United States Data Centre Market Overview

451 Research, LLC.

GLOBAL DATA CENTRE INDUSTRY

The global leased data centre industry has seen robust growth over the past decade and remained healthy in 2017. Leased data centres refer to facilities owned by an investor or data centre operator, which are leased to single or multiple tenants. These exclude facilities owned and operated by enterprises as in-house data centre space. The demand for global leased data centre space is expected to remain strong for the foreseeable future. The global leased data centre industry is expected to grow at a 8.6% CAGR from 2017 to 2022F. This can be attributed to the trend of enterprises moving towards digitisation and outsourcing, as well as the exponential growth of data and content.

Enterprise use of cloud and outsourcing is growing rapidly, transforming the hosting and leased data centre industries. The change has created strong demand for data centre space from cloud and service providers, as well as from enterprises. The global market for cloud computing 'as a service' is expected to grow at a 16.5% CAGR from 2017 to 2022F. The global market for outsourced data centre services is expected to grow at a 12.3% CAGR during the same period. Top cloud and information technology ("IT") service providers, such as Amazon Web Services, Microsoft, Google and Facebook in the United States as well as Baidu, Alibaba and Tencent in Asia have leased extensive data centre space around the world and will continue to do so to support their rapid growth.

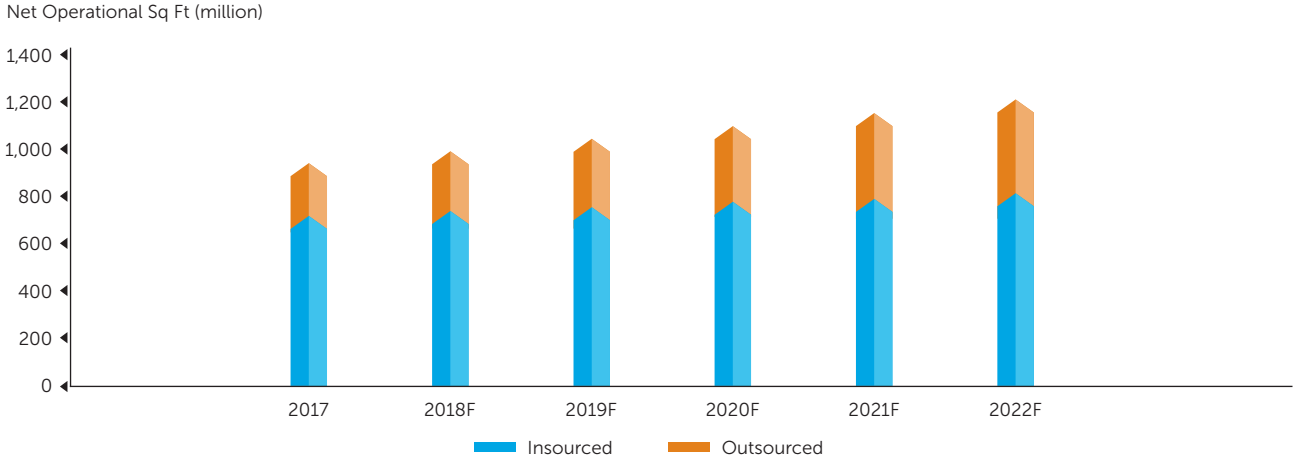
The exponential growth in data created from new technologies such as Internet-connected devices and 5G wireless networks will drive demand for global leased data centre space from enterprises as well as cloud and IT companies. Such trends are also expected to drive the need for colocation in fast-growing economic areas and smaller cities that currently have relatively little leased data centre space constructed.

Many countries have passed data sovereignty regulations requiring that data be stored in-country, which means multinational firms may require data centre space in multiple locations. This has in turn boosted demand for leased space in many markets that were previously served by centralised data centres elsewhere.

The demand for data centre space will continue to be strong in top data centre markets, which are generally capital cities or telecommunications hubs near submarine cable landings. This is because of the networking and interconnection requirements of cloud, network, IT and software service providers as well as the need to process and store data close to end users for minimal latency.

The bulk of IT equipment worldwide continues to be stored in enterprise-owned facilities. However, the growth of such space has moderated, with the difference made up by growth in leased data centre space and cloud provider-owned space.

FIGURE 1: WORLDWIDE INSOURCED (ENTERPRISE-OWNED) AND OUTSOURCED (LEASED AND CLOUD PROVIDER-OWNED) DATA CENTRE SPACE



Source: 451 Research, LLC., 2Q 2018

Insourced and outsourced data centre markets are expected to grow at a CAGR of 2.5% and 12.3% respectively (by net operational sq ft) from 2017 to 2022F.

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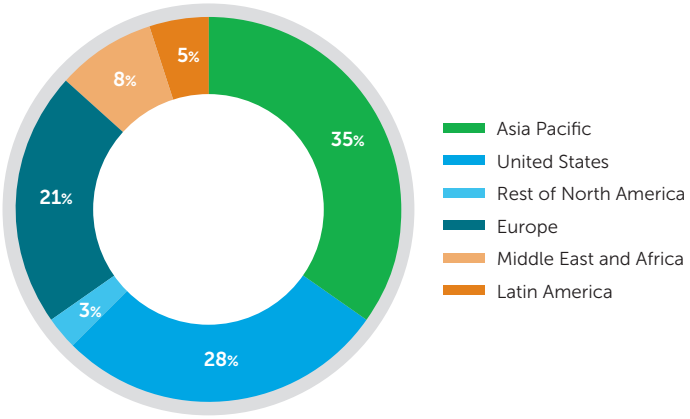
US DATA CENTRE GROWTH AND DEMAND DRIVERS

The United States is the largest and most established data centre market in the world. It represents 28% of the global insourced and outsourced data centre market (by net operational sq ft).

FIGURE 2: BREAKDOWN OF INSOURCED AND OUTSOURCED DATA CENTRE SPACE BY REGION

(By Net Operational Sq Ft)



Source: 451 Research, LLC., 2Q 2018

There are several key trends that impact the data centre industry in the United States, including the growth of data and content, the growth in mobile services, and the adoption of cloud services. The drivers of demand for leased data centre space are expected to remain strong for the next several years. These include:

1. **The movement to cloud and outsourcing.** The biggest demand for leased data centre space in the past two years has come from cloud service providers, because they need access to a large number of diverse network providers, connectivity to customers and partners, and large amounts of data centre space rapidly which leased data centres can provide. Though several of the largest cloud service providers (Amazon Web Services, Google and Microsoft) have built their own data centres, they continue to lease space from data centre operators in selected markets for connectivity reasons and for speed-to-market. Smaller cloud and hosting providers prefer to lease almost all of their data centre space from leased data centre providers.

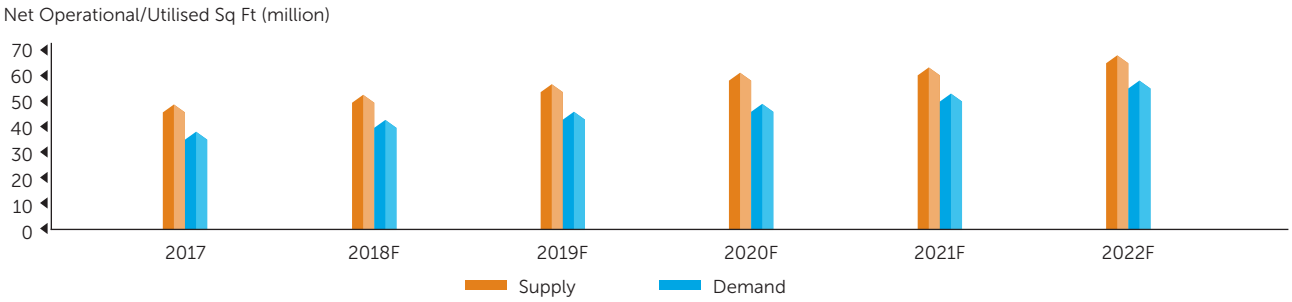
2. **The need for data to be stored close to its end users.** The rise of the mobile workforce and the demand for data and applications to be available on mobile devices have led to a requirement that data and services be available at any time, with relatively low latency, in multiple locations. This means firms will need to store data close to end users in key population centres; and therefore, they will require data centre space in multiple locations.

3. **The need for geographic diversity.** To minimise risks from natural disasters and terrorist attacks, firms are faced with a need for backup data centres where data can be duplicated and stored in case a primary data centre is affected by such risks.

4. **The potential impact of the Internet of Things.** Internet of Things deployments will generate large quantities of data to be processed and stored in Internet connected devices. This will in turn increase the workloads of data centres, which will drive the demand for data centre space.

The US leased data centre market was worth an estimated US$13.2 billion in 2017. The fundamental drivers for growth of leased data centres in the United States are expected to remain strong, which will continue to underpin the demand for data centre space.

FIGURE 3: LEASED DATA CENTRE SUPPLY AND DEMAND IN THE UNITED STATES



Source: 451 Research, LLC., 2Q 2018

Leased data centre supply (by net operational sq ft) and demand (by net utilised sq ft) are expected to grow at a CAGR of 6.8% and 8.7% respectively from 2017 to 2022F.

KEY DATA CENTRE MARKETS IN THE UNITED STATES

The amount of total data centre space (including enterprise facilities) in any city is related to factors such as how many businesses are located there, their propensity to use leased data centre or cloud services, and how IT-intensive those businesses are, as well as how underlying telecommunications fibre networks are configured.

The established data centre markets in the United States are namely Northern Virginia, New York /New Jersey, Dallas, Silicon Valley, Chicago, Los Angeles and Atlanta. These data centre markets have the strongest demand from local businesses and government agencies, as well as media and content firms that want to store data near the maximum number of end users. These cities are often connectivity hubs as well, so network service providers and cloud/hosting firms will also want to have their IT equipment in these locations. These markets together account for an estimated 53% of the net operational sq ft of leased data centre space in the United States.

The established data centre markets are likely to continue to see demand on a much larger scale than smaller markets. For example, the amount of new space leased each year in Dallas is roughly equal to the entire data centre markets in Minneapolis, Charlotte and San Diego. They also tend to be top markets when it comes to in-house data centre space, due to the large concentrations of enterprises in these cities.

FIGURE 4: ESTABLISHED DATA CENTRE MARKETS IN THE UNITED STATES (BY NET OPERATIONAL SQ FT)

Established data centre markets	Secondary data centre markets
Northern Virginia	Phoenix
New York/New Jersey	Las Vegas
Dallas	Denver
Silicon Valley	Boston
Chicago	Miami
Los Angeles	Seattle
Atlanta	Houston

Source: 451 Research, LLC., 2Q 2018

However, there has been increasing interest in many markets outside of the established data centre markets as enterprise demand rises due to the demand for content delivery, mobility, the Internet of Things. Both large and regional/local service providers are looking at expanding their coverage and capabilities with more remote and cost-effective data centres.

Although demand for space in established data centre markets continues to be strong, limited supply and difficulty in obtaining power have also created an increased demand for data centre space in nearby secondary markets. In addition, some states are proactively developing legislation that provides tax breaks specifically for mid-sized or large-scale data centres. This, along with the cost and source of power as well as fibre capacity can make certain states more appealing than others for large data centre deployments and boost demand for data centres in markets outside of the established markets or outside of large population centres.