

HPC SOLUTIONS - MADE FOR YOU.

How MEGWARE came to AlmaLinux for HPC

26-03-2026 – AlmaLinux Day: Germany 2026 @ Cloudfest, Europa-Park Rust | Peter
Grossoehme



agenda

- introduction
- the way to  **AlmaLinux**
- highlighting some TOP500 references with
- summary & questions



MEGWARE Computer GmbH

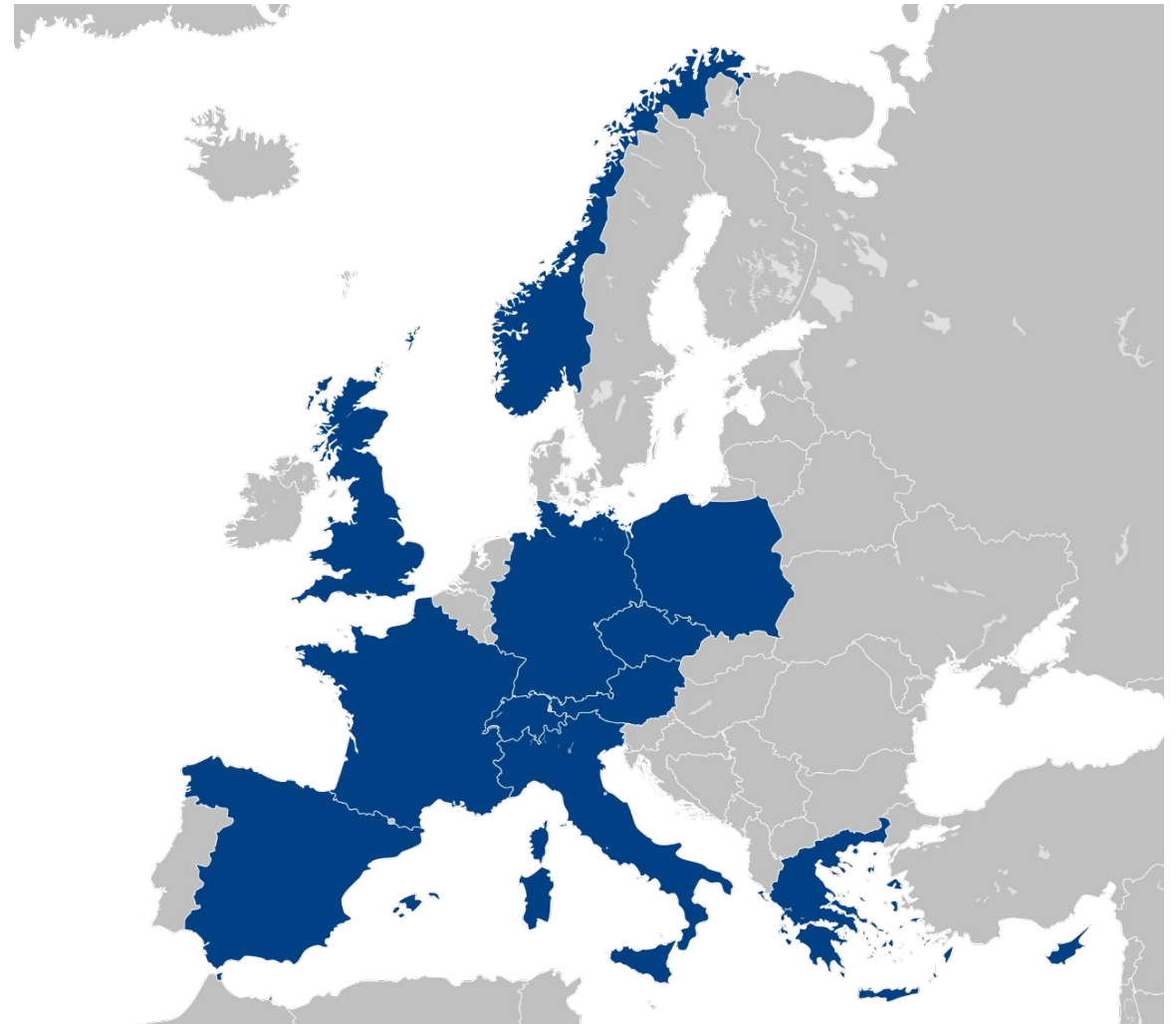
Company Profile

- established in 1990
- German private limited company
- more than 1800 installed cluster systems in Europe
- Turn-key solution provider for compute, storage, GPGPU AI/HPC cluster systems
- > 50 employees
- financially strong, profitable, growing



Over 1800 installed Systems in Europe... ... and worldwide

Norway
Austria
Abu Dhabi
Greece
Poland
Czech Republic
Cyprus
Switzerland
Spain ...



The way to AlmaLinux (1)

- for historical reasons (going back many years in 2000)
 - almost all our HPC clusters run on RPM-based distributions (CentOS, Scientific Linux or RHEL)
 - InfiniBand support (Mellanox OFED stack) just available for RHEL or SuSE
- widespread confusion following the announcement after announcement of CentOS project shifts focus to CentOS Stream on 8th December 2020
- looking for alternatives for new HPC cluster installations due to the long lifespans of the systems (~5 years or longer), especially in the academic / public sector
- Florian Tischler [1] from RICAM at University of Linz has asked us to pre-install AlmaLinux 8.3 RC1 (available on 22th February 2021) on his new HPC master node which ultimately marked **the birth of AlmaLinux** at MEGWARE
 - **[root@radon1]# cat /etc/redhat-release AlmaLinux release 8.3 RC (Purple Manul)**

[1] <https://www.jku.at/en/institute-for-industrial-mathematics/about-us/team/florian-tischler>

The way to AlmaLinux (2)

- upgrading a lot of existing CentOS 8.x based installations with ELevate
 - <https://almalinux.org/de/elevate>
- challenging times after Red Hat stopped publishing the source code for RHEL to the general public via git.centos.org
- in July 2023 AlmaLinux announced stopping to be 1:1 clone starting with AlmaLinux 9.3 Binary / **ABI compatibility** instead Bug-of-Bug - this is actually more of an advantage than a disadvantage as it allows for greater flexibility and even faster patches
- MEGWARE became Silver sponsor in January 2024
- regular communication with the Board of Directors and the Infrastructure Team Lead
- almost all HPC cluster installations have been based on AlmaLinux since March 2021 (with a few exceptions)

Why choose AlmaLinux ?

- the **_real_** community RHEL-based enterprise operating system
„The AlmaLinux OS Foundation is 501(c)(6) non-profit organization.”
- outstanding performance in terms of availability of
 - security patches and updates
 - new Minor releases
 - ... and even **Major** releases within some days after official release of RHEL
- extended Hardware support, e.g. for older devices
- additional SW repos available (devel, HighAvailability, nvidia, ...)
- available for other hardware architectures, e.g. aarch64 or riscv64 (**Kitten** only)
- recently released NVIDIA CUDA 13.2 + Drivers officially supports AlmaLinux 9 and 10
- major breakthrough in DACH / EMEA region: CERN selected AlmaLinux in December 2022
- finally find new some friends ☺ and always happy to meet at SuperComputing conference in US



References
(extract)



Powered by
AlmaLinux

109 placements since
2002

(June 2002 – November 2025) <https://www.top500.org/statistics/sublist/>

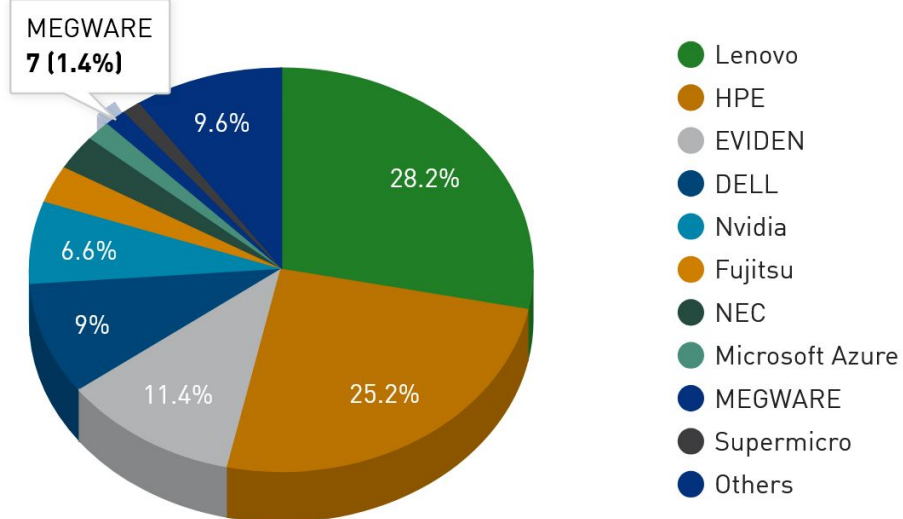


- 7+1 Projects placed in November 2025 List

<https://www.top500.org/statistics/list/>

- Market share: TOP 10 of 40 vendors worldwide

Vendors System Share



	Vendors	Count	System Share (%)	Rmax (GFlops)	Rpeak (GFlops)	Cores
1	Lenovo	141	28.2	862,826,198	1,444,395,077	15,166,988
2	HPE	126	25.2	6,910,686,370	9,936,332,957	51,229,776
3	EVIDEN	57	11.4	1,968,161,350	2,630,352,705	16,011,000
4	DELL	45	9	594,441,610	960,188,194	5,411,824
5	Nvidia	33	6.6	941,733,000	1,316,975,702	4,479,376
6	Fujitsu	15	3	676,142,660	846,984,367	9,979,584
7	NEC	14	2.8	101,980,050	134,318,070	914,648
8	Microsoft Azure	8	1.6	757,160,000	1,127,999,302	3,540,480
9	MEGWARE	7	1.4	76,141,410	119,348,510	444,656
10	Supermicro	6	1.2	170,360,000	255,848,110	1,039,064
11	Penguin Computing, Inc.	6	1.2	20,792,330	35,143,341	680,200
12	Inspur	3	0.6	8,678,410	15,482,120	136,416
13	ASUSTeK / ASUS Cloud / Taiwan Web Service Corporation	3	0.6	22,715,920	31,586,620	122,064
	⋮					
36	ASUSTeK / Taiwan AI Cloud / Taiwan Mobile	1	0.2	81,552,000	117,920,000	256,960
37	Netweb Technologies	1	0.2	8,500,000	13,169,860	81,344
38	Koi Computers	1	0.2	4,855,900	6,107,130	107,648
39	NVIDIA, Inspur	1	0.2	12,810,000	20,029,190	130,944
40	Mbuzz/Q-Leap Networks	1	0.2	19,480,000	26,571,520	61,600
41	MEGWARE / Supermicro	1	0.2	9,087,000	19,344,190	96,768

TOP 500 List – November 2025

Rank	System	Cores	Rmax (PFlop/s)	Rpeak (PFlop/s)	Power
58	Universität Erlangen Lenovo ThinkSystem SD665-N V3, AMD EPYC 9554 64C 3.1GHz, Nvidia H100 SXM5 94Gb, infiniband NDR200, AlmaLinux 9.4	125,952	32.22	51.03	651
73	Technische Universität Dresden Capella - Lenovo ThinkSystem SD665-N V3, AMD EPYC 9334 32C 2.7GHz, Nvidia H100 SXM5 94Gb, Infiniband NDR200, AlmaLinux 9.4	85,248	24.06	37.67	445
181	Universität Frankfurt Germany Goethe-NHR – Supermicro AS-4124GS-TNR, AMD EPYC 7452 32C 2.35GHz, AMD Instinct MI210 64 GB, Mellanox InfiniBand EDR	96,768	9.09	19,34	195
256	NHR@Göttingen Germany Grete – MEGWARE GPU Server System, AMD EPYC 7513 32C 2,6 GHz, Nvidia A100 SXM4 40 GB, InfiniBand HDR	49,600	5.46	7.90	206
322	Universität Erlangen Germany Alex – MEGWARE NF5488A5, AMD EPYC 7713 64C 2GHz, NVIDIA A100 SXM4 80 GB, InfiniBand HDR	37,696	4.03	6.08	179
343	NHR@Göttingen Germany Grete (Phase 3) – MEGWARE GPU Server System, Xeon Platinum 8468 48C 2.1GHz, Nvidia H100 SXM5 94 Gb, Infiniband HDR, Rocky Linux 8.10	15,600	3.65	6.86	80
350	Universität Erlangen Germany Fritz -MEGWARE D50TNP, Xeon Platinum 8360Y 36C 2.4GHz, InfiniBand HDR100	71,424	3.58	5.45	672
390	Technische Universität Darmstadt Germany Lichtenberg II (Phase 1) - MEGWARE MiriQuid, Intel Xeon Platinum 9242 48C 2.3GHz, Mellanox InfiniBand HDR100	59,136	3,15	4,35	690

GREEN500 List – November 2025

Rank	TOP500 Rank	System	Cores	Rmax (PFlops/s)	Power (kW)	Energy Efficiency (GFlops/watts)
6	73	TU Dresden Germany Capella – Lenovo ThinkSystem SD665-N V3, AMD EPIC 9334 32C 2.7GHz, Nvidia H100 SMX 94Gb, InfiniBand NDR200, AlmaLinux 9.4	85,248	24.06	445	68.053
35	58	Universität Erlangen Germany Helma - Lenovo ThinkSystem SD665-N V3, AMD EPYC 9554 64C 3.1GHz, Nvidia H200 SXM5 94Gb, InfiniBand NDR200, AlmaLinux 9.4	125,952	32.22	651	53.919
37	343	NHR@Göttingen Germany Grete Phase 3 – MEGWARE GPU Server System, AMD EPYC 7513 32C 2,6 GHz, Nvidia A100 SXM4 40 GB, InfiniBand HDR	15,600	3.65	80	53.708
52	181	Universität Frankfurt Germany Goethe-NHR – Supermicro AS-4124G5-TNR, AMD EPYC 7452 32C 2.35GHz, AMD Instinct MI210 64 GB, Mellanox InfiniBand EDR	96,768	9.09	195	46.543
76	256	NHR@Göttingen Germany Grete – MEGWARE GPU Server System, AMD EPYC 7513 32C 2,6 GHz, Nvidia A100 SXM4 40 GB, InfiniBand HDR	49,600	5.46	206	34.647
98	322	Universität Erlangen Germany Alex – MEGWARE NF5488A5, AMD EPYC 7713 64C 2GHz, NVIDIA A100 SXM4 80 GB, InfiniBand HDR	37,696	4.03	179	22.518
161	350	Universität Erlangen Germany Fritz -MEGWARE D50TNP, Xeon Platinum 8360Y 36C 2.4GHz, InfiniBand HDR100	71,424	3.58	672	5.325
175	390	Technische Universität Darmstadt Germany Lichtenberg II (Phase 1) - MEGWARE MiriQuid, Intel Xeon Platinum 9242 48C 2.3GHz, Mellanox InfiniBand HDR100	59,136	3.15	690	4.563

University Duisburg-Essen – Supercomputer „amplitUDE“

September 2023

UNIVERSITÄT
DUISBURG
ESSEN

Direct-liquid cooled Tier 3 HPC system, consisting of:

240 Compute Nodes Dual Intel® Xeon® Scalable 8480+ (56C, 2.0GHz)

- 176 Standard Nodes (512 GB RAM each)
- 51 “High-Mem” Nodes (1 TB RAM each)
- 13 “Super High-Mem” Nodes (2TB RAM each)

19 GPU Nodes Dual Intel® Xeon® Scalable 8480+ (56C, 2.0GHz)

- 15 GPU Nodes each with 4x NVIDIA® H100 80 GB HBM2e PCIe
- 4 GPU Nodes each with 2x NVIDIA® H100 80 GB HBM2e PCIe

1.83 PFlops R_{PEAK} (CPU-only)

3.00 PFlops R_{PEAK} (GPU-only, FP64-Tensor-Cores)

NVIDIA® NDR200 InfiniBand Network (1:1,66 Blocking)

Lustre File System with ~2.1 PB useable

□ Highest ranking German system in the Green500 (June 2023)

DVV

DUISBURGER VERSORGENGS-
UND VERKEHRSGESELLSCHAFT MBH

Offen im Denken

ZiM

Zentrum für Informations- und Mediendienste



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TOP 500
The List.

TOP500
Rank 483
(June 2023)

The
GREEN
500

Green500
Rank 8
(June 2023)

TU Dresden (ZIH) – GPU-Cluster „Capella“

October 2024



Computing capacity for machine learning, data analytics and HPC simulations:

Peak performance: ~ **38 petaflop/s** (FP64 tensor), ~ **1.14 exaflop/s** (FP16 tensor)

Computing nodes: **144 nodes** with **2 CPUs**, **4 GPUs** and **768 GB DDR5** main memory each

Processors: **288 AMD EPYC 9334** "Genoa" (32 cores each)

GPUs: **576 NVIDIA H100** with 94 GB HBM2e memory each

Storage: **1.1PB SSD storage** with **1.9 TB/s bandwidth** (read),
Connection to the TUD Barnard storage systems

Budget: 14M EUR

□ **Highest ranking German system in the Green500 (Nov. 2024)**

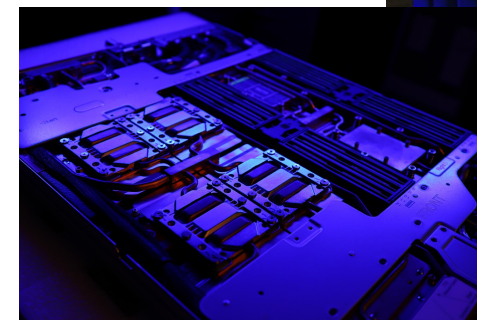
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TOP500
Rank 73
(Nov. 2025)
Rank 51
(Nov. 2024)



Green500
Rank 6
(Nov. 2025)
Rank 5
(Nov. 2024)



NHR@FAU – GPU-Cluster „HELMA“

October 2024 + May 2025



FAU Friedrich-Alexander-Universität
Erlangen-Nürnberg

Direct-liquid-cooled GPU Cluster system with 768 GPUs total, consisting of:

192 GPU-Nodes with 384 AMD EPYC Genoa 9554 CPUs,

64 Cores, 3,1 GHz base clock – 24.576 CPU Cores and ~148 TB DDR 5 main memory,

384 GPUs NVIDIA H100 SXM5 94 GB HBM2e memory (~36 TB HBM2e memory)

and

384 GPUs NVIDIA H200 SXM5 141 GB HBM3e memory (~55 TB HBM3e memory)

Theoretical compute power of ~52 PFlops R_{PEAK} (GPU-only, FP64)

8 MEGWARE Login-/Admin-Nodes for management and user access

NVIDIA InfiniBand NDR200 Fabric (1:3 Blocking)

Central All-Flash Lustre storage with a capacity of ~4.9 PB

MEGWARE ClusWare® cluster management software



TOP500
Rank 58
(Nov. 2025)
Rank 79
(Nov. 2024)



Green500
Rank 35
(Nov. 2025)
Rank 235
(Nov. 2024)



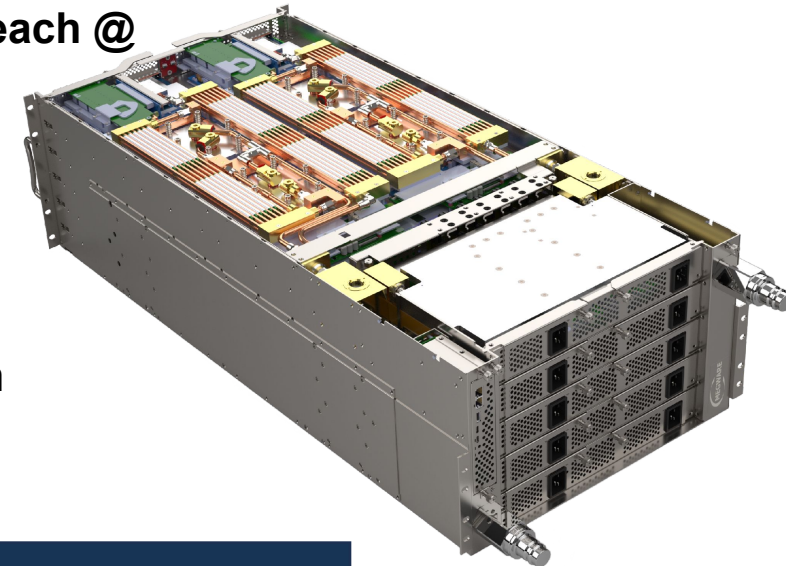
NHR@FAU – CPU-Cluster „HELMA“



New NHR Tier 3 HPC system - consisting of:

- **CPU Partition**

- **312 Compute Nodes (DLC) – 2x AMD EPYC™ 9965 with 192 CPU cores each @ 500W TDP**
 - 288x with 768 GB DDR5 main memory
 - 24x with 2048 GB DDR5 main memory
- **~119,808 AMD EPYC “Turin” Dense CPU cores**
- **Theoretical compute power of ~8.6 PFlops R_{PEAK}**
- **Multinode Server design based on MEGWARE EUREKA® Compute Platform**



+ Project „BayernKI“:

incl. **1024 GPUs NVIDIA GB200 NVL4**
installation Q3'26



HPC SOLUTIONS - MADE FOR YOU.

Thank you for your
attention!



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