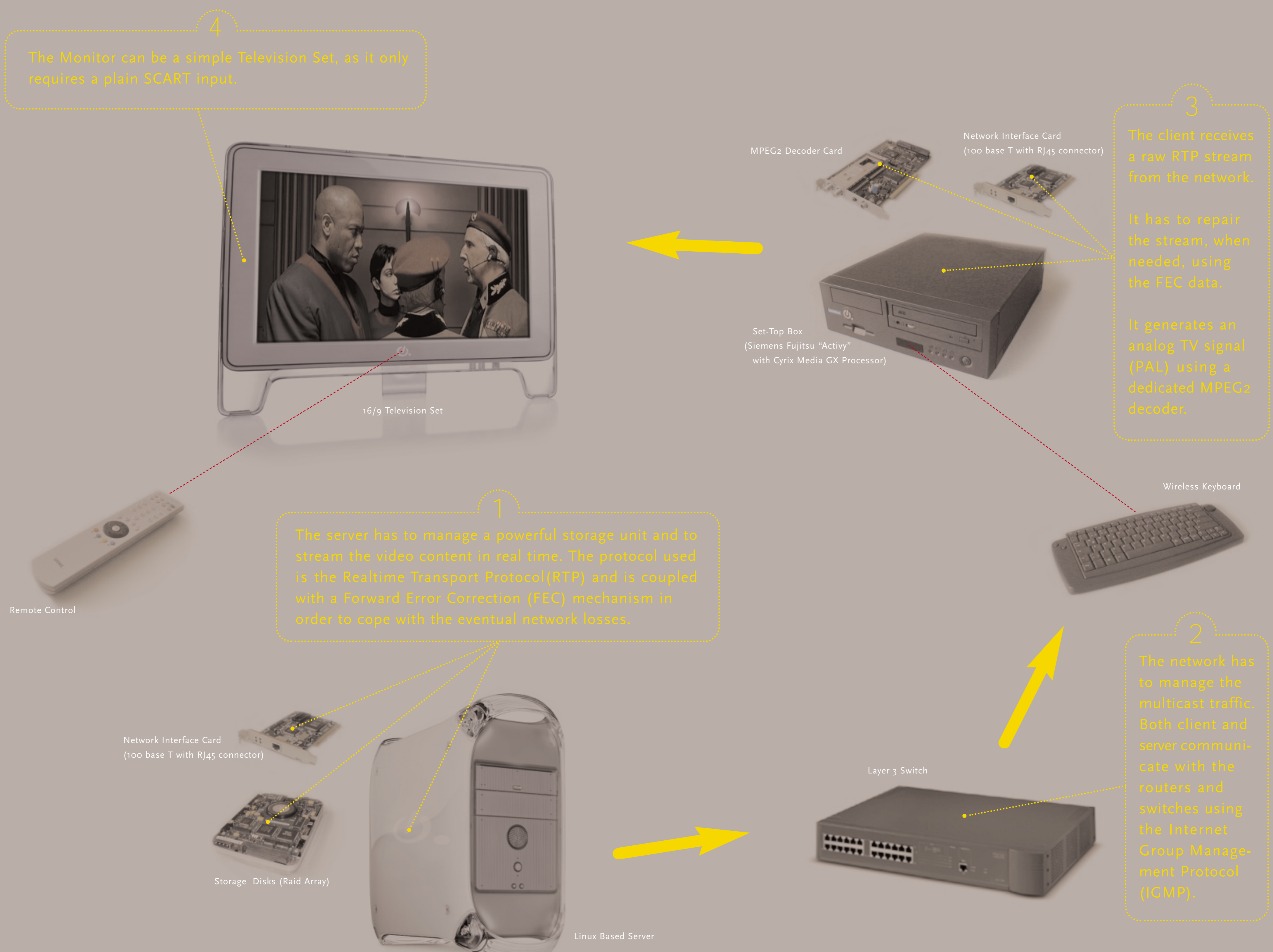# Audio and Video over IP-Multicast

a Tasks

* study the possibility to stream digital television over IP multicast
* implement mechanisms for multicast over unreliable networks

b Constraints

* use RFCs and drafts from the IETF relatives to:

  1. the Realtime Transport Protocol (RTP) and 2. Forward Error Correction (FEC)
* use MPEG2 coding from ISO/IEC

4
The Monitor can be a simple Television Set, as it only requires a plain SCART input.

3
The client receives a raw RTP stream from the network.

It has to repair the stream, when needed, using the FEC data.

It generates an analog TV signal (PAL) using a dedicated MPEG2 decoder.

MPEG2 Decoder Card

Network Interface Card
(100 base T with RJ45 connector)

Set-Top Box
(Siemens Fujitsu "Activy"
with Cyrix Media GX Processor)

16/9 Television Set

Wireless Keyboard

Remote Control

1
The server has to manage a powerful storage unit and to stream the video content in real time. The protocol used is the Realtime Transport Protocol(RTP) and is coupled with a Forward Error Correction (FEC) mechanism in order to cope with the eventual network losses.

2
The network has to manage the multicast traffic. Both client and server communicate with the routers and switches using the Internet Group Management Protocol (IGMP).

Network Interface Card
(100 base T with RJ45 connector)

Storage Disks (Raid Array)

Linux Based Server

Layer 3 Switch

c Results

* the scheme works very well for all MPEG2-Bitrates (up to 10Mbit/sec)
* the FEC implementation allows to stream with low Quality of Service (QoS) requirements
* the use of the Linux operating system makes both client and server cheaper