Synergy powers
growth

AI/ OCP Trend in Datacenter Market

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The Heart of AI applications: GPU versus CPU.

CPU

01 Functions

CPU's primary purpose is to perform instructions given by a software program, such as arithmetic, logic, and I/O controls.

02 Components

The CPU encompasses an MMU, Cache memory is faster than RAM and is placed on the processor's chip, causing it to be closer to the CPU.

03 Performance

CPU performance can be measured by several characteristics, including:

Clock speed: The number of cycles of execution of a program that can fit into a second

A number of cores: CPUs are classified based on the number of cores they have: single-core, dual-core, quad-core, Hexa-core, eight-core, and ten-core machines.

GPU

01 Functions

GPUs are designed with hundreds of individual cores, the ability of which to support thousands of threads at one time and thus optimize the product.

02 Video Memory

Aimed at controlling big bandwidth size from graphical-use applications, it has been specially planned for this purpose.

03 Cooling Systems

Some models of GPU are equipped with fans or exhaust systems to avoid heating and speed up the process to the level of efficient cooling.

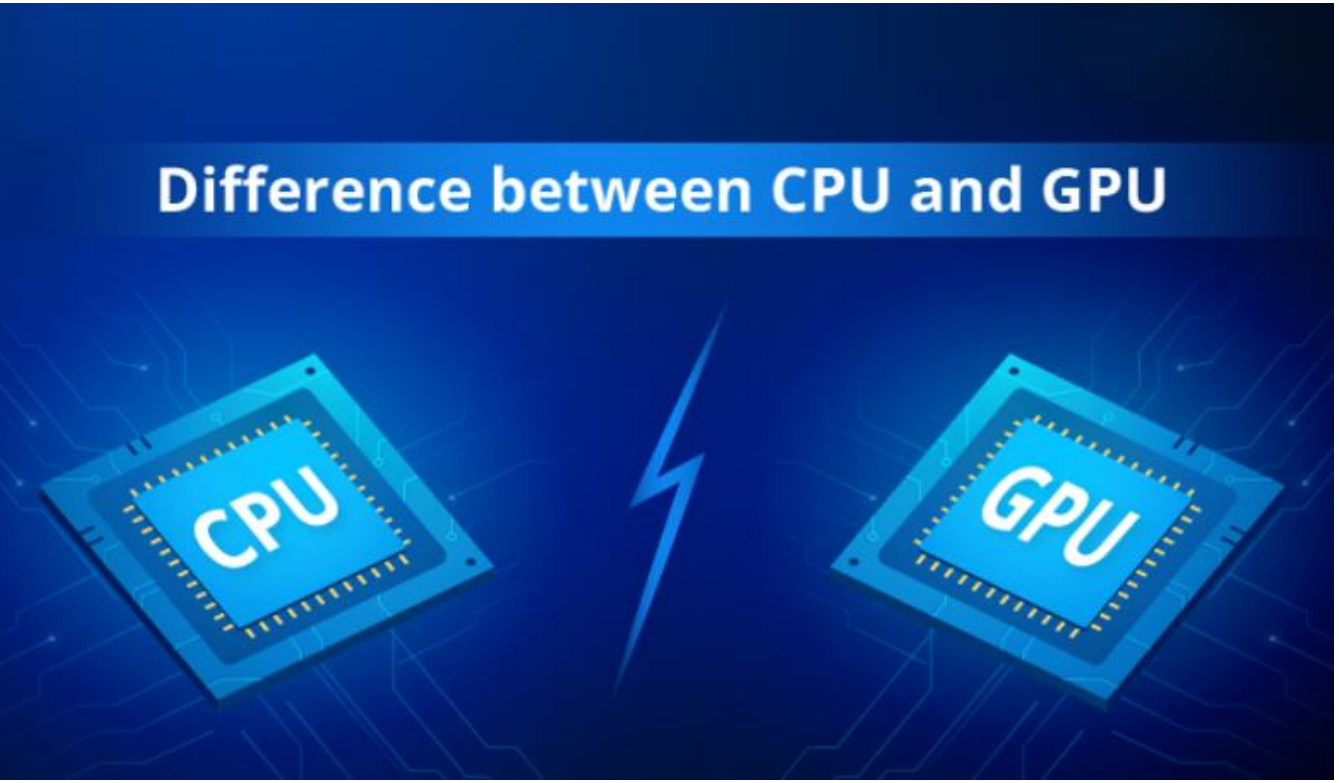
04 Low Latency

Some specific GPUs available today are configured to measure/ improve system latency to focus on performance enhancement. improved target-acquisition and reaction times.

05 Performance Drivers

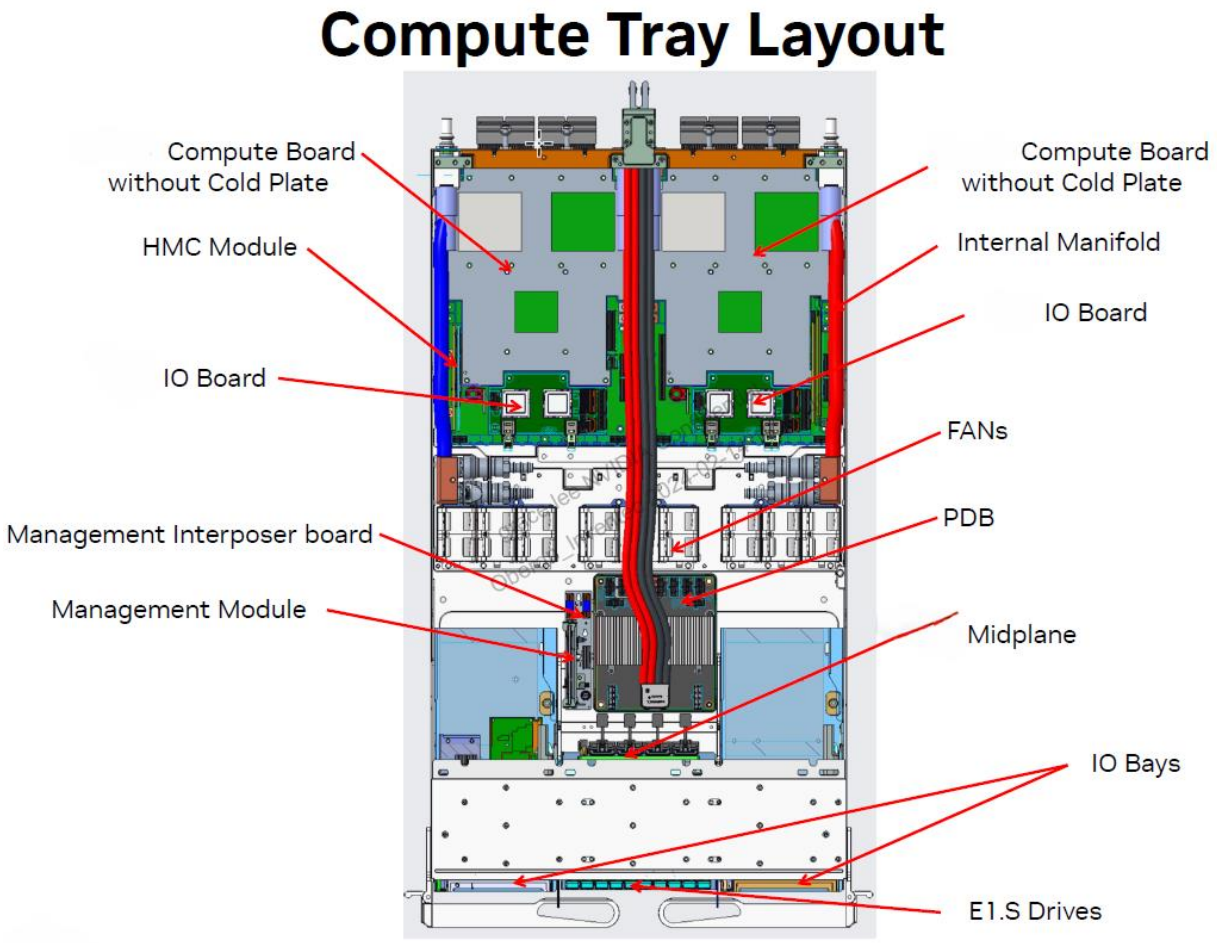
GPUs are the primary performance drivers in HEAVY.AI and CPUs play a supportive role.

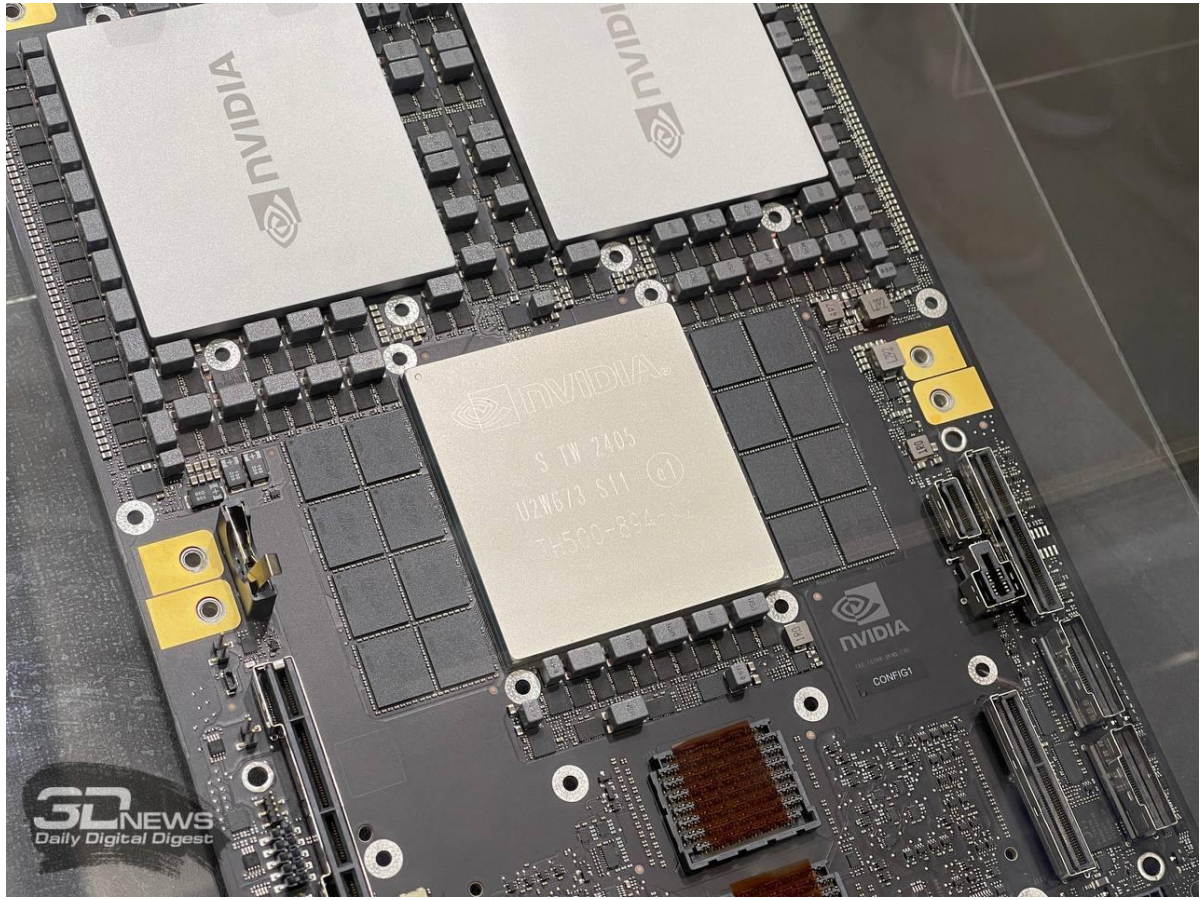
The Heart of AI applications: GPU versus CPU.



- The Central Processing Unit **(CPU)** and Graphics Processing Unit **(GPU)** both have unique computing strengths. CPU and GPU working together can optimize performance in many systems. The CPU handles general-purpose tasks and system management, on the other hand, the GPU takes on specific, computation-heavy tasks. This CPU/GPU combination offers better efficiency and faster processing in various applications.
- CPUs are crucial for tasks related to sequential processing and complex algorithmic calculations that need to be done one by one.
- GPUs are designed for parallel processing so they are ideal for training AI models. AI training involves performing similar operations on multiple data samples simultaneously. GPUs provide the necessary computational power for tasks like neural networks, accelerated AI operations, and traditional AI inference and training algorithms.

GB-200 drives AI applications: GPU + CPU.

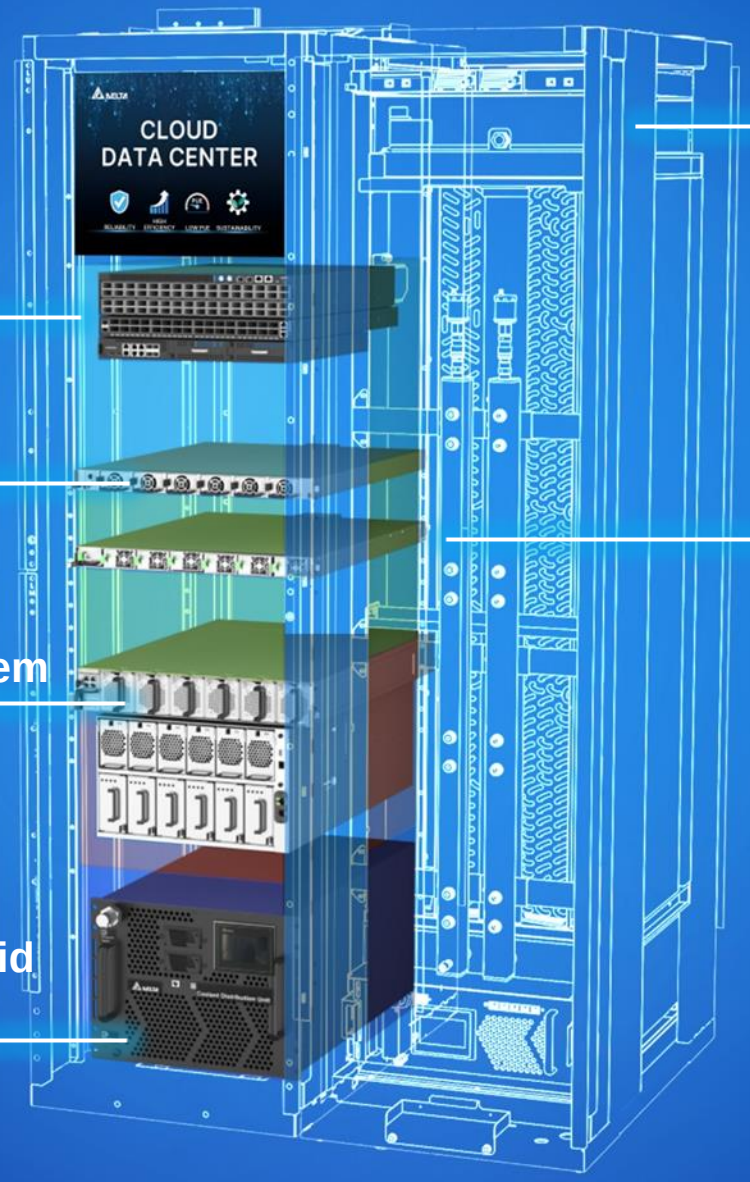




Delta OCP Solution

ORV3 Total Solution

The future of white space infrastructure solutions for AI applications:



AALC

ORV3 Rack

33 KW PS System

18 KW PS System

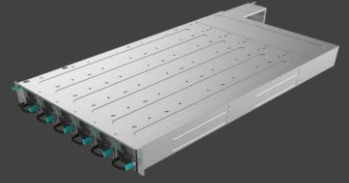
15kW/27.5kW Bat. Backup System

Liquid-to-Air or Liquid-to-Liquid CDU

66kW Power Supply System
U, 55 kW 50 VDC with 5.5 kW PSU modules

33kW Power Supply System
U, 27.5 kW 50 VDC with 5.5 kW PSU modules

18kW Power Supply System
U, 15 kW 50 VDC with 3 kW PSU modules



33kW Battery Backup System
(27.7 kW 48VDC+3kW BBU modules)

15kW Battery Backup System
(15kW 48VDC+3kW BBU modules)

ORV3 Rack
44 OU (1.89 per OU)

AALC
24 kW / up to 76 kW (conditional)

OCP Solution

(ORV3+AALC+CDU)

TRENDS

Liquid Cooling with the Open Compute Project (OCP) is a MUST-HAVE for AI applications

REQUIREMENTS

Building region competence over the OCP related products in product training, product information, capability to provide service and technical expertise.

MARKET POTENTIAL

The share of OCP + Liquid cooling is expected to grow rapidly with CAGR over 23% in the next 5 years.

Moving forward colocation providers are expected to adopt this new technology overtime.

Reference: https://www.mordorintelligence.com/industry-reports/data-center-liquid-cooling-market

OCP RACK | New Establishment

Plans to Meet HPC & AI Demands

OPEN COMPUTE PROJECT (OCP)

OPEN RACK VERSION 3 (ORV3) STANDARD

- Electrical
- Rack
- Power Shelf

SYSTEM ENGINEERING

ORV3 Rack Solutions

Slovakia

ASSEMBLY

RACK

Racks Assembled in
Liptovsky Hradok, SK

PRODUCTION

POWER SHELF & BBU **PSU**

- Power shelf & PSU

Designed in
Soest, Germany

COOLING

In-Rack/In-Row CDU **AALC**

Designed & Produced in
Taiwan

GPU Load Characteristics

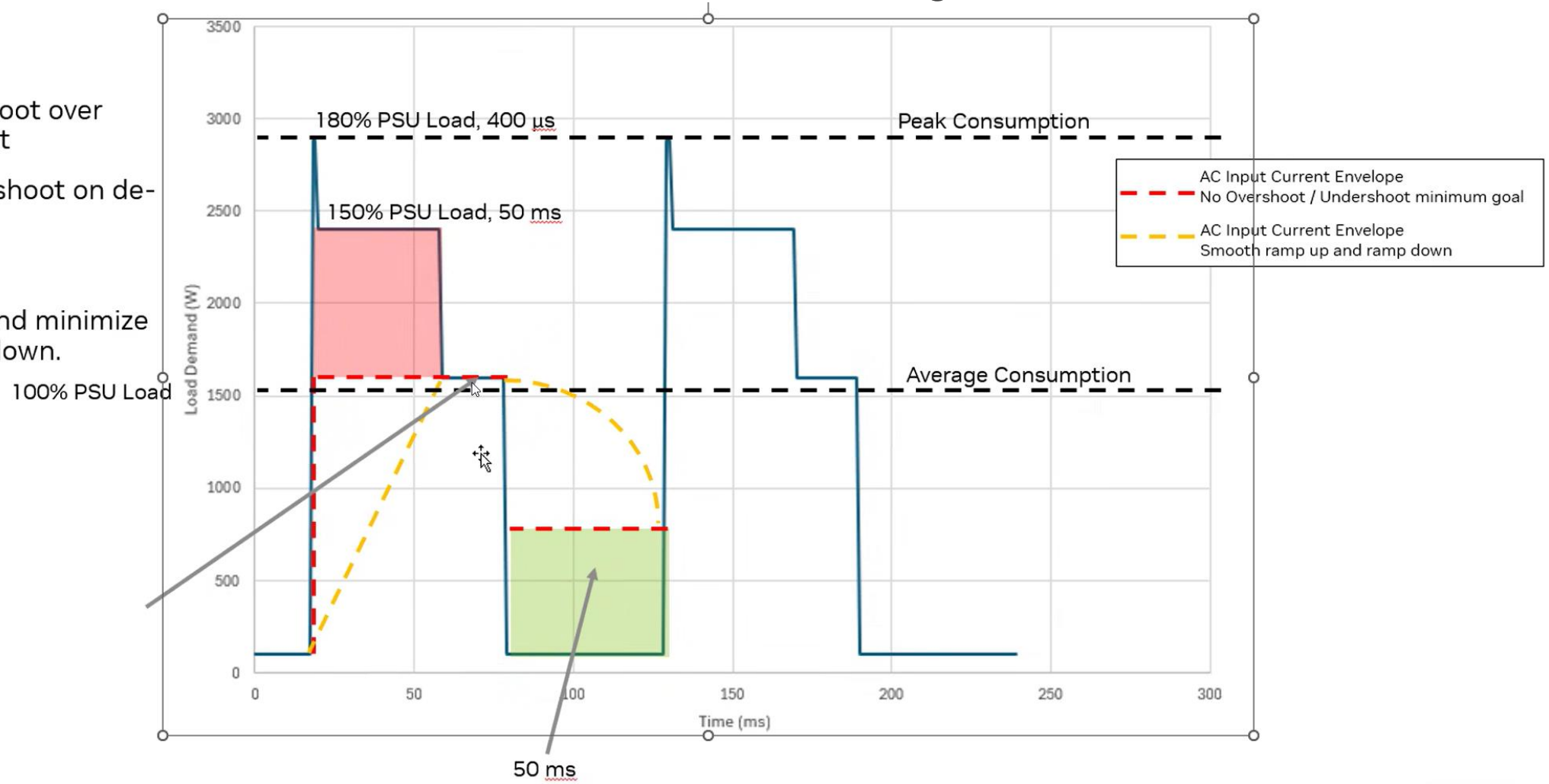
GPU Electrical Data Peak Processing

Red Line: Minimum

1. Need to have 0% overshoot over average AC input current
2. Need to not have undershoot on de-loading.

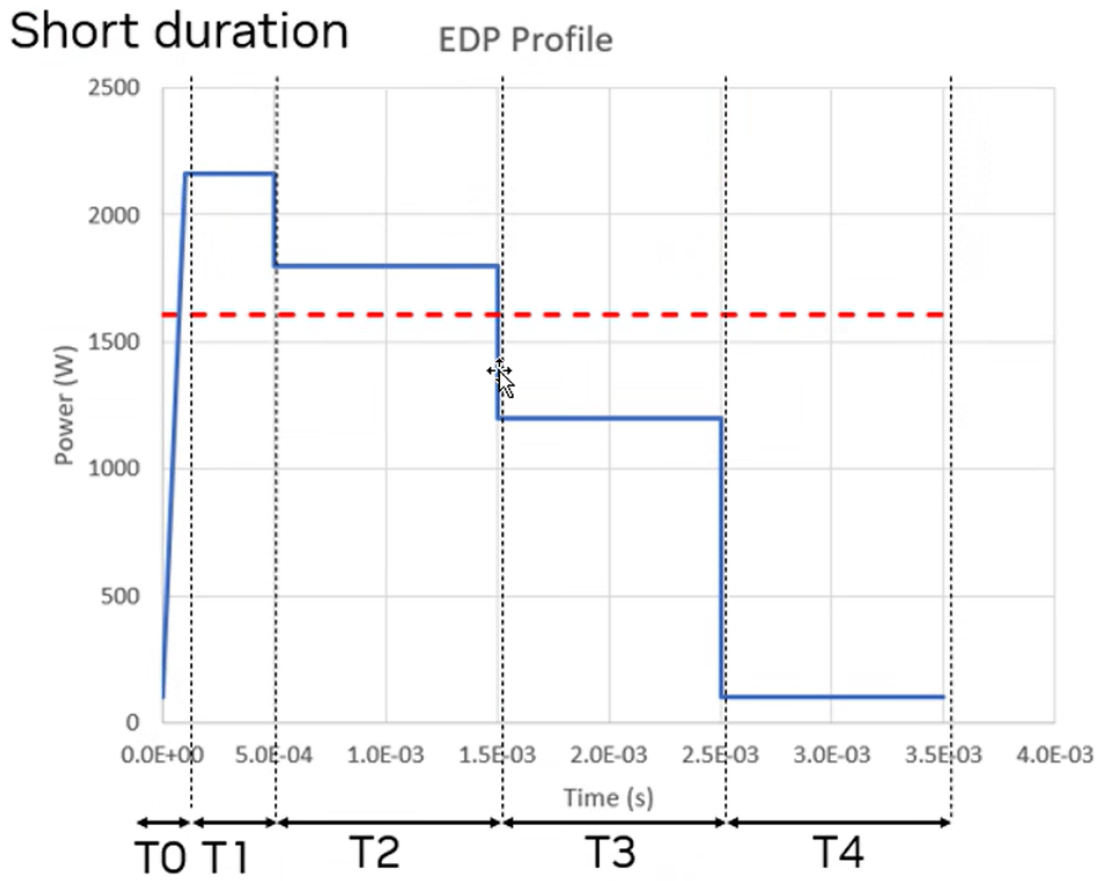
Orange Line: Target

1. Maximize holdup time and minimize ramp rate both up and down.



GPU Load Characteristics

- The GPU load profile can be broken down by 5 different time intervals
- T0 – Initial turn on slew
- T1 – settling time before reaching EDPp1 – 400us maximum
- T2 EDPp1 peak limiting target value – 50ms maximum
- T3 – EDPc unlimited duration
- T4 – waiting for next cycle – unlimited duration



Large UPS for AI Product Roadmap

DPS 3P4W 400V

- Gen.2 DPS 300/400/500/600/800 1000/1200kW 3P4W
- Eff. 96.5%

DPM Gen.2 400V 1,500kW
- Eff. 97.5%
- 3W& 4W Common platform

DPM Gen.2 400V 250/1,000/1,250kW
- Eff. 97.5%
- 3W&4W Common platform
- Q4, 2024 (250K/1M/1.25M)

Ultra high-Efficent UPS
- MW above
- Eff. 99%

DPM Gen.2 400V 500kW
- Eff. 97.5%
- 3W& 4W Common platform

DPM Gen.2 400V 750kW
- Eff. 97.5%
- 3W& 4W Common platform

EXISTING | 2024 | 2025 | 2026 | 2027 | 2028

DPM G2 General Specifications

		DPM Gen 2
Power Rating	Ready	250/ 1000/ 1250 kW
	Upcoming	500/ 750/ 1500/ 1750 kW
Input	Nominal Voltage	380/400/415 Vac, **3P3W+PE/ 3P4W+PE**
	THDi	<3%
	Power Factor	<0.99
Output	Voltage	380/400/415 Vac, 3P3W+G/ 3P4W+PE
	Voltage Regulation	±1% (static) VFI-SS-111 (dynamic)
	THDv	< 1% (linear load)
	Overload Capability	≦110%: continues, ≦125% : 10 minutes ≦150% : 1 minute, >150% : 1 sec
Battery	Battery Type	Lithium-ion, VRLA, Ni-Zinc
	Nominal Voltage	480V
	Quantity	34-35[1], 36-46pcs (VRLA 12V)
Efficiency	Online Mode	Up to 97.3%
Parallel Configuration		Up to 8 units
Conformance	Safety	CE, UKCA
	EMC	IEC 62040-2
	Performance	IEC 62040-3

UPS Li-ion Battery Product Roadmap

NMC Technology

UBH3 35.5 kWh

- Cell: NMC Delta P140
- Full front access
- UL9540A/IEC62619
- Depth – 625mm/against the wall
- 3W battery systems
- Oct, 2023

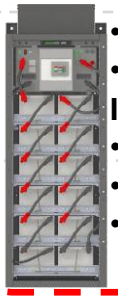
UZR3 31.0 kWh/62.1 kWh

- Cell: NMC Delta P140
- 2string 60Ah inside
- UL9540A/IEC62619
- 2W battery systems
- Oct, 2023

LFP technology

LZM/LBM 43.5kWh (10-30min)

- Cell: LFP 27Ah
- UL1973/UL9540A/ IEC62619/CE
- 2W/3W battery systems
- Q4, 2024
- Max. Power 200kW

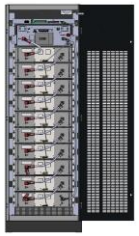


LZH 47.1kWh (<10min)

- Cell: LFP 40Ah
- UL1973/UL9540A/ IEC62619/CE
- 2W battery systems
- Q1, 2025
- Max. Power 400kW

LZE 51.2kWh (1h)

- Cell: LFP 100Ah
- UL1973/UL9540A/ IEC62619/CE
- 2W/batt. System
- Q1, 2025
- Max. Power 50kW



LZT 180kWh (>2h)

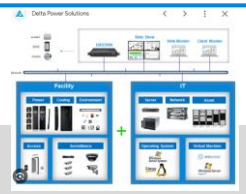
- Cell: LFP 314Ah
- UL1973/UL9540A/ IEC62619/CE
- 2W/batt. System
- Conceptual
- Max. Power 50kW

EXISTING | 2024 | 2025 | 2026

Data Center Portfolio

Grey Space

DCIM



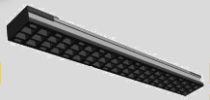
UPS

STS

PDU

Distribution Panels

Busways



LV/MV Switch gear

Auto Transfer Switch

LiB Battery

IT Racks

OCP Racks

rPDU
rSTS

Power shelves

Room cool

Row Cool

CoolDoor

New cooling products

Chillers

CDU

AALC

Direct to chip Manifolds & Rear door RDHx

IT devices, Memory, Storage, Network

White Space

Not Manufactured by Delta

Manufactured by Delta

Thank You!