Fujitsu's Approach to Online Medical Billing Mechanism

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Japanese ministerial reforms of 2006 called for an online medical billing system that would use secure network lines to claim remuneration for medical care rendered. Moreover, electronic billing (online billing or billing using optical disks) is to become mandatory in principle by fiscal 2015 as a matter of government policy. Sending bills over the Internet requires the use of a service provider abiding by the "Guideline for Security Management of Medical Information Systems." Fujitsu currently provides the FENICS Medical Group Net Service, which has conformed to this guideline from the start, and is also developing new online support services that use network connections for online billing. This paper outlines the online billing process, introduces Fujitsu's approach to online medical billing, and describes new services for small and medium-sized hospitals that use an online billing network.

1. Introduction

In April 2006, a new system for online medical billing[1] using network lines was introduced in Japan. It is as a method by which medical institutions authorized by the government to treat people covered by medical insurance ("authorized medical institutions") can claim remuneration for medical care rendered. It produces itemized bills for health insurance (hereafter "bills" or "billing") so that they can be sent to examination and payment organizations, on top of the existing paper media and electronic media including floppy disks (hereafter "FDs").

Electronic medical billing (online billing or billing using optical disks) is to become mandatory in principle by fiscal 2015 (except for some authorized medical institutions that create handwritten bills without using special computers, and that have difficulty computerizing bills, for which exceptional measures are taken such as exemption).

This online medical billing mechanism uses nationwide network lines to deliver electronic billing data online.

Only network lines with security that is ensured according to the "Guideline for Security Management of Medical Information Systems"[2] can be used for this mechanism.

Fujitsu started providing a service in 2008 to ensure security when delivering the electronic billing data online in conformity with this Guideline. With HOPE/SX-J, a medical insurance administration system intended for small and medium-sized hospitals, Fujitsu also started a new maintenance service to solve long-standing problems by making use of the network lines for online medical billing.

This paper presents Fujitsu's approach to online medical billing and new services making use of network lines for such billing, aiming to improve the efficiency of software maintenance and operational support in procedures and treatments except medical care, and it describes the future outlook for this online billing mechanism.

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2. Outline of online medical billing mechanism

2.1 Conventional medical billing mechanism and its issues

The conventional medical billing method used paper media specified in the Ministerial Ordinance concerning the Billing for Medical Care Benefits and Expenditure in Relation to Public-funded Medical Services or electronic media such as FDs specified in the Guidelines concerning the Billing for Expenditure Using Magnetic Tapes and Other Media in Relation to Authorized Medical Institutions.[3]

With these methods, the respective authorized medical institutions submitted paper bills or electronic media such as FDs storing electronic billing data to examination and payment organizations, delivering them by hand or by mail. The submitted bills were reviewed by the examination and payment organization at the time of acceptance, and if any of the bills had a problem they were returned to the authorized medical institution concerned the following month or later. The medical institutions then had to submit another bill.

This process of billing traditionally had the following problems:

1) Higher costs because of the need to prepare paper media and electronic media such as FDs

2) Risk of loss of data because the bills were delivered by hand or sent by mail

3) Hospitals received their revenue later than normal if they needed to return a bill that had failed to pass an acceptance review.

2.2 Outline of online medical billing mechanism

With the online medical billing mechanism, authorized medical institutions use secure network lines to connect to the online medical billing service (ASP service) of the respective examination and payment organizations and directly upload electronic billing data.

Compared with the conventional methods of billing, this mechanism has:

1) Cut costs by eliminating the need for paper media and electronic media including FDs

2) Ensured higher security than when delivering media including paper and FDs

3) Allowed medical institutions to receive revenue more quickly by having the bills reviewed immediately after they are uploaded to the system

To ensure the high security in 2) above, in particular, it is essential to use secure network lines that conform to the Guideline for Security Management of Medical Information Systems.

Secure network lines include a dialup connection, IP-VPN (closed IP network) connection and an Internet connection combining IPSec (Internet Protocol Security) and IKE (Internet Key Exchange).

For Internet connections that combine IPSec and IKE, the only services that can be used are those offered by providers that conform to the Guideline for Security Management of Medical Information Systems, assessed based on the Checklist for IPSec + IKE Service Providers for Online Billing to the Reimbursement Services provided by the Health Information Security Performance Rating Organization.[4]

3. Fujitsu's approach to online billing

Fujitsu started to provide the FENICS[note] Medical Group Net Service[5] as a service in conformity with the Guideline for Security Management of Medical Information Systems in 2008, when using an online medical billing mechanism combining IPSec and IKE became possible.

This service provides a system in which USB keys, routers, and other devices are used to connect between the respective authorized medical institutions and examination and

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note) Generic term for the network services provided by Fujitsu.

payment organizations to encrypt communication paths, and ensure strong authentication and destination management only when authentication is granted by the authentication server at a Fujitsu data center (**Figure 1**).

To help this online medical billing mechanism become popular, Fujitsu also started in 2009 to offer HOPE/SX-J Basic Pack, an inexpensive version of HOPE/SX-J intended for small authorized medical institutions that conventionally issued handwritten paper bills.

4. New services for medical insurance administration system

4.1 Problems with medical insurance administration system

Some authorized medical institutions have been using dedicated network lines to put in place an environment for remote maintenance and for other purposes while ensuring security. In reality, however, network lines have not become very popular. The reasons for this include the fact that institutions want to try to prevent security incidents and reduce the investment and operational costs involved in building dedicated

lines.

Under the circumstances, medical insurance administration systems had the following problems.

1) Time required for sending and applying patches

Medical insurance administration systems need to provide patches that are useful when updating the points mechanism in relation to medical billing and in updating the medical insurance system ("medical system revisions"). These patches must be sent in a short time and with high quality for authorized medical institutions nationwide (about 13 000 institutions as of February 2010 regarding HOPE/SX-J).

As described earlier, network lines were not widespread among authorized medical institutions and these patches were offered via electronic media such as CDs. This required time to make copies of electronic media and dispatch them, apply the patches and conduct an operation check at the authorized medical institutions.

The time required for making copies of electronic media, dispatching the media and applying the patches at authorized medical institutions put burdens on the authorized
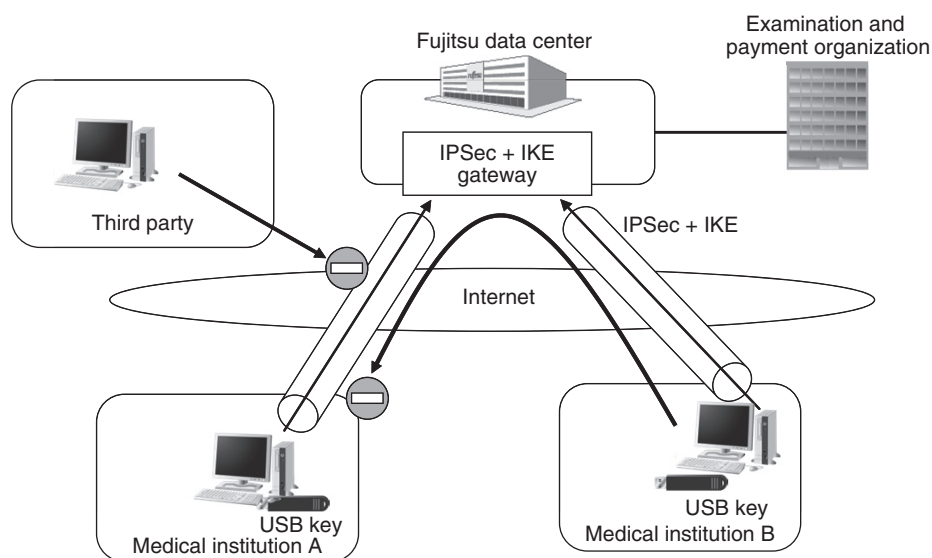

Figure 1
FENICS Medical Group Net Service.

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medical institutions and distribution and support companies as well as the developers. Therefore, the industry has been faced with the challenge of reducing the time required for these processes and easing the burdens on authorized medical institutions and distribution companies.

2) Prompt response to emergencies

Distribution and support companies were obliged, when emergencies occurred at the authorized medical institutions they were in charge of, to visit the sites and promptly solve the problems, even if the institutions were located in remote places or isolated islands, because networks were not necessarily in place, as described earlier. They conducted investigations and gathered information after arriving at the sites, and this meant that extra time was required for solving problems, which was another issue.

4.2 Online distribution of patches and its effect

As network lines for authorized medical institutions became popular along with online medical billing, we considered applying and using these secure network connections by means of USB keys or such like in conformity with the Guideline for Security Management of Medical Information Mechanism. We believed this might make it possible to reduce the time required for sending and applying patches and enable prompt responses to emergencies, as described above.

Accordingly, Fujitsu first launched the HOPE update center service that makes use of the FENICS Medical Group Net Service as a secure network connection for online medical billing.

The HOPE update center provides a mechanism to allow authorized medical institutions to directly download patches via a secure network connection and apply them to HOPE/SX-J (**Figure 2**).
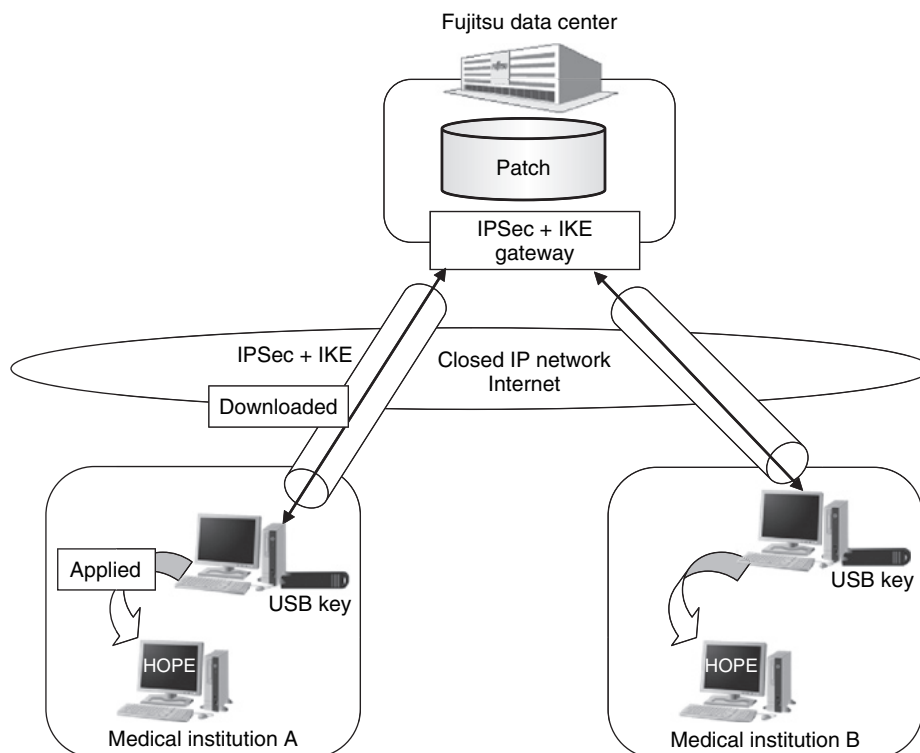
Fujitsu data center

Patch

IPSec + IKE gateway

IPSec + IKE

Closed IP network
Internet

Downloaded

Applied

USB key

HOPE

Medical institution A

USB key

HOPE

Medical institution B

Figure 2
Outline of HOPE update center.

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First, patches are deployed on the server at a Fujitsu data center. Then, authorized medical institutions use the mechanism of the FENICS Medical Group Net Service to connect to the server at the Fujitsu data center, directly download the patches as required and apply them to HOPE/SX-J.

Use of this HOPE update center eliminates the costs for copying and dispatching electronic media, which was necessary with the conventional method, allows patches to be sent to all medical institutions more quickly, and reduces the time required for applying them at authorized medical institutions.

4.3 Remote maintenance and its effect

To promptly respond to emergencies, we have taken advantage of network lines for online medical billing to launch a service intended for distribution companies. It provides remote maintenance between authorized medical institutions and distribution company offices by using a network connection method in conformity with the Guideline for Security Management of Medical Information Systems.

This service uses the mechanism of the FENICS Medical Group Net Service to connect between distribution company offices and the authorized medical institutions they are in charge of, and thus allows the distribution company offices to remotely and directly operate personal computers at the authorized medical institutions (**Figure 3**).

Use of this service reduces traveling times and costs and allows for immediate response in the event of problems. It is expected to have a significant effect on the operations at authorized medical institutions in remote places and isolated islands.

5. Future developments

This section presents Fujitsu's future developments that make use of the network for online medical billing.
1) Enhancement of HOPE update center functions

We intend to further enhance the content for a wider range of applications and provide greater
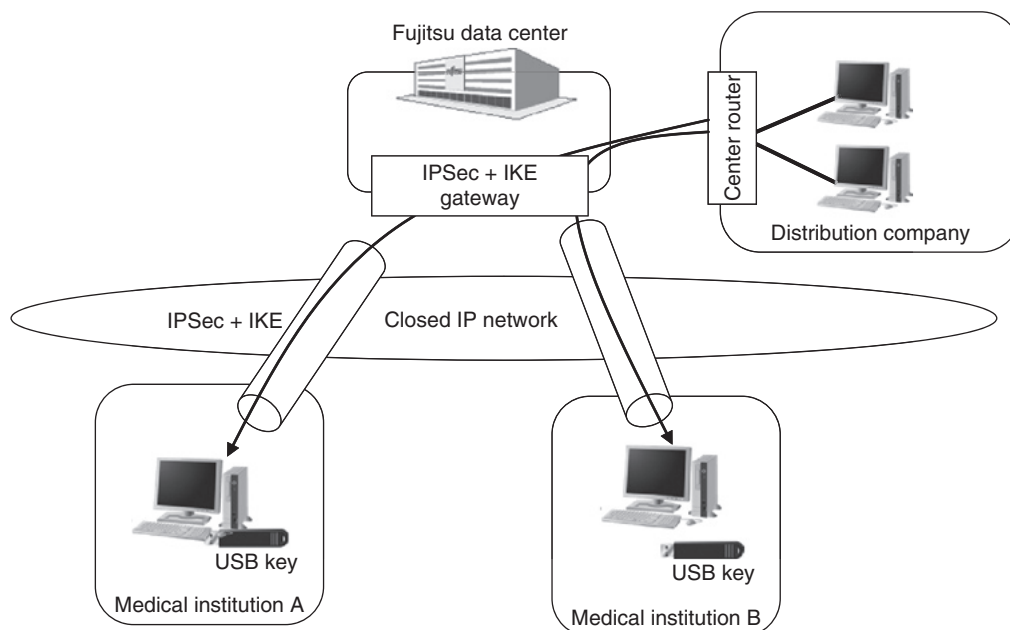

Figure 3
Outline of remote maintenance.

convenience in the future.

2) Application of HOPE update center to other systems

Up to now, we have built the HOPE update center service with the focus on HOPE/SX-J. Services like this that use network lines to provide patches are useful not only for medical insurance administration systems but also for other hospital information systems. In the future, we intend to apply the HOPE update center service to the HOPE/EGMAIN-CX electronic medical record system for medical offices without beds and the HOPE/WINCARE nursing care service provider assistance system to improve support for the entire HOPE series at small and medium-sized hospitals.

6. Conclusion

In this paper, we presented an outline of the online medical billing mechanism, Fujitsu's approach to this mechanism and new maintenance services for medical insurance administration systems that make use of network lines for online billing.

In the future, Fujitsu expects the network environment at authorized medical institutions to improve along with the diffusion of the method of online billing using network lines, and hopes that there will be greater regional medical cooperation thanks to this network. Fujitsu is committed to making ongoing contributions to help the online medical billing become widely used and realize a hospital information system. The aim is to improve the quality of medical care by regional medical cooperation.

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