IPTV System for Enterprise

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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 of 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.

Background

- Support stability, convenience, enlargement

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:** Multicast CDN Service  
- Low traffic at middle mile network

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

* CDN: Content Delivery Network
Multicast Solution of Streaming Service
- Support both IP multicast and application-level multicast
- Multicast under a variety of Internet environment
  - xDSL, Cable, B&A, Ethernet, Leased Line
Configuration of Centralized IPTV System

Broadcasting Center
- Encoder
- NAS
- Management Server
- CastBox Station
- Live server
- Multicast Router
- Multicast Router

IDC
- Switch
- VOD server
- Multicast Router
- NAS
- Web server

Internet
- Lease Line/VPN on xDSL

Branch Office
- CastBox agent
- CastBox agent

Branch Office
- CastBox agent
**Configuration of Distributed IPTV System**

**Broadcasting Center**
- Encoder
- NAS
- Management Server
- CastBox Station
- Live server
- Multicast Router
- Multicast Router

**IDC**
- Switch
- VOD server
- Multicast Router
- CastDistributor
- NAS
- Web server

**Internet**
- Lease Line/VPN on xDSL

**Branch Office**
- CastStation
- CastBox agent

**Branch Office**
- CastBox agent
Live & Recorded Broadcasting

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

Contents Distribution

Register channel

CMS (Contents Management System)
CMS (Contents Management System)

Program Schedule

Program Schedule (VOD)

VOD Broadcast Management

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Program Schedule

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Live Broadcasting

The various channel quality: 300K, 500K, 700K
**Live Broadcasting**

- **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

Broadcasting Center

IDC

Internet

Branch Office

- Encoder
- NAS
- Management server
- CastBox Station
- Live server
- Multicast Router
- Multicast Router
- Switch

- VOD server
- Multicast Router
- CastDistributor
- NAS
- Web server

- Switch

- Channel Quality: 1 ~ 1.5 Mbps

- Multicast Stream
- Information of demanded service
- Stream of forwarding data
Recorded Broadcasting

- Back-up

**Broadcasting Center**
- Live server (Active-Active)
- Multicast Router (Active-Active)

**CDN**
- Multicast Router (Active-Active)

**Branch Office**
- CastStation
- Error

- Support a perfect back-up at the Client PC
- Support a continuous Service

- A error of CastStation in branch office
VOD Service

Channel Quality: 1 ~ 1.5Mbps
CMS (Contents Management System)

- 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
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