

DATA CENTER STRUCTURES:
**MEETING THE SPEED AND AGILITY
DEMANDS OF WEB-SCALE IT**



DAMAC
PREMIUM DATACENTER PRODUCTS

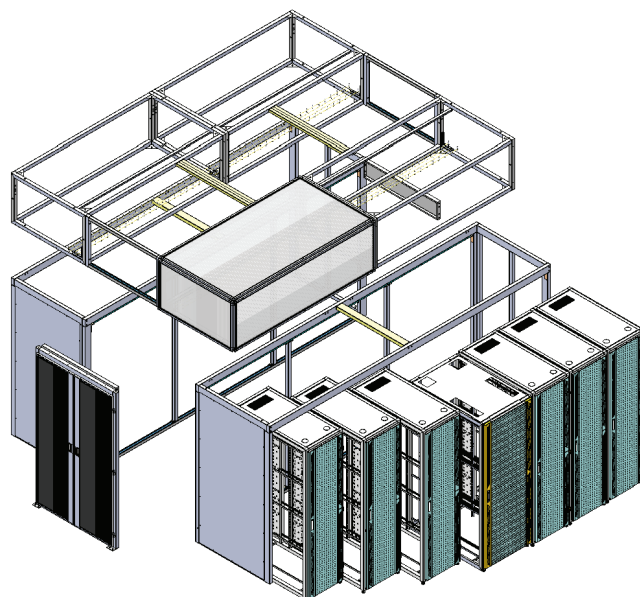
EXECUTIVE SUMMARY

The web-scale IT concept is derived from large service provider environments, which demand massive compute and storage capacity coupled with lightning-fast speed and agility. Typically associated with Amazon, Google and Facebook, the web-scale model has fundamentally altered the way IT services are delivered, and organizations are under increasing pressure to keep pace. As a result, Gartner predicts that 50 percent of enterprises will adopt a web-scale IT approach by 2017, up from less than 10 percent in 2013.

The data center infrastructure forms the foundation of web-scale IT. Data center facilities must be architected to optimize environmental conditions while enabling rapid deployment. In this context, traditional data center designs are giving way to a flexible approach based upon self-contained, modular structures.

Modular structures incorporate all of the components of a modern aisle-containment design in freestanding units that can be assembled rapidly onsite. These prefabricated systems enable organizations to reduce the time and cost associated with data center buildouts, and create a more consistent environment that responds to changing requirements. Modular structures further increase cooling efficiencies, enabling organizations to maintain optimum temperatures at a lower cost.

DAMAC has developed a modular structure system for today's web-scale IT environments. Crafted from the finest materials using best-in-class manufacturing processes, DAMAC's modular structures represent the leading edge in data center infrastructure design.



REDUCING TIME, COST AND WASTE

Traditional data center facilities are built from the ground up by anchoring server cabinets and racks to the floor then adding aisle containment, cable routing and overhead power distribution. The process is labor-intensive, and waste occurs when materials are cut to fit onsite. Of course, the greatest waste is in time — each component is typically handled by a different contractor, and each phase must be completed before the next phase can begin.

In a web-scale environment, such an approach is unsustainable. Organizations with high-density computing requirements have begun to rethink data center design from the ground up, developing a modular concept that affords greater speed, agility and scalability while reducing costs.

With a modular structure, all components are incorporated into a prefabricated system. Materials are cut and assembled to exact specifications, minimizing waste. A single vendor handles the entire process and all phases are completed at once. As such, a modular structure can be up and running in 75 percent less time than a traditional facility.

TRADITIONAL DATA CENTER BUILD-OUT	MODULAR STRUCTURES
Server cabinets and racks are mounted to the floor. A contractor must be engaged to drill holes in the data center floor and anchor the cabinets.	Server cabinets and racks are bolted to the freestanding structure.
Once the cabinets and racks are in place, a contractor must be engaged to install the hot or cold aisle-containment system.	Aisle containment is integrated into the structure.
A cabling contractor is then engaged to install basket tray, ladder rack or fiber runner duct systems within, across and along the aisles to route data and fiber cables to each cabinet and rack, and back to the main distribution frame.	The structure includes a cable routing system that is laid out, cut and color coded according to the customer’s requirements.
An electrical contractor must be engaged to install an overhead busway power distribution system.	The busway system is already mounted onto the modular structure.

ADDITIONAL BENEFITS

Modular structures enable organizations to develop a corporate standard for the data center infrastructure. With a prefabricated system, the design can be replicated — not only within the same facility but across multiple data center facilities. By creating consistency throughout the enterprise, modular structures streamline data center management processes and facilitate moves, adds and changes.

Because the modular structure supports the overhead busway, cable routing and aisle-containment components, the building's ceiling system does not have to handle the load. This eliminates the need to build or retrofit the roof with ceiling support grids. The only modifications to the building involve anchoring the structure to the floor. Modular structures reduce the number of connections required for the data center infrastructure. The structure requires just one power connection, one data in-feed and one cooling inlet.

A prefabricated structure also enables an organization to improve the facility's power usage effectiveness (PUE), the measure of how much energy is consumed by computing equipment versus cooling and other overhead. Modular structures have a defined footprint, enabling organizations to accurately calculate how much cooling is needed for the equipment installed within the structure. There is no need to overbuild power and cooling systems to support the entire facility.

DAMAC's Four-Tier Modular Structure System

- Tier 1: Cabinet Anchoring
- Tier 2: Aisle Containment
- Tier 3: Cable Routing
- Tier 4: Power Distribution Busway

Each project begins with a consultation to determine the customer's design preferences and data center facility requirements. The structure is then manufactured to precise specifications by the DAMAC team.

THE DAMAC DIFFERENCE

DAMAC is a pioneer in the development of modular structures for web-scale IT environments. The company developed its first structure in 2009, and has evolved the modular structure concept to meet the changing requirements of high-density data centers.

Today, DAMAC's modular structures incorporate tubular steel construction and fabricated brackets to create a highly flexible yet durable system. These units are built to the same exacting standards as the company's server cabinets, racks and aisle-containment systems.

DAMAC's quick-connect system and adjustable channels and tracks make modifications simple. Structures can also be coupled together in a daisy-chain configuration.

Customers can choose just the cabinet anchoring and aisle-containment structure, add the cable routing structure, or go with a complete system that includes the power distribution busway. Third-party components can also be incorporated into DAMAC's prefabricated system.

CONCLUSION

As more enterprises seek to gain the benefits of an agile, cost-optimized data center environment, the web-scale IT model is slowly becoming mainstream. Web-scale IT is a set of architectures and best practices that are designed to squeeze out cost and waste while accelerating technology deployments. It brings an industrial engineering mindset to the data center environment with an emphasis on tightly integrated systems and optimized processes.

Modular structures have become a core component of the web-scale IT environment. Because they eliminate the need for complex, multiphase buildouts, these prefabricated systems reduce the time needed to construct the data center infrastructure by up to 75 percent. They also help optimize cooling, cabling, power distribution and more, while reducing costs and enhancing efficiency.

DAMAC has leveraged its expertise in web-scale data center infrastructure to develop a state-of-the-art modular structure system. This proven, turnkey solution provides a flexible, scalable platform for web-scale IT deployments.



DAMAC

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