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The Modular Data Center

The Good, the Bad and, the Not so Gly

In today's global economy, organizations must be agile when it comes to changing business landscapes, whether scaling up or down data capacity, high-density computing, or cloud environments. The modular data center may be a viable choice.

Modular Data Centers, also called Micro or Containerized Data Centers, provide a portable approach to deploying data center capacity anywhere and anytime. It comprises prefabricated modules and standardized components, including racks and IT infrastructure.

By the end of 2023, the global data center market size is forecasted to grow to more than **\$416 billion**, with the modular data center estimated to be over **\$30 billion**.

Modular Data Center Drivers

Cloud Computing

Provides a high-density or private cloud computing solution that becomes operational quickly.

Network Edge

Organizations are utilizing technologies that need to deploy at the network edge.

Scalability

The concept of pay as you grow is an easy solution when needing to expand or decrease capacity according to your organization's needs.

Sustainability

Net-zero initiatives play a significant role within the data center industry. Modular data centers are factory-produced structures. They require fewer people to build and maintain on-site operations, decreasing energy costs, including power for the plant, tools, lighting, transport, and workman accommodations. Additionally, these data centers are prefabricated — components are pre-cut to standard sizes — which decreases waste. Modular data centers are built off-site and shipped to their destination in one delivery. Recycling is an option for modular parts like cooling, uninterruptible power supply (UPS), and equipment if or when the modular data center is no longer needed.

Flexible and Mobile

Companies are looking for location flexibility to get their end users as close to the data source as possible while offering the option to scale quickly. These data centers can move seamlessly from one location to another.

Fully Tested with Quick Deployment

Modular data centers are fully tested before deployment. It takes a few days up to a few weeks to deploy compared to 9 to 12 months at a traditional data center.

Challenges of Modular Data Centers

Testing and Certification

Depending on what country you are deploying your modular data center, local authority approvals must be met for specific test certificates, like building materials, equipment, and components used in the construction. Other certifications include structural design calculation formats, fire rating of the door and wall panels, cables and electrical panels, and firefighting vendor certification. Once a modular data center is ready to deploy, it must pass a final inspection.

The **US National Electrical Code (NEC)** article 646 allows manufacturers to certify modular data centers for compliance before distribution with the UL2755 certification. It must be obtained before the modular data center is shipped from the factory to the installation site.

Long-Term Agreement

On average, modular data center customers must enter into an agreement term of 15 to 25 years. This long-term agreement is risky since many components, controls, and software are vendor-owned. It makes for a one-sided relationship where the customer depends on the vendor. In this type of long-term relationship, ensuring the vendor will have spare parts available is difficult to gauge when it comes to replacing equipment or software.

Weather

Unlike a traditional data center, the modular data center is out in the open and subjected to extreme weather conditions, insects, animals, and even vandalism.

Modular Data Center Use Cases

Sporting Events

The use of modular data centers within the sporting industry is common. Formula One teams require the ability to process data on-site. Teams need computing, storage, and network technologies to analyze data and monitor performance on the track. The short distance between the source and the processing of information provides teams with **telemetry data** that is accessible in real-time. Formula One cars have 120 sensors that measure oil, water, exhaust, tire temperatures, speed, engine revs per minute, clutch fluid pressure, and the driver's heartbeat. They need a modular data center that is compact, light, quick to set up, and transportable anywhere in the world.

Military

Modular data centers are used for defense military deployments. It provides the military with a strategic advantage in remote locations, easily transferred from one place to another, and can be deployed anywhere in the world, including war zones. Once a mission is complete, the modular data center can be easily relocated.

Disaster Areas

Modular data centers are a viable choice for disaster-prone areas due to the lower cost of deployment, their ability to be deployed in harsh conditions, and are secured more easily due to their smaller size compared to traditional facilities.

The Takeaway

Modular data centers have their benefits and challenges. Exploring and evaluating long-term vs. short-term goals is essential before choosing a data center provider. There are many options. Remember to ask the right questions to ensure your business strategies align with the specific provider, their solutions, and services.

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