

## IPTV

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### Objective

g Use existing infrastructure/technology for

- Access
- Transport
- Video encoding
- Authentication
- Billing

To provide Television services (Live & VoD) to consumers.

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## Access

- g Wireless feasible?
- g xDSL
  - 512kbps, 768kbps etc is inadequate
- g Solution?
  - Fiber to home
  - Fiber to neighborhood
- g Mobility Vs Nomadicity
  - Mobility: Point of attachment changes in-session

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## Transport

- g Efficient way of transporting in IP layer
  - Broadcast TV (bTV)
  - VoD
  - Live-Pause TV or Network PVR
- g bTV natural candidate for Multicast
- g VoD for Unicast
- g Live-pause TV?

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## bTV: Multicast Issues

- g What about lost packets?
  - Retransmission
  - FEC
  - Interpolation
- g Is there such a thing as ‘reliable multicast’?
- g Multicast tree administration?

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## Video Encoding

- g Group of Pictures (GOP)
  - GoP size varies over time
  - Average with variance bounds exists
- g I/P/B frames
  - Transmission sequence : **IBBPBBPBBPBB**
- g CBR Vs VBR
  - CBR is preferred for predictability and efficient network engineering

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**bTV: QoE**

- g Channel surfer experience
  - Load on network
- g Immediate channel change
  - How to overcome wait for I-Frame?
    - Smaller GoP encoding
    - Start from previous I-Frame
      - Catchup?
    - Create I-frame on request
- g How network knows I-frame carrying IP packet?

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**VoD**

- g Buy now, watch anytime in next 30 days
- g Trick mode operations
  - Pause/FF/Rew
- g Content theft prevention
  - DRM system on top of every content flow

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## Authentication

- g Identity levels
  - Household
  - Individual
  - Avatar
- g How to use existing AAA infrastructure?
  - Limitations
- g 802.1X, SIM card, PKI certificate...

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## Billing

- g Online billing
  - Non-IPTV services
- g Offline billing
  - Traditional billing

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Future IS/IT

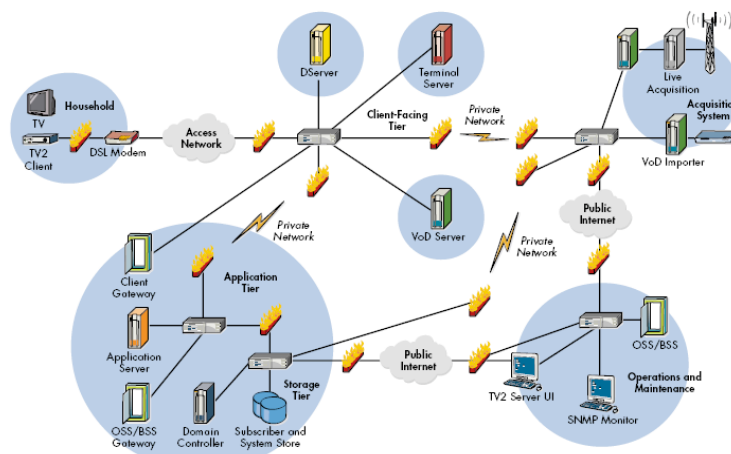
IP address is associated with viewer.  
Leverage it for unique services

- g Websurfing/shopping
- g Targeted Advertisements
- g Interactive TV
- g Blended services
  - Caller ID on TV
  - E-mail alerts



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MSTV Architecture



[http://www1.alcatel-lucent.com/com/en/appcontent/opgss/IPTV\\_sb\\_tcm228-693051635.pdf](http://www1.alcatel-lucent.com/com/en/appcontent/opgss/IPTV_sb_tcm228-693051635.pdf)

### Cisco IPTV Architecture

