

# Cloud-Based Interpreting Service Using a Videoconference Telephone Compatible with Multiple Devices

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## Abstract

With Japan's workforce shrinking in the face of the nation's plunging birth rate and aging population, the Japanese government has undertaken a series of growth-oriented measures aimed at reversing this trend. Among the many initiatives recently announced as part of this growth strategy that includes the relaxation of visa requirements for foreigners visiting Japan in order to encourage the entry of migrant workers. As entry restrictions have eased, the lower yen exchange rate has also encouraged more foreigners to visit Japan, with the number of visitors topping 10 million in 2013 and even more expected in the future. However, the official government report reveals that the country is poorly prepared to accommodate the needs of foreign visitors, especially in terms of communication. To help overcome this condition, NEC has developed a cloud-based interpreting service that uses a videoconference telephone and can be accessed anywhere and at any time, wherever a tablet PC is available in an internet connected environment.

## Keywords



cloud-based interpreting, 24 hours a day and 365 days a year, five-language translation, videoconferencing, multiple devices, multiple protocols, SIP, H.323, mobile terminals, 2020 Tokyo Olympics

## 1. Introduction

Japan is facing the nation's plunging birth rate and aging population. To foster development of new industries and stimulate growth of the workforce in such a social environment, the Japanese government unveiled the Agenda for the Evolution of Growth Strategy, its blueprint for economic revival, at the Council on Competitiveness-Nippon (chaired by Prime Minister Shinzo Abe) on January 20, 2014. Part of this grand design included creating an environment more receptive to foreign workers and revisions to the technical intern training program. The government also announced that plans to beef up its tourism program, taking advantage of the international exposure offered by the upcoming Tokyo Olympics and Paralympics with the goal of increasing the number of foreign visitors to Japan to 20 million by 2020.

To support efforts to recruit more foreign workers, the Alien Registration Act was abolished in July 2012 and basic government services are now provided to foreign residents under the terms of the Residential Basic Book Act. With more foreign residents eligible for more services, municipalities have come under increasing pressure to provide multilingual customer and counter services leading to growing demand for

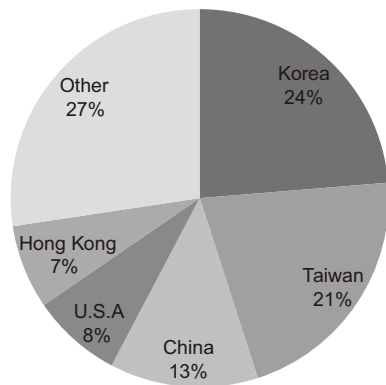
multi-language interpreting solutions that take advantage of the advanced capabilities of today's information and communications technology (ICT).

## 2. Tourism Trends

To assess trends in tourism to Japan, we looked at various studies prepared by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the Japan National Tourism Organization (JNTO), the two departments primarily responsible for developing and managing the Japanese government's policies on foreign visitors to Japan.

### 2.1 International Visitors to Japan According to Country and Language

According to JNTO's research, international visitors to Japan totaled about 10.36 million between January and December 2013. When broken down by country of origin, more than 70 percent of those visitors came from Korea, Taiwan, China, the United States, and Hong Kong, in that order (**Fig. 1**). This means that the majority of foreign visitors to Japan can be effectively accommodated by providing interpreting services in Korean, Mandarin, and English.



Source: Japan National Tourism Organization (JNTO)

Fig. 1 Top 5 source countries for foreign tourists to Japan (2013).

Moreover, because there are many countries where people speak English as a second language, NEC estimates that it would be possible to support more than 85% of the foreign tourists to Japan with English, Mandarin, and Korean interpreting services.

However, when foreign residents and workers in Japan are taken into consideration, things aren't so simple. Translation services in English, Mandarin, and Korean alone would not meet the needs of the many foreign residents who, depending on their country of origin, speak Portuguese or Spanish. Today, the ability to provide counter services in Portuguese and Spanish, as well as Korean, Mandarin, and English is crucial for many municipalities.

### 2.2 Trends in Number and Duration of Visits

According to the Japan Tourism Agency's (JTA) "Consumption Trend Survey for Foreigners Visiting Japan" in the July to September quarter of 2013, less than 30% of the foreign nationals visiting Japan whose purpose of visit was tourism and leisure visited four or more times. This is also the case with visitors from Korea and China, which are Japan's closest neighbors (Fig. 2). This makes it clear that there is room to expand the number of repeat visits.

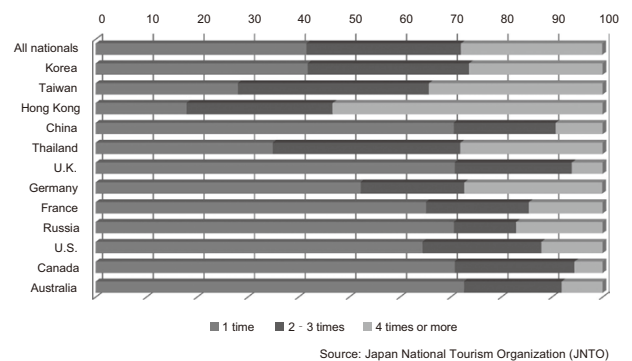
The length of stay of international visitors whose reason for visiting was tourism and leisure was also examined in the survey. Significant differences were found, depending on the visitor's country of origin. Nearly 30% of visitors from Korea stayed for 3 days or less, demonstrating a clear tendency amongst Koreans to stay in Japan for shorter periods than visitors from other countries. Of those Korean visitors who stayed more than 3 days, less than 10% stayed in Japan for more than 2 weeks. Visitors from other neighboring countries such as China showed similar tendencies, with visitors who stayed in Japan for 2 weeks or more accounting for less than 10% of the total. Tourists from North America and Europe, on the

other hand, were much more likely to spend 2 weeks or more in Japan. Visitors from the U.K., Germany, and France were especially likely to stay longer, with more than 40% of them staying for 2 weeks or more (Fig. 3). Although this is due to some extent to cultural differences in vacation systems, tourism analysts believe that there should be room to encourage visitors from neighboring countries to stay longer and to boost the consumption of those visitors who do stay longer.

The estimated quarterly value of tourist consumption derived by multiplying travel expenditures such as lodging, dining, and shopping expenses by the number of visitors is calculated to be 325.3 billion yen. According to the Strategic Market Creation Plan of "Japan Revitalization Strategy - Japan Is Back," another key component of the Japanese government's grand design for economic revival, annual tourist consumption is estimated to reach 4.7 trillion yen in 2030.

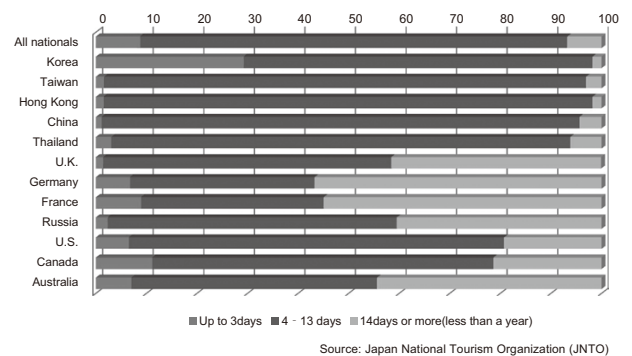
### 2.3 Problems and Solutions in Accommodating Foreign Visitors to Japan

The above-mentioned analysis also supports the notion that businesses that target foreign visitors to Japan will be able to tap into a lucrative market with strong potential for growth in the future. Nevertheless, JTA research has uncovered three major issues raised by international travelers regarding their stay



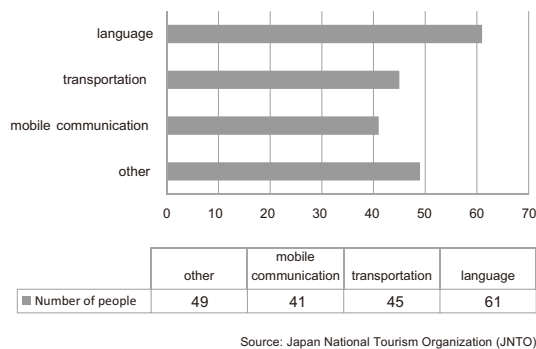
Source: Japan National Tourism Organization (JNTO)

Fig. 2 Number of visits for purpose of tourism in July-September quarter of 2013.



Source: Japan National Tourism Organization (JNTO)

Fig. 3 Length of stay for purpose of tourism in July-September quarter of 2013



Source: Japan National Tourism Organization (JNTO)

Fig. 4 Issues considered problematic by foreign visitors to Japan during their stay.

in Japan that could negatively impact future growth if they are not resolved (Fig. 4).

- Language (unable to communicate with people and read signs on the streets)
- Transportation (complexity of routes and inability to read directions at train stations)
- Communications (Wi-Fi access points difficult to find or use)

NEC’s cloud-based interpreting service has been specifically developed to solve the language issue.

### 3. Overview of the Cloud-Based Interpreting Service

Based on our videoconferencing system, NEC’s cloud-based interpreting service (Photo) is now offered at municipal offices, hospitals and clinics, transportation facilities and large-scale retail stores.

This service provides a multi-language interpreting service using a videoconference telephone. When foreign visitors to Japan are seeking assistance at municipal offices, trying to make themselves understood at a pharmacies and hospitals, or make a payment at a department store, they can take advantage of real-time interpreting between Japanese and Chinese, English, Korean, Portuguese or Spanish for 24 hours a day, every day, 365 days a year.

To make it easier to understand the features of the cloud-based interpreting service, we compare it below with hiring an actual interpreter.

#### 3.1 Problems That can Occur When an Interpreter is Hired and Dispatched

One of the problems our customers have found with live interpreters is the seasonal factor. That is, the need for an interpreter to support an organization’s customer service operations varies according to season. Hiring an interpreter year-round is not cost-effective, making it impossible to establish an organization structure in which dedicated interpreters are hired



Photo Videoconference telephone interpreting using NEC’s tablet.

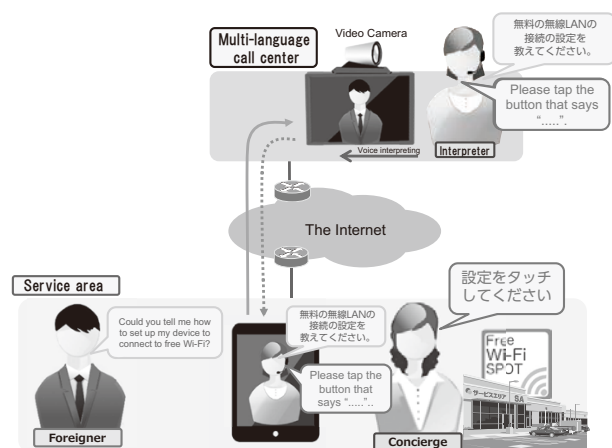


Fig. 5 Conceptual diagram of how NEC’s interpreting service can be used.

for long periods. At the same time, a sudden influx of international visitors, such as when a major international conference happens to be held, can result in a shortage of experienced interpreters, making it difficult to use them when required. In other words, there are two problems in dispatching and hiring of interpreters as shown below.

- Setting appropriate prices to assure cost-effectiveness of the interpreting service
- Ensuring flexibility and effectiveness of the interpreting system

#### 3.2 Features of Cloud-based Interpreting Service

NEC’s cloud-based interpreting service lets customers share more than 100 multi-language interpreters/operators deployed in a call center that operates 24 hours a day, 365 days a year. When a customer has a foreign visitor who needs help communicating, they can connect the visitor to our call center using a tablet or other mobile device where they will be able to use one of our interpreters via our videoconferencing telephone service. This ensures that interpreting services are available

when needed, while reducing the costs associated with hiring interpreters and enabling organizations to easily accommodate the needs of foreign visitors at any time (Fig. 5).

#### 4. NEC's Core Videoconferencing Technology and How It Supports Cloud-based Interpreting

Our data center operates advanced communications facilities that maintain the highest standards of video and audio quality via the Internet in order to provide a secure environment that can assure stable, uninterrupted conversations between customers and interpreters. The core technology that supports the cloud-based interpreting service is described below.

##### (1) Network technology infrastructure

###### 1) Stable communication

The communications equipment that connects the interpreter/operators with the customers who use the interpreting service supports multiple TCP connections to ensure that UDP packets can be routed along stabilized communication pathways. This minimizes reduction of packet loss to assure smooth, glitch-free communications (Fig. 6).

###### 2) High-speed data compression decoding processing

Conventionally, compressing and decoding video and audio data puts a high load on the computer's processors and extends the processing time.

At NEC, we use a combination of dedicated hardware and customized software to perform high-speed compression and decoding processing, which makes it possible to minimize the processing delay so that the highest audio and video quality can be maintained to ensure the optimal user experience.

###### 3) Video/audio packet priority processing

NEC's original optimization setting prioritizes the processing of video/audio packets currently carrying conversations along communication paths to assure smooth, clear video/audio communications during videoconferencing.

##### (2) Mutual operation technology infrastructure for H.323/SIP

H.323 and SIP are the standards for call control protocols to implement video/audio communications. While the H.323 standard is widely incorporated in videoconference terminals and their operations well understood, the SIP

standard features high compatibility with the Internet and ease of incorporation in mobile devices. NEC has successfully deployed equipment that takes advantage of the characteristics of each protocol.

However, because there is no protocol compatibility between H.323 and SIP, a gateway device is required between an H.323-compatible terminal and SIP-compatible terminal.

NEC has developed technology that performs conversion between H.323 and SIP without delay. This technology is implemented in the H.323 videoconference-dedicated equipment installed at the desks of the interpreters/operators at the call center and the SIP video application used by the users' tablets.

#### 5. Conclusion

It is expected that more people than usual will visit Japan during the Olympics and Paralympics in 2020. It is also expected that a conventional interpreting service that requires many interpreters will have difficulty coping with the surge of foreign visitors. We believe that supporting conventional services with ICT is critical. This also includes multi-language GPS navigation systems in conjunction with map services and translation software that utilizes OCR.

However, in situations where automatic interpreting and translation machines are inadequate, such as in cases of serious illness, accidents or robbery, our cloud-based interpreting service supports smooth communication with foreign visitors to Japan.

As our cloud-based interpreting service can also be accessed from overseas, we plan to promote outbound market development such as usage by Japanese when they are traveling overseas.

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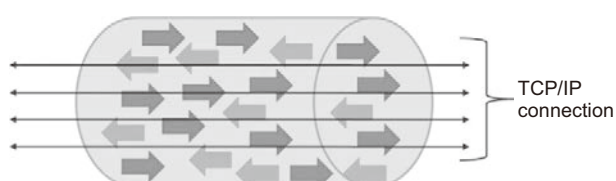


Fig. 6 Schematic diagram of UDP packet transmission by TCP.

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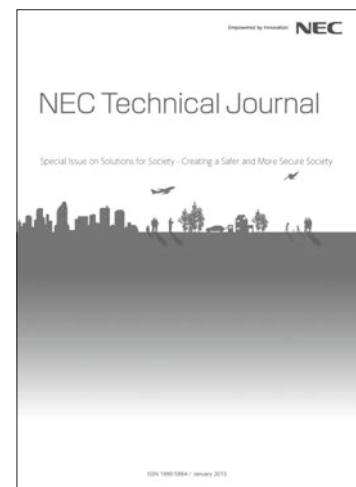
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