

DAMAC CASE STUDY

Social Media

Overview

A social networking and technology company experiencing triple-digit growth rates asked DAMAC to design and implement a new type of data center racking system. The goal was to accommodate rapidly increasing storage and compute densities while maximizing a fixed amount of floor space within multiple third-party colocation facilities spanning the United States.

The company's specifications called for a rack that could:

- Support a 3,000 lb. static weight load
- Be integrated either on-site or off-site for easy plug-and-play deployment.

The high-density equipment clusters in the colocations would increase the heat load, which made effective thermal management critical. At the time, most data center designs had a uniform energy distribution of around 2kW to 4kW per rack. This new rack, however, would have to accommodate much higher kW loads, a level where traditional forced-air cooling methods lose their effectiveness.

To reduce heat and meet strict power consumption restrictions established by the colocation facilities, the customer required a rack design that would also work in a hot aisle/ cold aisle configuration.

DAMAC's Solution

After reviewing all project requirements, DAMAC's engineers developed our FasTrak server rack, which features tubular steel construction and fully-welded seams for enhanced vertical and horizontal strength. The customer could safely transport the FasTrak with up to 3,000 lbs. of equipment because of its enhanced structural integrity. Our FasTrak server rack met the customers' requirement for on-site or off-site configuration, allowing them to rack, stack and ship their rack from their off-site integrator directly to their colocation facility.

The FasTrak design also delivers more functional space than one would receive from a traditional rackmount footprint. Recessed side panels allow for zero-clearance coupling between cabinets, and a top panel has multiple pass-through ports for routing cables. A proprietary rear coffin section allowed the company to recess power and data cables into the cabinet frame to ensure unobstructed airflow and easy access for equipment maintenance. These design elements allow for servers and other gear to occupy the full height of the rack and make it easier to access servers and switches.

To further improve energy efficiency, the customer deployed DAMAC's cold aisle containment system within the colocation space. Because this system uses lightweight polycarbonate panels to isolate chilled intake air from hot exhaust air, it increased cooling and airflow efficiencies.

Quick Wins

For the initial deployment, DAMAC's FasTrak server racks were configured and deployed on-site within seven working days. The speed and agility of this deployment provided quick capacity expansion for growing data traffic. Immediate return within the colocation included:

20% improvement in airflow efficiency

30% reduction in cooling costs (When combined with DAMAC's cold aisle containment system)

A Continued Partnership

A year after successful projects at multiple colocation facilities, the customer decided to build three independent data centers to accommodate their continued growth. This time DAMAC was asked to collaborate with their team to develop a new rack to meet unique mounting requirements for servers that were outside the industry-standard Electronic Industries Alliance (EIA) mounting specifications.

This new customer-developed server would require a taller, wider and deeper rack to pack more servers into data center real estate, improve airflow management and fit more cabling into cabinets. This effort marked the beginning of the Open Compute Project (OCP), an industry-wide initiative to share efficient server and data center designs.

DAMAC engineers conceived the Triplet OCP Rack, the industry's first OCP standard rack, which combines three traditional server racks into one triple-wide rack system that reduces the rack footprint by 5 percent. It can be fully populated in an off-site integration facility and shipped with a rolling weight capacity of 6,500 lbs. Because the customer's data center was in an area with potential seismic activity, the rack also features a seismic floor mounting plate, anchor points and levelers.

As the customer's needs continued to drive the OCP standard in more platforms within its data center, DAMAC developed additional racks to meet those needs. The Triplet Rack gave birth to a single rack version and many other variations over the next three years.

DAMAC also developed its hot aisle containment system specifically for this data center project to isolate hot exhaust air and move it out of the building, dramatically reducing the amount of space that needs to be cooled.

The effectiveness of DAMAC's products was demonstrated by the facility's Power Usage Effectiveness (PUE) rating, an industry-accepted metric for measuring data center efficiency, calculated by dividing the total power consumed by a data center facility by the power consumed by the IT equipment. A data center PUE of 1.0 would indicate 100-percent efficiency, and the typical data center PUE is around 1.67. This customer's PUE was an impressive 1.07.



Our team is here to help with your next data center project.
Contact us today at DAMACSales@Maysteel.com or give us a call at 714-228-2900

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Solution Summary

- Initial custom design accommodates high-density storage and compute requirements while maximizing colocation real estate
- Aisle containment strategies combined with rack designs deliver immediate improvements in airflow efficiency and power consumption
- Following continued growth, DAMAC achieved the industry's first "OU" rack, with non-EIA equipment mounting built to the Open Compute Standard
- Tubular steel construction and fully-welded seams support a 6,500-lb. dynamic weight load and meet seismic construction standards
- Additional aisle containment systems contribute to a near-perfect data center efficiency rating



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