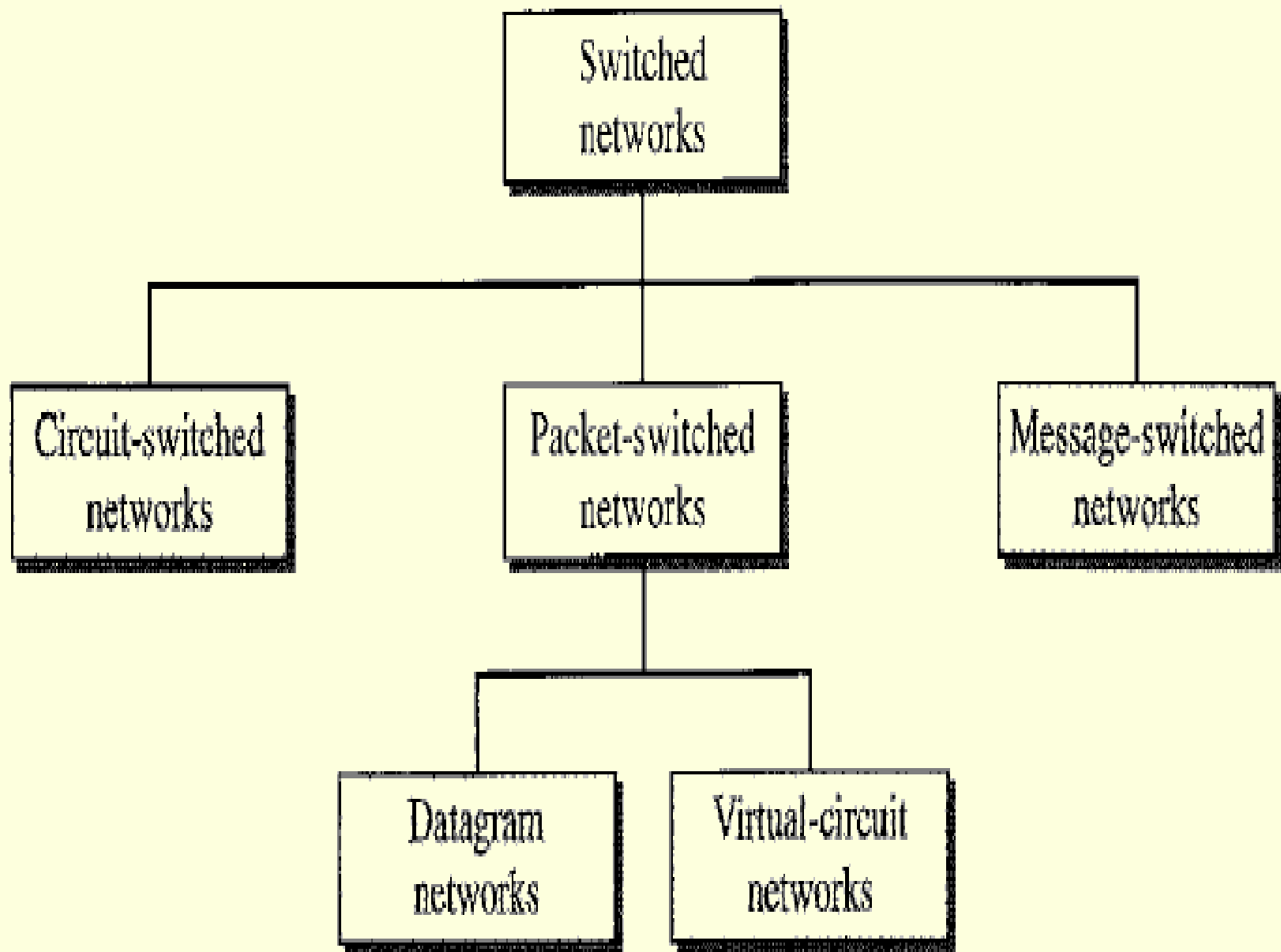


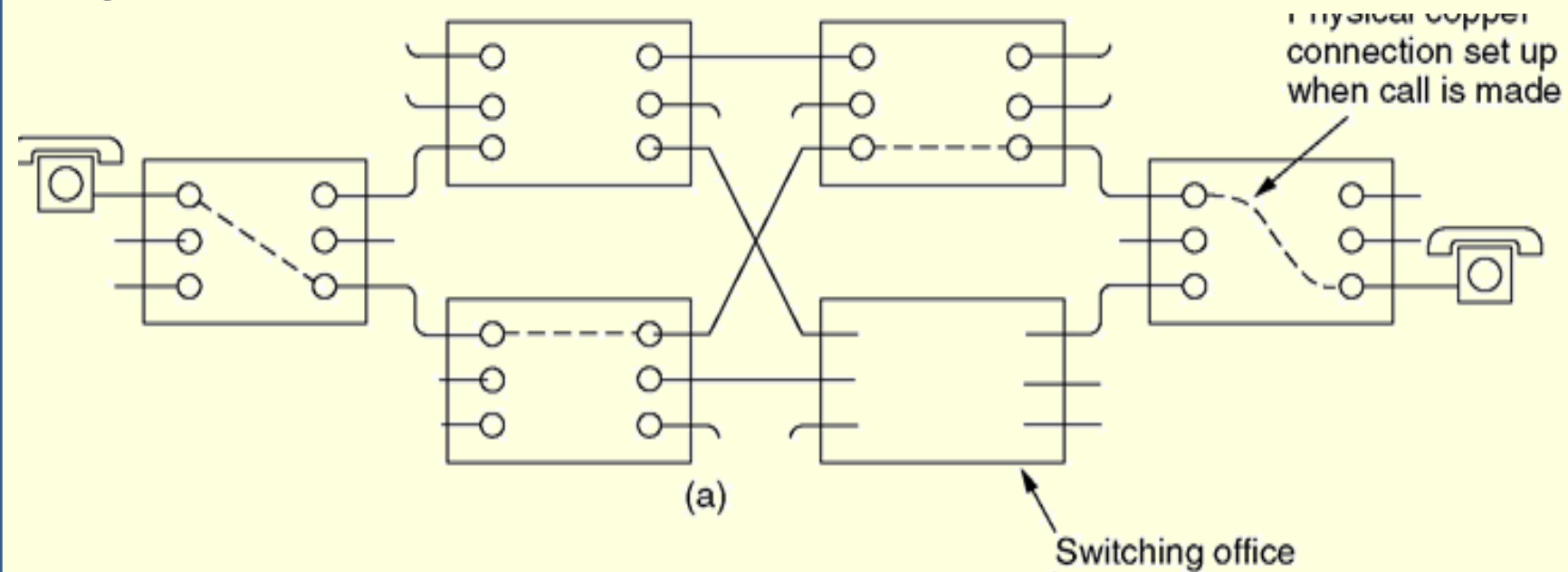
# ***Switching***

Creating temporary connections



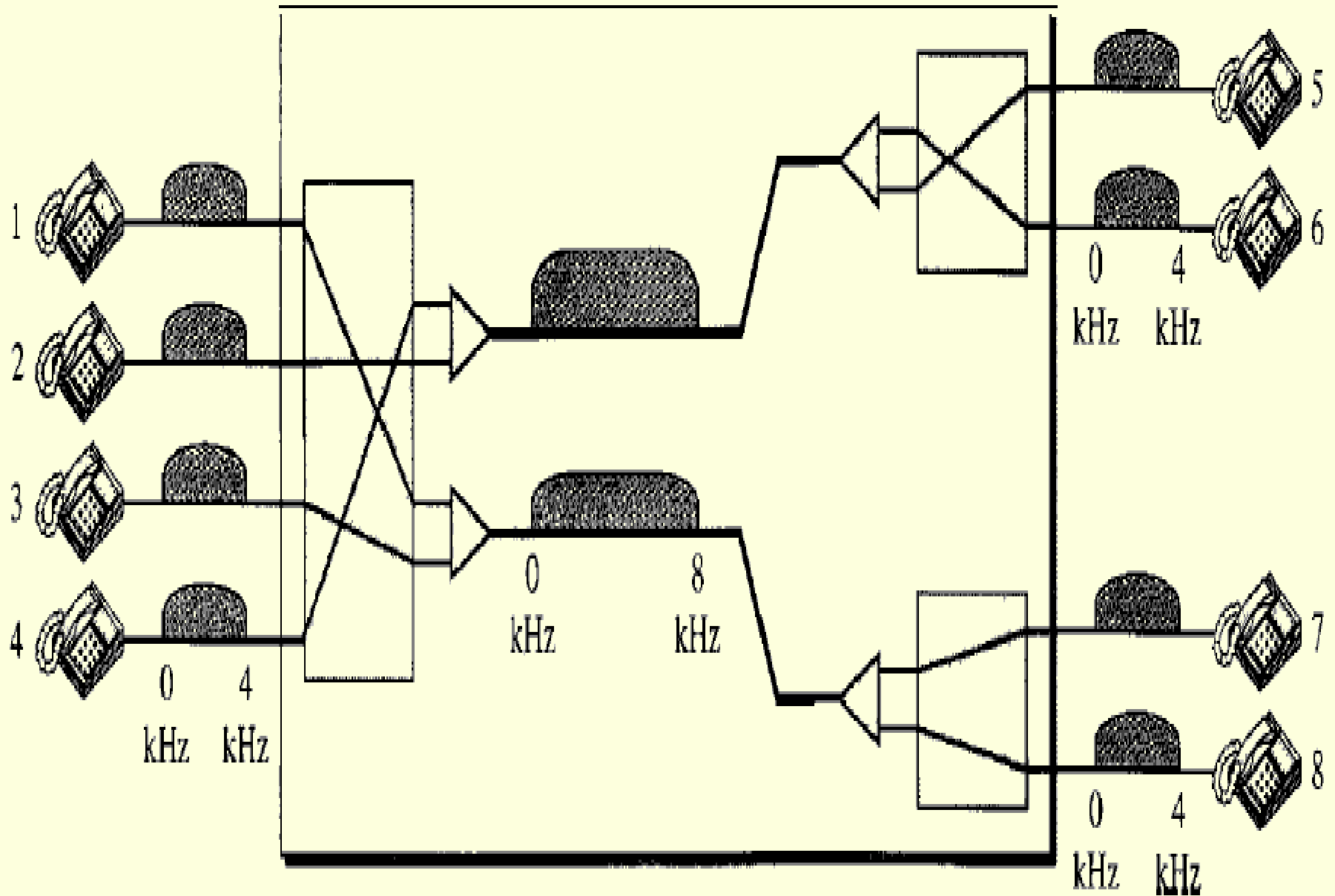
# CIRCUIT-SWITCHED NETWORKS

- Set of switches connected by physical links.
- Dedicated path
- Link divided into  $n$  channels by using FDM or TDM

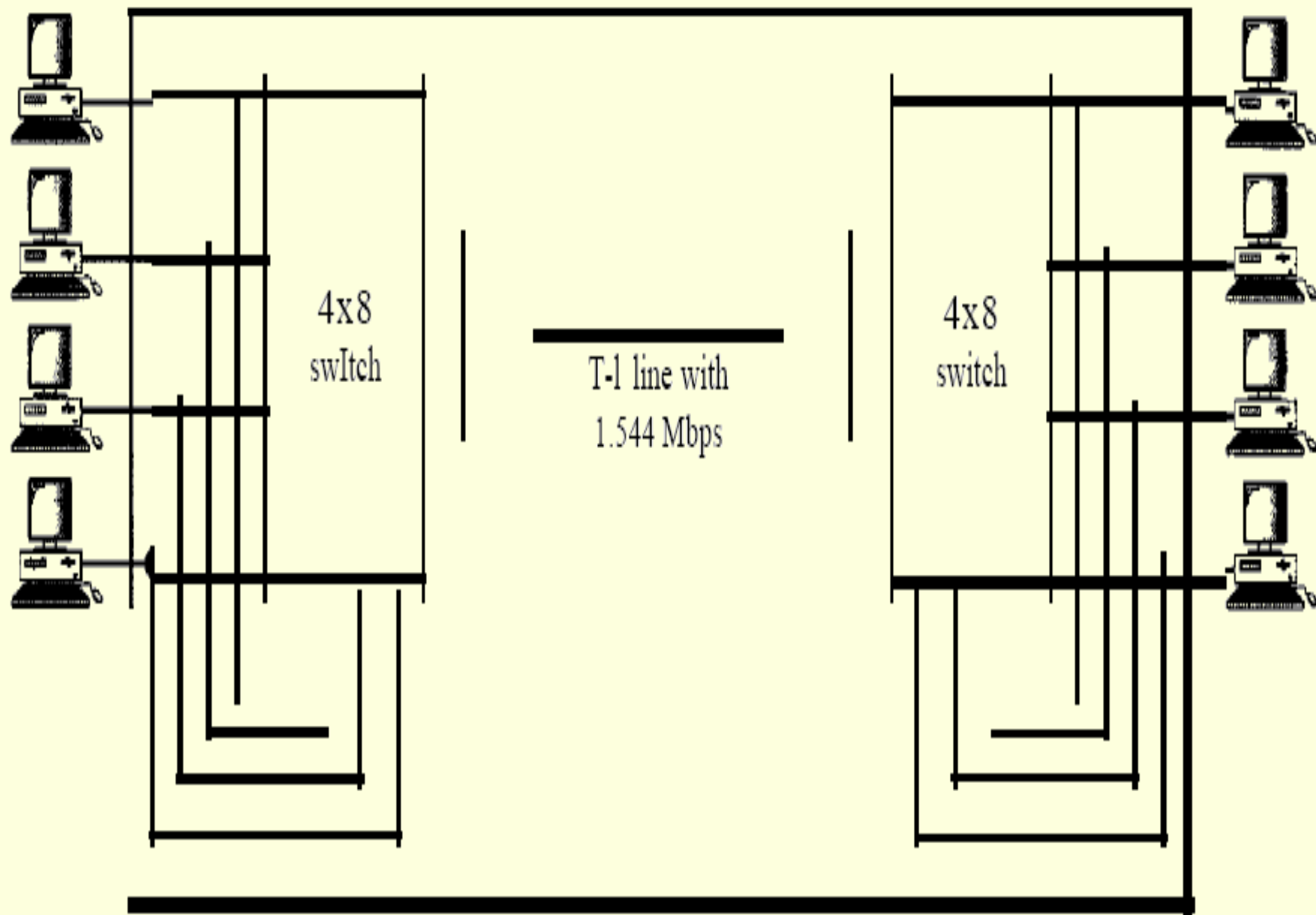


- Circuit switching takes place at the physical layer.
- Switch buffers , switch processing time, and switch input/output ports
- Data transferred not packetized
- No addressing involved during data transfer.

# Circuit-switched network



# Circuit-switched network



# Three Phases

## 1) Setup Phase

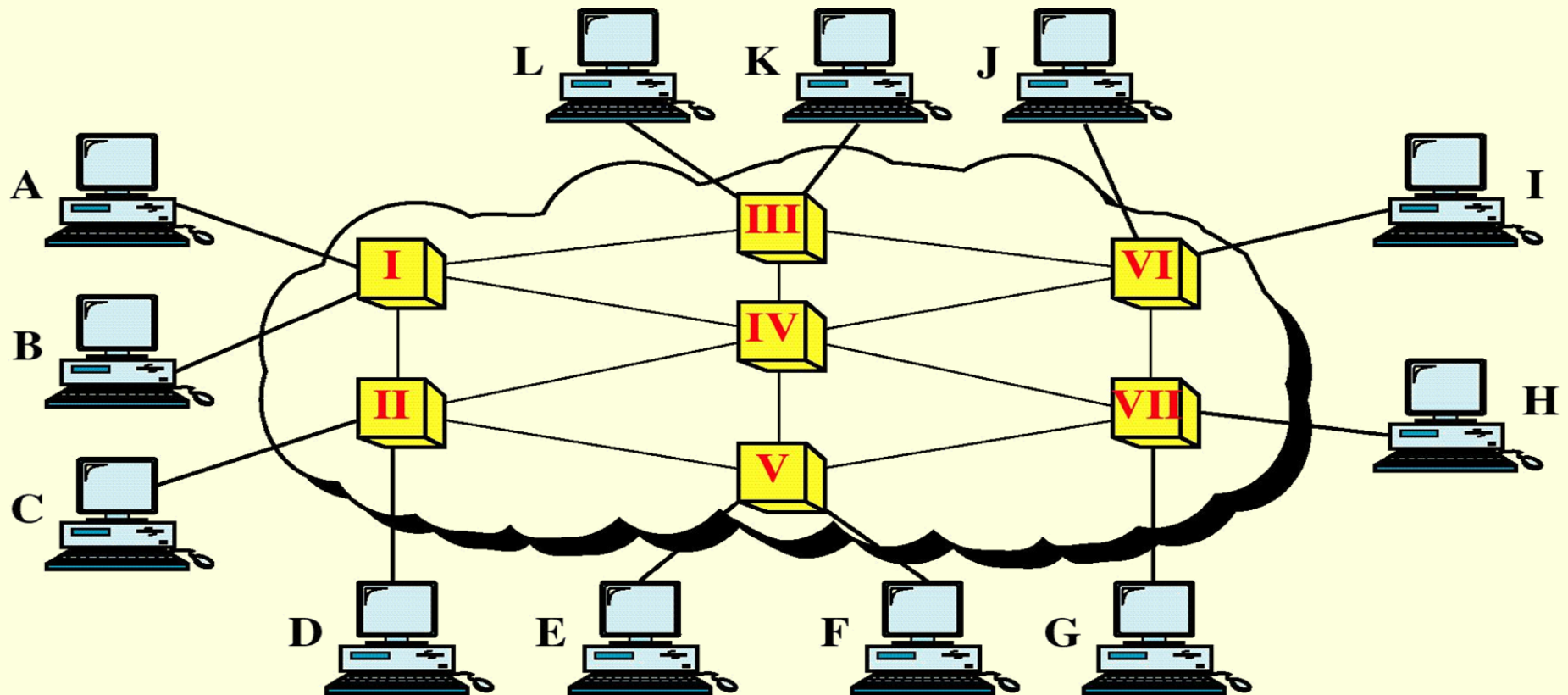
- Dedicated channels between the switches
- Setup request
- An acknowledgment

## 2) Data Transfer Phase

## 3) Teardown Phase

# Efficiency ?

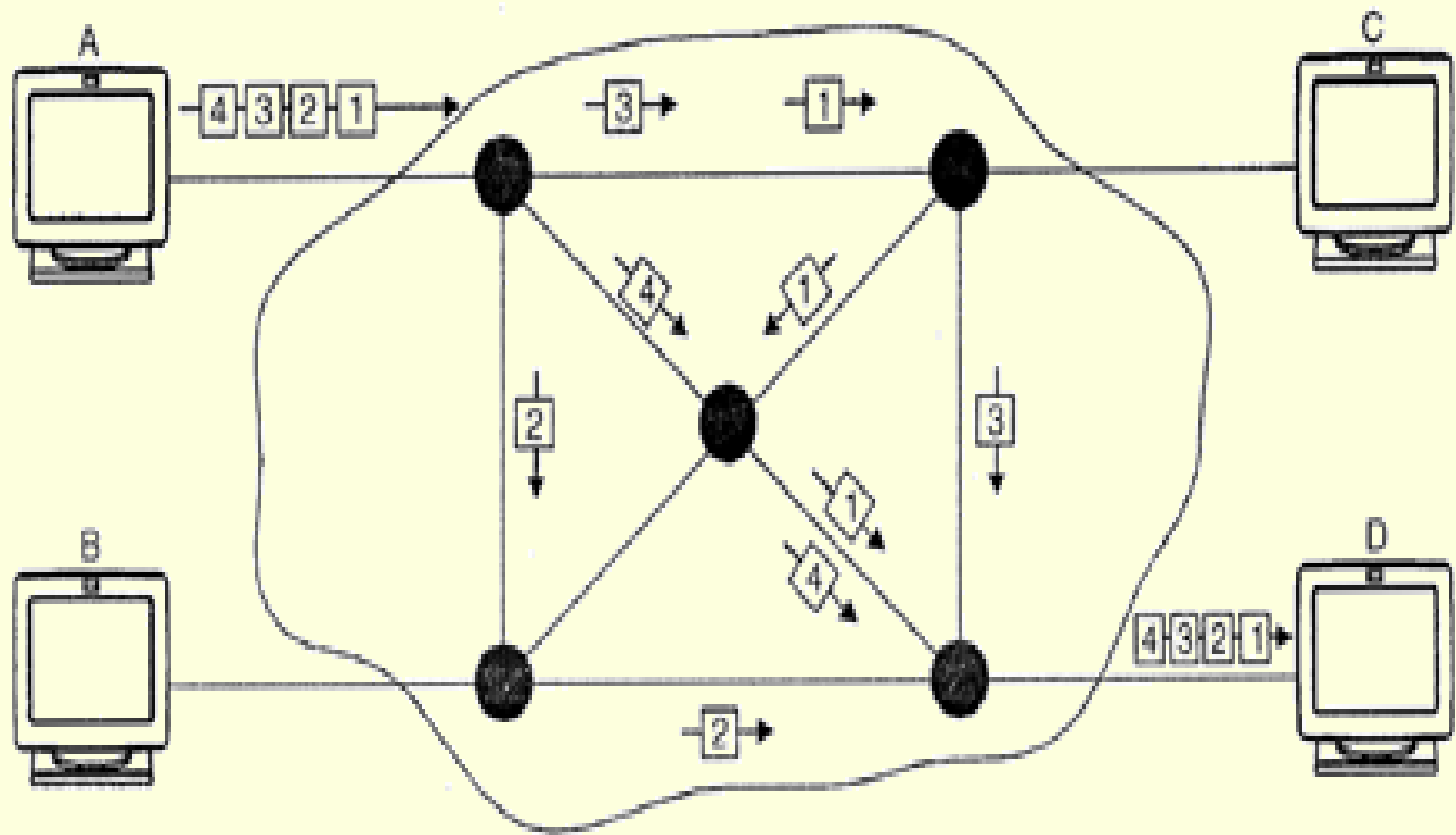
## Delay ?





# **DATAGRAM NETWORKS**

- Divided message into packets
- No resource allocation for a packet.
- Resources are allocated on demand.
- No scheduled processing time
  - ✓ First come first-served
- At the network layer.
- connectionless networks.
- Efficiency ?
- Delay ?
- In the Internet .



Datagram network

Datagram packet switching

# **VIRTUAL-CIRCUIT NETWORKS**

Circuit-switched & a datagram

- Three phases
- Resources can be allocated during the setup phase
- Data are packetized
- All packets follow the same path established
- Normally at data link layer