

# Emerging Trends of Micro Data Centers

## Micro Modular Data Centers and the IoT

The Internet of Things can be defined as an interconnected network of real-world physical objects capable of communicating without human interaction or an IP. It is also defined as a network of physical objects that have technology embedded in them so they can interact with themselves or their external environment.

Some businesses in the market are estimating immense growth of the micro modular data center industry by 2020. The internet develops quickly in a short period of time. Micro modular data centers may be the best way for the IoT to grow, as traditional data centers will have far too much latency and lead to frustrated consumers.

The number of devices anticipated to be connected to the IoT by 2020 is a staggering 20 billion to 50 billion devices. These devices range from wearable to sensors located inside a smart building. An example of a smart building would be pipes fitted with sensors so they can detect water leaks and monitor the performance and health of other parts of the system.

## The containerized model data center

The prefabricated AST Modular system produced by a company of the same name is a unique kind of data center. It's designed to be deployed rapidly and engage in high-density computing at a lower cost than a traditional data center. You can become operational in a far less time with an AST Modular system than with a traditionally built center.

The containerized datacenter is a fully portable ISO container which is also available as a standalone power and cooling module and even a standalone IT unit. The high functionality is why this is known and referred to as a "plug & play". You're getting all the required components to run a data center operation.

The AST Modular unit can withstand a wide range of temperatures, from -50 to +150 C. An uninterruptible power supply is available along with cooling components. The unit is incredibly easy to send to remote locations and beginning using it immediately. The AST Modular containerized data center doesn't cause issues when it comes to space & power

limitations and operational costs. These all-in-one units provide a fully functional data center in one of the standard sizes, 20', 40', and 53'.

The AST Modular system has many benefits including:

- Can be used by small, medium, and large size business owners
- Survives any kind of weather condition whether cold or a flooded region
- Consumes less energy and is more efficient than the larger, traditional data center.
- Provides a strong data network with less power
- Costs less to purchase and less to maintain
- Easy to scale by adding more components as the demand arises

## Why Cloud Computing Continues To Emerge

Micro modular data systems play a role in making the IoT possible, by providing the infrastructure. Business owners will need a way to keep up with the demand of IoT and the massive amount of data that comes with it. The way that data centers are developed is bound to evolve in order to keep up with the massive amount of data being produced. Companies may suddenly find themselves needing the ability to build a new data center quickly that is completely flexible and reliable.

By utilizing cloud computing through your micro modular data center, you can contract and expand resources as you see fit. Multi-tenancy is an available option, allowing you to provide access to multiple independent users. It is a fact that your data is more secure when your resources are isolated. Cloud computing allows a company to benefit from the shared cost of the infrastructure. The resiliency of your company can be increased with more flexible service management that can isolate server failure.

The ease of workload movement is unmatched, the facility can be relocated wherever necessary. Block or allow access to data effectively and precisely. Give yourself the ability to pull up private data during as an employee during a meeting. There is substantial range available from the micro data center with the ability for employees to pull data and work from home if necessary. You can restrict access to where it is only available during work hours. On the contrary, you can have the micro modular data center can be set to where only company devices and computers can have access to the cloud.

Store private data such as social security numbers safely and securely from a micro modular data center without using the cloud. In this way, access to specific data can be disabled. Some may think that "cloud" implies free and open space. However, you have total control over the information you choose to put in the cloud. Plus there is no need to use additional

devices, cords, or cables to access data from the data center, simply stream directly from a device. The cloud computing offered by micro modular data centers will help support the massive growth necessary for companies to function properly. For example, Facebook, Google, and Amazon have massive data centers and the need will only increase.

## The Crucial Subject of Physical and Cybersecurity

IT security is becoming more important in an increasingly digital world. Companies are investing more into cyber security since the capability of hackers has increased greatly. Hackers have capabilities at their disposal that they did not previously have. Hackers have more complicated attacks than they ever have resulting in an increased amount of cyber threats.

Since malicious individuals are able to inflict more damage upon companies, it's necessary for businesses to be proactive and have security measures ready and in place in case of these events. IDG Research Services polled 100 IT workers asking what were the top five factors considered regarding spending IT dollars.

The respondents of the poll mentioned security more than any other expenditure. Furthering this point, they also said that this issue is more crucial than it was just two years ago. A great deal of technological advancement can occur in two years. The respondents of the poll mentioned security more than any other expenditure. Furthering this point, they also said that this issue is more crucial than it was just two years ago. A great deal of technological advancement can occur in two years.

Companies that don't want to fall victim to cyber attacks need to have measures in place to prevent it. It's worth it for a business to craft a strategy tailored to its needs to triage and escalate issues of a certain nature, provide external threat intelligence, log information, as well as store, process, and collect the information. The data center is the number one place that is targeted because it is the home of a company's digital assets. This is why a cybercriminal would target a data center.

A micro modular data center is an excellent way to keep intruders from accessing private company data. Unlike micro modular data centers, centralized data centers allow hackers to access all of the company's information on one platform. Micro modular systems make it easier to hide information from hackers. A hacker might only be successful at hacking the information from one department without making the entire company vulnerable. Also, it's easier to find a hacker on a system that uses minimal data instead of a large amount of data.

## Flash based storage is growing in popularity

Flash-based storage has been found to be more efficient than HDD-based storage. It also has 40 times better input/output performance than hard disks, using 50 percent less power. The lead analyst of Technavio Sunil Kumar Singh believes that the higher cost of acquiring flash-based systems will result in its increased growth in data centers. He also predicts the prices of the systems to drop 5 to 10 percent year over year, causing further demand in the years 2018-2020. Singh also believes that flash adoption will add more revenue as time goes on.

## More consumers and companies are adopting to IoT

Technavio believes that 20 billion internet enabled devices will be online by 2019. The growth in usage will produce large amounts of data from communities and cars that are connected to the IoT. The Internet of Things will also likely be used in the retail, auto, manufacturing, and utilities industries as well as social media.

RFID chips will play a huge role in the growth of the IoT, due to their ability to track, read, and allow different object to communicate with each other. Consumers that want to use the IoT need an internet connection. So it makes sense to lead to a logical conclusion that the traffic of data centers will likely be increased 40 times the current traffic due to the IoT.

Businesses are currently working together to build more data centers to handle the demands of IoT data storage, including micro modular data centers. Regarding the future, companies who provide cloud services will increasingly need storage to expand their services as well as grow into new regions. Schools will require data centers at some point. The growing need of society's ability to compute directly affects storage requirements.

Hewlett Packard Enterprise offers three different data center configurations. One is a software-defined data center, the second type has defined IT components configured from reference architectures. The third type is a tailored IT solutions created specifically for your needs. The growing IoT is considered as "growth in the edge of the network", leading to the propagation of more modular data centers. Containers provide a perfect indoor/outdoor solution to meet the demand

## An increased amount of containerized data centers are being fabricated

Containerized data centers are portable and prefabricated inside of shipping containers. The center is able to fully house cooling, IT, and power equipment easily in a 20 foot or 40 foot space. They're available on demand and are able to be placed in any environment, making them highly convenient. They can be easily relocated for far less than the cost of rebuilding a data center.

These data centers can vary vastly in price, with higher end models costing upwards of \$7 million dollars. Creation, installation, and deployment is all done within a 6 month period. A containerized data center is filled with racks and equipment including standing room. Microsoft has a modular data center located in Virginia, made up of several data center containers.

According to Technavio, micro mobile data centers are set for growth of 46 percent within their forecast period. The high level of security and the ability to move the center anywhere are driving forces behind the growth. Flash and hybrid storage options are likely to make market growth increase in the next few years. Flash-based storage is more efficient than its traditional counterpart, HDD storage. Though the flash option is currently more expensive, increasing demands are driving down the price. Vendors are lowering the cost of the option based upon demand.

Many vendors in the storage market offer NAS, SAN, and DAS options for storage. However, those who are using flash-based storage are experiencing increased revenue. Technavio predicts storage area network or SAN to grow to \$33 billion by the year 2020. It currently proliferates the market providing block level data storage for applications. The other storage technology offered by vendors now is network-attached storage or NAS, a file-based type of storage.

NAS devices create backups and have the ability to share files across several devices. Consumers use NAS devices to share and store files like photos, music, and video. In a home office or small office environment, NAS is used to share files among five to 20 people in the office. It also has the functionality of connecting to mobile devices and printers. This is a low maintenance storage option that allows you to manage it remotely.

In 2015, the Americas controlled 40 percent of the market shares in the data center storage market. The reason behind this is the large number of data center demand that led to adoption of the systems.

## Major Technology and Telecommunications Providers Make Advances

Many companies are making advancements in the cloud space. IBM is providing a way for internet users to enjoy private cloud environments when using the IBM Cloud which helps to balance your workload. IBM announced new hardware and cloud offerings designed to simplify data, services, and application within a hybrid cloud space.

The same technology provider has also introduced the z Systems which is a service that gives operational insights, analytics, and ongoing benchmarking. With z Systems, developers can build data-driven applications. The new application allows developers to build data driven applications even without mainframe skills. Companies can capitalize on on-premises investments while adapting.

Cloud projects enable you to create and support new business models. OpenStack-based cloud management and elastic models are allowed with the new IBM Power Systems designed for cloud. IBM is looking to increase the acceleration of the IBM Power platform. Hillery Hunter, director of Systems Acceleration and Memory for IBM Research has stated that acceleration is what is necessary to take steps towards innovation. ZTE is a major provider of telecommunication services as well as enterprise and consumer technology solutions internationally.

ZTE and Tencent have been working together to develop the most energy efficient mobile modular data center, Tencent West Lab. The West Lab operates a smart management system that utilizes radio frequency identification (RFID) management, a new advancement in micro modular data centers. The data center created by Tencent and ZTE puts major technological breakthroughs on display such as cooling, design structure, control, management, and a power usage effectiveness (PUE) level of 1.0665.

The power supply for the system is unique, it combines solar photovoltaic with HVDC, and mains power. The West Lab data center is the first in China to put indirect evaporative free cooling technology into an actual business application. West Lab has achieved an Energy Efficiency Ratio (EER) of 16.0, which is greater than five times the efficiency of traditional mechanical compression cooling AC systems.

