

Next-Generation Content Delivery Services in NTT

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Abstract— Converging media services and Next Generation Networks (NGN) are hot buzzwords in the current telecoms and service providers industry. In this paper, the future of next-generation content delivery services is shown. NTT is developing next-generation content delivery systems, such as next challenges in IPTV environment, mobile multimedia broadcasting platform and digital signage platform. These systems can offer new attractive services and are based on standard specifications in order to supply to the global market.

Keywords—component; IPTV; Mobile multimedia broadcasting; Digital broadcasting; Digital Signage; Content delivery

I. INTRODUCTION

The media contact time of viewers has tended to increase as digital content has been increasing. As shown in **Fig.1**, The average length of media contact time was 319 minutes per day in 2008 but extended to 348 minutes in 2010, showing a nearly 10 percent increase in just over two years. The amount of disposable time, way of spending it, and media used differ for different categories of viewers.

To deliver digital content to viewers reliably and effectively, it is necessary to select content media type optimal to attributes, lifestyle, preferences and devices of individual viewers.

Expanding the media contact opportunities of viewers requires a common infrastructure that interconnects different content distribution platforms.

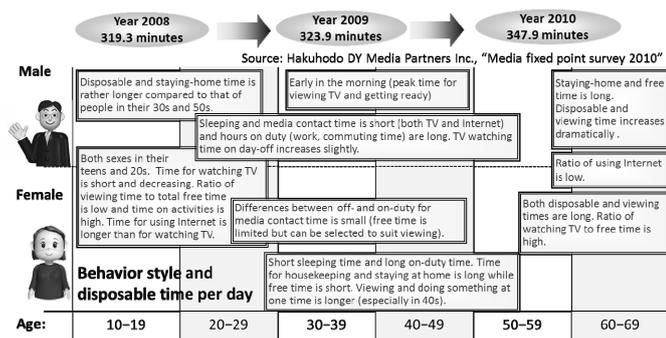


Figure 1. Shift in media contact time (per day)

II. NTT R&D ACTIVITIES - IPTV

NTT R&D is developing a variety of core technologies that support content distribution platforms. NTT Pala, one of the NTT group companies, launched Hikari TV Service in March

2008. In addition, IP retransmission service for digital terrestrial television broadcasting was launched in May 2008 in the Tokyo and Osaka areas. Its head-end system was developed by NTT R&D and has a high affinity for ISDB-T (**Fig.2**). The service is now provided in 17 prefectures in Japan.

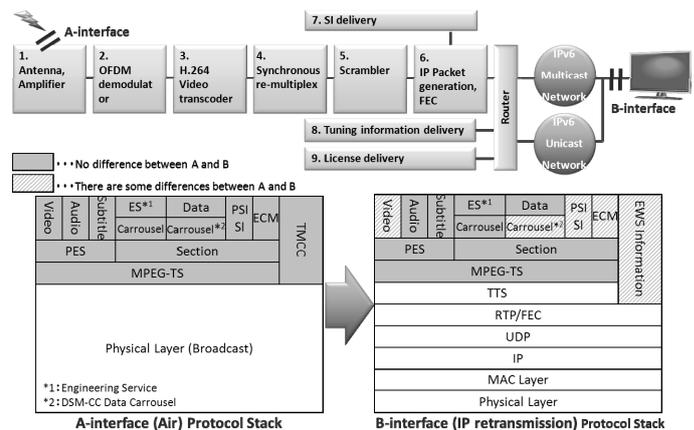


Figure 2. System configuration and protocol stack of IP retransmission

Hikari TV uses a platform that conforms to standardized IPTV specifications. Thanks to this, TV sets with built-in Hikari TV capability are now available on the market. ITU-T recommendations on IPTV adopted for Hikari TV include H.770, H.701, H.721, and H.762 (**Fig.3**). These specifications have made it possible for not only set-top boxes but also commercial TV sets to receive IPTV.

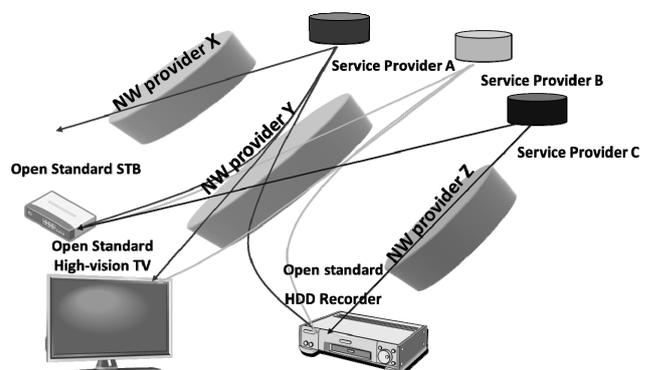


Figure 3. IPTV Service discovery (H.770)

NTT R&D is also studying delivery of 3-dimensional videos as new IPTV service. The market for a 3D content delivery service, which has been encouraged by the recent success of 3D digital cinema, is expected to grow. 3D-capable blue-ray discs have already appeared in the market, while specifications for Full-HD 3D content delivery for services that use the broadcast radio waves or communications lines have not yet been established. NTT R&D will lead the industry in the 3D market with content delivery method which will be established using these radio waves and communication lines.

III. NTT R&D ACTIVITIES – MOBILE MULTIMEDIA BROADCASTING

Mobile multimedia broadcasting is a new type of broadcasting media service that combines the features of broadcasting and communication networks. As shown in Fig.4, mobile multimedia broadcasting can provide services that freely combine *video/audio/data* and *streaming/downloading* to exploit both broadcast radio waves and communication lines. Using both broadcast radio waves and telecommunications lines, mobile multimedia broadcasting can provide services in one way or another.

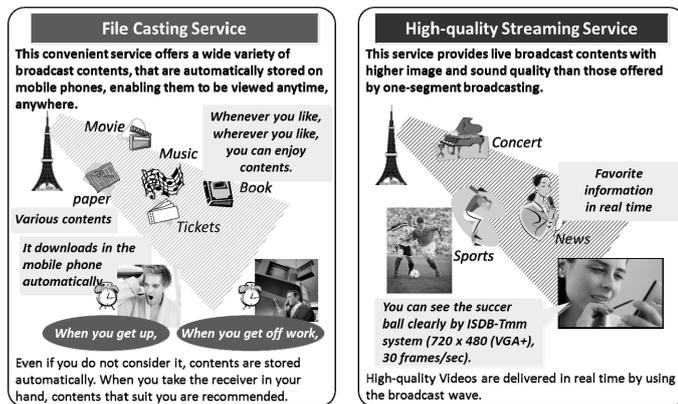


Figure 4. Mobile multimedia broadcasting service

The NTT Group developed metadata technology for IPTV. It is now studying the possibility of applying it to ISDB-Tmm, which is a mechanism, used for mobile multimedia broadcasting. NTT R&D is also studying the possibility of using telecommunications lines to supply any data that may have been lost in the transmission using broadcast radio waves. This is a promising service example of convergence between broadcasting and telecommunications (Fig.5).

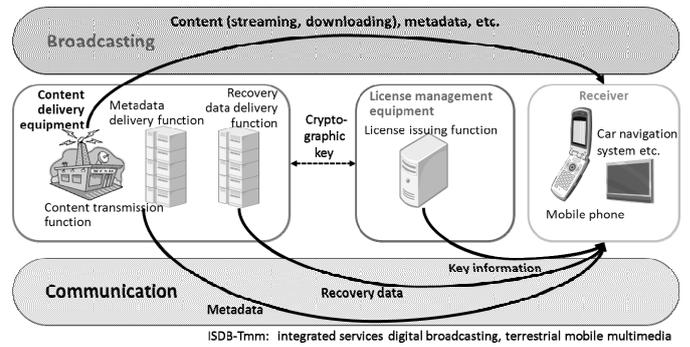


Figure 5. Example of technology for mobile multimedia broadcasting

IV. NTT R&D ACTIVITIES – DIGITAL SIGNAGE

Digital signage presents information on an electronic display installed at sites other than homes, such as outdoors, in shops, and on public transport facilities. These days, it is attracting considerable attention as a very effective advertising tool because the locations of the displays can be optimized for specific target audience.

To promote advertising on digital signage, it is necessary to control the scattered digital signage displays in an integrated manner and to establish an ad platform so that advertisers can have better control of the scattered displays.

As shown in Fig.6, NTT R&D has been developing technologies for this platform, and has already begun to provide “Hikari-signage”, which is a series of solution packages that can be connected to the ad platform. NTT R&D has developed technology for integrating metadata distribution and management as the core technology for creating an ad marketplace. It is designed to achieve optimally targeted advertising by matching the attributes of target viewers specified by advertisers or advertising agents with the spare timeslots of displays that are equipped with a common interface and scattered in different locations.

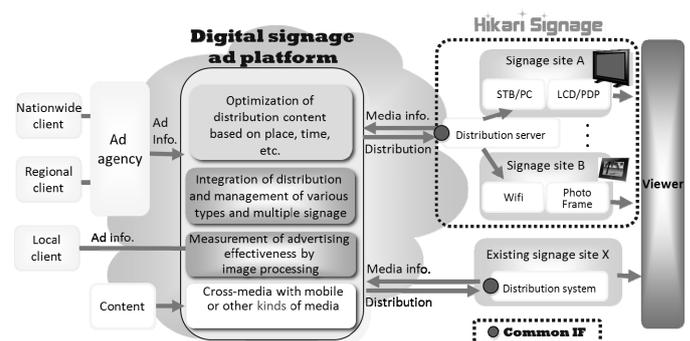


Figure 6. Ad platform and solution packages of “Hikari-Signage”

NTT R&D is also developing technologies for measuring the effectiveness of advertisements on digital signage. This idea is similar to TV audience rating. These technologies are used to

measure how many people are in front of a specific display and what percentages of them are looking at it.

V. CONCLUSION

NTT R&D will continue to develop technologies that support content delivery. For example, it will strengthen R&D in the following areas:

- Technology to support content production and license processing assuming content distribution to multiple channels;
- Technology to manage and control content distribution to multiple channels across multiple platforms, and to analyze feedback from it;
- Technology to present content to viewers in a manner convenient and appropriate for their individual lifestyle and situation.

Through the activities described in this paper, NTT R&D will contribute to the creation and development of content distribution services, thereby helping to further energize the content business and expand the content distribution market.