Introduction of Video Communications Cloud Services Compatible with Multiple Devices

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Abstract

Against the background of an aging population, combined with a diminishing number of children as well as prolonged economic stagnation, there is an ongoing trend in which many public institutions and private enterprises are choosing cloud services for the sake of cost reduction. At the same time, their review of BCPs (Business Continuity Plans) has spurred increased interest in video-based communications, including videoconferencing systems that take advantage of tablets as part of the maintenance of a remote office environment. To meet these needs, NEC offers a multifunctional video communications cloud service that is compatible with multiple devices and multiple protocols while ensuring the capability to link with conventional videoconferencing systems.

Keywords

multiple devices, multiple protocols, virtual network, SIP, H.323
mobile terminals, five-language interpretation, videoconferencing

1. Introduction

Japan's economy has been suffering from a prolonged recession, while its society is aging, with fewer children. Now, against this background, there is an ongoing trend in which many public institutions and private enterprises are choosing cloud services for the sake of cost reduction, the result of further efforts to reduce fixed expenses and increase strictness in the cost effectiveness of system investments.

Combined with the lessons learned from the 2011 off the Pacific coast of Tohoku Earthquake, many companies and governmental/municipal organizations are reviewing their BCPs. This has resulted in their increased interest in video communications such as videoconferencing systems. They are expected to promote the preparation of a remote office environment. Especially for business sector, such systems are expected to accelerate the maintenance of a collaborative environment between establishments in and outside Japan for the purpose of increasing their overseas sales ratio, in addition to the aforementioned cost reduction.

2. The Development of a Video Communications Cloud Computing System

The need to develop a cloud computing system for video communications was first noticed when the present authors, who are its planners and developers, conducted original questionnaire surveys on videoconferencing by telephone aimed at approximately 1,400 companies in February 2011.

2.1 Research into Companies about Introduction of Video Communications Systems

As a result of this research, it was found that over 60 percent of companies carried out production overseas. There were many responses saying that they wanted to use video communications such as videoconferencing to announce management strategies and business decision to their overseas market.

On the other hand, over 70 percent of companies responded that they did not have concrete plans for the introduction of video communications such as videoconferencing.

Among the private enterprises that responded to our questionnaire surveys, one company presented an advanced case of accomplishing simultaneously knowledge sharing, with effective use of time, by simultaneously holding, recording and distributing videoconferences of various liaison meetings and training seminars and revising regulations and systems among forty places, including offices and mobile phones.

2.2 Issues in Video Communications

There are three major issues when introducing a video com-

munications platform, as in the advanced case mentioned above.

- High initial cost (investment in equipment and facilities)
- Difficulty in deployment video communications networks
- Lack of understanding of the effectiveness of video communications usage

NEC developed the Vaether service with a view to addressing these problems.

3. Overview of the Vaether Service

In the description that follows, for the sake of making it easier to understand the features of the Vaether service, a comparison is made with the introduction of an ordinary videoconferencing system.

3.1 Introducing an Ordinary Videoconferencing System

The main factors generally causing the high initial introduction cost of a videoconferencing system and the difficulty in introducing a video communications network are as follows.

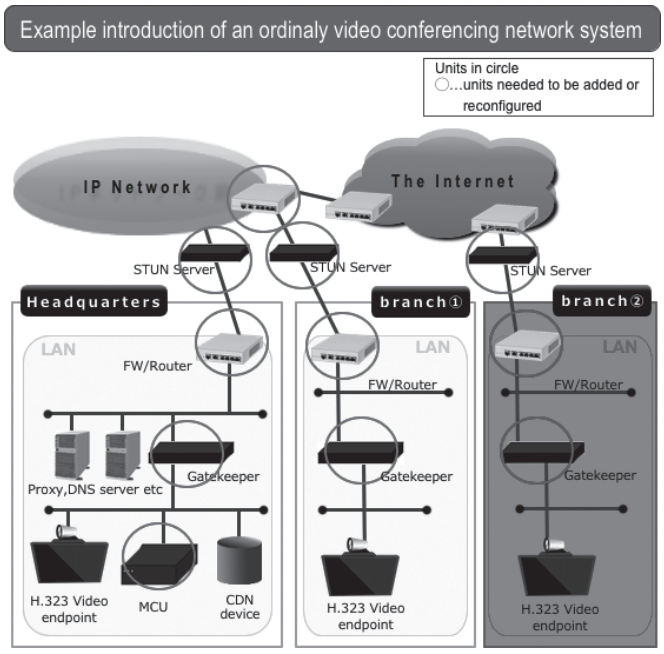

Fig. 1 Deployment of an ordinary videoconferencing system.

- The complexity of adding equipment and altering existing networks
- Assuring connectability with existing equipment and maintaining security

In other words, advanced network technology is required to introduce and set up equipment and the equipment itself is very expensive (**Fig. 1**).

3.2 Introducing a Videoconferencing System with the Vaether Service

With the Vaether service, the NEC data center maintains and manages costly communications facilities for the aforementioned videoconferencing to offer an environment that allows users to easily and safely connect to networks with customers (**Fig. 2**).

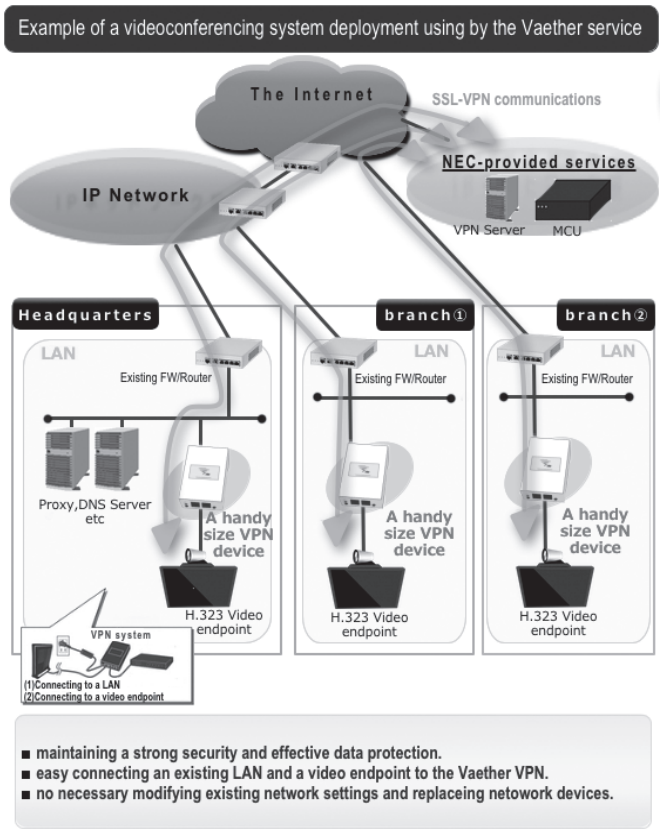

Fig. 2 Deployment of a videoconferencing system with the NEC Vaether service.

3.3 Four Available Services

The four services the Vaether service has to offer are now introduced below (**Fig. 3**).

(1) SSL-VPN service

This is a rental service for a compact SSL-VPN device (**Photo 1**) that was originally customized by NEC to improve throughput, for example through priority control of packets for video communications.

This device links to a NEC VPN server to allow users to easily and safely build an SSL-VPN connection environment with external systems without the need to change the security settings of a corporate intranet. It also helps to achieve encryption of communications between different makers, which is difficult with an ordinary videoconferencing system alone.

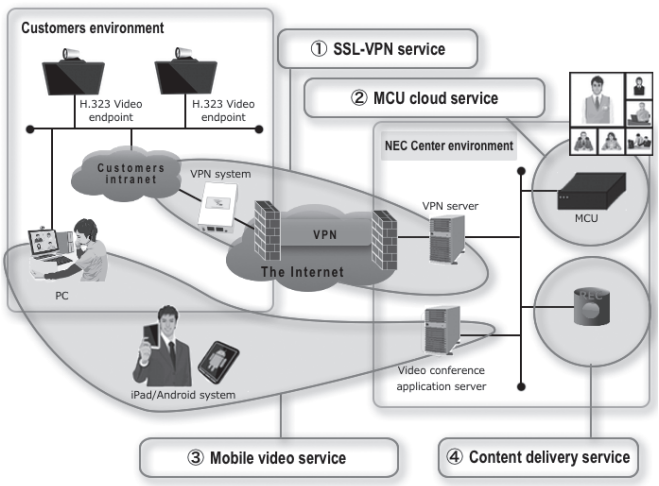

Fig. 3 Four services of Vaether.

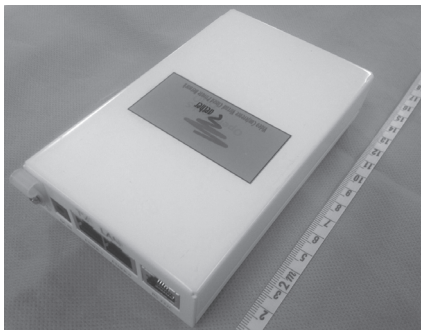

Photo 1 A handy size SSL-VPN device.

(2) MCU Cloud Service

Generally speaking, a device called an MCU (multipoint control unit) is required to bridge videoconferencing connections between three locations or more.

The MCU Cloud Service lets users use MCUs owned by NEC. Simultaneous connections between up to 20 locations are possible in the standard service.

This service is compatible with standard audio/video protocols like SIP and H.323, which are used by many videoconferencing terminals, thereby enabling connections between different makers.

In short, this service enables mutual connections with newly introduced equipment to help achieve the effective utilization of existing assets.

(3) Mobile Video service

This service enables the mutual interaction of audio and video information between mobile terminals such as iPhones, iPads and Android phones, as well as Windows PCs and existing videoconferencing terminals manufactured by NEC, Polycom and Sony. It helps to increase productivity through its capability to allow users to participate in conventional videoconferences using mobile terminals such as iPhones, iPads and Android phones when they are away from the office.

(4) Content delivery service

With this service, a videoconference connected via SSL-VPN to the Vaether service is recorded in real time for streaming distribution. This makes it possible to record and distribute content such as CEO speech at annual conference and various remote seminars. iPhones, iPads, Android phones and other mobile terminals are incorporated into this service as tools for video communication.

4. Basic Technologies Supporting the Vaether Service

The basic technologies used by the Vaether service to achieve easy-to-use yet advanced video communications are described below.

4.1 Network Technologies

(1) Stabilization of communications

The SSL-VPN device employed for the Vaether service uses a technology that establishes multiple sessions of TCP connections during a VPN connection to stabilize a VPN tunnel through which UDP packets are distrib-

uted. This reduces packet loss in the unstable communication conditions in which packet loss is likely to occur.

(2) High-speed encryption/decryption processing technology

In encryption and decryption, encryption processing time generally increases relative to encryption strength.

The compact SSL-VPN device employed for the Vaether service minimizes the delay in encryption processing by performing high-speed processing of encryption and decryption, including 256-bit AES encryption processing, thereby enabling audio/video communications free from the impression of influence from encryption/decryption processing.

(3) SSL-VPN technology

The compact SSL-VPN device employed for the Vaether service takes advantage of a VPN that uses HTTPS (SSL) communications. HTTPS is a protocol with which communications with the outside are generally permitted. Because the VPN is built in layer 2 in the HTTPS communications, safer use of videoconferencing is possible without changing the settings of existing networks.

(4) Optimization of video and audio packets

The Vaether service performs original settings optimization for priority processing of audio and video packets inside the VPN to achieve clear video and audio communications in videoconferencing.

4.2 H.323/SIP Conversion Technology

In general, the H.323 and SIP standards are used as call control protocols to perform video and audio communications. The advantage of SIP is that it is easier to incorporate into web and other applications and offers high compatibility with mobile/cellular phones. As for H.323, it was standardized three years before SIP, so videoconferencing terminals using H.323 have been more widely disseminated, with a much greater number of implementations. Unfortunately, there is no protocol compatibility between H.323 and SIP, making it difficult to bridge between H.323-compatible and SIP-compatible devices.

The communications devices of the Vaether service implement a technology that converts between SIP and H.323 without delay.

5. Conclusion

Currently, an interpretation cloud service (**Photo 2**) based on the Vaether service is being offered at mass transit systems and retail shops.

Photo 2 Installation conditions of interpretation service terminals.

This interpretation cloud service achieves a multilingual interpretation service compatible with multiple devices. When foreigners visit Japan, they can use real-time Japanese interpretation to and from a range of languages including English, Chinese, Korean, Portuguese and Spanish via a dedicated application on mobile terminals such as iPhones, iPads and Android phones, in various situations - for example, when visiting municipal tourist information offices, purchasing drugs at pharmacy counters, going to hospitals and shopping at shopping centers.

Conversely, the Japanese traveler can easily use the interpretation service at all times from their mobile terminals via the Internet when overseas.

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