FUJITSU

Public cloud-based ICT platform – Fujitsu's initiative to migrate all its systems to the cloud

There are various benefits to using public clouds: lower initial costs, shorter installation times and reduced operational burdens. However, some readers may think it an impossible task to migrate all their company's internal systems to the public cloud. This is because they believe such a move would limit their freedom to configure and run systems, while there is also a shortage of experienced cloud integrators. However, there is a company that is already migrating all its systems onto the public cloud. This is the ICT company Fujitsu. This report will use Fujitsu's internal project as an example of how to migrate to the cloud.

Corporate systems and so on are steadily migrating to public cloud platforms. This is because migrating to the cloud can bring many benefits. Perhaps more importantly, initial costs are growing cheaper and migrations can be completed in a shorter period. By utilizing public cloud platforms, companies can swiftly set up operations without needing to buy or construct their own system infrastructure.

Another key advantage is that companies can alleviate operational workloads by entrusting the management of system infrastructure to cloud businesses. The more systems a company maintains, the more impact this will have.

Such a move would also make it easier to access systems from outside, for instance, or to link systems up with external systems. In turn, this would make it easier to change employee working styles or launch new digital businesses. Companies will need to consider using the public cloud environment when examining how best to develop their businesses going forward.

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Migration to the K5 shared platform (from ownership to use)
Effective utilization of resources; enhancement of collaboration and connectivity

Standardization of business application development, operation and maintenance
Streamlining business applications through K5 PaaS/common services; transition to microservices/loose coupling
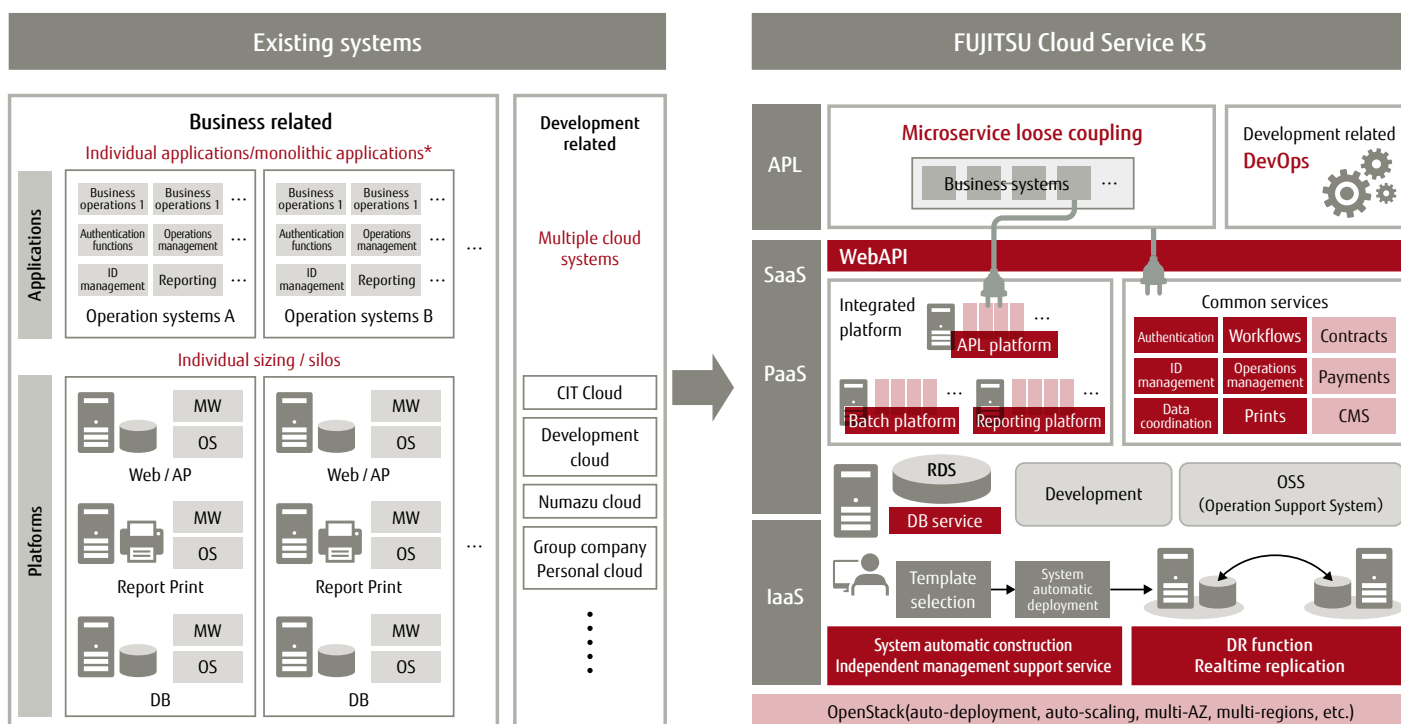
*A monolithic application refers to a single-module software application with everything combined into one program

Figure 1: An outline of Fujitsu's project to migrate all its systems to the cloud. Fujitsu aims to establish an ICT platform capable of supporting sustainable growth and strategies by: migrating its business applications to a common platform; and promoting the standardization of business application development, operation and maintenance

However, some readers may think it impossible to migrate all their company's internal systems to a public cloud. There are many reasons for thinking so. The first is that such a move would possibly restrict a company's freedom to configure systems. This is because such systems would be operated by virtual machines provided by public clouds, so it seems difficult to migrate systems that depend on hardware. The second reason is the seeming difficulty of maintaining detailed control. Thirdly, it seems there is still a shortage of integrators well-versed in the ways of the public cloud.

Well rest assured, there is an ICT company that is already migrating all its systems onto the public cloud as a model for how customers can make a similar transition. That company is Fujitsu. Including group companies, this migration involves over 640 systems, both within Japan and overseas. So how has Fujitsu carried out this bold, ambitious project?

Fujitsu's bold project to migrate over 640 systems to the cloud

In February 2015, Fujitsu announced it would 'Migrate All Internal Systems to a New Cloud Platform.' The aim is to reduce total cost of ownership (TCO) by approximately 35 billion yen by migrating over 640 systems (including 450 in Japan) over a five-year period.

However, reducing TCO is not the only aim of this project. The main goal is to construct an ICT platform capable of supporting sustainable growth and strategies (Figure 1).

"In order to migrate to the cloud, Fujitsu is utilizing the new FUJITSU Cloud Service K5 (hereinafter 'K5') and it pushing forward with the migration using this as a common platform," says Takahiko Kouketsu, head of Fujitsu's IT Strategies Unit. He says this allows resources to be used effectively while also enhancing collaboration and connectivity between systems.

Fujitsu's internal systems in Japan and elsewhere are being migrated to K5

The Fujitsu Group's
K5 migration commences

450 systems
in Japan

64 systems
(already operating on K5)

131 systems
(currently migrating)

Internal cloud services

- Development of Japanese version

  2 services

  East Japan Region
  West Japan Region 1

Common services

- Internal K5 common services

  4 services

  Integrated infrastructure monitoring,
  Log management
  Data sharing (ESB)
  WebApi management

Migration progress

- K5 migration plan (Japan)

  450 services

IaaS evaluation via pilot program

- Enhancement of IaaS functions related to the management of Enterprise systems

  Operation and maintenance:
  3 cases

  Migration and management:
  5 cases

Common services (plan)

- Personal authentication service
  - VDI/door security POC via personal authentication service (TPS5)
  - ID management

- Self-service portal
  - CSM for development cloud

- Cloud migration service
  - V to F (Fsas cloud→K5)

Application standardization project

- RDS (PostgresSQL standardization)
  - Native Symfoware→RDS migration
  - Oracle→RDS migration

- Development cloud migration WG
  - Numazu cloud, SI technological development cloud, CIT-Cloud, etc.; migration to individual clouds

- K5 PaaS internal implementation WG

As of January 2017

Figure 2: Fujitsu's migration of its internal systems to K5 as a of FY2016. 64 systems are already operating in full on K5, with 131 more systems being migrated across. The knowhow gained from these migrations is being fed back into K5 itself

Furthermore, PaaS is also being used alongside the IaaS that provides the systems infrastructure. By streamlining business applications and transitioning to microservices / loose coupling, explains Kouketsu, Fujitsu can promote the standardization of business application development, operation and maintenance. "Our final goal is to modernize our business applications in this way and promote digital innovation," he adds.

He also says Fujitsu had previously pursued server integration by virtualization in order to streamline internal systems. Though this was successful in some ways, it was not sufficient to streamline the entire system. "We concluded that with absolutely no labor used to construct or run the system infrastructure, it would be impossible to optimize the entire system unless we standardized application domains, so we decided to migrate all our internal systems to the cloud and we launched a cloud platform for this purpose," says Kouketsu.
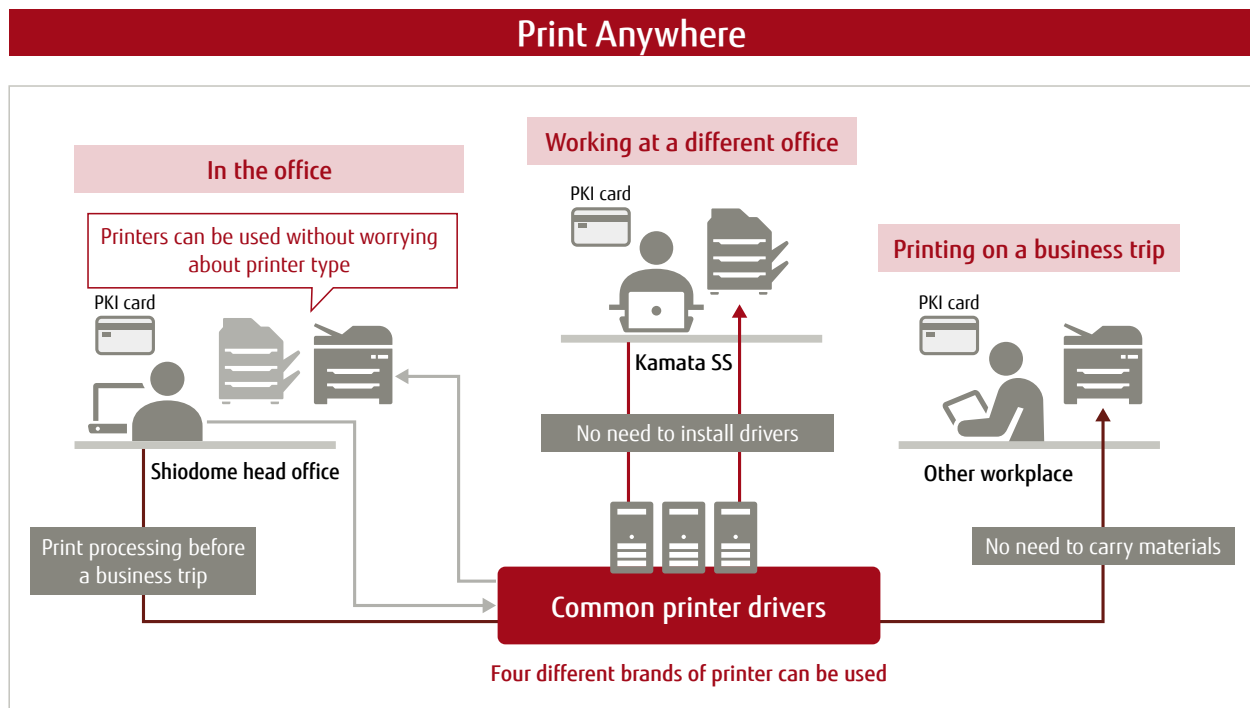
The pilot migration has cut operation-person hours by 30% and the period required to introduce infrastructure has been reduced by seven-eighths

After making this announcement, Fujitsu began work on the pilot project. In 2015 the budget management system, etc. was running on K5.

The first thing to note here was how Fujitsu managed to standardize and automate the functions for system-wide monitoring. Also noteworthy is the migration from a hardware base to a software base. This move also enabled networks to be built in a flexible manner. Of course, auto-scaling and other core cloud functions were also implemented.

Fujitsu also managed to cut platform construction times drastically by standardizing (patterning) common platforms. These initiatives halved the number of virtual machines needed while also cutting operation-person hours by two-thirds, with the period required for introducing infrastructure reduced by seven-eighths.

- Business divisions, laboratories and group companies are working together to apply personal authentication/'Print Anywhere' services to the VDI service
- After internal implementation, the services will be developed for customers (K5-PaaS)

Figure 3: 'Print Anywhere' has developed as a PaaS service through Fujitsu's experience of internal implementation. It uses common print drivers, so each device no longer needs to have its own drivers installed. Fujitsu plans to expand the provision of these kinds of PaaS functions

The migration of internal systems to K5 has continued since then. In FY2016, 64 systems began operating in full on K5, with 131 more systems currently being migrated across (Figure 2).

The knowhow gained from these migrations is being fed back into K5 itself. For example, Fujitsu has established two K5 regions in Japan, in East Japan and West Japan, and it provides standards for disaster recovery (DR) functions, as this was deemed indispensable when migrating internal systems to the cloud in a safe and efficient manner. Furthermore, integrated infrastructure monitoring, log management, data coordination (Enterprise Service Bus (ESB)) and WebApi management services are also being developed as common, shared K5 services. Fujitsu is also moving to ensure firewalls and other key security functions can be physically shared and applied to each system in a logical manner.

The migration of overseas systems to K5 is expected to proceed from FY2017. "We will launch our first system transition in the UK, the location of our first overseas base, while transferring across the knowledge gained from the Japanese migration," says Kouketsu.

Turning necessary shared functions into PaaS services

Fujitsu has also begun to migrate systems using PaaS. In line with this, Fujitsu is providing functions needed by multiple systems as K5 services.

One of these is the 'K5 Authentication Service.' This uses Fujitsu's advanced sensing technology to carry out personal authentication based on biometric data, such as irises, palm veins or fingerprints. Kouketsu says the Authentication Service plays a vital role in providing a secure virtual desktop infrastructure (VDI) service.

Fujitsu is also working with several manufacturers to develop a 'Print Anywhere' service that allows the user to print from anywhere using a network, with the service scheduled for release in October 2016 (Figure 3). With this service, it will no longer be necessary to install printer drivers on each device. Four top printer manufacturers are already on board. This is being also pursued as a step toward providing a VDI service.

"By developing these services, Fujitsu is linking up its business divisions, laboratories and group companies. Fujitsu has also eliminated several problems through this internal implementation. We plan to use this experience to develop services for our customers," says Kouketsu. From here on, Fujitsu will actively develop and provide PaaS functions. As Kouketsu explains, "We are already developing ID management and common workflows. Functions that were previously developed and implemented separately for each system are now being shared. This will make business application development a lot more efficient and will also make it easier to make amendments."

At the same time, knowledge gained so far from the process of migrating internal systems to K5 will be actively provided to customers. "Fujitsu will not use our customers' systems to carry out trials,' says Kouketsu, adding "we will conduct trials at our own company first and we will only provide a service to our customers once we are sure of its quality. It will also become the norm to utilize enterprise resource planning (ERP) and handset business applications via the cloud. Fujitsu is playing a leading role in these developments." Fujitsu: Steadily building the environment to help our customers migrate to the cloud.