

IP Announcement Solution

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Abstract

In recent years the spread of broadband through FTTH (Fiber To The Home) is progressing largely in the countryside under the leadership of local governments. A notable trend in system usage is the realization of applications accompanied by audio (voice) in an IP environment. The means of achieving this is the IP Announcement Solution, and this paper introduces the background that lead to its appearance, actual case studies, and its potential for the future.

Keywords

FTTH, Broadband, ICT, TCP/IP, IP multicast, IP phone, SIP, triple play, ubiquitous network

1. Introduction

In Japan, the broadband environment has expanded rapidly in the 5 years since 2000, predominantly in urban areas.

Concurrently as part of the policies of e-JAPAN and the Great Heisei Merger, improvement of the broadband environment in rural areas is being advanced under the leadership of the government.

Behind these achievements are performance objectives such as the improvement of the broadband environment for the use of IT based on TCP/IP technology, as well as bridging the digital divide. Furthermore, from 2005, increased utilization of the broadband environment is being promoted based on the ICT (Information Communication Technology) policy that is stipulated in the u-JAPAN policy.

However, we have yet to reach a situation where ICT and high-speed Internet can be enjoyed equally in any region and by any gender or age group.

This is why we are seeing a sharp increase in cases where IP networks are being adopted as a way to provide services that are familiar to residents such as “telephony” and “audio broadcasting”, aiming to encourage greater use and enjoyment of the broadband environment without hesitation.

What arrived as the answer to this need was the IP Announcement Solution.

By implementing the IP Announcement system, the IP Announcement Solution is able to offer the basic functionality of telephony and audio broadcasting over IP networks, plus a dynamic data link for applications to potentially offer new services for residents.

2. Market Environment and Arrival of IP Announcement System

2.1 Market Environment

The main objective of the FTTH measures being promoted by local governments is to bring the broadband environment into the homes of local residents. And in this environment ICT services and high-speed Internet connection are provided.

Additionally, each region is undertaking their own regional information-oriented projects with the cooperation of industrial, governmental and educational institutions, with some projects achieving results for propagation into other regions. However, this does not mean that usage is widespread throughout the community. It is undeniable that there is a disparity in the level of active ICT usage according to demographic factors (age / gender / profession).

In the countryside there is a marked trend towards depopulation with a shrinking number of children and growing number of elderly, so an aging population can be regarded as a topic of utmost urgency for local residents.

Under this environment, difficulties associated with the man-machine interface for elderly users since the system is based around the personal computer, can be cited as the direct primary deterrent for active usage.

2.2 Arrival of the IP Announcement System

The IP Announcement system was thus introduced with the aim of increasing usage by efficiently transitioning already existing services over to the broadband environment, such as the

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“telephone” which people use everyday, and “audio broadcasting” which is commonly implemented in rural areas and provided through Offtalk Services.

The extreme simplicity of usage, consisting of “telephone” and “audio broadcasts from a speaker”, make it easy for anyone to start using the system immediately, and are the rationale for their selection.

Furthermore, as shown in Fig. 1, the IP Announcement terminal that is installed into homes features a simplified design with only a few buttons, making it easy to use even for the elderly, and thereby contributing to increased usage.

As you can see in the Fig. 2 bird’s-eye view, the important points of NEC’s IP Announcement Solution are as follows:

- Integration of audio (voice) applications with IP networks
- Provision of high quality audio broadcasting services
- Realization of seamless connection to IP phone from ex-

tension phone within the area

- Expansion of community services through use of various Contact points and IP dynamic data links

3. Basic Service and Expanded Service Functions of IP Announcement System

The IP Announcement system is a system which provides services by linking groups of servers with dedicated terminals as shown in Fig. 2. The servers that are installed at the center can be largely divided into the IP Announcement broadcast server group and the IP phone server group, providing “audio broadcast” and “IP phone” services respectively.

NEC offers an integrated system consisting of the AX-5000 SIP server, plus AG-140 IP Announcement terminals and a lineup of various types of Announcement broadcast servers.

3.1 Basic Service Functions

The basic service functions consist of “IP phone” and “audio broadcasting (Announcement broadcasts)”.

(1) IP Phone

As shown in Fig. 3, the “IP phone” is a community service that is typically provided within a particular area as an extension phone, generally offered free of charge or at a fixed rate.

The method of call processing adopts SIP which is the de facto standard in the IP phone environment, using SIP to apply call sending and receiving processing both during extension calls and when communicating via IP phone.

Furthermore, by keeping the regular phone line connected to the terminal, it is able to offer a lifeline function in which the system switches to used only the regular phone line in cases

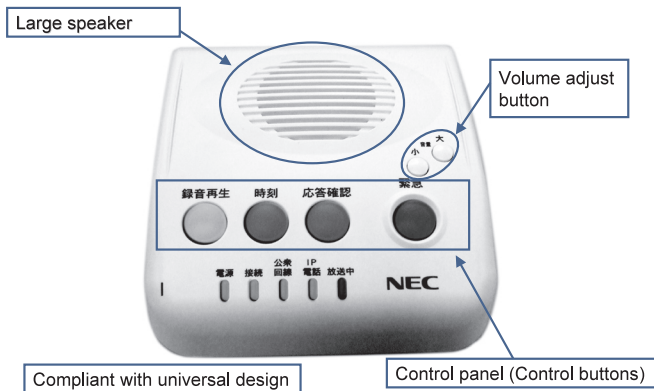


Fig. 1 Exterior of IP Announcement terminal.

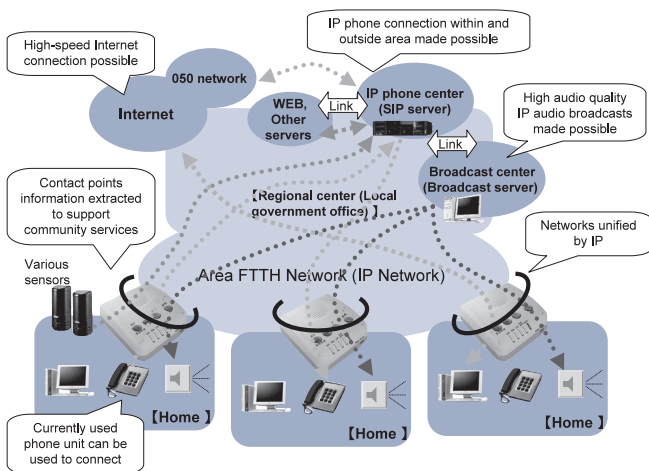


Fig. 2 Bird's-eye view of IP Announcement system.

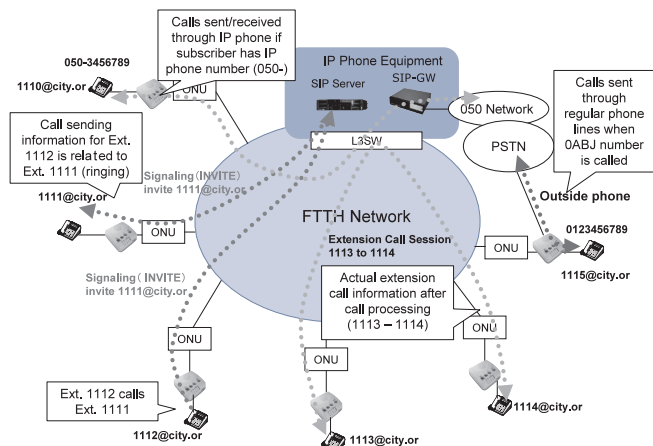


Fig. 3 Outline of IP phone operation.

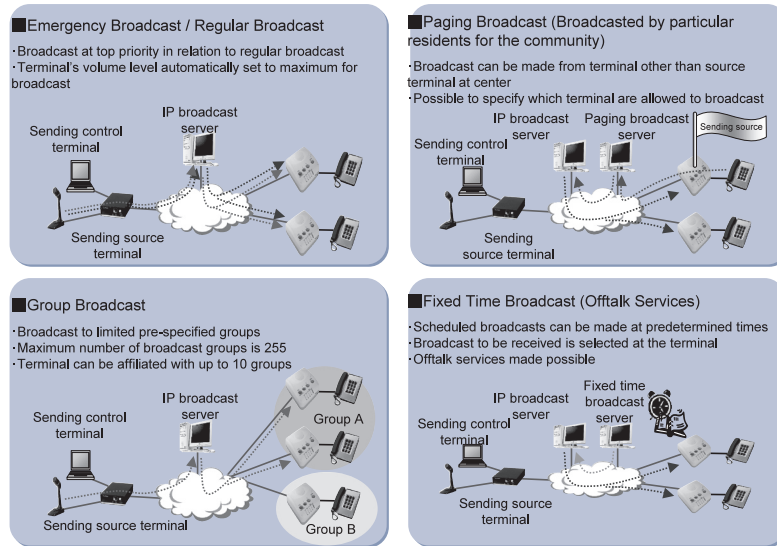


Fig. 4 Outline of IP Announcement broadcast operation.

where the extension phone cannot be used due to IP network problems, etc.

In order to guarantee sound quality on an equal level with regular phone lines, quality assurance measures are taken within the terminal and network.

Instead of the usual method of creating new extension numbers and distributing them to the residents, it is possible to enhance usability since in-area extension phone use and out-of-area outside line usage are differentiated. The system offers capability to use the extension simply by adding a single numeral to the beginning of the usual phone number.

(2) Audio Broadcasting (Announcement Broadcasts)

“Audio broadcasting (Announcement broadcasts)”, as shown in Fig. 4, are general broadcasts such as emergency broadcasts or event information, etc., done at local government broadcast centers. Or they can consist of group broadcasts done on a community level by individual precinct or school district, as well as other music programs or radio programs. These broadcasts use IP multicasting, with multiple broadcast groups sending multicast data within the network. Since the broadcast groups one wishes to receive are selected beforehand at the Announcement terminal, only the required broadcasts will be received.

And since it is possible to receive broadcasts and use the IP phone at the same time, one is able to receive emergency broadcasts while on the phone, or make/receive calls while a broadcast is being received.

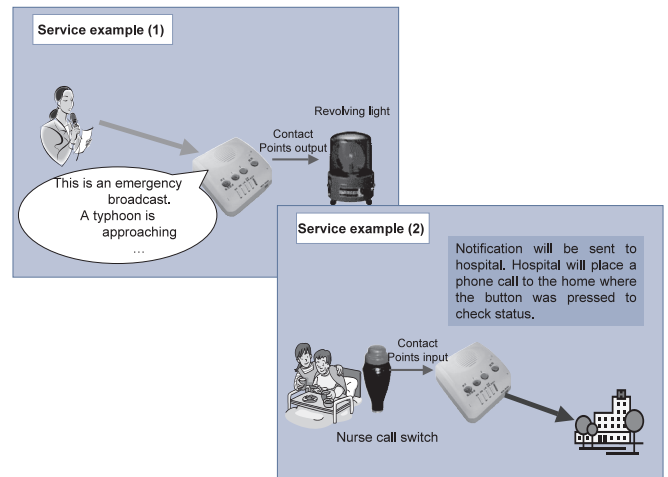


Fig. 5 Examples of services using input/output contact points IF.

3.2 Expanded Service Functions

Expanded service functions are comprised of community services that utilize the AG-140’s input/output Contact Points interface, and those that are based on IP dynamic data links using SIPHIA middleware for SIP-WEB linkage.

(1) Services at Contact Points of Input/Output

For Contact Points, the AG-140 IP Announcement terminal that NEC is offering is equipped with 2 inputs and 2 outputs. By using these contact points, community services such as those shown in Fig. 5 become possible.

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■ Post-Disaster Safety Confirmation Service

- ① Emergency broadcast for disaster notification.
- ② "Response button" is pushed, and all safety information is managed at the terminal management server.
- ③ Safety information uploaded to Web server.
- ④ For terminals from which there is no response for a certain duration, phone calls can be automatically made with guidance messages or an operator.

※ In addition to no-response terminals, the same phone service or email notification can be applied to family and friends living far away.

- ⑤ Safety information can be confirmed on the Web.

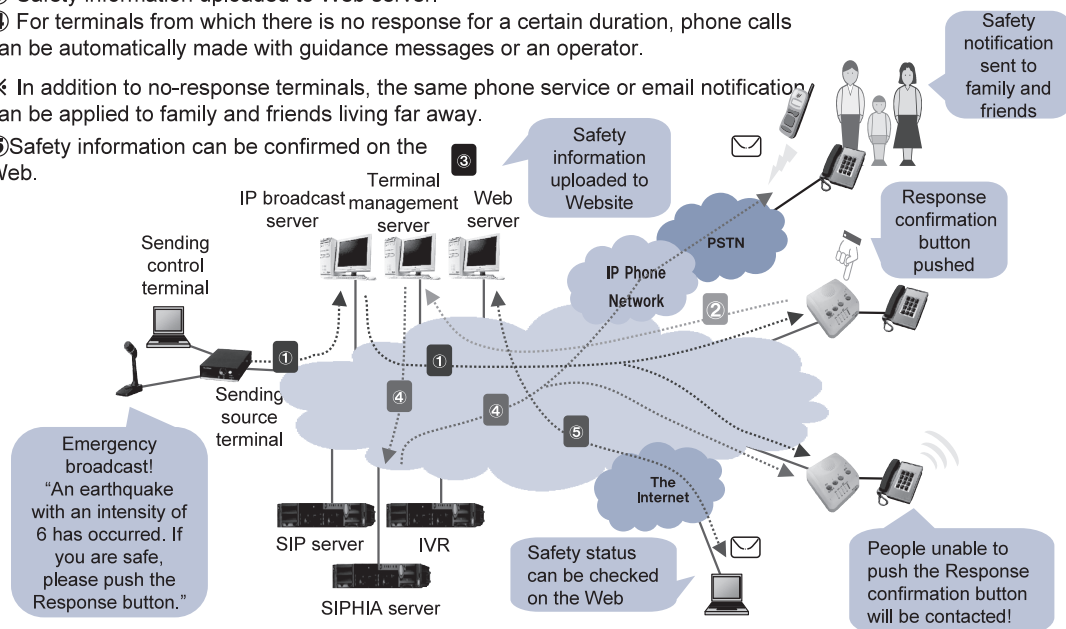


Fig. 6 Example of service using IP application dynamic link.

Although the requirements made of this service differ by each local governing body that implements it, one thing that should be noted is that there are relatively a large number of requests for its application in areas such as social welfare and nursing care.

(2) Services through IP Dynamic Data Link

By using SIPHIA for a dynamic data link with SIP-WEB, it is possible to automate the sending/reception of phone calls as well as the display of WEB data on an application level.

Fig. 6 shows an example of a disaster contingency plan which displays safety verification information on the WEB, triggered by residents pushing the "response acknowledgment button" on their terminals in response to emergency broadcasts, in addition to automating the process of making follow-up calls using the telephone. This is a mere example, and various expanded services can be provided to address a variety of needs.

4. Potential for IP Announcement System

After the broadband environment is put into place, next is the convergence of broadcasting and communication with the goal

set at 2008.

In the future, it is expected that IP Announcement solutions will further expand to offer compatibility with the Internet (IP data communication), audio/voice, and video, or the so-called triple play.

We expect that when the time comes, there will be communication that interactively utilizes the 3 media of data, audio/voice and visual images.

Also, it is speculated that the dedicated Announcement terminal will change its form to STB (Set Top Box) or Home Gateway and information appliances as well as other network appliances will allow interconnection with each other.

Furthermore, this configuration will have IPv6 installed as standard, allowing seamless connection on the IP network.

We believe that this aspect will play a role in the realization of the "ubiquitous network society" as envisioned in the u-JAPAN policy.

5. Conclusion

The use of the broadband environment has only just begun. Regarding the IP Announcement solution we have just now

introduced as the first step towards the realization of a ubiquitous network, originating from the countryside, we shall endeavor to contribute to the creation of that inevitable ubiquitous network society by participating in the system that will reach over 100 thousand subscribers in 2006 or afterwards.

*As the products introduced in this paper are mainly sold for the domestic market, some figures feature explanations by the Japanese Language.

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