Providing Efficient Management of Rapidly Increasing Amounts of Data
SUSE Enterprise Storage

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"Domestic Software-Defined Storage Market Forecast 2018 to 2021 (IDC #JPJ42922617, issued February 2018)"
Created based on “Survey on 2018 Domestic Trends in Domestic Storage Demand: Data Management and Storage Selection (IDC #JPJ42921918, issued February 2018)"

Sponsored by SUSE Software Solutions Japan*
*The sponsor of this research report was changed from Novell to SUSE Software Solutions Japan upon SUSE becoming independent from Novell

Digital transformation (DX) involves business transformations that use third-platform technologies (cloud, big data and analytics, mobile, and social technologies). DX brings a dramatic increase in the volume of data to be managed, along with an ever-widening range of usage scenarios such as data analytics. In DX, the amount of value that can be generated from data directly impacts the competitiveness of companies and organizations. IDC believes that accumulating data and using it effectively will become ever more important in the future. As for infrastructure for managing data, ongoing investment in conventional storage infrastructure will become increasingly difficult because of insufficient scalability, increased operational management burdens and costs.

This research report analyzes market trends in software-defined storage, a solution to these issues that is becoming increasingly popular in Japan’s domestic market. As a strategy to fully overhaul storage infrastructure, SUSE uses SUSE Enterprise Storage, a software-defined storage solution based on Ceph Open Source Software (OSS) technology. This solution offers improved scalability and availability, and is efficient and easy to operate.

Issues with Storage Infrastructure and Usage Trends for Software-Defined Storage

For its research report “Survey on 2018 Domestic Trends in Domestic Storage Demand: Data Management and Storage Selection (IDC #JPJ42921918, issued February 2018),” IDC surveyed respondents at 700 companies in Japan involved in the introduction and operational management of storage on the subject of storage trends. This section uses data from the survey to analyze issues with companies’ in-house storage infrastructure, their intent to use software-defined storage, and their reasons for introducing such a solution.

Issues with In-House Storage Infrastructure

This survey asked 368 companies using in-house storage infrastructure to identify areas of concern surrounding the construction of this infrastructure, with multiple responses allowed. The top three responses in order were “reducing construction costs (57.6%),” “migrating data from existing systems (44.8%),” and “reducing construction time (43.2%).” When it comes to the construction of storage infrastructure, reducing construction costs and increasing the pace of construction are two key concerns. The survey also reveals that as requirements for data use increase with the advance of DX, business divisions increasingly need storage infrastructure to be built or expanded in a short time. Another important issue is data migration. Increased data capacity makes it more and more difficult to migrate data from existing storage infrastructures smoothly when these infrastructures are upgraded. IDC believes that awareness of this issue is increasing.
Next, we will look at issues regarding operational management. Figure 1 shows the main issues in the operation of in-house storage that were identified in the study (multiple responses allowed). These issues are the flexible scalability of capacity and performance, increased operational management burdens resulting from shortages of administrators and the increasing complexity of operational management, and increased maintenance costs. Notably, the key issues in terms of scalability include not only storage capacity but also scalability of performance. As the amount of data increases, so does the need to analyze obtained data, and to rapidly reflect the results in business. There is a growing need for architectures that support flexible expansion in terms of both capacity and performance to keep pace with how the storage infrastructure is used. As for operational management, storage infrastructure brings a high operational management burden that is shouldered by a limited number of administrators as necessity dictates. It will be difficult for companies to increase the number of storage infrastructure administrators in the future; the survey responses reflect the reality that operational management falls on a limited number of administrators. An important area of concern for the future is how we can simplify the operational management of storage infrastructure. The increase in maintenance costs appears to be caused by expansion of existing storage infrastructure and longer maintenance periods.

Figure 1

<table>
<thead>
<tr>
<th>Issues with operational management of in-house storage infrastructure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible expansion of capacity is difficult</td>
<td>44.6%</td>
</tr>
<tr>
<td>Administrator shortages</td>
<td>39.1%</td>
</tr>
<tr>
<td>Operational management is more complex</td>
<td>32.1%</td>
</tr>
<tr>
<td>Flexible expansion of performance is difficult</td>
<td>31.8%</td>
</tr>
<tr>
<td>Increase in maintenance costs</td>
<td>29.6%</td>
</tr>
</tbody>
</table>

Notes:
- Multiple responses allowed. Questions posed to 368 companies currently using in-house storage infrastructure.
- Top five responses selected
- Created based on “Survey on 2018 Domestic Trends in Domestic Storage Demand: Data Management and Storage Selection (IDC #JPJ42921918, issued February 2018)”

Source: IDC Japan, February 2018

Reasons for Introducing Software-Defined Storage

The above IDC survey on trends in storage shows that out of 700 companies, 7.7% of respondents are already using software-defined storage. 19.1% of respondents report that they plan to start using software-defined storage within one year. 18.6% plan to start using it within two years, while another 18.3% are considering using software-defined storage but have not yet decided on a time frame. This shows that over 50% of respondents intend to use software-defined storage in some form, highlighting the enthusiasm of the Japanese market for software-defined storage.

The survey asked the 446 companies that already use, plan to use, or are considering using, software-defined storage about their reasons for introducing such a solution. Figure 2 shows their responses (multiple responses allowed). The top response was “reducing procurement costs.” This was followed by reasons relating to operational management efficiency, including “lowering operational management costs” and “automating and streamlining operations.” This indicates that companies have high expectations for software-defined storage when it comes to reducing introduction costs, operational management burdens and operational management costs. They also have high expectations when it comes to ensuring “flexible scalability of capacity and performance.” We can conclude that companies wish to achieve a storage infrastructure with flexible scalability by introducing software-defined storage. Resolving data migration issues by achieving “operation not dependent on hardware life cycles” also seems to be among companies’ goals.
Prospects for the Domestic Software-Defined Storage Market

In the domestic market, software-defined storage is showing increased potential as a solution for solving storage infrastructure problems. The IDC research report “Domestic Software-Defined Storage Market Forecast 2018 to 2021 (IDC #JPJ42922617, issued February 2018)” predicts a compound annual growth rate (CAGR) for the domestic software-defined storage market for 2016 to 2021 of 29.2% in terms of sales and 58.1% in terms of shipped volumes. Sales for 2017 amounted to ¥32,375 billion, while shipped volumes amounted to 319 PB (petabytes). The report predicts that by 2021, we will see an increase to ¥83,575 billion in sales and 2206 PB in shipped volumes.

As increasing data volumes and the advancement of DX increase companies’ requirements when it comes to data use and more efficient operational management of storage infrastructure, the Japanese market for software-defined storage is expected to expand rapidly. IT vendors are working to diversify the delivery models for software-defined storage, moving forward by offering software units, applications and cloud instances. Accordingly, IDC believes that workload, IT buyers’ policies and requirements regarding storage infrastructure construction and operational management, and the ability to precisely adapt to administrator resources and skill levels have all been influential factors in the spread of software-defined storage.

However, there are some issues that hinder the smooth introduction of software-defined storage at companies. The above IDC survey on trends in storage usage asked 446 companies that already use, plan to use, or are considering using software-defined storage to comment on these issues. The top issues that companies identified were “struggling to achieve the expected reductions in operational costs (43.3%),” “reliability (39.5%),” “shortages of personnel who are competent in operating software-defined storage (37.9%),” “insufficient technical know-how regarding software-defined storage (35.4%),” and “isolating points of failure (35.2%)” (multiple responses allowed). Companies find it difficult to move forward with the introduction of software-defined storage when these issues cannot be resolved. The result is that IT buyers repeatedly build onto existing storage systems instead of overhauling their storage infrastructures. Accordingly, companies want IT vendors to put together robust support systems and provide product enhancements that improve ease-of-use and reliability. Another important factor in popularizing and expanding the use of software-defined storage in Japan will be helping the system integrators who function as local sales partners build skills in constructing and operating software-defined storage systems. IT vendors need to strengthen partnerships with these market players in order to step up their efforts to expand use of software-defined storage.

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SUSE Enterprise Storage Differentiation and Domestic Penetration Strategy

SUSE is a vendor that works in system infrastructure software, providing commercial distributions based upon OSS such as Linux, OpenStack, Ceph, Kubernetes and Cloud Foundry. Established in 1992, SUSE boasts more than a quarter-century of experience with Linux distributions. SUSE was the first company to offer commercial enterprise-grade distributions for Linux, OpenStack, Ceph, and so on, and is always first to market with enterprise-grade products that leverage the latest technical innovations in OSS. SUSE is using its software-defined infrastructure solutions to overhaul IT infrastructures that include existing workloads, and has a strategy to provide simple IT infrastructures using rapid construction and consistent management.

When it comes to software-defined infrastructure, SUSE offers SUSE Enterprise Storage and SUSE OpenStack Cloud. These are software-defined storage solutions based on the SUSE Linux Enterprise Server OS and Ceph technology. SUSE’s portfolio also includes the infrastructure management solutions SUSE Manager and SUSE OpenStack Cloud Monitoring. For application delivery, SUSE offers the SUSE CaaS (Container as a Service) Platform based on Kubernetes and the SUSE Cloud Application Platform based on Cloud Foundry.

SUSE is focusing strongly on storage, a new field of business that is experiencing significant growth. In response to the rapid increase in data volumes in recent years, SUSE provides OSS-based storage solutions to improve the scalability and availability of storage infrastructure and boost the development of the storage market. The ultimate goal is to help reduce initial costs and operational management costs. Through these efforts, SUSE aims to respond promptly to the business needs of IT buyers, and help make efficient operation of storage infrastructure a reality.

SUSE Enterprise Storage Differentiation

SUSE Enterprise Storage is a commercial distribution of SUSE that features high extensibility, reliability and multi-protocol support. Based on Ceph technology, which is often used in OpenStack environments, SUSE Enterprise Storage also adds support services and peripheral tools such as a Graphical User Interface (GUI) and SUSE OpenStack Cloud Monitoring. SUSE hopes to differentiate SUSE Enterprise Storage from its competitors in the following areas.

- **Ease of operation**: Ceph’s high extensibility, together with its unified storage system that is compatible with block, file and object protocols, enables integration with storage infrastructures that may have to scale out to hundreds of petabytes. This makes it possible to create a single storage pool capable of handling diverse workloads. Consolidating and simplifying storage operations in this way can help improve efficiency. Optimization of data placement using automated rebalancing can automatically improve efficiency as well. Software-defined storage also allows for flexible selection of commodity-grade hardware. The result is a reduced dependence on hardware, reduced maintenance costs, and less time and effort needed to migrate data when hardware is overhauled. SUSE Enterprise Storage supports multiple server operating systems, ensuring interoperability with existing environments. SUSE also aims to differentiate itself from its competitors by offering simplified installation and operational management through its own OSS-based “openATTIC” GUI and the Salt-based DeepSea installation and deployment tools. In the future, SUSE hopes to use Ceph Manager to further improve manageability. As for support, SUSE has many years of experience providing OSS support for Linux. With Ceph, SUSE also works closely with the OSS community to build a system that can offer prompt support. SUSE also works with Independent Hardware Vendor (IHV) partners to provide support, as described below.
**Reliability**: The distributed architecture removes single points of failure (SPOF) to provide high redundancy and self-healing functionality, achieving a high-availability storage infrastructure. This infrastructure also supports enhanced security through the use of encryption. Ceph has been in development for over ten years, and many OSS contributors have improved both its performance and its reliability. The Ceph Foundation was established as a part of the Linux Foundation in November 2018. The Foundation provides a structure that not only helps improve the scalability and functionality of Ceph, but also allows for leveraging more investment to enable even higher levels of storage reliability. SUSE is a premium member of the Ceph Foundation, and plans to keep contributing to the development of Ceph. The fact that SUSE’s support system is based on close collaboration with the OSS community helps ensure that the system can provide support during failures and contribute to the stable operation of storage infrastructure.

**Potential**: SUSE’s work with commercial distributions shows its track record of being first to market with iSCSI, CephFS, the new BlueStore back end, and so on. Looking forward, SUSE plans to keep providing new functions and containers to Ceph in a timely manner, and in accordance with the long-term development roadmap put forward by the aforementioned Ceph Foundation. Additionally, SUSE will continue integrating SUSE Enterprise Storage with other SUSE products including SUSE Linux Enterprise Server, SUSE OpenStack Cloud, the SUSE CaaS Platform and the SUSE Cloud Application Platform. These integrations enable automation of not only storage, but also operation of the IT infrastructure as a whole, contributing to improved operational efficiency. In addition to integrating and offering these product families, SUSE also supports the introduction of individual products to match the realities of product use within existing IT infrastructure. This enables staged introduction of SUSE solutions, helping IT buyers move ahead with migration while protecting existing investments.

SUSE Enterprise Storage offers per-node subscriptions instead of capacity-based licenses. This enables SUSE to offer flexible configurations that align with customer needs, enabling customers to start with small-scale configurations and then add high-density hardware to increase per-node storage capacity, and ultimately build a large-capacity storage pool at a low unit price. SUSE also offers trial software free of charge on its website and supports verification and trial installations.

**SUSE Enterprise Storage Domestic Penetration Strategy**

SUSE’s policy is to focus on applications that require high capacity and high scalability, for example, data analytics, HPC, backup and archiving, while rolling out SUSE Enterprise Storage in the Japanese market. SUSE is working globally with major backup and archiving vendors to obtain certification. This helps SUSE provide an environment that facilitates smooth introduction of SUSE Enterprise Storage as secondary storage. Also, the SAP Cloud Platform, a Platform as a Service (PaaS) deployed by SAP, uses SUSE Enterprise Storage together with SUSE OpenStack Cloud as its platform. SUSE solutions are also seeing increased usage and application around the globe as they are adopted by universities, public research institutes, communications cloud services and enterprise environments.

In Japan, communications service providers are introducing SUSE solutions for their cloud and storage services infrastructure. SUSE also foresees increased uptake among universities, medical institutes, healthcare environments and research institutes. SUSE’s forward strategy includes expanding into business fields that involve storage and use of large volumes of data, such as manufacturing, finance and distribution; content development in media and web services; and integrated storage infrastructure for private enterprise clouds. Additionally, many Ceph users who use the OSS version are not taking full advantage of Ceph because installing Ceph or keeping it up to date can be difficult. SUSE plans to encourage the spread of SUSE solutions among Japanese OSS Ceph users by emphasizing that SUSE makes it easy to use the latest version of Ceph.

SUSE is working together with hardware vendors, globally partnering with IHV partners such as Cisco Systems, Dell, Fujitsu, Hewlett Packard Enterprise (HPE), IBM, Lenovo and Supermicro. In Japan, SUSE is developing solutions with Fujitsu and HPE in particular. Looking forward, SUSE hopes to further expand in Japan by strengthening partnerships with Japanese system integrators.
The Challenges

It is fair to say that since its full-scale launch in the Japanese market, SUSE Enterprise Storage has received little attention and remains relatively unknown. The spread of software-defined storage is fostering awareness in the Japanese market of the importance of commercial support for OSS. SUSE continues to drive demand for software-defined storage, and there is widespread recognition that SUSE Enterprise Storage is a viable option when selecting software-defined storage. SUSE needs to work harder to ensure that the market understands the factors that make SUSE unique, such as its ease of operation management, reliability and future potential.

IDC feels that as DX advances, storage infrastructure will play an increasingly important role in creating business value in the future. SUSE offers not only software-defined storage but also infrastructure layers including Linux and OpenStack, as well as application delivery platforms such as the SUSE CaaS Platform and the SUSE Cloud Application Platform. SUSE is a vendor that can provide broad-ranging support to manage the expansion of workloads brought on by DX, including the use of containers. However, simply having the right portfolio will not ensure that SUSE can expand in the market. SUSE needs to make more efforts to penetrate the market by establishing usage case scenarios that combine its own solutions. System integrators and other sales partners also have a major role to play when it comes to expanding into the Japanese market. In the deployment of SUSE Enterprise Storage, SUSE needs to not only collaborate with others in the storage business but also encourage market penetration by promoting integration with solutions owned by other partners. SUSE is aware of this and has already started relevant initiatives. To accelerate the introduction of SUSE Enterprise Storage into the Japanese market through improved collaboration with partners, SUSE will need to offer flexible combinations of SUSE solutions that match partner strengths and help partners improve the competitiveness of their businesses.

Conclusions

The results of the IDC survey show that many Japanese companies are interested in using software-defined storage. IDC also forecasts that software-defined storage will see accelerated uptake within the Japanese market. The increased amounts of data that result from DX fuel increase demand for storage infrastructure that enables efficient management and easy use of data. IDC believes that software-defined storage can offer effective solutions in this area. The introduction of software-defined storage also requires that IT buyers change the way they think about procurement and operation, moving away from investment in conventional storage. IDC feels that IT vendors such as SUSE that provide software-defined storage solutions can take the lead in overhauling storage infrastructures and help Japanese IT buyers overhaul their storage infrastructure.

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