Section 8 Trends in the data center market and cloud services market

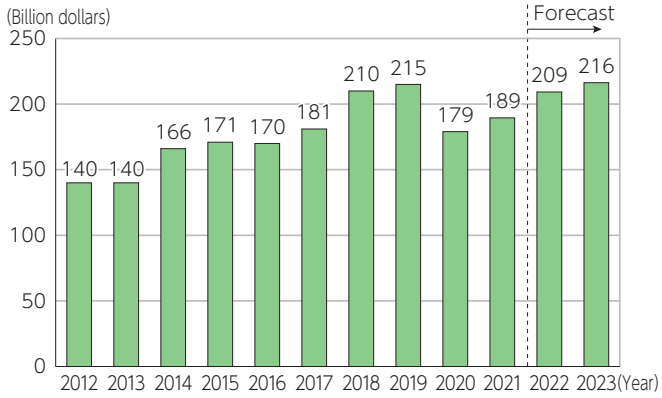
1. Data centers

The number of large data centers globally exceeded 800 at the end of the second quarter of 2022[1] and continues to grow. Regarding the share of the global data center capacity, the U.S. accounts for over half at 53%, followed by Europe, the Middle East and Africa (16%), China (15%) and the Asia Pacific Region excluding China (11%).

The size (in terms of expenditure) of the global data center systems market was 27.5081 trillion yen (up 32.3% from the previous year) in 2022 (**Figure 4-8-1-1**). After a brief decline in 2020 due to the spread of COVID-19, it has been on an upward trend since then and is forecasted to grow larger than it was in 2019 in 2023.

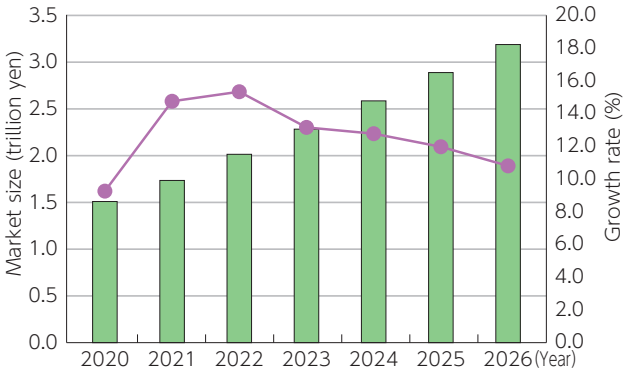
The size (in terms of sales) of the Japanese data center services market is expected to reach 2.0275 trillion yen in 2022 (up 15.3% from the previous year), and exceed 2 trillion yen for the first time (**Figure 4-8-1-2**).

Figure 4-8-1-1 Changes and forecast in the size of the global data center systems market (in terms of expenditure)



(Source) Statista (Gartner)[2]

Figure 4-8-1-2 Changes and forecast in the size (in terms of sales) of the Japanese data center services market



*2022 is an estimate, and 2023 and beyond are forecasts.

(Source) IDC "Japan Datacenter Services Forecast" (August 29, 2022)[3]

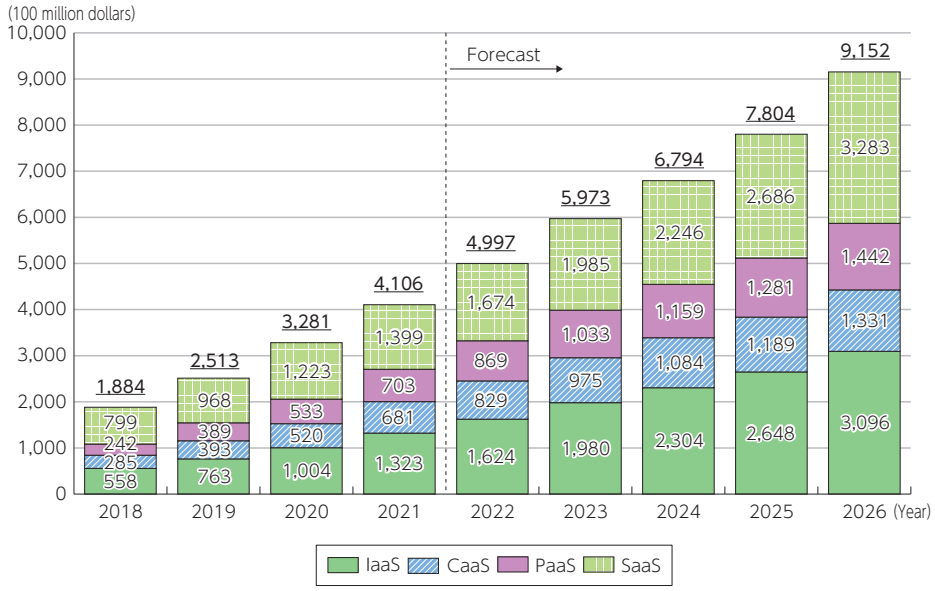
Figure (related data) Share of global large-scale data center market by region (data capacity)
Source: Synergy "Virginia Still Has More Hyperscale Data Center Capacity Than Either Europe or China"
URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2023/data_collection.html#f00245
(Data collection)

[1] https://www.srgresearch.com/articles/virginia-still-has-more-hyperscale-data-center-capacity-than-either-europe-or-china
[2] https://www.statista.com/statistics/268938/global-it-spending-by-segment/
[3] https://www.idc.com/getdoc.jsp?containerId=prJPJ49623222

2. Cloud services

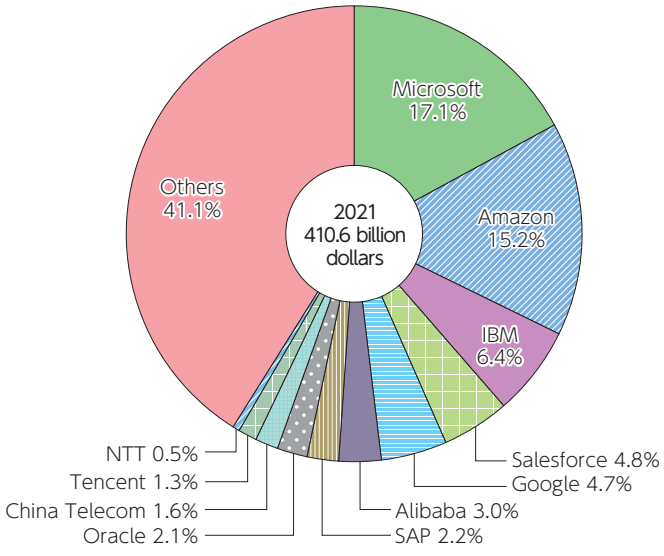
The global public cloud services market[4] was 45.0621 trillion yen in 2021, up 28.6% from the previous year. For example, PaaS is expected to continue to grow rapidly as service providers continue improving convenience and users tend to continue to use it (**Figure 4-8-2-1**). Looking at market share, the top five U.S. companies (Microsoft, Amazon, IBM, Salesforce, Google) account for about half of the total, so the market is in an oligopoly situation (**Figure 4-8-2-2**).

Figure 4-8-2-1 Changes and forecast in the size (in terms of sales) of the global public cloud service market



(Source) Omdia

Figure 4-8-2-2 Share of the global public cloud services market



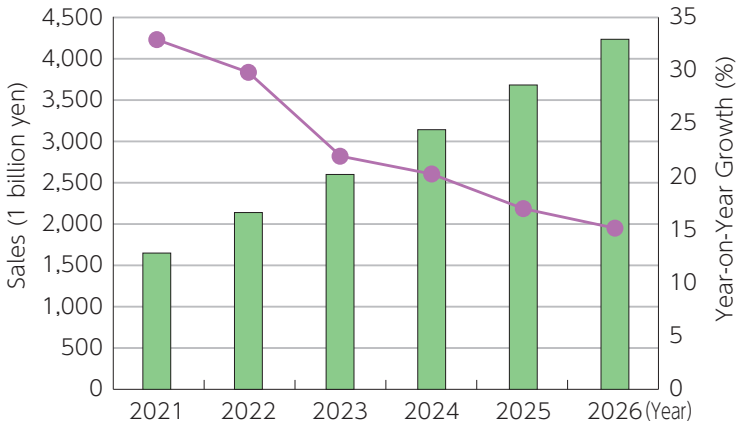
(Source) Omdia

The Japanese public cloud services market[5] is expected to increase to 2.1594 trillion yen in 2022 (up 29.8% from the previous year) mainly due to the shift from on-premises environments to the cloud due to the continuing impact of COVID-19 (**Figure 4-8-2-3**).

In Japan's PaaS and IaaS markets, the high usage rate of major cloud services (AWS (Amazon), Azure (Microsoft), GCP (Google)) stands out. In particular, AWS accounts for more than half of PaaS/IaaS enterprises, up more than 10 percentage points from the previous year.

[4] Services provided by third parties via a public or private network, such as computer and other hardware, software, databases, storage, etc.
[5] Cloud services that specialize in IT-related functions provided to a wide range of users without special regulations or restrictions.

Figure 4-8-2-3 Changes and forecast in the size (in terms of sales) of the Japanese public cloud service market



(Source) IDC "Japan Public IT Cloud Services Forecast" (September 15, 2022)[6]

3. Edge computing and edge infrastructure

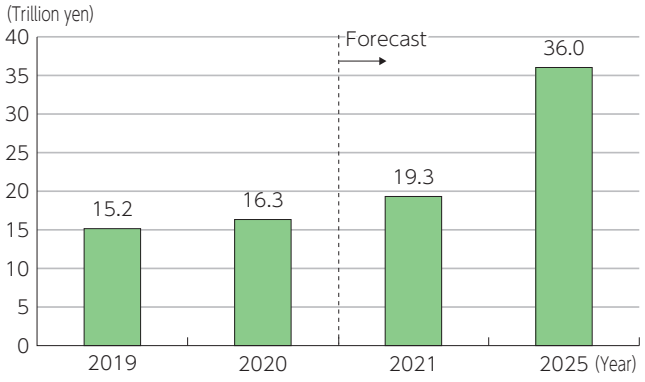
The size (revenue) of the global edge computing market was 16.3 trillion yen in 2020, and is forecasted to grow to 36 trillion yen in 2025 (**Figure 4-8-3-1**).

The size (in terms of expenditure) of the Japanese edge infrastructure (hardware[7]) market was 429.5 billion yen in 2021 and is forecasted to expand to 729.3 billion yen in 2026 (**Figure 4-8-3-2**).

Use cases by enterprises include applications that require instantaneous decision making utilizing AR/VR or AI, such as machine control and monitoring in manufacturing operations, video streaming, drone control, autonomous driving, and remote surgery, and it is also expected to be used for the primary processing of large volumes of data in areas that are physically far from data centers.

In recent years, a system called edge AI that performs AI processing using edge computing to reduce communications with the cloud as much as possible is attracting attention. In the past, AI processing has mainly been done by sending data to an on-premises environment or the cloud for processing on the cloud side, but benefits include (1) reduced communication costs, (2) realization of low latency processing, and (3) reduced privacy risks. The Japanese products and services market (in terms of sales) in the edge AI field is expected to be 7.66 billion yen in fiscal 2021, an increase of 70.8% from the previous year, and 11.7 billion yen in fiscal 2022, an increase of 52.7% from the previous year. The annual growth rate is forecasted to be 41.3% until fiscal 2026 to reach 43.1 billion yen in fiscal 2026.

Figure 4-8-3-1 Changes and forecast in the size of the global edge infrastructure market (revenue)

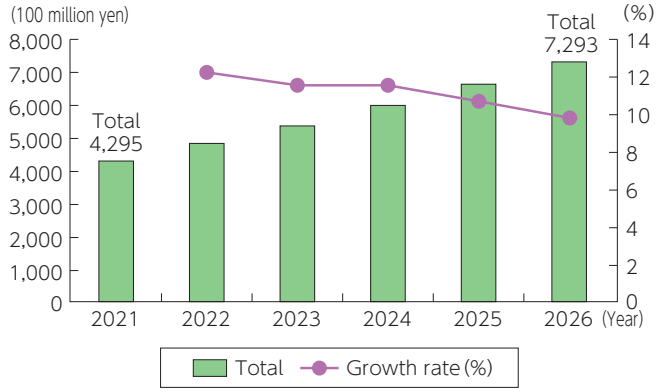


*2025 is calculated at the 2022 exchange rate.

(Source) Statista (IDC)[8]

[6] https://www.idc.com/getdoc.jsp?containerId=prJPJ49684222
[7] Applies to servers, storage, gateways, and network equipment.
[8] https://www.statista.com/statistics/1175706/worldwide-edge-computing-market-revenue/

Figure 4-8-3-2 Changes and forecast in the size (in terms of expenditure) of the Japanese edge infrastructure market



(Source) IDC "Japan Edge Infrastructure Forecast" (January 18, 2023)[9]

Figure (related data) Changes and forecast in the size (in terms of sales) of the Japanese edge AI solutions market
Source: Deloitte Tohmatsu MIC Research Institute "Reality and Future Prospects of Edge AI Computing Market" (October 24, 2022)
URL: https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2023/data_collection.html#f00255
(Data collection)

[9] https://www.idc.com/getdoc.jsp?containerId=prJPJ50045223