Digital Terrestrial TV in Japan

Rapid growth and progress

SET 2004
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Topics

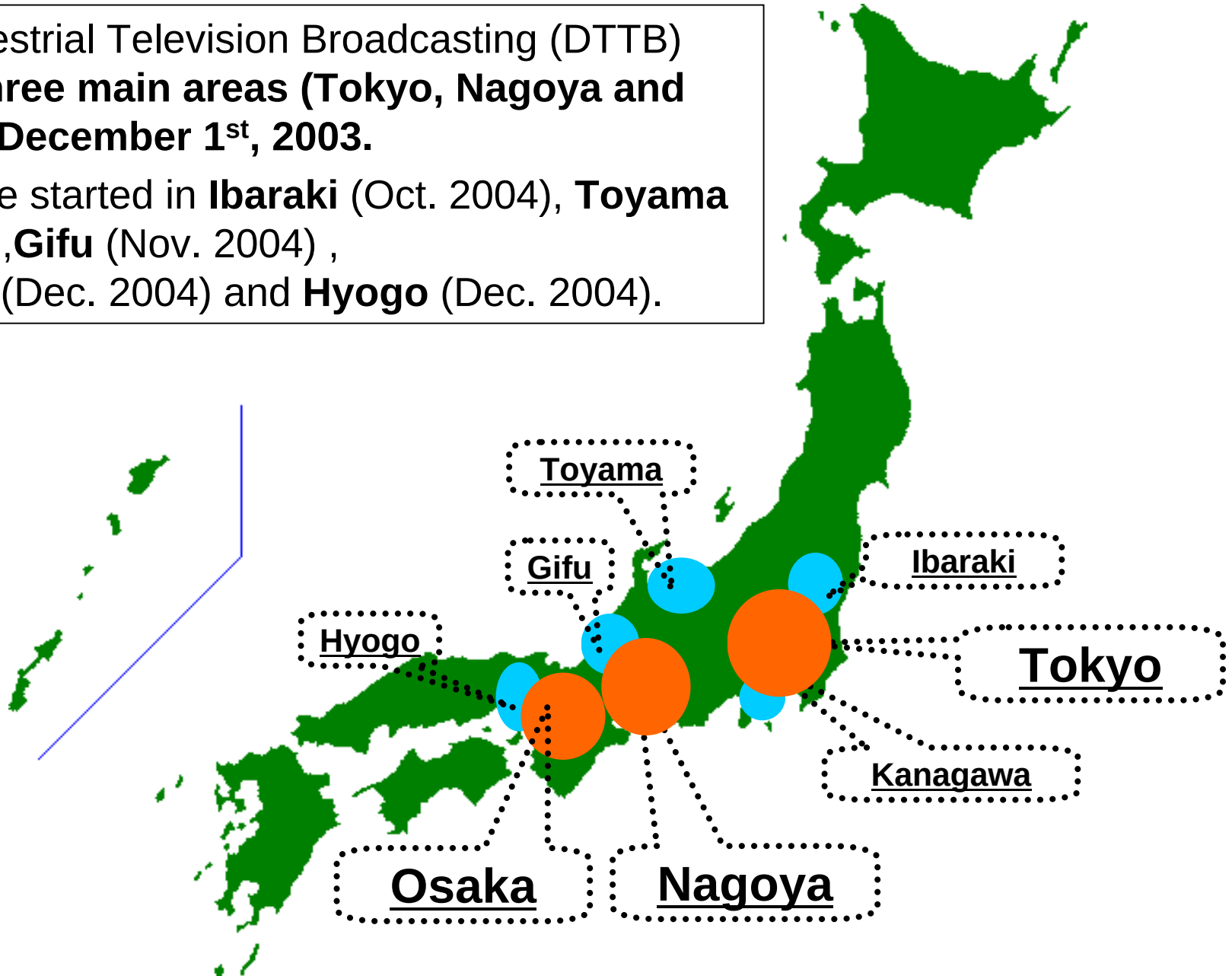
1. Update of Digital Terrestrial Television Broadcasting (DTTB) in Japan
2. Policy and Strategy for DTTB
3. Service Features of DTTB
4. World Trend of DTTB

Update of Digital Terrestrial Television Broadcasting in Japan

Service area of DTTB in Japan

Digital Terrestrial Television Broadcasting (DTTB) started in **three main areas (Tokyo, Nagoya and Osaka) on December 1st, 2003.**

DTTB will be started in **Ibaraki** (Oct. 2004), **Toyama** (Oct. 2004) ,**Gifu** (Nov. 2004) , **Kanagawa** (Dec. 2004) and **Hyogo** (Dec. 2004).



Population Coverage of DTTB in Japan

Approximately over 12 million households

(25% of total household in Japan)

Expansion of population coverage (households)

2004 17 million (35%)

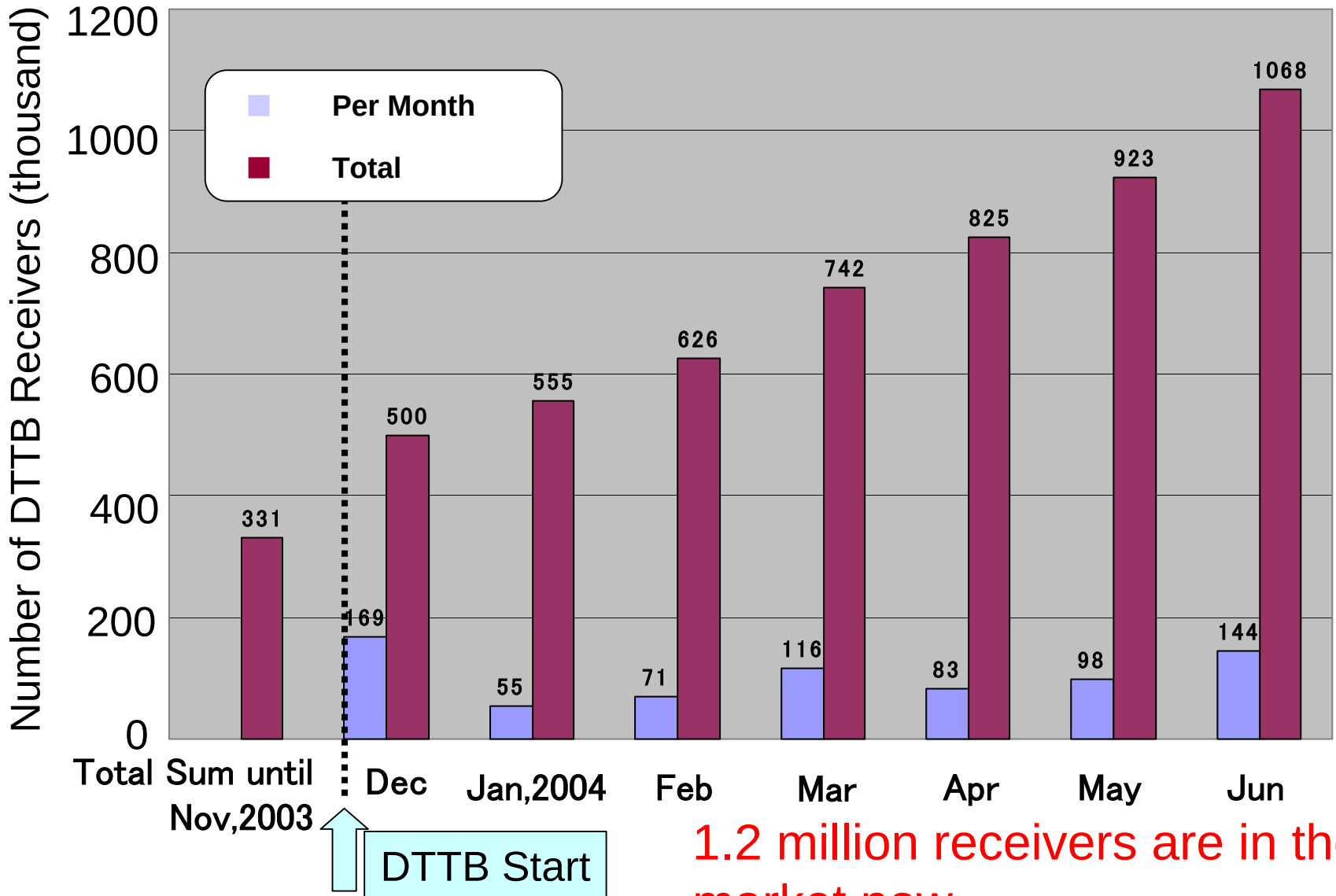
2005 23 million (48%)

2006 available at all prefectures (80%)

Number of potential households via CATV networks

7 million households in total

Rapid increase of DTTB Receiver Shipment



1.2 million receivers are in the market now

Digital TV Products

Plasma

PDP

HITACHI

SONY

Panasonic

Pioneer

Victor·JVC

SANYO

TOSHIBA

Digital TV Products

LCD

Panasonic

SONY

SHARP

TOSHIBA

Victor · JVC

SANYO

MITSUBISHI

HITACHI

Digital TV Products

CRT

Panasonic

SONY

MITSUBISHI

TOSHIBA

STB type

SONY

Panasonic

More manufactures are entering the market!

All-in one DTTB Receiver

1.2 million of DTTB receiver are All-in one DTTB receivers

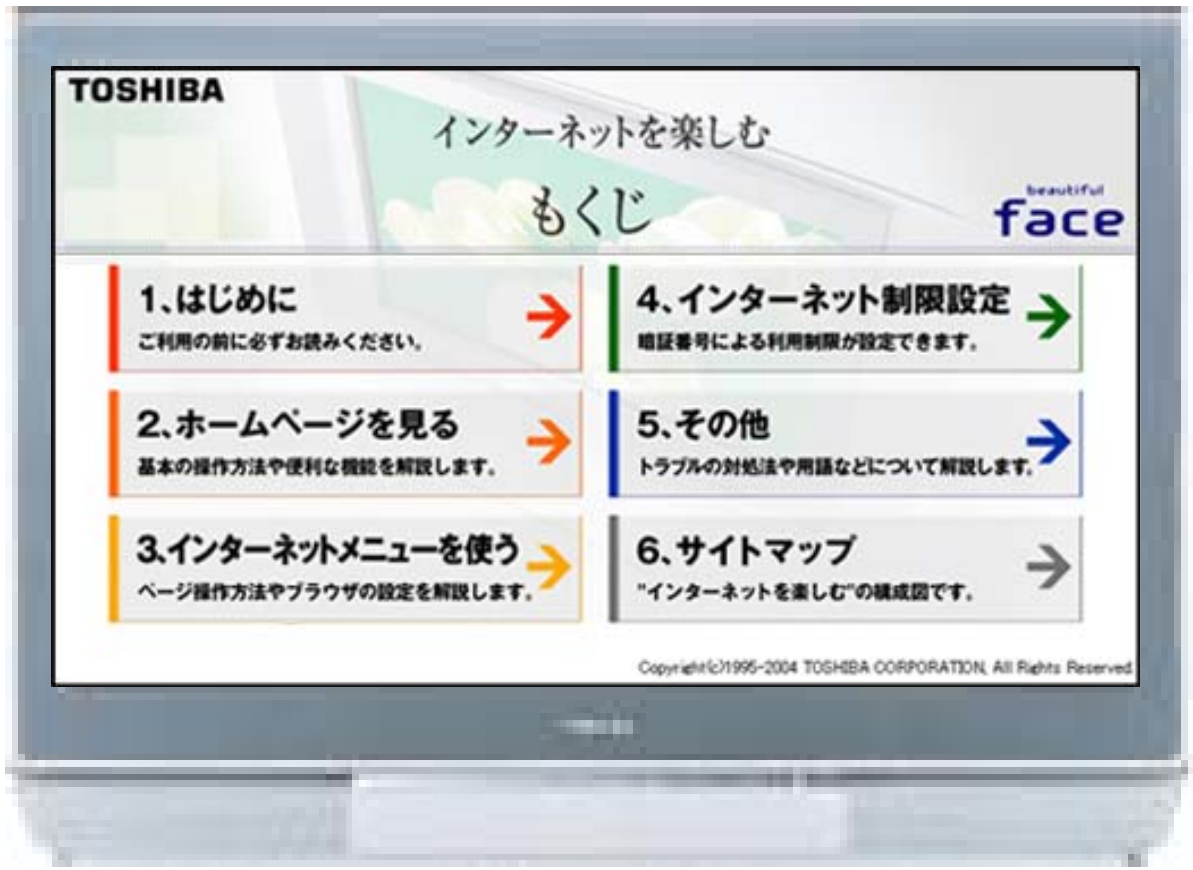
- **Equipped with Digital Terrestrial and Satellite Tuner**
- **Compatible with HDTV (1080i)**
- **Equipped with Data Broadcasting decoder**
- **Capability to connect Network**

Some models have internet web browsing function

In addition, more than 3 million of HDTV ready TV (HDTV display without digital tuner) are in the market

Example of Internet TV

Portal Site



Character Input Button

Internet Button

Operation Button

Access to Favorite Site

TOSHIBA

Example of Internet Function

Internet Screen

One Screen Mode

Internet Screen

TV Mode

Two (TV + Internet) Screen Mode

TOSHIBA

Example of Internet TV

EPG and T-navi Portal Site

T-navi: dedicated sites for TV internet viewers

Panasonic

Example of Internet TV

T-navi Menu List

NEWS

Travel

Shopping

Panasonic

Example of Digital TV Product

1920x1080 full HDTV resolution LCD display

Digital HDTV recorder (HDD+DVD) with digital TV tuner

SHARP

Example of Digital TV PC Product

EPG enables to record TV program to PC

PC with DTTB tuner card

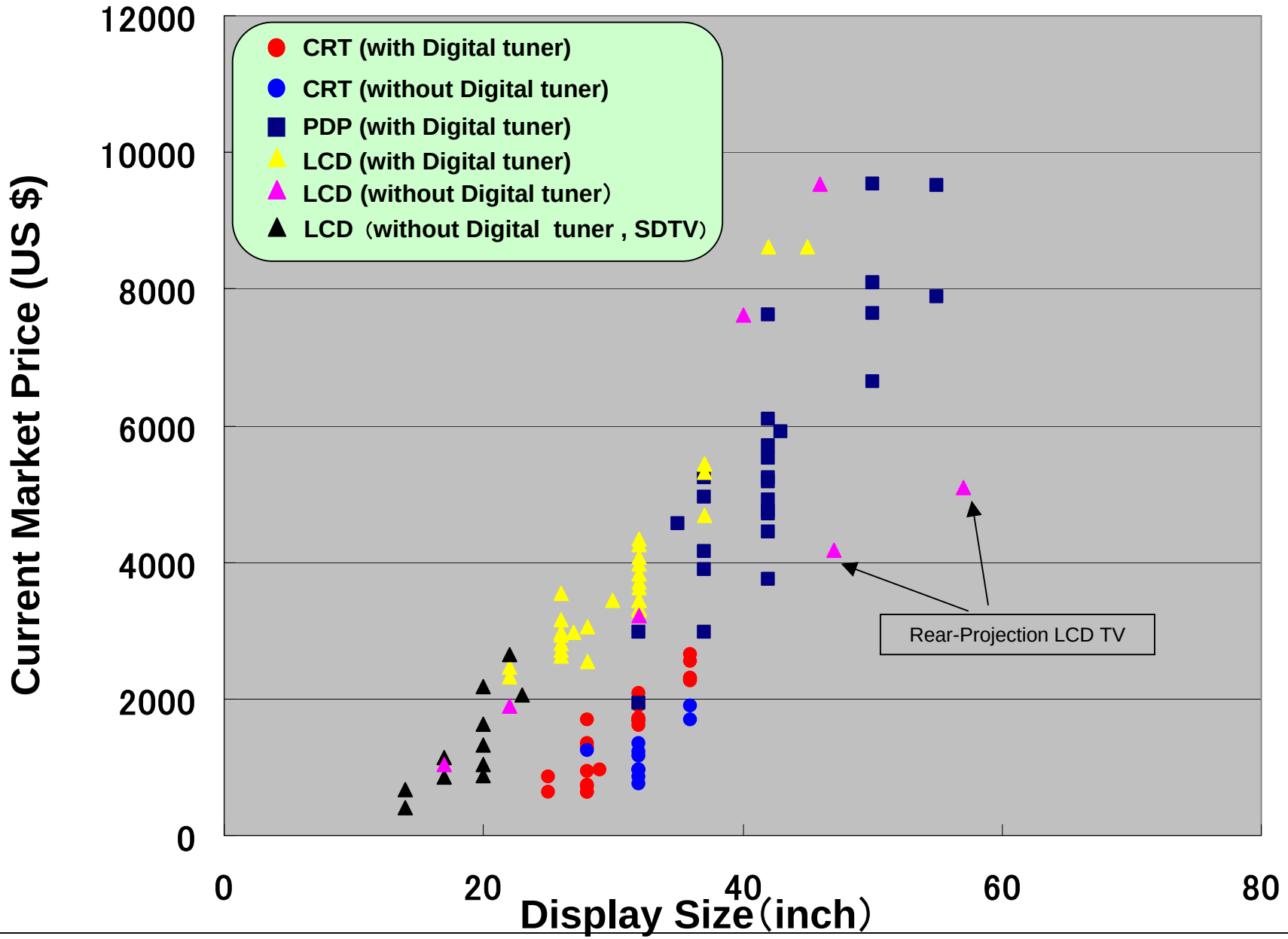
Example of Product (CATV Digital STB)

DTTB is broadcasted by CATV with 64QAM transmodulation.

30 million digital STB sets are in the market

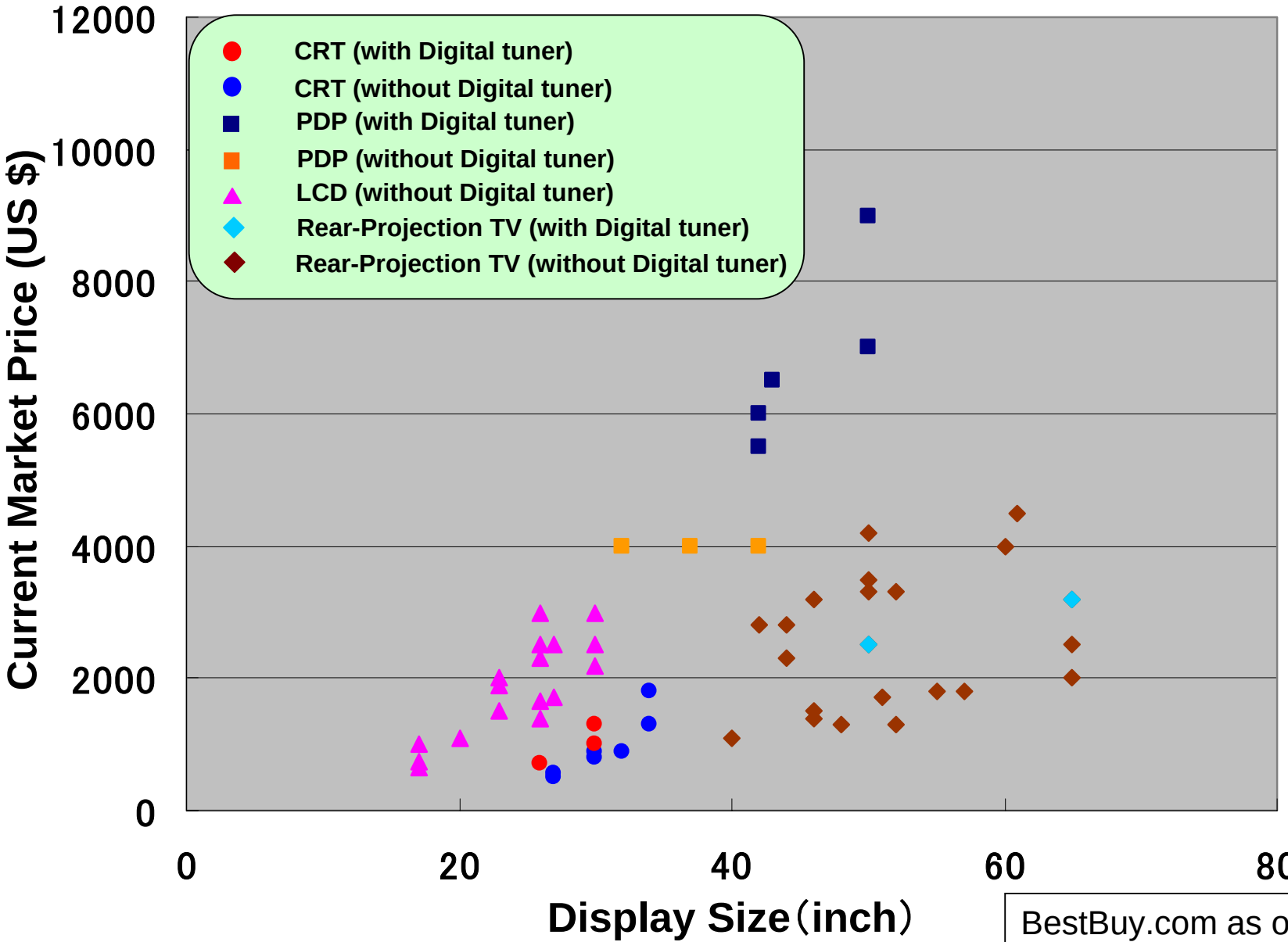
Panasonic

Price Trends of HDTV Receiver in Japan



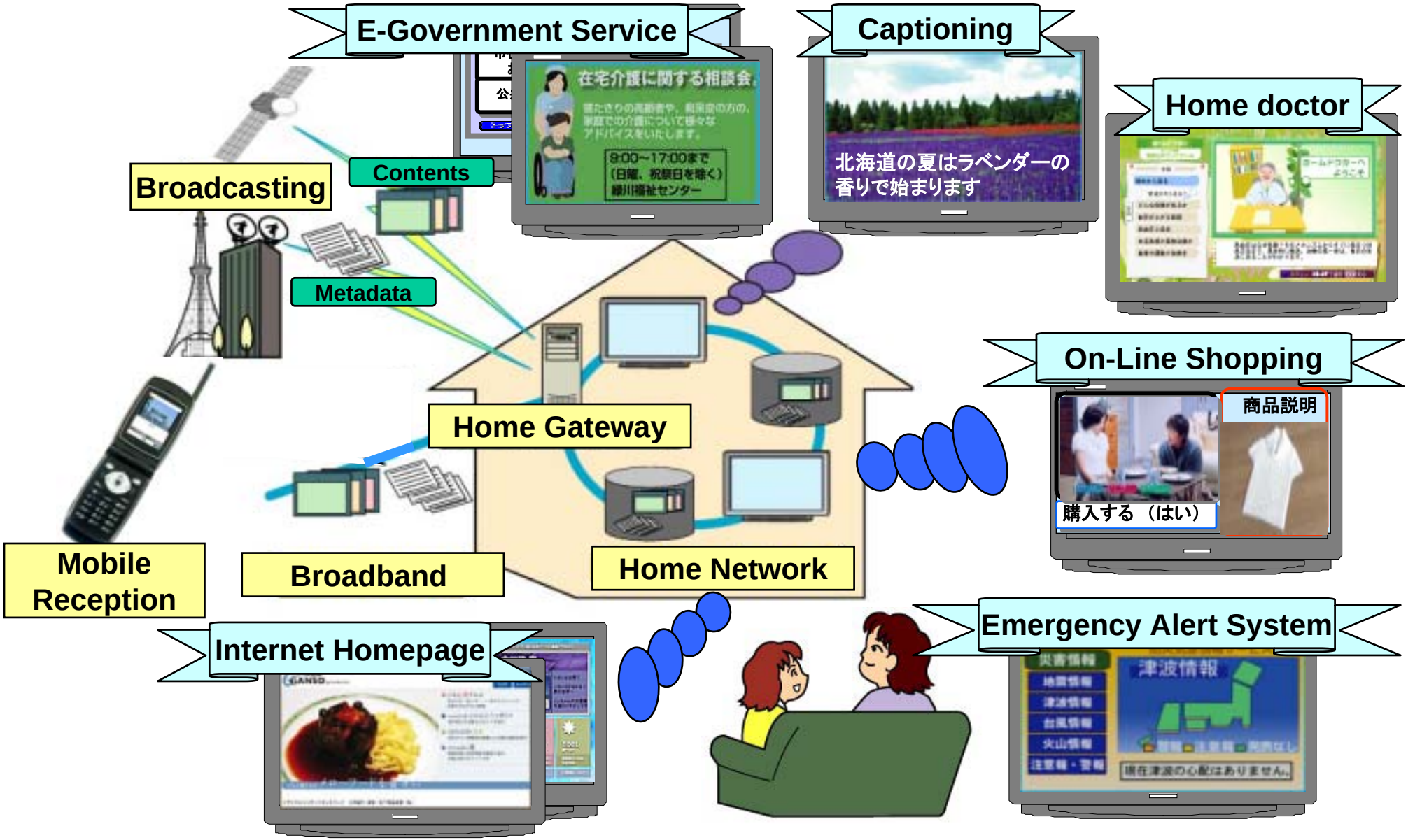
Japanese Major Electric Household Appliance Store's HomePage (yodobashi.com,biccamera.com etc) as of Jun.9.2004

Price Trends of HDTV Receiver in USA



BestBuy.com as of Aug.12.2004

Digital TV
~Home gateway to the ICT society~



Policy and Strategy for DTTB

Policies and Bottleneck for DTTB

- Assign 6MHz channels for incumbent terrestrial broadcasters
- Simulcast of Analog, but something more values ; i.e. HDTV, SDTV multichannels, datacast, etc
- Different and additional value more than satellite digital TV (SDTV more channel)
- Digital Television set as integrated home information terminal
- Massive reallocation of existing relay station channels

Example of New lifestyle for Viewers

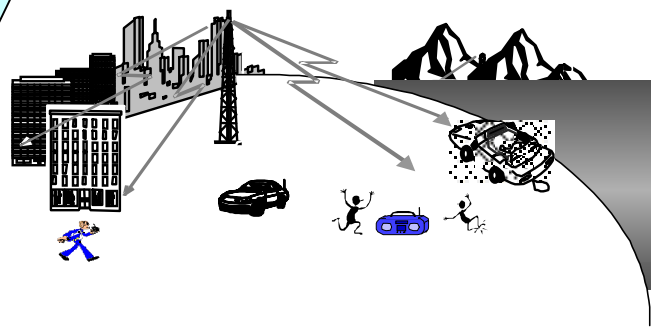
HDTV

Multiple programs

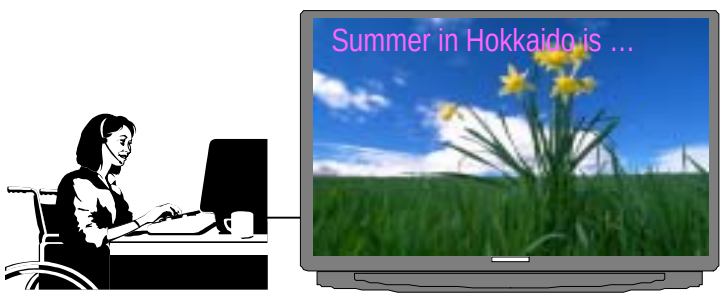
Data broadcasting

Merits

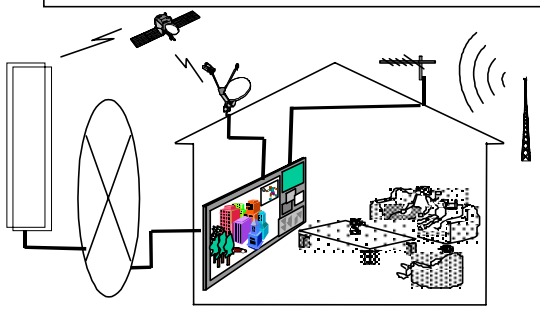
Mobility



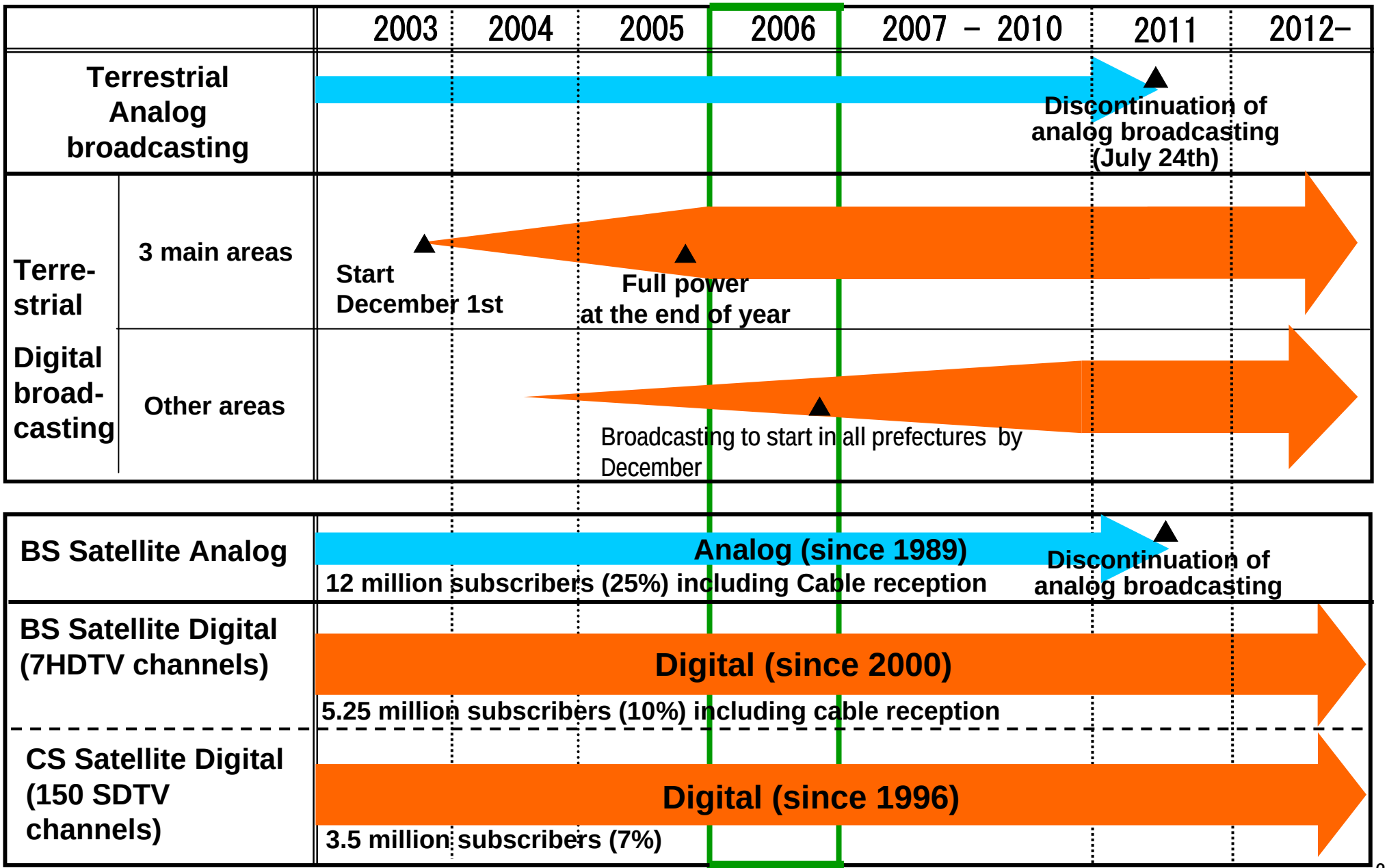
Advanced captioning etc.



Interactive TV



Schedule for Digital Broadcasting in Japan



Implementation Schedule of Digital Terrestrial Television Broadcasting in Japan

Dec 1.st 2003 — **Start of DTTB !** (Tokyo, Nagoya, Osaka)

Apr. 2003 — Provisional licenses were awarded

Feb.2003 — Start of Analog channel relocation

Sep. 2002 — MPHPT established license conditions and requirements

1999-2003 — Real Scale Experiment Broadcasting

1999 — MPT established technical standard

1998 — Issue of Digital Broadcasting Study Group Report

1994 — MPT asked to Council for technical requirement

Conditions and Requirements for DTTB licensee in Japan

- Over 2/3 simultaneous as analog per day
- HDTV is more than 50% of all programs
- Broadcasting using subtitles and commentary
- Covered same areas as analog
- Updating the receiver's by data broadcast

Expansion of DTTB services

- **Dec. 1st 2003: Start of Digital Terrestrial Television Broadcasting (DTTB) in Japan (Tokyo, Osaka, Nagoya)**

- **Population coverage of DTTB (households)**

  Now: 12 million (25%)
  2004 17 million (35%)
  2005 23 million (48%)
  2006 available at all prefectures

- **The number of shipment DTTB receivers**

  1.068 million sets as of June 2004

Strategy to promote DTTB

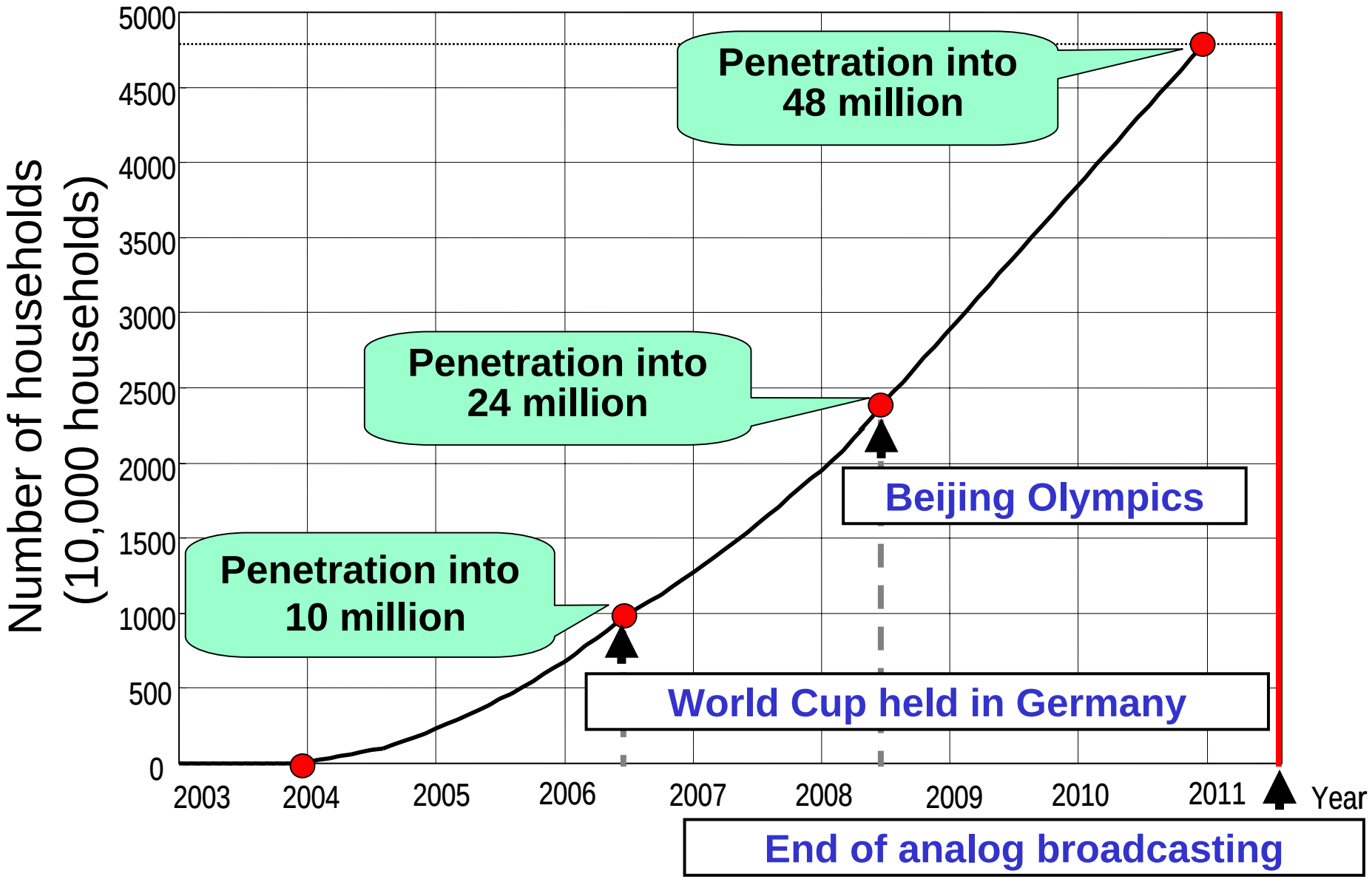
- End of Analog Broadcasting; July 2011 mandated by Radio Law
- Replace analog receiver into digital by the time
- Need of collaborative work among government, broadcasters and industry
- Promote DTTB receivers
- DTV as integrated home information terminal

Action Plan to Promote DTTB

Decision of the "DTTB promotion conference (Oct 31th 2003)

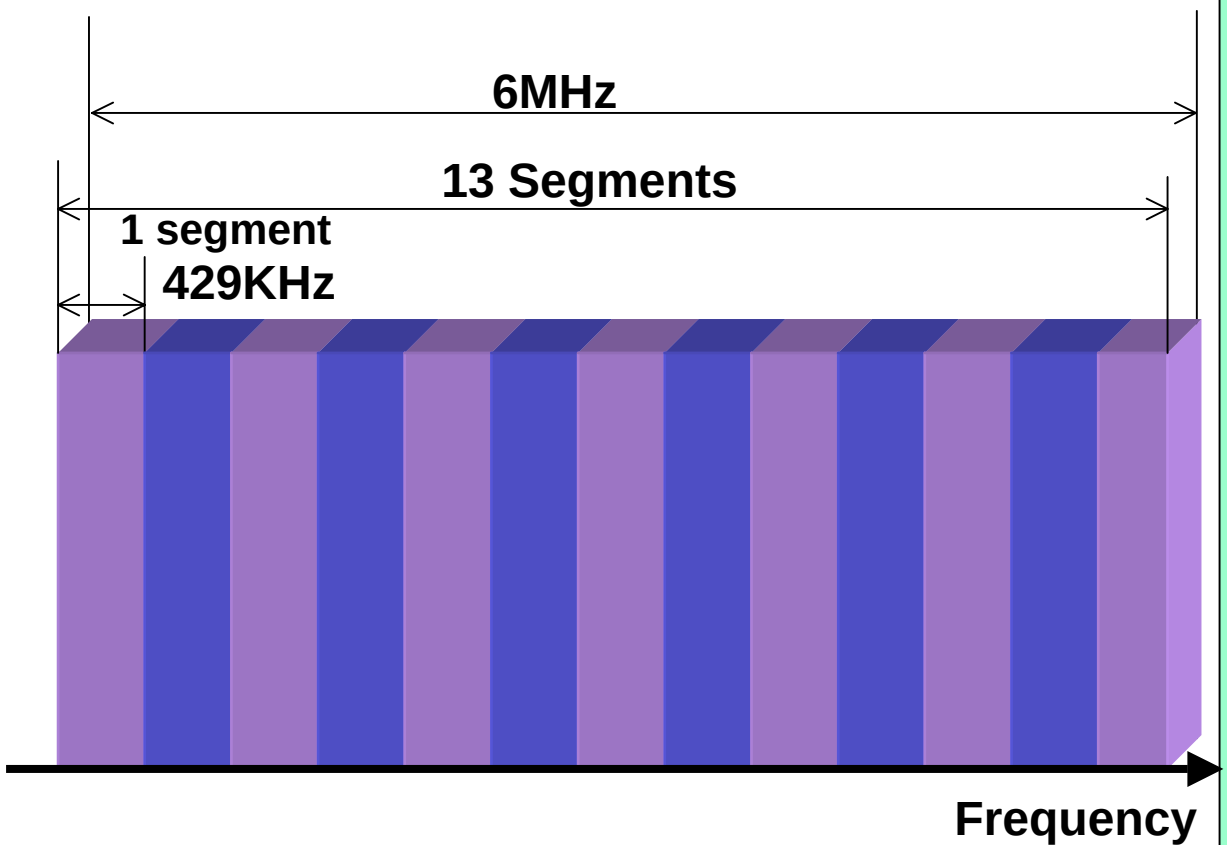
- **Set objectives for the penetration of DTTB receivers including cable reception**
- **Set objectives for expansion in the coverage rate of digital broadcasting in the three main areas (Tokyo, Osaka, Nagoya)**
- **Action items for government, broadcasters, manufactures, retailers**

Objectives for the penetration of terrestrial digital broadcasting receivers (households)



ISDB-T system

Band Segmented OFDM : Orthogonal Frequency Division Multiplexing

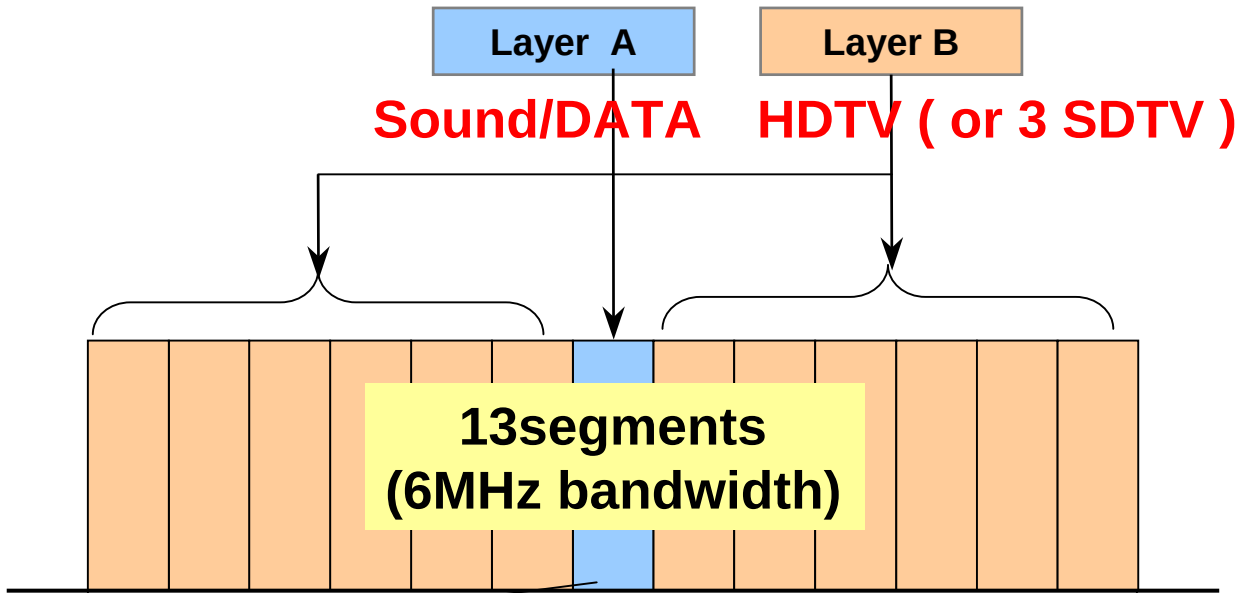


Features

- Modulation: DQPSK, QPSK, 16QAM, 64QAM
- 1HDTV or 3 SDTV/channel
- Net data rate: 23.42Mbps (6MHz)
- Single Frequency Network
- Mobile reception (time interleaving)

Segmented Structure and Partial Reception

HDTV + mobile reception within one 6MHz channel



Mobile reception

HDTV reception

DTTB Standards

Technical Standards for DTTB	established
ARIB STD-B32 image encoding, sound encoding and multiplexing formats	2001.5
ARIB STD-B24 Data broadcasting encoding formats and transmission formats	1999.10
ARIB STD-B25 Restricted reception formats	1999.10
ARIB STD-B10 Program lineup information	1997.6
ARIB STD-B31 transmission formats	2001.5
ARIB STD-B21 receiver device	1999.10
ARIB TR-B14 Terrestrial TV operation specification	2002.1

ARIB:
Association of Radio Industries and Businesses

Private standardization body in Japan

Service Features of DTTB

HDTV as thruster of digital TV

● High- Definition programs

Pure HDTV: produced by HDTV 1080i format

- **NHK provides pure HDTV more than 90% of all programs in the three metropolitan Area.**

  Prime time : more than 90%

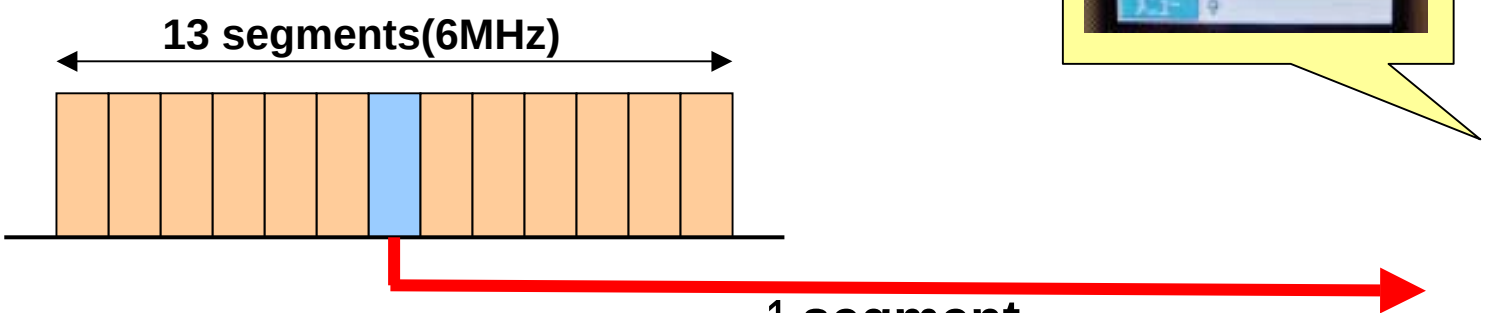
- **Commercial Network stations provide pure HDTV about 50% of all programs in Tokyo Area.**

  Prime time : more than 50%

Broadcasting to Portable Terminals

Example :

modulation	16QAM
code ratio	1/2
guard interval	1/4
bit rate	630 kbps



An example of KDDI

Prototype of Mobile Phone receiver (May, 2004)

Implementation Schedule toward portable reception of DTTB

- Video compression system: MPEG4 AVC/H.264
- Patent agreed in March 2004
- Prototype receivers already developed by manufactures
- Service will start in late 2005
- TV viewing on Cellular phone while commuting

HDTV mobile reception (1)

HDTV Broadcasting

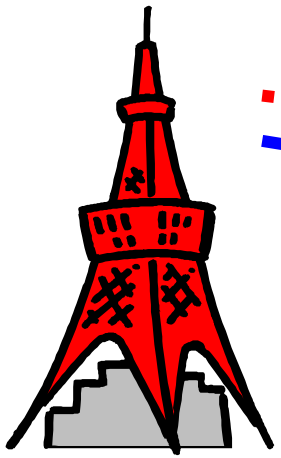
Data Broadcasting

Demonstration will be provide at ITS World Conference in Oct. 2004 in Nagoya

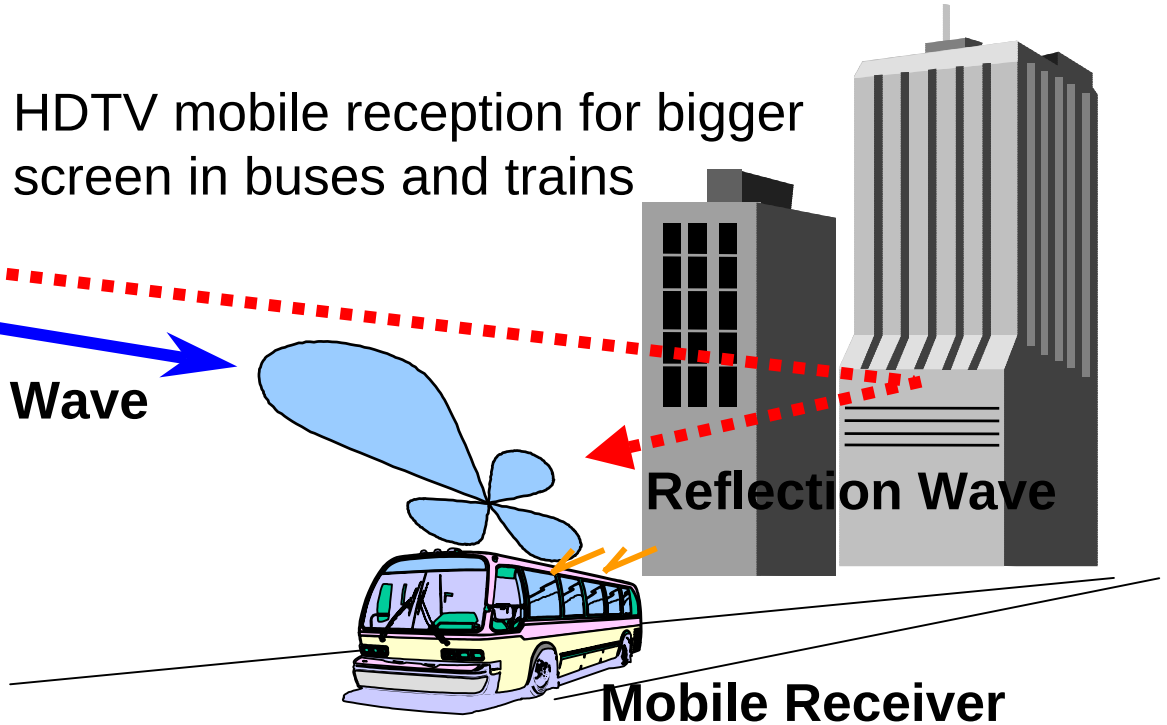
HDTV mobile reception (2)

Broadcasting station

HDTV mobile reception for bigger screen in buses and trains

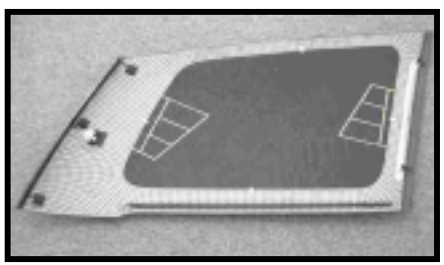


Direct Wave

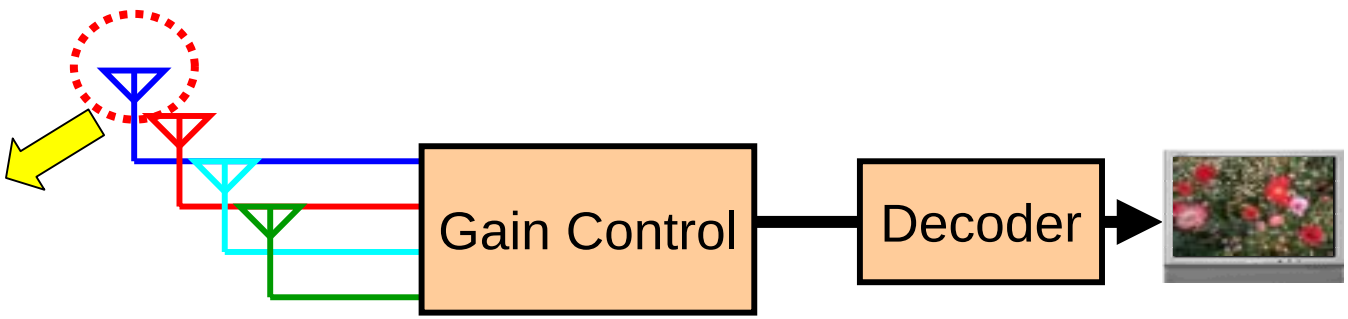


Reflection Wave

Mobile Receiver



Adaptive Array Antenna on the vehicle's window



Antenna Gain Control Technique

Data Broadcasting

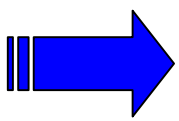
All DTTB Broadcasters and BS Broadcasters providing Data broadcasting (datacast) now

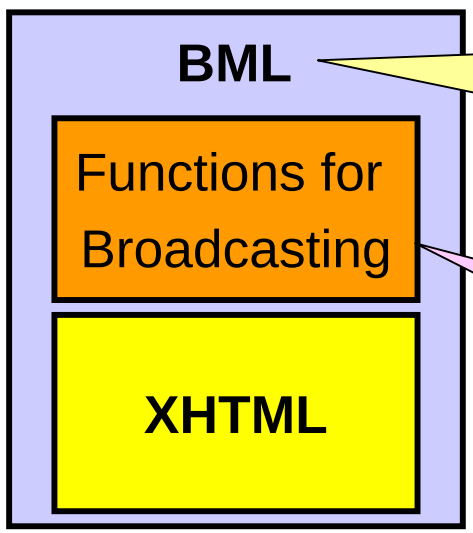
Program related information	Anytime news
Weather information	Report of sports game etc,

Currently the description language is BML format

Based on

XHTML





Features

Easy creation of contents

Facilitate convergence of internet

Additional capability

Example for Data Broadcasting (1)

Top menu

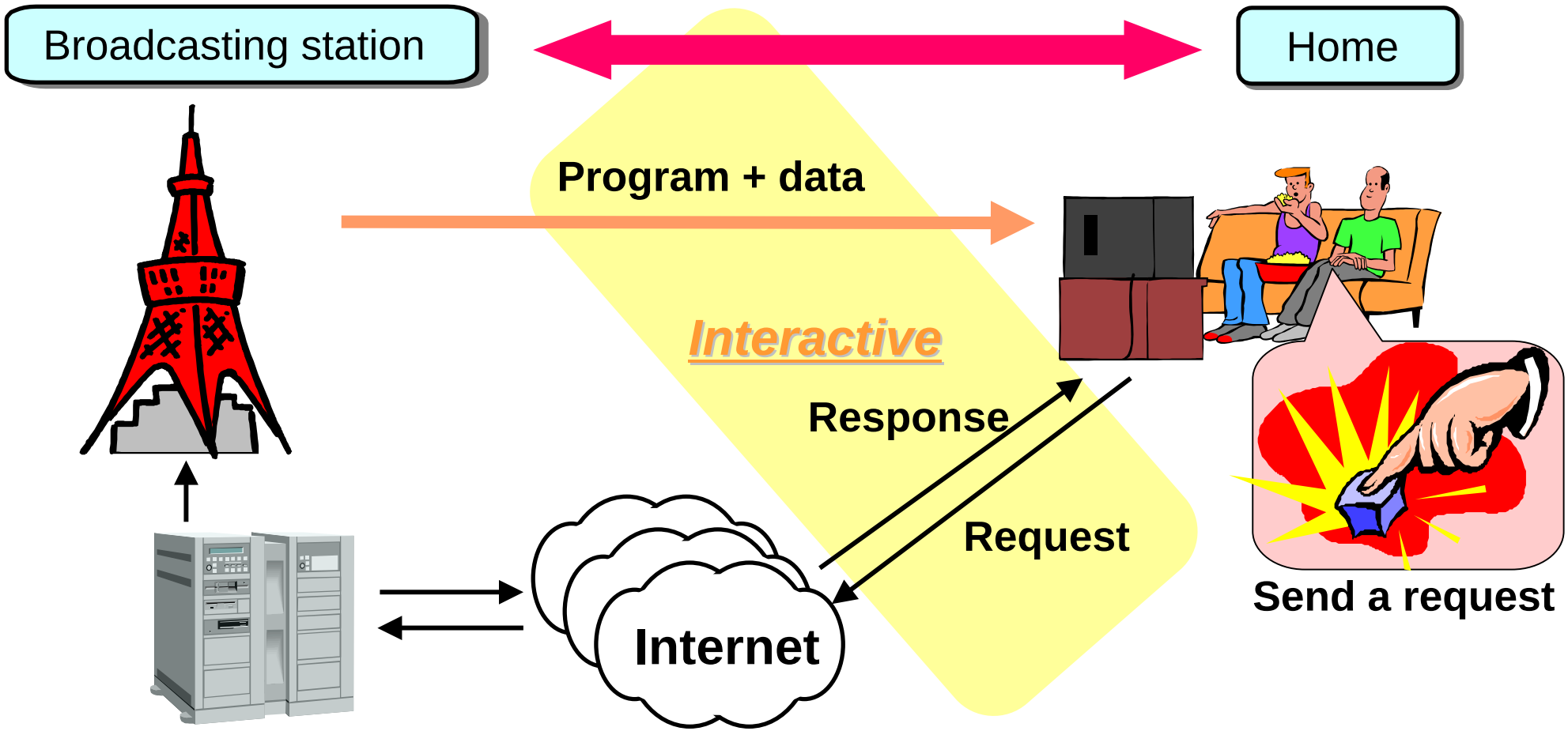
Example for Data Broadcasting (2)

Weather news

Example for Data Broadcasting (3)

Program related data

Interactive Broadcasting



Join the Quiz show by voting
Purchase on TV shopping

Interactive data service

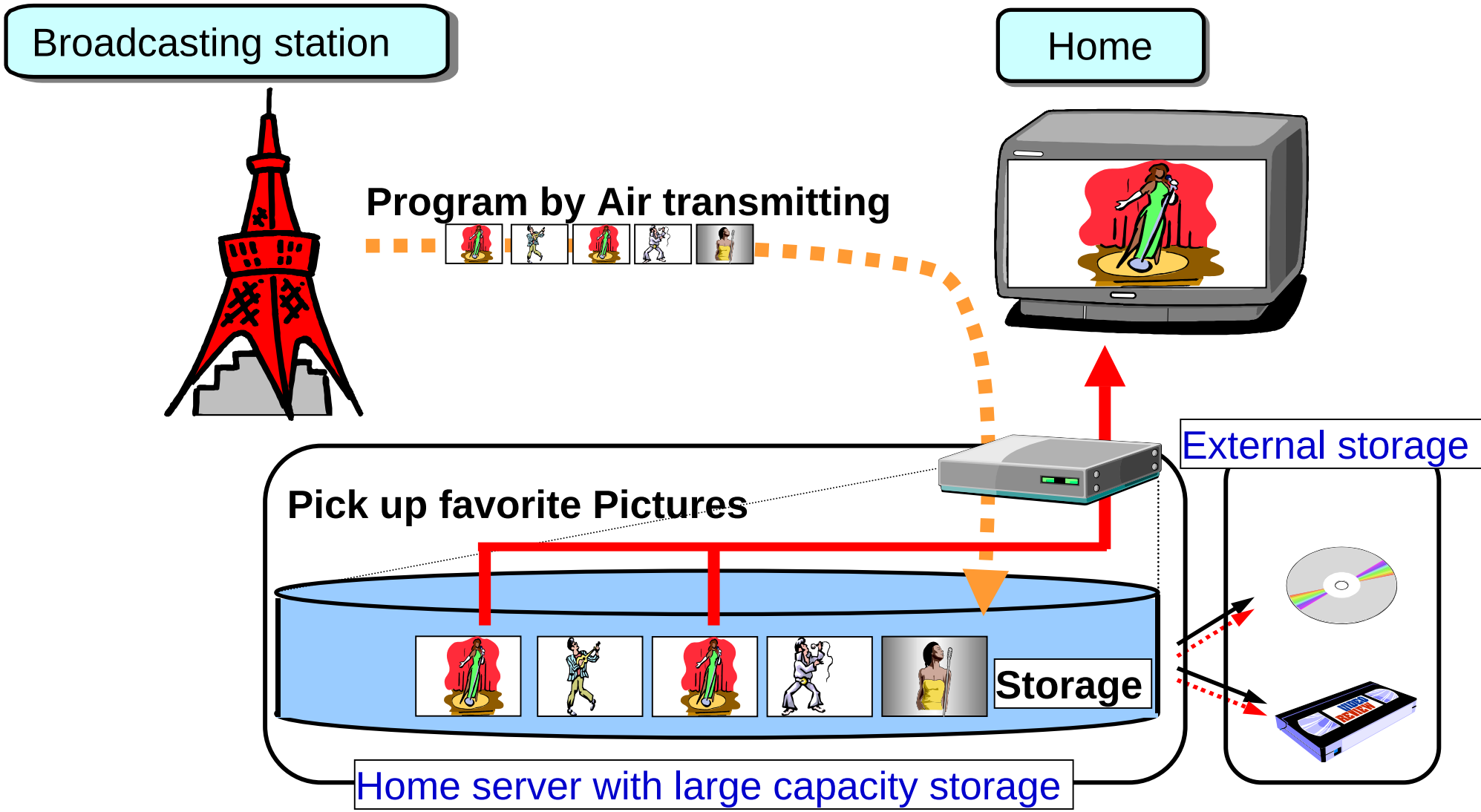
NHK Data Online service available from April 2004

Top menu of Data broadcasting

NHK Data Online image

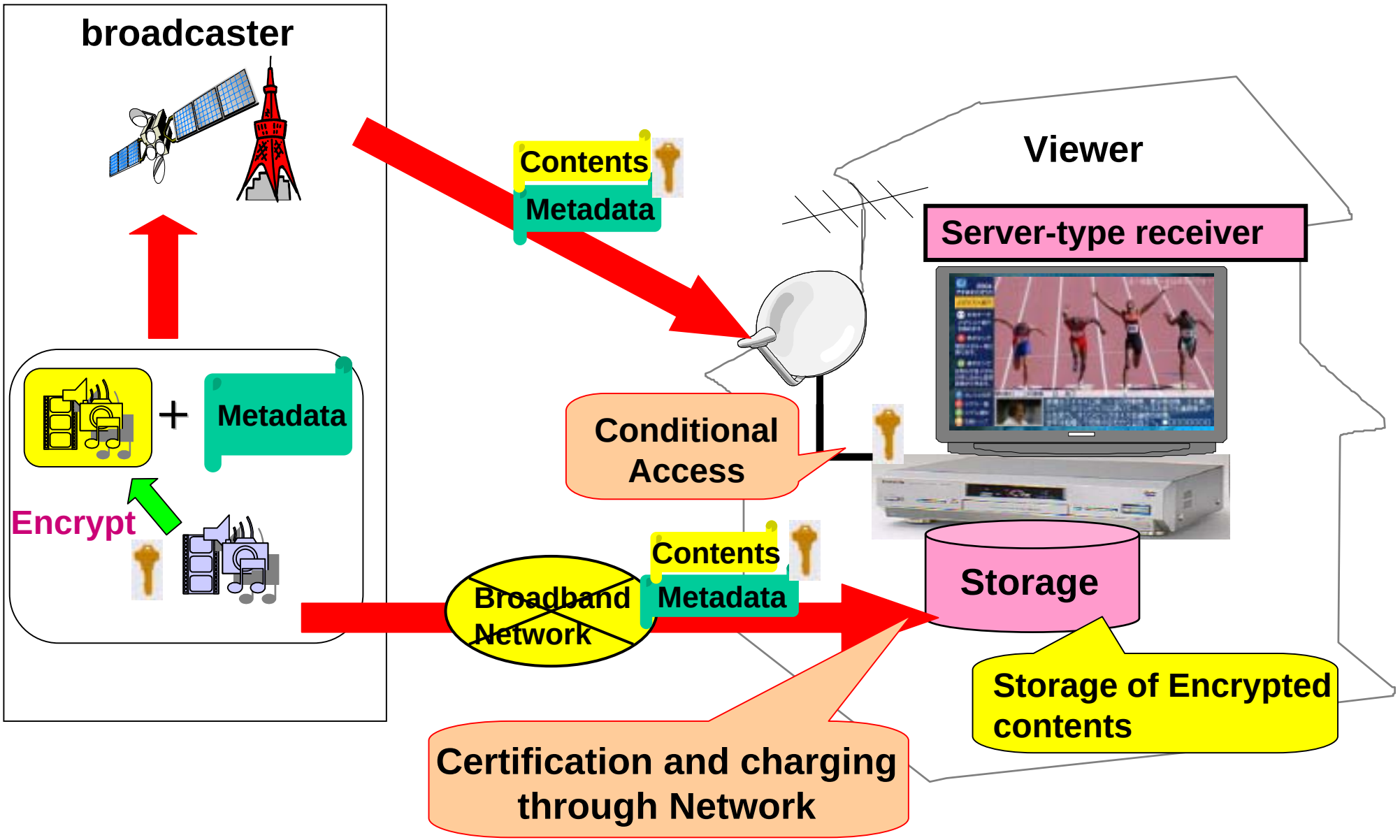
Access to NHK Data server

Server-type Broadcasting System



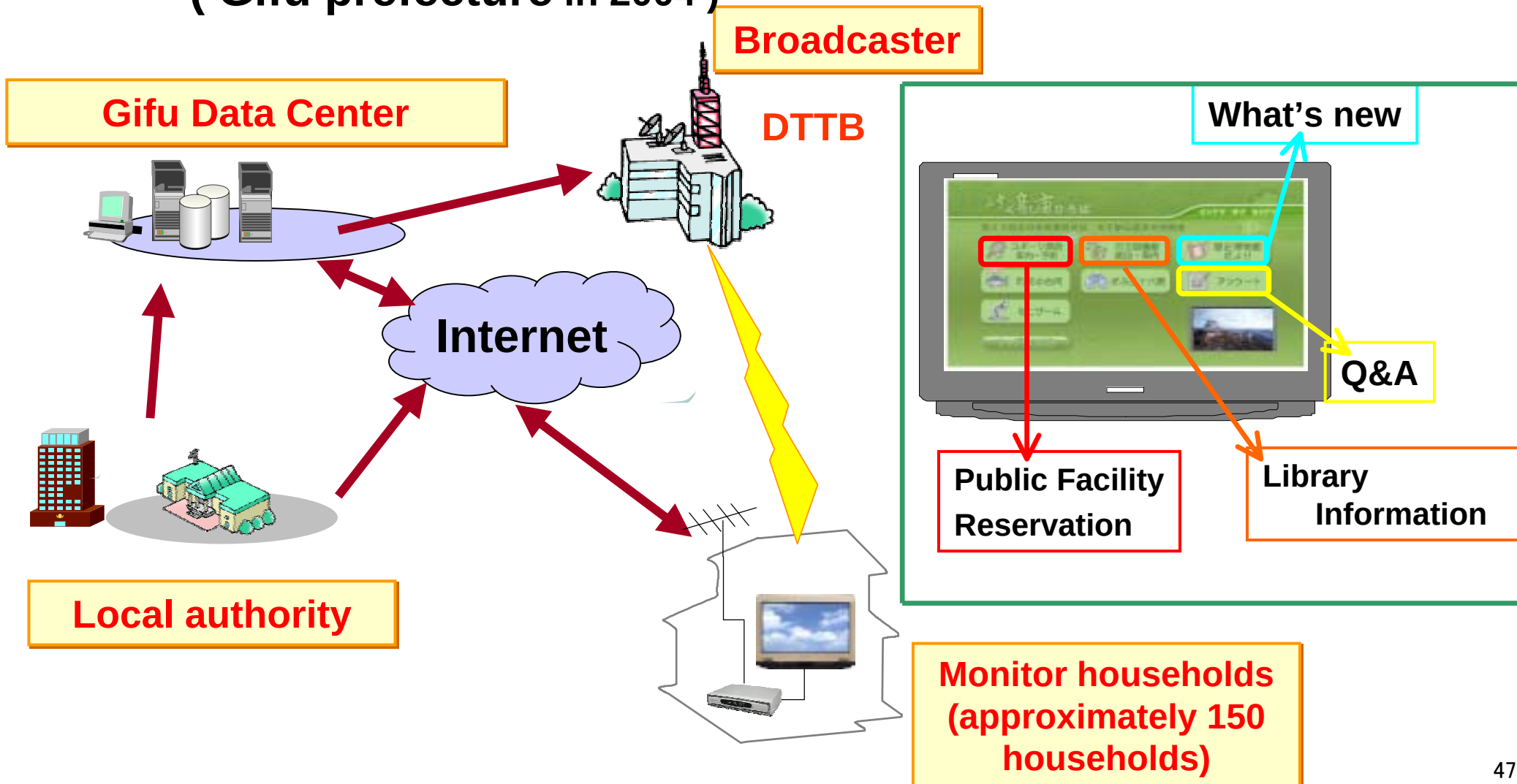
Service coming soon

System model of Server-type broadcasting



E - government service trial using DTTB

Local governmental information service using datacast of DTTB (Gifu prefecture in 2004)

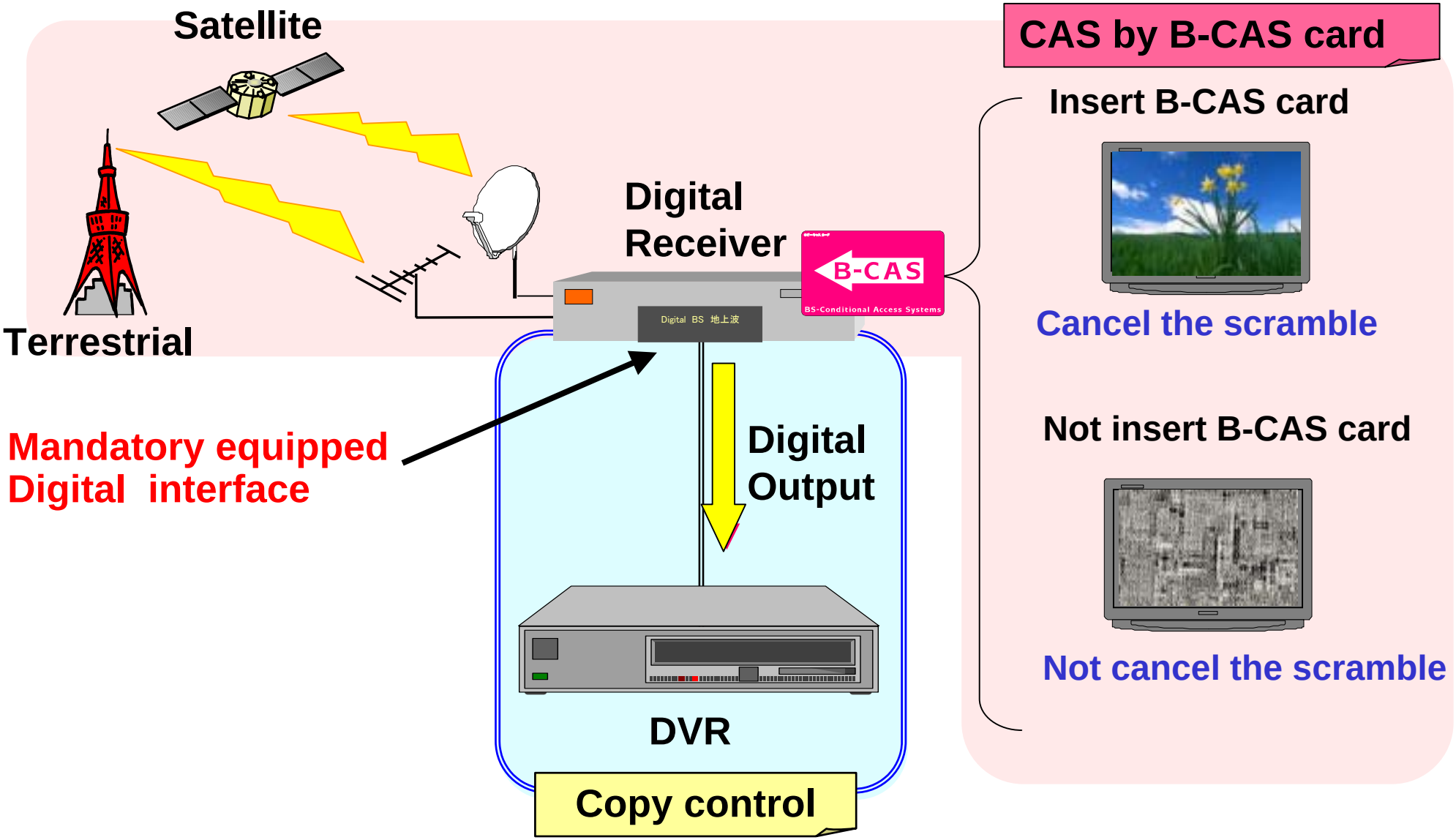


Home doctor by Digital Broadcasting

<Home doctor>

- **Programs received by broadcasting wave**
- **Personal information received by Internet**

Content Protection



In operation from April 2004

World Trend of DTTB

Digital Terrestrial TV in the World

	EU UK, Germany, Sweden, Finland, Spain etc.	Asia Pacific USA, Canada, Australia, Korea, Japan
Regulatory framework	New license -Multiplex -Program (4-6 programs in 1 multiplex)	Give 6(7)MHz to incumbent analog operators Simulcast requirement
Services	Pay TV or Free to air More channels, no HDTV STB	Free to air HDTV Integrated digital TV set
System	DVB-T	ATSC (USA, Canada, Korea) ISDB (Japan) DVB-T (Australia)

HDTV as mainstream of digital TV

country	HDTV requirement and service
USA	No mandatory requirements Major terrestrial TV network started HDTV in primetime Satellite and cable operators started HDTV service
Canada	Market driven but emphasis on HDTV in CRCT licensing policy in 2002 Satellite, Cable and terrestrial TV providing HDTV
Australia	HDTV requirement: 20 hours per week, from July 2003 (including up-converted HDTV)
Korea	HDTV requirement: 14 hours per week for pure HDTV
Japan	HDTV requirement: more than 50% (including up-converted HDTV) NHK-G providing 90% pure HDTV

Summary

- Digital Terrestrial TV should have more values than multi-channels; i.e. pure HDTV, datacast, interactive service, mobile reception.
- All Digital Terrestrial TV broadcasters are providing such services
- All in one HDTV sets are available in the market as thrusters of digital market.
- 1.2 million of HDTV sets with digital tuners are in the market. Furthermore, 0.3 million digital cable STB, more than 3 million HDTV without digital tuners. The largest penetration in the world
- Collaborative work among government, broadcasters, industry to promote DTTB

Reference

Obrigado

MPHPT http://www.soumu.go.jp/joho_tsusin/eng/

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