NHK STRL

As novidades do Laboratório de Pesquisas de Ciências e de Técnicas (STRL) da NHK.

4, Sep 2003 SET2003
9:00-11:00 Auditório B
Hiroo Arata

MENU

- NHK STRL open house(Presentation)
- Video(English) 20 minute

- HDTV Mobile reception (Presentation)
- Video(Portuguese) 5 minute

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About NHK STRL(1) (Science & Technical Research Laboratories)

- Organization of STRL (9 Research Laboratories)
  - Digital Broadcasting Networks
  - Digital Satellite Broadcasting Systems
  - Multimedia Services
  - Advanced Audio & Video Coding
  - Three-Dimensional Audio Visual Systems
  - Human Science
  - Recording Technology & Mechanical Engineering
  - Advanced Imaging Devices
  - Display and Optical Devices

About STRL(2)

- STRL employees (as of March 31, 2002)
  - 291 Personnel (265 research engineers)
  - Doctorate holders:63 personnel
  - Invited research engineers: 5 personnel
- NHK STRL OPEN HOUSE
  - 22/May/2003 to 25/May/2003
  - 35 exhibitions

Specific Research Themes (from STRL Open House)

The era of digital broadcasting

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The history of digital broadcasting in Japan

- Jun. 1994 Telecommunications Technology Council consulted regarding “Conditions for digital broadcasting technologies”
- Jul. 1995 Report on digital CS(124/128degree) broadcasting
- Jun. 1996 Start of digital CS broadcasting
- Feb. 1998 Report on digital BS broadcasting (ISDB-S)
- May 1999 Report on digital terrestrial TV broadcasting(ISDB-T)
- Nov. 1999 Report on digital terrestrial sound broadcasting(ISDB-SB)
- Jan. 2000 Report on digital CATV broadcasting (digital terrestrial broadcasting transmissions)
- May 2000 Report on digital CATV broadcasting(64QAM/ISDB-C) (digital BS broadcasting transmission ; Trans-modulation)
- Dec. 2000 Start of digital BS broadcasting(ISDB-S)
- Oct. 2003 Scheduled start of final phase of experimental digital terrestrial sound broadcasts(ISDB-SB)
- Dec. 2003 Scheduled start of digital terrestrial TV broadcasts(ISDB-T)

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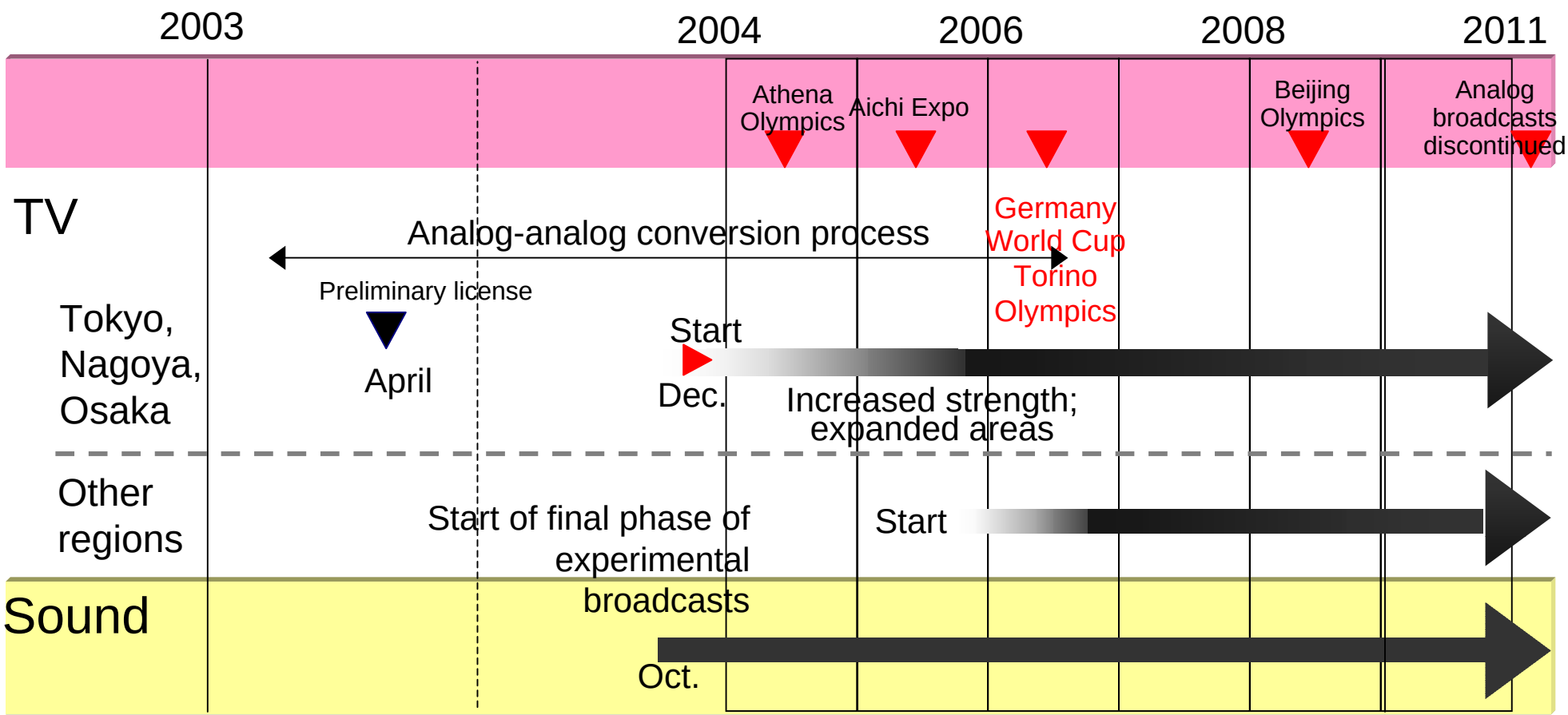
Digital terrestrial broadcasts (1)

Schedule of ISDB-T

Start in Tokyo, Nagoya, and Osaka in Dec. 2003. Gradual expansion to other areas.



Digital terrestrial broadcasts (2)

ISDB-T services

- Digital terrestrial TV broadcasting(ISDB-T)
  - Improved image quality through HDTV (according to licensing policies, defined as HDTV broadcasts accounting for 50% or more of broadcast dime during a given week) and 5.1 surround stereo system
  - Multi-broadcasting (broadcasting 2-3 HDTV/SDTV programs simultaneously per 6MHz)
  - Data broadcasting and EPG
  - Services for mobile reception (1 segment broadcasts)
  - Access to INTERNET services using TV set (Universal service)
  - Engineering services to increase receiver functions and resolve problems using broadcast waves
  - Channel(Spectrum) re-allocation(Upper channel of UHF to Mobile phone)
  - Economic impact to industry
- Digital terrestrial sound broadcasting
  - Providing high-quality sound broadcasts and data broadcasts based on text, still images, simple videos, etc.

ISDB-S

- Digital BS broadcasting services
  - High picture quality/sound quality → HDTV images and 5.1 surround stereo system
  - Multi-broadcasting
  - High performance → Electronic Program Guide (EPG)
    Data broadcasting (Program related data services, interactive data services)
  - High stability → Reduced audio and video interruptions due to heavy rain (hierarchical transmission)
- Popularization of Digital BS broadcasts
  - Subscribing households: approx. 4.3 million households
    - BS digital receivers: approx. 2.39 million households
    - Cable viewers: approx. 1.91 million households

Digital terrestrial broadcasts (3)

Promoting ISDB-T

Actively promoting the establishment and popularization of ISDB-T as a national policy

- Actively assisting in the analog-analog conversion process, which is a national policy, and gradually expanding on digital broadcast areas
- Taking advantage of the features of terrestrial broadcasts to improve on regional data broadcast services
- Development and popularization of common receivers for Terrestrial, BS and 110-degree CS broadcasting
- Achieving “Anywhere” through use of FTTH as a supplemental media

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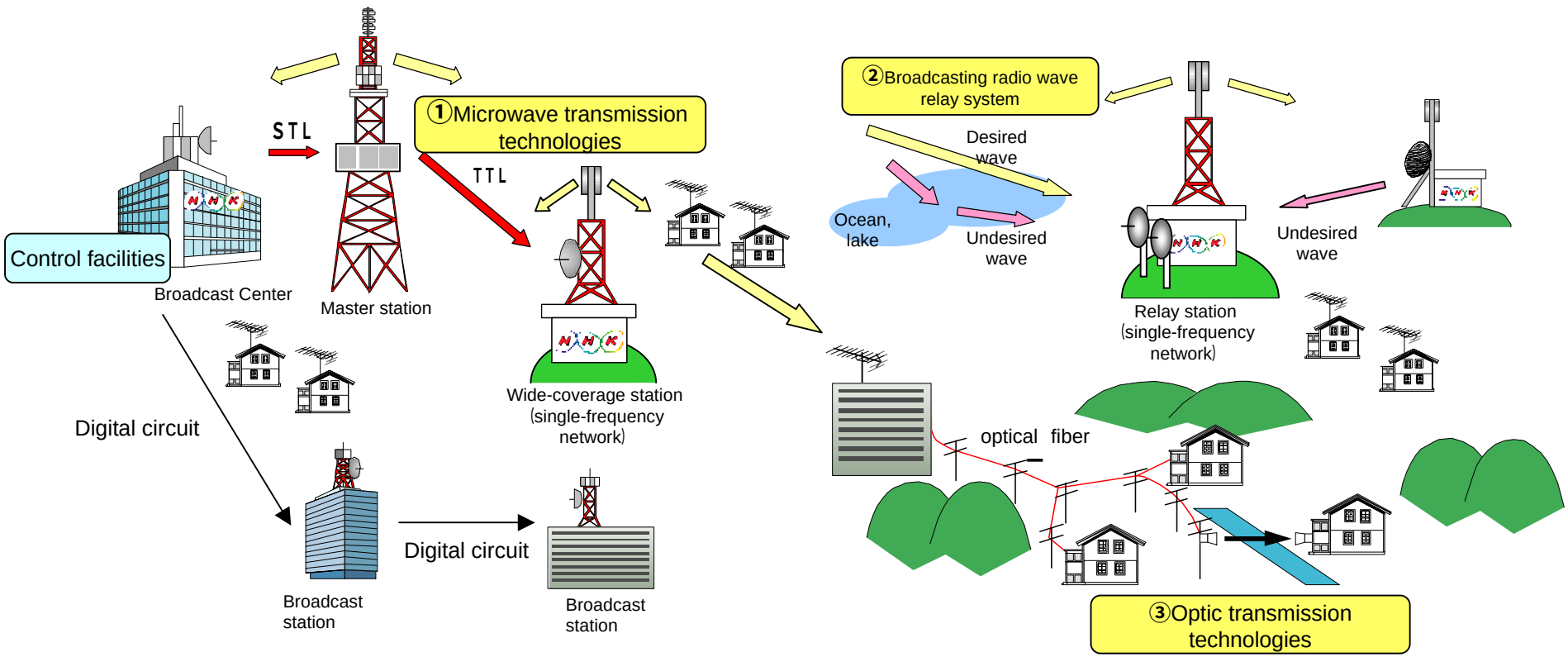
Technologies Supporting Digital Terrestrial Broadcasting(ISDB-T)

- Technologies to provide digital terrestrial broadcast waves throughout Japan
  - ①Digital terrestrial broadcast control facilities and SHF band STL/TTL
  - ②Broadcasting radio wave relay systems, including adaptive array antennas to eliminate co-channel interference
  - ③WDM transmissions and other optic transmission technologies



Multi－channel microwave relay system

Decision equalizing re-transmission equipment

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Co-channel interference rejection type re-broadcasting equipment(Adaptive array antenna)

CLI(Coupling loop interference Canceller)

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Long delay(Over Guard interval) Multi-path Equalizer

Network-linked data broadcasting services

- Advanced data broadcasting service for Mobile reception
  - Information from INTERNET
  - Data broadcasting (1 Segment or 3 Segment)
- The TV will become an integrated information receiver.
  - Broadcasting
  - Telecommunications

New Broadcasting Services Based on Home Servers

- Storage/reception of broadcast contents, and new services with broadband links
  - In addition to images, sounds, and data broadcasts sent by radio waves, use program-related images via broadband
  - Integrated services with broadcast and telecommunication networks that seamlessly combine contents from broadcast, communication, and home servers using metadata
  - Protecting content copyrights using advanced CAS
- TVs will become in-home Integrated Information Terminals that combine broadcast and communication

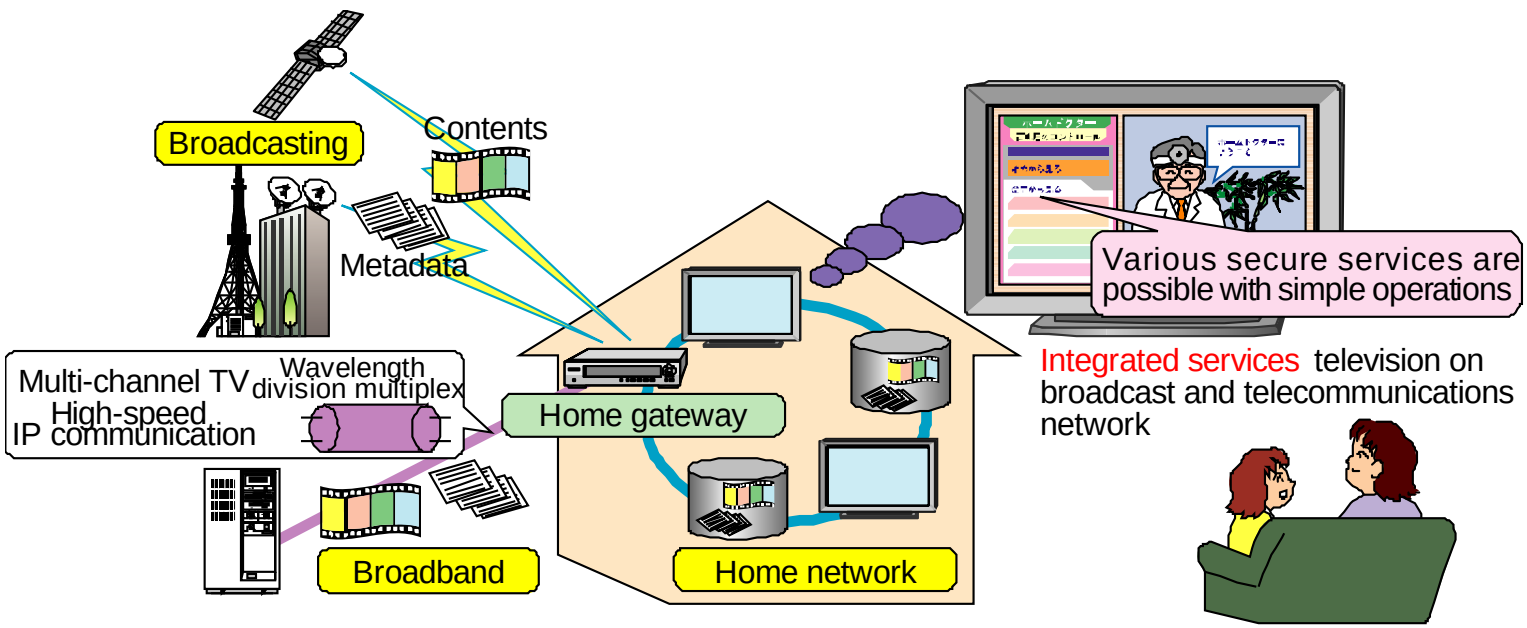
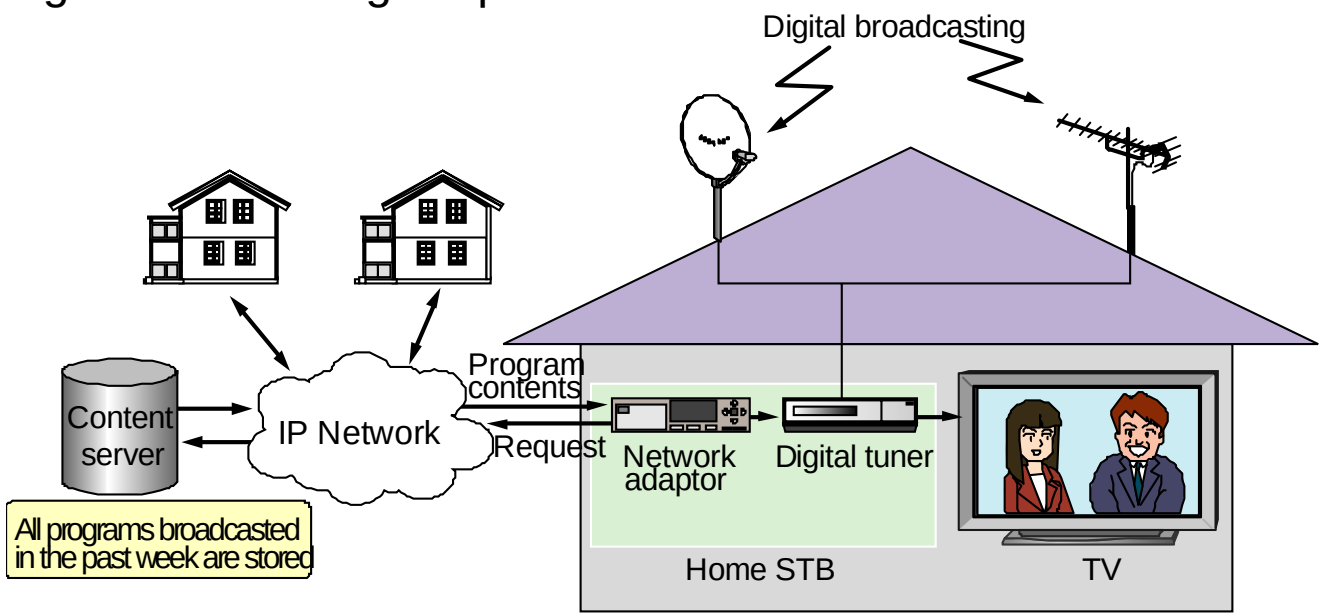


Image of broadcasting services based on home servers

Program Request Service

- To respond to viewer requests for rebroadcasts, broadcast programs are stored on a network and viewed individually on demand
  - Prototype system enables viewing of all NHK programs over the past week using a high-speed access network (100 Mbps),
  - Enables viewing of broadcast quality programs using a remote-control-unit attached with the digital satellite STB
  - Exploring new technological possibilities



Program request service using a network

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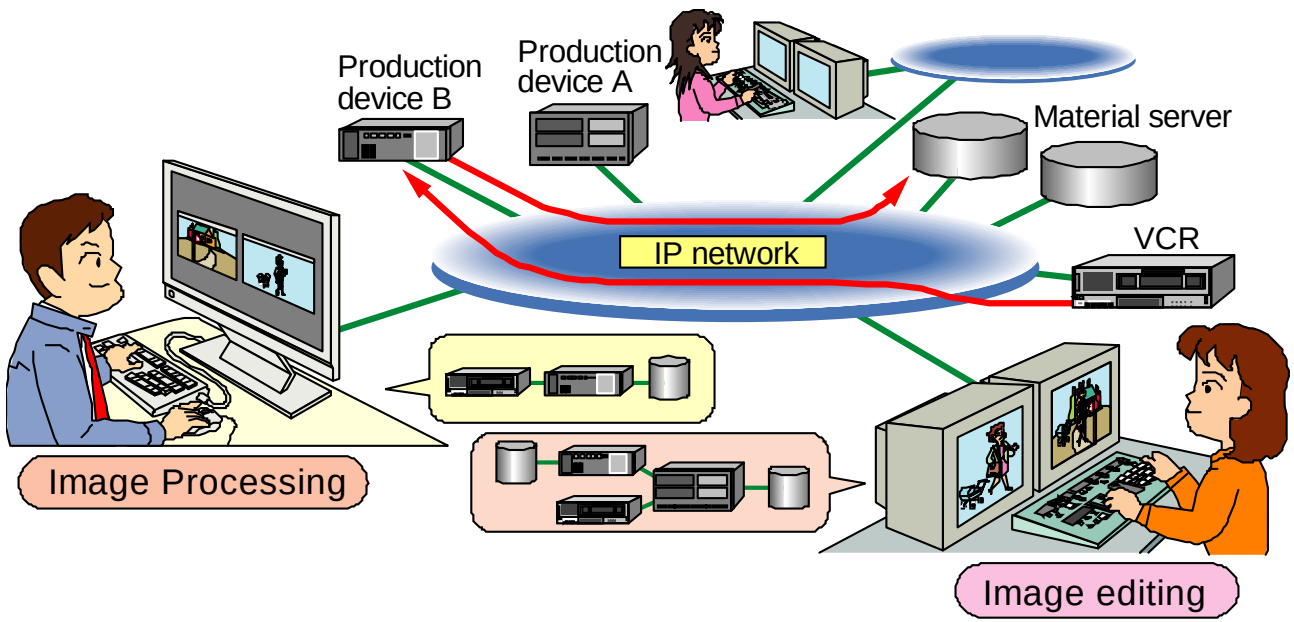
Advanced Program Production & Control System Using High-Speed Network

- A broadcast station system for the broadband era, which enables more prompt and efficient production of broadcast programs
  - Freely combines network devices to enable TV program production and editing
  - Enables performing real-time transmission/processing of non-compression SDTV format on a network
  - Promoting research with a view toward the growth of high-definition TV



Advanced network system for broadcasting station

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The Robot Changes the TV Channel

- The Robot identify the viewer
  - Facial and Vocal characteristics
  - Robot memorize your personal preference on DATA base.


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Re-transmission system using 60GHz

- Re-transmission system for apartment building
  - BS-IF 1GHz to 1.3GHz(ISDB-S)
  - 110DegreeCS-IF 2.6GHz(ISDB-S)

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Re-transmission system using 60GHz