



# ELIMINATING LIMITS TO DATA CENTER GROWTH AND SUSTAINABILITY WITH LIQUID COOLING

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Chris is an Applications Engineer for the Thermal Business Unit at CPC focused on liquid cooling for electronics. He spends much of his time working with data center-based customers implementing AI solutions for their customers. Prior to his customer-facing roll, Chris was a design engineer for the Thermal Business Unit.

- Mission critical facilities demand **uninterrupted operation** and **performance**
- **Massive increase in deployments** of rack system liquid cooling at scale in support of accelerated compute for AI
- Cold plate cooling loop ecosystem contains many critical components

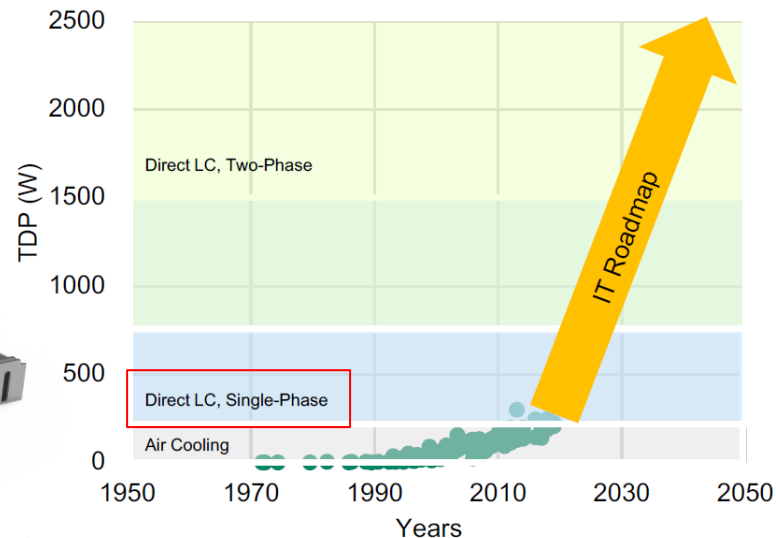


Liquid cooled Aurora Supercomputer at Argonne National Laboratory

## Why do we need liquid cooling?



As technology gets more powerful (hotter), dominant cooling solutions must also scale to support them.

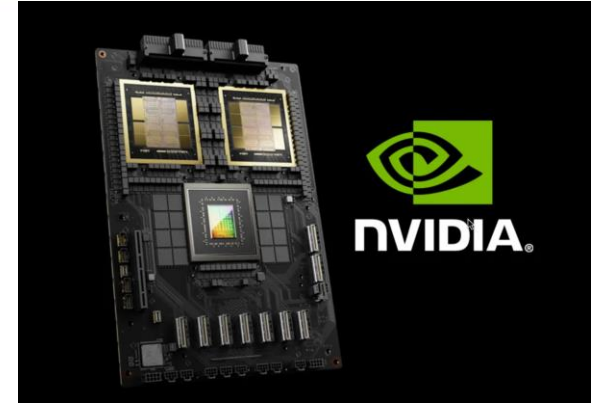


Example 8U (14") direct to chip air cooling vs. 1U (1.75") direct to chip liquid cooling

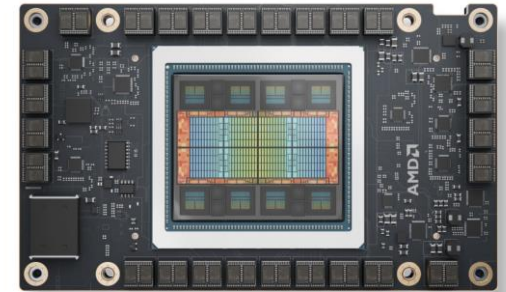


## AI Driving Technology Advancements

- Liquid cooling known for years; AI bringing it to the main stage
- **TDP of 1kW+** driving liquid cooling in AI processors
- Next, best AI and HPC chips ***require* liquid cooling** – air cooling is no longer feasible
- More components within servers will be liquid cooled in the future, further driving the need



nVidia GB300, TDP 1.4 kW



AMD Radeon Instinct MI325x, TDP 1 kW

- Liquid cooling enables higher efficiency data centers
  - **Less fans** for air cooling, rather using pumps
  - More **efficient heat rejection**
  - Facility A/C not as prevalent
- Resulting in **lower PUE** data centers
- **EU** and **USDOE** initiatives - requiring higher-efficiency data centers
- Up to **52% of HPC/AI data centers** will have over half of their cooling needs met with liquid within the next year

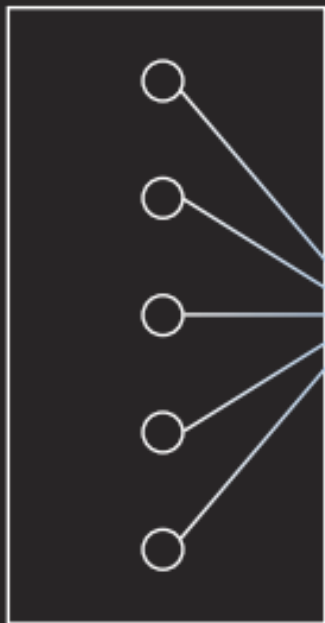


## Thermal Management Liquid Cooling Expertise

- Industry-leading innovation and engineering collaboration
- Dedicated research, testing, and redundant manufacturing with expansive production capacity
- Highly differentiated offering with made-for-liquid-cooling Everis® line of quick disconnect products



## AIR COOLING



## LIQUID COOLING



3,500-4,000 TIMES MORE EFFICIENT AT TRANSFERRING HEAT

SIGNIFICANT COST SAVINGS RESULT FROM MORE EFFICIENT COOLING

ENERGY USE REQUIRED FOR COOLING IS REDUCED

NOISE REDUCED DUE TO SLOWER FAN SPEEDS

85% REDUCTION IN CARBON FOOTPRINT



# Thank You

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