

A photograph of several server racks in a data center. The racks are filled with server units, and red and blue liquid cooling tubes are connected to the components. The image is partially obscured by geometric shapes: a grey triangle on the left and a purple triangle on the right.

GIGABYTE™

GIGABYTE Direct Liquid Cooling Solution

GIGABYTE Direct Liquid Cooling solution focuses on innovative breakthroughs in AI, HPC and cloud computing, delivering outstanding efficiency in heat dissipation while achieving high system availability and stability.

GIGABYTE Direct Liquid Cooling Solution

The New Mainstream for AI & HPC.

GIGABYTE offers both independently developed and third-party Direct Liquid Cooling (DLC) solutions designed for high-density computing in data centers. The advanced cooling system operates by allowing direct contact between heat-generating components, such as CPUs and GPUs, and a cold plate connected to tubes with coolant inside, effectively removing heat from the server through a more efficient and rapid method. Compared to traditional air-cooled systems, DLC transfers heat at a much higher rate, ensuring overall system performance and stability.

GIGABYTE DLC solutions can be easily integrated with both liquid-to-air and liquid-to-liquid coolant distribution units (CDUs), requiring minimal modifications to existing cooling hardware in data centers. Another option for easier adoption of new cooling solutions is deploying Rear Door Heat Exchangers (RDHxs). Compatible with both DLC servers and air-cooled servers, this design offers an ideal solution for gradually transitioning from air-cooling infrastructure to DLC data centers. These designs effectively help customers meet the increasing demands for greater heat dissipation at a reasonable cost and with ease of deployment.

To simplify the validation process, GIGABYTE also provides pre-tested, rack-scale DLC solutions with included software, which are easy to deploy and performance-optimized while still offering customizable options. With GIGABYTE servers and components from our trusted partners, we are committed to providing simple solutions for anyone looking for quick adoption of the latest cooling alternatives.



Cooling Challenges for AI, HPC, and Cloud Computing

Following the booming numbers in cloud computing services, AI has also started to become mainstream in every part of our daily lives. Combining the HPC needed in the field of scientific research, data centers worldwide continue to grow in number and scale. As the demand for computing power rapidly expands with limited space to be utilized, data centers are forced to come up with a much higher density solution, bringing unprecedented loads to the traditional air-cooling system design. Furthermore, the vibration generated by cooling fans in a server may result in damage to server components such as HDDs, and the noise could potentially damage the hearing of workers that routinely maintain IT hardware.

It is estimated that data centers now consume approximately 1% of the world's electricity, with the average power usage effectiveness (PUE) being in the range of 1.4 to 1.6. This number indicates that around 33% of the facility power is spent not on powering the IT hardware itself but on facility costs, including a majority part on air conditioning. DLC is a much more efficient way of transferring heat away from electrical components, and since air cooling equipment within a server, such as large fans and heat sinks, is no longer required, liquid cooling systems can fit into a more compact design, potentially supporting a much greater density of CPUs and GPUs in limited space. Overall, the popular and standardized DLC technology has been proven effective throughout the past few years, and it is now a mature technology suitable for all scales of applications from small-sized data centers and smaller HPC cluster deployments to exascale computing facilities.

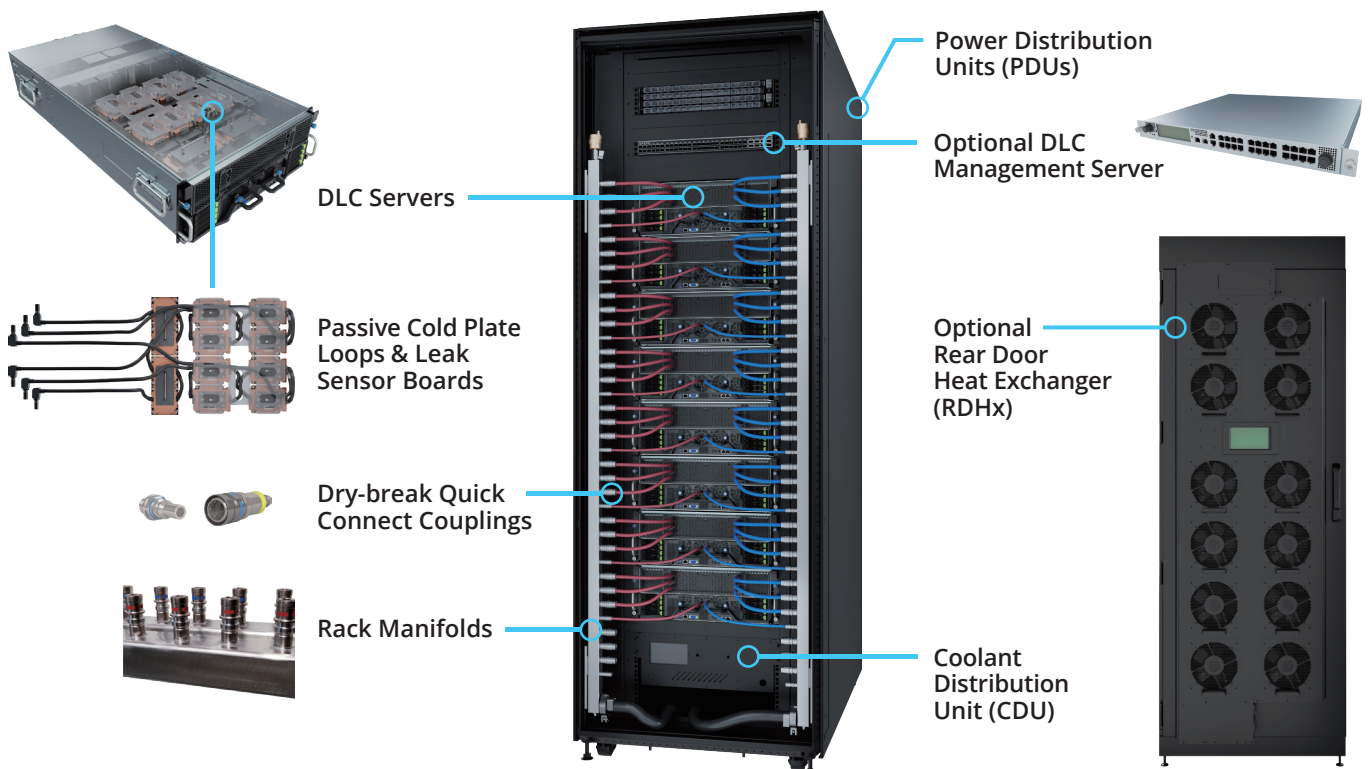
Liquid-Cooled Rack Configurations



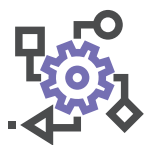
Project name	DL83-GP0	DL83-GP1	DL83-GP2	DL83-GP4	DL83-HD0	DL83-HD1
Compatible DLC Server (w/o redundant)	Max. unit: 4 G593-SD1-LAX3 G593-ZD1-LAX3 G593-SX1-LAX1 G593-ZX1-LAX1	Max. unit: 8 G4L3-SD1-LAX3 G4L3-ZD1-LAX3	Max. unit: 8 G4L3-SD1-LAX5 G4L3-ZD1-LAX5 G4L3-ZX1-LAX2	Max. unit: 8 G383-R80-LAP1	Max. unit: 16 H263-S62/S63-L H273-Z80/Z81-L H274-S60/S61-L Max. unit: 10 H374-A8/A81-L	Max. unit: 15 H273-Z85-LAZ1 H274-A81-LAZ1
Manifold	1	1	1	1	1	1
CDU	1	1	1	1	1	1
PDU* (w/o redundant)	2	4	4	2	2	2
Rack	1 (manifold in front)	1 (manifold in front)	1 (manifold in front)	1 (manifold in rear)	1 (manifold in rear)	1 (manifold in rear)

*Optional Smart PDU (Default is Metered Input PDU.)

Hardware Components of DLC Solution

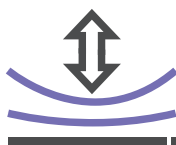


Why GIGABYTE DLC Solution



All-in-one & fully optimized

Providing an all-in-one rack solution tailored for customers seeking a complete, high-performance setup.



Flexible & reliable

Tested with various brands to allow customers to customize configurations using products from verified partners.



Faster delivery at a lower cost

Ensuring shorter lead times and competitive pricing while maintaining the high-quality performance and services offered by GIGABYTE and its partners.

Another Step Toward Green Computing with GIGABYTE DLC Solution

GIGABYTE DLC technology further demonstrates our commitment to sustainability. Compared to air cooling solutions, the DLC solution is more energy efficient, as seen in its low PUE value. It eliminates the need for additional server fans, and the passive cold plates and CDUs enable precise control of the system's operating temperature. This results in a significant decrease in lost energy and noise. At the same time, the lower and stable component temperature extends the hardware lifespan.

The GIGABYTE DLC solution not only provides innovative technical solutions but also reflects GIGABYTE's leadership in advancing technology, tackling heat dissipation challenges, and pursuing sustainable development. It enables clients to achieve environmental sustainability aligned objectives and usher in green computing. Additionally, it facilitates rapid deployment for businesses, streamlines client verification and evaluation processes, saves time, and reduces operational costs.



G4L4/G4L3 Series

4U DP 8-GPU HPC/AI Server
NVIDIA HGX™ / AMD Instinct™



G383-R80

3U 4-APU HPC/AI Server
AMD Instinct™ MI300A



XN24-VC0

2U MGX Server
NVIDIA GB200 NVL4



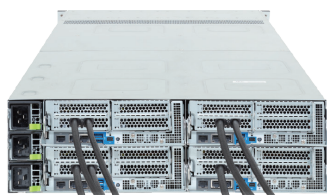
R184/R183 Series

1U DP Rack Server
Intel® Xeon® / AMD EPYC™



B684/B683 Series

6U 10-Node DP Blade Server
Intel® Xeon® 6
AMD EPYC™ 9005/9004



H374 Series

3U 4-Node High-density Server
Intel® Xeon® 6



H273/H263 Series

2U 4-Node High-density Server
Intel® Xeon® / AMD EPYC™
NVIDIA Grace™ Superchip



N120-LS0

DLC Management Server
Monitoring for DLC components



Learn more at <https://www.GigaComputing.com/en>

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