



Digital TV in Finland Are there alternatives?

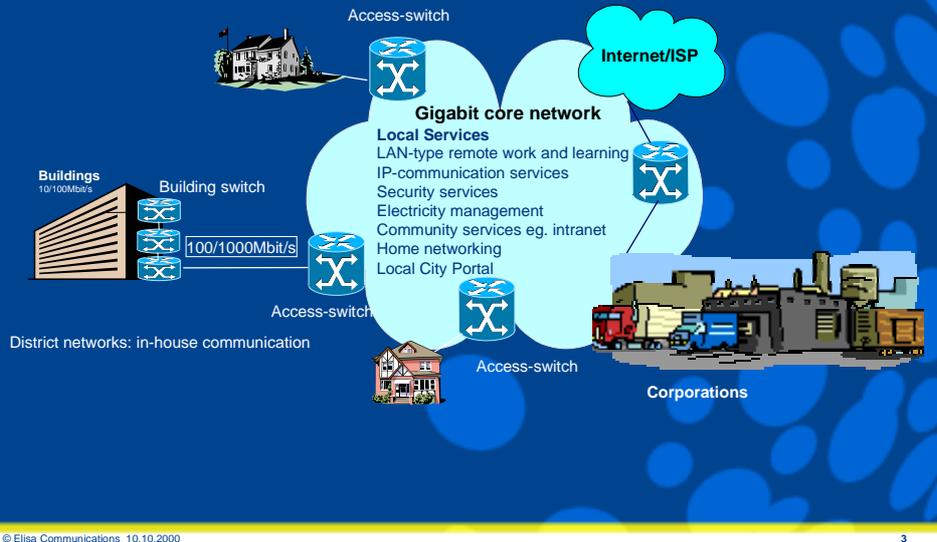
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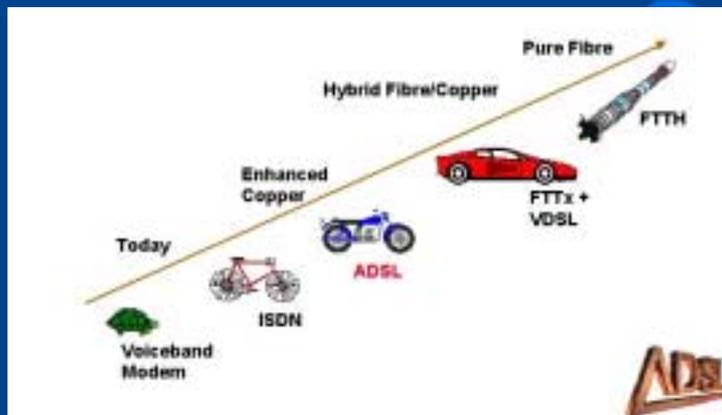
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 - ADSL & IP Multicast
- IP Television
- Home network development
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Network architecture

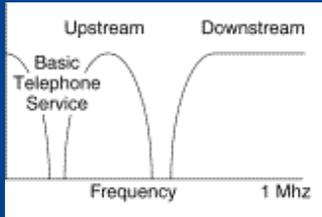


Evolution of Access Speeds

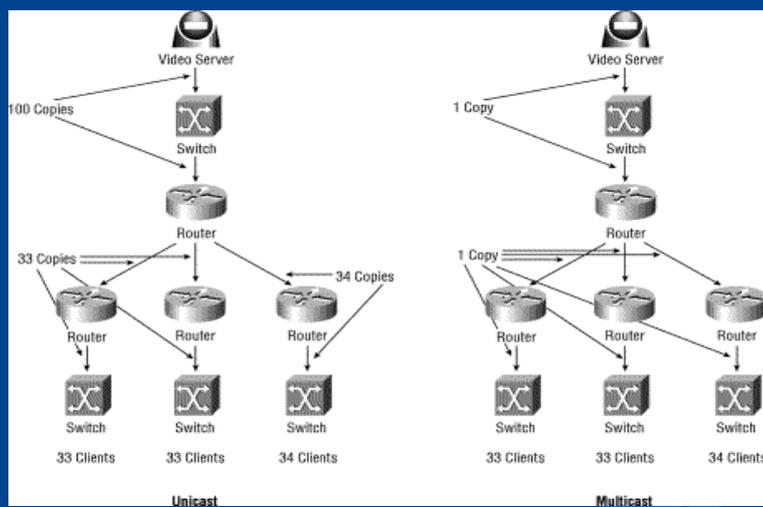


ADSL Technology

- 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



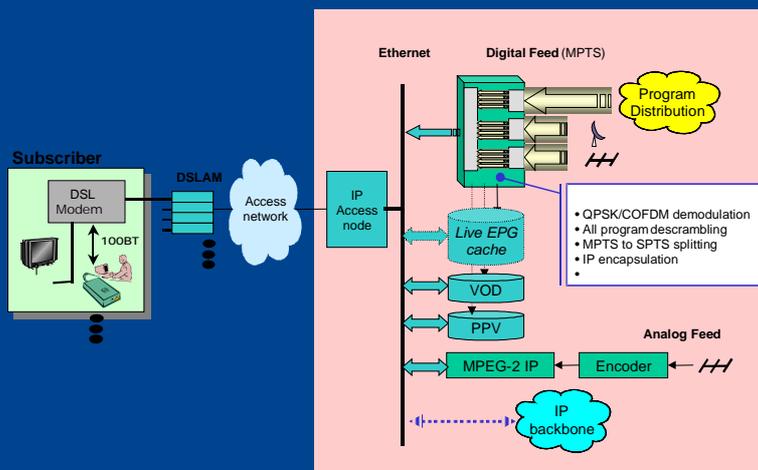
IP Multicast



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



The IP Television Concept: A Real Life Example



- Kingston Interactive Television Ltd. is targetting 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



HS210

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 ?