



SUCCESSFUL SOLUTIONS

Lakeland COMMUNITY COLLEGE



Lakeland Community College offers associate degrees, technical certificate programs, and noncredit workforce and professional development courses to more than 20,000 students across its four primary locations. The main campus, located northeast of Cleveland in Kirtland, Ohio, is the hub of Lakeland's information technology facilities. Lakeland's data center is responsible for ensuring that many services, including administrative functions, file storage, and multimedia file sharing are accessible to students and faculty. Most importantly, the data center must be able to support Lakeland's extensive distance learning program (which includes online courses and interactive video conference) so that it can provide dependable services to students across its campuses in Ohio as well as students enrolled throughout the US. In order to maintain reliable services, the Lakeland Community College data center must properly manage power, cooling, cable management, and its ability to scale as the college grows.

As Lakeland's energy-savings initiative (the Feasibility Assessment and Integrated Energy Master Plan) unfolded across campus, the data center also underwent improvements. Beginning in 2011, the original data center building was remodeled and a new wing was constructed that would house the updated data center.

In 2012, Great Lakes worked closely with the facilities managers at Lakeland to understand their goals and vision of the data center and campus. Initial discussions included topics on how to properly cool the data center, internal and external cable management, grounding requirements, and cabinet identification. However, the ultimate objective of Lakeland was to "future-proof" its data center, or ensure the cooling capacity, cable management, and power management could continuously be upgraded throughout the life of the data center, all while utilizing the same equipment (including enclosures) chosen in the initial design phase.

Nine (9), 78"H x 32"W x 48"D EN enclosures were deployed to manage large switch installations. Twelve (12), 78"H x 30"W x 42"D ES Server enclosures were deployed to hold switch and EMC storage equipment for Lakeland, and several enclosures would be offered as co-location space to other schools.

GREAT LAKES CASE & CABINET



Invest in Solid Engineering

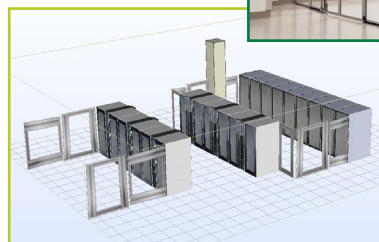
The long term goal at Lakeland was to implement containment throughout the data center while using a combination of traditional CRAC units and several in-row cooling units. Three rows of enclosures were arranged in a hot aisle/cold aisle configuration; two rows of six ES enclosures and one row of nine EN enclosures. Each row of ES enclosures included space for up to three in-row cooling units. A total of three in-row units were installed within the two rows of ES enclosures; however, three additional 12" gaps were left between enclosures to allow future units to be installed. In order to preserve proper cooling in the hot aisle/cold aisle layout, Great Lakes manufactured in-row place holders to fill the gaps. When increased cooling capacity is required, the panels can easily be removed to make room for additional in-row units.



In-row cooling unit

In-row place holder

Nearly eighteen months after the initial install of Great Lakes enclosures, cold aisle containment was implemented in the data center. Lakeland and Great Lakes discussed the requirements needed to deploy a proper containment solution, and there were several unique variables that existed: the row of ES and EN enclosures that faced each other were not the same length; the third row of enclosures faced a wall; and the aisle widths were more than 48" apart (the typical data center aisle is 48"W). Great Lakes was able to source a unique solution for Lakeland. Containment panels, constructed of extruded aluminum frames and clear polycarbonate panels, were added to the row of ES enclosures. The ES and EN rows were now even, allowing dual sliding doors to be added to one end of the row. A structural support beam was located at the opposite end of the aisle; a single aisle door and panels were added to contain the opposite end. A third row of enclosures was contained with sliding doors that extended from the enclosure to the wall. All containment panels were manufactured at custom sizes to accommodate the unique dimensions within the data center.



After installation of the custom containment system and virtualization of hundreds of servers onto 50 denser blade systems, the single 10 ton cooling unit was able to be shut off. This change allowed Lakeland to achieve 9000 kWh reduction in the row and 2334 kWh reduction at the UPS, contributing to the college's overall savings of \$550,000 per year in annual utility costs. Reduced utility consumption in electricity, natural gas, and water usage helped the college achieve LEED silver certification in 2014.

Over the past four years, Great Lakes has been able to provide Lakeland College with dedicated support. The same Great Lakes sales manager, engineer, and local manufacturer's representative have worked with Lakeland to ensure that current and future data center needs are met.

DATA CENTER OVERVIEW

- Starline Track Busway system
- 21 Great Lakes enclosures in 3 rows
- ABB DCIM software
- 3 In-Row Liebert CRV 30 row based cooling
- 10-ton AC unit (shut off)
- Liebert MPH Power Distribution – Power Strips
- 93 Terabytes of data
- 50 total physical servers
(8 physical to run 144 virtual servers)
- Redundant Power Supplies
- 1 Generator
- Awarded LEED Silver 2014