Cooperative Broadcasting and Communication Technology for a New Way of Viewing TV

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Abstract

Cooperative broadcasting and communication technology is needed for the distribution of broadcast programming over an optical network. By specifying content metadata (which can be used by both broadcasting and communication media), program distribution control information, copyright protection information, and audience information, this technology enables cooperation between broadcasting and communication services, thus opening the way to a more advanced style of enjoying television.

1. Cooperative broadcasting and communication technology

As broadband Internet access spreads, the services provided over an IP network will gradually expand from IP telephony communication to the distribution of TV broadcast contents. In the United States, a bundled set of services called "triple-play (telephone, Internet access, and TV)" is making headway. In Japan, too, companies that offer high-quality video broadcasting distribution to broadband users have appeared, providing broadcasting services that viewers cannot easily distinguish from conventional terrestrial, satellite, and cable TV broadcasting services.

There is also a move within broadcasting services away from conventional basic broadcasting toward premium broadcasting that the viewer pays for in return for the ability to select programs. Moreover, broadcasting content is also moving from simple audio and video to full-spectrum content that includes data broadcasting. There is also progress toward server-type broadcasting, which lets viewers search for specific programs or scenes stored on their receiver and watch them any time they wish. User-controlled program viewing is expected to increase, as is indicated by the rapidly increasing sales of personal video recorders (PVRs), which record digitally to a hard disk drive (HDD) rather than to an analog video cassette tape. On the other hand, the popularity of PVRs gives many viewers the ability to freely organize how they view programs, which decreases the effectiveness of advertising and alters the program organization intended by the distributor. To continue providing programming of good quality to viewers, the industry must produce content through the creation of new services.

We have developed a broadcasting and communication cooperation system. It applies broadcasting technology (such as the program multiplexing selected for digital broadcasting and program management technology) to communication media. Moreover, by linking to technology for content distribution over an IP network, it can promote both broadcasting and communication services through the creation of content distribution that cuts across media types and new content. The overall configuration of our system is illustrated in **Fig. 1**. There is a choice of six methods of distributing broadcast programming and related content.

(1) Broadcast streaming distribution (conventional wireless radio frequency (RF) broadcasting and server-type broadcasting)
(2) Multicast streaming distribution (high-quality streaming)
(3) Unicast streaming distribution (video-on-demand (VOD) distribution)
(4) Broadcast file distribution (data broadcasting and server-type broadcasting)
(5) Multicast file distribution (server-type broadcasting)

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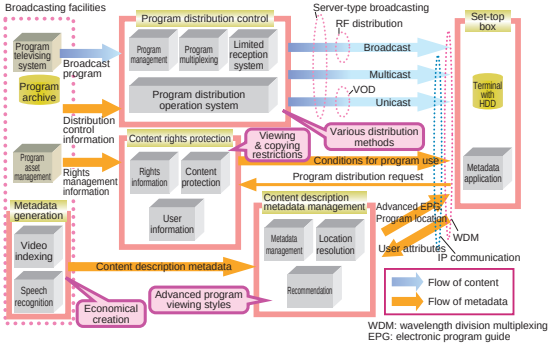

Fig. 1. Broadcasting and communication cooperation system.

(6) Unicast file distribution (server-type broadcasting)

The distribution platform employs methods for protecting content (encryption), controlling access (charging), and multiplexing services (program organization) that are based on current standards.

The program information (metadata) and program protection (program use conditions) comply with the technical specifications that are being formulated by the Association of Radio Industries and Businesses (ARIB) in Japan [1] and by the TV-Anytime Forum [2] internationally. By combining the six methods of distribution described above and implementing a single standard distribution platform, it is possible to achieve the following three extensions beyond conventional TV viewing.

- Transition from broadcasting format to communication format (for example, switching programs from a broadcast format (1) to charged VOD viewing (3))
- Transition from communication format to broadcasting format (for example, selecting a broadcast program (1) from information received by data communication (6))
- Simultaneous use of both broadcasting and communication (for example, dynamically inserting content received via a communication medium into a program that is being broadcast)

The following five articles in this special feature introduce platform technology for achieving cooperation between broadcasting and communication media.

References

[1] http://www.arib.or.jp/
[2] http://www.tv-anytime.org/

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