



High Density Reference Design for AI

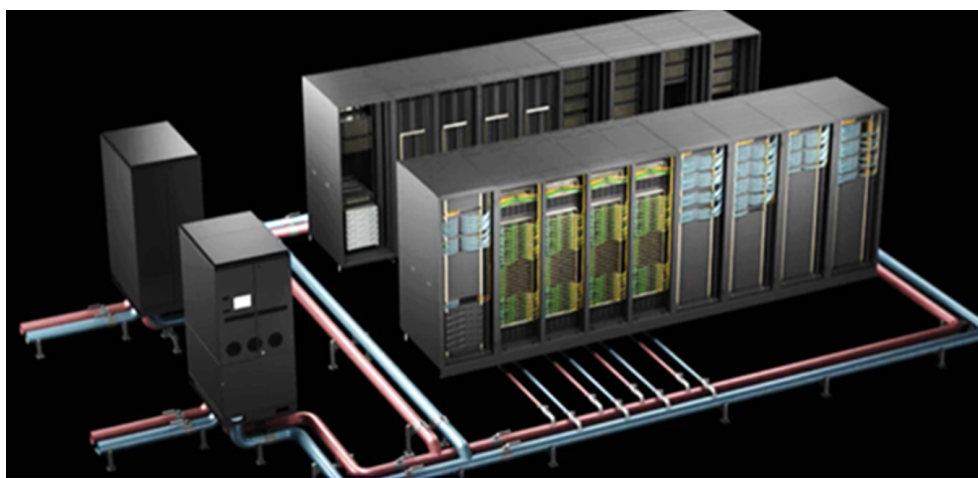
AI Reference Design #020

6x 1.2MW NVIDIA DGX SuperPODs

A full data center environment designed for a 7MW solution with 4 to make 3 redundancy, using six NVIDIA DGX SuperPOD systems utilizing the NVIDIA GB200 NVL72 platform. The latest end-to-end power and cooling solution including OCP-compliant components.

Design Principles

- 1. Design both Power and Cooling** together to optimize AI infrastructure.
- 2. Power is at a premium.** Eliminate stranded power by aligning AI clusters to data center 'capacity blocks.'
- 3. Consider total cost of ownership, redundancy, and blast radius** in AI power and cooling designs, and the tradeoffs among them.
- 4. Handle AI workload surges** though system-level controls and power and cooling buffers.
- 5. Design for a mix of liquid and air cooling**, which have a combined and interdependent impact on the ability to remove heat.
- 6. Design for the future.** AI power density will rapidly grow toward 1MW per rack.



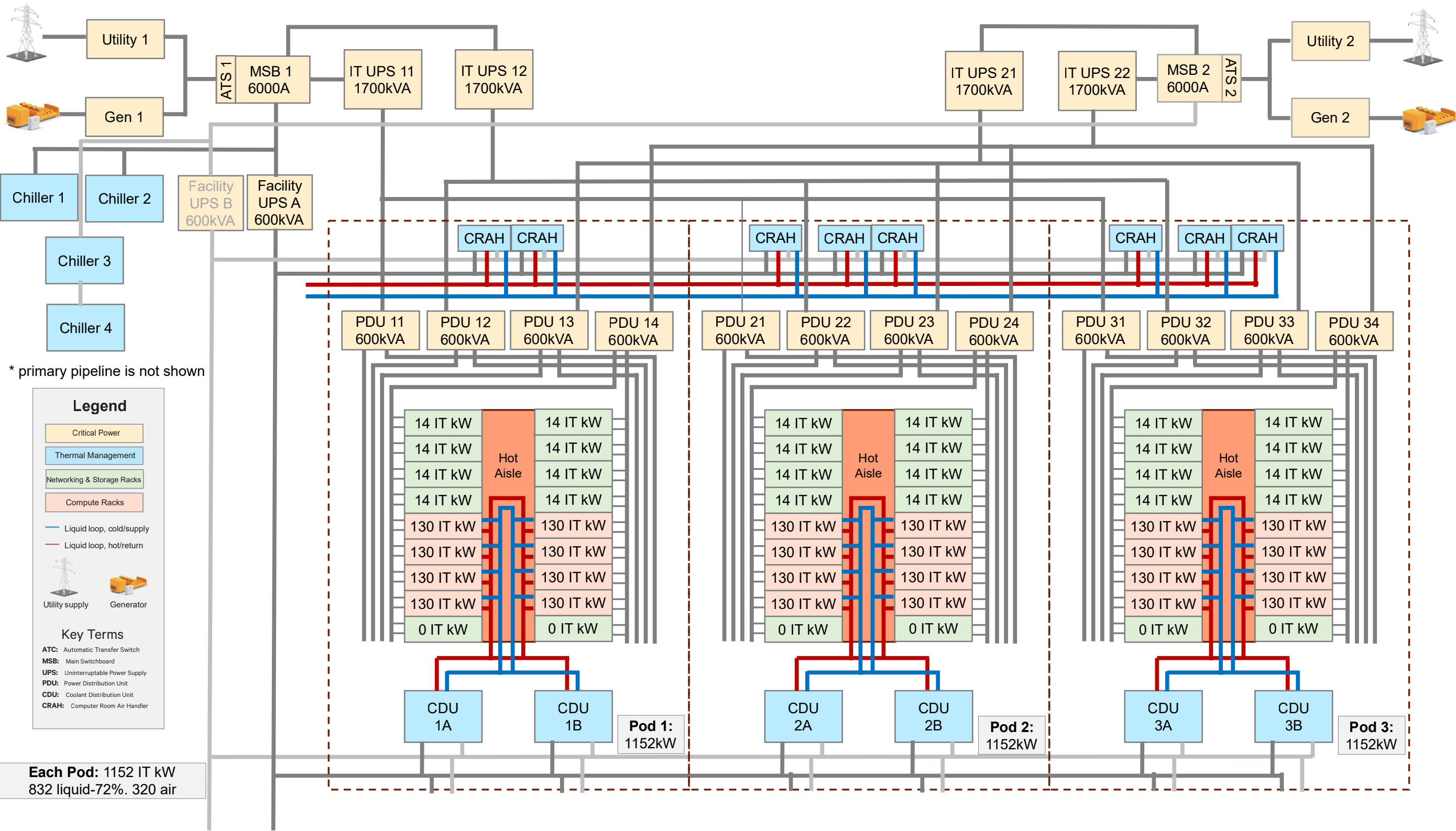
1 POD shown above, design is for 6 PODs

Design Summary

Solution Capacity	7MW
Redundancy	4 to make 3 for power, N+1 for cooling
Total IT Load	6,912kW (1,152kW per POD)
Rack Density (IT load)	48 racks at 130kW, 48 racks at 14kW
Rack(s)	108 (12 used for wire management)
Cooling Topology	72% Liquid (direct-to-chip) 28% Air (perimeter units)
Coolant Distribution	XDU1350
Perimeter air cooling	CW205
Chiller	FH3135
Rack Power Shelf	33kW DC power shelf, 8 per computing rack
Rack PDU(s)	30A rack PDU, 2 per support rack
Busway	400A busway, 8 per POD 60A TOB, 2 per computing rack per busway 40A TOB, 2 per support rack
Room/Row PDU	600kVA PDU, 4 per POD
UPS for IT	1200kVA UPS, 4 supplying 2 PODs, 6 PODs total
UPS for Cooling System	240kVA UPS, 2N, supplying both cooling loops

Reference Design Schematic

3 PODs shown below, design is for 6 PODs total



Vertiv Components of the Design

Component	Details
Medium Switchboard	4x 6,000A for IT and facility
UPS for IT	8x 1,700kVA Primary UPS for six PODs, 4 to make 3 redundancy
UPS for Facility	2x 600kVA facility UPS system for six PODs, 2N
PDU	24x 600kVA PDU
Busway	8x 400A, 240/415V busway per POD
Tap-off Boxes for computing racks	2x 60A TOB per computing rack per busway
Rack power for computing racks	8x 33kW OCP HPR ORV3 DC power shelves per computing rack
Tap-off Boxes for support racks	2x 40A TOB per support rack
Rack PDUs for support racks	2x 30A vertical rPDUs per rack, 2N
Free Cooling Chiller	8x 1,481kW chiller with 30% propylene glycol, N+2
CDU	2x 1,368kW CDU (N+1 pumps) per POD, N+1
CRAH	2x 205kW perimeter cooling for each pod, N+2 for three pods
Racks for support racks	60x 48U 800×1200mm, 10x per POD
Racks for computing racks	48x OCP ORV3 racks, 8x per POD