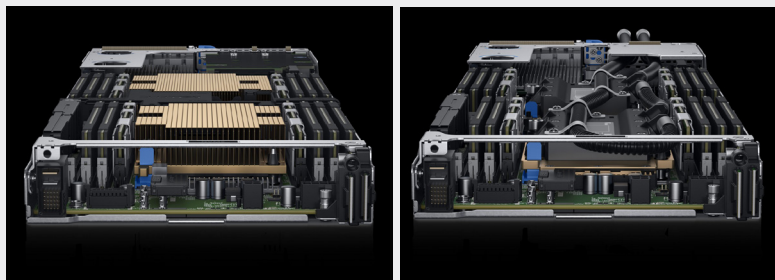


IMPROVE POWER EFFICIENCY WITH DELL EMC POWEREDGE AND COOLIT SYSTEMS RACK DCLC™

ACCELERATE DATA CENTER PERFORMANCE AND REDUCE TCO BY HALF



Benefits of Rack DCLC

56%	<p>Spend up to 56% less on cooling energy costs (Cooling PUE) for data center infrastructure with Direct Contact Liquid Cooling (DCLC).¹</p>
23%	<p>Deploy approximately 23% more equipment with Direct Contact Liquid Cooling (DCLC).²</p>
< 1	<p>Deploy Direct Contact Liquid Cooling (DCLC) within existing cooling tower infrastructure and receive a ROI of less than 1 year.³</p>

¹ Based on Dell EMC internal analysis, April 2017, comparing a hypothetical air-cooled data center with a cooling PUE of 0.6 to a hybrid data center with a cooling PUE of 0.26. A PUE of 0.22 was assigned to all overhead not attributed to cooling. Individual operating costs and other factors will cause results to vary. RS Means industry standards cost basis was used to measure typical cooling infrastructure costs and determine projected savings.

² Based on Dell EMC internal analysis, April 2017 comparing a hypothetical air-cooled data center to a hybrid data center. Assuming 800 nodes, the air cooled data center uses 874.7 kW whereas the hybrid uses 676.5 kW. Individual operating costs and other factors will vary the results. RS Means industry standards cost basis was used to measure typical cooling infrastructure costs and determine projected savings.

³ Based on Dell EMC internal analysis, calculating the capital cost of DLC minus the amount of CRAH, pumps, chiller, and tower to equal the net cost of DLC, and examining the operational costs of a hypothetical air-cooled data center and a hybrid data center to determine ROI. Assumes a high wattage CPU. HPC engineering developed an analytical model that ascribes capital and operating costs to the various types of facility infrastructure equipment. Individual operating costs and other factors will vary the results. RS Means industry standards cost basis was used to measure typical cooling infrastructure costs and determine projected savings.

High Performance Computing (HPC) and hyperscale data center growth is on the rise and customers relying solely on air-cooling face challenges in maintaining performance and efficiency. Dell EMC PowerEdge with CoolIT Systems Liquid Cooling can improve power and cooling efficiency in these large scale environments.

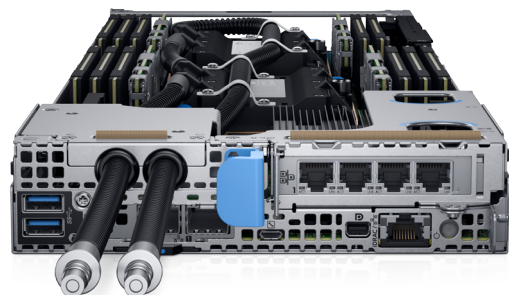
The Bedrock of the Modern Data Center

Purpose-built for high performance, hyperscale workloads, PowerEdge C6420 allows customers to accelerate application and workload performance and reduce power costs while dramatically increasing rack density.

Featuring 4 nodes in a 2U form factor, this robust server leverages CoolIT Systems' rack-based Direct Contact Liquid Cooling technology (Rack DCLC™) to support higher wattage processors for increased performance, energy efficiency and rack-level density for today's modern data centers.

Improve Power Efficiency, Increase Density and Reduce TCO with CoolIT Systems Rack DCLC

Each 1U half-wide compute sled (1 node) includes dedicated liquid cooling to high wattage dual processors. The cold plate solution, designed and manufactured by CoolIT, uses room-temperature water to cool the CPUs, eliminating the need for chilled water and lowers overall energy costs by 56%. This impressive liquid cooled solution allows for approximately 23% more rack equipment using existing cooling infrastructure, perfect for installations with space constraints.

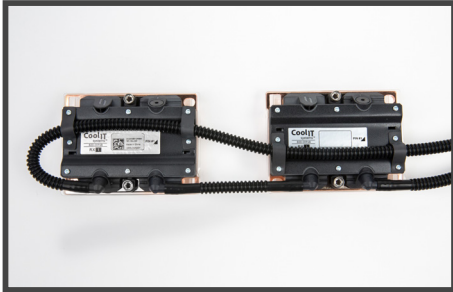


Dell EMC PowerEdge C6420 Liquid Cooling Sled

Modular DCLC Solution Components

Rack DCLC™ utilizes a three module “building block” approach that provides a tremendous amount of product flexibility when integrating liquid cooling into any compute environment or configuration.

- **Passive Coldplate Loop:** CoolIT Systems RX1 coldplates, specifically designed for use with Intel® Xeon® SP processors, are passive CPU Cooling solutions managed via a centralized pumping architecture. These coldplate assemblies replace heatsinks and are purpose-designed to accommodate C6420 compute sleds



C6420 Passive Coldplate Loop

- **Rack Manifold:** Coolant tubes come out of each sled and connect to a manifold unit. Made with reliable stainless steel and 100% non-drip quick disconnects, Rack Manifolds for PowerEdge C6320 are installed in the back of the rack, and can be customized for a particular installation.



Rack Manifold

- **Coolant Distribution Unit:** CoolIT Systems Rack DCLC product line offers a variety of Coolant Distribution Units depending on load requirements and availability of facility water, including rack mount CHx80, stand-alone CHx650 and custom options.

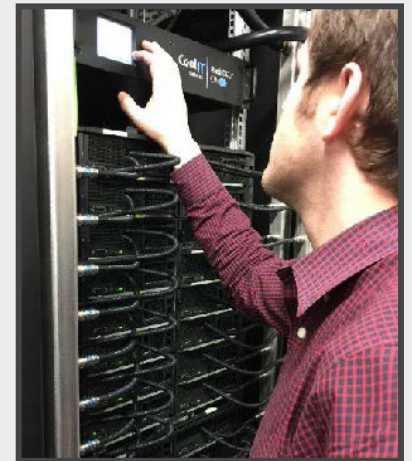


Rack DCLC CHx80 Coolant Distribution Unit

DCLC: The Future of Data Center Cooling

Direct Contact Liquid Cooling (DCLC™) uses the exceptional thermal conductivity of liquid to provide dense, concentrated cooling to targeted surface areas. By integrating DCLC, dependence on fans, expensive air conditioning and air handling systems is drastically reduced, enabling extremely high rack densities, reduced power use and access to higher performance potential.

Supported by Coolant Distribution Unit options for data centers with or without facility water hook up, customers can immediately benefit from measurable OPEX savings.



Data Center using Rack DCLC™ CHx40



Learn more about Dell EMC server solutions:
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*Not all features are available on all platforms. For a comprehensive list, visit dell.com/servers.

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