



Scale at speed: Critical data center power trends TMCES Workshop

Parag Mehresh

Director, Technical Business Development

2026



Global presence, local expertise



● Worldwide

Manufacturing Locations: **30**
Service Centers: **~320**
Service Field Engineers: **~5,000**
Technical Support/Response: **~400**
Customer Experience Centers/Labs: **26**



● Americas

Manufacturing Locations: **14**
Service Centers: **~180**
Service Field Engineers: **~2,600**
Technical Support/Response: **~170**
Customer Experience Centers/Labs: **3**

● Europe, Middle East, and Africa

Manufacturing Locations: **10**
Service Centers: **~60**
Service Field Engineers: **~700**
Technical Support/Response: **~150**
Customer Experience Centers/Labs: **12**

● Asia Pacific

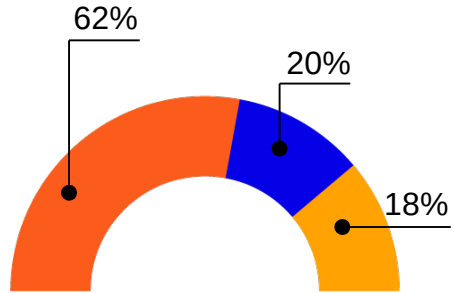
Manufacturing Locations: **6**
Service Centers: **~80**
Service Field Engineers: **~1,700**
Technical Support/Response: **~80**
Customer Experience Centers/Labs: **11**

Note: Company information as of December 31, 2025.

Robust operations, supply chain and service presence globally

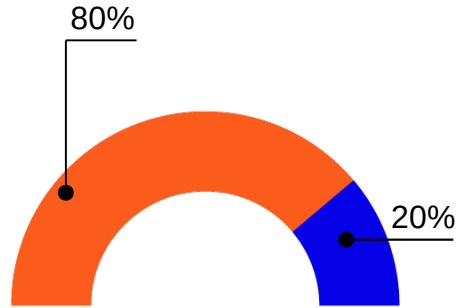
Vertiv at-a-glance

VRT
LISTED
NYSE



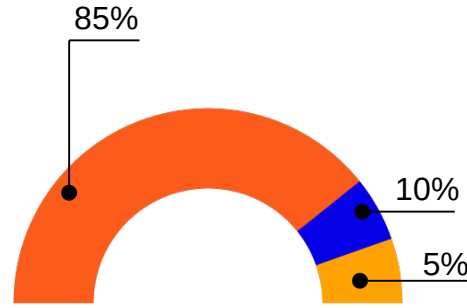
Geography¹

- Americas
- APAC
- EMEA



Portfolio¹

- Products
- Services & Spares



Market Segment^{1,2}

- Data Centers
- Communication Networks
- Commercial & Industrial

~\$10.2B
USD revenue¹

~34,000
employees globally

#1
in thermal
management³

60+
years in the industry

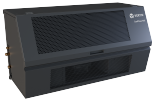
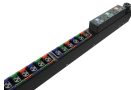
130+
countries served

#1
in 3-phase large UPS
& power distribution
infrastructure^{4, 5}

Note:¹Based on FY 2025 revenue; ²Market segment rounded to nearest 5%; ³Dell'Oro Data Center Physical Infrastructure reporting 2025; ⁴Omdia UPS Hardware Market Tracker 2025, >250 kVA; ⁵Omdia Ultimate Power Study Dec 2025, Busway, Remote Power Panel, Static Transfer Switch, Three-Phase PDU. All else, company information as of December 31, 2025.

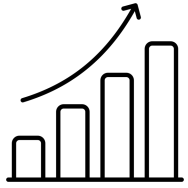
A leader in power and cooling, supporting impactful market segments in all world regions

Leading innovator with most complete critical digital infrastructure portfolio

Power Management	Thermal Management	IT Systems
Power Train - All the "cars" from grid-to-chip  Switchgear  Large power converters  Medium UPS  Energy storage  Power distribution  Busway  DC power  Microgrid	Thermal Chain - All the "links" from chip to heat reuse  Chilled water  Direct expansion  High-density & liquid-cooling  Custom thermal  Edge thermal	IT Systems - All the components from distributed IT to gigawatt data center sites  1-Phase UPS  Rack PDU  Racks and enclosures  KVM & serial  High-density solutions 
Integrated monitoring, management, and controls		
Infrastructure Solutions	Integrated, prefabricated solutions for rapid, repeatable deployment  Power modules & skids  All-in-one data centers  Multi-module data centers  Prefab hybrid data centers	
Services	Designed for agility, engineered for scale, and delivered with precision Consulting Implementation Optimization Lifecycle  Digital services embedded throughout	

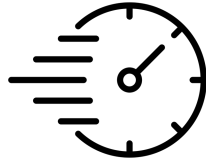
Portfolio strength and constant innovation with end-to-end coverage

Five intensifying forces are transforming data center architecture and design



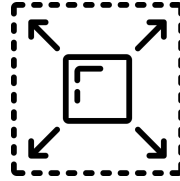
Density

Compute densification in rack and pod



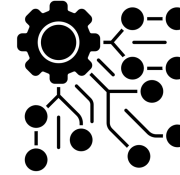
Speed

Deploy capacity ahead of technology cycle



Scale

High-density pods to gigawatt-scale data centers



Complexity

Increasing system interfaces



Load profile

Dynamic, synchronous workloads

The evolution of AI depends on highly integrated infrastructure deployed at an unprecedented scale

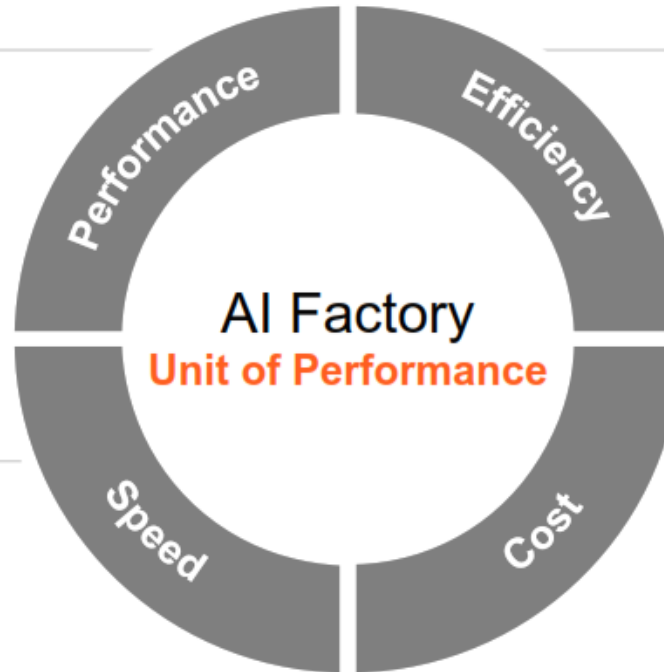
KPI defining success of an AI Factory...

Tokens per Second

Generate more tokens from the same power envelope with better economics

Time to First Token

Accelerate the path from infrastructure deployment to productive AI compute



Tokens per Watt

Minimize auxiliary infrastructure power consumption across the site

Tokens per \$

Optimize total cost of ownership across capital, operating, and lifecycle costs

Vertiv is uniquely positioned to support all four

Vertiv™ OneCore

1. Vertiv™ Power Modules and Skids

- Vertiv™ RMU
- MV Transformer
- Vertiv™ LV Switchgear
- Vertiv™ UPS
- Vertiv™ Batteries
- Vertiv™ HPB Busbars

2. Vertiv™ Data Hall

- Flexible design, no size limitations
- Rapid deployment

5. Vertiv™ SmartRun IT superstructure

- TCS/SFN Piping
- Vertiv™ iMPB busbars
- Vertiv™ CoolChip CDU
- Optical and Mesh trays
- Containment

6. Vertiv™ Heat Rejection

- Vertiv™ CoolLoop Trim Cooler
- Vertiv™ Liebert® FIZ chiller
- Vertiv™ Liebert® AFC chiller
- Buffer tanks

7. Vertiv™ Hydro Modules

- Water treatment for PFN
- Filtration
- Water Softening & Conditioning
- Chemical Dosing
- Monitoring & Control

8. Vertiv™ Auxiliary Modules

- Office rooms
- Security room
- Unloading area
- Storage area
- Staging area
- NOC room
- MeetMe room

Vertiv™ ITS

- Vertiv™ racks
- Vertiv™ rPDU
- Vertiv™ DC Power shelf
- Vertiv™ manifold
- Vertiv™ RDHx
- Vertiv™ in-rack CDU

Vertiv™ Monitoring & Control

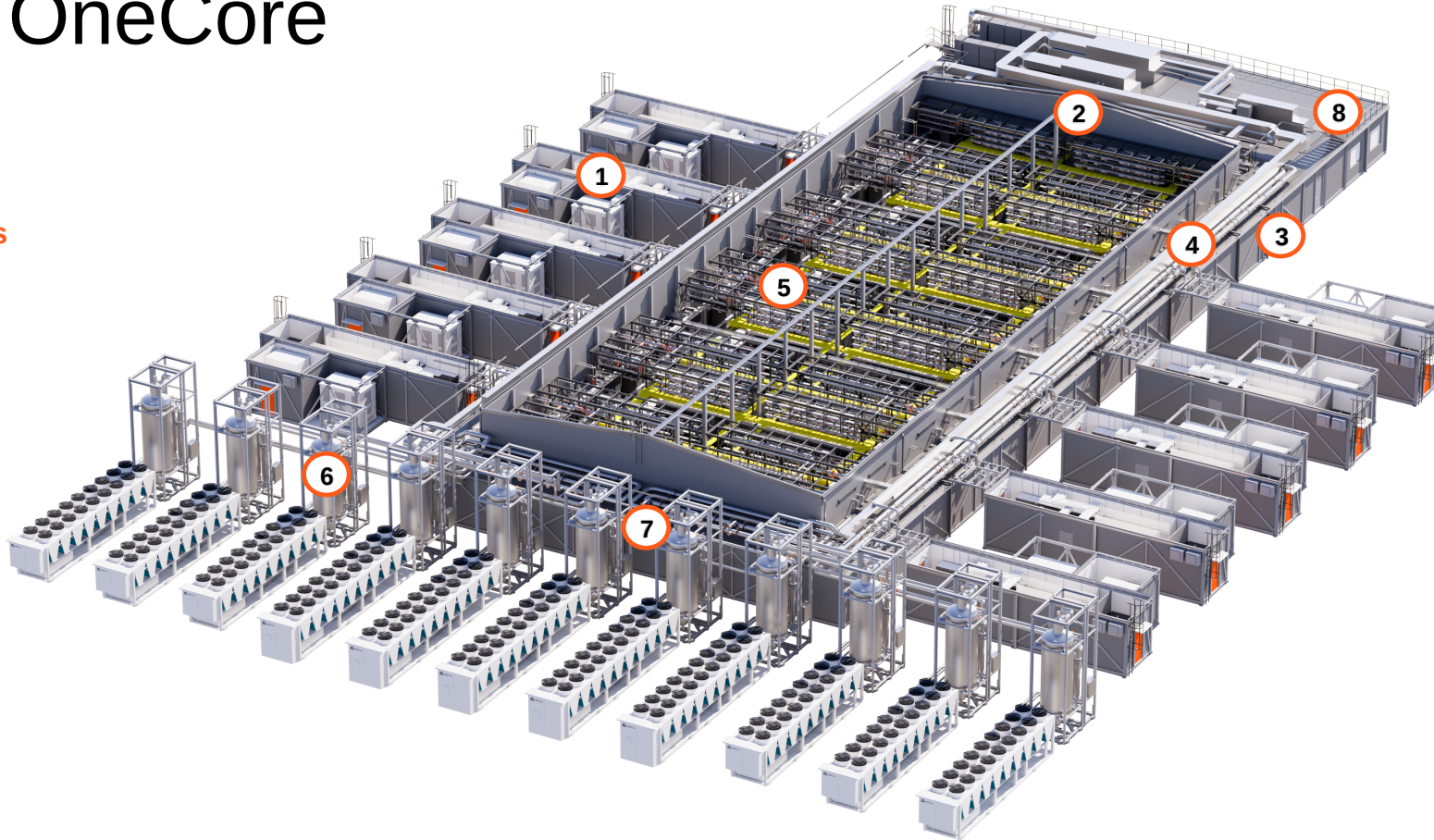
- Vertiv™ Unify
- Unified Interface
 - Real-Time
 - Plug-and-Play
 - Open Protocol
 - Scalable Architecture

3. Vertiv™ Service Modules

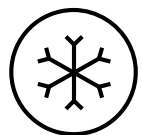
- Vertiv™ Remote Power Panels
- Step-down transformer
- Vertiv™ Cooling units
- Fire suppression detection and suppression system

4. Vertiv™ Cooling Modules and Skids

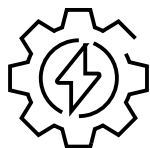
- Cooling skid
 - Vertiv™ cooling units
 - Vertiv™ CoolChip CDU
 - PFN piping
 - External AHU unit
- Piping skid
 - PFN piping



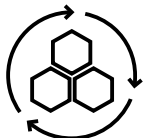
Vertiv™ OneCore – Large AI data center



Thermal



Power



Systems

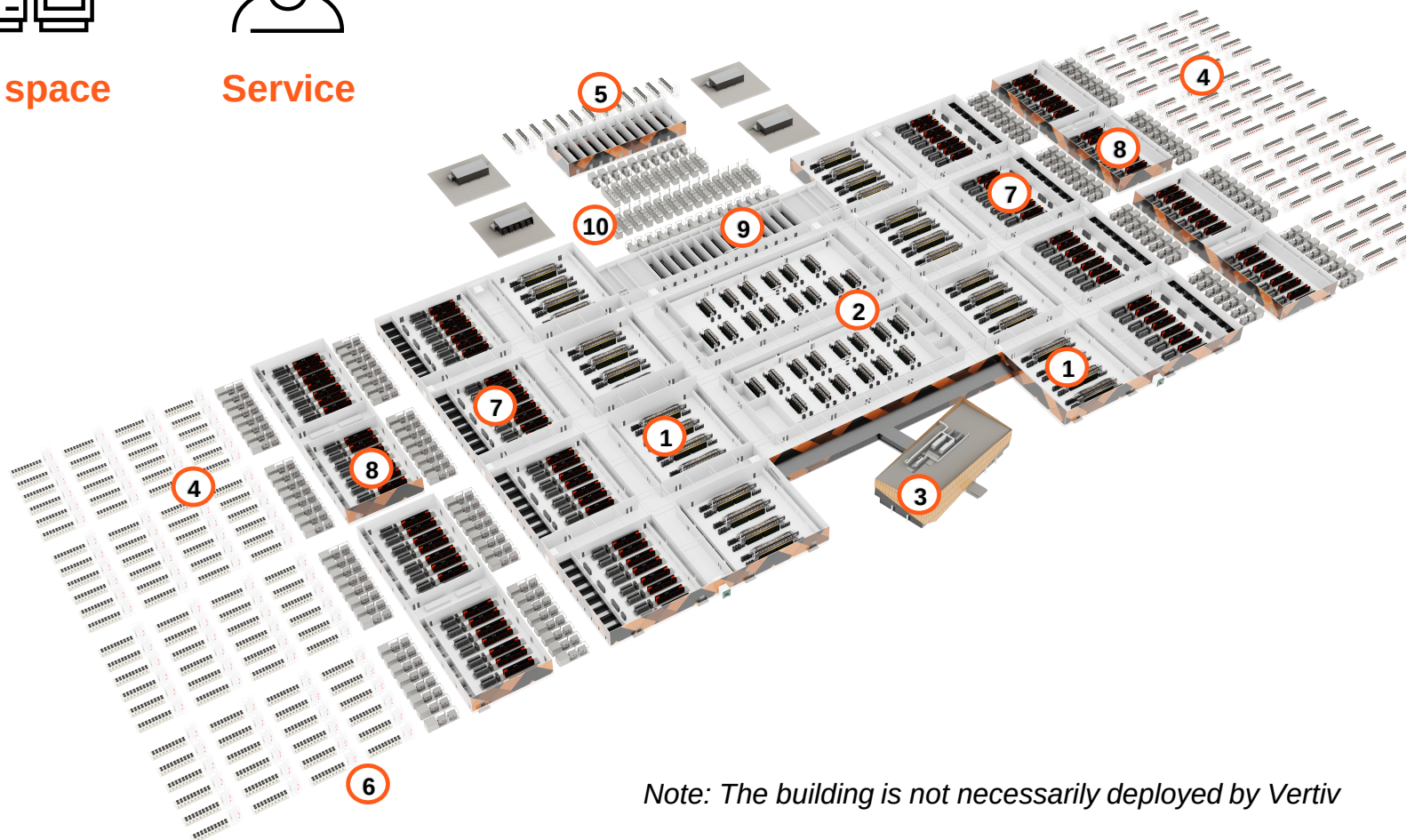


IT space



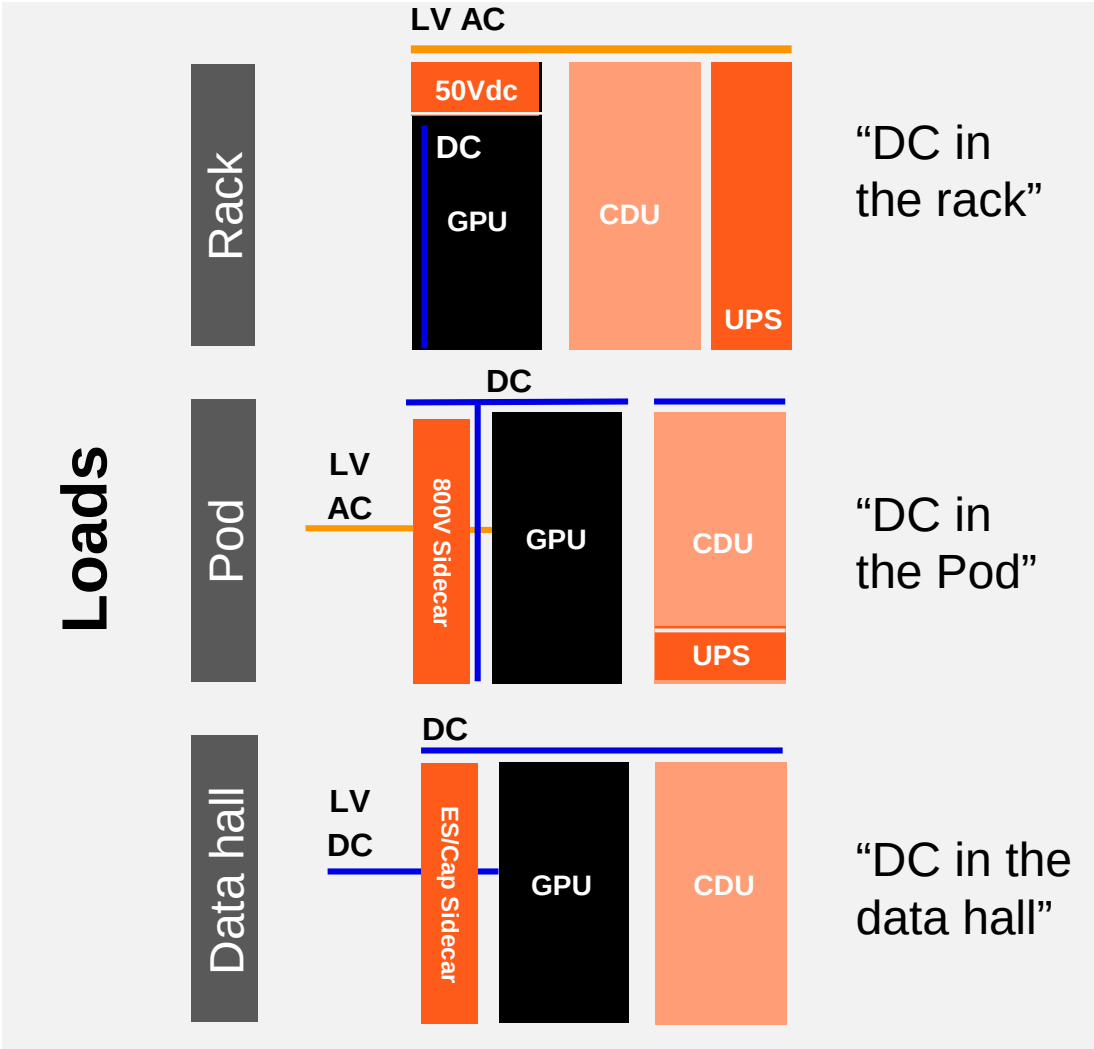
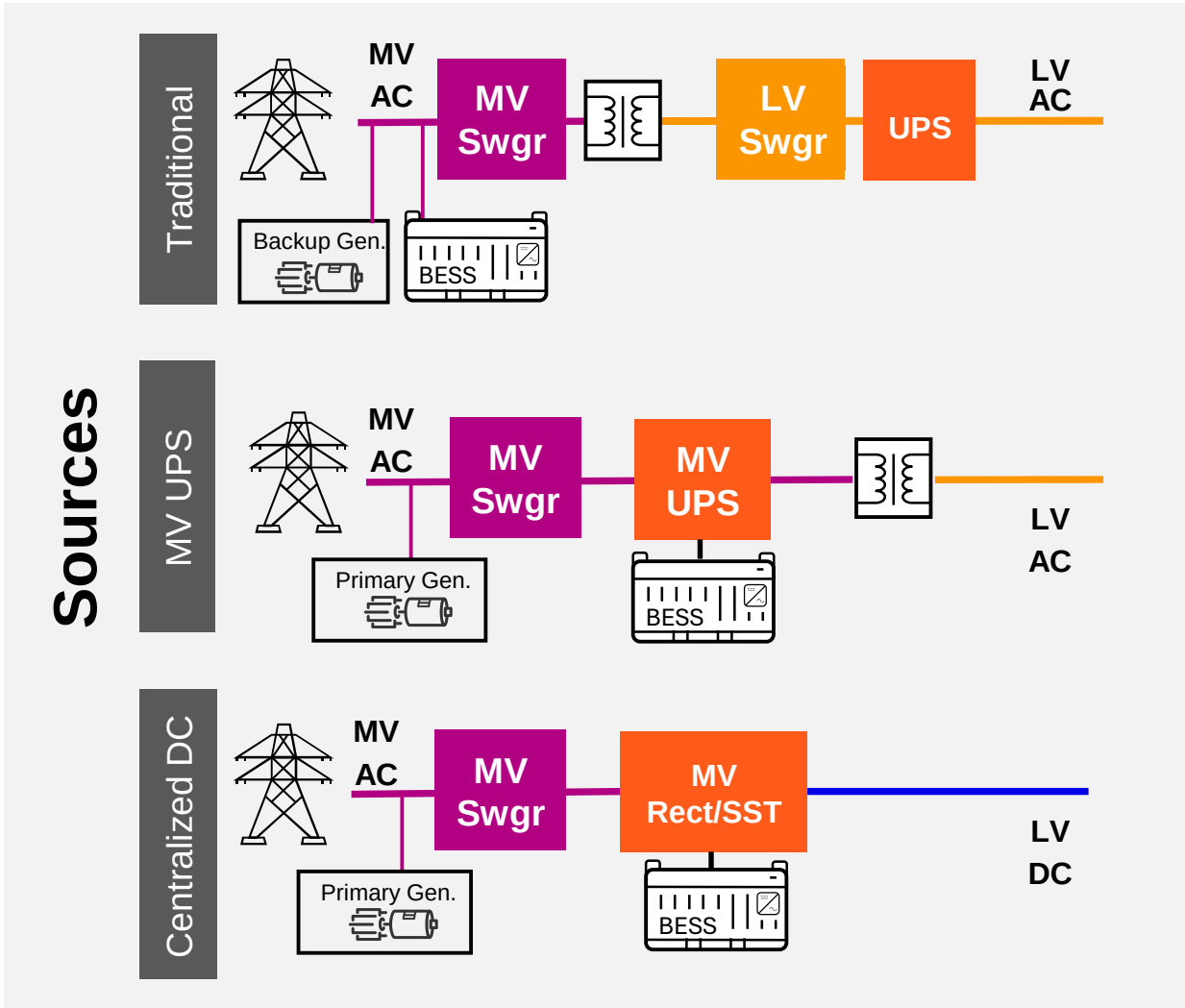
Service

1. Compute room location
2. Core room location
3. Office building
4. Heat rejection units for Compute rooms
5. Heat rejection units for Core room
6. TES – buffer tanks
7. Vertiv™ Power skids for Compute rooms
8. Vertiv™ Power skids for Mechanical load
9. Vertiv™ Power skids for Core room
10. Diesel generator



Note: The building is not necessarily deployed by Vertiv

Power architectures are evolving to support next-gen AI infrastructure



Different architectures connect sources and loads to meet customer requirements and constraints

Complexities of an AI Factory

- Grid interaction is becoming more complex
- Dynamic and synchronous AI loads
- Rack densities are rapidly increasing

Vertiv offers solutions to customers that seamlessly integrate and simplify these design challenges.

Fault ride-through (FRT): Problem statement

The rapid growth of voltage-sensitive loads, especially data centers, creates a significant risk of large, simultaneous loads disconnecting from the grid that can cause:

- **Frequency instability:** A rapid rise in frequency due to a mismatch between generation and load.
- **Voltage instability:** A rapid rise in voltage due to reduced power flow.

Grid requirements worldwide are evolving to keep large UPS systems connected during short voltage and frequency disturbances. Data center customers, following Transmission Service Operators (TSOs) expectations, are increasingly requesting proven FRT capability.

Need: UPS to avoid load transfer to battery systems during grid fault events. Improved control can ride through brief faults and reconnect faster.

Risk: Products without FRT capabilities may lead to grid connection delays or non-compliance with regional requirements.

FRT helps stabilize the grid by making the UPS more resilient to grid instabilities and avoid further load disconnections.
Also compatible with AI load management.

Not all faults are created equal

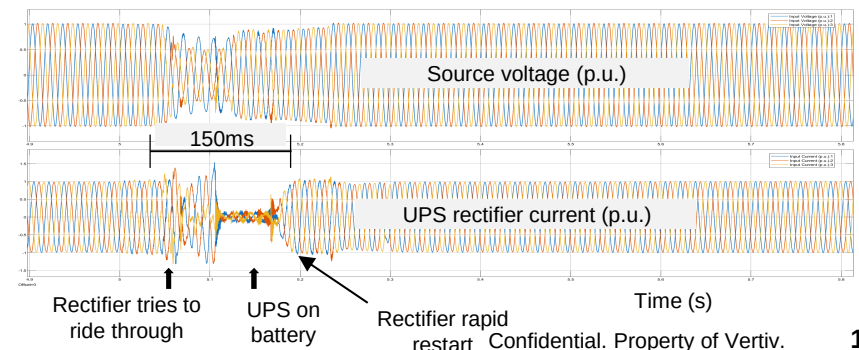
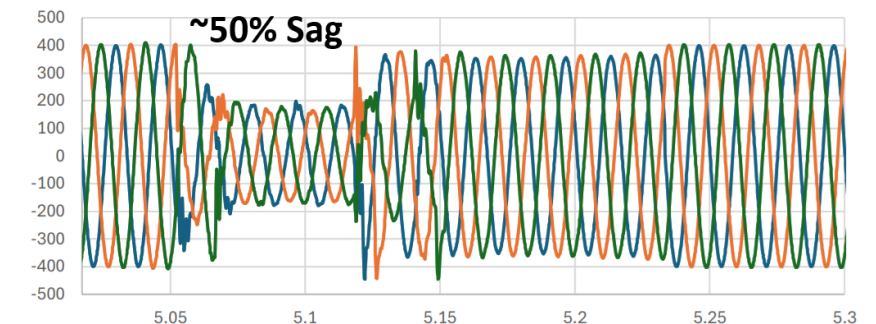
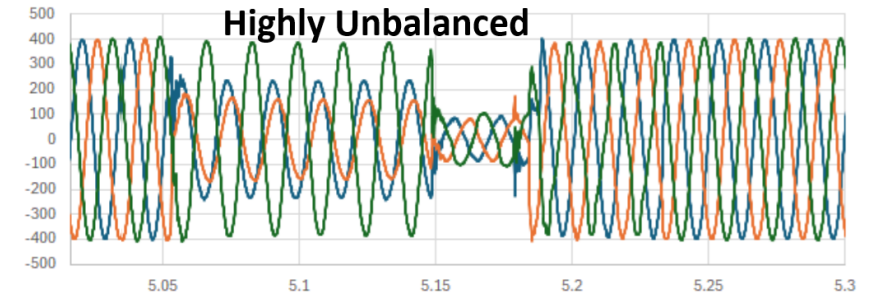
Three-phase voltage sags and surges **can** be tolerated.

Highly unbalanced faults will most likely cause the UPS to go to the battery.

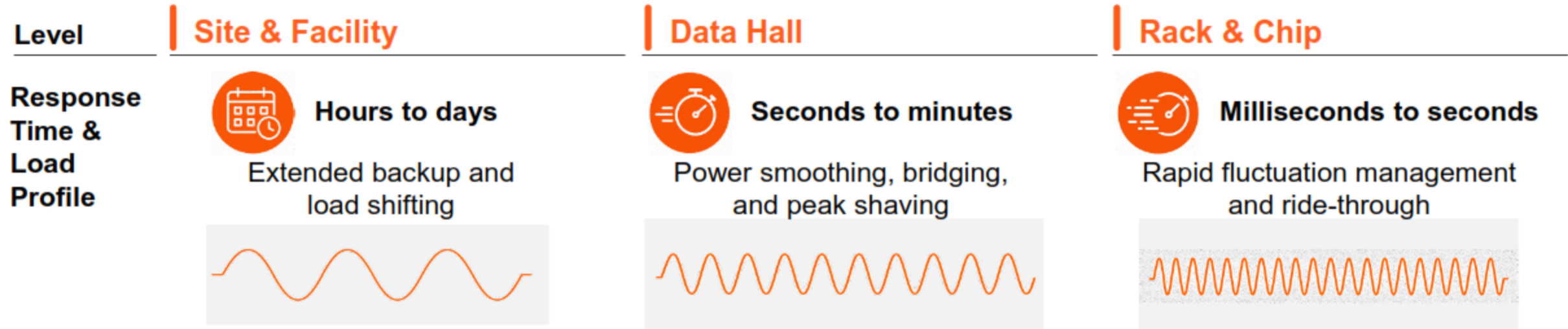
Large phase hops cannot be tolerated by the UPS and will result in the UPS going to the battery.

Voltage sags below 0.30 p.u. will cause the UPS to go to the battery. Not enough signal to do anything.

Regardless of the fault, the UPS can requalify, restart, and ramp up to 100% power in less than a second.



Coordinated energy storage across multiple time domains...



Vertiv manages AI power dynamics from grid-scale energy storage to rack-level ride-through

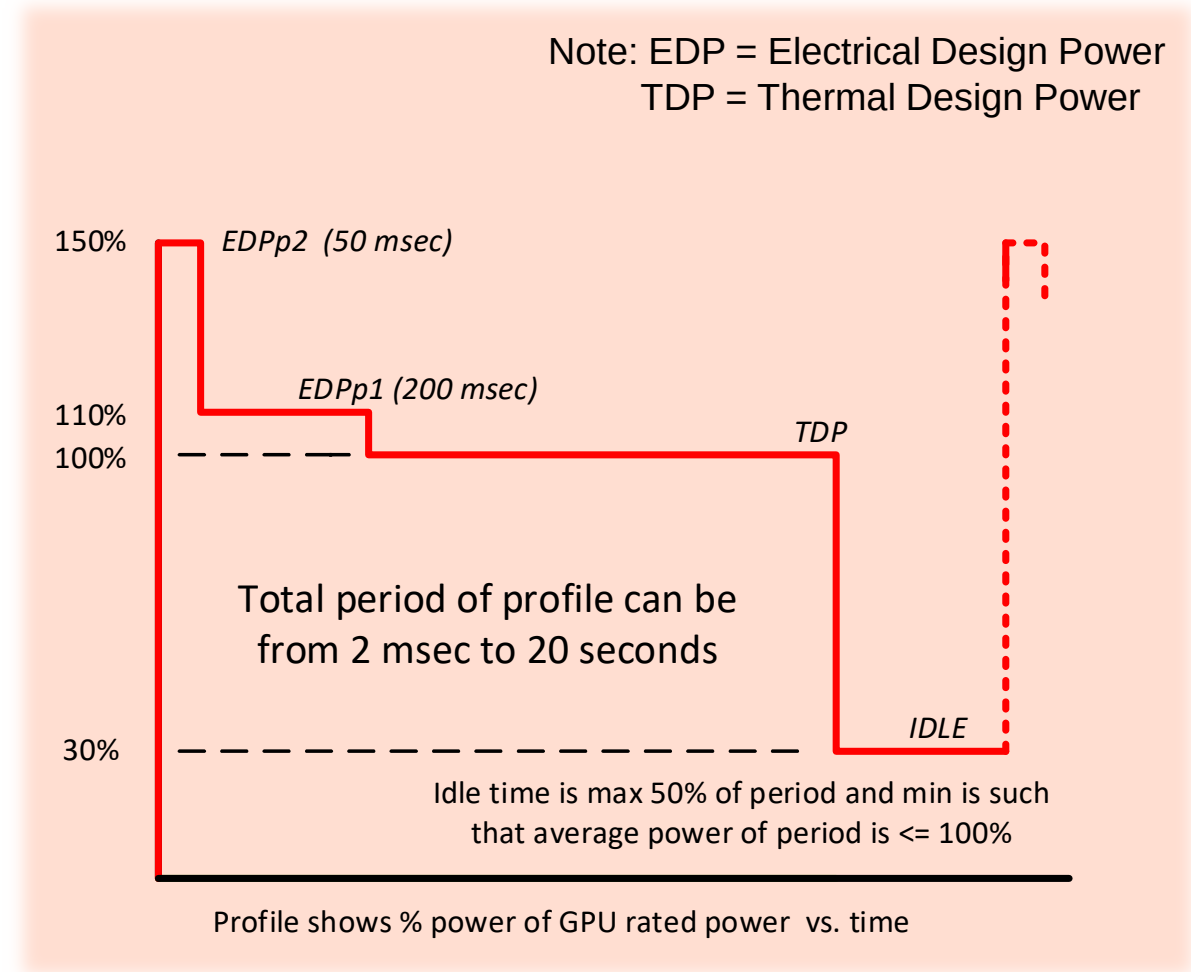
AI load power profile

An AI training session typically consists of a series of repeating power steps.

A range of power vs. time for each cycle is illustrated here.

Parts of a cycle:

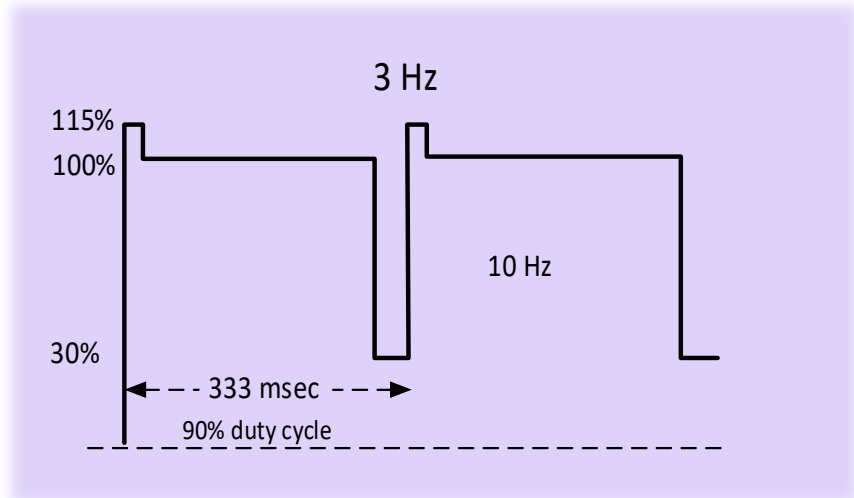
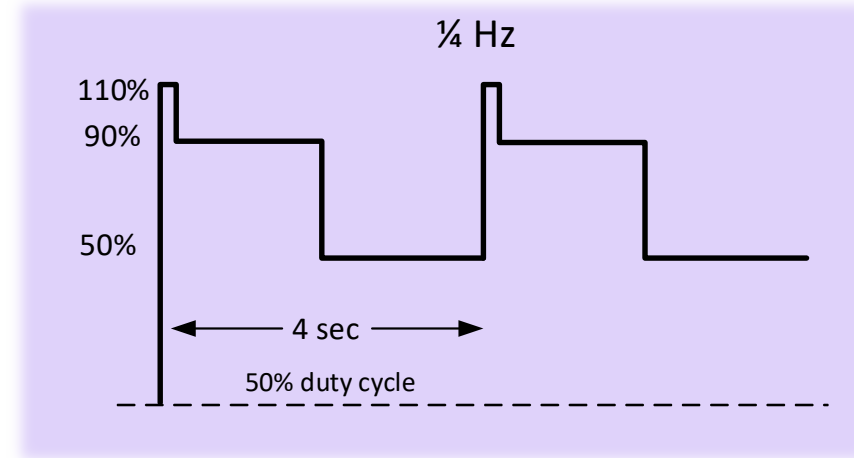
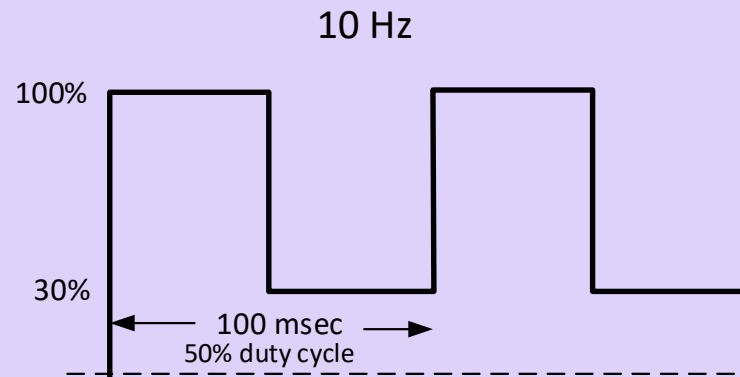
- EDPp2: Amount of electrical power the GPU may consume for a short time at the start of each cycle.
- EDPp1: Electrical power GPU may consume for an additional short time following EDPp2.
- TDP: Maximum average power based on the thermal limit of GPU
- Idle: Power after training cycle pauses and the next cycle begins.



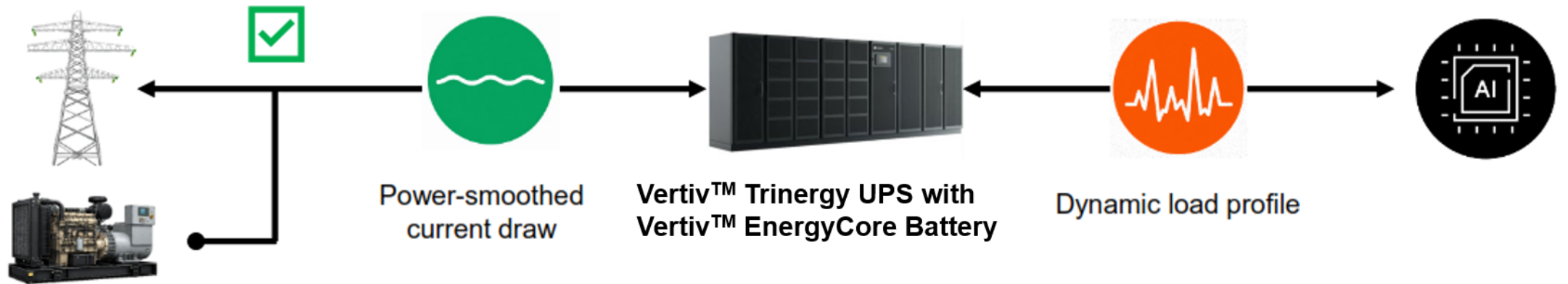
AI training profiles observed at operating sites

There is no “standard” AI training power profile. It depends on the application and the training method used.

- The EDP short power pulses are not always present.
- The idle period can vary in both time and power level.
- The training cycle frequency can be from 20 Hz (or more) and $\frac{1}{4}$ Hz (or less).



Power smoothing is an enabling technology



Power smoothing turns the UPS from backup infrastructure into an active performance and grid-stability asset

Key messages: Five Intensifying Forces

01 Density: Compute densification in rack and pod

02 Speed: Deploy capacity ahead of technology cycle

03 Scale: High-density pods to gigawatt-scale data centers

04 Complexity: Increasing system interfaces

05 Load Profile: Dynamic, synchronous workloads



Parag Mehresh

Director Technical Business
Development

parag.mehresh@vertiv.com

+1-740-833-0934 (M)

