performance

10s digit - Indicator of performance within the Series

- F = Highest performance per core
- 4,5,6,7= Performance
- 1 = Value

AMD CPUs

Warum AMD einsetzen?

Gründe

Mehr Kerne pro Sockel

Bessere Performance per Core

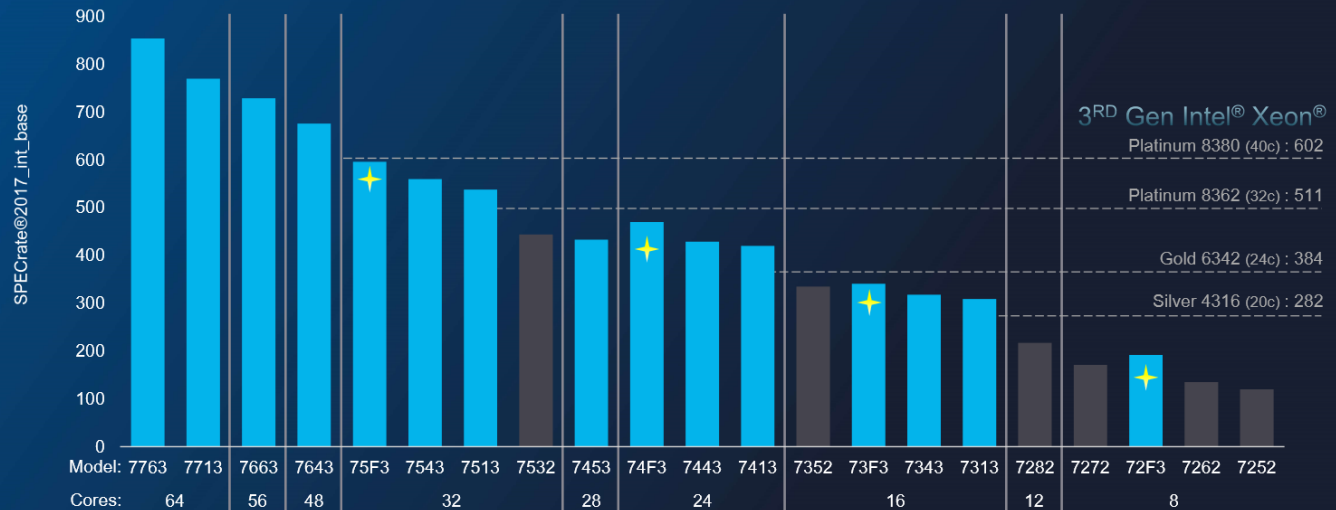
Flachere NUMA Domain,
niedrigere Latenz und kleinerer
System-Diameter

TDP Spanne: 120 W – 280 W

AMD EPYC™ Prozessorfamilie

Performance Übersicht

★ Performance / Core optimized



2X 3RD GEN AMD EPYC™ CPU URLS: [7252](#), [7262](#), [72F3](#), [7272](#), [7282](#), [7313](#), [7343](#), [73F3](#), [7352](#), [7413](#), [7443](#), [74F3](#), [7453](#), [7532](#), [7513](#), [7543](#), [75F3](#), [7643](#), [7663](#), [7713](#), [7763](#). 2X 2ND GEN EPYC URLS: [7632](#), [7352](#), [7282](#), [7272](#), [7262](#), [7252](#). BEST PERFORMING 2X INTEL XEON PLATINUM, GOLD AND SILVER PROCESSORS PUBLISHED AT [WWW.SPEC.ORG](#) AS OF 07/06/21. INTEL XEON URLS: 2X XEON PLATINUM [8380](#), PLATINUM [8362](#), GOLD [6342](#), SILVER [4316](#); SPEC® AND SPECrate® ARE REGISTERED TRADEMARKS OF THE STANDARD PERFORMANCE EVALUATION CORPORATION. AS OF 7/6/21, SEE [WWW.SPEC.ORG](#) FOR MORE INFORMATION.

Technologien in der 15. Servergeneration

Komponenten in den neuen
Serversystemen

Neuerungen mit Dell EMC PowerEdge 15G

Bessere Bedienung



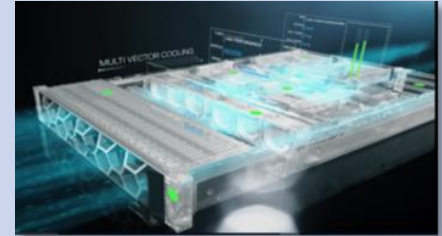
Hot-Plug BOSS-S2

Mehr Geschwindigkeit

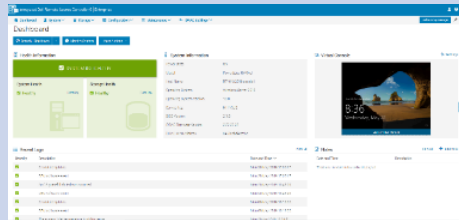


Onboard NIC mit OCP V3 Karten

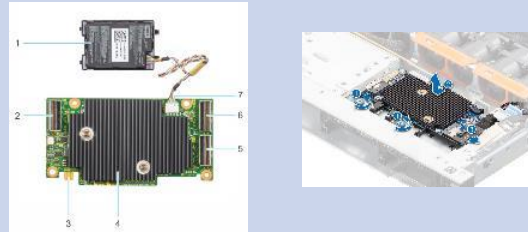
Höhere Effizienz



Neues Chassis und MB Design



iDRAC FW V4.x mit Telemetrie



PERC 11 mit 16 SAS Ports / NVMe

PCI  EXPRESS®

PCIe Gen4 & Direct Attach
NVMe

Dell EMC definiert Networking Industry Standards

PowerEdge Networking geht auf den neuen Open Compute Project (OCP) 3.0 Standard



Dell rNDC

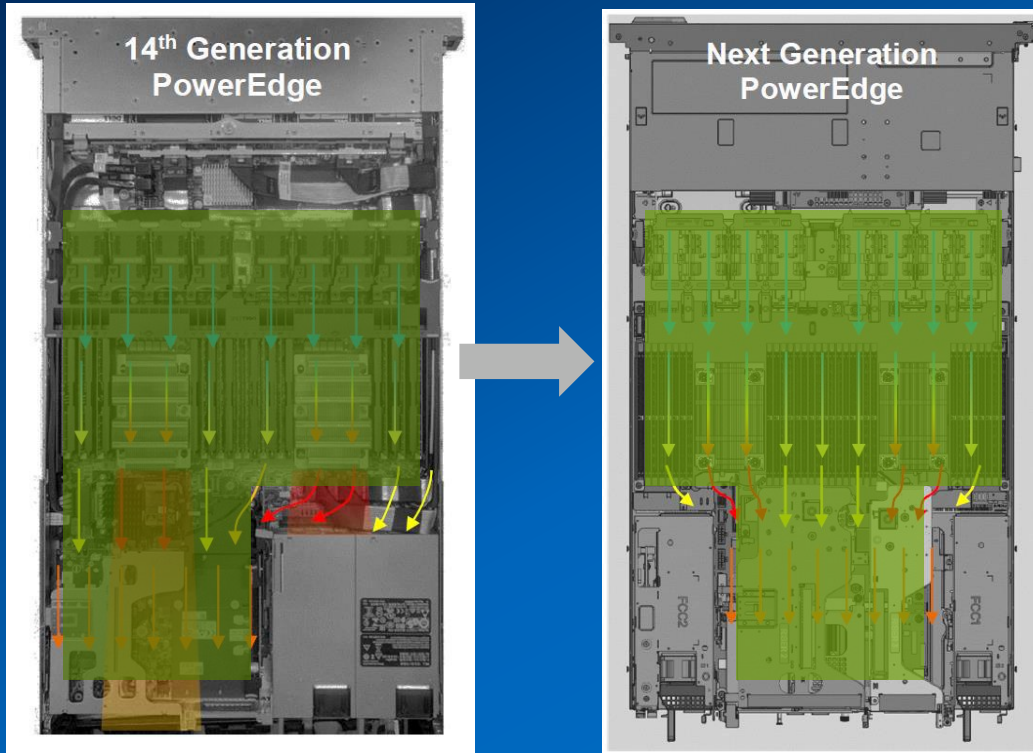
- Proprietär
- x8 Gen3
- Kein normaler Connector
- Shared LOM mit iDRAC



OCP 3.0

- Industrie Standard - mehr Karten schneller verfügbar
- Bis x16 Gen4 – mehr Bandbreite, mehr Geschwindigkeit
- Standard Connector
- Shared LOM mit iDRAC möglich

Chassis Air-Flow Design 14G vs. 15G



Optimiertes Design

- Netzteile links und rechts
- Hotspots entzerren
- Bessere Luftführung
- Nochmals verbesserte Lüfter
- Multi Vector Cooling V2.0
- Damit höhere Energie-dichten möglich

Direct Contact Liquid Cooling über das Portfolio



Heat Exchanger

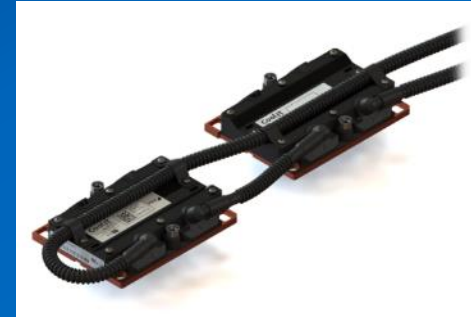
Heat Exchange Module Optionen:

- CHx (Liquid-to-Liquid)
- AHx (Liquid-to-Air)
- Custom Optionen

Hinweis: Abhängig von Ausstattung und Verfügbarkeit von Kühlmittel



Volles Rack



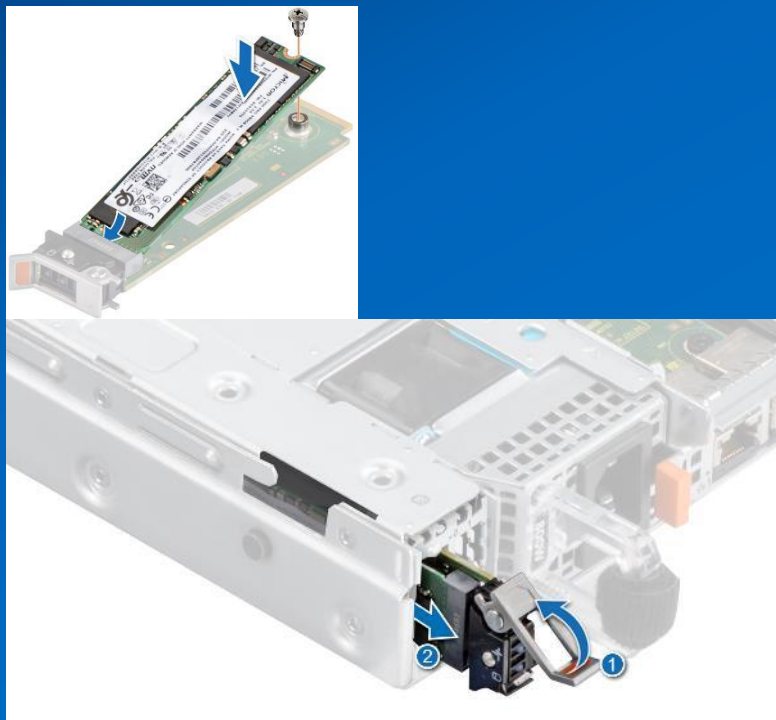
CPU Cold Plate

Passives CPU Cooling ersetzt den normalen Kühlkörper und wird über eine zentrale System versorgt

Boot Optimized Storage Solution (BOSS)

Hot-Plug BOSS-S2

- Separates Boot Medium
- Dual SATA Gen3 M.2 Devices
 - 240/480 GB 1 DWPD
 - Hot-Plug Carrier
- Support für RAID1 und Pass-Through
 - SATA RAID Controller
 - Standard OS AHCI Treiber
- Support für UEFI & Legacy Boot
- Überwacht von der iDRAC
- LEDs für M.2 Device



Dell PERC

PERC11 H755/H755N

- PCIe Gen4
 - x8 -> Host
 - x16 -> Storage bzw.
 - 16 Ports SAS/SATA
- NVMe HWRAID Connectivity ist per x2 Gen4
- Drei Versionen
 - SAS/SATA
 - NVMe only
 - SAS/SATA/NVMe
- Zwei Formfaktoren
 - Front PERC (fPERC)
 - PCIe Steckkarte

VALUE PERF. HIGH PERF.

VALUE

SWRAID

PERC9/10 PowerEdge 14G

H740P/H840 12Gb
Dual Core
4/8GB, NV 72-bit

H730P 12Gb - 1200Mhz
Dual Core
2GB, NV 72-bit 1866Mhz

H330 12Gb
Kein Cache

Interner HBA – HBA330
12Gb
Kein Cache

Externer HBA 12Gb
Kein Cache

S140
SW RAID SATA/NVMe

PERC10 PowerEdge 15G

H745 12Gb
Dual Core
4/8GB, NV 72-bit

H345 12Gb
Kein Cache

Interner HBA – HBA345
12Gb
Kein Cache

PERC11 PowerEdge 15G 2S

H755 12Gb
Dual Core
8GB, NV 72-bit

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PowerEdge 15G Intel und AMD Memory Übersicht

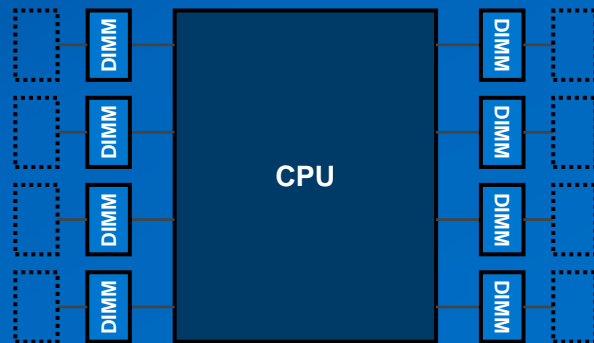
15G Ice Lake, Rome und Milan CPUs haben 16 DIMM Slots mit einem maximalen Memory Bus Speed von 3200MT/s

Balanced Memory Konfigurationen

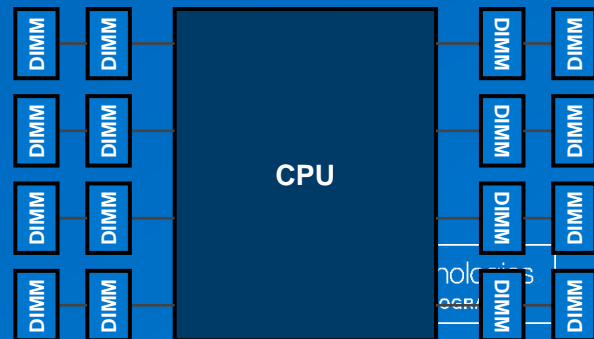
- Die beste Memory Performance bekommt man mit Balanced Memory Konfigurationen
- 2-socket Systeme: 16 oder 32 DIMMs
- 1-socket Systeme: 8 oder 16 DIMMs
- Für weitere Details siehe Balanced Memory Whitepaper:
 - <https://www.delltechnologies.com/resources/en-us/asset/whitepapers/products/servers/whitepaper-memory-population-rules-for-3rd-generation-intel-xeon-scalable-processors-on-poweredge-servers.pdf>
 - <https://www.delltechnologies.com/resources/en-us/asset/tech-notes/products/servers/whitepaper-memory-population-rules-for-3rd-generation-amd-epyc-processors-for-poweredge-servers.pdf>

15G Intel and AMD DRAM Balanced Memory Configs

8 DIMMs per CPU



16 DIMMs per CPU



Server der 15. Generation

Rack, Modular & Spezialsysteme

Nomenklatur



1 2 3 4 5

R 6 5 0

6 7 8 9

Generation



xeon

Prozessor



1 2 3 4 5

R 6 5 1 5

6 7 8 9

Generation

Anzahl CPUs



Prozessor



PowerEdge Server

	TOWER	RACK	MODULAR				
Value	T40 T150 T350	R250 R350	-				
Mainstream	T440	R540 R640 XR11 & XR12 XR2420	R450 R6515 R6525 R650xs & R650	R550	FX2 FC640	VRTX M640p	C6420 C6520 C6525
High-Performance	T550	R740 R740xd R740xd2 R840 R940 R940xa DSS 8440 XE8545	R7515 R7525	R750xs R750 R750xa		VRTX	MX7000 MX740c MX750x MX840c



AMD basierte Server

1S und 2S



POWEREDGE R6515

Kompakter 1 HE Server mit 1 CPU und der Leistung eines traditionellen 2 Sockel Servers



WIRD ZUM 1. NOVEMBER ABGEKÜNDIGT!!!

Workloads

- Virtualisierung
- HCI
- Remote Site Server

Key Features

- Bis zu 10 NVMe SSDs mit Direct Connect für schnellsten Zugriff
- Bis zu 64 Cores, ZEN2 und ZEN3 Architektur
- 16 DIMM Steckplätze
- Umfangreiches Management und Scripting Support für iDRAC9 mit Lifecycle Controller und Redfish API

HIGHLIGHTS

- 10 Direct Connect NVMe PCIe Steckplätze für maximale Leistung
- Bis zu 2 GPUs zur Performancesteigerung
- Umfangreiches Dell EMC System Management
- vSAN Ready Nodes



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PowerEdge R6515

Features PowerEdge R6515

CPU	1x AMD Rome/Milan (Socket SP3), up to 280W (cTDP)
Memory	DDR4: Up to 16 x DDR4 RDIMM, LRDIMM (2TB), bandwidth up to 3200 MT/S
Disk Drives/Storage	Front: <ol style="list-style-type: none">Up to 4x 3.5" Hot Plug SAS/SATA HDDUp to 10x 2.5" Hot Plug SAS/SATA/NVMeUp to 8x 2.5" Hot plug SAS/SATA Internal: Option 2x M.2 (BOSS)
PCIe Storage	Up to 10 NVMe Direct
USB	Front: 1 ports (USB 2.0), 1 (micro-USB, iDRAC Direct) Rear: 2 ports (USB 3.0) Internal: 1 port (USB 3.0)
Storage Controller	HW RAID: PERC 9/10 - HBA330, H330, H730P, H740P, H840, 12G SAS HBA Chipset SATA/SW RAID (S150): Yes
Network Daughter Cards (NDC)	2 x 1GbE; 2 x 10GbE BT; 2 x 10GbE SFP+; 2 x 25GbE SFP28
PCIe slots	Up to 2 PCIe: 1 PCIe Gen3; 1 PCIe Gen4
Power Supply Unit (PSU)	PSU – 550W
System Mgmt	LC 3.x, OpenManage, QuickSync 2.0, Digital License Key, iDRAC9, iDRAC Direct (dedicated micro-USB port), Easy Restore
High Availability (HA)	Hot plug Hard drives, PSUs, IDSDM, Boot Optimized Storage Subsystem (BOSS)
Security	Dell EMC Integrated Security
Graphics Processing Unit (GPU)	Up to 2 Single-Wide GPU (T4)

POWEREDGE R7515

Flexibler 2 HE Server mit 1 CPU und der Leistung eines traditionellen 2 Sockel Servers

Workloads

- Software Defined Storage Knoten
- Virtualisierung
- Data Analytics

Key Features

- Bis zu 12 NVMe SSDs mit Direct Connect für schnellsten Zugriff, 24/26 Medien insgesamt
- Bis zu 64 Cores mit 1 CPU und ZEN2/ZEN3 Architektur
- 16 DIMM Steckplätze
- Umfangreiches Management und Scripting Support für iDRAC9 mit Lifecycle Controller und Redfish API



HIGHLIGHTS

- Bis zu 26 Medien, davon 12 NVMe Direct Connect
- Bis zu 4 GPUs zur Performancesteigerung
- Umfangreiches Dell EMC System Management
- vSAN Ready Nodes



PowerEdge R7515

Features PowerEdge R7515

CPU	1x AMD Rome/Milan (Socket SP3), up to 280W (cTDP)
Memory	DDR4: Up to 16 x DDR4 RDIMM, LRDIMM (2TB), bandwidth up to 3200 MT/S
Disk Drives/Storage	Front: 1. Up to 8 x3.5" Hot Plug SATA/SAS HDDs 2. Up to 12x 3.5" hot-plug SAS/SATA HDDs 3. Up to 24x 2.5" Hot Plug SATA/SAS/NVMe Rear: Up to 2x 3.5" hot-plug SAS/SATA HDDs Internal: 2x M.2 (BOSS)
PCIe Storage	Up to 24 NVMe (Up to 12 NVMe Direct)
USB	Front: 2 ports (USB 2.0), 1 (micro-USB, iDRAC Direct) Rear: 2 ports (USB 3.0) Internal: 1 port (USB 3.0)
Storage Controller	HW RAID: PERC 9/10 - HBA330, H330, H730P, H740P, H840, 12G SAS HBA Chipset SATA/SW RAID(S150): Yes
Network Daughter Cards (NDC)	2 x 1GbE; 2 x 10GbE BT; 2 x 10GbE SFP+; 2 x 25GbE SFP28
PCIe slots	Up to 4 PCIe: 2 PCIe Gen3; 2 PCIe Gen4
Power Supply Unit (PSU)	PSU – 495W, 750W, 1100W, 1600W
System Mgmt	LC 3.x, OpenManage, QuickSync 2.0, Digital License Key, iDRAC9, iDRAC Direct (dedicated micro-USB port), Easy Restore
High Availability (HA)	Hot plug Hard drives, PSUs, IDSDM, Boot Optimized Storage Subsystem (BOSS)
Graphics Processing Unit (GPU)	Up to 4 Single-Wide GPU (T4); Up to 1 Full-Height FPGA

POWEREDGE R6525

Leistungsstarker 2 Sockel/1 HE Server, maximale Performance im kompakten Gehäuse

Workloads

- HPC
- Virtualisierung
- VDI Cloud Client Computing
- Applikationsserver

Key Features

- Bis zu 10 NVMe SSDs mit Direct Connect für schnellsten Zugriff
- Bis zu 64 Cores pro CPU mit AMD ZEN2/ZEN3 Architektur
- 32 DIMMs für bis zu 4 TB Memory
- Umfangreiches Management und Scripting Support für iDRAC9 mit Lifecycle Controller und Redfish API



HIGHLIGHTS

- Optionale Flüssigkeitskühlung der CPUs, damit volles Portfolio in einer HE
- 10 Direct Connect NVMe PCIe Gen4 Steckplätze für maximale Leistung
- Bis zu 3 GPUs zur Performancesteigerung
- Bis zu 4 TB Memory für Virtualisierung



PowerEdge R6525

Features PowerEdge R6525

CPU	2x AMD Rome/Milan (Socket SP3), up to 280W (cTDP)
Memory	DDR4: Up to 32 x DDR4 RDIMM, LRDIMM (4TB), bandwidth up to 3200 MT/S
Disk Drives	Front: 1. Up to 4x 3.5" Hot Plug SAS/SATA HDD 2. Up to 12x 2.5" (10 Front + 2 Rear) Hot Plug SAS/SATA/NVMe 3. Up to 8x 2.5" Hot plug SAS/SATA Optional: BOSS (2x M.2)
PCIe Storage	Up to 12 (10+2) NVMe Direct
USB	Front: 1 port (USB 2.0), 1 (micro-USB, iDRAC Direct) Rear: 1 port (USB 3.0) + 1 port (USB 2.0) Internal: 1 port (USB 2.0)
Storage Controller	HW RAID: PERC 10.4 - HBA345, H345, H745, H840, 12G SAS HBA Chipset SATA/SW RAID: Yes
Network	OCP x16 Mezz 3.0 + 2 x 1GE LOM
PCIe slots	Up to 3 x PCIe x16 Gen4 slots @ 16GT/s
Power Supply Unite (PSU)	PSU – 800W, 1400W
System Mgmt	iDRAC9 with Lifecycle Controller
High Availability (HA)	Hot plug redundant Hard drives, Fans, PSUs BOSS (2 x internal M.2)
Graphics Processing Unit (GPU)	Up to 3 nvidia T4 or 2 x FH ¼ L at 150W each

POWEREDGE R7525

Universeller 2 Sockel/2 HE Server mit hoher Speicher- und I/O-Leistung, maximale Anzahl an Cores

Workloads

- HPC
- VDI Cloud Client Computing
- Datenbanken/In-Line Analytics
- Scale-Up Software Defined Umgebungen

Key Features

- Bis zu 24 NVMe SSDs mit Direct Connect für schnellsten Zugriff
- Bis zu 64 Cores pro CPU mit AMD ZEN2/ZEN3 Architektur
- 32 DIMMs für bis zu 4 TB Memory
- Umfangreiches Management und Scripting Support für iDRAC9 mit Lifecycle Controller und Redfish API



HIGHLIGHTS

- Multi-Vektor Cooling liefert hochoptimierten Luftstrom und ermöglicht eine große Konfigurationsvielfalt und effizienten Betrieb
- 24 Direct Connect NVMe PCIe Gen4 Steckplätze für maximale Leistung
- GPU/FPGA zur Performancesteigerung
- Bis zu 4 TB Memory für BI und Virtualisierung



PowerEdge R7525

Features PowerEdge R7525

CPU	2x AMD Rome/Milan (Socket SP3), up to 280W (cTDP)
Memory	DDR4: Up to 32 x DDR4 RDIMM, LRDIMM (4TB), bandwidth up to 3200 MT/S
Disk Drives	Front: <ol style="list-style-type: none">Up to 8x 3.5" Hot Plug SAS/SATAUp to 8x 2.5" Hot Plug NVMeUp to 12x 3.5" Hot plug SAS/SATAUp to 16x 2.5" Hot plug SAS/SATAUp to 24x 2.5" Hot plug SAS/SATA\NVMeUp to 2x 2.5" Hot plug SAS/SATA + Rear up to 2x 2.5" Hotplug SAS/SATA Optional: BOSS (2x M.2)
PCIe Storage	Up to 24 NVMe Direct
USB	Front: 1 port (USB 2.0), 1 (micro-USB, iDRAC Direct) Rear: 1 port (USB 3.0) + 1 port (USB 2.0) Internal: 1 port (USB 2.0)
Storage Controller	HW RAID: PERC 10.4 - HBA345, H345, H745, H840, 12G SAS HBA Chipset SATA/SW RAID: Yes
Network	OCP x16 Mezz 3.0 + 2 x 1GE LOM
PCIe slots	Up to 8 x PCIe x16 Gen4 slots @ 16GT/s
Power Supply Unite (PSU)	PSU – 800W, 1400W, 2400W
System Mgmt	iDRAC9 with Lifecycle Controller
High Availability (HA)	Hot plug redundant Hard drives, Fans, PSUs BOSS (2 x internal M.2)
Graphics Processing Unit (GPU)	Up to 3x 300W DW or 6x 75W SW or 4x 150W SW

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POWEREDGE C6525

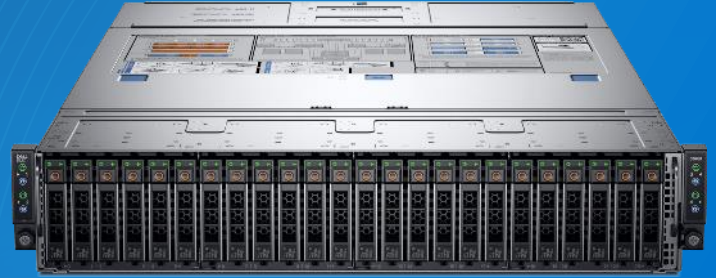
Universeller 2 Sockel/2 HE Server mit hoher Speicher- und I/O-Leistung, maximale Anzahl an Cores

Workloads

- HPC
- Web Tech
- Forschung

Key Features

- 24 Medien, 6 pro System optional davon 2 NVMe
- BOSS Boot Medium
- Bis zu 64 Cores pro CPU mit AMD ZEN2/ZEN3 Architektur
- 16 DIMM Sockel
- Umfangreiches Management und Scripting Support für iDRAC9 mit Lifecycle Controller und Redfish API



HIGHLIGHTS

- Ultrakompakter 4 Server in 2 HE (4in2) Server mit optionaler Flüssigkeitskühlung
- Komplettes CPU Portfolio
- Viele I/O Optionen
- Optional NVMe Direct Connect für Caching



PowerEdge C6525

Features PowerEdge C6525

CPU	Single or dual AMD Rome (and Milan) per node Air and Direct Contact Liquid Cooling (DCLC target post RTS)
Memory	DDR4: 8 channels/CPU; Up to 16 x RDIMMs and LRDIMMs Speed: up to 3200 MT/s
Storage	Backplanes: <ul style="list-style-type: none">• 24 x 2.5" (direct, and NVMe with 2 universal slots)• 12 x 3.5" direct• No-Backplane Internal: uSD card M.2 SATA BOSS
PCIe slots	2 PCIe Gen4 HH/HL slot, x16 (network, storage, AIC) 1 x16 Gen4 OCP 3 Slot
USB	MiniDP, 1x USB 3.0, dedicated iDRAC direct port
Storage Controller	HW RAID: PERC 10.4: H345, HBA 345 & H745 adaptor PERC SW RAID: Yes, S150
LOM	Single port 1Gbe LOM (Broadcom)
Power Supply Unite (PSU)	PSUs (support for 2x1600W, and 2400W), and 2000W 240VDC
System Mgmt	iDRAC9 with Lifecycle Controller
High Availability (HA)	Hot plug Hard drives and PSUs, Dual rotor redundant fans
Graphics Processing Unite (GPU)	1 x T4

POWEREDGE XE8545

Leistungsstarker GPU-basierter Server

Workloads

- HPC
- Machine Learning/Deep Learning/AI
- GPU Virtualization

Key Features

- 10x SAS/SATA, bis zu 8x NVMe
- BOSS Boot Medium
- Zwei Sockel mit bis zu 64 Cores pro CPU mit AMD ZEN3 Architektur
- 32 DIMM Sockel
- Bis 4x A100 GPUs mit NVLink



HIGHLIGHTS

- Support für 4x 400W/500W NVIDIA A100
- Milan Support
- Fresh Air Optionen



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PowerEdge XE8545

Features PowerEdge XE8545

CPU	Single or dual AMD Milan CPU up to 64 cores per processor support for up to 2x 280W processors
Memory	DDR4: Up to 32 x DIMMs Speed: up to 3200 MT/s
Storage	Backplanes: <ul style="list-style-type: none">• 10 x 2.5" Hot Plug SAS/SATA• 8 x 2.5" NVMe Optional: M.2 SATA BOSS
PCIe slots	1x PCIe Gen4 LP x16 slot, 1x PCIe Gen4 FH x16 slot + 1x PCIe Gen4 FH x16 slot or 2x PCIe Gen4 FH x8 slot
USB	Front: 1 port (USB 2.0), 1 (micro-USB, iDRAC Direct) Rear: 1 port (USB 3.0) + 1 port (USB 2.0)
Storage Controller	HW RAID: PERC 10.4: H745 adaptor
LOM	2x 1Gbe
OCP	1x OCP 3.0
Power Supply Unite (PSU)	2+2 2400W
System Mgmt	iDRAC9 with Lifecycle Controller
High Availability (HA)	Hot plug Hard drives and PSUs, Hot plug redundant cooling
Graphics Processing Unite (GPU)	4 x A100 NVLink

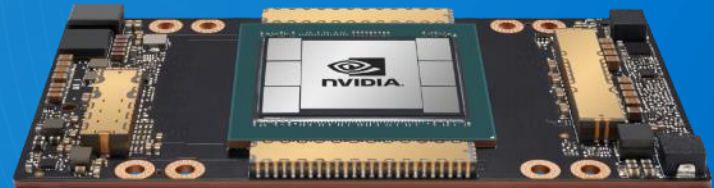
POWEREDGE XE8545

NVIDIA A100 SXM4 GPU



GPU Memory	40 GB oder 80 GB
Memory Bandwidth	1,6 TB/s
Power	400 W oder 500W
Interconnect	PCIe Gen4 64 GB/s
Multi-Instance GPU	Bis zu 7
Formfaktor	Fix 4 GPU Board

- 2x HPC Performance
- 3x ML Training Performance
- 7 “virtuelle” V100 in einer A100 (mit Multi-Instance GPU)



Ein A100 SXM GPU
“Modul”

*Das 80GB/500W GPU Modell kann bis zu 13% mehr Training Performance ergeben.**

* Based on Dell internal testing

POWEREDGE XE8545

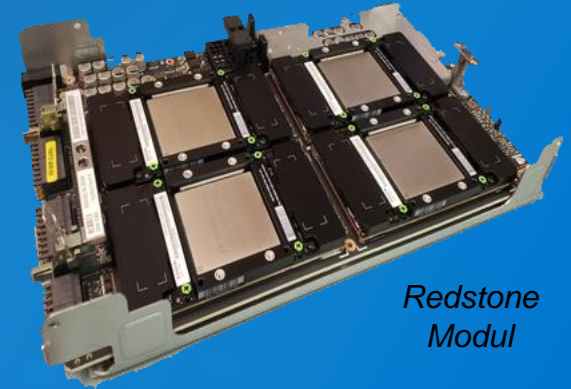
HGX A100 4-GPU Baseboard "Redstone" – Festes 4 Wege SXM4 GPU Modul mit NVLINK

Der XE8545 hat ein Modul mit 4 SXM4 Mezzanine GPUs **mit NVLINK Interconnect**

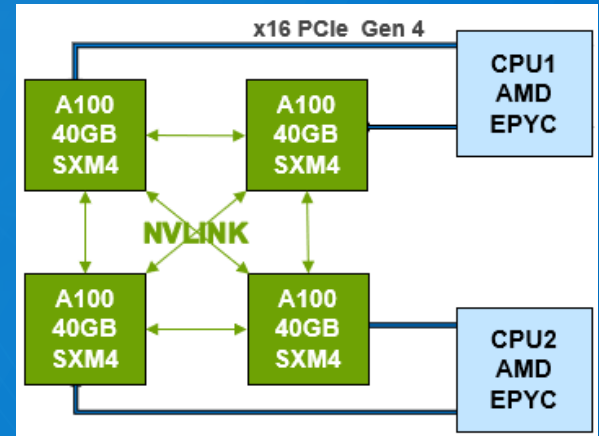
Das 4 SXM4 Module ist fest mit dem Mainboard verbunden **kein Switch wird benötigt**

12 NVLINK Interfaces pro GPU für schnelle **GPU zu GPU** Kommunikation (600 GB/s)

Die A100 SXM4 GPU Module auf der HGX Platine haben **entweder 40GB / 400W oder 80GB / 500W**



Redstone
Modul



Mainstream WORKLOADS (R750, R7525, R650, R6525)



Database and Analytics

Ideal for XaaS, Hadoop, OLTP and Decision Support Systems workloads with flexible resources (NVMe, large memory and capacity)



Virtual Desktop Infrastructure

Balanced core count and GPU to support for maximum numbers of end users



Mixed Workload Standardization

For datacenters that require standardized hardware for several diverse workloads. Provides the highest performance, capacity and configuration flexibility in the most dense form factor.

Optimized WORKLOADS (R750xs, R7515, R650xs, R6515)



Virtualization / Cloud

A perfect choice for medium businesses exploring the advantages of software virtualization.



Medium VM (virtual machine density)

Consider medium VM as an adaptable option to right size your virtual instances needed to process workloads as they fluctuate in your business.



Medium Duty Inferencing

Tuned to power medium duty AI or ML tailored inferencing algorithms to drive more timely and accurate business insights.

Specialized WORKLOADS (XE8545, R750xa)



AI-ML/DL Training/Inferencing

High Performance compute and accelerators configuration options enables AI/ML/DL workloads



High-Performance Compute

High performance compute, higher CPU and GPU core density per rack enables HPC simulation modeling



Render farms and Virtualization

GPU flexibility enables various workloads, as well as higher GPU-utilization using multi-tenancy to serve multiple users without compromising performance

C-Series WORKLOADS (C6520,C6525)



High-Performance Computing

High compute performance, higher core/node density per rack enables HPC, Research, Rendering, Vectorized and Advanced Vector Extensions (AVX)



Financial analysis / High Frequency Trading

Density optimized compute and low latency I/O configurations



Scale-out Web Tech

High performance cache tiering, better I/O performance for volume scale-out workloads and 1S optimized configurations

Telco/Edge WORKLOADS (XR11,XR12)



Telecommunications

Compact and rugged design capable of supporting accelerators for remote private networks requiring AI/ML/DL type workloads.



Government / Military

Reliable DC power in a hardened chassis to support mobile data centers deployed globally to collect and analyze reconnaissance data.



Retail & Restaurants

Built with a minimum footprint and enterprise compute to optimize expensive retail space and deliver a targeted virtual experience.

Modular WORKLOADS (MX750c)



General Purpose IT

Scalable processor core count, higher performance memory configurations, sufficient storage capacity and networking capabilities



Software-Defined Storage & Software-Defined Networking

Flexible and richer storage config
High speed networking support
Redundant IO



Database Analytics

Compute and memory rich configurations (Structured and Unstructured DB, Database analytics)

Welche Kunden profitieren - R750xa & XE8545

R750xa Customer

Characteristics

- Workload and use-case focused: HPC, AI/ML Training and inferencing, Rendering, graphics and data-analytics
- Seeking time-to-market with optimized GPU offerings. Often times led by communication from NVIDIA marketing)
- Looking for ready software frameworks to minimize time-to-value

Key Selling Points

- Optimized for acceleration and supports the entire GPU portfolio and GPU workloads
- Simple mainstream design to ease deployment
- Air-cooled, 2U dense with NVLINK bridging capability for best perf/\$

Opportunity

- New-to-GPU customers: flexible GPU platform to ease deployment and easy scale-out
- Cloud providers: MIG option allows higher GPU utilization per node



Key Feature Deltas	R750xa	XE8545
GPU Requirement	<ul style="list-style-type: none"> • Flexible GPU offerings • Supports up to 4xDW • Perf/\$ • NVLINK Bridges 	<ul style="list-style-type: none"> • Fixed GPU offerings • Highest dual precision performance • Full NVLINK support
CPU support	Intel Ice Lake	AMD Milan
Density	2U	4U
GPU support	2-4xDW, 2-6xSW (A100, A40, M10, T4 MI100 and more)	4xDW A100 NVLINK only
NVLINK support	NVLINK Bridges	Full NVLINK connectivity (Redstone)

XE8545 Customer

Characteristics

- Seeking high end performance for AI/ML use-cases
- Focused on the latest CPU and GPU technologies
- Open to moving to AMD for acceleration platforms (higher core counts)

Key Selling Points

- 500W GPUs with largest memory (80G) delivers the highest performance available
- Air cooled even at the highest GPU TDPs (500W)
- Full NVLINK connectivity for peer-to-peer communication/compute

Opportunity

- Customer's looking for highest performance, but is reluctant to move to liquid cooling
- Customers that are reaching the limits of their acceleration capabilities

Ressourcen

Links, Guides usw.

Ressourcen

Server quick comparison guides

https://www.delltechnologies.com/resources/en-us/asset/quick-reference-guides/products/servers/dell_emc_poweredge_rack_quick_reference_guide.pdf

https://www.delltechnologies.com/resources/en-us/asset/quick-reference-guides/products/servers/dell_emc_poweredge_c_series_servers_quick_reference_guide.pdf

Virtual Rack

<https://esgvr.dell.com/>

PowerEdge 15G 3D (public)

<https://content.hmxmedia.com/poweredge-servers/index.html>

Balanced Memory Whitepaper

<https://www.delltechnologies.com/resources/en-us/asset/white-papers/products/servers/whitepaper-memory-population-rules-for-3rd-generation-intel-xeon-scalable-processors-on-poweredge-servers.pdf>

<https://www.delltechnologies.com/resources/en-us/asset/tech-notes/products/servers/whitepaper-memory-population-rules-for-3rd-generation-amd-epyc-processors-for-poweredge-servers.pdf>

Server Übersicht & Tec Specs

<https://www.delltechnologies.com/de-de/servers/poweredge-rack-servers.htm#accordion0&accordion1&accordion2&accordion3>

Direct from Development

<https://www.delltechnologies.com/resources/en-us/asset/tech-notes/products/servers/direct-from-development-dell-technologies-liquid-cooling-support-for-new-poweredge-servers.pdf>

<https://www.delltechnologies.com/resources/en-us/asset/tech-notes/products/servers/direct-from-development-pciegen4.pdf>

Dell EMC Enterprise Operating Systems (public)

<https://www.dell.com/support/contents/en-us/article/product-support/self-support-knowledgebase/enterprise-resource-center/server-operating-system-support>

https://downloads.dell.com/manuals/all-products/esuprt_solutions_int/esuprt_solutions_int_solutions_resources/s-solution-resources_white-papers2_en-us.pdf

Quickreference Guides 14G & 15G Betriebssysteme (public – Link via Dell Partner Portal)

<https://www.delltechnologies.com/asset/en-us/products/servers/briefs-summaries/ws-22-on-poweredge-15g-qrg.pdf.external>

<https://www.delltechnologies.com/asset/en-us/products/servers/briefs-summaries/ws-22-on-poweredge-14g-qrg.pdf.external>

Dell EMC 15G Server Broschüre (public – Link via Dell Partner Portal)

<https://www.delltechnologies.com/asset/en-us/products/servers/briefs-summaries/dell-emc-poweredge-15g-portfolio-brochure.pdf.external>

The Dell Technologies logo is centered within a white rectangular border. It features the word "DELL" in a bold, sans-serif font, where the 'E' is stylized with three diagonal lines. To the right of "DELL" is the word "Technologies" in a lighter, sans-serif font.

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