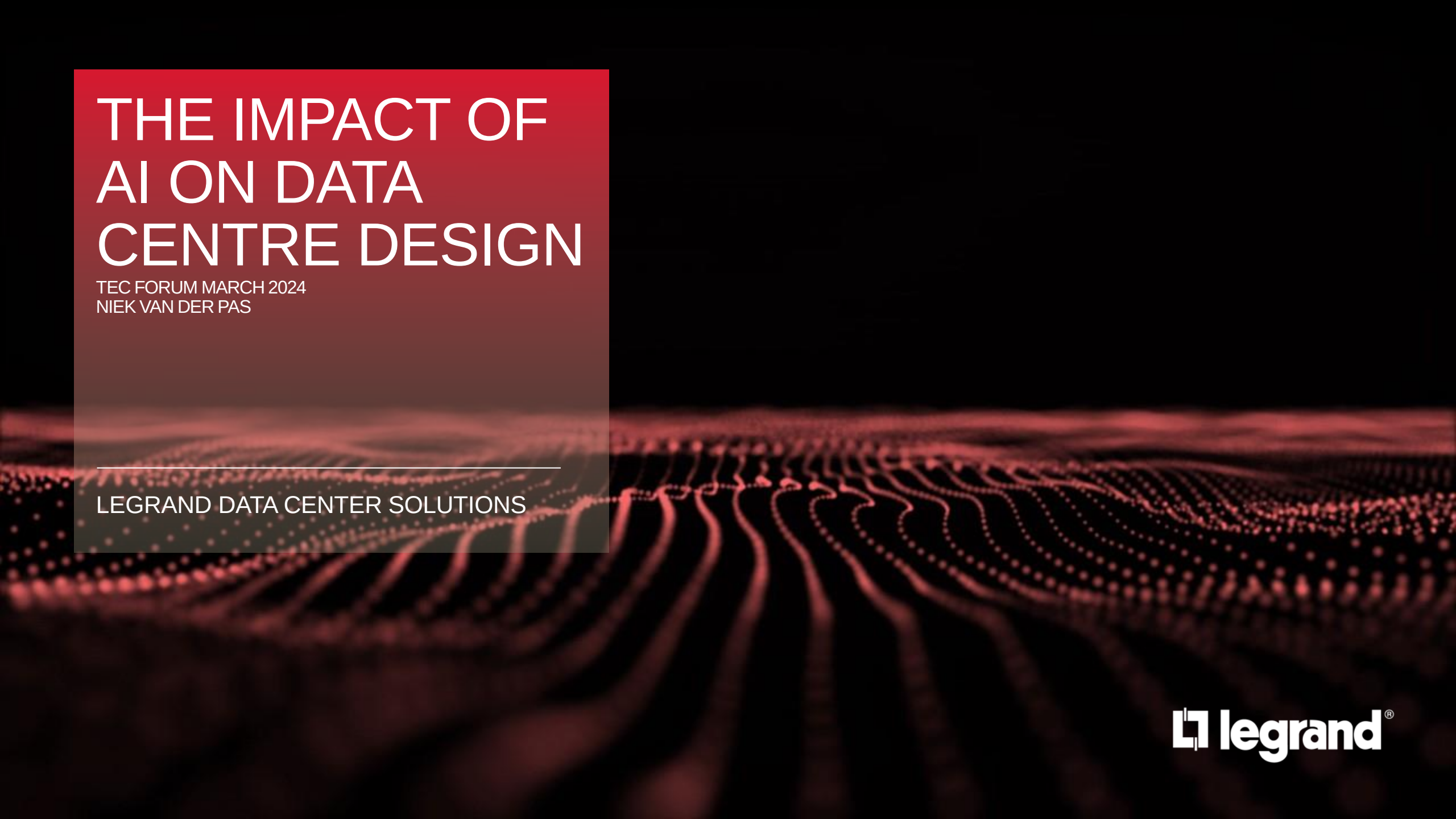
THE IMPACT OF AI ON DATA CENTRE DESIGN

TEC FORUM MARCH 2024

NIEK VAN DER PAS

LEGRAND DATA CENTER SOLUTIONS



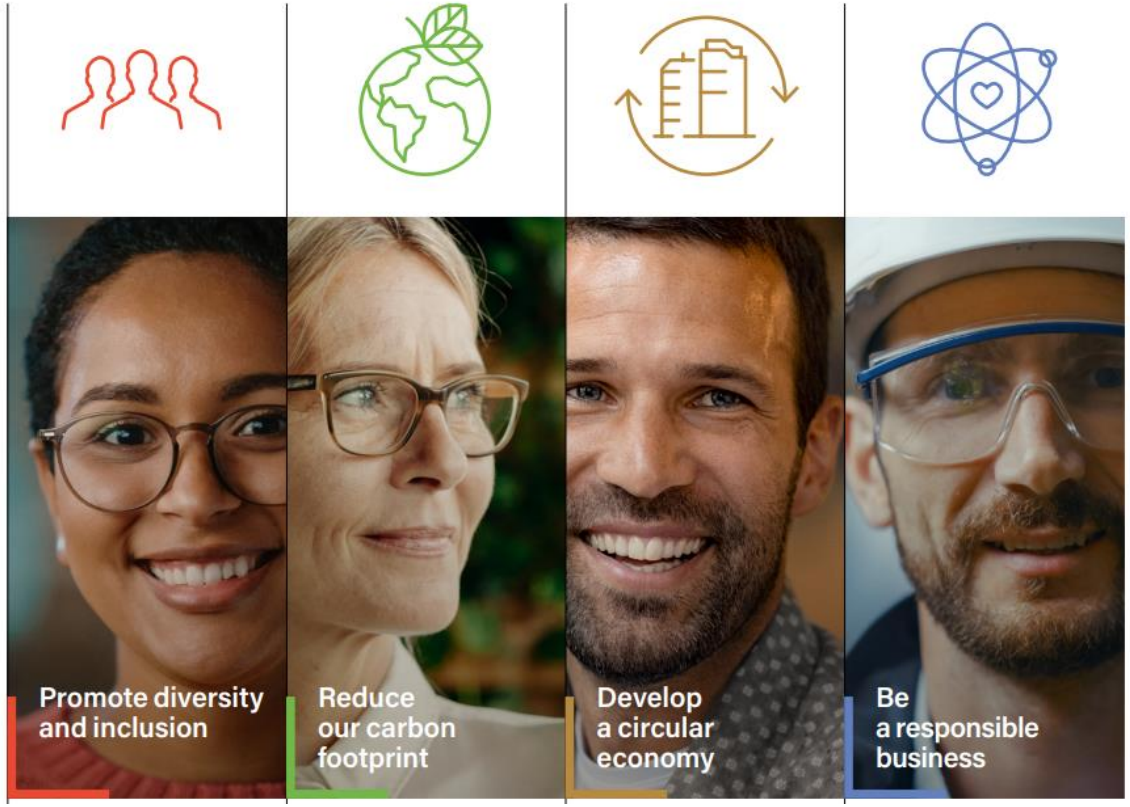
Who is presenting

Lead Data Centre Expert
Minkels - A brand of Legrand
Nov 1990 - Present · 33 yrs
Veghel

-Coordinator Europe, Data Centre Standards, Legrand
-Convenor of ISO/IEC JTC1/SC 39 WG 1: Resource Efficient Data Centres
-Vice chair of the 2022 TiC council Drafting Group for the Development of a Temporary Assessment Framework For Data Centre Activities based on the EU Taxonomy Climate Delegated Act addressing "Data processing, hosting and related activities"
-Member of the working group on the European Code of Conduct on Data Centre Energy Efficiency
-Chair of the Dutch Standards committee "NEN Normcommissie 381039 'Computerruimtes en datacenters' "
-NEN representative in CENELEC TC 215 "Electrotechnical Aspects of Telecommunication Equipment" WG 3 "Facilities and Infrastructures"
-NEN representative in ISO/IEC JTC1/SC 39 WG 3: Sustainable facilities and infrastructures
-NEN representative in IEC TC 48D: Mechanical structures for electronic equipment

LEGRAND'S CSR APPROACH

The CSR strategy is driven by a CSR roadmap 2022-2024 and is based on four main areas of action to improve lives. These main areas guide and structure its commitments.



2030 TARGETS

activities by **50%** and reduce carbon emissions in our value chain by **15%**

Achieve **80%** of our sales with eco-responsible solutions

50/50 Achieve gender parity across the Legrand group's workforce

Women in **1/3** of key positions

THE GROUP IN FIGURES

In 2022

Close to
8.3B€ turnover

More than
38 000 employees

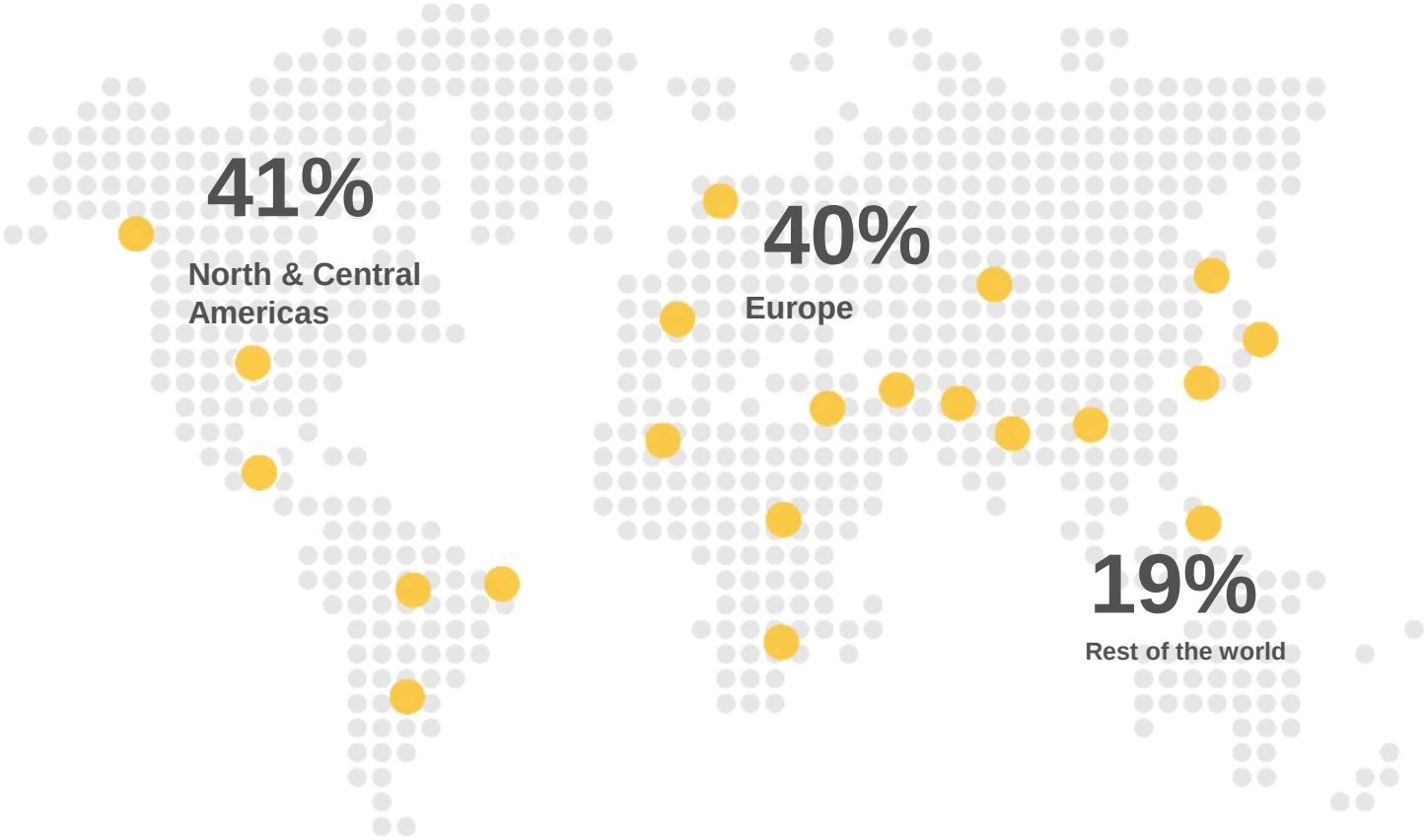
CSR Achievement rate
123%

Present on
5 continents

Located
90 countries

Distributed in
170 countries

TURNOVER BY GEOGRAPHIC AREA



legrand®
DATA CENTER SOLUTIONS

legrand®
Complete global solutions for digital and electrical infrastructure.

BORRI
Specialist in UPS for industrial applications and datacenters.

CABLOFIL
Using its global strength and market leading position, Cablofil has developed a complete range of cable management solutions.

COMPOSE
Specialist in passive data communication solutions, cabling of data centers, buildings and fiber optic infrastructures.

Raritan.
Proven leader of intelligent PDUs, transfer switches, environmental sensors, serial consoles and KVM-over-IP Remote Access switches.

Server Technology.
Leading specialist in customer-driven power, access and control solutions for monitoring and managing critical IT assets.

Starline.
Starline has grown to become a global leader in busbar power distribution equipment

USystems
USystems provide cooling products that enhance data center cooling, providing these to global businesses, making their data centers more environmentally friendly.

GEIGER.
Data center fiber optic infrastructures, data center design and DCIM (monitoring & management) service and implementation.

MINKELS
Turn-key hot/cold aisle containment and enclosures for data center infrastructures.

modulan
Provider of fully customizable containment solutions. Maximum flexibility to cover customer needs.

PowerControl
A leading provider of uninterruptible power supply (UPS) solutions, trusted by businesses worldwide to protect their critical power loads and avoid unplanned business downtime.

VOLTADIS
Voltadis offers support in electrical power supply systems for data centers' grey rooms including design, commissioning, equipment supply, and installation.

ZUCCHINI
Zucchini has become a leading brand of cast resin transformers, offering one of the most comprehensive ranges on the market.

DATA CENTER SOLUTIONS

CRITICAL POWER

CAST RESIN TRANSFORMERS

HIGH POWER BUSBAR

UPS & STS SOLUTIONS

DMX3 ACB & DPX3 MCCB

BUSWAYS

CABLE MANAGEMENT

OVERHEAD CABLE MANAGEMENT

EZ-PATH FIRE RESISTANT CABLE DUCT

IT INFRASTRUCTURE

CONTAINMENT AND COOLING

SERVER AND NETWORK CABINETS

INTELLIGENT PDU'S AND SENSORS

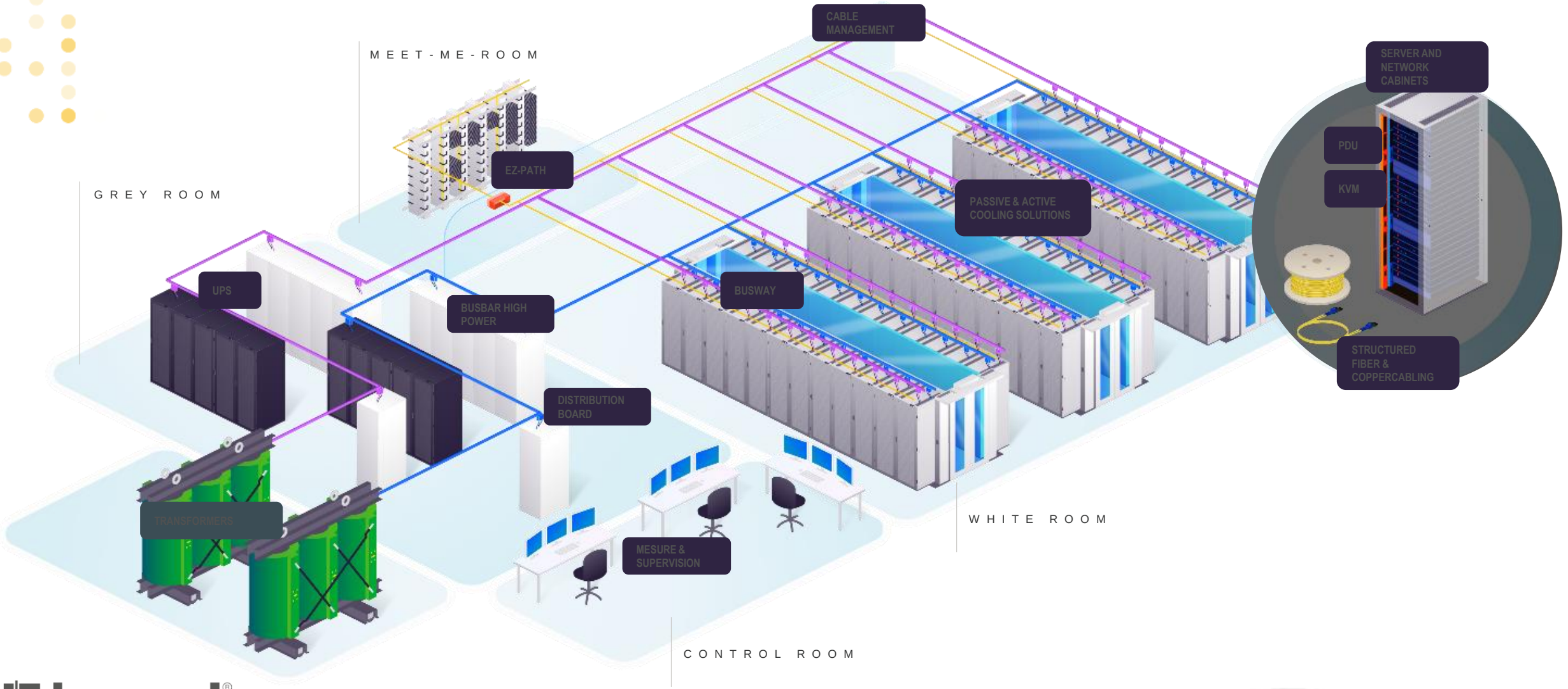
KVM & SERIAL CONSOLE

STRUCTURED FIBER AND COPPER CABLING

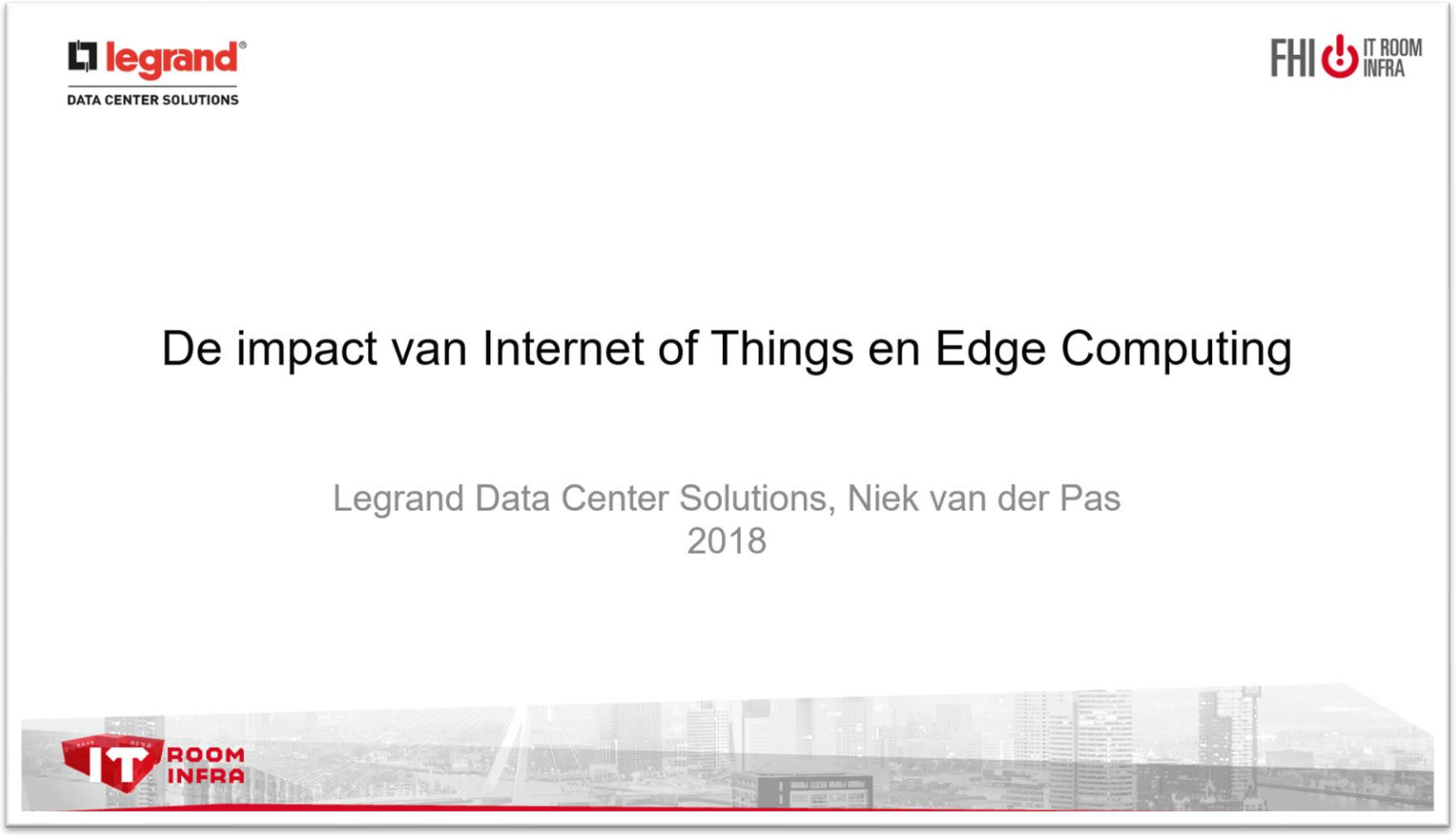
DCIM SOFTWARE INTEGRATION

legrand®

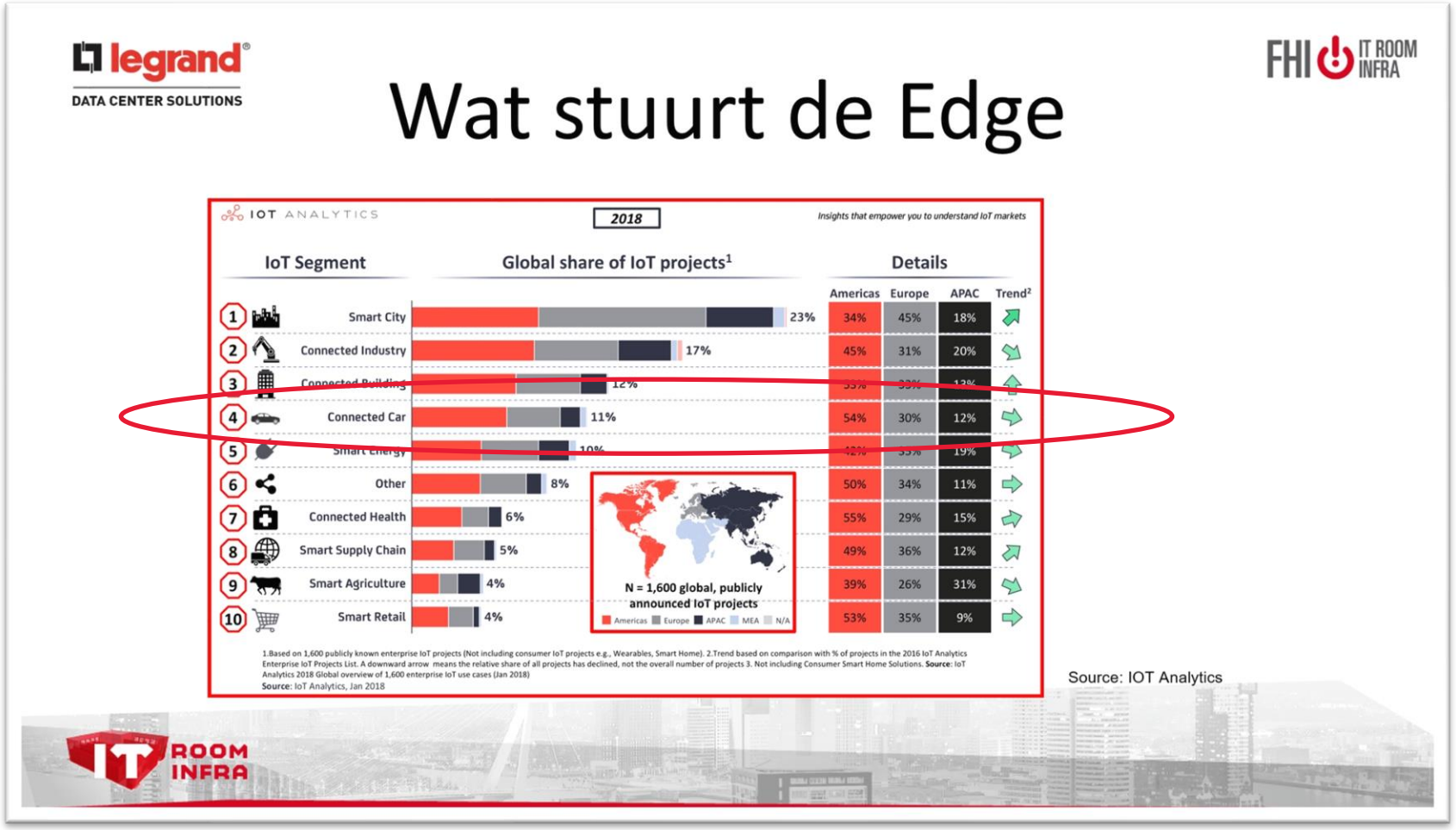
DATA CENTER SOLUTIONS



Looking back 5 Years

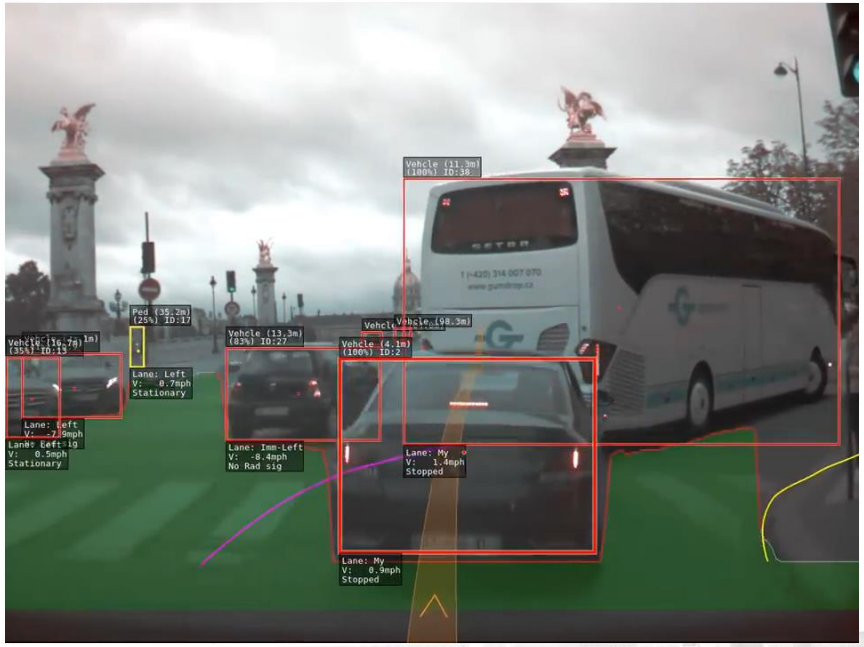


Looking back 5 Years What is the Edge

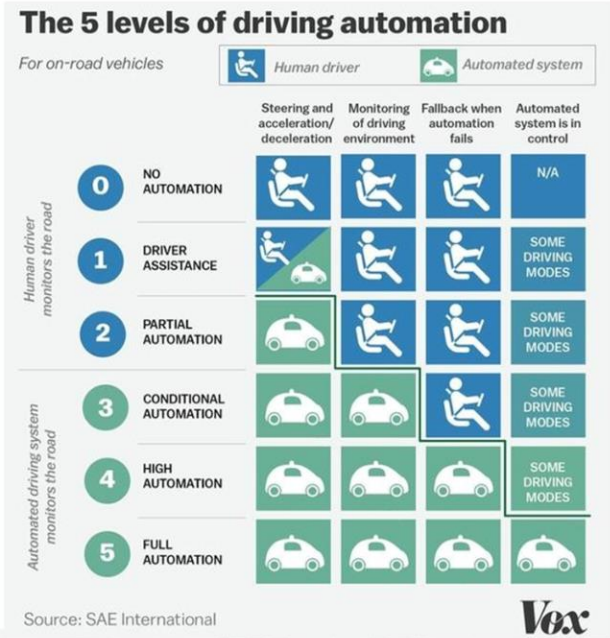


Looking back 5 Years What is the Edge

Zelfrijdende auto's



Source: Youtube



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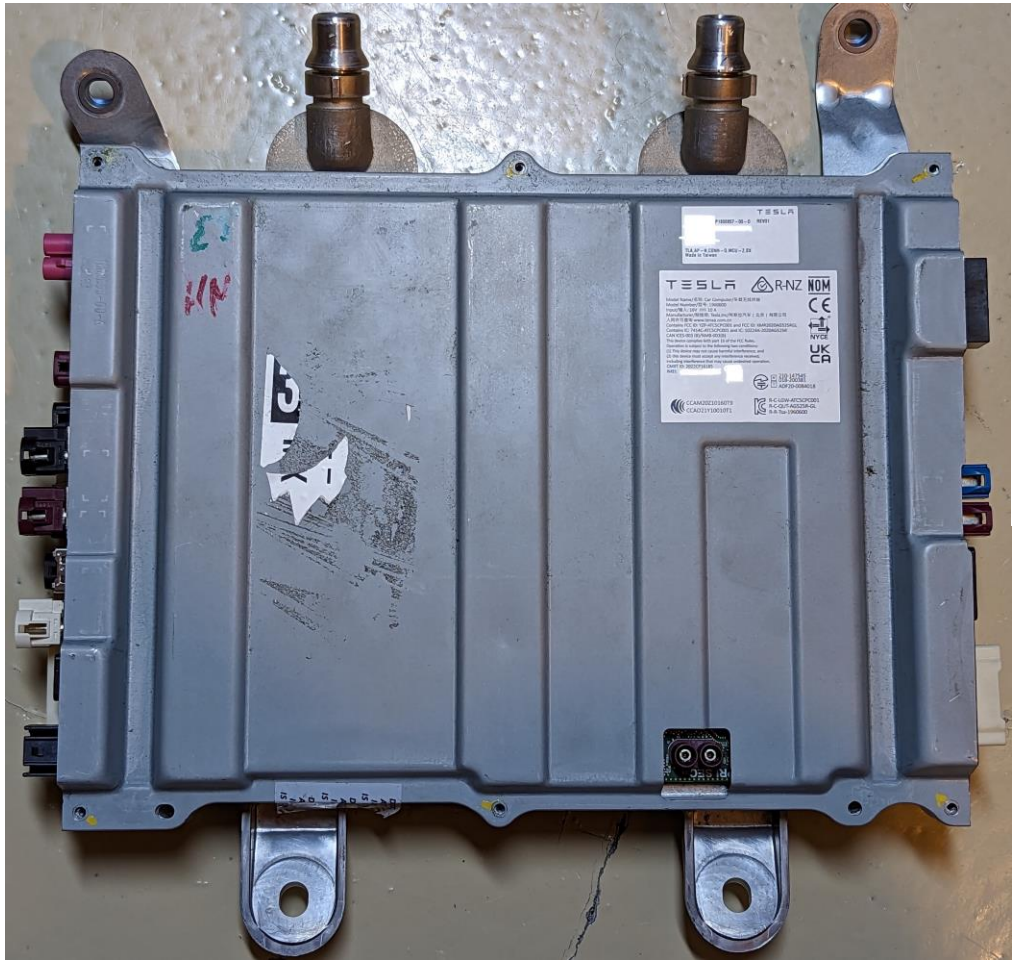
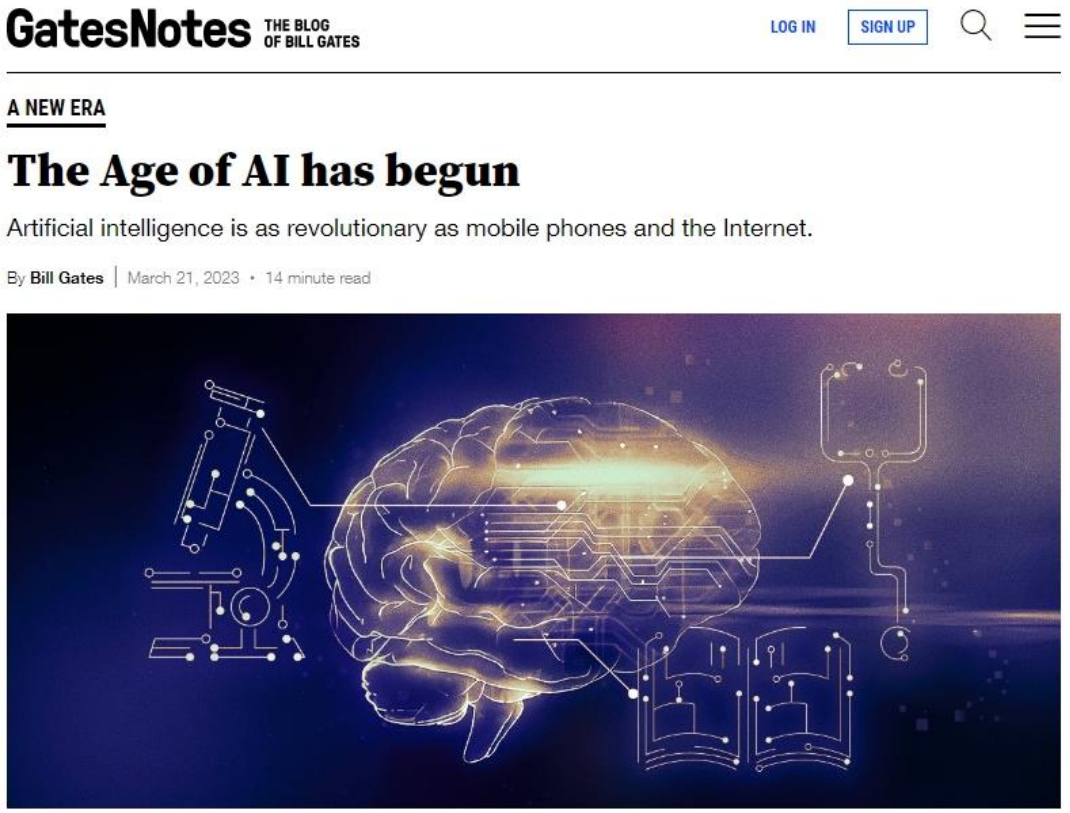


Tesla
model Y
Computer

Tesla
model Y
4G
Antenna

Artificial Intelligence will become a dominant IT driver



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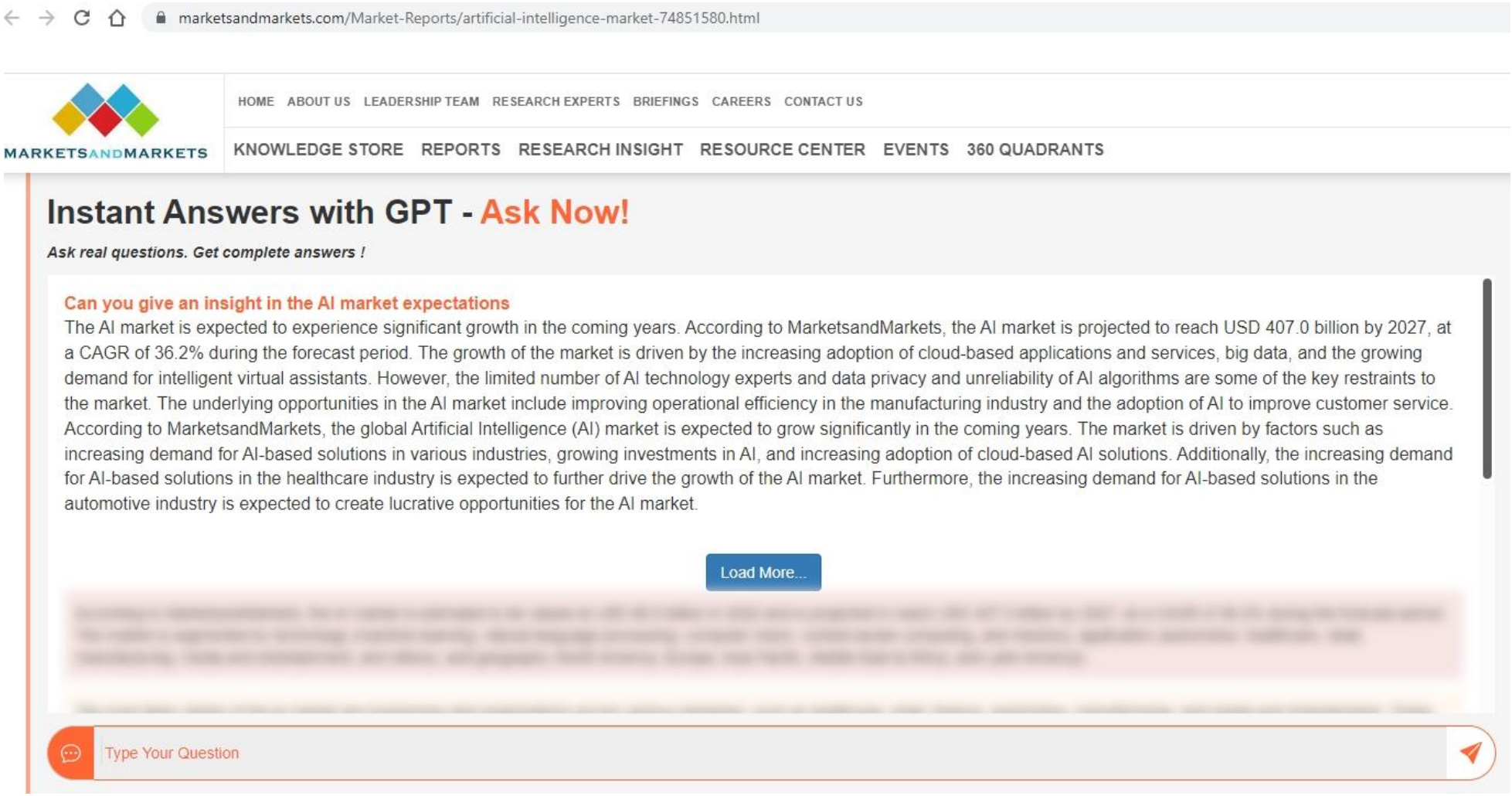

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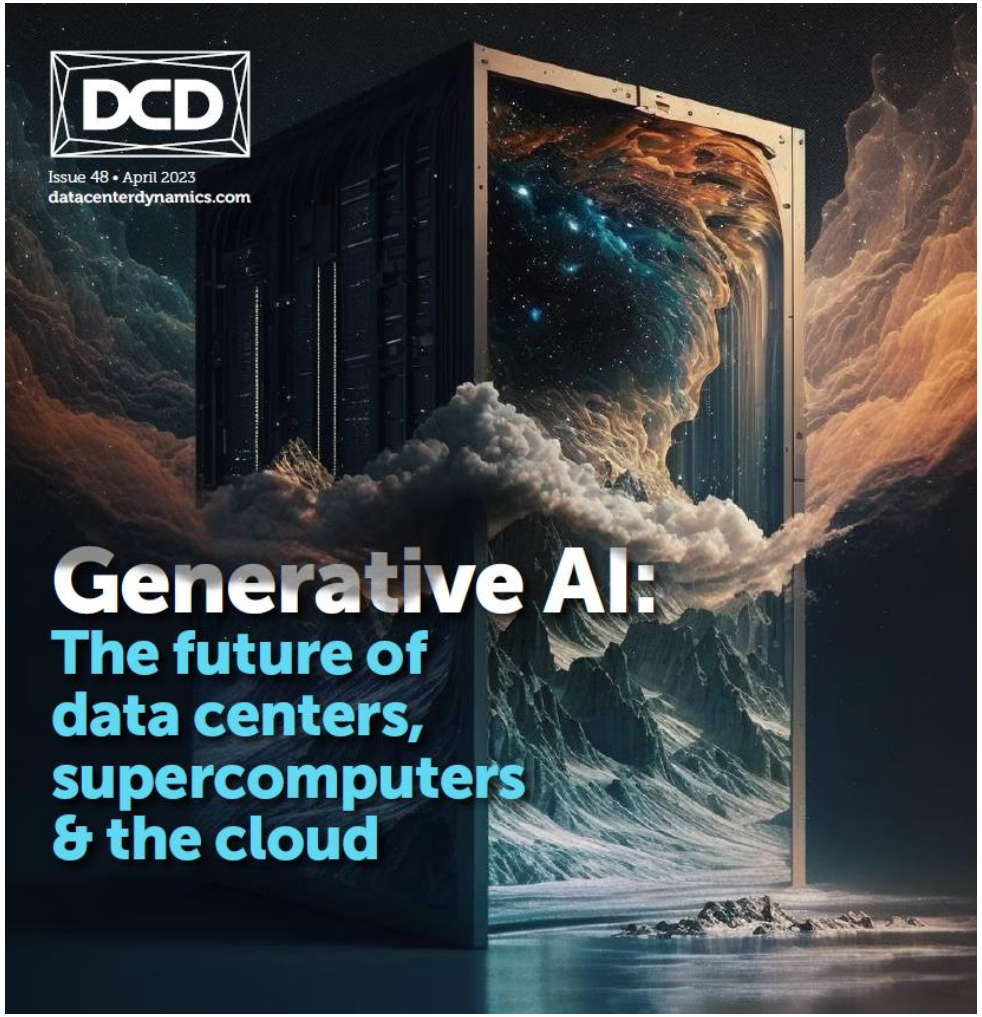
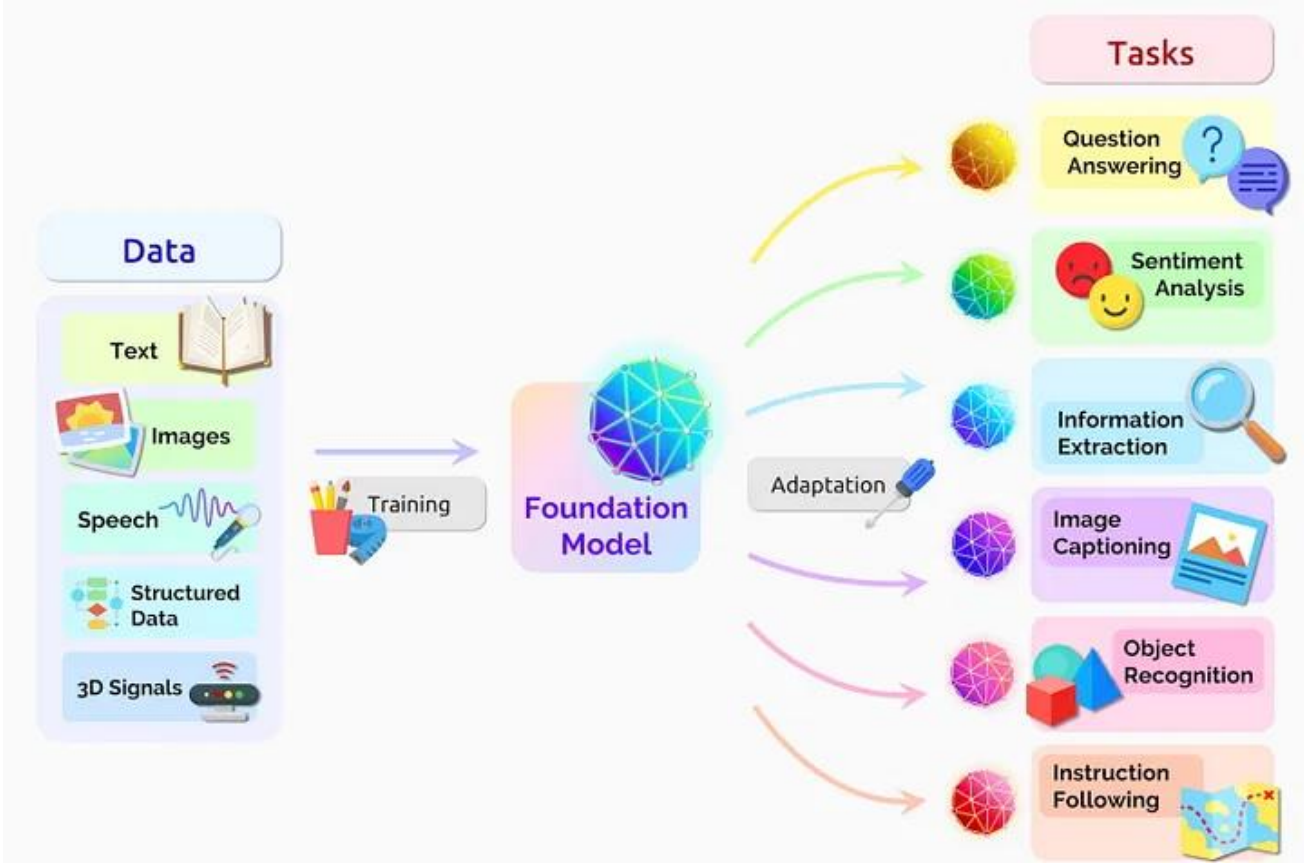
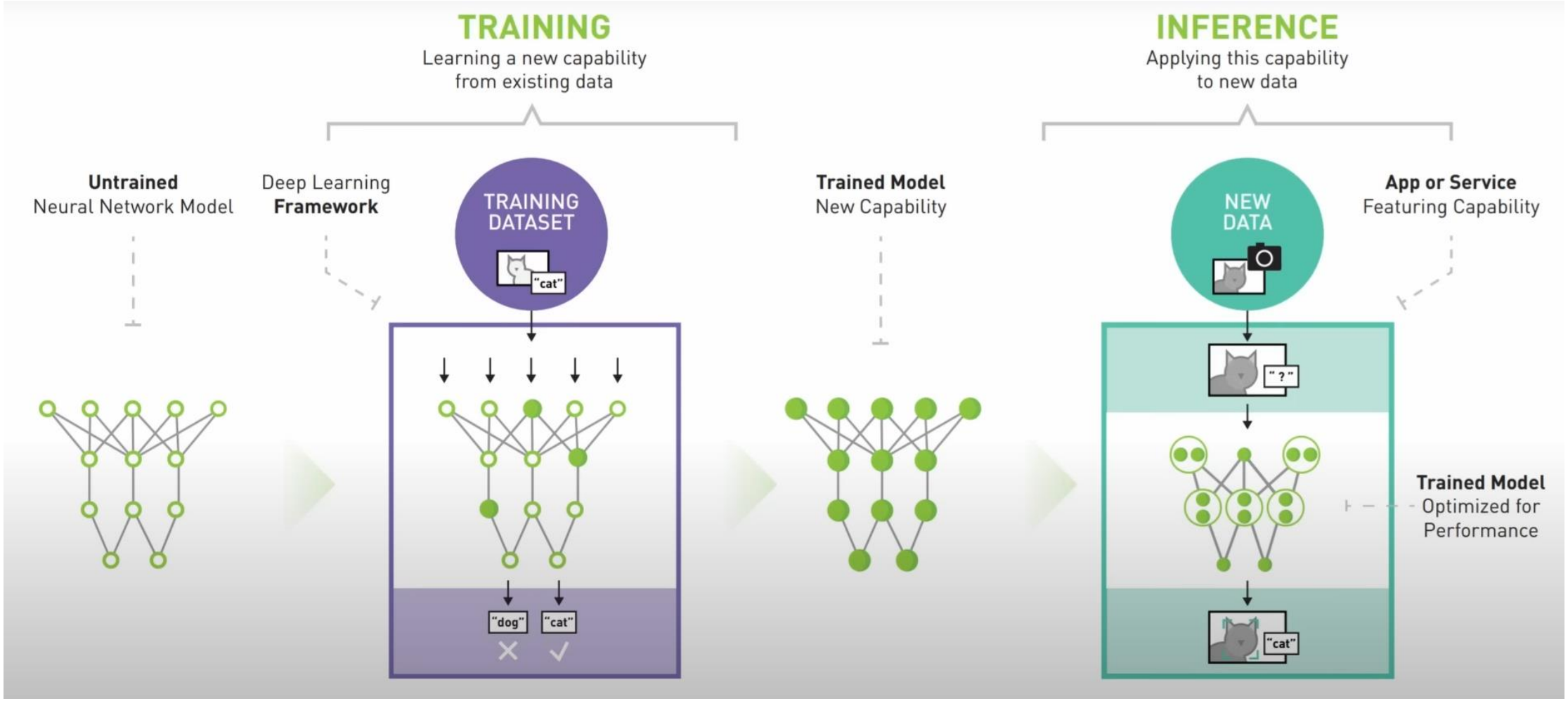


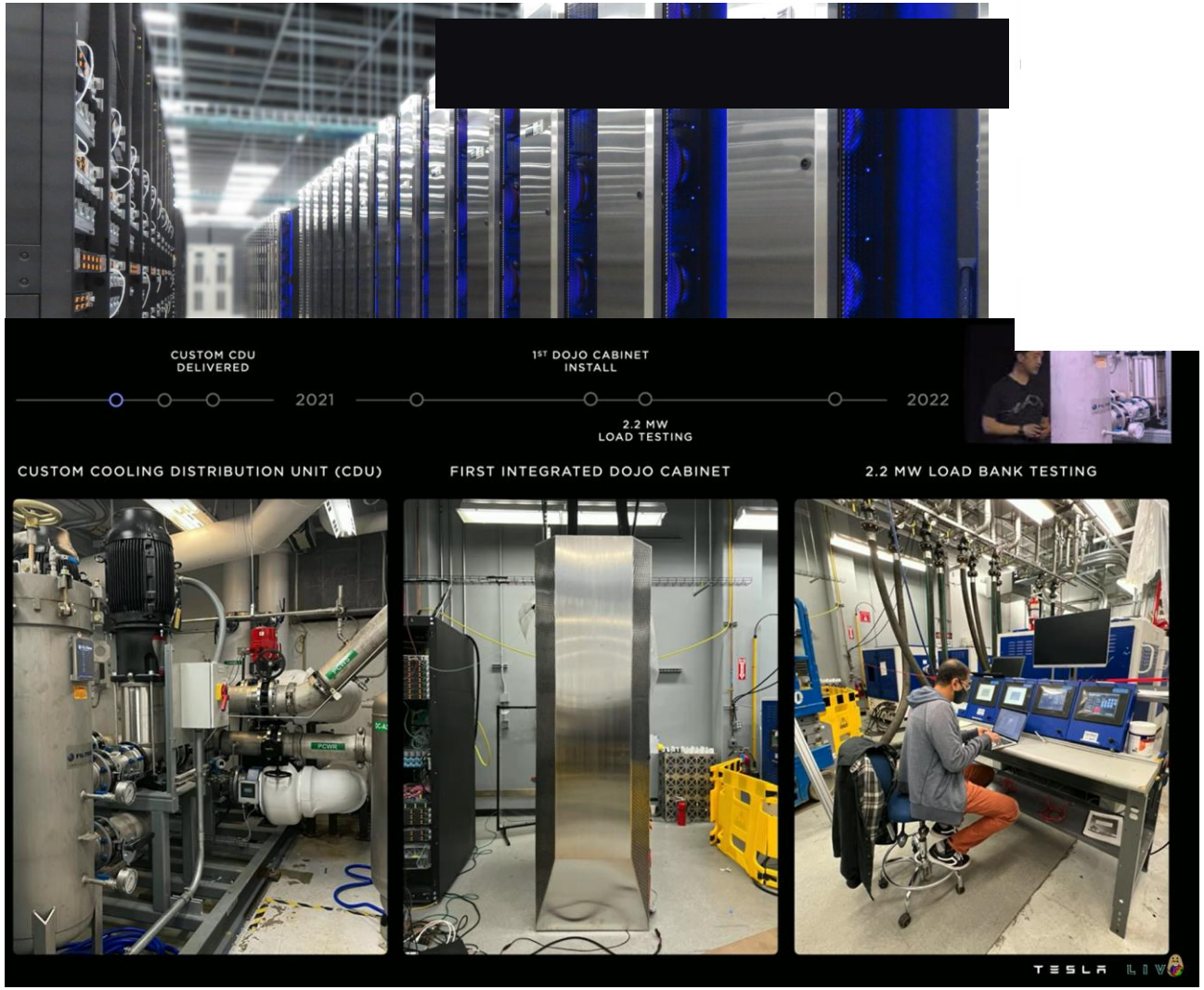


Source: knowledgezone.co.in

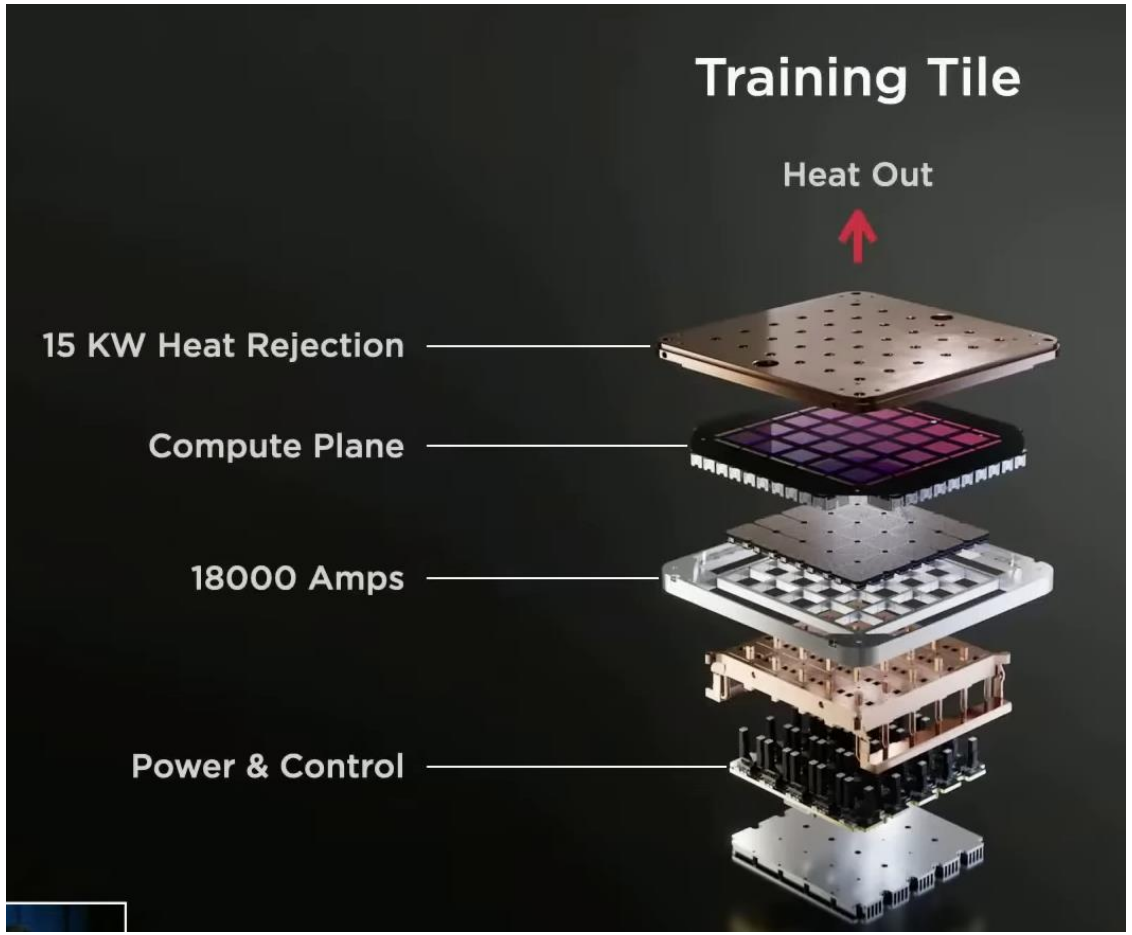
Artificial Intelligence will become a dominant IT driver

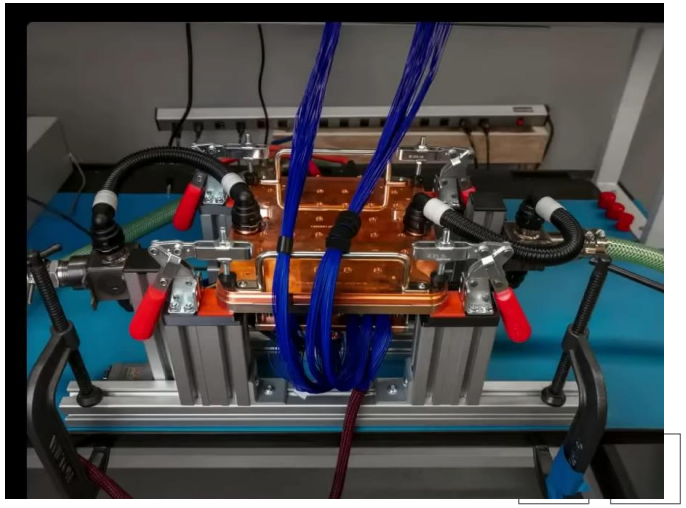


Where does **A**rtificial **I**ntelligence live



Tesla and AI

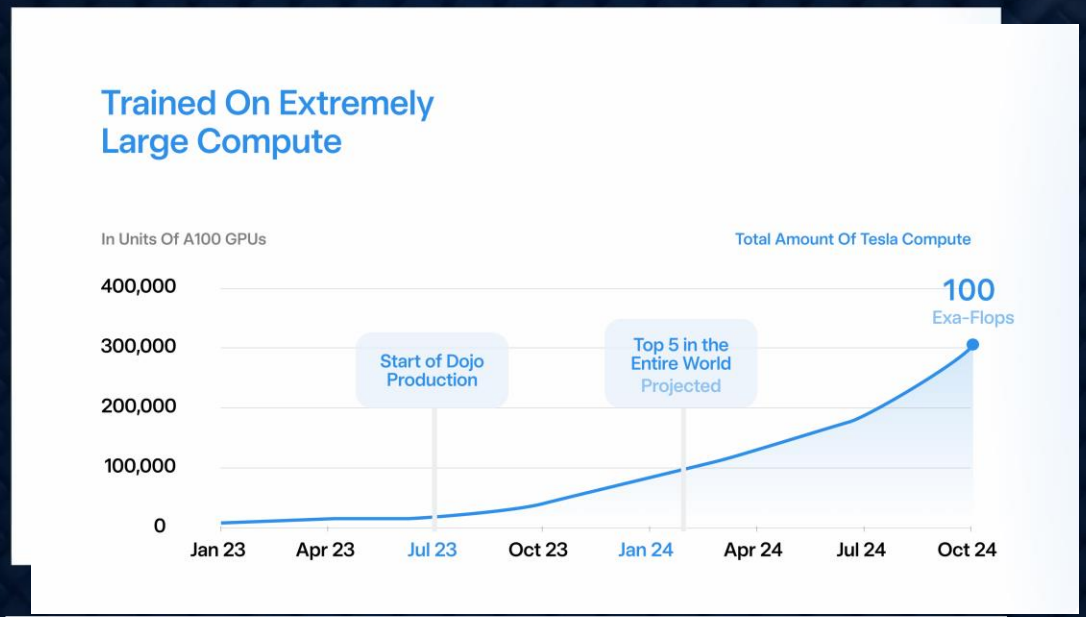

Training Tile
Heat Out
15 KW Heat Rejection
Compute Plane
18000 Amps
Power & Control



Tesla and AI

Tesla Owners Silicon Valley @teslaownersSV · Jun 21

Exponential improvement coming to FSD Beta once Dojo is up and running.



Elon Musk @elonmusk · Jun 21

Subscribed

Replying to @teslaownersSV

I should clarify that Dojo V1 is highly optimized for vast amounts of video training vs general purpose AI. Dojo V2 will address these limitations.

Tesla AI @Tesla_AI · Jun 21

Replying to @Tesla_AI

These models will learn from a huge set of extremely diverse data from the Tesla fleet

32 190 2,053 149.9K

Tesla and AI

legrand®
DATA CENTER SOLUTIONS

← **Tweet**

Penny2x @imPenny2x · Jun 22
No big deal, Tesla is just going live with an Nvidia competitor soon.

🤸🤸🤸.

53 122 1,907 1.9M

Elon Musk @elonmusk
Subscribed

Subscribe

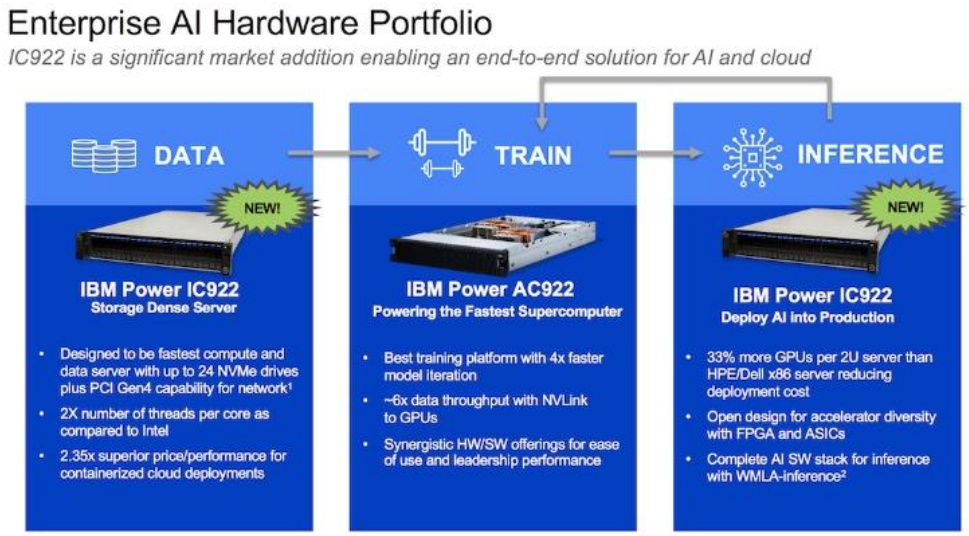
Not exactly a competitor to Nvidia, as we aren't selling Dojo computers (although it could be sold as service).

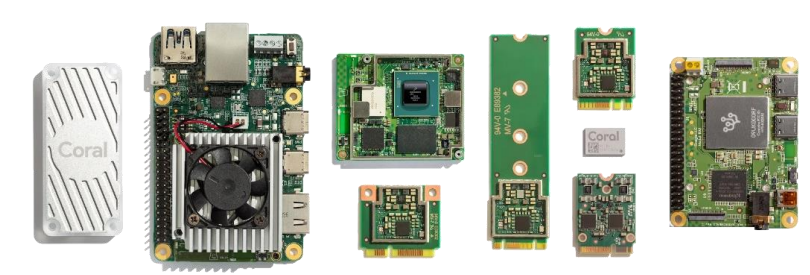
We just need a crazy amount of training compute to get full self-driving 10X safer than human, but can't get enough GPUs, plus prices are extremely high!

12:31 AM · Jun 22, 2023 · **2M** Views

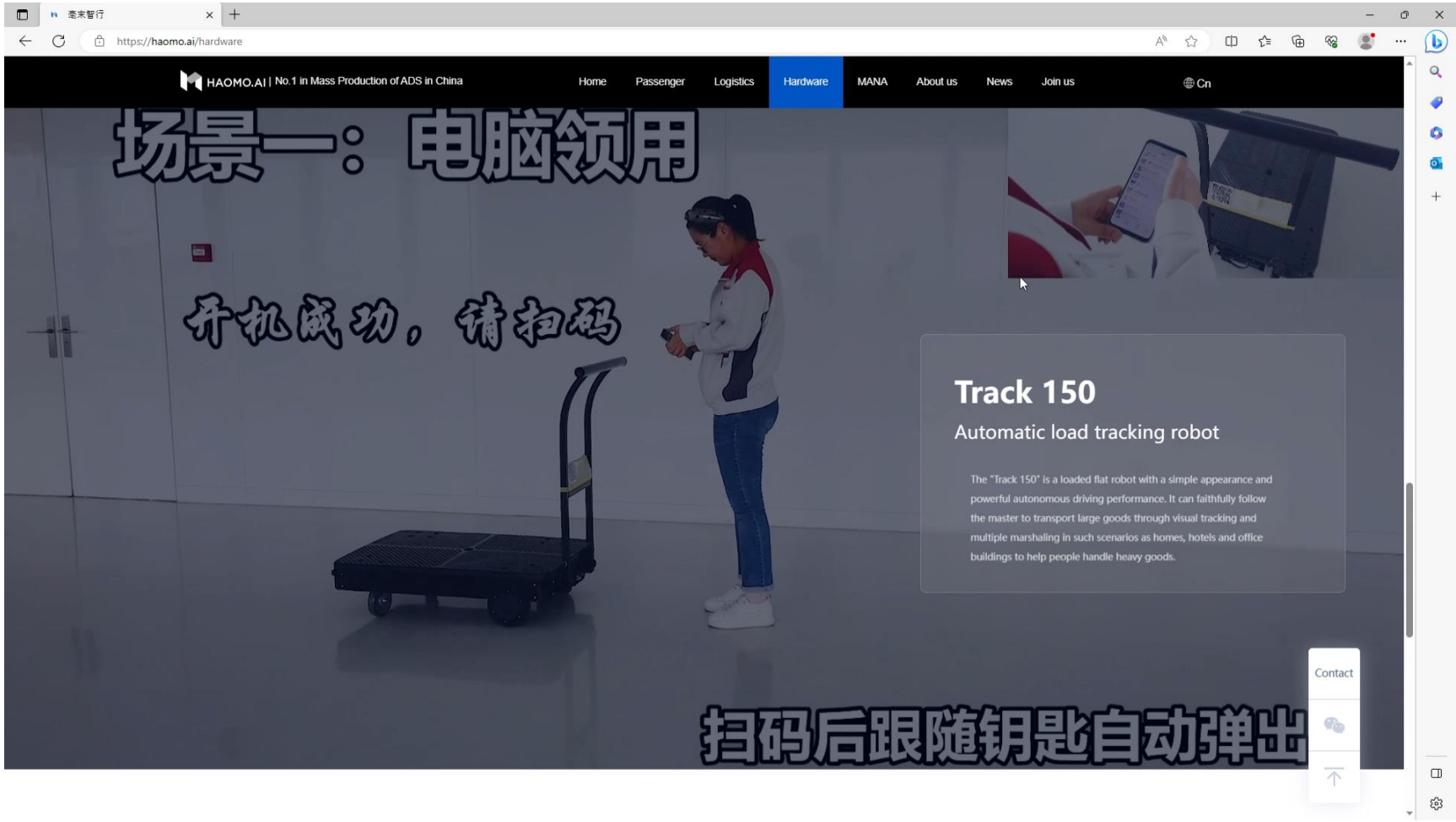
757 Retweets **104** Quotes **11.3K** Likes **184** Bookmarks

Artificial Intelligence will become a dominant IT driver





Where does **A**rtificial **I**ntelligence live



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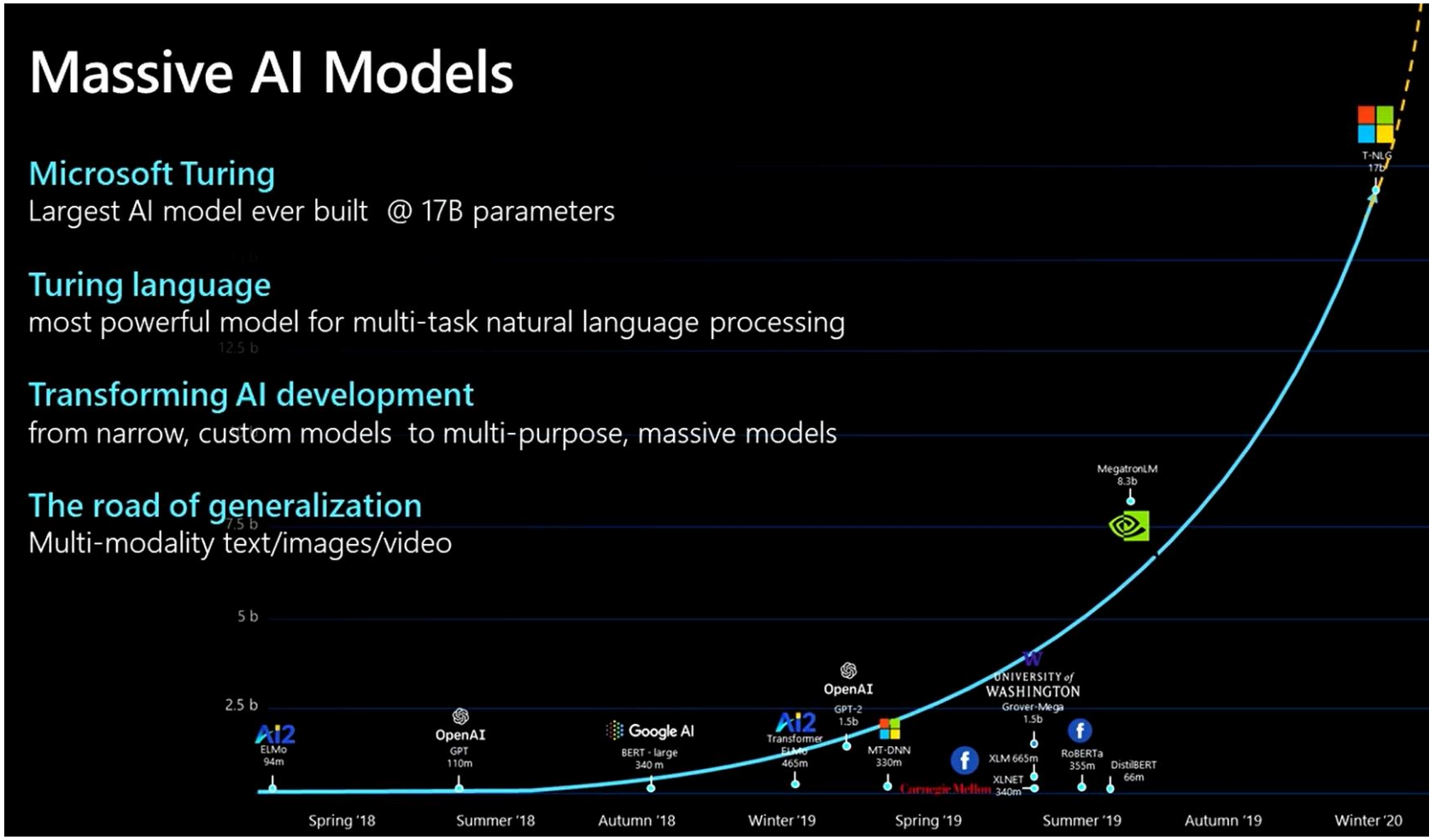

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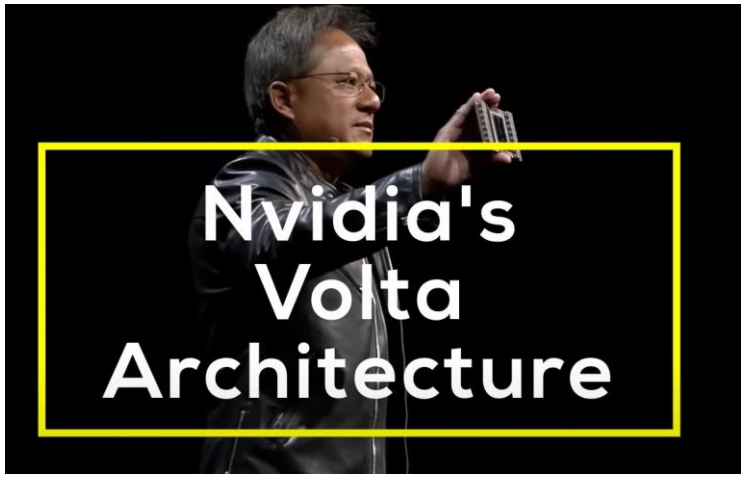

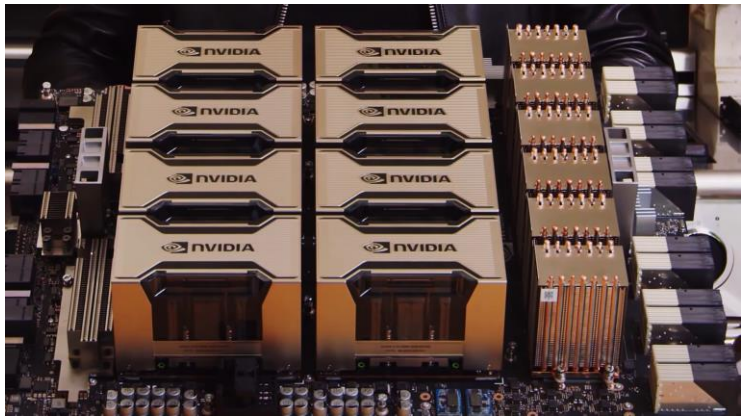

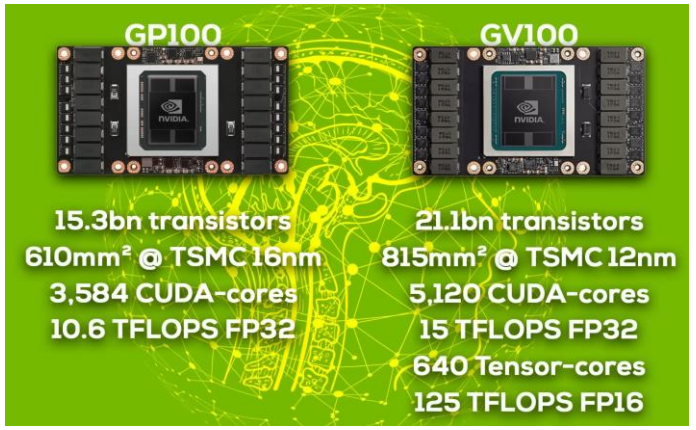

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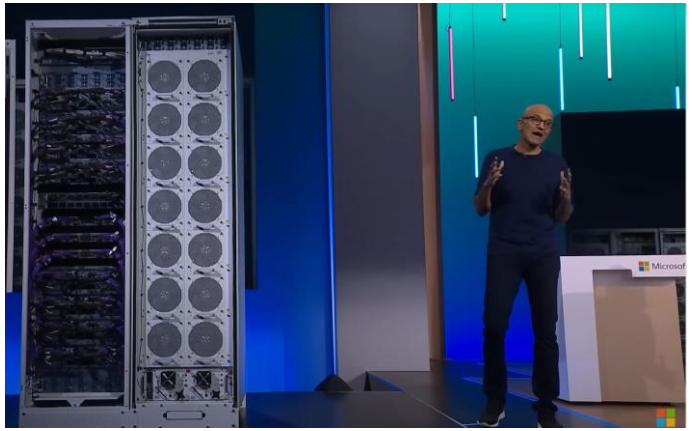

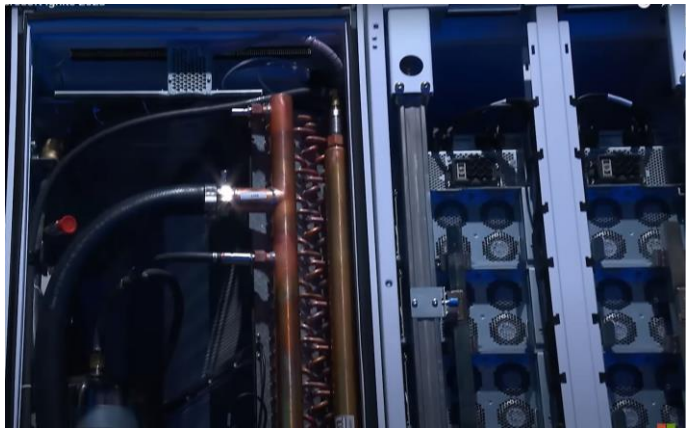

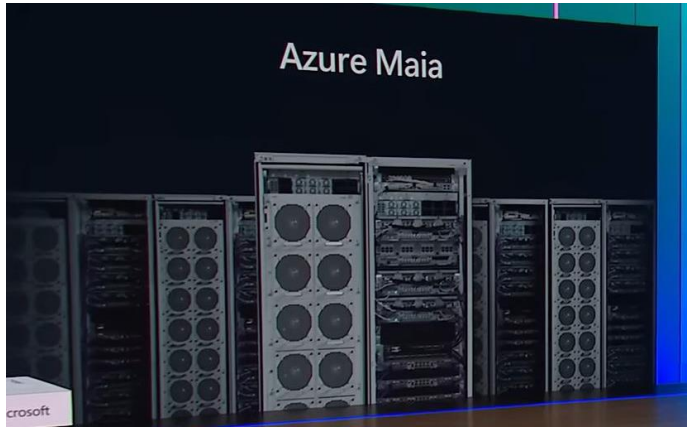

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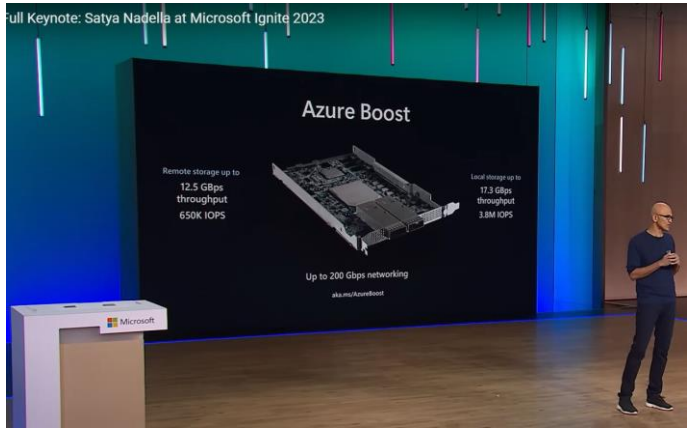
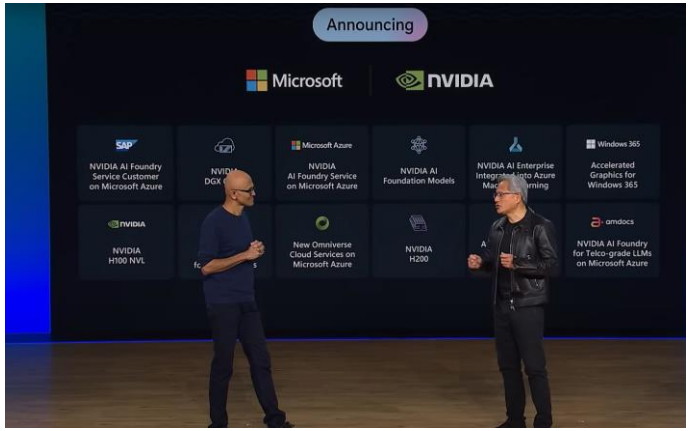
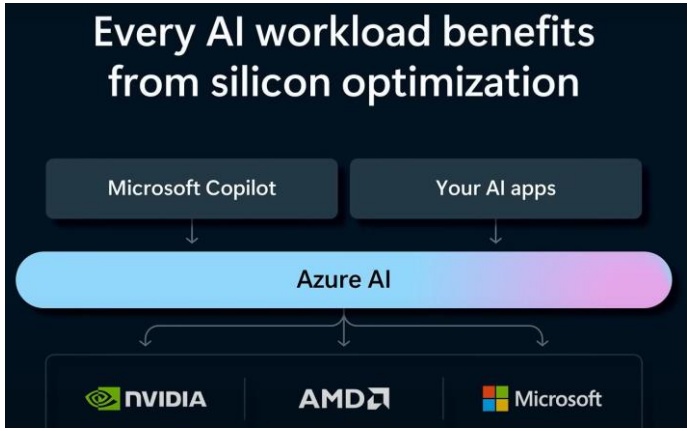
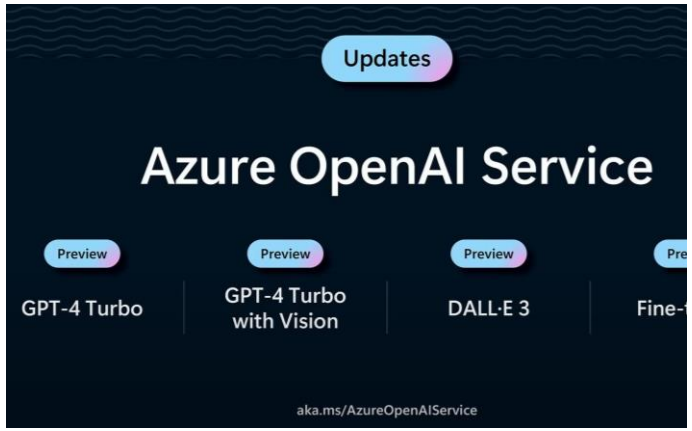
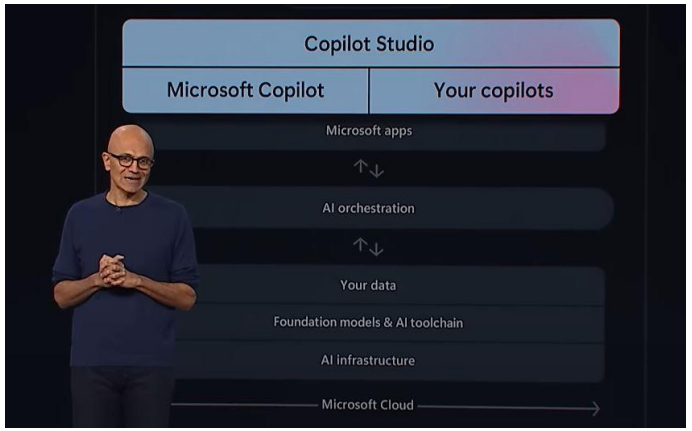


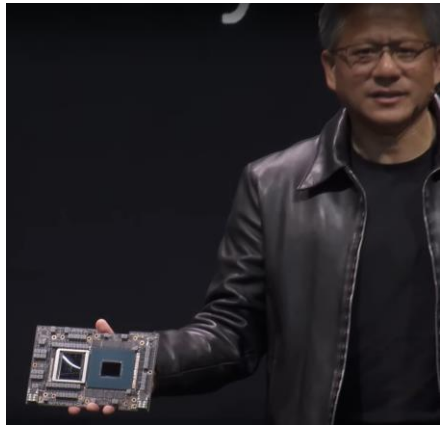




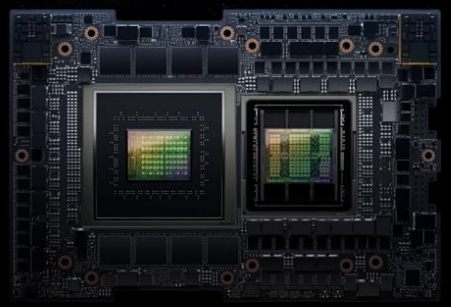


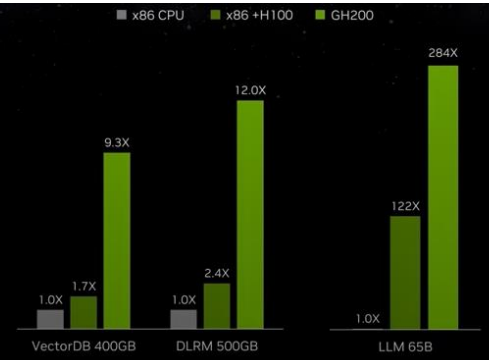


Where does **A**rtificial **I**ntelligence live in the future



NVIDIA GH200 GRACE HOPPER SUPERCHIP
NOW IN PRODUCTION
The Engine for the Generative AI Era





4 PetaFLOPS TE | 72 Arm CPUs | 96GB HBM3 | 576GB GPU Memory

NVIDIA

INTRODUCING MGX
Open Modular Server Design for Accelerated Computing

Multi-Generation Standardized for TTM and Improved ROI

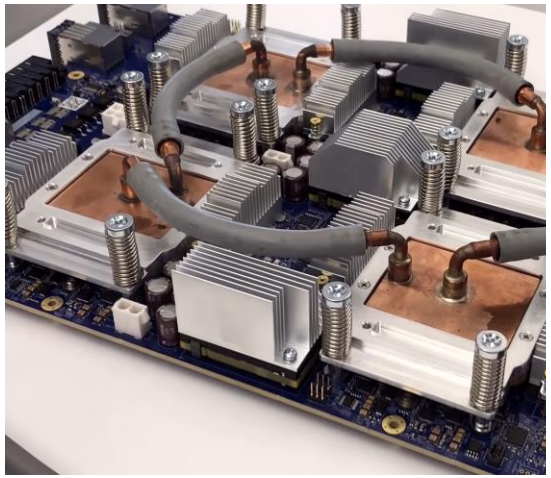
Configurable into 100s of Solutions

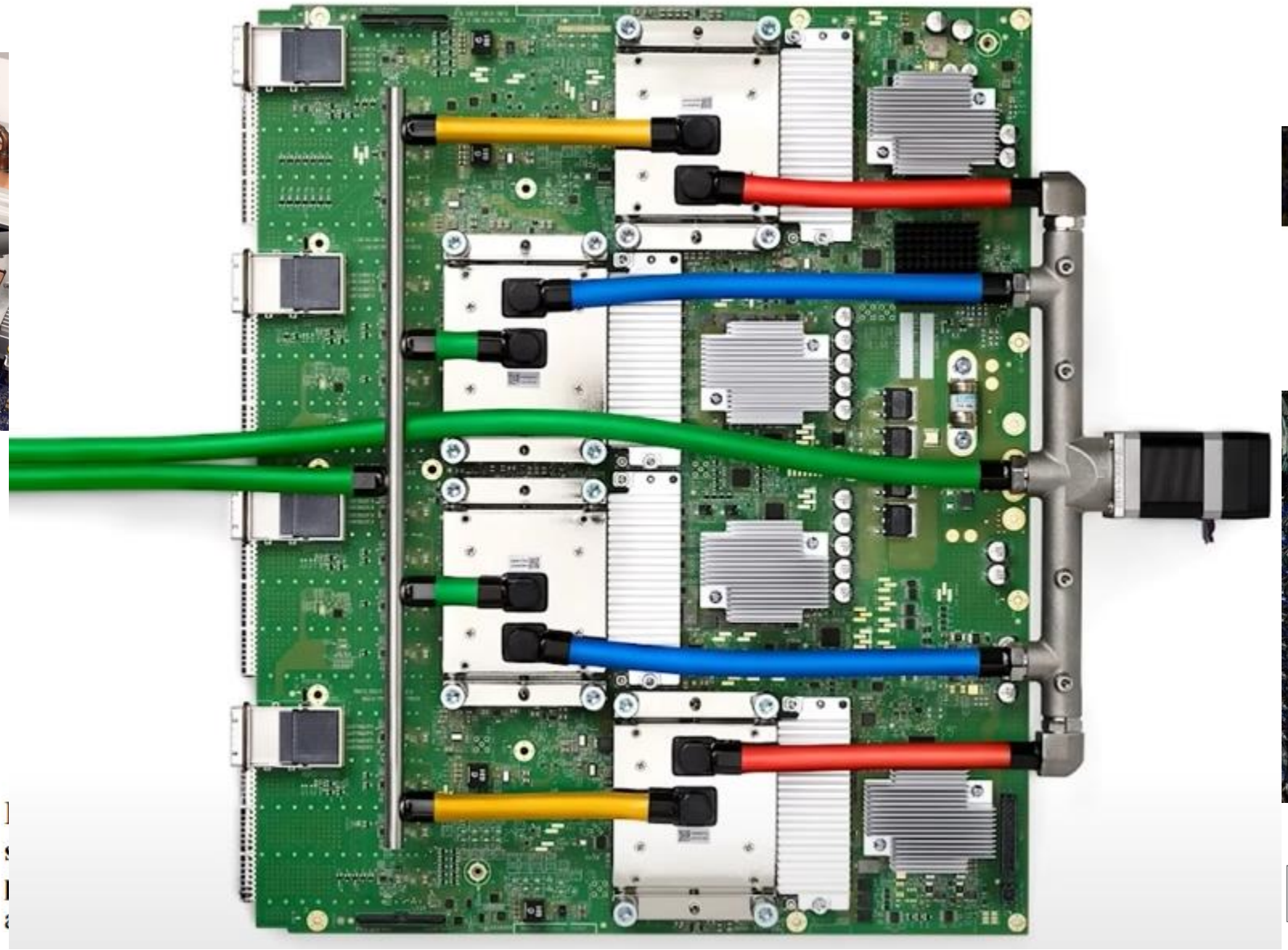
Integrates into Cloud and Enterprise Data Centers

Grace Hopper Liquid-Cooled Server for HPC
1U | 2 Grace Hopper | 2 BF-3 | 4 PCIE

1 GPU

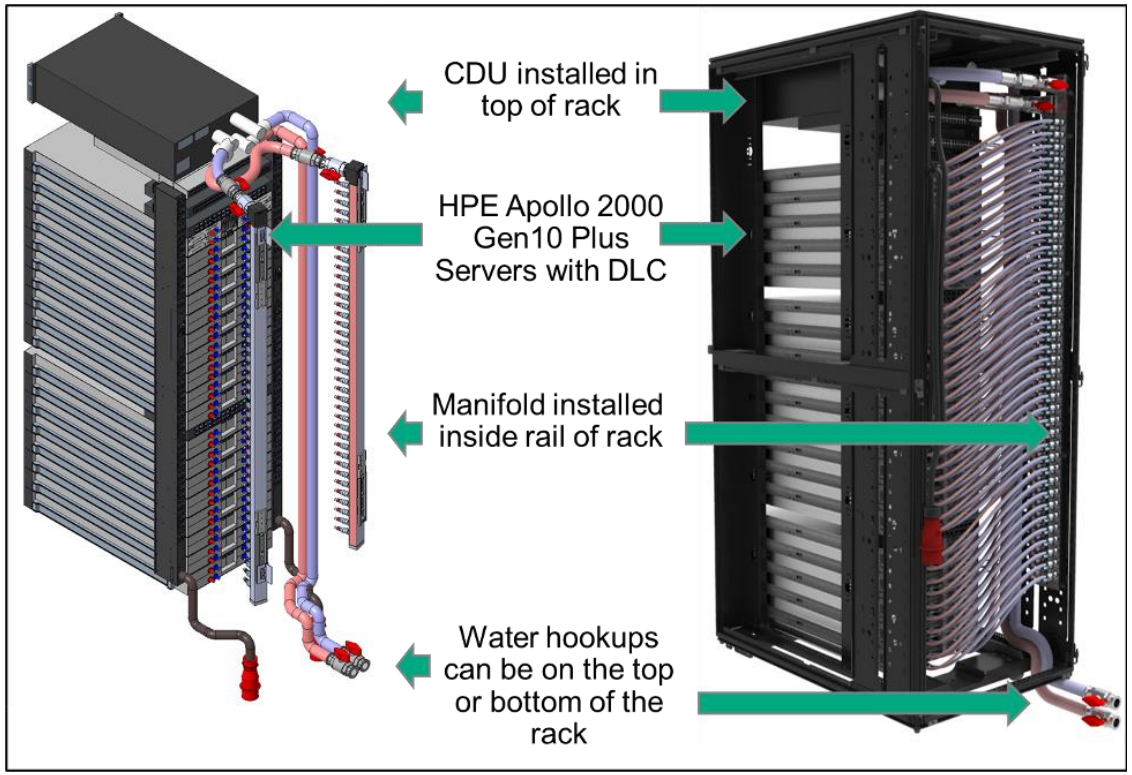
Artificial Intelligence will become a dominant IT driver

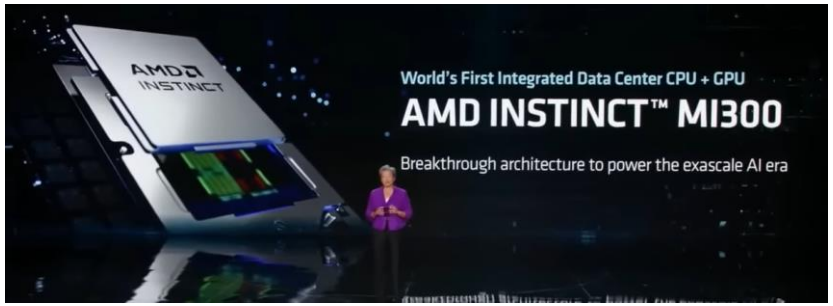




Artificial Intelligence will become a dominant IT driver

Hewlett Packard Enterprise





Where does **A**rtificial **I**ntelligence live

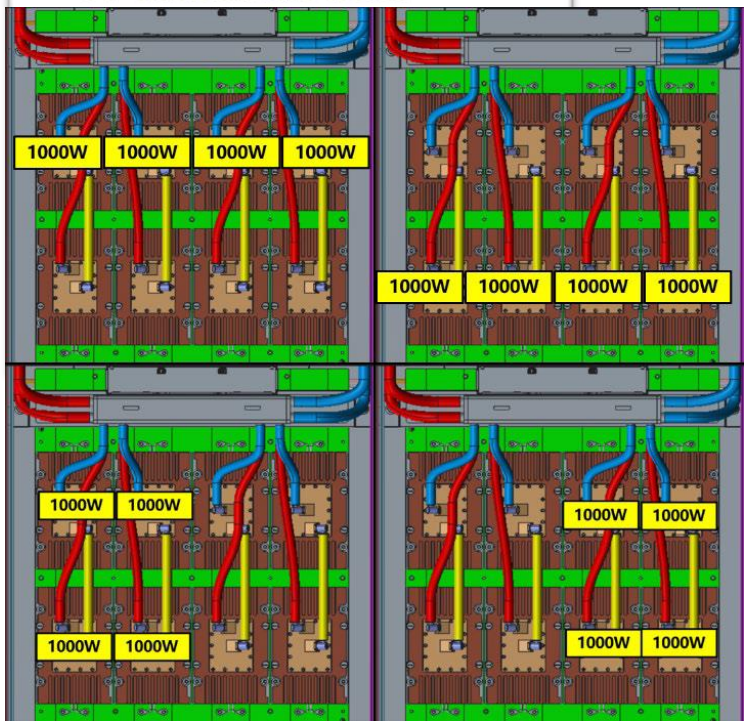
DATA CENTER SOLUTIONS

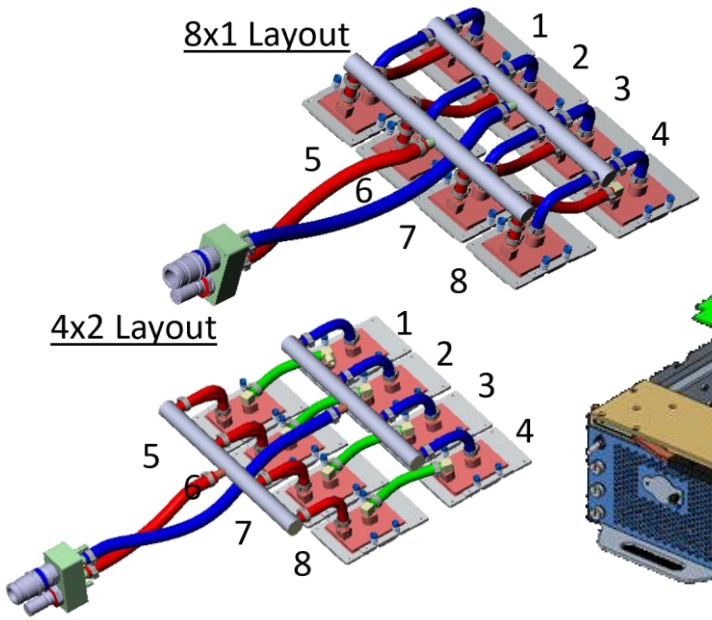
OPEN Compute Project

OCP OAI System Liquid Cooling

Executive Summary

This document is not a specification for OAI/OAM products. It is a set of guidelines on design, validation and implementation of liquid cooling solutions for AI Training Systems with 8x OAM products or others alike





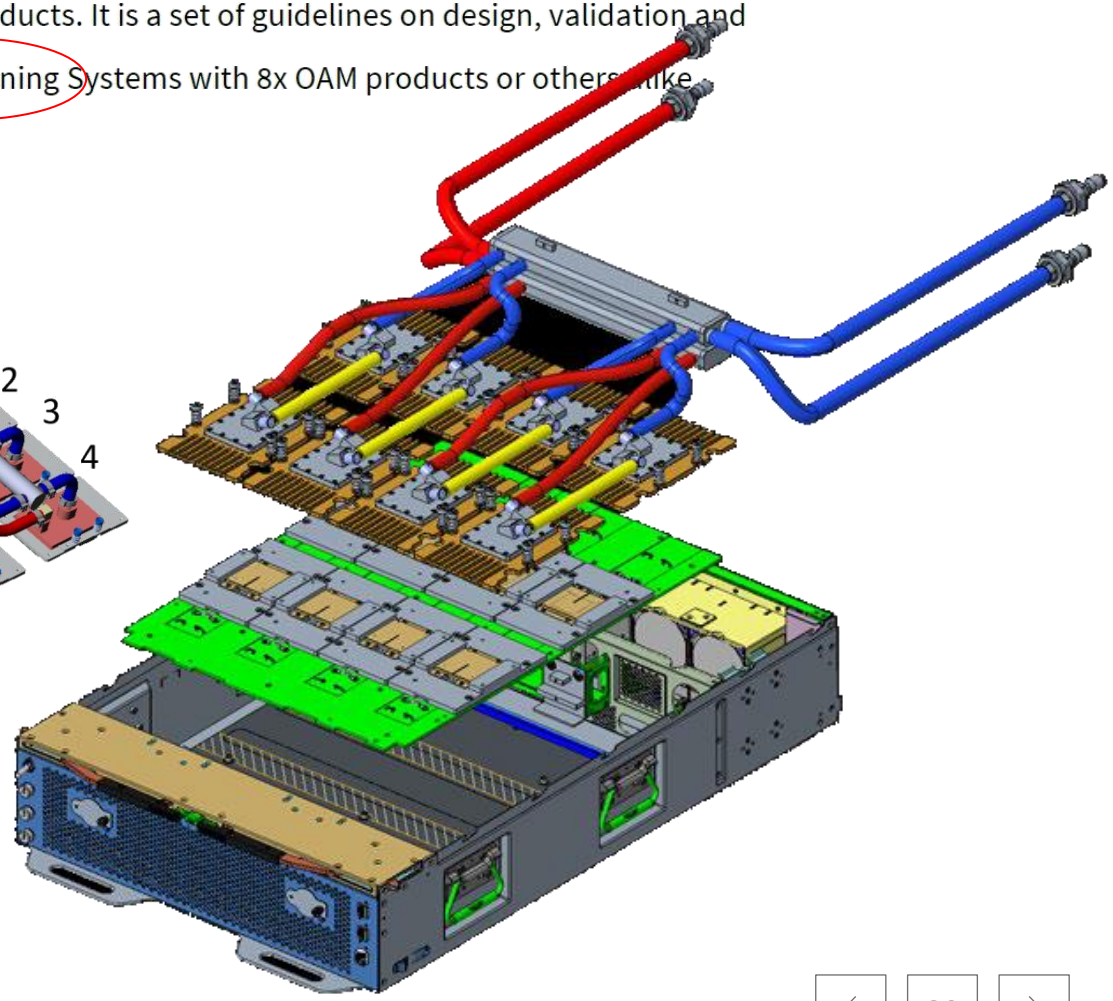
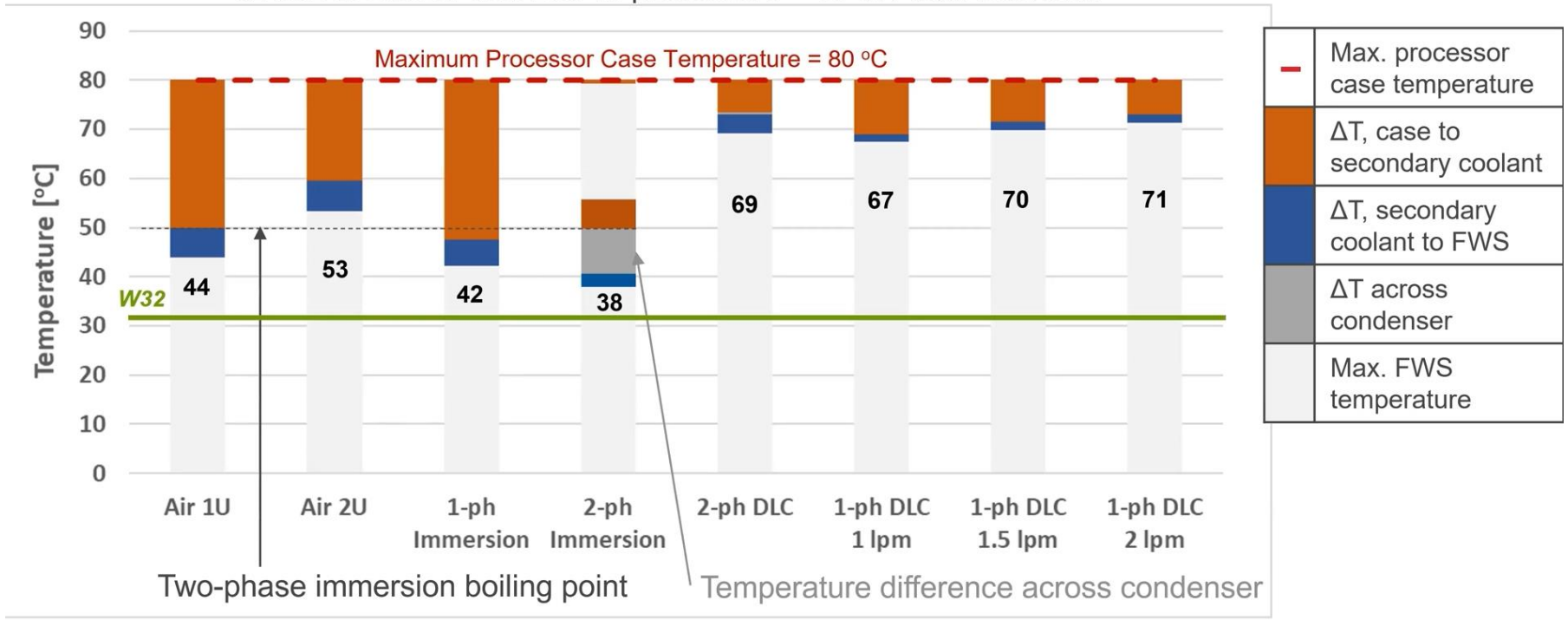


Figure 1. Prototype Chassis Design with TTV tray representing UBB1.0 and the 4x2 coldplate pairs of 5mm Manually-mate Quick Connects for coolant supply/return.

IT cooling will move from Air to direct liquid Cooling

Cooling water temperatures - 250 W processors

32 server rack of dual 250 W processors – 16 kW total rack load



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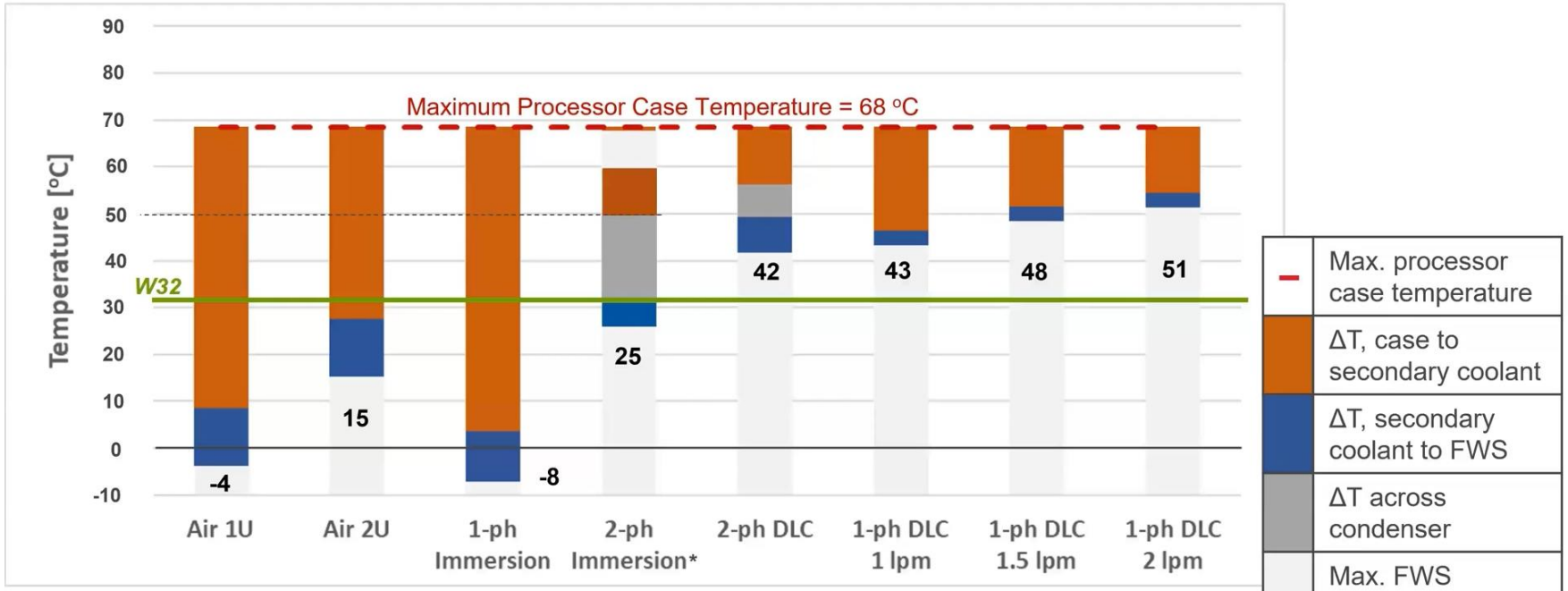
IT cooling will move from Air to direct liquid Cooling

Cooling water temperatures - 500 W processors

32 server rack of dual 500 W processors – 32 kW total rack load



*Boiling point 50 °C

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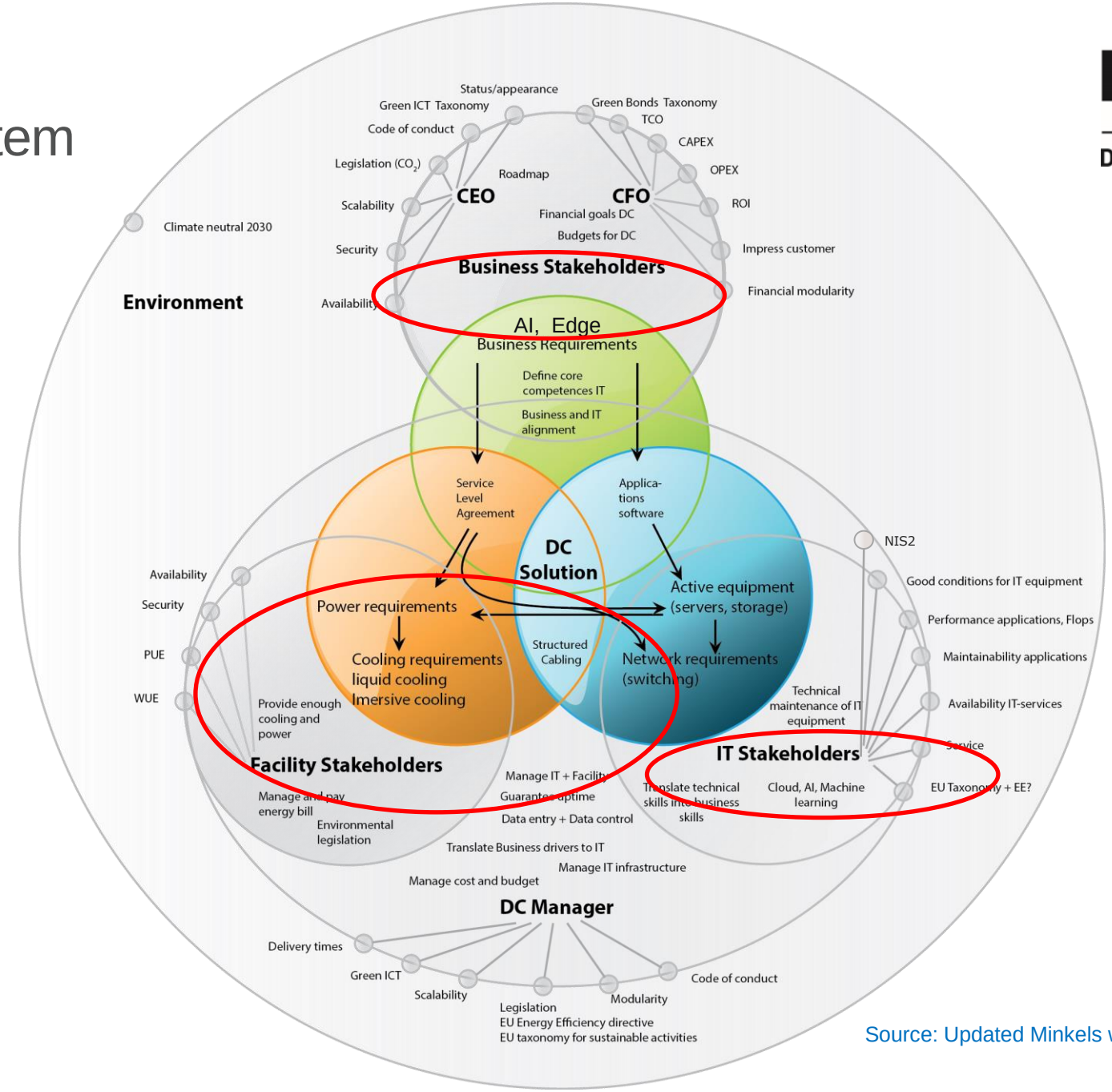
Data Centre ECO system



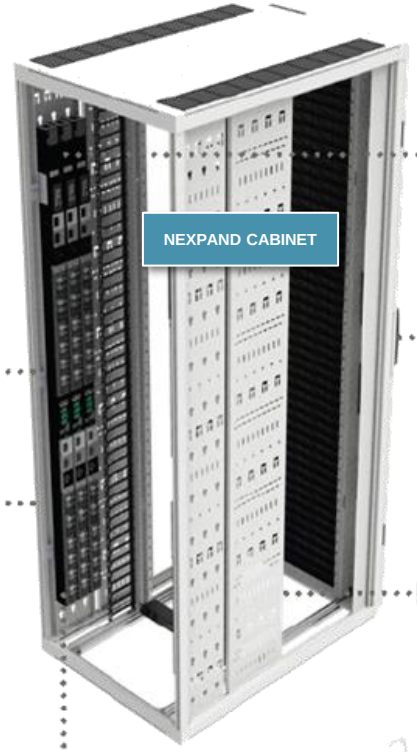
Source: Updated Minkels white paper 2

HIGH PERFORMANCE/AI COMPUTING
LEGRAND DATA CENTER SOLUTIONS

DATA CENTER SOLUTIONS

COLDLOGIK CL20
REAR DOOR COOLER

INTERFACE FRAME



NEXPAND CABINET

SWITCHED PER
OUTLET POWER
SENSING PDU

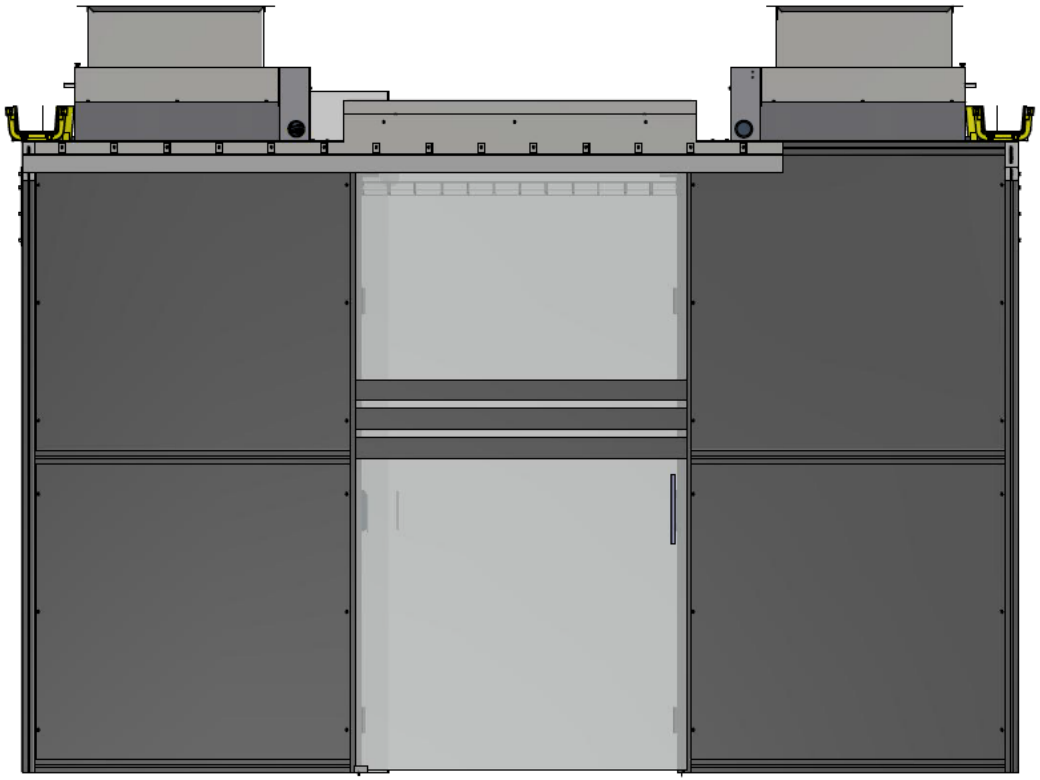
ELECTRONIC
LOCKING

STRUCTURED
CABLING

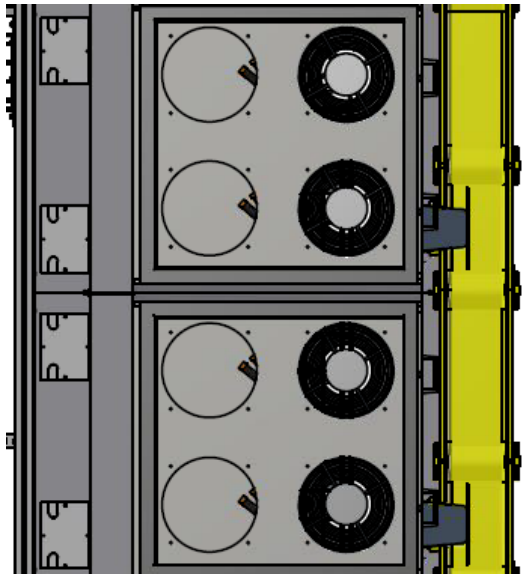
REMOTE MONITORING
& ACCESS CONTROL

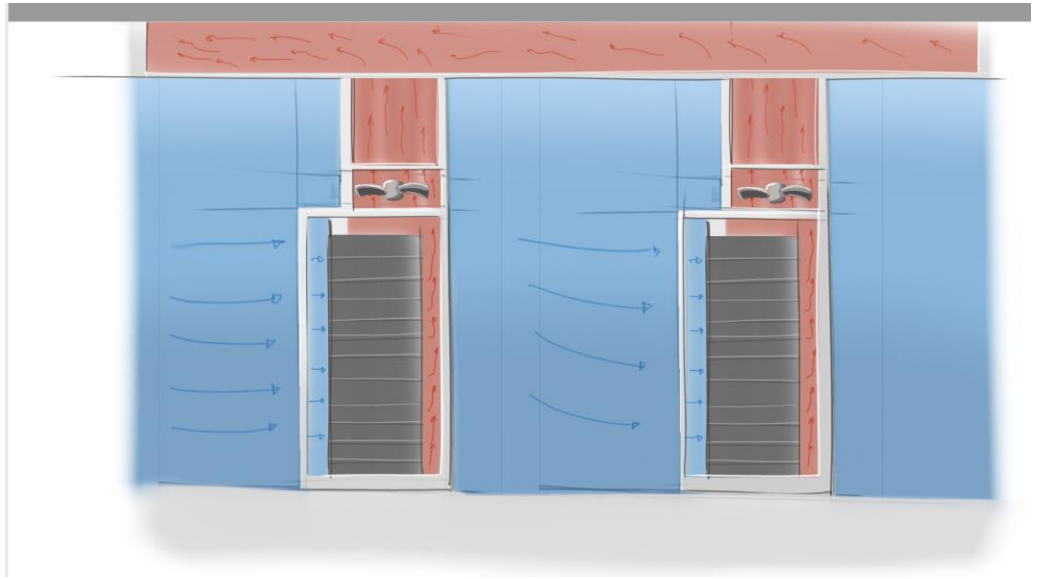
InfiniBand

HIGH PERFORMANCE/AI COMPUTING
LEGRAND DATA CENTER SOLUTIONS

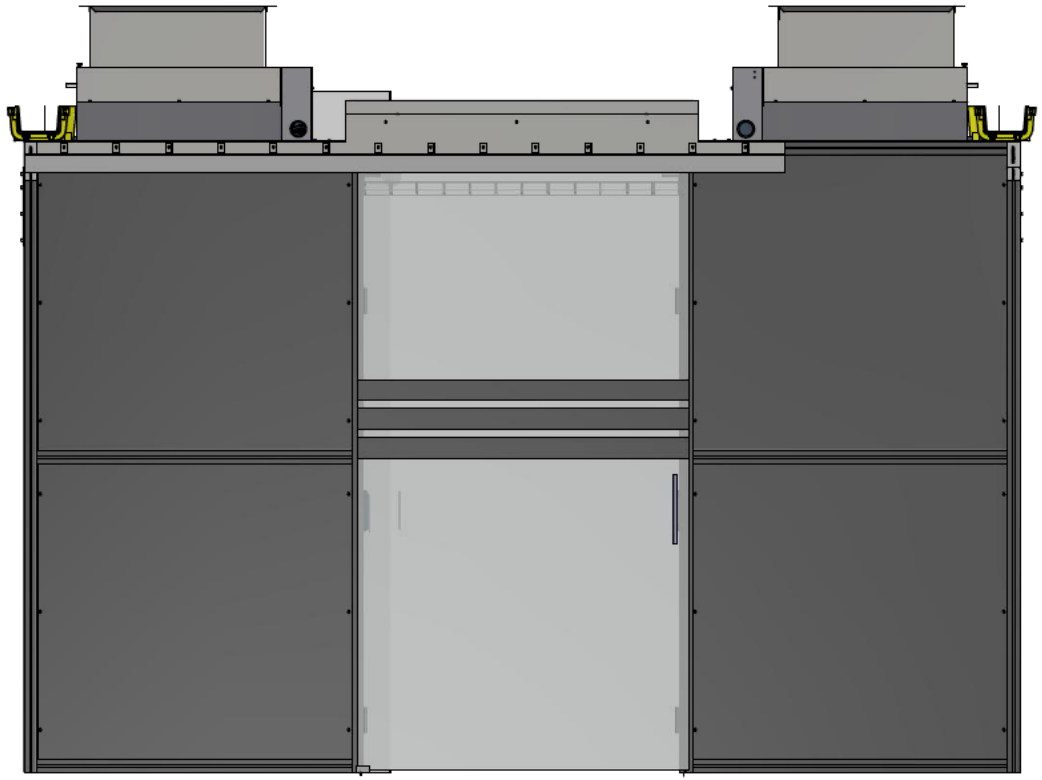


HD cooling



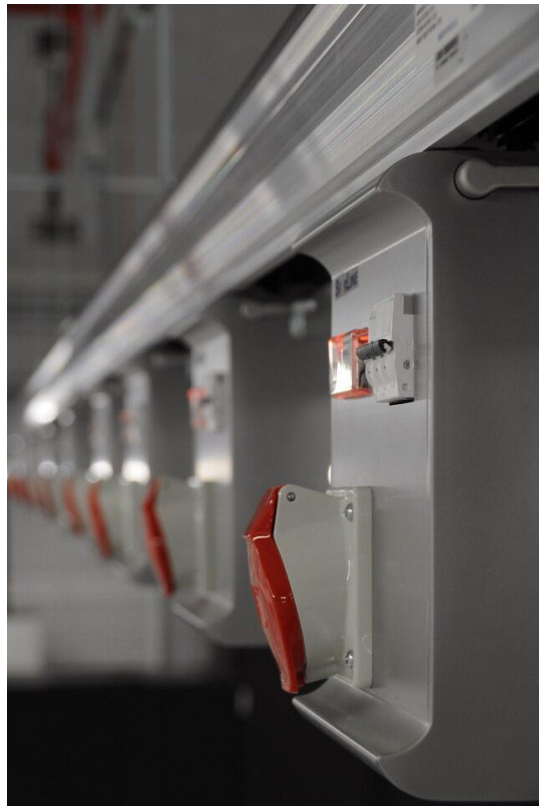


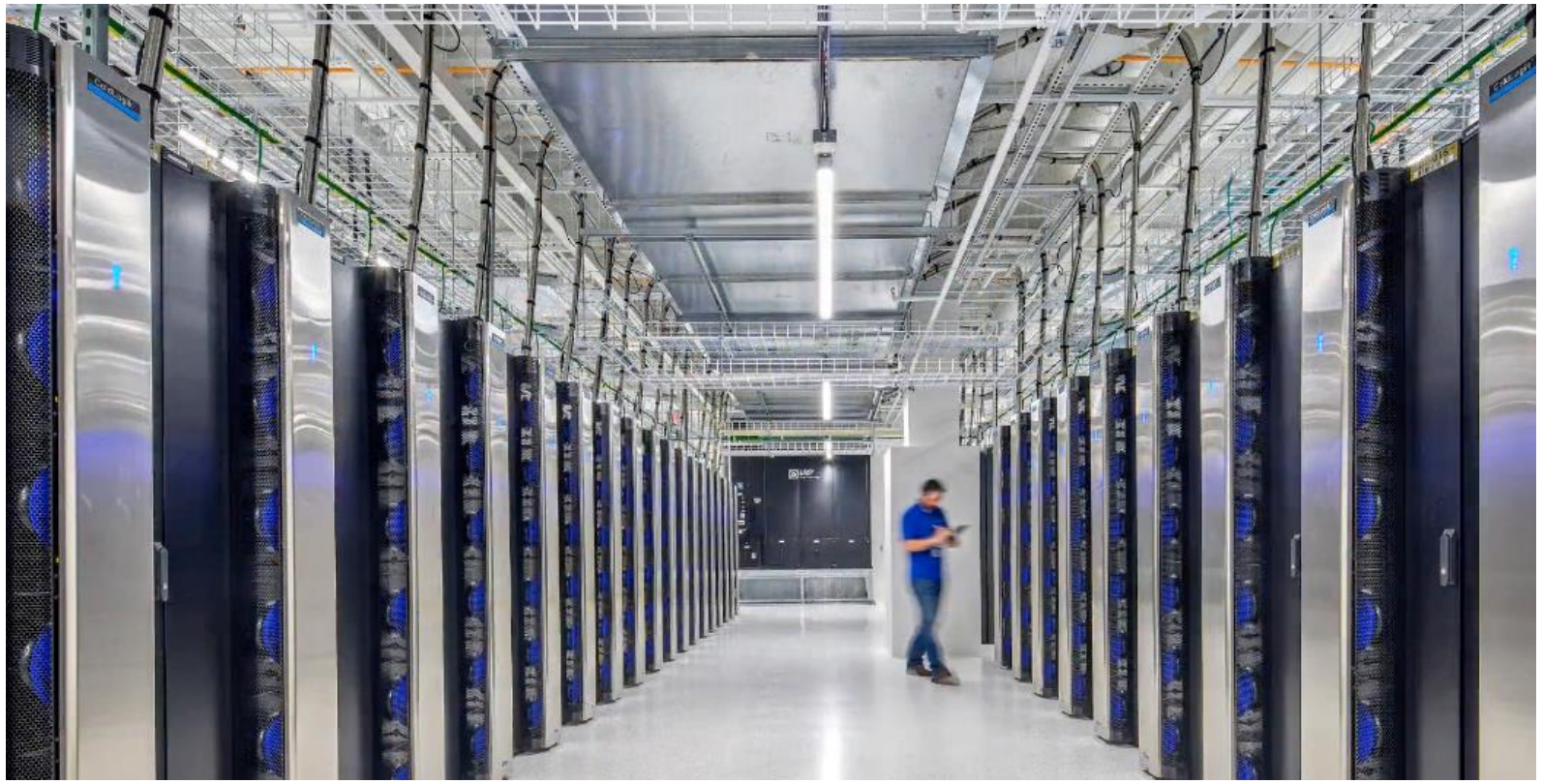
HIGH PERFORMANCE/AI COMPUTING
LEGRAND DATA CENTER SOLUTIONS



HD cooling

HIGH PERFORMANCE/AI COMPUTING
LEGRAND DATA CENTER SOLUTIONS



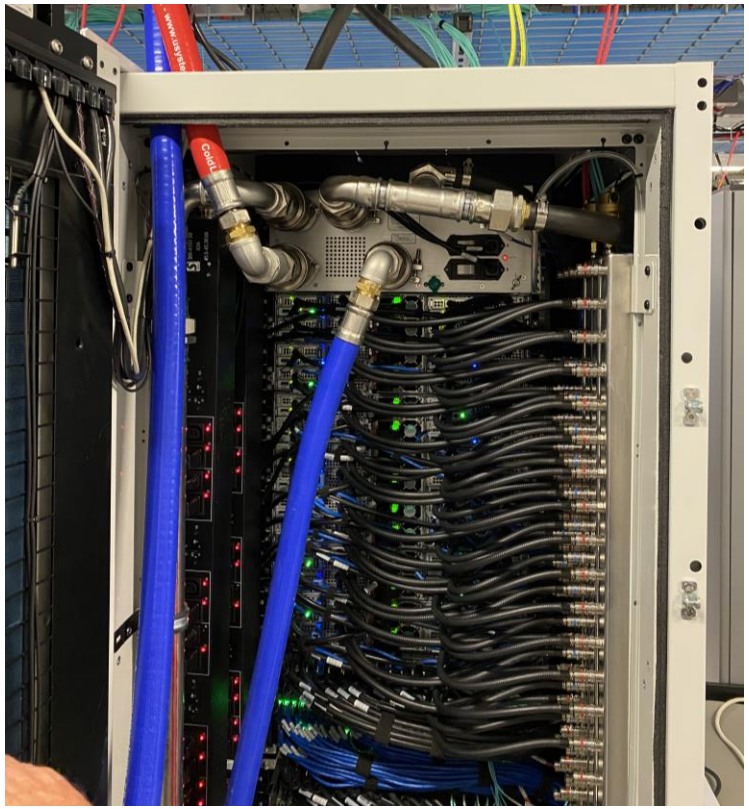


High power Starline Busbar + Rear door cooling

HIGH PERFORMANCE/AI COMPUTING
LEGRAND DATA CENTER SOLUTIONS

Rear door cooling

+



Liquid chip cooling

Questions - Discussion

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