FGCP/A5: PaaS Service Using Windows Azure Platform

● Hitoshi Monma

In August 2011, Fujitsu started offering Fujitsu Global Cloud Platform "FGCP/A5" Powered by Windows Azure service (hereinafter, FGCP/A5) as part of a strategic partnership with Microsoft announced in July 2010. This service—the only Azure service offered in Japan—is provided from Fujitsu's domestic data centers. Fujitsu is initially providing FGCP/A5 with the same level of functionality as the Windows Azure public cloud service provided by Microsoft but plans to link it to its existing cloud services and middleware products. Furthermore, listening closely to customer feedback, Fujitsu will use FGCP/A5 as an opportunity to enhance its original, high-value-added services and expand its own cloud services. This paper introduces the application scope of FGCP/A5, its service menu, and examples of its initial application.

1. Introduction

In July 2010, Fujitsu entered into a strategic partnership with Microsoft Corporation covering use of the Windows Azure platform. Fujitsu has since completed the construction of a new cloud service known as Fujitsu Global Cloud Platform "FGCP/A5" Powered by Windows Azure, (hereinafter, FGCP/A5). It has been offering this service on a trial basis to selected companies since April 22, 2011, and on commercial basis to all companies since August 1, 2011. This paper introduces the application scope of FGCP/A5, its service menu, and examples of its early application.

2. Application scope of FGCP/A5

The Windows Azure platform (referred to below as "Azure")[1] is a cloud service environment that Microsoft has been providing globally since 2009.

As shown in **Figure 1**, FGCP/A5 is a platform as a service (PaaS) providing Azure on Fujitsu hardware (PRIMERGY) from Fujitsu

data centers in Japan. Fujitsu is adding a group of high-quality services including log management, application monitoring, and data linking with other clouds.

Fujitsu also advocates "hybrid cloud integration": combining Fujitsu cloud services with those of other companies in accordance with customer needs. As a platform service for accomplishing this, FGCP/A5 has three key application areas—core systems, front systems, and social systems—as shown in **Figure 2**.

1) Core systems

This area consists of company-wide business systems such as enterprise resource planning (ERP) and supply chain management (SCM) under the control of the company's IT department. The aim of FGCP/A5 in this area is to make internal operations more efficient.

2) Front systems

To enable "front-line" departments to create new business in the field, this area makes use of systems and collaborative software as a service (SaaS) products for making business
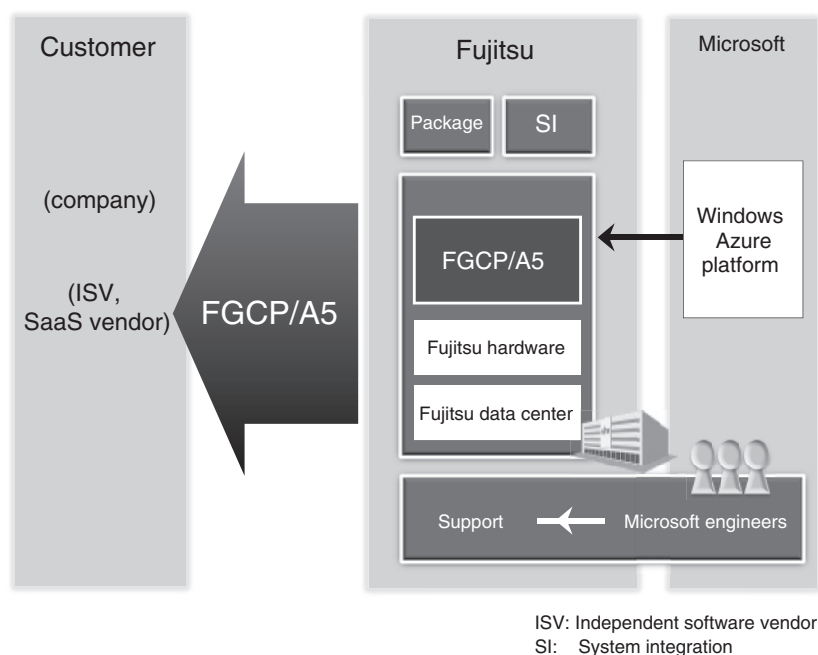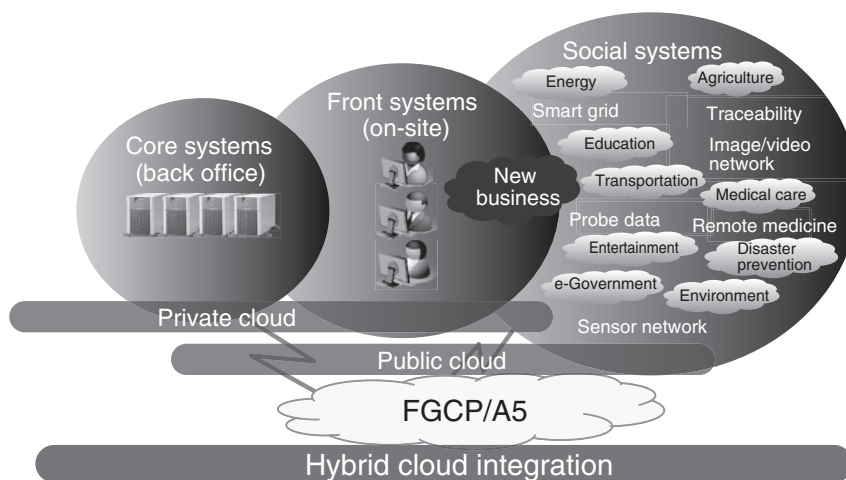
Figure 1
Provision of FGCP/A5.

Figure 2
Application areas of FGCP/A5.

operations more efficient without the aid of the IT department.

3)   Social systems

This area consists of fields like agriculture, medical care, and transportation that have traditionally been passed over as targets for systemization since the results of applying IT (cost-versus-effect) could not be directly determined. When applying the cloud, however, drastic reductions in IT costs and especially in network and storage costs can be expected here.

The FGCP/A5 service menu and a list of related services are shown in **Figure 3**. The services provided by FGCP/A5 fall into the following categories:

・   Platform

Services launch in August 2011

| FGCP/A5 cloud service | Related services |

Implementation

Consulting service

Consulting (implementation/migration/operation)

Cloud-security consulting

Development service

Business application development

Implementation /migration services

Performance-evaluation support

APM modernization for the cloud
- Business-applications screening service
- Application-assets migration service

Operations

Operation services
- External access monitoring
- Log monitoring
- Job execution
- Agent services (performing standard operations on behalf of customer)

Operations management
- Service/operations management

Backup services
- Remote backup
- External media management

Security services
- Cloud-security evaluation/auditing
- Web application diagnosis

Business operations
- BPO (business process outsourcing)

Middleware

Azure-supporting middleware

Interstage Application Server | Systemwalker Operation Manager

NetCOBOL | Interstage List Creator

Platform

FGCP/A5 basic services

Azure functions (Windows Azure, SQL Azure, AppFabric) | Support services

Application services

Industry-specific applications

Manufacturing/distribution

Agriculture, forest, and fisheries

Public sector (civil service, government, education)

Service industry

Community (local government)

Finance (financial services, insurance)

Life sciences

Technical computing (computer science)

Social infrastructure

Standard business applications

Front office

Back office

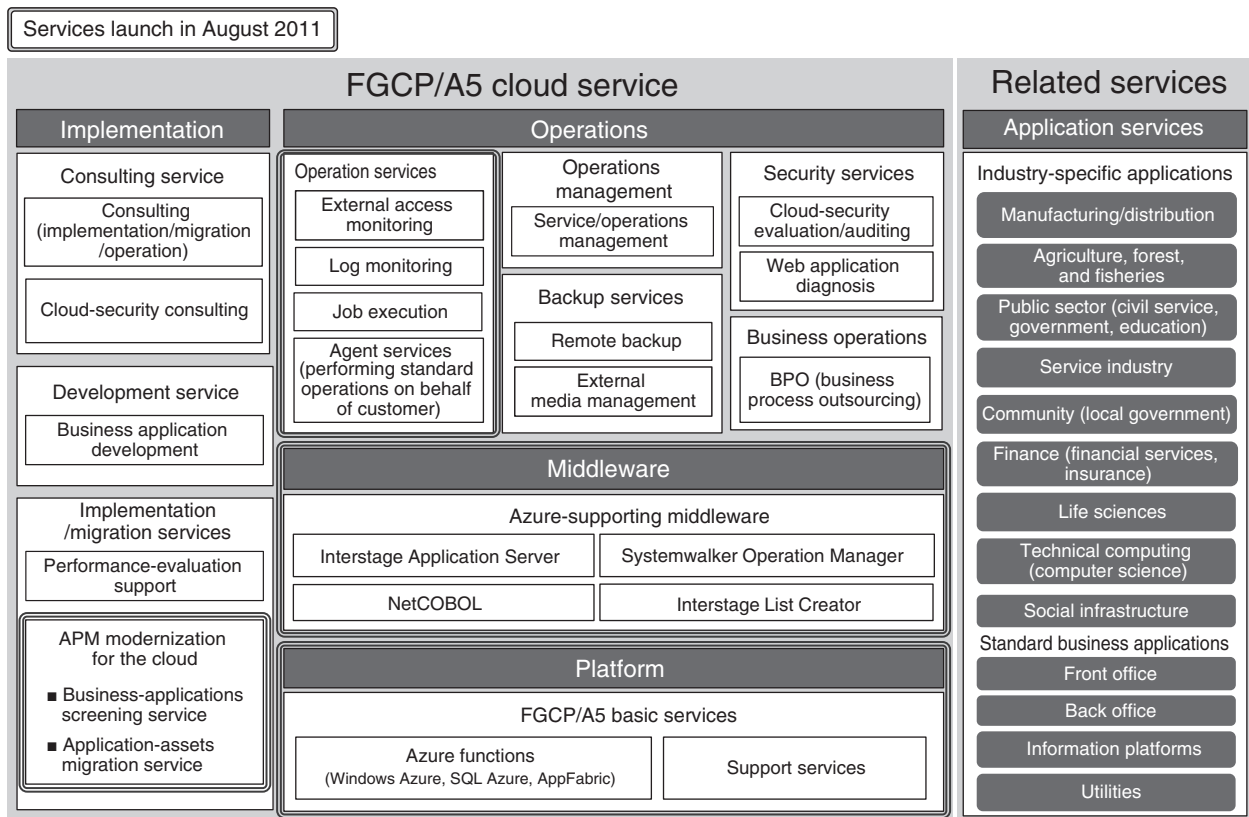Information platforms

Utilities

Figure 3
Service menu.

- Operations
- Middleware
- Implementation

Fujitsu also provides customers with value-added application services consisting of industry-specific applications and standard business applications.

2.1 Platform

An outline of the platform services is shown in **Figure 4**. The platform section provides the following three Azure-equivalent functions:

- Windows Azure
- SQL Azure
- AppFabric

Since the Azure platform has already been described by Microsoft itself and as related documents are readily available,[2] a detailed description is omitted here.

2.2 Operations

The FGCP/A5 service provides high-value-added operations-related services on the Azure platform that promote the use of cloud services.

1) Operation services

These services expand the target of operation monitoring as performed by existing outsourcing services at Fujitsu data centers to applications running on FGCP/A5.

For example, by enabling Systemwalker Centric Manager to support Azure, Fujitsu will provide a service that monitors log messages output by applications running on FGCP/A5 and forwards reports to appropriate recipients in accordance with the conditions surrounding message detection. Fujitsu will also provide a job scheduling service using a version of Systemwalker Operation Manager updated for Azure.
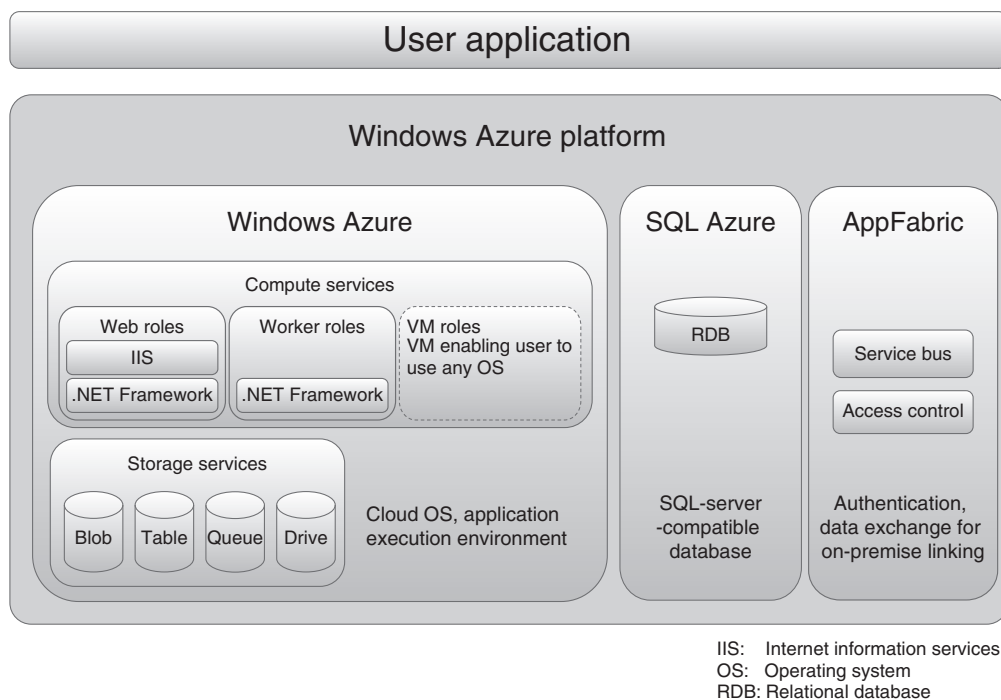
These operation services will enable

Figure 4
Overview of platform.

system engineers working in the field and even customers themselves to manage applications running on FGCP/A5 and to maintain business continuity or restore business in the event of an operation failure.

2)   Operations management

Total management services for customer systems as provided by existing outsourcing services are being expanded to run on FGCP/A5 to provide customers with a cloud service that they can use with confidence.

The plan here is to provide a system-operation agent service that operates systems on behalf of the customer, including incident management and configuration management, and an application-management agent service that manages applications on behalf of the customer, including application resource management and application release management.

3)   Backup services

To enable customers to make full use of cloud services within their business operations, it is essential that existing on-premise data

be migrated to the cloud and that data newly created by cloud services be migrated back to the existing system. These services facilitate a smooth migration of data between on-premise storage and FGCP/A5.

4)   Security services

These services include a "cloud-security consulting service," which informs the customer of security issues in cloud computing and supports safe-and-secure system construction and system use on the cloud, and a "cloud-security evaluation/auditing service."

The cloud-security consulting service targets customers who are considering the use of cloud computing. It establishes guidelines for implementing cloud security measures and helps customers in reviewing their security policies.

The cloud-security evaluation/auditing service targets cloud service providers. It provides services for evaluating and auditing security in the provision of cloud services.

These services are performed by Fujitsu consultants having extensive experience and

a proven track record in consulting related to information security and to the acquisition of International Standards Organization (ISO) and Privacy Mark certifications publically certified by third-party organizations.

Furthermore, as a business entity authorized by the Payment Card Industry Security Standards Council (PCI-SSC), the Fujitsu consulting department can conduct audits from the viewpoint of the PCI Data Security Standard (DSS), a global security standard in the credit industry.

2.3 Middleware

Fujitsu middleware products are being provided from FGCP/A5 as a service, and preparations are being made to expand the classes of applications that can be loaded on FGCP/A5.

In terms of execution environments, Interstage Application Server will be provided for Java applications and NetCOBOL for COBOL applications. In addition, Interstage Information Integrator will be provided for data linking with on-premise systems and Interstage List Creator for outputting portable document format (PDF) logs. For operation management, there are plans to provide Systemwalker Operation Manager to enable applications to be scheduled on FGCP/A5 from the on-premise side.

2.4 Implementation

Looking forward, the roles of cloud integrators and cloud service managers in determining the applicable domain of multiple cloud services and in designing, constructing, and operating hybrid cloud systems will become increasingly important. Fujitsu aims to create a mechanism for training and developing personnel for these roles within the company's system engineering (SE) department and to effectively uncover customer needs and reflect them in the systems to be constructed and implemented.

1) APM modernization for the cloud

For existing applications to be used as cloud services on FGCP/A5, they must be upgraded to exploit the features and characteristics of FGCP/A5. For example, before applications developed using Visual Basic are loaded on FGCP/A5, they must be restructured into .net applications. For this reason, Fujitsu is expanding its existing Application Portfolio Management (APM) modernization service to FGCP/A5 and providing support services for migrating applications in a relatively short period at low cost.

2) Consulting service

Given the variety of cloud services to choose from, it is important to determine what business applications should be provided from what cloud services. It is also important that such decisions be made in the initial stage of system implementation. This service supports the customer in determining what business applications are suitable for FGCP/A5.

3) Development service

In this service, an SE group having experience in developing FGCP/A5-based business applications and possessing extensive know-how in design, construction, and operation provides customers with business-development support.

This service aims for prompt and productive application development to respond quickly to changes in the business environment. It also aims to create a mechanism for managing application lifecycles to facilitate ongoing functional enhancements during the course of the business lifecycle.

3. Examples of FGCP/A5 applications

The following presents some representative example applications using FGCP/A5.

3.1 *Gyuho* system

An overview of the *Gyuho*[note] system is shown in **Figure 5**. Using a patent applied for by
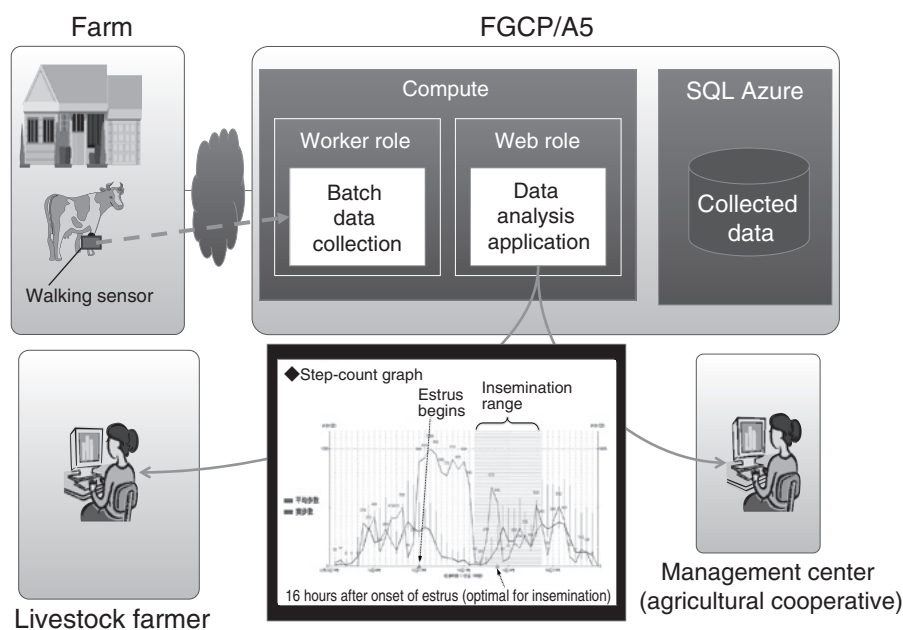
note) It means "cow walking."

Figure 5
Overview of *Gyuho* system.

COMTEC Co., Ltd., the *Gyuho* system provides animal husbandry support functions such as the collection of behavioral data on dairy cows and beef cattle, analysis of animal behavioral patterns, and determination of optimal timing for insemination. These functions can help dairy farms and cattle ranches improve their breeding rates and make their businesses more efficient.

Up to now, the *Gyuho* system has been packaged as a .net application and provided directly to dairy farms and regional agricultural cooperatives. However, offering the system as an FGCP/A5 service in the cloud environment would eliminate the need to install the system on individual servers or personal computers, and individual cows could easily be tracked by simply attaching walking sensors to them. This approach would make production of calves more efficient and significantly reduce costs. It would also reduce maintenance costs and provide collected data to inseminators, meat product producers, and beverage producers. Fujitsu aims to expand its cloud business by providing the *Gyuho* system as an FGCP/A5 service in other

countries such as Korea and Australia.

3.2 Migration of .Net Pet Shop to FGCP/A5

The migration of .Net Pet Shop to FGCP/A5 was attempted to test its compatibility with FGCP/A5.[3]

As reflected in **Figure 6**, .Net Pet Shop[4] is a sample application that simulates a shopping-cart-style electronic-commerce (EC) site. It is hosted by CodePlex, a Microsoft site providing open source software (OSS). Being a .net application, it appeared easy on the surface to migrate .Net Pet Shop to FGCP/A5, but functional limitations such as a maximum capacity of 50 GB in the SQL Azure database had to be dealt with. To overcome these limitations and achieve scalability, the application structure was overhauled such as by changing the data-holding destination from a database to a table service.

Furthermore, using as a reference the in-house results of testing the scalability of the well-known PetStore application—an equivalent sample application in Java—on PRIMEQUEST
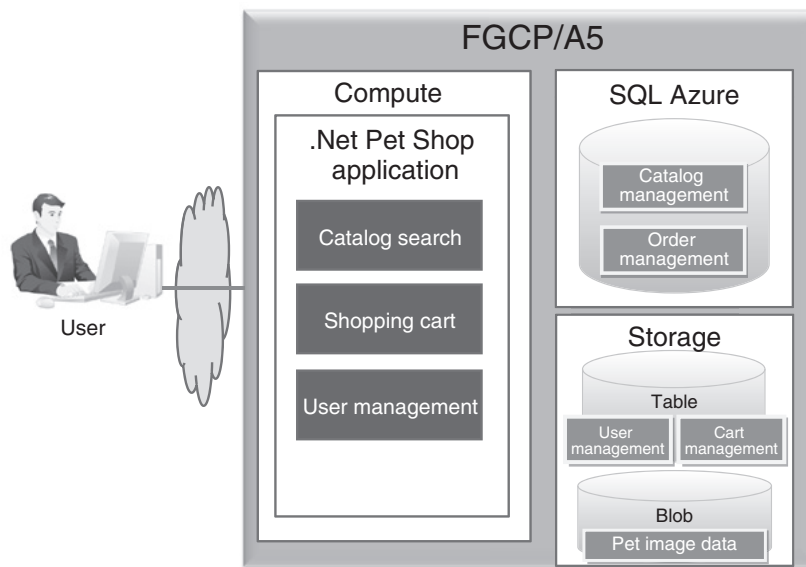
Figure 6
Overview of .Net Pet Shop and compatibility with FGCP/A5.

+ Oracle-RAC[5], Fujitsu is continuing to test the performance of .Net Pet Shop at a data scale fitting commercial services and will continue to test the feasibility of providing EC applications on FGCP/A5.

3.3 Improving efficiency of cloud operations

Fujitsu expects the provision of SaaS on FGCP/A5 to become a full-scale operation in the future. Once it does, SaaS providers will be able to provide services promptly, accurately, and cost effectively in response to a request for software use from a company. It is essential that the labor involved in operations and maintenance such as the allocation of SaaS environments and the loading of applications be reduced.

AppRegion[6] (**Figure 7**) is an operations tool that satisfies the above requirements. Using a system management application programming interface (API) provided by FGCP/A5, AppRegion provides the following functions.

1) Tenant management

This function registers SaaS users (companies) as tenants and allocates SaaS environments. It provides a dashboard enabling
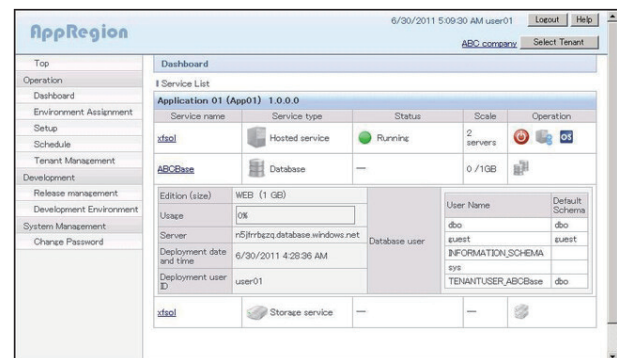

Figure 7
Main screen for AppRegion.

the display of operating conditions and other information for each tenant.

2) Automatic application deployment

This function registers application modules (applications, SQL scripts, files, etc.) beforehand so that applications can be deployed automatically and services can be provided promptly to end users.

3) Joint management by several people

This function enables operation and management by more than one person as is often required by actual systems as well as cross-sectional management as in the case of multiple

FUJITSU Sci. Tech. J., Vol. 47, No. 4 (October 2011)

449

FGCP/A5 subscriptions. It also includes other convenient functions such as access control, unauthorized operation prevention using an operation-log function, and problem occurrence auditing.

4) Automatic operations by scheduling

This function enables automated operations based on scheduling including the automation of backup operations (database, blob storage). It also enables the number of program instances to be modified through scheduling and auto-scaling to be achieved. Here, the results of automatic execution can be forwarded by E-mail, thereby reducing operation load.

The above features help to reduce the cost of SaaS environment operations and to speed up the provision of SaaS services.

4. Future outlook

By providing the FGCP/A5 cloud service, Fujitsu and Microsoft are accumulating valuable know-how on the provision of cloud services and acquiring the knowledge and methodology needed to provide customers with examples of optimally combined cloud services.

At the same time, Fujitsu is upgrading its in-house systems with the aim of providing vertical services in which the development of original services and functions is integrated with the provision of Fujitsu hardware and software. It will likewise work to revise its sales system, service development system, and service

operation system with the aim of providing uniform services not only to the Japanese market but to the global market as well.

5. Conclusion

The provision of FGCP/A5 has become, in practice, a cross-cultural project featuring close communication with Microsoft on a daily basis. Through this project, Fujitsu looks to grasp global market needs early, to acquire know-how on project promotion to enable it to expand services globally in an agile manner, to establish a system for promoting Fujitsu's own global cloud service business, and to expand its service provision region to the entire world.

References

1) Microsoft: Windows Azure Platform.
   http://www.microsoft.com/windowsazure/
2) Windows Azure White Papers.
   http://www.microsoft.com/windowsazure/whitepapers/
3) Application migration to cloud: a taxonomy of critical factors.
   http://portal.acm.org/citation.cfm?id=1985505
4) Microsoft .NET Pet Shop 4: Migrating an ASP.Net 1.1 Application to 2.0.
   http://msdn.microsoft.com/en-us/library/aa479070.aspx
5) Oracle Japan, Fujitsu: Results of Scalability Test of Oracle Real Application Clusters/Oracle Application Server on Fujitsu PRIMEQUEST. (in Japanese).
   http://otndnld.oracle.co.jp/tech/grid/pdf/FJ-GC-P1.0.pdf
6) Fujitsu System Solutions: AppRegion. (in Japanese).
   http://jp.fujitsu.com/group/fsol/release/20110404.html

Hitoshi Monma
Fujitsu Ltd.
Mr. Monma is engaged in the standardization, development, and operation of various types of PaaS services.