IPTV System for Enterprise

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CONTENTS

❑ **IPTV System for Enterprise**

- Overview
- Services
- Application

Introduction of IPTV

□ **Definition of Internet Protocol TeleVision (IPTV)**

- IP television systems provide video services through the use Internet protocol (IP) networks. These IP networks initiate, process, and receive voice or multimedia communications using IP protocol.
- Broadcasting over Internet
- Deliver TV Service over Broadband IP networks

□ **Range**

- Broad sense: Video streaming service
- Limited sense: Broadcasting (Except VOD)

Overview of IPTV System for Enterprise

IPTV System Construction for Enterprise

Goal

- **Live, Recorded broadcasting, VOD Service**
- **Extend various service in future.**

- **Support stability, convenience, enlargement**

Background

Improve Competitive

- Increase business education
- Improve business competitive

Improve satisfaction of internal customer

- Activate communications in company
- Improve satisfaction of customer

Improve broadcasting system

- decrease maintenance cost
- Extend a broadcast time and content
- Extend service to branch office

Services of IPTV System for Enterprise

Live Broadcasting

- Real-time live broadcasting service
- Multicast support: broadcasting service to many users

Recorded Broadcasting

- Recorded broadcasting service
- **Multicast support: broadcasting service to many users**

VOD Service

- On-demand service that they want to watch.
- Unicast support:

CMS

- Contents Distribution
- Contents Management
- Electronic Program Guide

NMS

- System Management
- Network Management

Report

- Monitoring of status
- Statistics of usage

Approaches for IPTV system

❑ VOD based systems

- Providing VOD only services
- Restricting simultaneous use of services according to available bandwidth

❑ Centralized IPTV systems

- Locating the system to broadcasting center
- Providing VOD and Broadcasting services

❑ Distributed IPTV systems

- Distributing of the service to branches
- Providing VOD and (Live and Recorded) Broadcasting services

VOD based systems

- ❑ **Characteristics**
  - ▪ E-learning systems
  - ▪ No broadcasting services using Internet
  - ▪ Centralized system
    - Bandwidth limitation
    - Easy management
- ❑ **Status: Typical use in Organizations**

Centralized IPTV systems

❏ **Characteristics**

- ▪ E-learning and Broadcasting Systems
- ▪ Centralized system
  - • Best-effort service with Internet broadcasting quality
  - • Bandwidth limitation
  - • Easy management

❏ Status: Starting services

Distributed IPTV systems

❑ Characteristics

- ▪ E-learning and Broadcasting system
- ▪ Systems for branches
- ▪ Distributed systems
  - Highly reliable services with Broadcast quality
  - No limit on usage
  - Careful management

❑ Status: Emerging services

Challenges of Enterprise IPTV systems

❑ **Distributed offices around country**
- Over 1000 offices
- Unstable or unmanageable environment in offices

❑ **Best-effort Internet**
- xDSL or low bandwidth leased line
- No QoS

❑ **Various network environment**
- xDSL: VPN, dynamic IP, NAT
- Leased line, Firewall

❑ **Broadcasting quality service required**
- SD quality services
- Highly reliable service: Non-stop service

❑ **No multicasting service in public Internet**

❑ **Integration with existing or emerging applications of company or organization**

Basic concept for Enterprise IPTV

❑ **Distributed offices around country**
- ▪ Stable Equipment in offices controlled by remote center

❑ **Best-effort Internet**
- ▪ TCP streaming
- ▪ Reliable Multicast feature
- ▪ Contents distribution to edge network

❑ **Broadcasting quality service required**
- ▪ Encoding format with high compression
- ▪ Dual systems
- ▪ Adaptive quality control for streaming

❑ **No multicasting service in public Internet**
- ▪ Overlay multicast

❑ **Integration with existing or emerging applications of company or organization**
- ▪ Web interface

Network System – Application of Multicast Router

A

B

Multicast CDN Center

Broad -casting Station

Leased Line

Multicast CDN Root Center

Service Server

Multicast CDN Regional Center

Multicast CDN Regional Center

xDSL

Branch

Branch

Branch

* CDN : Content Delivery Network
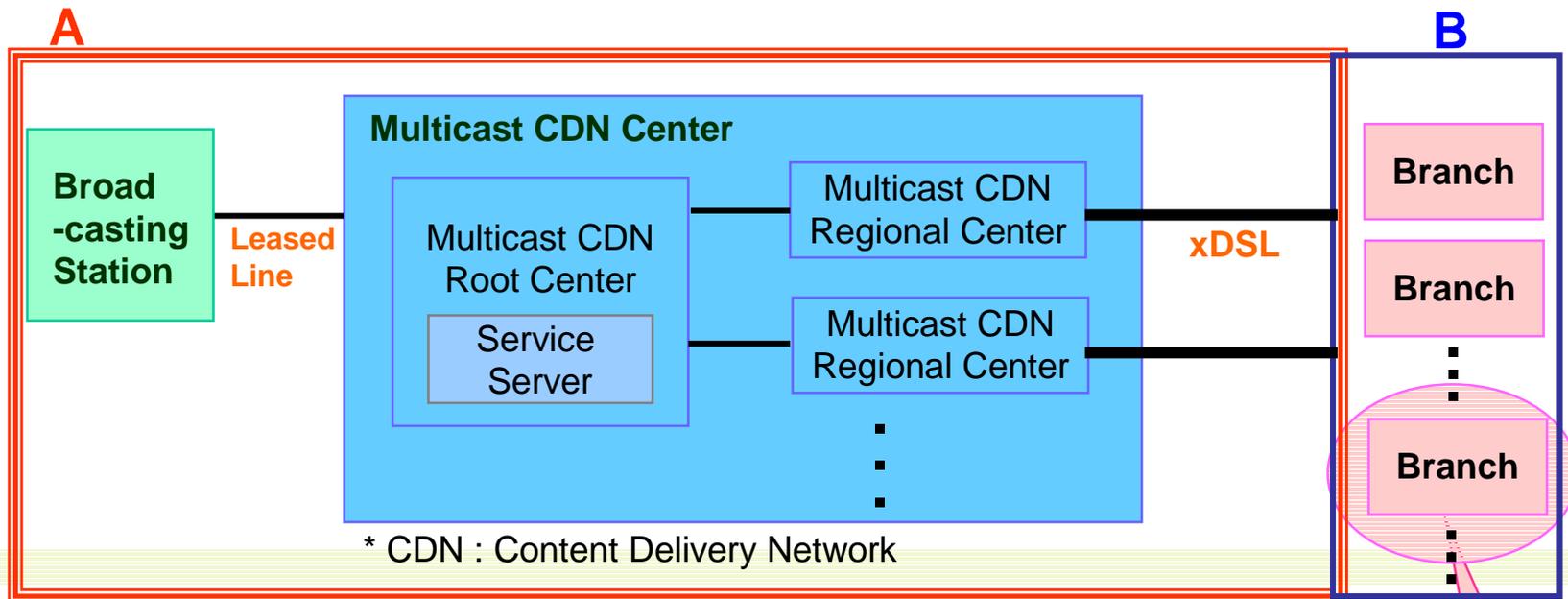
A : Multicast CDN Service
  - Low traffic at middle mile network

B : Multicast Router, CastStation at branch
  - Low traffic at branch network

Hall

Personal

Personal

Multicast Router

Real-time Broadcasting

CastStation

VOD/Recorded Broadcasting
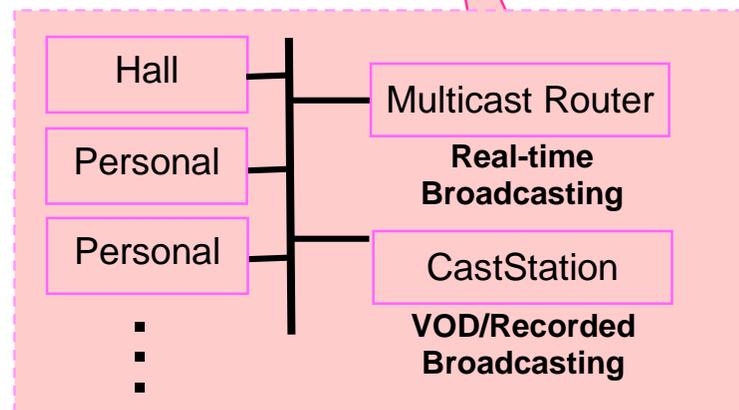
Introduction of Multicast
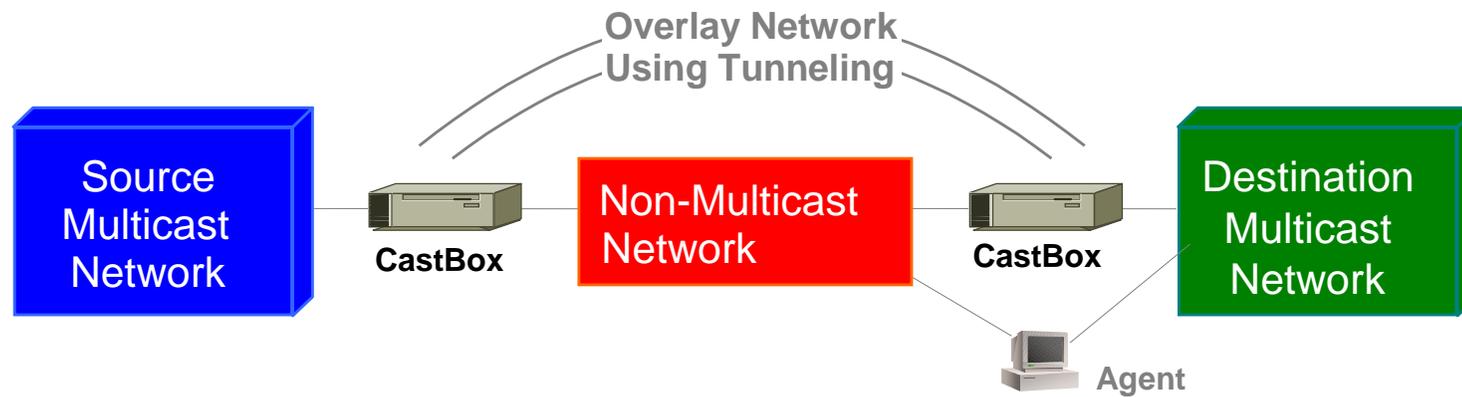
- ❑ **Multicast Solution of Streaming Service**

- ❑ **Support both IP multicast and application-level multicast**

- ❑ **Multicast under a variety of Internet environment**

  - ▪ **x**DSL, Cable, B&A, Ethernet, Leased Line

Configuration of Centralized IPTV System

Broadcasting Center

Encoder

NAS

Management
Server

CastBox
Station

Switch

Live server

Multicast
Router

Multicast
Router

IDC

Switch

VOD server

Multicast
Router

NAS

Web server

Internet

Lease Line/VPN on xDSL

Lease Line/VPN on xDSL

CastBox
agent

CastBox
agent

CastBox
agent

CastBox
agent

Branch Office

Branch Office
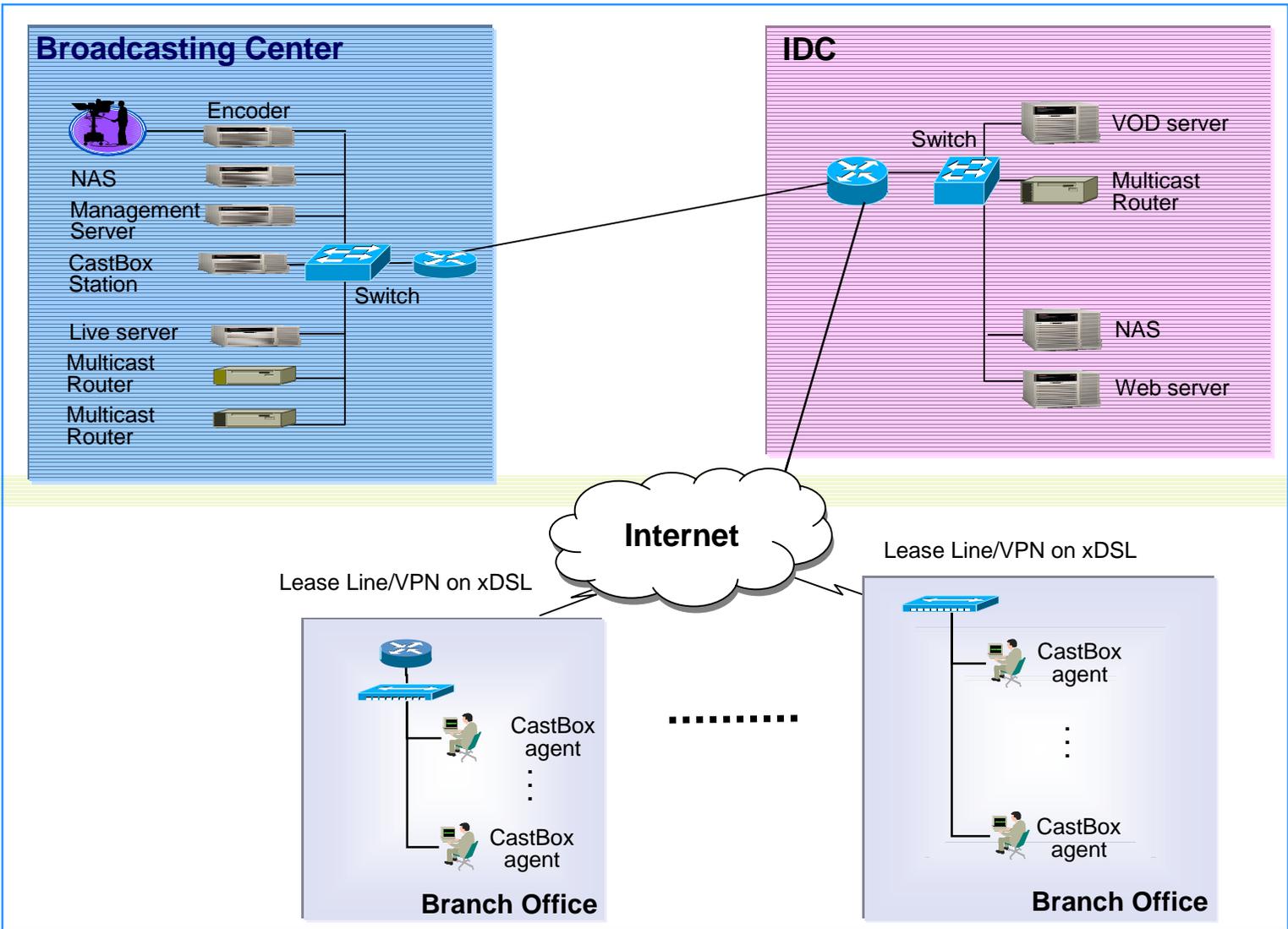
Configuration of Distributed IPTV System

Broadcasting Center

Encoder

NAS

Management
Server

CastBox
Station

Switch

Live server

Multicast
Router

Multicast
Router

IDC

Switch

VOD server

Multicast
Router

CastDistributor

NAS

Web server

Internet

Lease Line/VPN on xDSL

Lease Line/VPN on xDSL

CastStation

CastBox
agent

CastBox
agent

Branch Office

CastStation

CastBox
agent

CastBox
agent

Branch Office

zooin.net
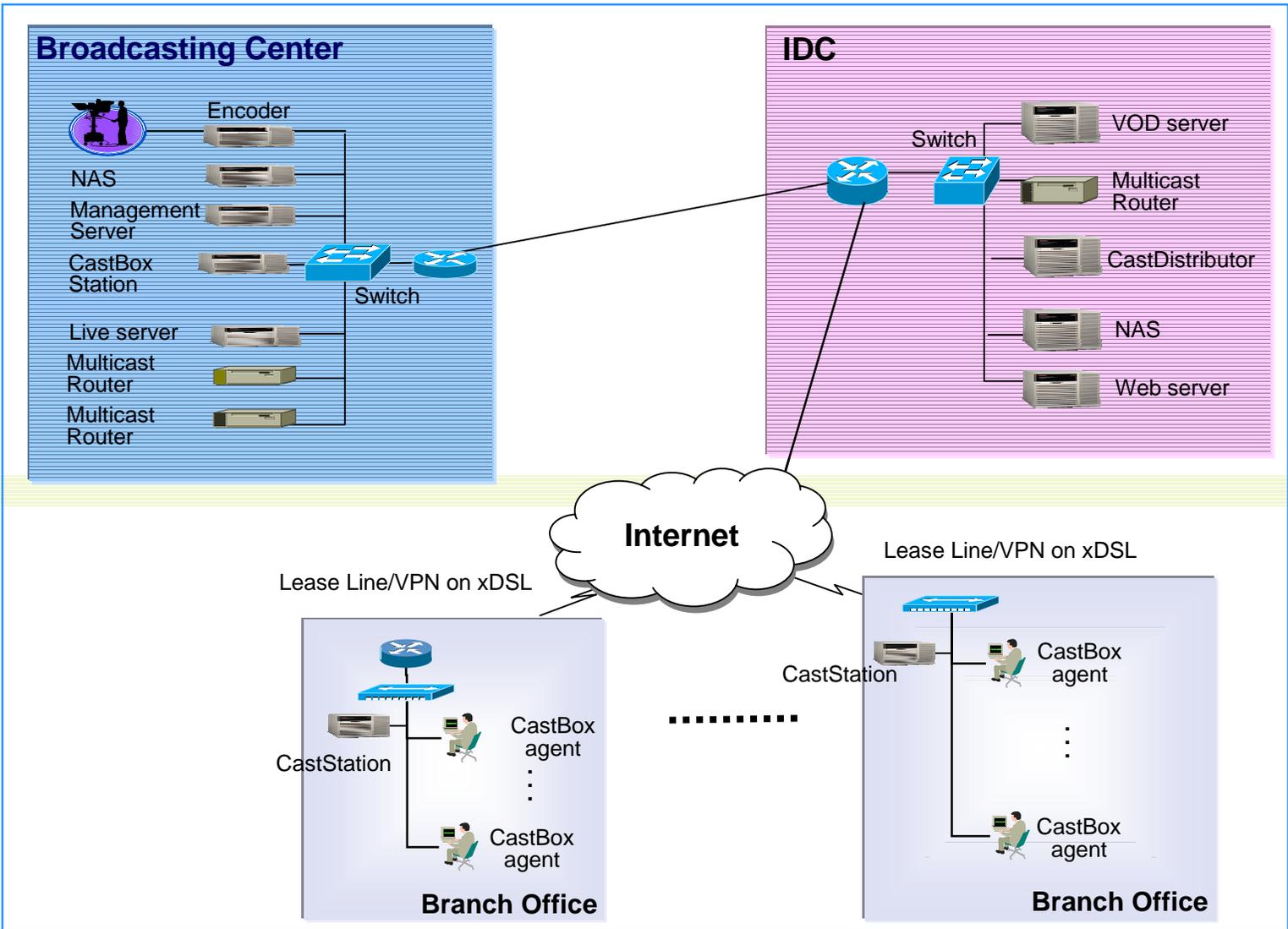
Live & Recorded Broadcasting

❑ Support real-time multicast (Live Multicast with Multicast Router)
❑ Live broadcasting service
    ❑Weekly meeting, Event
❑ Recorded broadcasting service
    ❑Interactive education

VOD Service

❑ High quality service with VOD services.

CMS (Contents Management System)

❑ Catalog Management

❑ Contents Distribution

❑ CastStation(Media server) Information Management

❑ Remote management at center (Registration, Status Monitoring)

❑ Active-Active backup.(24x7x365 service)

❑ Real-time/File Broadcasting/VOD Management

❑ Real-time/File Broadcasting Channel Management

❑ Schedule-based reliable high quality service

CMS (Contents Management System)

- Content Register

< Preview >

<Meta Information>

CMS (Contents Management System)

Contents Distribution

Register channel

CMS (Contents Management System)

Program Schedule

## Program Schedule (VOD)

Live Broadcasting

❑ The various channel quality: 300K, 500K, 700K

Live Broadcasting

Normal route
Back-up route
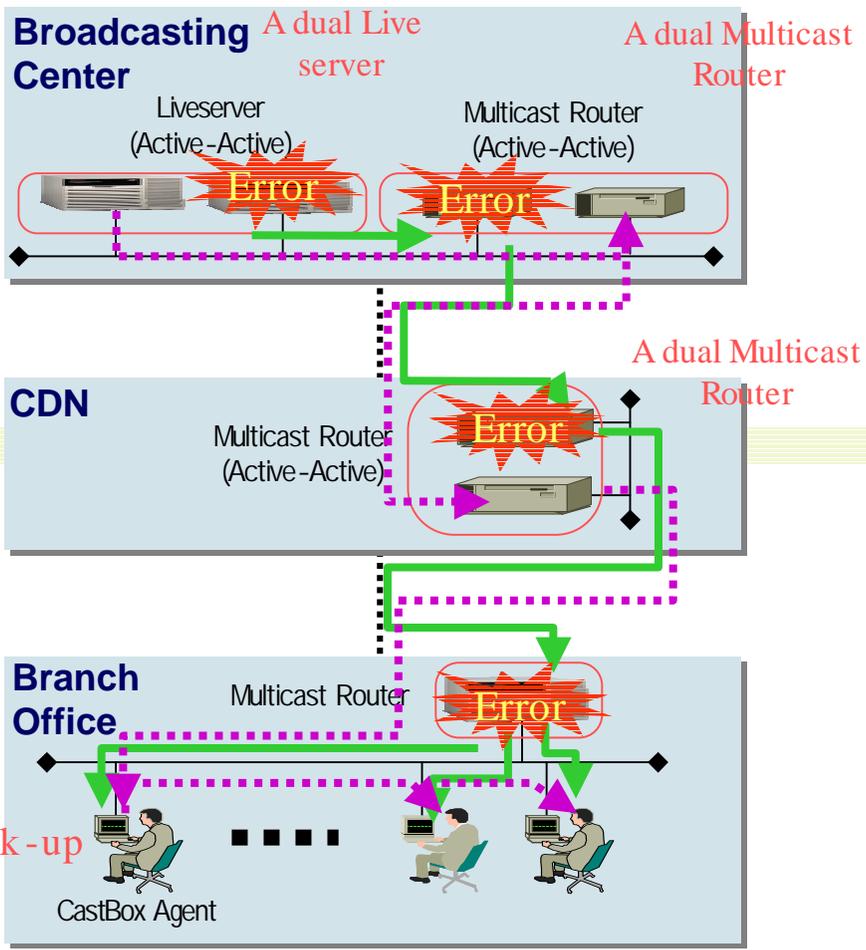
● Back-up

- A error of live server in broadcasting center

- A error of Multicast Router in broadcasting center

- A error of multicast router in CDN

- A error of Multicast router in branch office

Support a perfect back-up at **a dual live server, a dual multicast router** and **the client PC**

Support a continuous service

Recorded Broadcasting
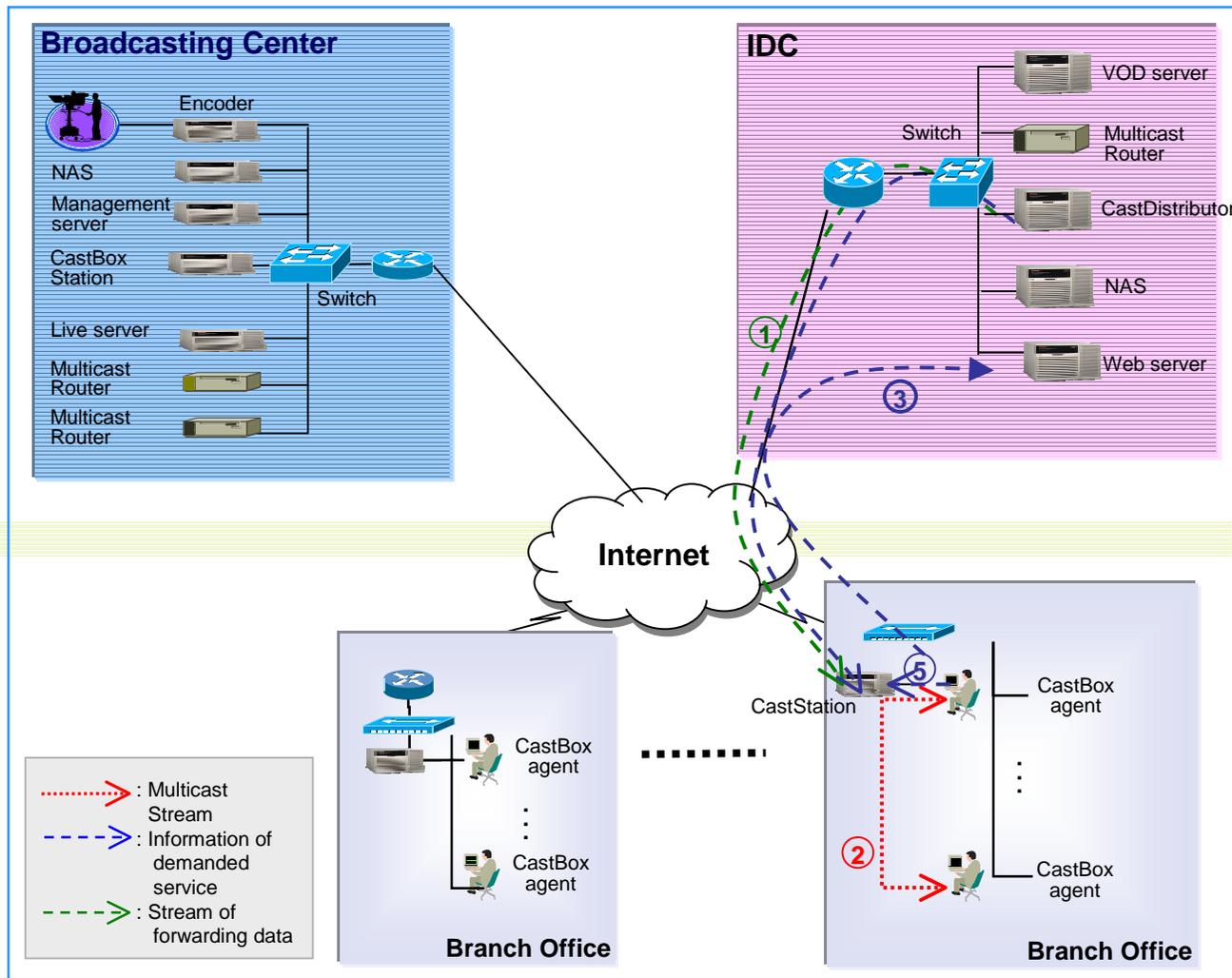
❑ Channel Quality: 1 ~ 1.5Mbps

Recorded Broadcasting

Normal route
Back-up route

Back-up

Broadcasting Center

Live server
(Active-Active)

Multicast Router
(Active-Active)

CDN

Multicast Router
(Active-Active)

Branch Office

CastStation

Error

PC Back-up

CastBox Agent
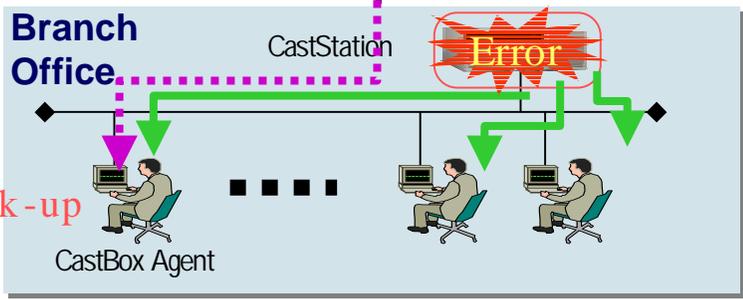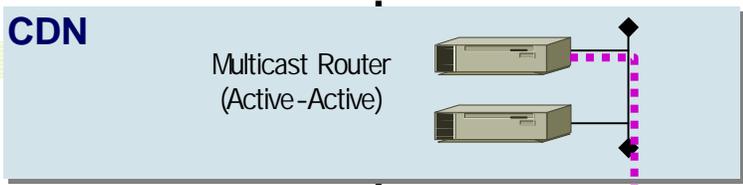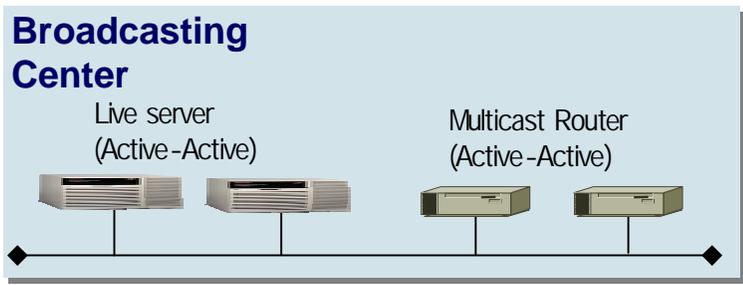
- A error of CastStation in branch office

Support a perfect back-up at **the Client PC**

Support a continuous Service

VOD Service
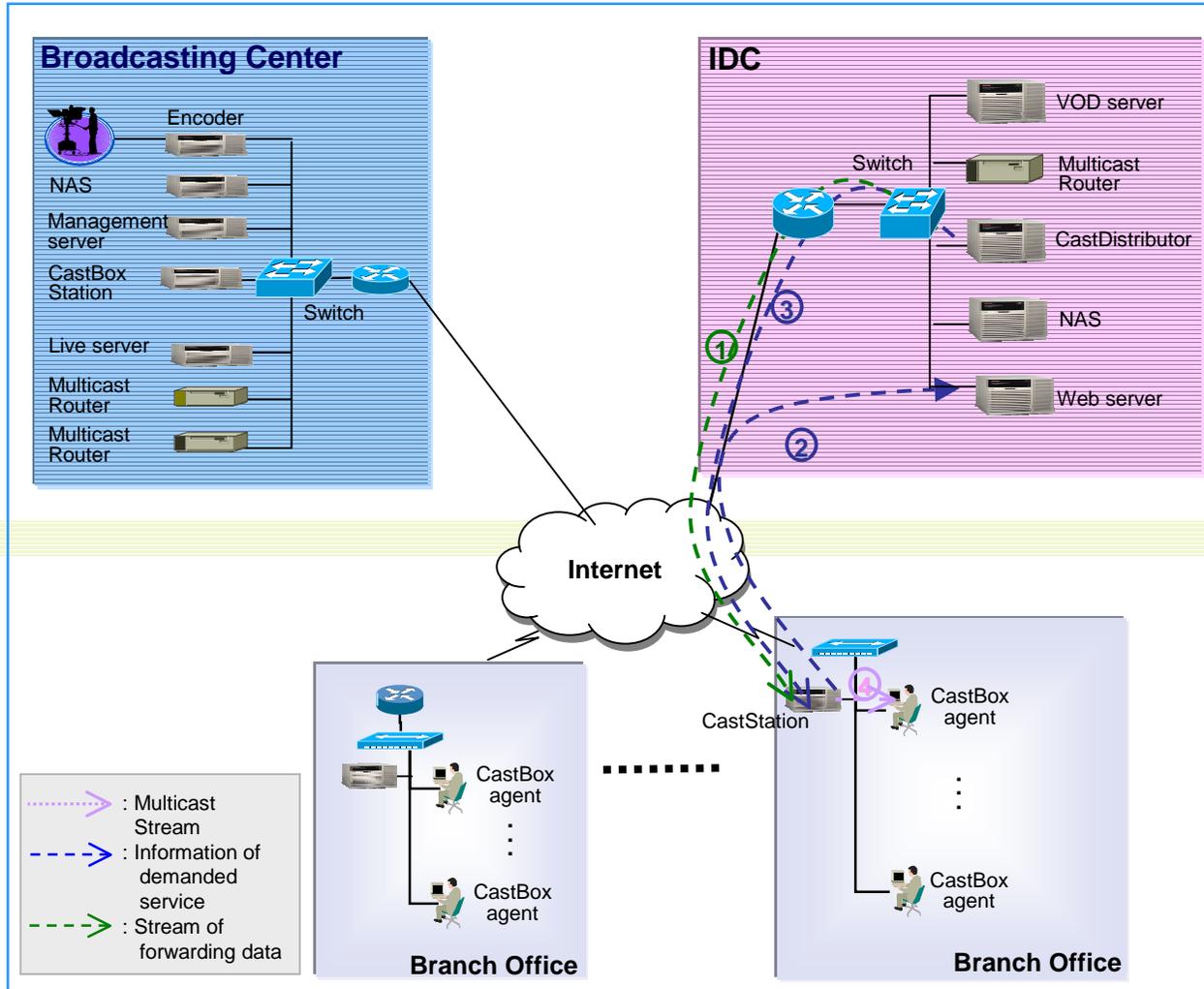
□ Channel Quality: 1 ~ 1.5Mbps

CMS (Contents Management System)

Normal route
Back-up route

● Back-up

A Dual CastDistributor

CDN

CastDistributor (Active-Active)

Error

Retransfer after recovering the network

Error

Branch Office

CastStation

Error

Retransfer after recovering the CastStation

CastBox Agent
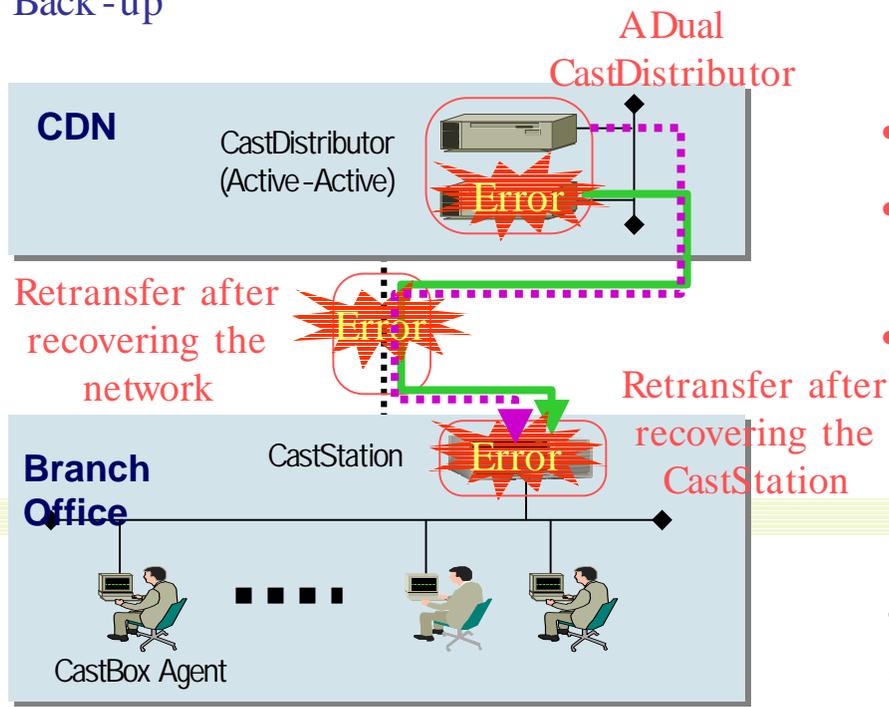
- A error of CastDistributor in CDN

- A error of Internet network in branch office (In a short time)

- Branch Office CastStation Error

• Support a perfect back-up at a dual **CastDistributor in CDN , Support continuous service**

• Complete to transfer a data without a loss for recovering a **Network and CastStation** In a short time

Stop to transfer

Complete to transfer a data continuously
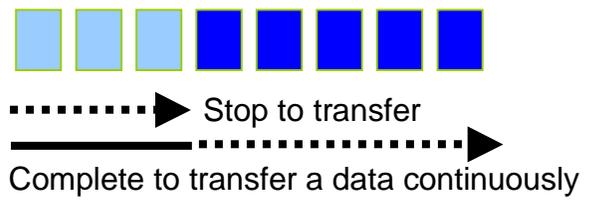
Case Studies with examples

Concluding Remarks

❑ **Convergence of broadcasting and communication for enterprise environment is coming.**

❑ **IPTV services include (live and recorded) broadcasting and VOD.**

❑ **IPTV services should match broadcast quality service to compete with the satellite.**

❑ **IPTV systems should add various technologies to enhance unreliable and best-effort services:**

- Reliable overlay multicast
- Dual systems
- Contents distribution policy