

Colovore Deploys Liquid Cooling Solution to Offer Customers Rack Capacities up to 50 Kilowatts



A Vertiv Case Study



Background

Located in the heart of Silicon Valley, Colovore was created specifically to meet the area's need for data center infrastructure able to support next-generation high-performance computing (HPC). With up to 50 kilowatts (kW) of power and cooling capacity in every cabinet and a pay-by-the-kW pricing model, Colovore's data center is optimized to support private and hybrid cloud, big data, artificial intelligence (AI), machine learning, and internet of things (IoT) applications. Servers supporting these data-intensive applications require significantly more power and cooling to operate efficiently, stressing legacy colocation environments.

Challenge

Expansion limitations

The age of connectedness and massive data consumption has boosted the adoption of advanced hardware which requires more power consumption than other data center equipment. For example, graphics processing unit (GPU) servers today routinely draw 1 kW per server rack unit. This increase in power usage coupled with the high operating temperatures of high-density environments required Colovore to implement a robust thermal management solution that would enable compact server footprints that maximize power, cooling and operating efficiency.

The Silicon Valley region, featuring the largest concentration of high-tech companies in the United States, has a relatively constrained supply of land and data center space. Colovore's high-density solutions are an ideal fit for the region because they allow customers to deploy servers in a highly compact footprint that requires much less space and far fewer cabinets than traditional colocation facilities. The solutions reduce costs and improve IT scalability, allowing Bay Area customers to grow within their footprint as opposed to requiring more floor space.



Challenge: Implement a robust thermal management solution that would enable compact server footprints that maximize power, cooling, and operating efficiency

Solution: IT racks using Vertiv™ Liebert® DCD rack door cooling module

Results:

- Enabled fully-packed, top-to-bottom rack deployments with no wasted or unusable rack unit slots
- Increased operating and capital efficiency due to significant reductions in required cabinets and data center floor space
- Achieved lower operating costs with savings passed on to customers
- Improved cooling effectiveness enabling continued support of advanced applications and higher rack densities

Solution

Utilizing Vertiv equipment since it was founded in 2012, Colovore was designed specifically to meet the high-density colocation needs of the tech-heavy Silicon Valley. Not only does the geography demand superior space utilization for maximum power, cooling and operating efficiency, but so do the area's customers — many of which are on the leading edge of developing or using data-intensive technologies such as AI, VR, and big data cloud applications. The servers underlying these applications require significantly more power and cooling than traditional general-purpose server infrastructure.

This high-density environment needed a thermal management solution beyond typical data center cooling and the Vertiv™ Liebert® DCD heat exchanger that installs at the rear door of a rack was an ideal solution, allowing for elevated heat loads.

In a national data center industry survey by Uptime Institute, the highest server density deployed by 59% of the respondents was 19 kW per rack or less and the single highest-density deployment was 26 kW per rack. Additionally, only 14% of respondents were cooling their high-density racks using liquid-based cooling. The Vertiv™ Liebert® DCD rack door cooling module allowed Colovore to provide up to 50 kW per rack across the entire data center floor which is a differentiator in the Bay Area colocation marketplace.

In fact, Colovore was recently certified by HPC market leader NVIDIA as a DGX-Ready Data Center, signifying that Colovore is well-positioned to support high-density DGX GPU server deployments because of its distinguished power and cooling capabilities. It already has close to 1,000 DGX platforms in service in its data center.

"We always want to drive operating efficiencies and PUE as low as possible, as this ultimately benefits our customers," Coughlin said.

It was in this vein that Colovore's engineering team worked with Vertiv to do performance testing, ensuring the Vertiv™ Liebert® DCD solution could deliver within its unique space. This testing validated a very low PUE while running at wet bulb temperatures well within geographic-specific guidelines from the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

Already understanding Vertiv's expertise and having confidence in the local support received since its inception, Colovore chose to standardize on Vertiv solutions. The company has deployed

"It's not uncommon to see power usage effectiveness at 1.6 or higher at an 80% load, and with the water-cooled rear doors, we have already dropped our PUE to 1.1 at a 50% load, which quite frankly is phenomenal."

— Ben Coughlin, Chief Financial Officer
and Co-Founder, Colovore

several hundred IT racks using the Vertiv™ Liebert® DCD cooling modules in all three phases of its data center, and the rear doors' performance has been flawless after several years in operation.

Colovore has also utilized other Vertiv infrastructure such as the Vertiv™ Liebert® EXL uninterruptible power supply (UPS), Vertiv™ Liebert® CRV system for supplemental cooling, Vertiv™ Liebert® DS cooling system for its electrical room, intelligent rack power distribution units (rPDUs), and the Vertiv™ Liebert® SiteScan™ monitoring and control system.

"Vertiv was uniquely positioned to be a total solutions provider having unmatched expertise in both data center power and cooling, along with a breadth of products to meet other monitoring and management needs," Coughlin said. "We expect ever-increasing density requirements, and I have no doubt the Vertiv team will continue to be a partner in addressing them."

Colovore recently expanded and pre-sold its entire 2 MW fourth phase of development and plans to deliver its second 9 MW, liquid-cooled data center in Silicon Valley within 18 months.

Results

By embracing new technologies, Colovore was able to more effectively meet its customers' needs. Ultimately, this provider of colocation solutions:

- Enabled fully-packed, top-to-bottom rack deployments with no wasted or unusable rack unit slots
- Increased operating and capital efficiency due to significant reductions in required cabinets and data center floor space
- Achieved lower operating costs with savings passed on to customers
- Improved cooling effectiveness, enabling continued support of advanced applications and higher rack densities

Go online to learn more about [liquid cooling](#) and the [Vertiv™ Liebert® DCD rack door cooling module](#).

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