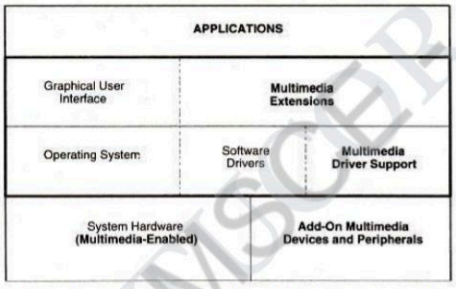
components of a video clip.

3.3 MULTIMEDIA SYSTEMS ARCHITECTURE

Multimedia encompasses a large variety of technologies and integration of multiple architectures interacting in real time. All of these multimedia capabilities must integrate with the standard user interfaces such as Microsoft Windows.

The following figure describes the architecture of a multimedia workstation environment. In this diagram.



The right side shows the new architectural entities required for supporting multimedia applications.

For each special devices such as scanners, video cameras, VCRs and sound equipment-, a software device driver is need to provide the interface from an application to the device. The GUI require control extensions to support applications such as full motion video

High Resolution Graphics Display

The various graphics standards such as MCA, GGA and XGA have demonstrated the increasing demands for higher resolutions for GUIs.

Combined graphics and imaging applications require functionality at three levels. They are provided by three classes of single-monitor architecture.

(i) VGA mixing: In VGA mixing, the image acquisition memory serves as the display source memory, thereby fixing its position and size on screen:

(ii) VGA mixing with scaling: Use of scalar ICs allows sizing and positioning of images in pre-defined windows.

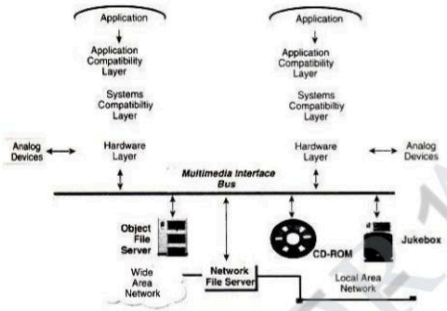
Resizing the window causes the things to be retrieved again.

(iii) Dual-buffered VGA/Mixing/Scaling: Double buffer schemes maintain the original images in a decompression buffer and the resized image in a display buffer.

The IMA Architectural Framework

The Interactive Multimedia Association has a task group to define the architectural framework for multimedia to provide interoperability. The task group has C0ncentrated on the desktops and the servers. Desktop focus is to define the interchange formats. This format allows multimedia objects to be displayed on any work station.

The architectural approach taken by IMA is based on defining interfaces to a multimedia interface bus. This bus would be the interface between systems and multimedia sources. It provides streaming I/O service"s, including filters and translators **Figure 3.4** describes the generalized architectural approach



Network Architecture for Multimedia Systems:

Multimedia systems need special networks. Because large volumes of images and video messages are being transmitted.

Asynchronous Transfer Mode technology (A TM) simplifies transfers across LANs and W ANs.

Task based Multi level networking

Higher classes of service require more expensive components in the' workstations as well as in the servers supporting the workstation applications.

Rather than impose this cost on all work stations, an alternate approach is to adjust the class of service to the specific requirement for the user. This approach is to adjust the class of services according to the type of data being handled at a time also.

We call this approach task-based multilevel networking.

High speed server to server Links

Duplication: It is the process of duplicating an object that the user can manipulate. There is no requirement for the duplicated object to remain synchronized with the source (or master) object.
Replication: Replication is defined as the process of maintaining two or more copies of the same object in a network that periodically re-synchronize to provide the user faster and more reliable access to the data Replication is a complex process.

Networking Standards:

The two well-known networking standards are

1. Ethernet
2. token ring.

ATM and FDDI are the two technologies which are going to be discussed in detail.

ATM:

- ATM is a acronym for Asynchronous Transfer Mode. It's topology was originally designed for broadband applications in public networks.
- ATM is a method of multiplexing and relaying (cell-switching) 53 byte cells. (48 bytes of user information and 5 bits of header information).
- It has been increasingly used for transferring real time multimedia data in local network at a speed higher than 100Mbits/sec. ANSI has adopted ATM as the cell switching standard.
- **Cell Switching:** It is a form of fast packet switching based on the us of cells. **Cells:** Short, fixed length packets are called cells.
- The ANSI standard for FDDI allows large-distance networking. It can be used as high-performance backbone networks to complement and extend current LANs.
- ATM provides high capacity, low-latency switching fabric for data. It is independent of protocol and distances. ATM effectively manage a mix of data types, including text data, voice, images and full motion video. ATM was proposed as a means of transmitting multimedia applications over asynchronous networks.

FDDI:

- FDDI is an acronym of Fiber Distributed Data Interface. This FDDI network is an excellent candidate to act as the hub in a network configuration, or as a backbone that interconnects different types of LANs.
- FDDI presents a potential for standardization for high speed networks.
- The ANSI (American National Standard Institute) standard for FDDI allows for single-mode fiber supporting up to 40 km between stations.
- It extends the current LAN speed from 100 Mbits/sec to several Gigabits per seconds, and large-distance networking.

Difference between ATM and FDDI

ATM	FDDI II
ATM pushes network speed as high as 622Mbits/sec	FDDI II pushes network speed as high as 100 Mbits /sec
ATM is capable of lower speeds at the workstations.It reduces number of devices protocol translation require for communication between local and wide area network	FDDI II does not allow a user to connect to the network at the spped required by the user, rather it requires the user to be capable of supporting the network speed.

Benefits of Shared media Networks:

- Ease of installation
- Lack of common equipment
- Connectionless operation
-

Difficulties of Shared Media Networks:

- Wiring existing buildings
- Fault isolation

3.4 EVOLVING TECHNOLOGIES FOR MULTIMEDIA SYSTEMS

Multimedia applications use a number of technologies generated for both commercial business application as well as the video game industry.

Let us review some of these technologies in this section.

1.Hypermedia documents

Hypermedia documents are documents which have text, embedded or linked multimedia objects such

Components of a Multimedia System

- Now let us consider the Components (Hardware and Software) required for a multimedia system:
- Capture devices — Video Camera, Video Recorder, Audio Microphone, Keyboards, mice, graphics tablets.
- Storage Devices — Hard disks, CD-ROMs, DVD-ROM, etc..
- Communication Networks — Local Networks, Intranets, Internet, Multimedia or other special high speed networks

Components of a Multimedia System

- Computer Systems — Multimedia Desktop machines, Workstations.
- Display Devices, quality speakers, HDTV. monitors, Colour printers etc