Multimedia Systems

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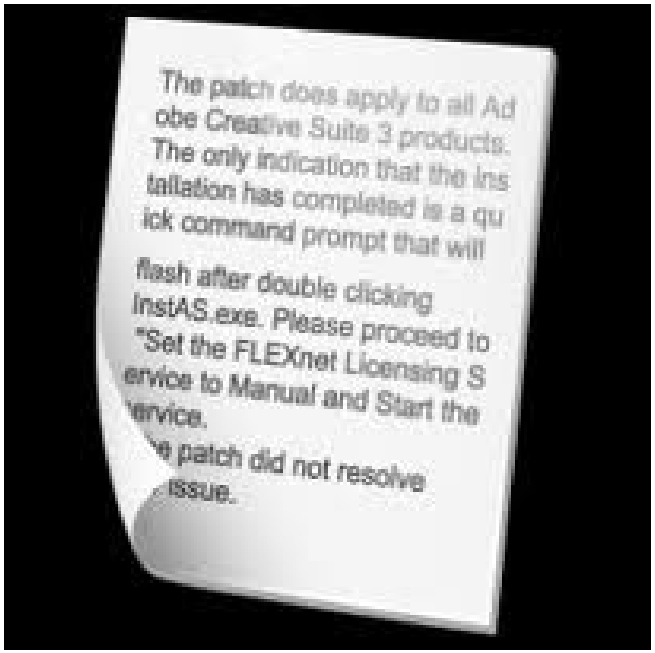
CS4185 Multimedia Technologies and Applications

Multimedia

Traditional contents typically contain only a single media. If it is a text file, then we only have text in the file.



If it is an audio file, then it contains only audio.

or image:

or video …. or animation:

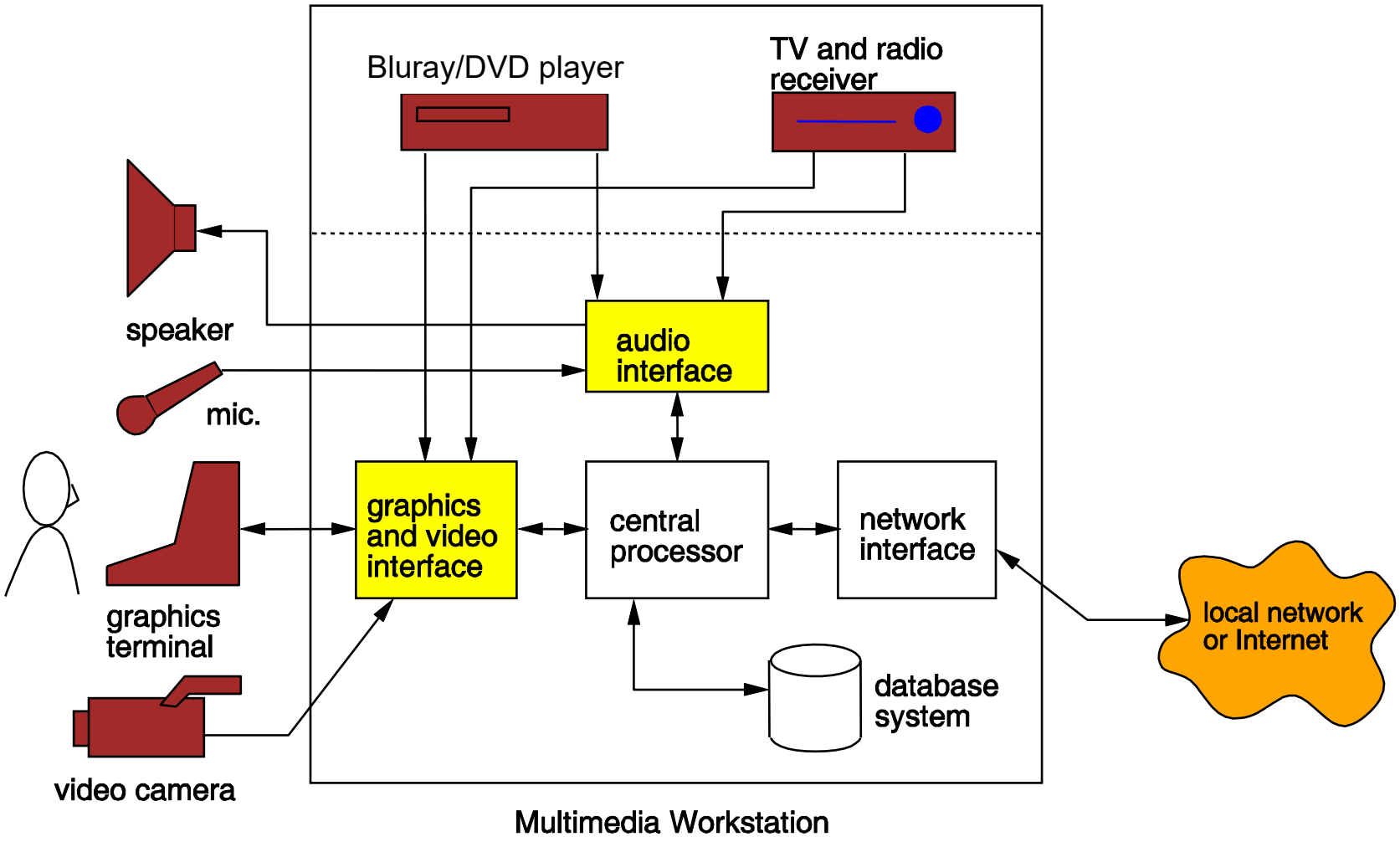
Multimedia refers to content that contains more than one media of information. For example, a single webpage may contain text, images, videos as well as animations. All these information can be integrated and made available on a single display environment.

Multimedia Systems

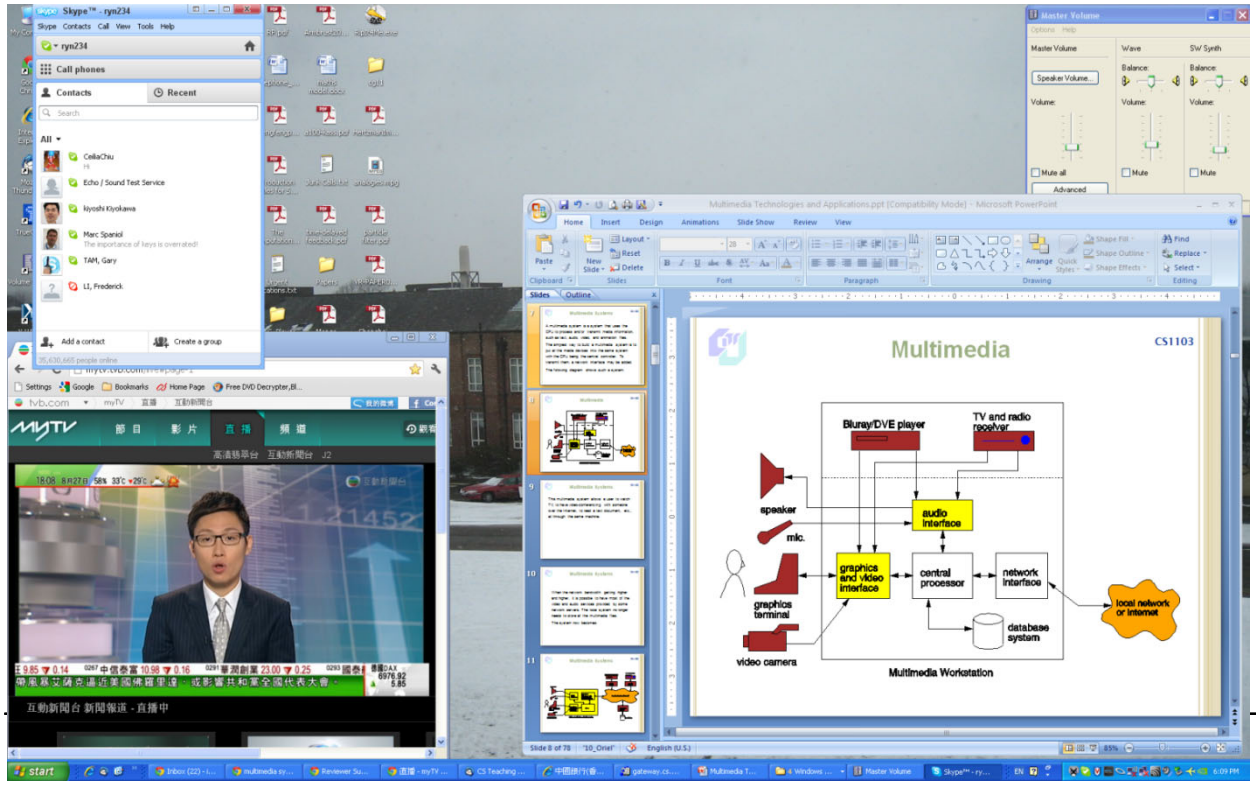
A multimedia system is a system that uses the CPU to process and/or transmit media information, including text, audio, video, and animation files.

The simplest way to build a multimedia system is to put all the media devices into one system with the CPU being the central controller. To transmit these information, a network interface may be added.

The following diagram shows such a system:


Bluray/DVD player
TV and radio receiver
speaker
audio interface
mic.
graphics and video interface
central processor
network interface
local network or Internet
graphics terminal
database system
video camera
Multimedia Workstation

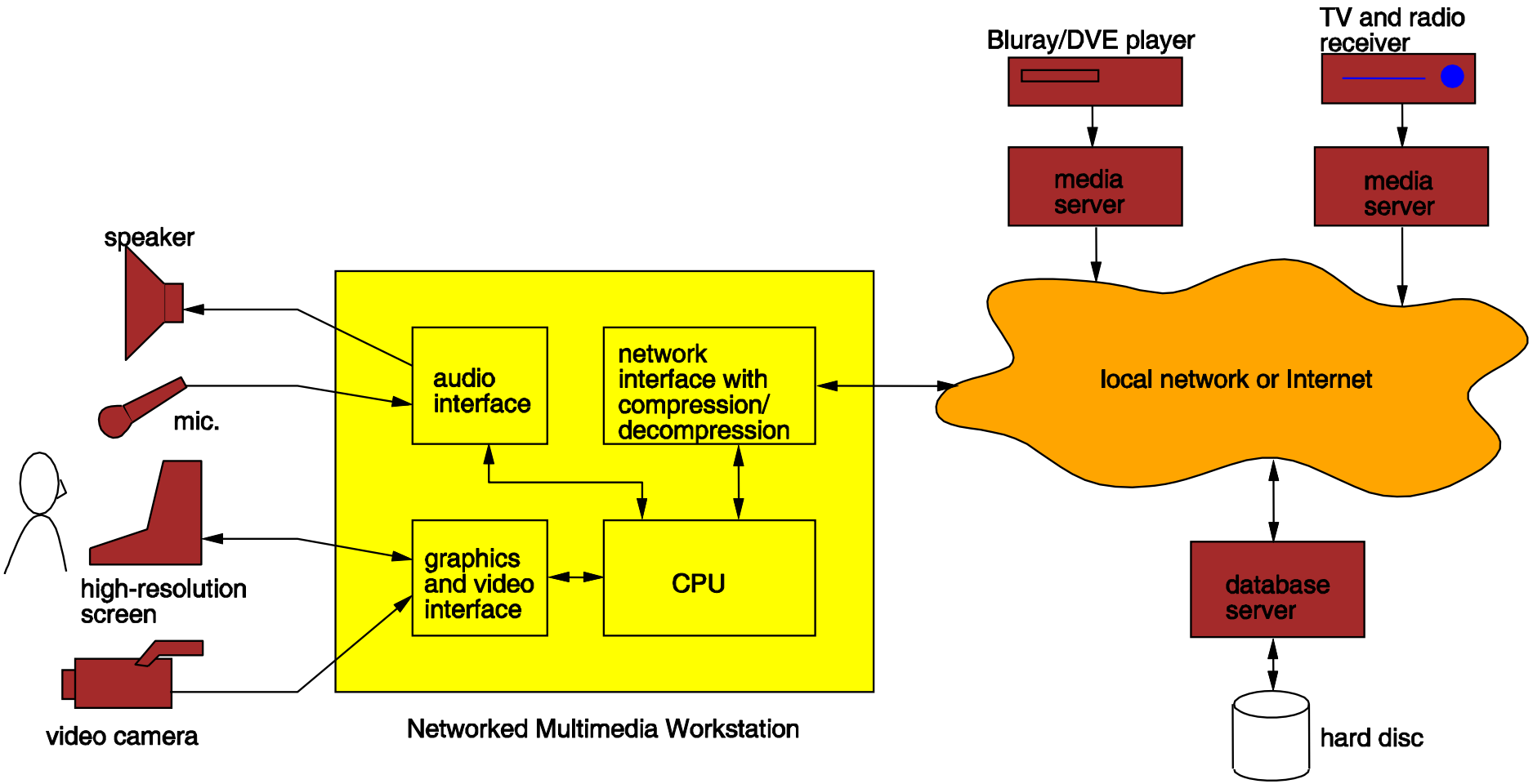
Such a multimedia system allows the user to watch TV, to have video-conferencing with someone over the Internet, to read a text document, etc., all on the display screen.



Multimedia files are typically large in size. To save storage space, compression algorithms are developed to reduce the size of multimedia data.

As the network bandwidth gets higher and higher, it is now possible to obtain videos and audios on demand from some network servers. The multimedia system no longer needs to store all the multimedia information or files locally.

The system now becomes:


Bluray/DVE player
TV and radio receiver
media server
media server
speaker
mic.
high-resolution screen
video camera
audio interface
network interface with compression/ decompression
graphics and video interface
CPU
local network or Internet
database server
hard disc
Networked Multimedia Workstation

- In a networked environment, some servers may provide multimedia services, so that any computers connected to the network can access these services.
- In such an environment, a multimedia computer only needs to be equipped with a video/graphics interface to display/capture real-time images/videos/graphics and an audio interface for audio input and output.
- We may also have large networked database servers to provide various information services.

- However, as the size and variety of multimedia information grow, we have problems of finding suitable information from large multimedia databases or from the Internet.
- We need some efficient media retrieval techniques to retrieve the desired information.
- A lot of research is being conducted to address this problem. Many solutions are developed for retrieving text / image / video files.

- In this course, we will focus on the handling and compression of multimedia data.
- We will also briefly talk about multimedia retrieval. Our course project will focus on image retrieval, which is one area of media retrieval. Other areas include audio retrieval and video retrieval.
- To reduce your study effort, our examination will not cover multimedia retrieval.