



# Herzlich Willkommen!

Lenovo Austria

Von Wasserkühlung bis KI  
– welche IT-Trends  
betreffen uns wirklich?

Alexander Stanzel | Senior Manager – Infrastructure  
Solutions Group



# Innovating for Sustainability



## Water-cooling technology

Lenovo's water-cooling Neptune technology offers energy efficiency features to save energy, lower operational costs and reduce environmental impact



## Low temperature solder

Lenovo uses a new and more sustainable process to build stronger, more reliable devices and conserve energy



## Recycled plastic

Lenovo uses post-consumer recycled content in laptops, desktops, workstations, monitors and select accessories



## Bio-based packaging

Lenovo's lighter bio-based packaging reduces the overall package size, resulting in reduced transportation CO<sub>2</sub> emissions



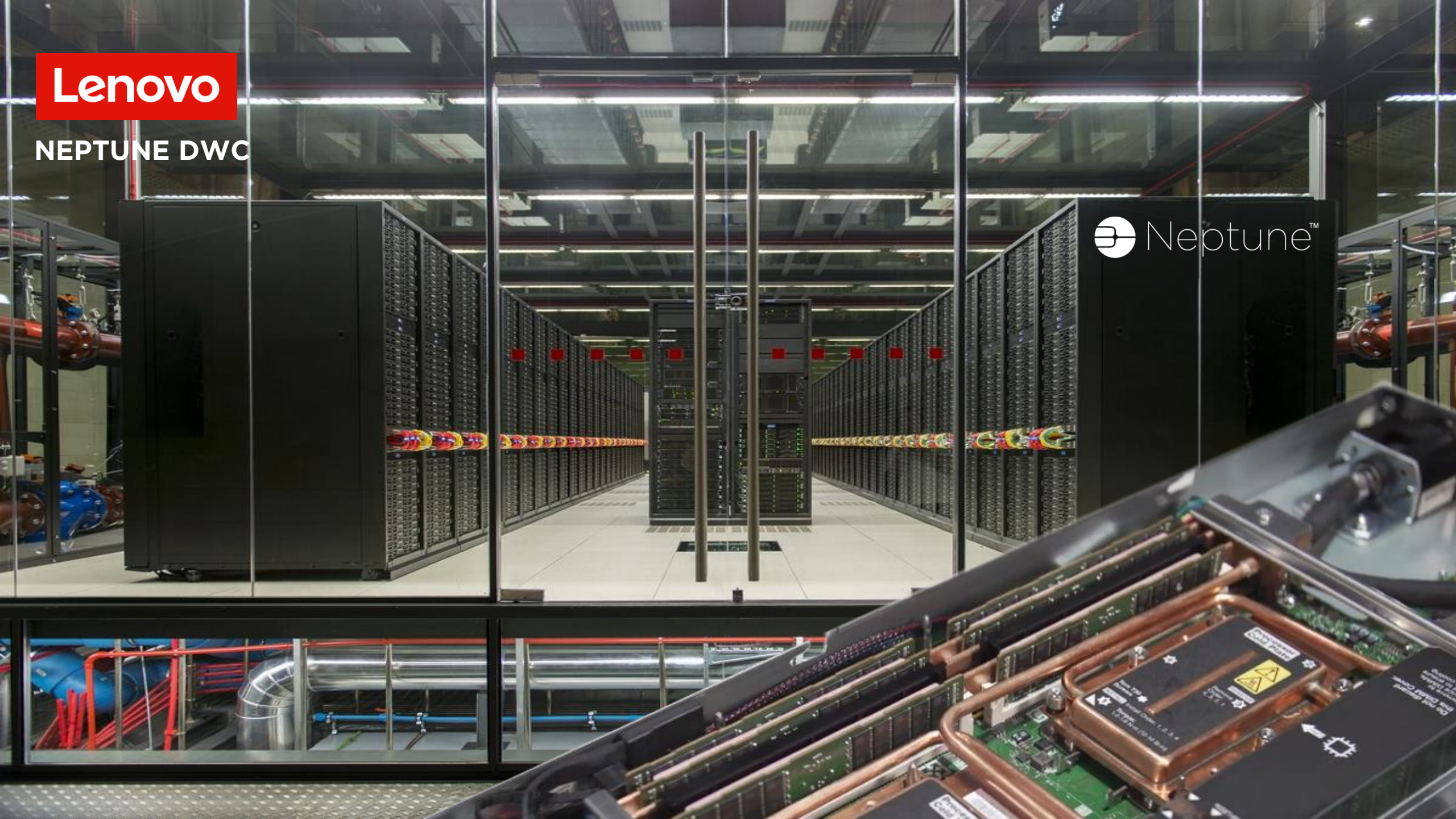
## Product end-of-life management

Lenovo's Product End-of-Life Management (PELM) program is an important part of its efforts to support a transition to a circular economy

**Lenovo**

NEPTUNE DWC

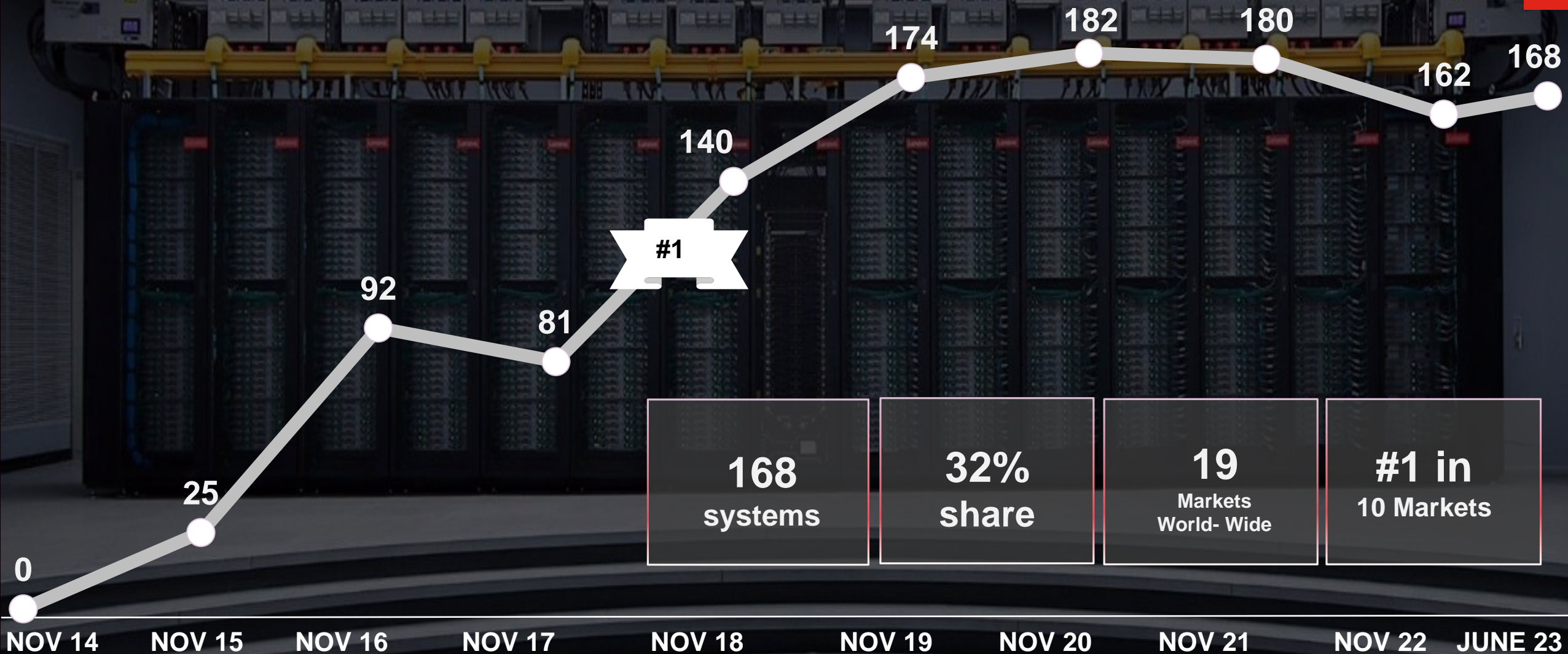
 Neptune™



# #1 provider of Supercomputers in the world

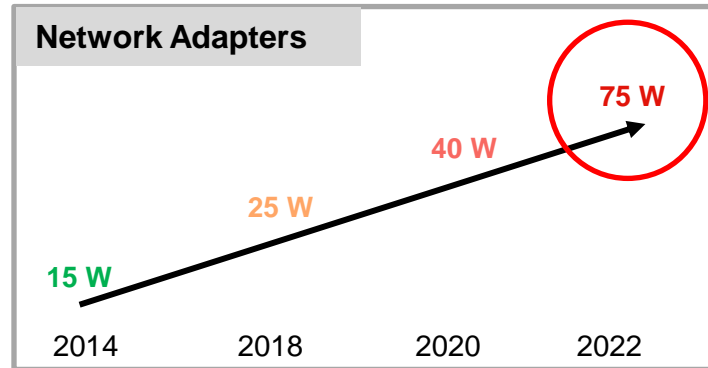
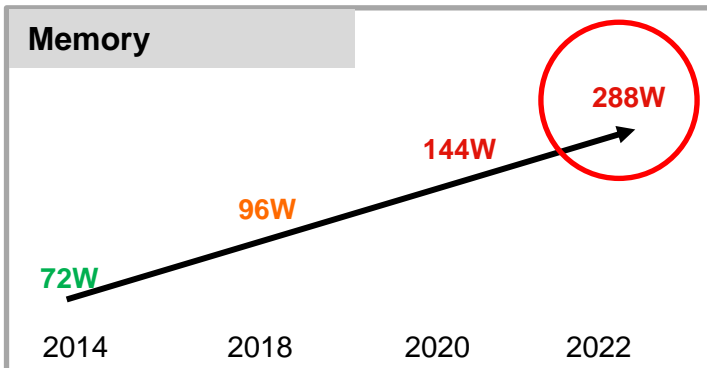
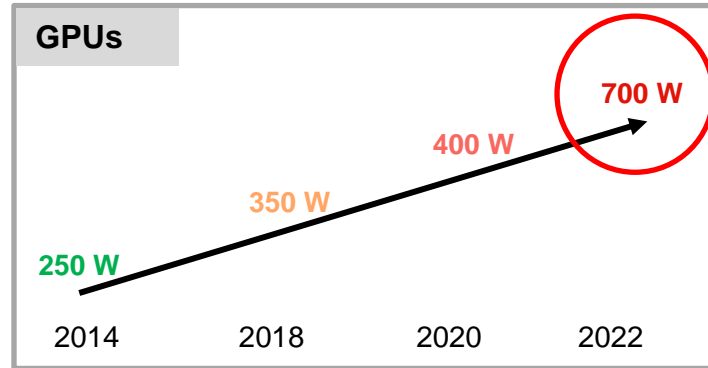
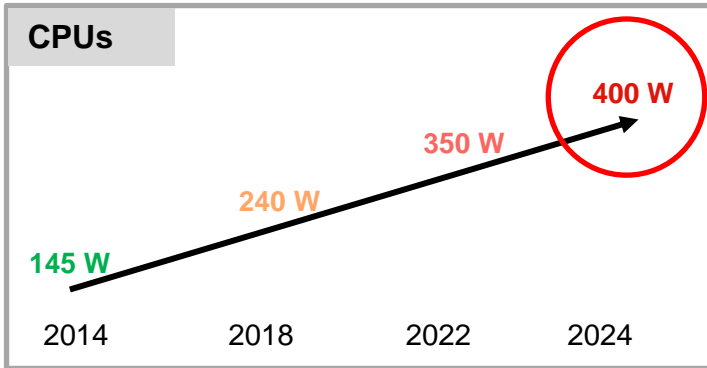
## 1 in 3 RUNS ON LENOVO HPC

Lenovo



Based on count of listing on the TOP500.org May 2023 list.

# Traditional Cooling Approaches Are Reaching Critical Limits

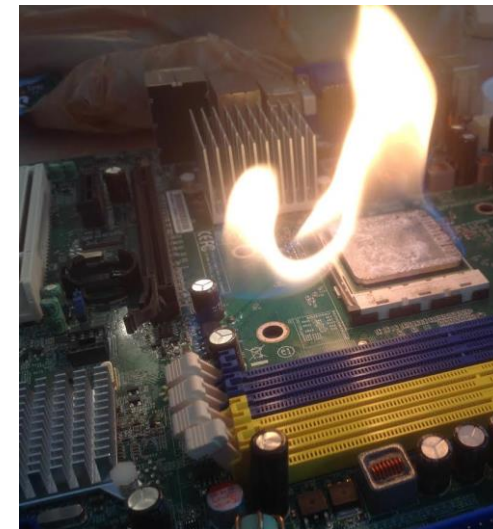


- ### Requires
- Greater CFM = more fans, higher speeds
  - Higher performing heat sinks (needs liquid)
  - Increase in datacenter air-handling capabilities
  - More VRs
  - High-capacity power supplies

- ### T-Case Temperatures
- Max CPU Junction temperature ( $T_{junc}$  or heat sink to die) is relative to  $T_{case}$  and Power.
  - As power goes **up**,  $T_{case}$  has to come **down** to keep the  $T_{junc}$  within max temperature range

Default TDP (W)	$T_{case}$ Max (°C)
120/155	85
170	
180	81
200	
225	81
280	71

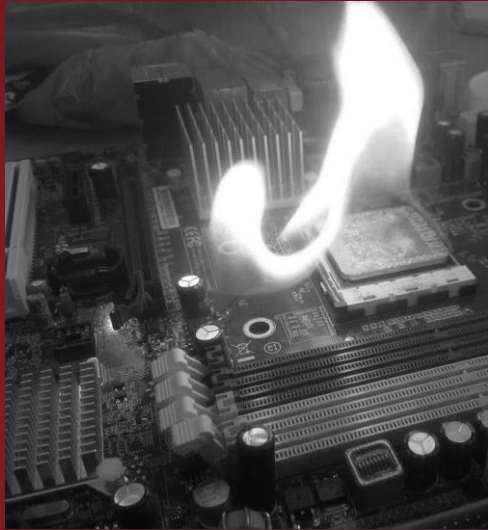
OR



# Lenovo Neptune<sup>®</sup> technologies



*Consequence of increasing cooling problems?*



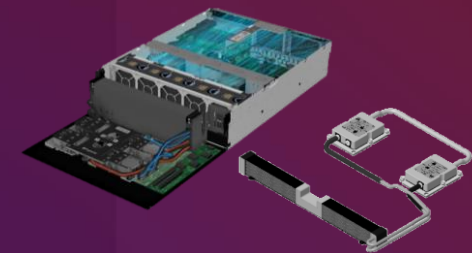
*How much power is consumed for fans & cooling ?*

**> 30%**

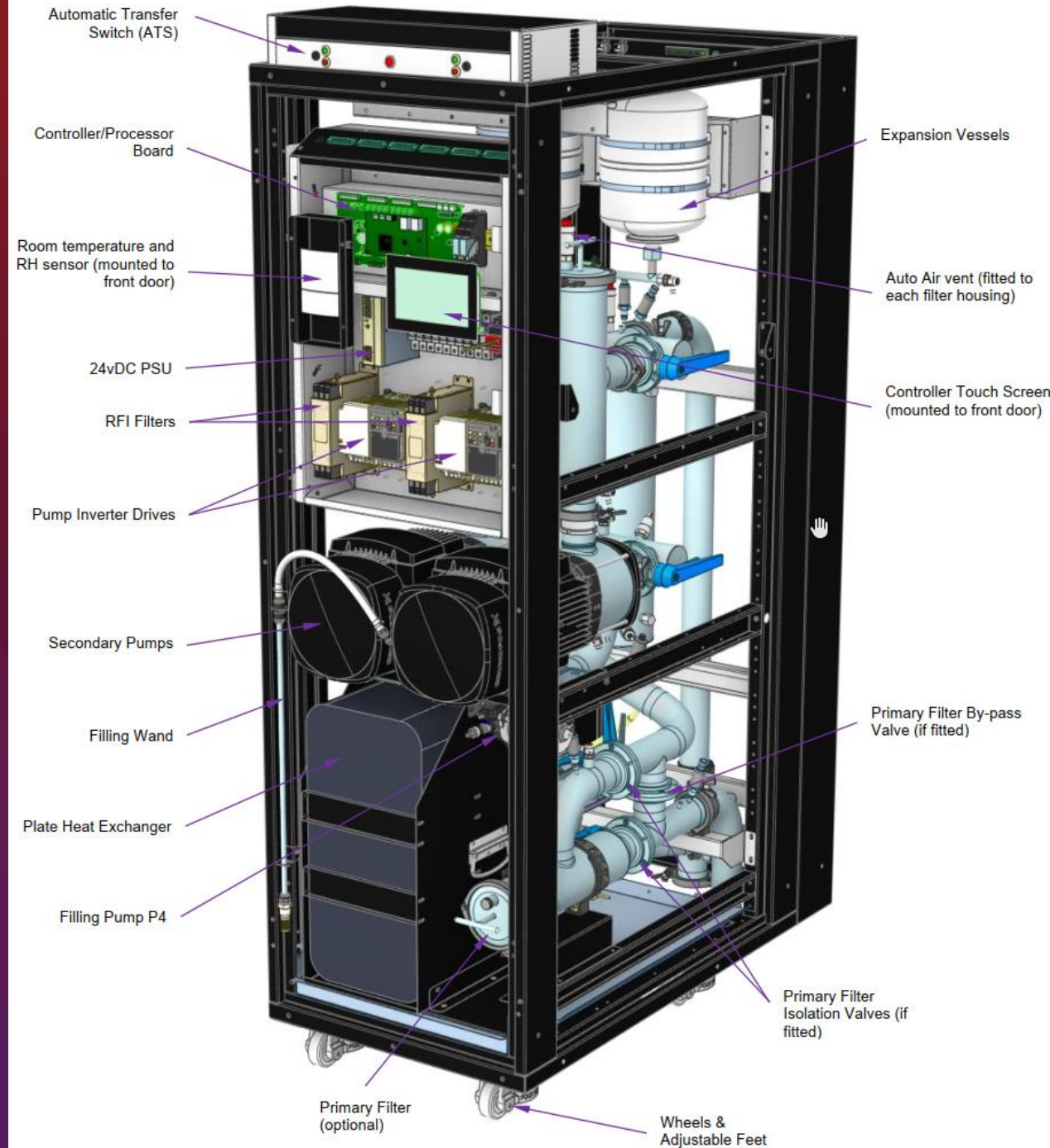
**DIRECT WATER COOLING**



**LIQUID ASSISTED COOLING**

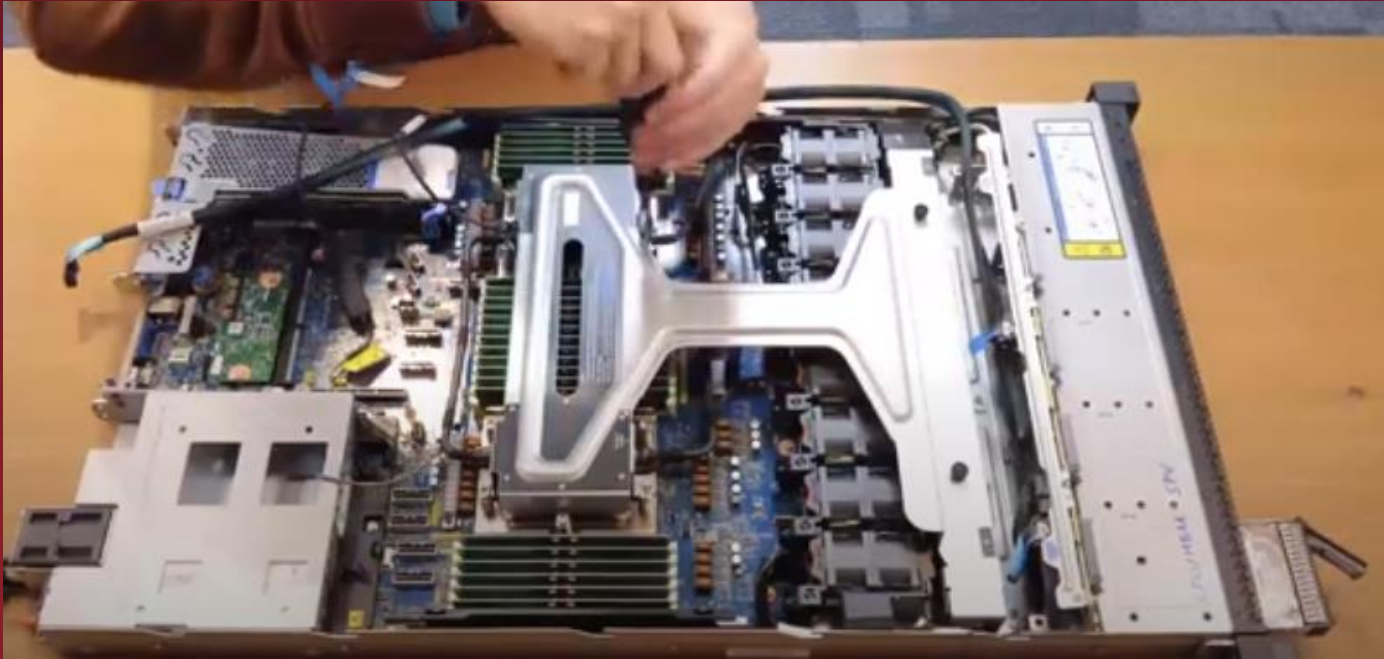


# Direct water cooled





# Liquid to air / Liquid assisted





# “Greenest” Supercomputer Flatiron Institute 65GFLOPS/W

Supercomputers are increasingly using GPUs (Graphics Processing Units) alongside traditional CPUs (Central Processing Units) for several reasons:

1. **Parallel Processing Power:** GPUs are highly parallel processors, meaning they can perform many calculations simultaneously. This makes them well-suited for tasks that involve massive parallelism, such as scientific simulations, weather modeling, and deep learning.
2. **Performance Boost:** GPUs can significantly accelerate specific types of calculations, particularly those used in scientific and engineering simulations, artificial intelligence (AI), and machine learning (ML). They can deliver a substantial performance boost compared to CPUs alone.
3. **Energy Efficiency:** GPUs are more energy-efficient for certain workloads, as they can accomplish a similar amount of computational work as CPUs while consuming less power. This is especially important for supercomputers where power consumption and heat generation are critical considerations.

# VIRTUAL or REAL ? – The borders are blurring...



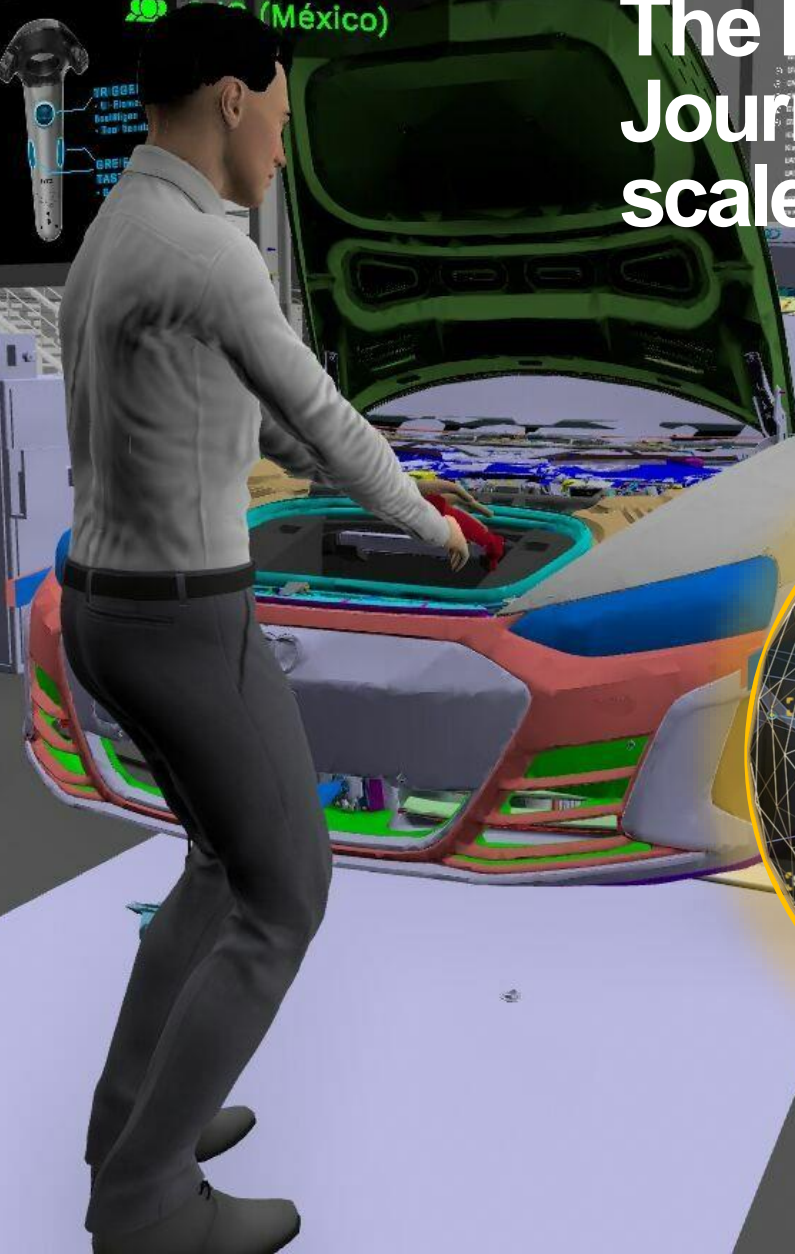
# Metaverse & Digital Twins

Andrés Kohler  
(México)

# The Nvidia Omniverse OVX Journey – supporting every scale

Bastian Küssel  
Ingolstadt

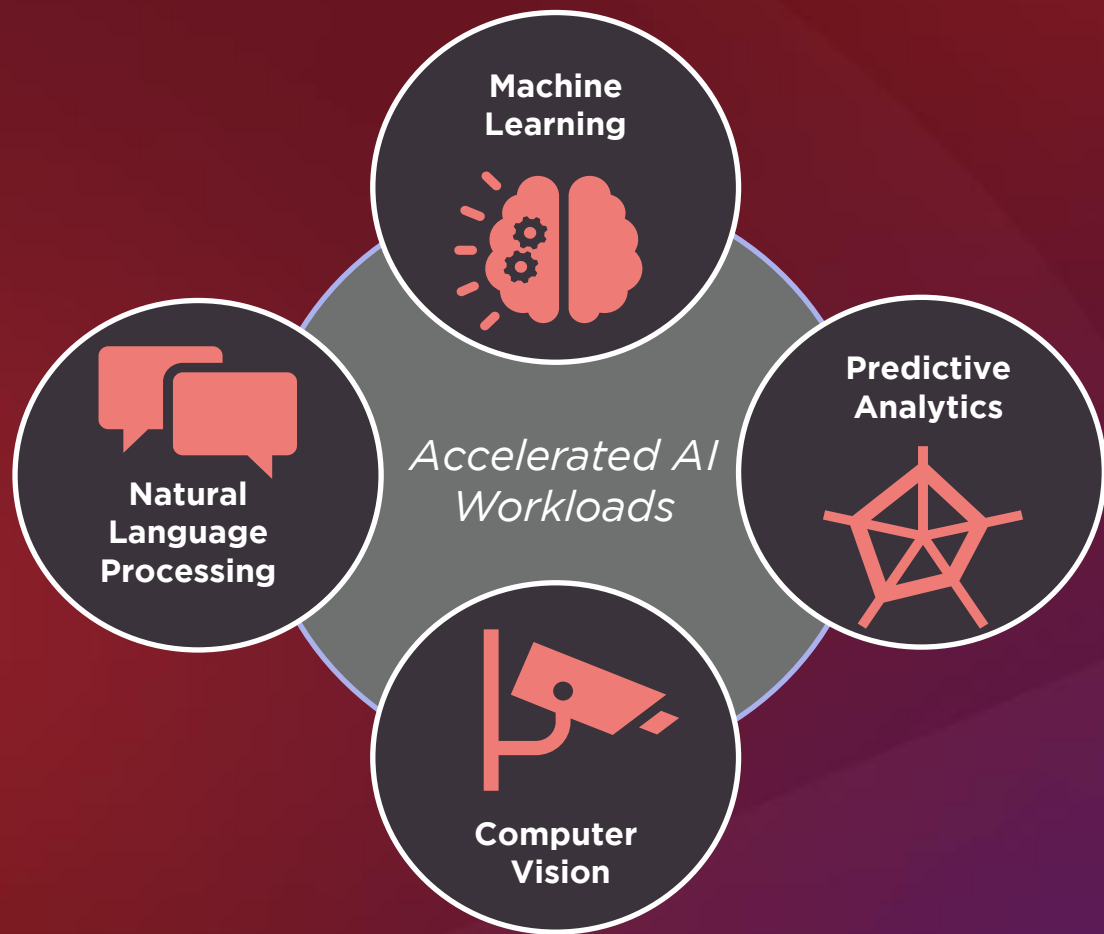
TASTENBELEGUNG



Alle Arbeitsplätze  
Werker 1, Takt 36 li.  
Werker 2, Takt 36 re.

Neckars Inn

# AI Acceleration



**Smart Retail**



**Smart Healthcare**



**Smart Manufacturing**



**Smart City**

# Desktop To Data Center: End To End AI Infrastructure

## AI Development

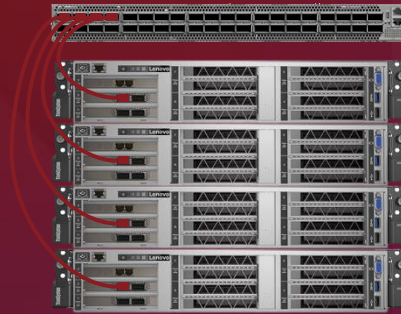


Lenovo Data Science workstations  
& mobile workstations

### Powerful model development

- Bringing Deep Learning to your Desktop
- Your own Sandbox environment for prototyping & model development

## AI Training



Lenovo ThinkSystem SR670  
Lenovo AI Training RAs  
Lenovo Scalable Infrastructure

### Scale out distributed Training

- Optimize training infrastructure use with LiCO
- Expand as your models scale, and your users grow
- Supported, integrated solutions for maximized performance

## AI Inference

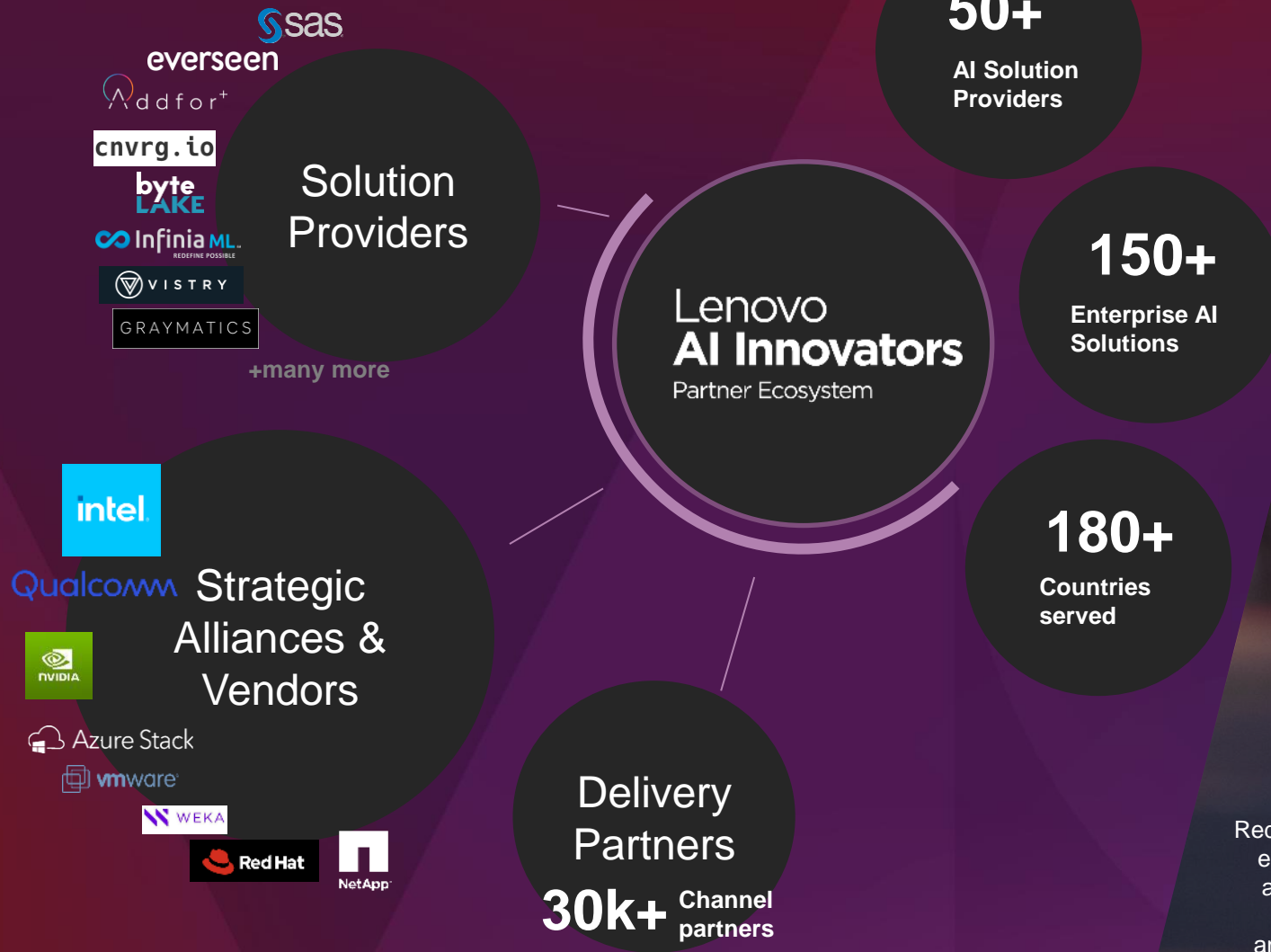


AI-Ready ThinkSystem Servers,  
Client AI & Smart Edge Products

### Inference from Core to Edge

- Ruggedized IoT servers, taking inferencing to the edge
- Dense GPU & CPU platforms for inferencing in your data center
- Extreme performance at the edge with the most compact edge server supporting discrete GPUs

# Your AI Partner for Scale



it takes an **ecosystem to deploy cognitive solutions at scale** that deliver business value.



Reduced complexity, early technology access, quicker deployments and time to value



Complementing cutting edge tech with world class supply and supports chains



Combined AI expertise across technology stacks, industries and research



Full range of support from PoC to Scaling AI, locally or worldwide at lower risk and full cost of ownership



# Edge Computing

## Edge computing is...

computing capacity outside of the traditional data center. It brings the compute power closer to where the data is being generated and when it can be acted upon more quickly and is characterized as being part of a highly distributed computing framework.

## Businesses are challenged to...

- Operate in difficult physical environments
- Process data where it is generated to resolve latency and data traffic jams between devices and clouds
- Deploy and manage compute solutions at scale
- Maintain security on distributed networks, sometimes located in very remote or aggressive locations
- Innovate across the heterogeneous needs for computing and intelligence, and edge-cloud content collaboration

## Lenovo's Edge Computing solutions are...

- Purposely built computing platforms designed to operate outside of a traditional datacenter
- Smaller, quieter, more ruggedized, and more secure with diverse networking functionalities using Lenovo ThinkEdge servers and clients



# The Lenovo Portfolio from Edge to Core

*Far Edge*

**ThinkShield**

*Near Edge*

*Core*



SE10, 10-i



M90n-1



SE30



SE50



SE70



SE350



SE450



SR630, SR645



Interactive display



KIOSK



Barcode scanner



Interactive display



Manufacturing machine



Multi-IP cameras



- Robotics / Automation
- Quality Management
- Inventory Management



- Customer Experience
- Inventory Management
- Targeted advertising



- Security/ Surveillance
- Resource Deployment
- Maintenance



# The Lenovo ThinkEdge Ecosystem

Partnerships  
delivering value to  
our customers



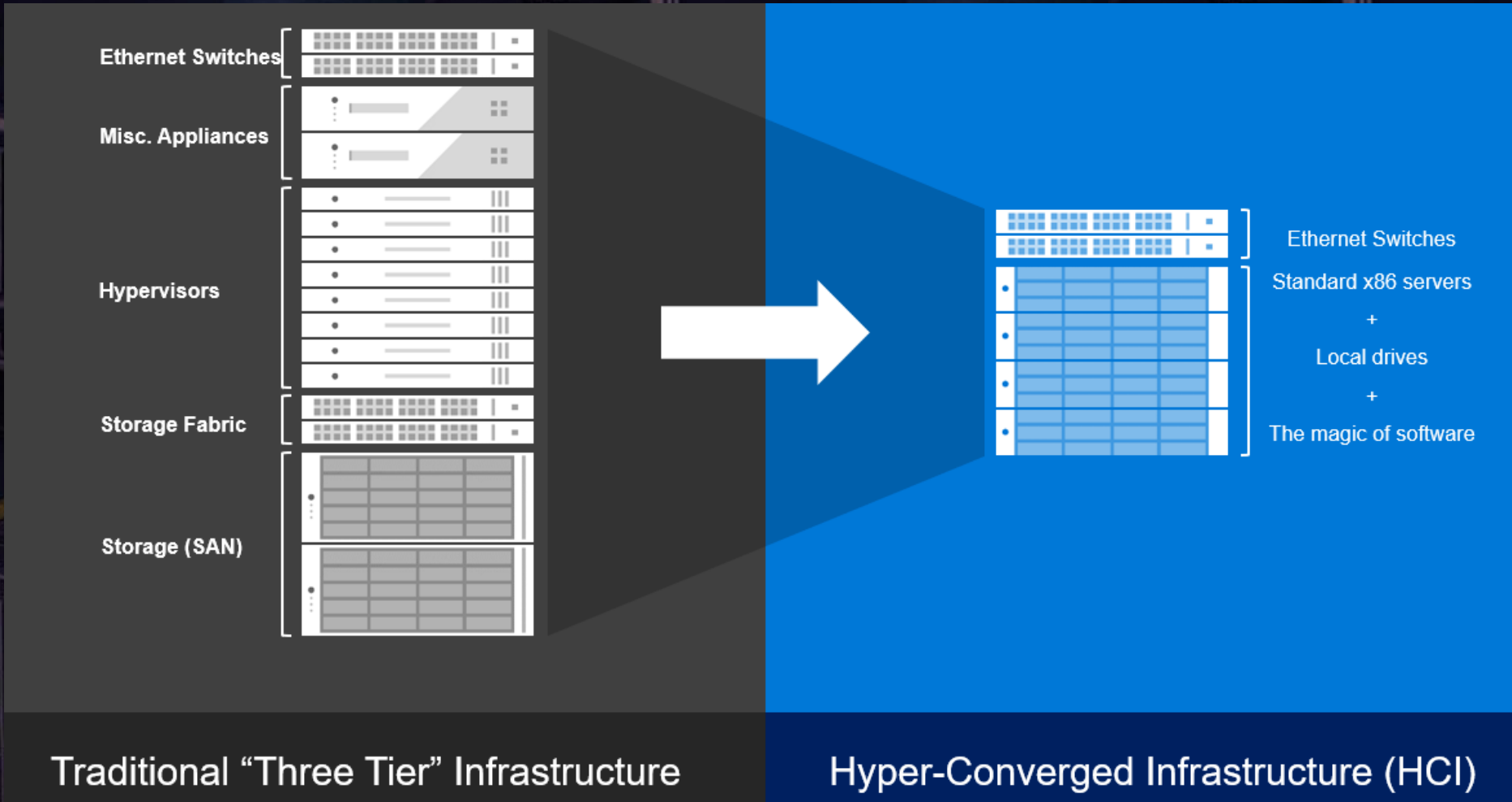
Services delivery in all  
markets with Lenovo  
TruScale

Scalable software,  
securbely  
automating,  
managing edge  
deployments



Innovative edge computing portfolio  
for on-premises deployments

# Hyperconverged Infrastructure (HCI)



Industry

# Boosting CAD performance for cutting-edge development


## AICHELIN Group

To break the cycle of costly CAD workstation refreshes, AICHELIN Group signed up for Lenovo TruScale Infrastructure as a Service. With virtual desktops running on Lenovo ThinkAgile VX Series nodes powered by AMD EPYC™ 73F3 Processors, the company can cut costs and scale seamlessly.

Lenovo

Powered by

AMD



*Wir entwickeln diese hochwertigen Triebwerke, in denen die Turbinenblätter Temperaturen aushalten müssen, die höher sind, als der Schmelzpunkt des Metalls aus dem sie gebaut sind. [...]. Aus technologischer Sicht sind sie großartig, [aber unsere Kunden sehen sie nur als ein] Rohr, das sie an ihre Flugzeuge schrauben, damit sie planmäßig und zuverlässig am Ziel ankommen.*

*(Quote: Rolls Royce)*

SCOOT

# Warum ist CAD VDI aaS ein Erfolgsmodell ?



Immer die richtige Skalierung & Performantes User Profil



Kosteneffiziente Bereitstellung & Kostentransparenz in den Fachabteilungen



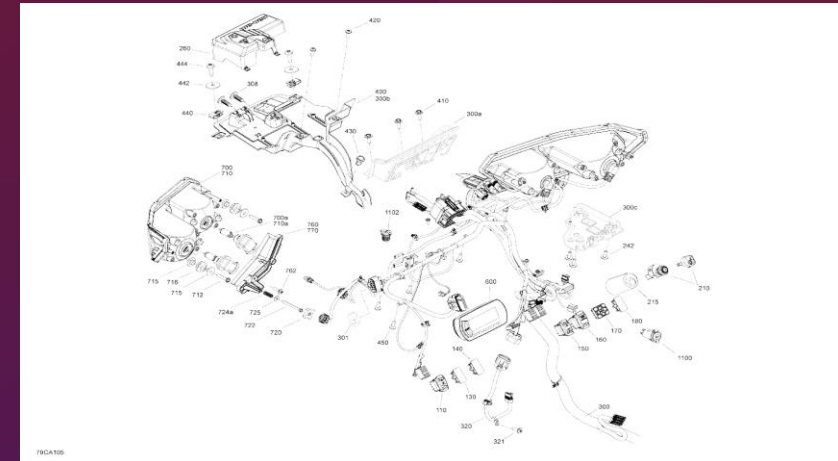
Security Aspekte erfüllt / On premise



Uptime & Zufriedenheit der Nutzer steigt / Dedizierte Infrastruktur extern gemanaged

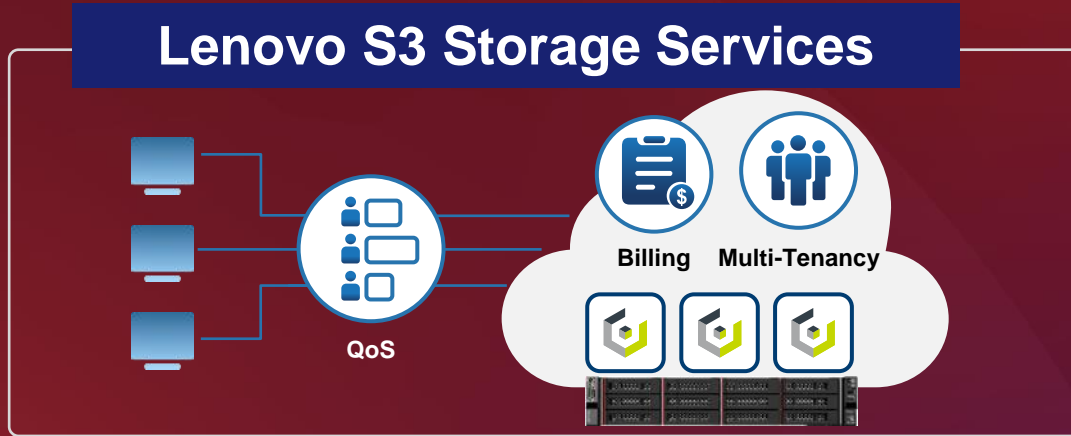
**DIE HERAUSFORDERUNG FÜR KUNDE UND PARTNER:**

**Limitierte IT Ressourcen!**

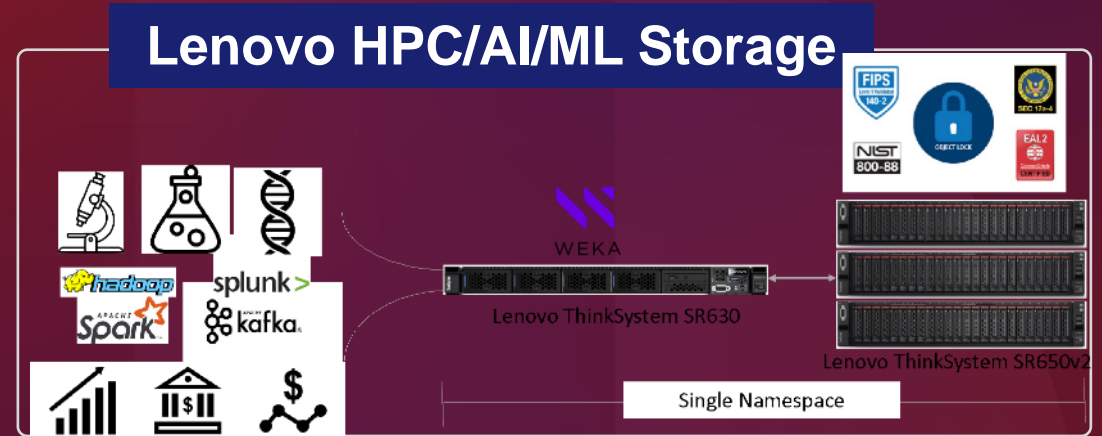


# Software Defined Storage Solutions

## Lenovo S3 Storage Services



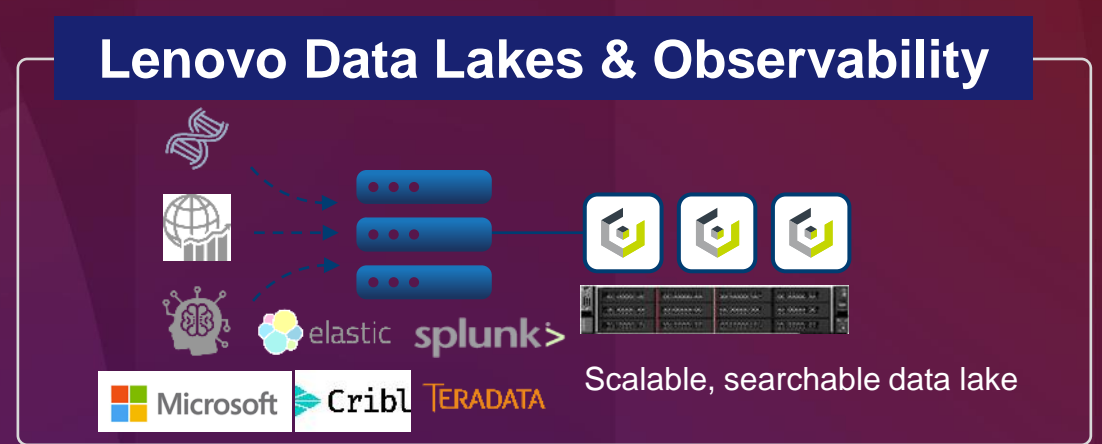
## Lenovo HPC/AI/ML Storage



## Lenovo Data Protection



## Lenovo Data Lakes & Observability



# LENOVO OBJECT STORAGE POWERED BY CLOUDIAN

## MILITARY-GRADE SECURITY

### Data Immutability

S3 Object Lock for ransomware protection  
Data cannot be changed or deleted  
Tamper-proof protection



### Security Certifications

The most complete set of certifications in object storage:



Common Criteria, FIPS 140-2 SEC Rule 17a-4(f), CFTC 17 C.F.R. § 1.31, FINRA 4511c, IDW PS 880 (German), OR §§ 957ff (Swiss) NIST 800-88



### Secure Multi-tenancy

Securely share single environment  
Unique namespaces & management  
QoS controls ensure performance



### Data Encryption

Data at rest: AES-256 encryption (NIST)



Data in flight: TLS 1.2 and 1.3 protocols (Internet Engineering Task Force)







# ISG Product Portfolio ...

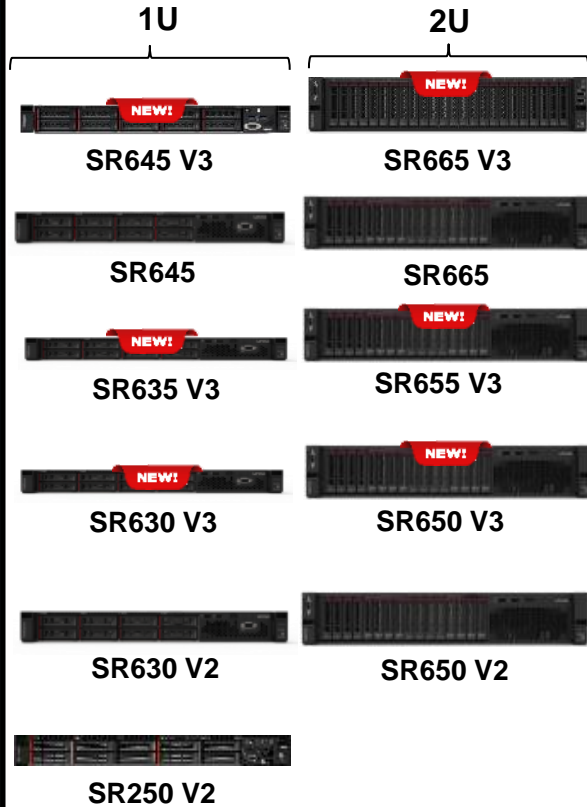
# Lenovo Server Portfolio 2023

## ThinkSystem ST series



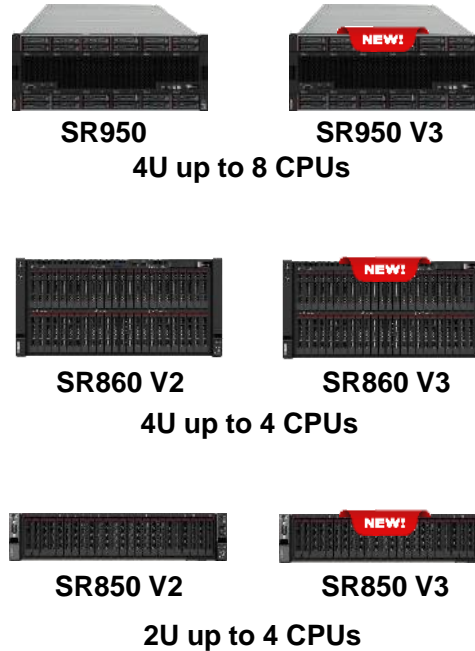
ST50 V2 ST250 V2  
ST650 V2 ST650 V3

## ThinkSystem SR series



1U 2U  
SR645 V3 SR665 V3  
SR645 SR665  
SR635 V3 SR655 V3  
SR630 V3 SR650 V3  
SR630 V2 SR650 V2  
SR250 V2

## ThinkSystem Mission Critical



SR950 SR950 V3  
4U up to 8 CPUs  
SR860 V2 SR860 V3  
4U up to 4 CPUs  
SR850 V2 SR850 V3  
2U up to 4 CPUs

## ThinkSystem SE series



SE350  
SE350 V2  
SE360 V2  
SE450  
SE455 V3

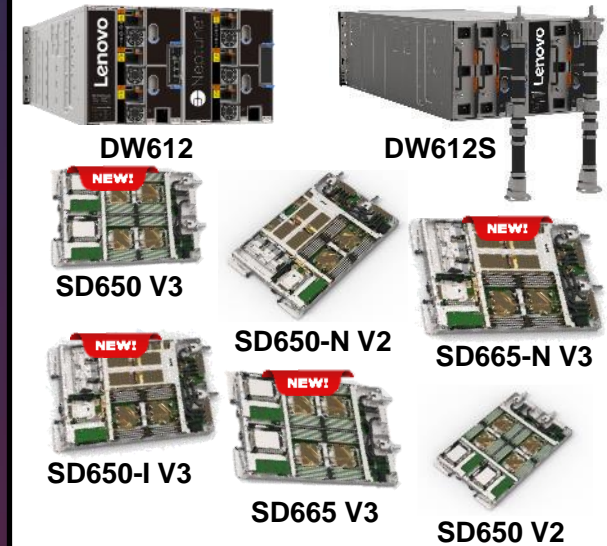
## ThinkSystem HPC / AI

### GPU Optimized



SR670 V2  
SR675 V3

### Water Cooled



DW612 DW612S  
SD650 V3 SD650-N V2 SD665-N V3  
SD650-I V3 SD665 V3 SD650 V2

# Lenovo Storage Portfolio 2023

## Block Storage



DE2000H



DE4000H



DE6000H



DE4000F



DE6400F



DE6000F



DE6600F

## Unified Data Storage



DM3000H



DM5000H



DM7100H

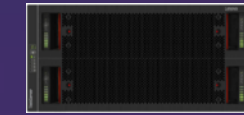


DM5000F  
DM5100F



DM7100F

## Direct Attached



D3284



D1212/1224

## Tape



TS4300



TS2900



TS22xx

## SAN Switch



DB610S



DB620S



DB630S



DB720S



**Vielen Dank!**