

Smarter technology for all

# Lenovo Supercomputing Portfolio Update

HPC User Forum Europe 2024

Lenovo





Pictures Courtesy of Barcelona Supercomputing Center

# MareNostrum 5

**Lenovo**

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**FORTUNE**  
**GLOBAL**  
**500**

Ranked  
**#248**

**180**

**Markets**

**69.5K**

**People**



**18**

**R&D locations worldwide**



**30+**

**Manufacturing sites**

**Transparent global business**



# Made in Europe for Europe

# Gartner Supply Chain Top 25 for 2024

01

**Schneider  
Electric**

02

**Cisco  
Systems**

03

**Colgate-  
Palmolive**

04

**Microsoft**

05

**Johnson &  
Johnson**

06

**Diageo  
and L'Oréal**

07

**NVIDIA**

08

**The Coca-Cola  
Company**

09

**Walmart**

10

**Lenovo**

12 AstraZeneca

13 PepsiCo and Nestlé

14 NIKE, Inc.

15 Intel

16 Siemens

18 Inditex

19 Dell Technologies

20 Pfizer

21 HP Inc.

22 Danone

23 BMW

24 Heineken

25 JD.com

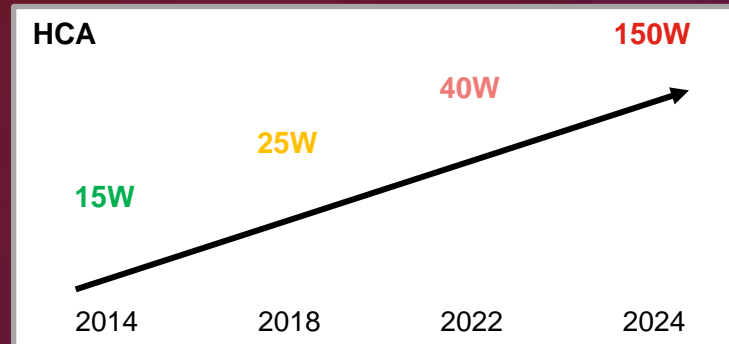
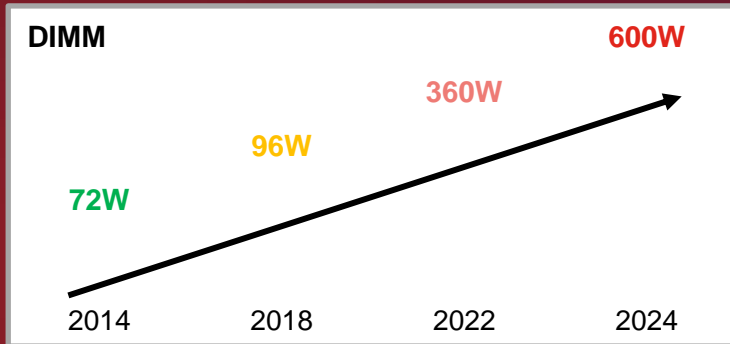
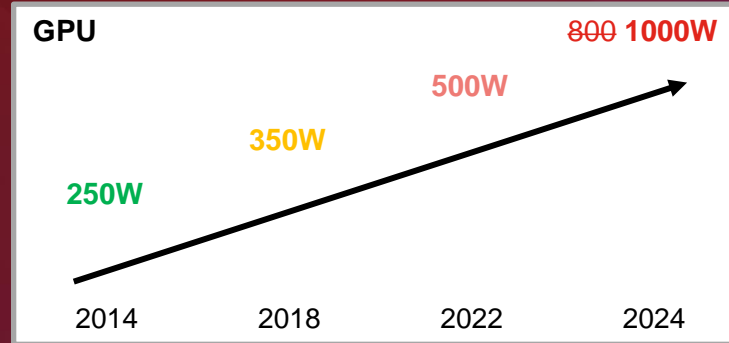
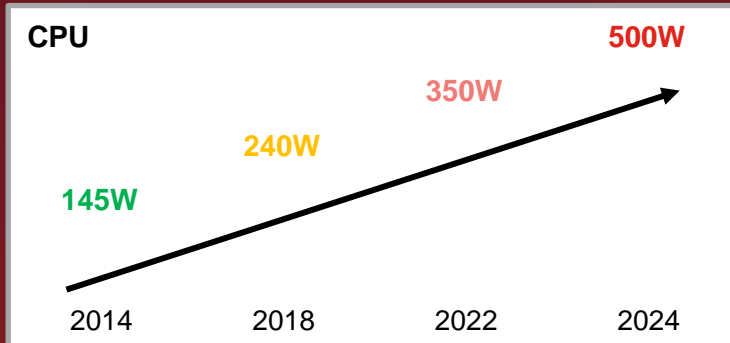
Turn the page to read profiles of the companies ranked 1 – 10. Clients may read additional profiles (the companies ranked 11 – 25) at [gartner.com](https://gartner.com). See the Gartner Supply Chain Top 25 most relevant to your geography or industry at [gartner.com/en/supply-chain-top-25](https://gartner.com/en/supply-chain-top-25).

## Global Supply Chain

**Lenovo**

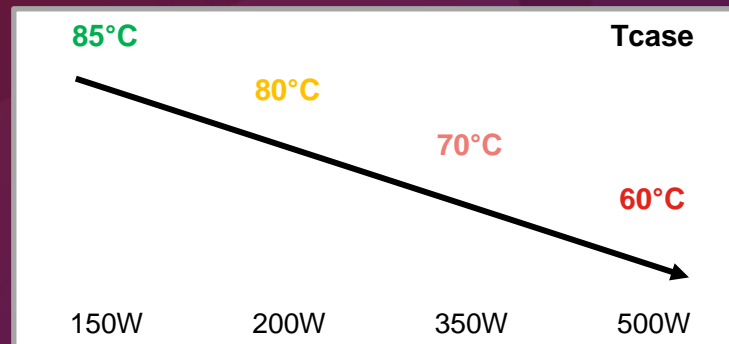
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# Technology Evolution forces our hands



### The constraints of physics

- Max CPU Junction temperature ( $T_{junc}$  or heat sink to die) is relative to  $T_{case}$  and Power.
- As Thermal Design Power goes **up**,  $T_{case}$  must come **down** to keep  $T_{junc}$  within max temp range.

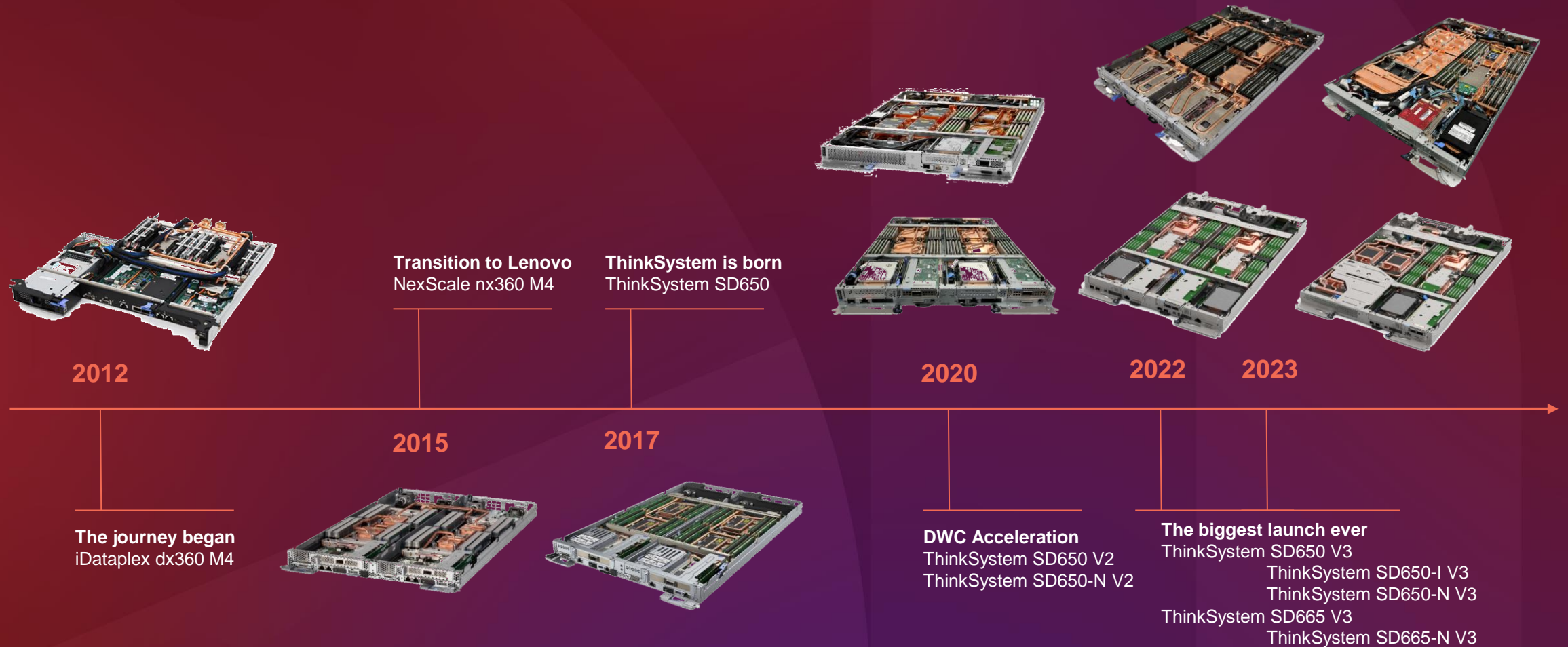


# HIGHER WIDER WATER

# Lenovo Neptune<sup>®</sup> history



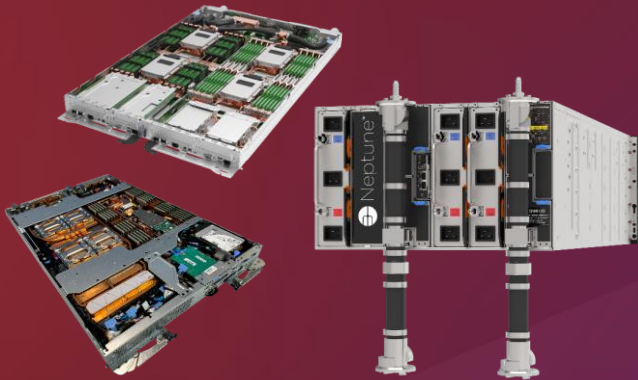
## A Decade Of Innovation



# Lenovo Neptune<sup>®</sup> technology family

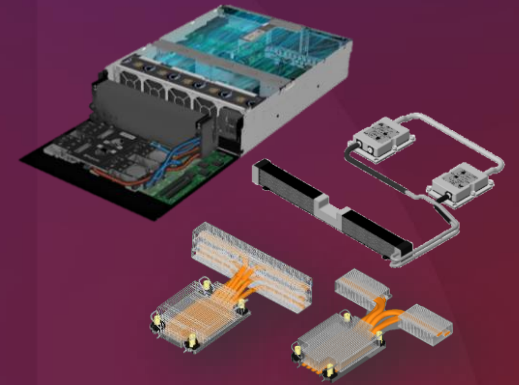
## Neptune<sup>®</sup>

- The original, market-leading 100% direct water cooling
- Warm water up to 45°C inlet
- #1 performance density platform
- ExaScale to EveryScale™ design



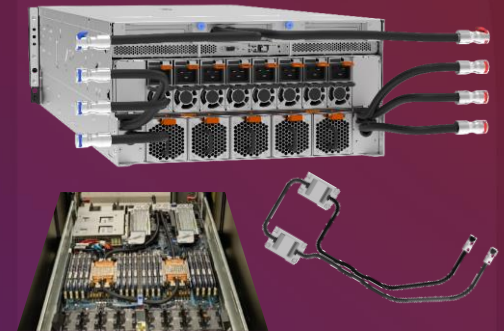
## Neptune<sup>®</sup> Air

- Liquid Assisted Cooling to Air
- Close Loop with Radiator Resign
- Best air-cooling efficiency
- For broad configurability



## Neptune<sup>®</sup> Core

- Targeted at the **Core** Components
- Open Loop Direct Water Cooling
- For datacenter PUE <1.2
- Maintain most configurability



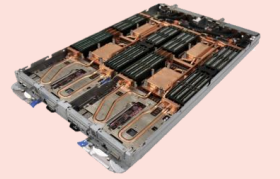
Lenovo Neptune<sup>®</sup> offers the right choice for your datacenter at every scale.

# Neptune<sup>®</sup>



## Warm Water Cooling

- $\geq 45^{\circ}\text{C}$  inlet temperature at the system
- 100% heat capture from the system
- Advanced heat sink and waterloop designs



## Most Reliable Materials

- Copper based water loops
- Aluminium based cold plates
- Thick EPDM or Stainless Steel hoses



## Safe for the Environment

- Pure Water – distilled or similar
- Treated against corrosion/biosphere
- No hazardous Glycol necessary



## From Exascale to Everyscale<sup>™</sup>

- Build for the fastest Supercomputers
- Scalable down to less than one 19' rack
- Lenovo Manufacturing integrated, tested





## Evolution of Lenovo Liquid Cooling



**Lenovo**

Lenovo Techworld, Oct 15<sup>th</sup> 2024

# Lenovo ThinkSystem N1380



# Lenovo ThinkSystem N1380



- 13U Enclosure building block  
*designed for the next decade*
  - 8x OpenCompute aligned Compute Trays
  - 4x 15kW Power Conversion Stations*from Exascale to Everyscale™*
  - 19inch rack support, scale from 1 tray/chassis
  - Fully rack-integrated as well as standalone
- Lenovo Neptune
  - Zero airflow design, 100% direct water cooled
  - Stainless Steel and EPDM quality
  - Up to 45°C Inlet Water temperature
  - High flow rate, low pressure drop manifolds

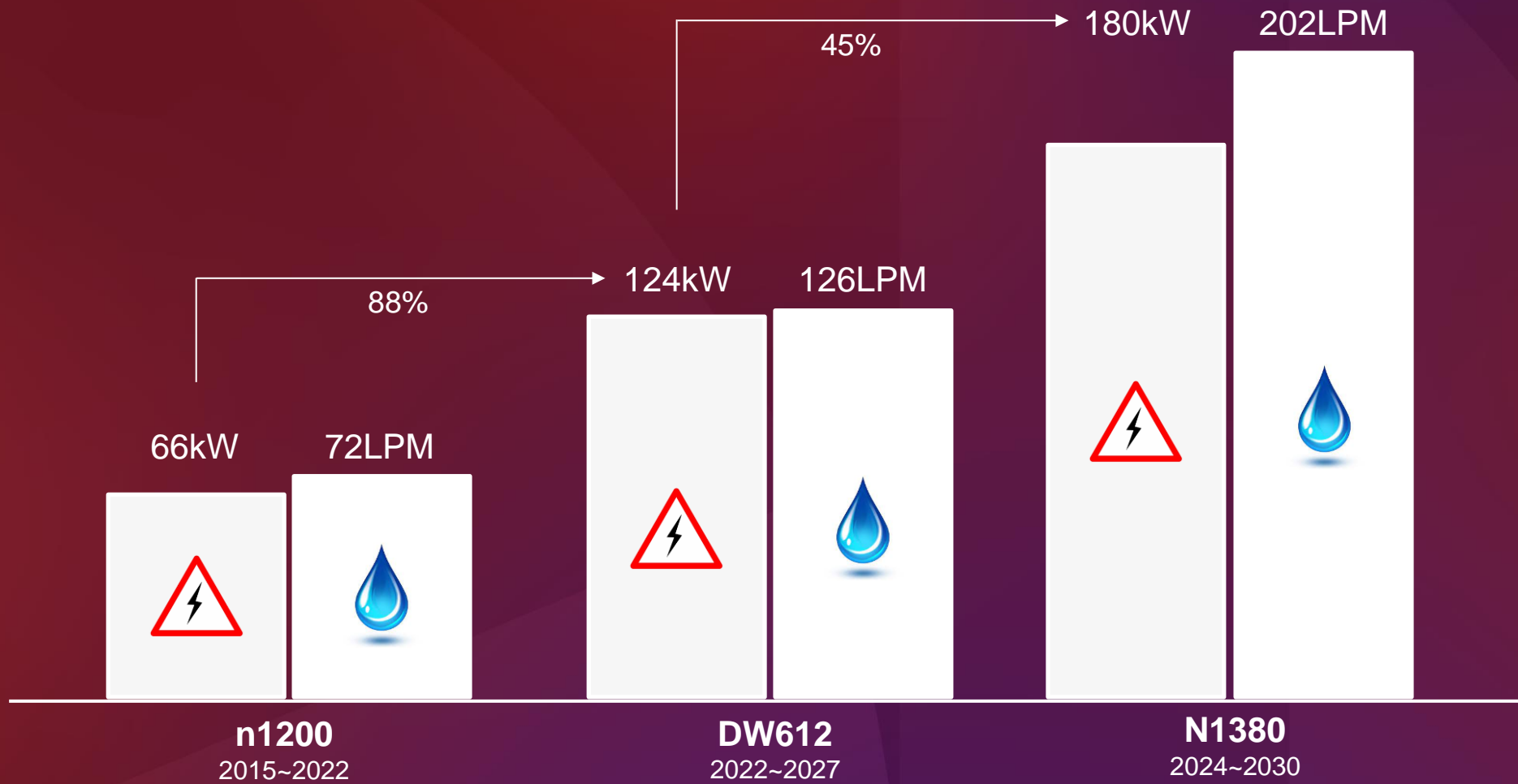


# Lenovo Power Conversion Station



- All-in-one power delivery
  - 15kW with built-in 120% Oversubscription
  - Direct attached to 32A/63A 3P 380-480V AC
  - Phases automatically always fully balanced
  - 96% Efficiency, 99% Power Factor - >80Plus Titanium
  - Feeding 48V enclosure-internal busbar
  - High granular Telemetry
- Lenovo Neptune
  - Zero airflow design, 100% direct water cooled
  - Copper and Stainless Steel quality
  - Up to 45°C Inlet Water temperature
  - Optimized waterflow avoiding hot-spots

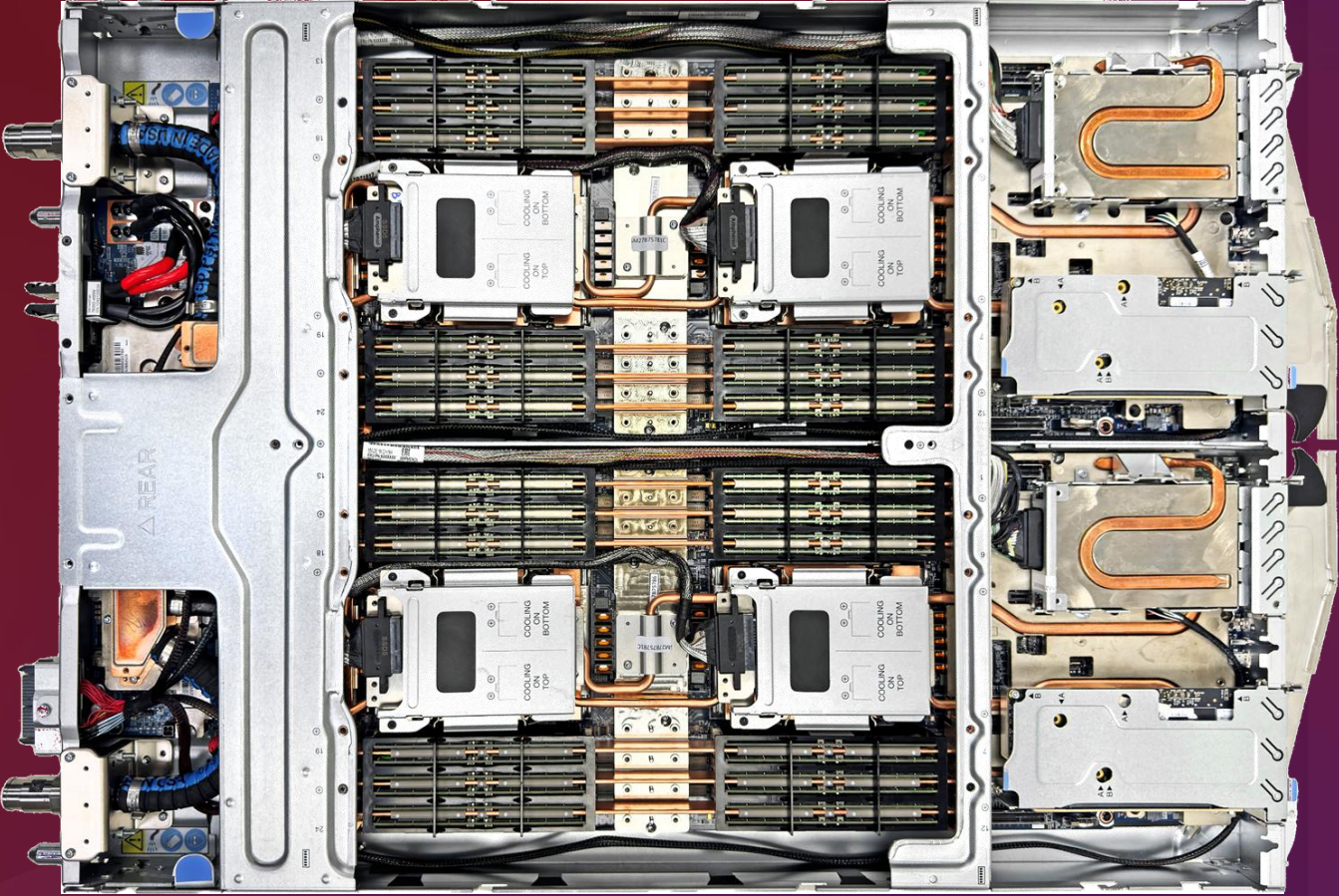




# N1380 Tray vs Open Rack



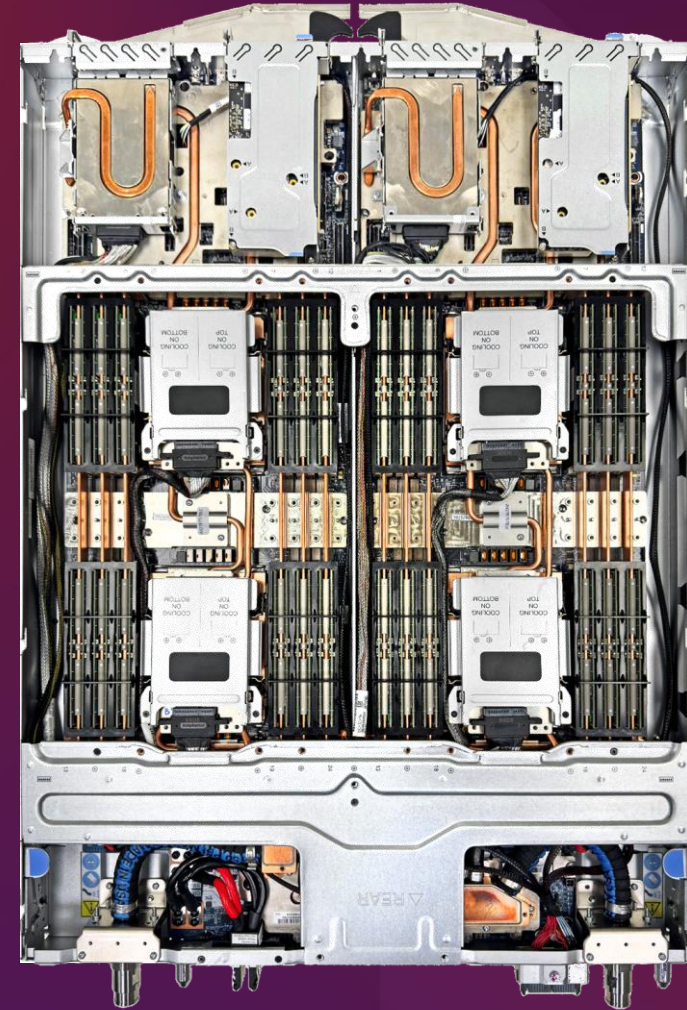
# Lenovo ThinkSystem SC750 V4



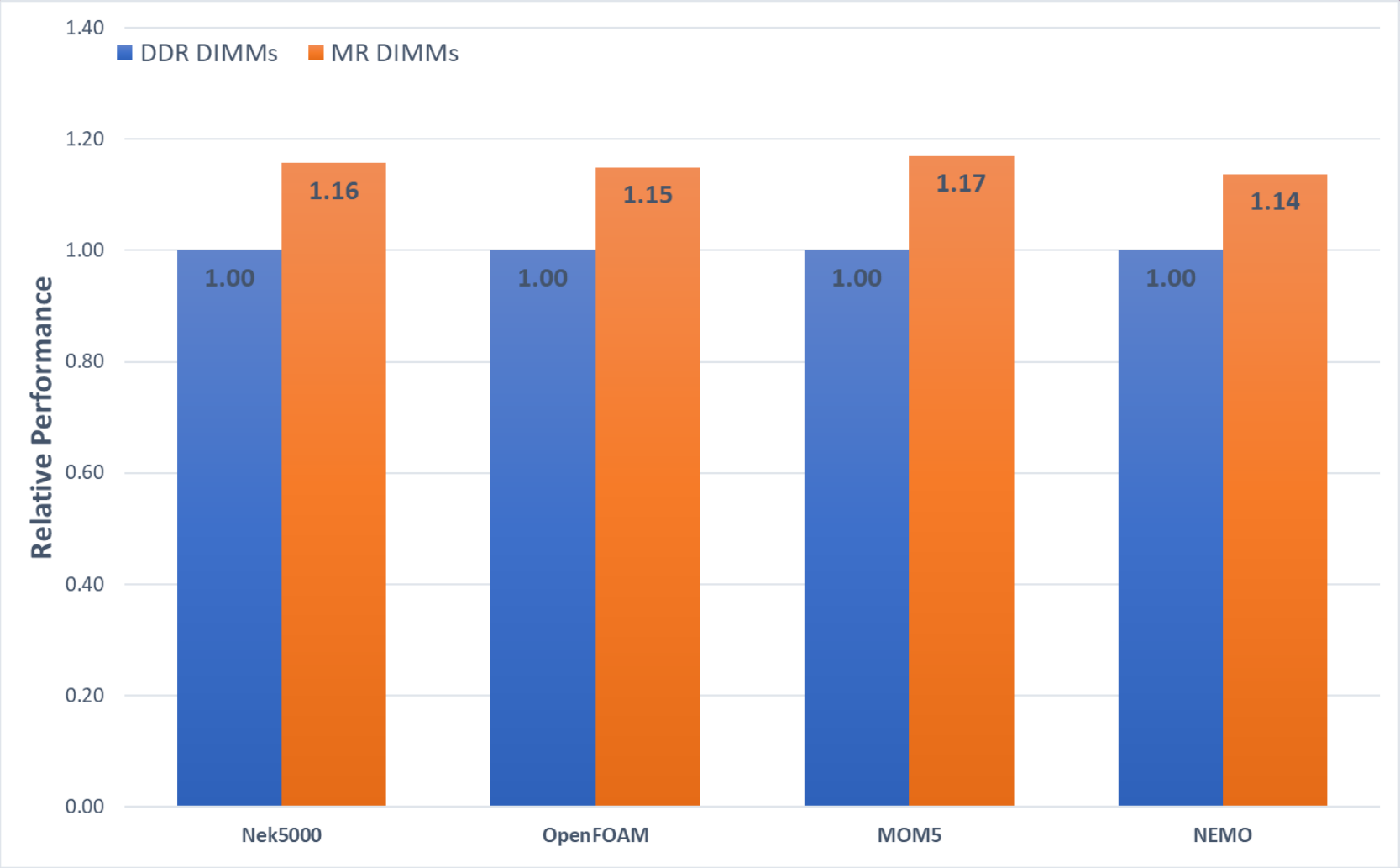
# Lenovo ThinkSystem SC750 V4



- 2 Nodes per Tray
  - 2x Intel Xeon 6900-series up to 288 Cores
  - 24x DDR5 6400 RDIMM or 8800 MRDIMM
  - Up to 6x E3.S 1T local storage
  - Up to 2x x16 Gen5 LP (each in place if 2x E3.S)
  - 2x 25GbE + 1x 1GbE LOM
  - DC-SCM w/ Lenovo xClarity Controller
- Lenovo Neptune
  - Zero airflow design, 100% direct water cooled
  - Copper, Stainless Steel and EPDM quality
  - Up to 45°C Inlet Water temperature
  - Optional Double Sided Memory Cooling



# The Value of MRDIMM



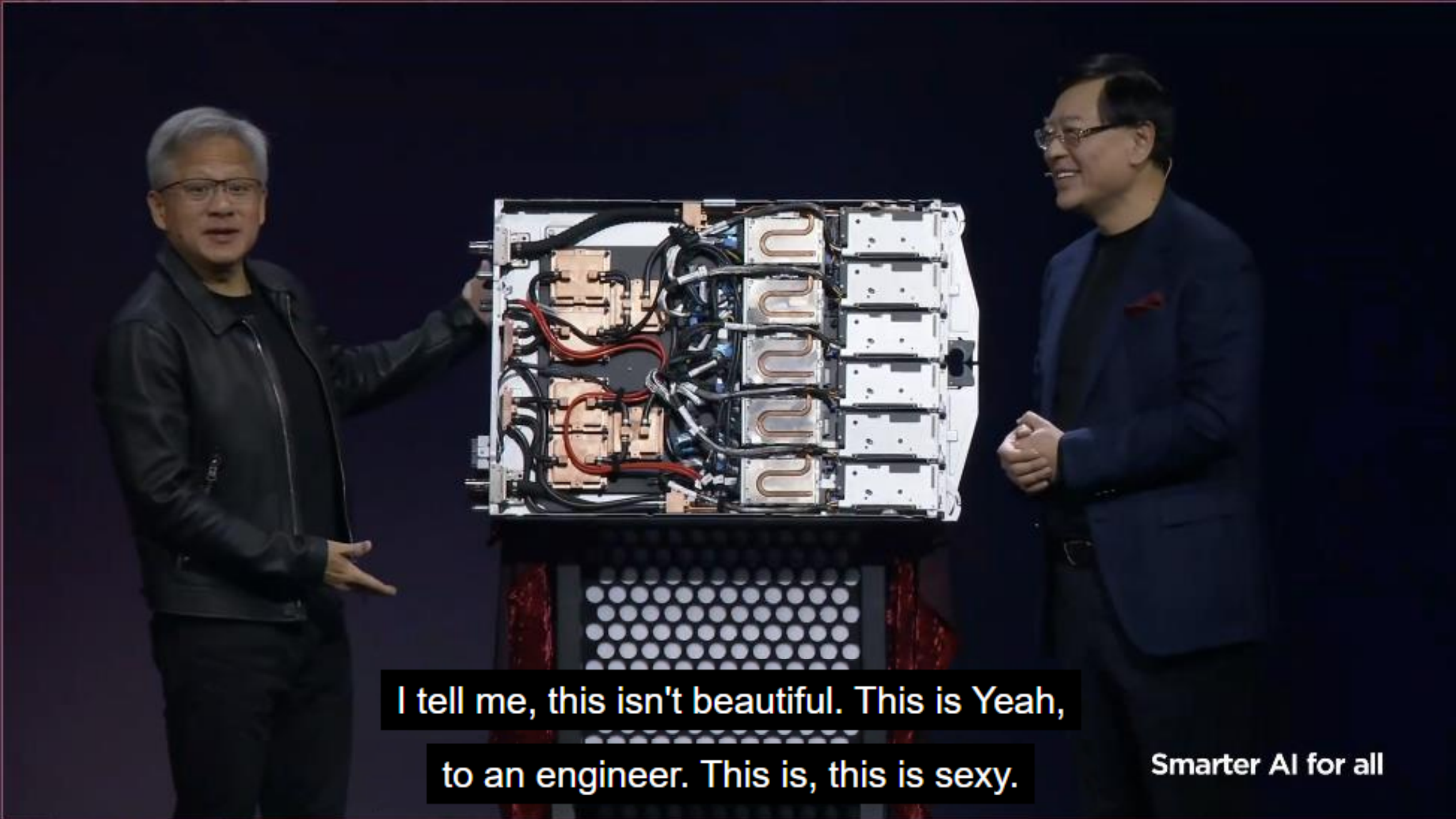
# Times are changing – or – why NVIDIA stock does not too bad

## Lenovo

- 74% of Neptune revenue in fiscal H1 24/25 was accelerated.

## Hyperion Research

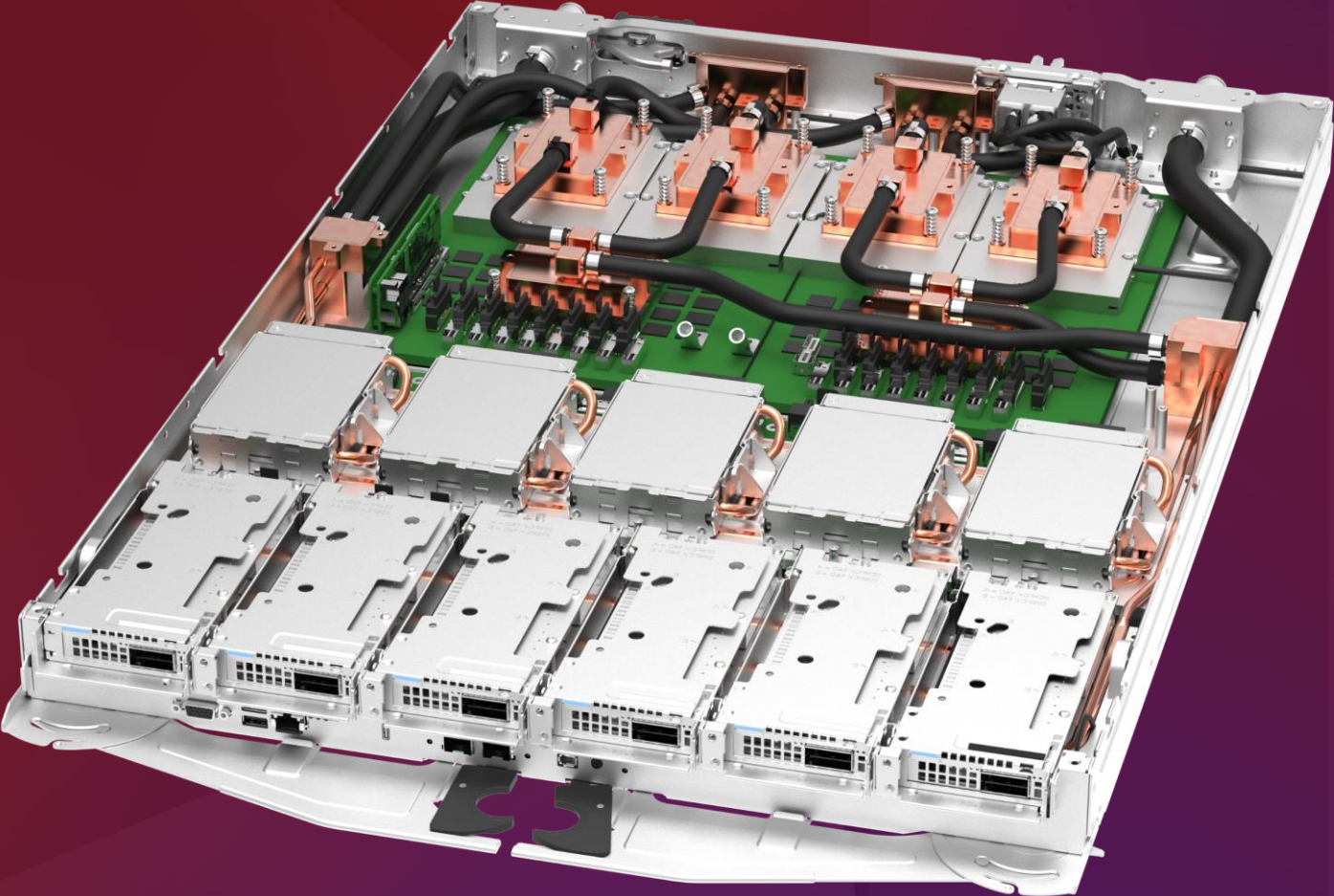
- For HPC including AI for Science in the next 5 years the net yearly growth in GPU revenue at ~35% will be ~3X the rate of CPU revenue at ~12%.



I tell me, this isn't beautiful. This is Yeah,  
to an engineer. This is, this is sexy.

Smarter AI for all

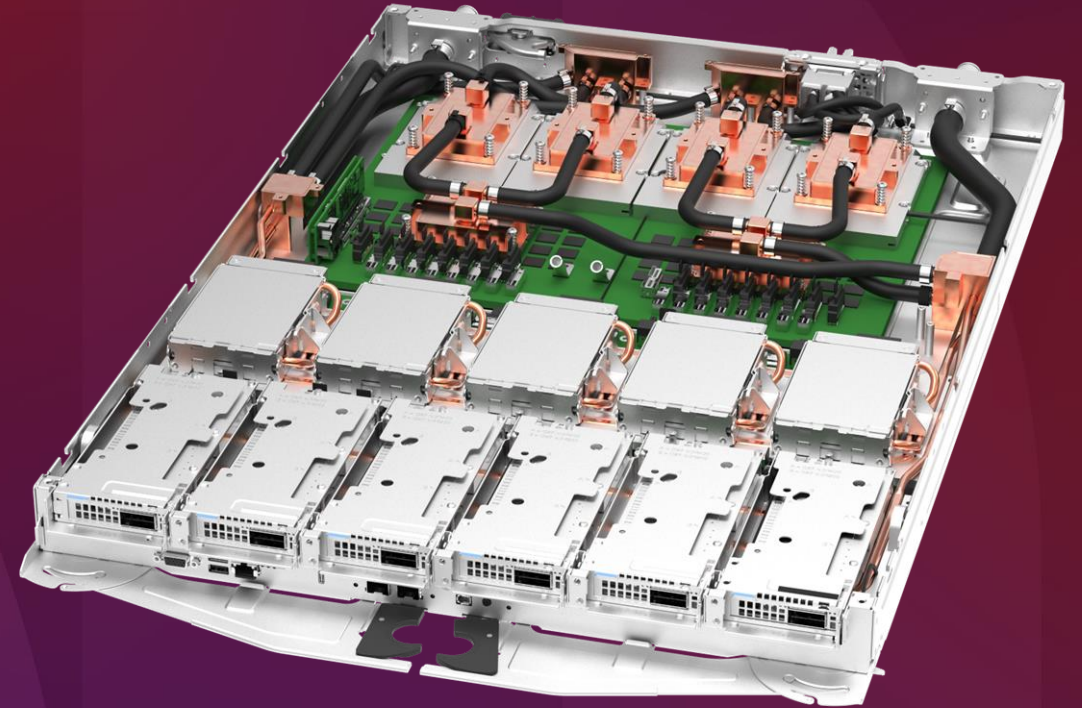
# Lenovo ThinkSystem SC777 V4



# Lenovo ThinkSystem SC777 V4



- 4 GPUs per Tray
  - 2x NVIDIA Grace and 4x NVIDIA Blackwell
  - ~1TB memory (LPDDR5 + HBM3e)
  - Up to 8x E3.S 1T local storage + 2x OS
  - Up to 6x x16 Gen5 LP (or 3x x32)
  - 2x 25GbE + 1x 1GbE LOM
  - DC-SCM w/ Lenovo xClarity Controller
- Lenovo Neptune
  - Zero airflow design, 100% direct water cooled
  - Copper, Stainless Steel and EPDM quality
  - Up to 45°C Inlet Water temperature
  - Lenovo in-house designed coldplates

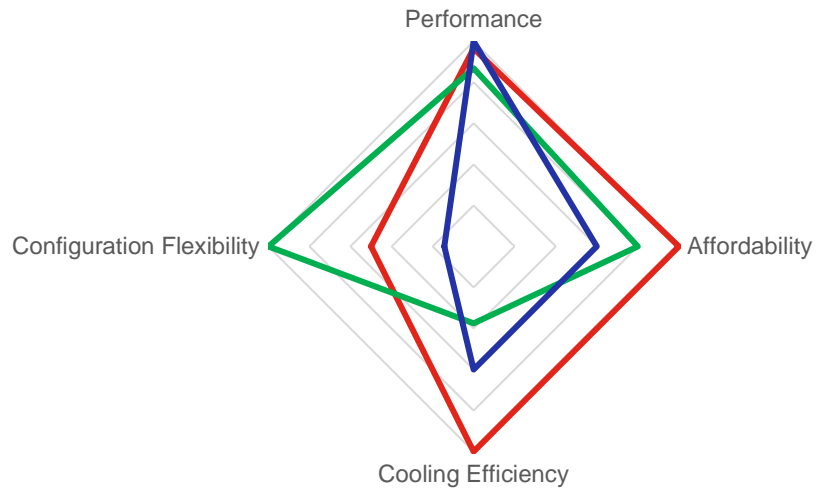


# 175B+ Parameter AI Training choices w/ B200

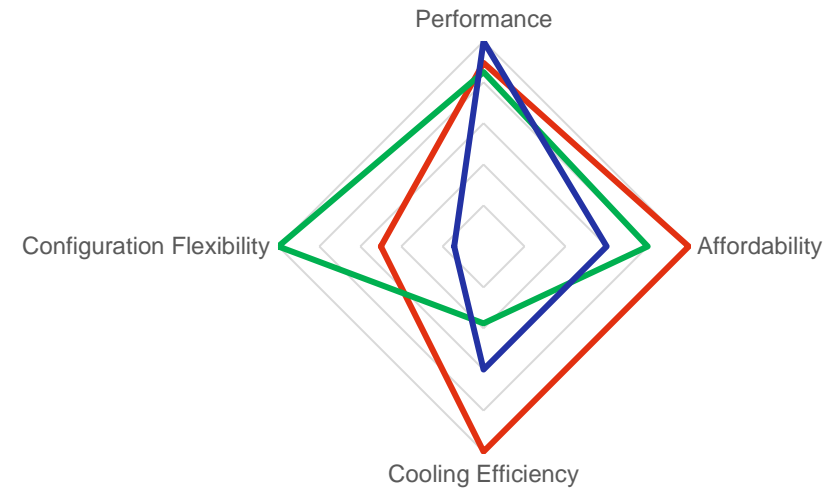


<b>32 GPUs</b>	<b>&lt;512</b>	<b>&lt;1024</b>	<b>&lt;2048</b>	<b>&lt;4096</b>	<b>&lt;8192</b>	<b>&gt;8192</b>
~\$1.5M	<=\$25M	\$50M+	\$100M+	\$200M+	\$400M+	>\$400M+

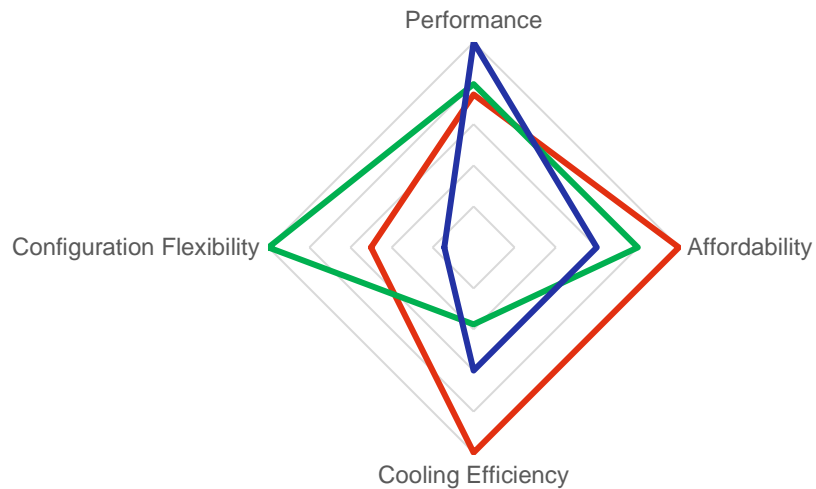
### 175B P Training w/ 1024 GPUs | \$50M+



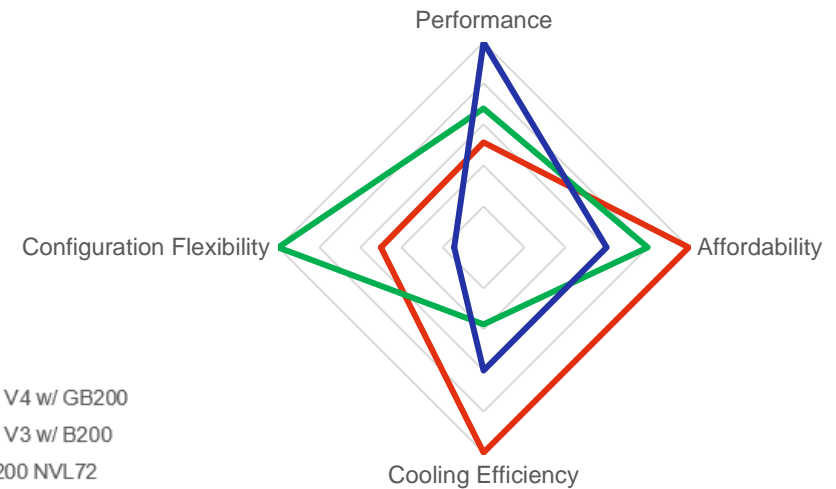
### 175B P Training w/ 2048 GPUs | \$100M+



### 175B P Training w/ 4096 GPUs | \$200M+



### 175B P Training w/ 8192 GPUs | \$400M+



- Lenovo ThinkSystem SC777 V4 w/ GB200
- Lenovo ThinkSystem SR780 V3 w/ B200
- Lenovo CSR4172 V2 w/ GB200 NVL72

# Lenovo ThinkSystem HPC & AI Compute Line Up 2025

SD535 V3

- Neptune® Air
- Neptune® Core



SR645 V3  
SR665 V3

- Neptune® Air
- Neptune® Core



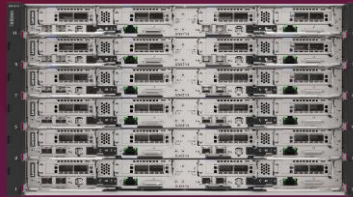
SR630 V4

- Neptune® Air
- Neptune® Core



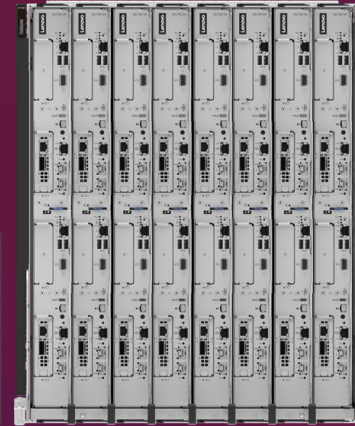
SD665 V3

- Neptune®



SC750 V4

- Neptune®



SC777 V4

- Neptune®



SR675 V3

w/ 4x DW PCIe

w/ 8x DW PCIe

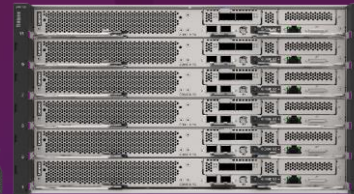
w/ 4x SXM

- Neptune® Air



SD650-N V3  
SD665-N V3

- Neptune®

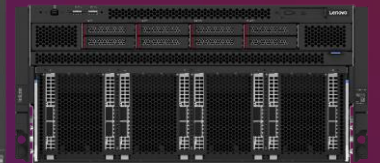


SR680a V3  
SR685a V3



SR780a V3

- Neptune® Core



Smarter  
technology  
for all

Lenovo

thanks.