Digital TV in Finland
Are there alternatives?

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Network architecture

- Gigabit core network
- Local Services: LAN-type remote work and learning, IP-communication services, Security services, Electricity management, Community services e.g. intranet, Home networking, Local City Portal
- District networks: in-house communication
- Access-switch
- Buildings
- Access-switch
- Internet/ISP
- Corporations

Evolution of Access Speeds

- Hybrid Fibre/Copper
- Pure Fibre
- FTTH
- Enhanced Copper
- FTTx + VDSL
- ADSL
- ISDN
- Voiceband Modem
ADSL Technology

- Uses existing twisted-pair telephone lines to transport high-bandwidth data
- Point-to-point connection between the central office and customer site
  - Needs both central office (DSLAM) and customer site (modem) equipment
- Asymmetric: max 6 Mbps downstream, 640 Kbps upstream

IP Multicast
IP Multicast

- Traffic is sent to a class D address, which identifies the multicast group
- IGMP (RFC 1112) is used to dynamically register individual hosts in a multicast group
- Hosts identify group memberships by sending IGMP messages, and traffic is sent to all members of that multicast group
- Under IGMP, routers listen to IGMP messages and periodically send out queries to discover which groups are active or inactive on particular LANs
- Routers communicate with each other by using one or more protocols (PIM, DVMRP, MOSPF) to build multicast routes for each group

The IP Television Concept

- DSL Modem
- Subscriber Access network
- DSLAM
- Ethernet
- Digital Feed (MPTS)
- Live EPG cache
- VOD
- PPV
- MPEG-2 IP Encoder
- Analog Feed
- IP Backbone
- Program Distributor
- 8PSK/COFDM demodulation
- All program descrambling
- MPTS to SPTS splitting
- IP encapsulation
- Live EPG cache
- VOD
- PPV
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The IP Television Concept: A Real Life Example

- Kingston Interactive Television Ltd. is targeting 30,000 homes in East Yorkshire, U.K.
- Offers 50 channels in an area with no cable TV coverage.
- Basic package of 13 channels for £10 / month.
- Internet access & e-mail £15 / month (256 Kbps).

WLAN & ADSL in the home

- ADSL modem with built-in WLAN basestation (ex. Nokia MW1122).
- IEEE 802.11b standard 11 Mbps WLAN technology.
- Max. 31 stations.
- Range 30-90 m inside, up to 300 m outside.
Examples of new terminals

- FridgePad
- HIS210
- Bluetooth/WLAN

So what are the problems?

- DSLAMs and, ideally, customer site modems must support IP multicast in order to work effectively
- "Channel surfing" is popular and very quick in analog TV, joining/leaving IGMP groups is slow
- Penetration of ADSL is still low, approx. 1300 customers 6/2000
- A traditional broadcast network is still more cost effective for large publics
- "Internet content is free" - so where does the content come from?