



Supermicro Liquid Cooling Solutions

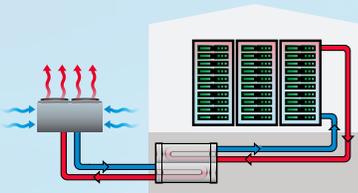
Superior Effectiveness of Liquid Cooling with Proven Deployments at Scale

More advanced data center cooling solutions are required to maintain the optimal operating conditions for today's data centers' smooth and efficient operation. As the rise of AI and big data requires massive amounts of data processing, heat is a byproduct of the high processing power.

- **Switching from Air Conditioning to More Effective Liquid Cooling Reduces OPEX by more than 40%**
 - A Switch from Air Conditioners to Liquid Cooling Technology Saves Energy
 - Additional power is saved by reducing system Fan Operation
 - 1 Year Average Payback on Facility Investment increases the ROI
- **Liquid Cooling Efficiency Dramatically Improves the PUE of Data Centers for High Performance, High Power CPUs, and GPUs**
 - Liquid is fundamentally more efficient at removing heat by up to 1000X
 - Future generations of CPUs and GPUs may require liquid Cooling as air cooling capacity is exceeded
 - The Highest performance and Highest Density servers can be supported, increasing computing capacity per sq. ft.
- **Reduces Costs and Environmental Impact**
 - Liquid cooling reduces power usage and lowers carbon emissions from fossil fuel power plants. Reducing the environmental impact of today's data centers is becoming a corporate responsibility.

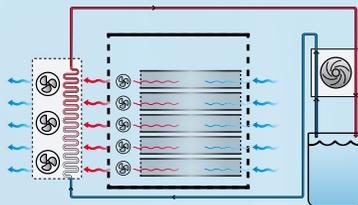
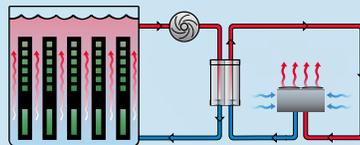
Supermicro's Rack Integration Services works with customers to architect, design, build, and test whatever type of liquid cooling is required. Supermicro engineers work to optimize at the rack level to enable high performance workloads.

Types of Liquid Cooling for your Datacenter that Supermicro Offers:

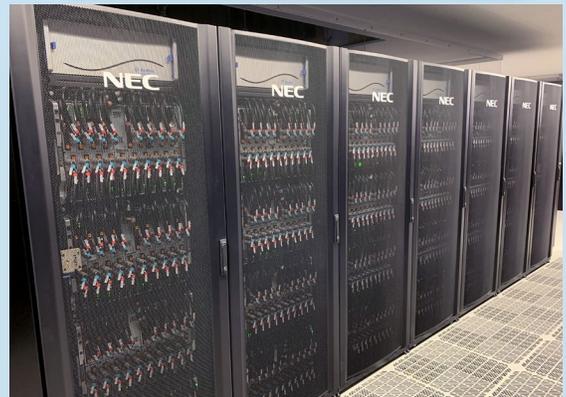
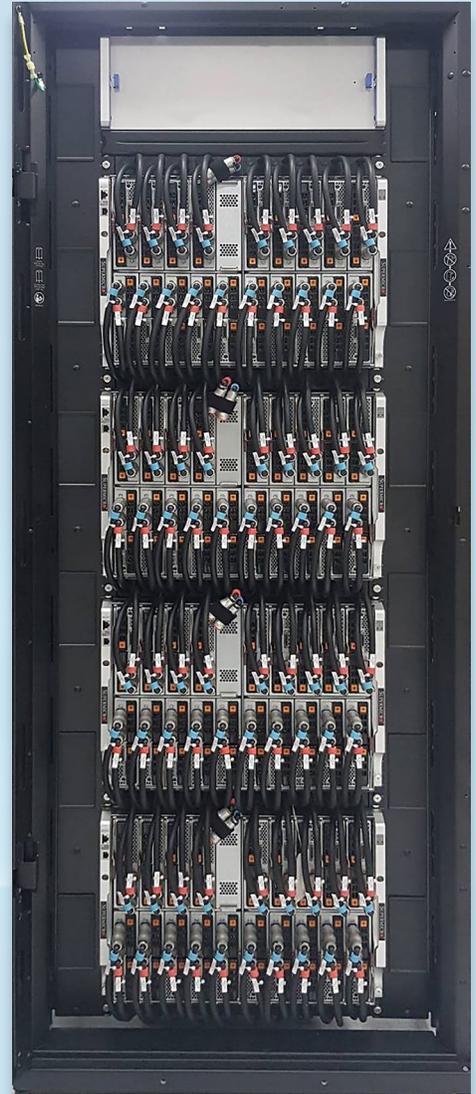


Direct To Chip – Liquid passes directly on the surface of a chip and draws heat away. The liquid is then cooled through a liquid to liquid heat exchanger, either contained within the rack or externally.

Immersive Cooling – The entire system is immersed in a liquid which cools all components. The warm liquid is then chilled and brought back into the tank.



Rear Door Heat Exchanger – The rear door of a rack contains several fans that draw hot air away from the servers and cool the air before the air is returned to the datacenter. The cooling liquid is then chilled externally to the door.



Supermicro Liquid Cooling Solutions



BigTwin®

The Supermicro BigTwin represents flagship performance for the most demanding applications and HCI environments. The innovative design supports up to four nodes in a 2U enclosure with no-compromise support for processors, memory and I/O. Each node can support dual 3rd Gen Intel® Xeon® Scalable processors, up to 20 DIMMs of DDR4 memory/PMEM and up to six high speed NVMe drives. AIOM (superset of OCP 3.0) networking options include 10GbE, 25GbE, 100GbE and InfiniBand (200 Gb HDR per port). Shared power and cooling maximize the resource-savings of the multi-node design. D2C coolers are mounted on the processors within each BigTwin node and routed through a CDM loop to the Liquid Cooling CDU.

SUPERBLADE®

A shared cooling, power, and networking infrastructure is key to the high density and server efficiency offered by the SuperBlade. Supermicro's high performance, density optimized, and energy-efficient SuperBlade supports up to 20 blade servers in an 8U chassis, with a choice of the 3rd Gen Intel® Xeon® Scalable processors or 3rd Gen AMD EPYC™ processors. With advanced networking options including 200G HDR InfiniBand, Supermicro's new generation blade product portfolio has been designed to optimize the TCO of key criteria for today's datacenters, e.g. power efficiency, node density and performance. A D2C cooler is mounted on each of the processors within the SuperBlade system and routed through a CDM loop to the Liquid Cooling CDU.



ULTRA

Supermicro Ultra SuperServers are designed to deliver the highest performance, flexibility, scalability and serviceability to demanding IT environments. 1U and 2U Ultra systems support dual 3rd Gen Intel® Xeon® Scalable processors or 3rd Gen AMD EPYC™ processors, up to 32 DIMMs of DDR4 memory and with a variety of Ultra Riser options offer built-in 1G, 10G and 25G Ethernet. Multiple high performance NVMe storage configurations are supported as well as options for SAS/SATA and hybrid NVMe drive bays. A D2C cooler is mounted on each of the processors within the Ultra system and routed through a CDM loop to the Liquid Cooling CDU.

GPU

Supermicro GPU systems are at the heart of today's AI and HPC excitement by combining the fastest processors, memory and GPUs together in a family of systems for AI/ML, Inferencing and HPC. The 2U or 4U GPU systems support 4 or 8 NVIDIA® A100 GPUs together with NVLink® and NVSwitch respectively, and are powered by the 3rd Gen Intel® Xeon® Scalable processors or AMD EPYC™ 7003/7002 Series processors, and up to 32 DIMMs of DDR4 memory providing an extremely compact and powerful AI or HPC system. D2C coolers are mounted on each of the processors and GPUs within the GPU system and routed through CDM loops to the Liquid Cooling CDU.



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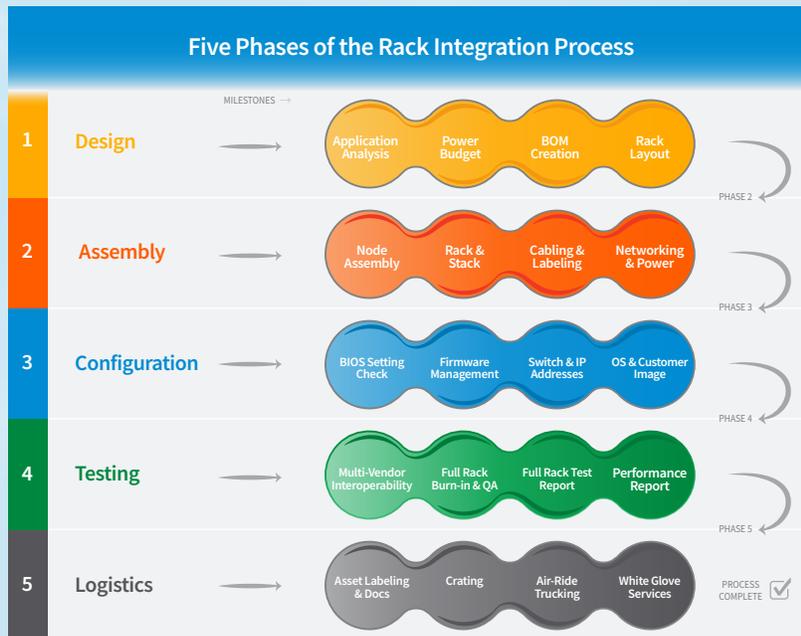
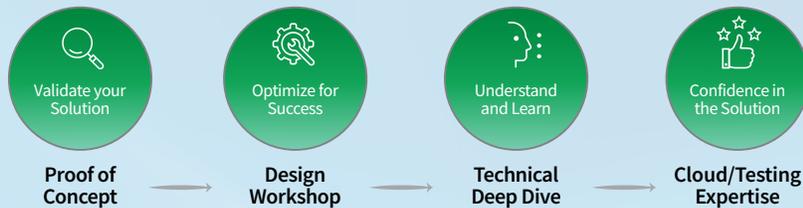


Supermicro's Rack Integration Services, Turnkey Cluster Level Liquid Solutions

Supermicro's Rack Integration Services leverage application-optimized motherboards, chassis, cooling subsystems, networking components, cluster management tools, energy-efficient power supply technologies, and compact enclosures to design and develop customized and enterprise solutions. Supermicro understands the importance of today's fast pace business problems and customer requirements; therefore, we offer an end-to-end integration service that helps customers reduce overhead, maximize efficiency and quality, making this a competitive strategy and a quick go-to-market advantage.

Supermicro works with leading organizations in all geographies to design, install, and test various liquid cooling solutions. The Supermicro process involves a rigorous set of phases that ensure the most optimized and tested solution for environments where liquid cooling is required for maximum performance.

Working with Supermicro Experts



Learn more at:

www.supermicro.com/liquidcooling

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