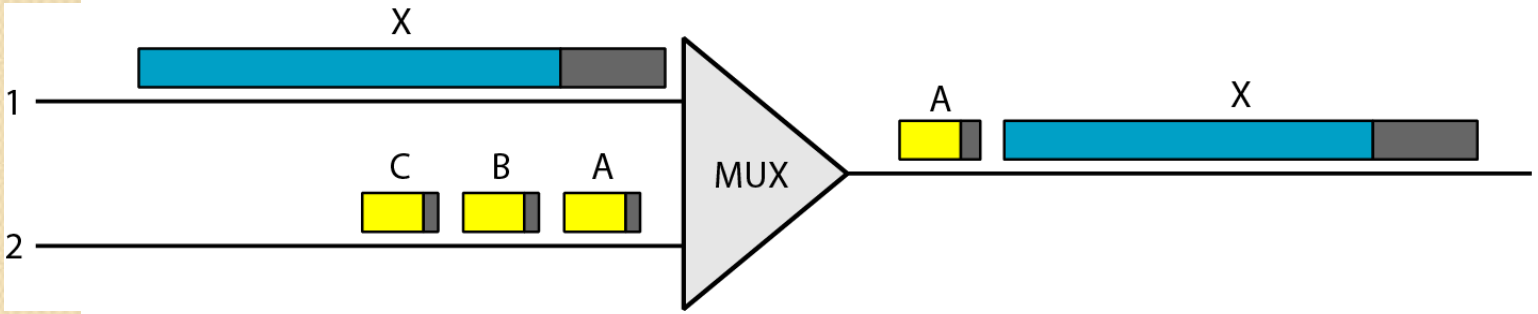
ATM

ATM

Asynchronous Transfer Mode (ATM) is the cell relay protocol designed by the ATM Forum and adopted by the ITU-T.

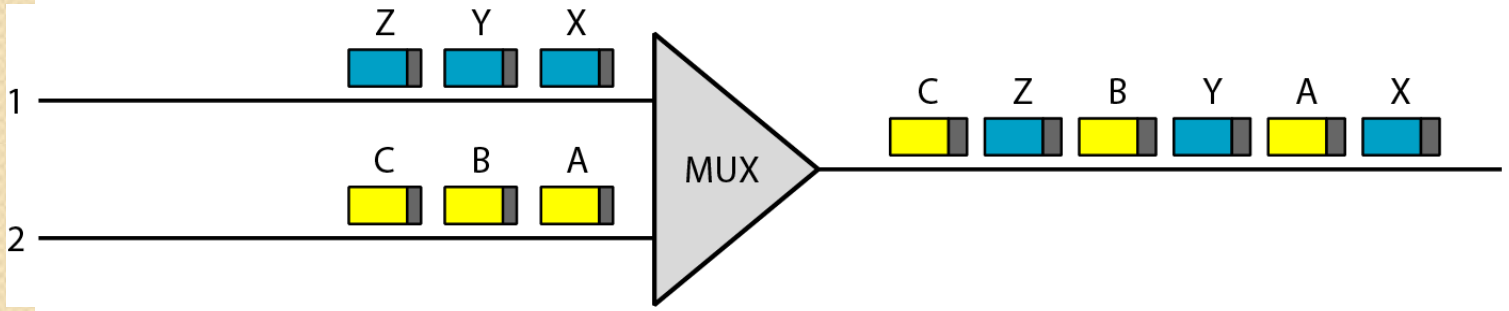
Multiplexing using different frame sizes



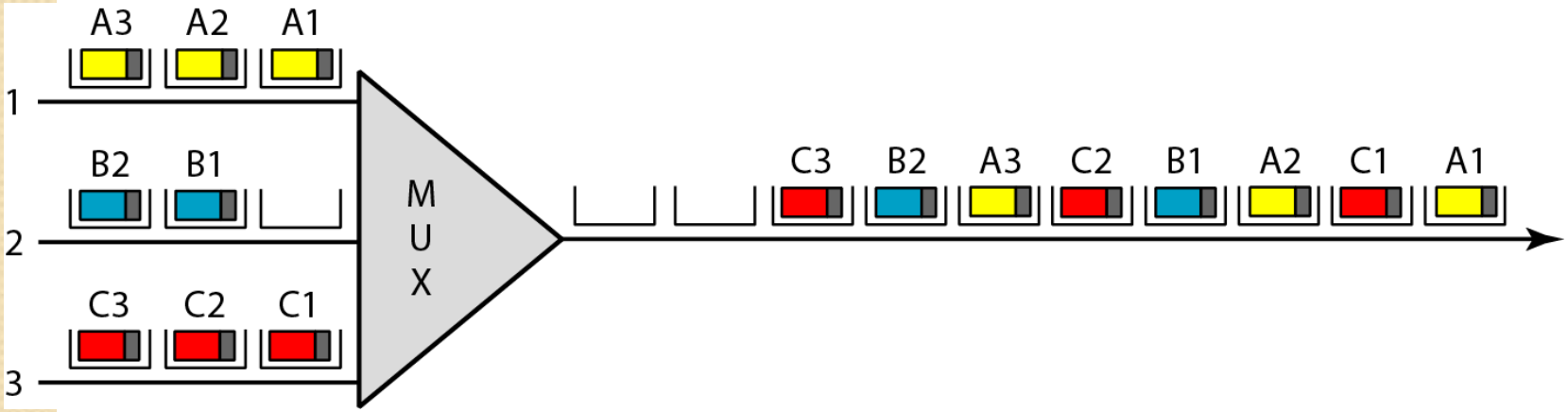
Note

A cell network uses the cell as the basic unit of data exchange.
A cell is defined as a small, fixed-size block of information.

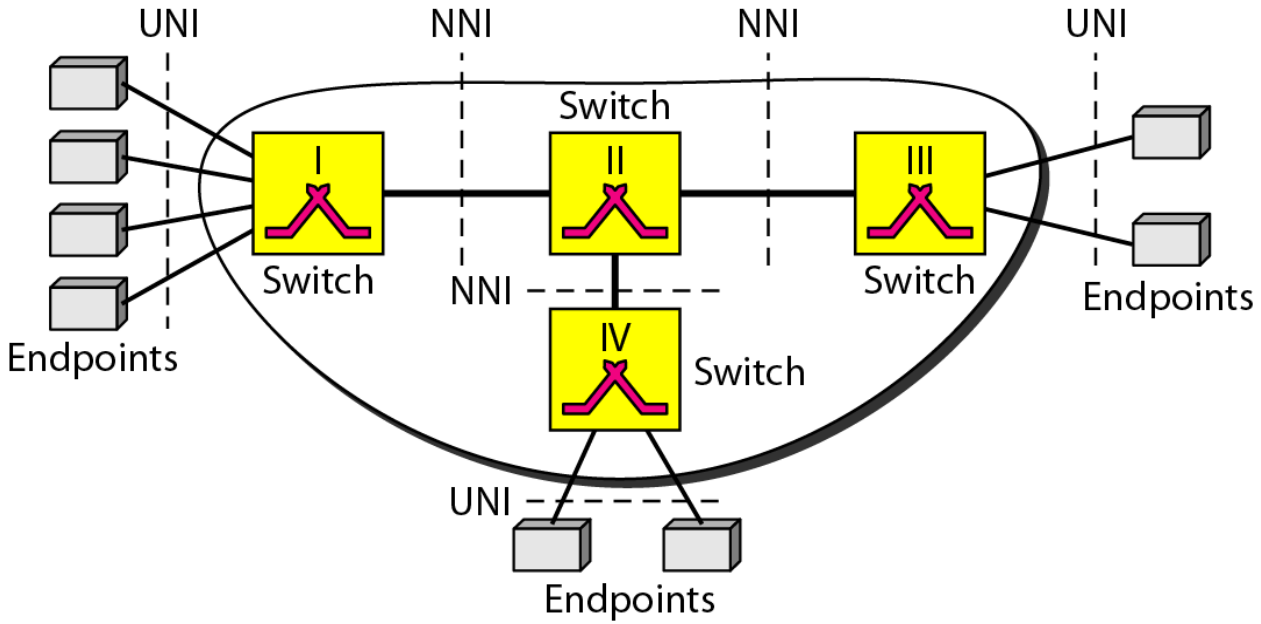
Multiplexing using cells



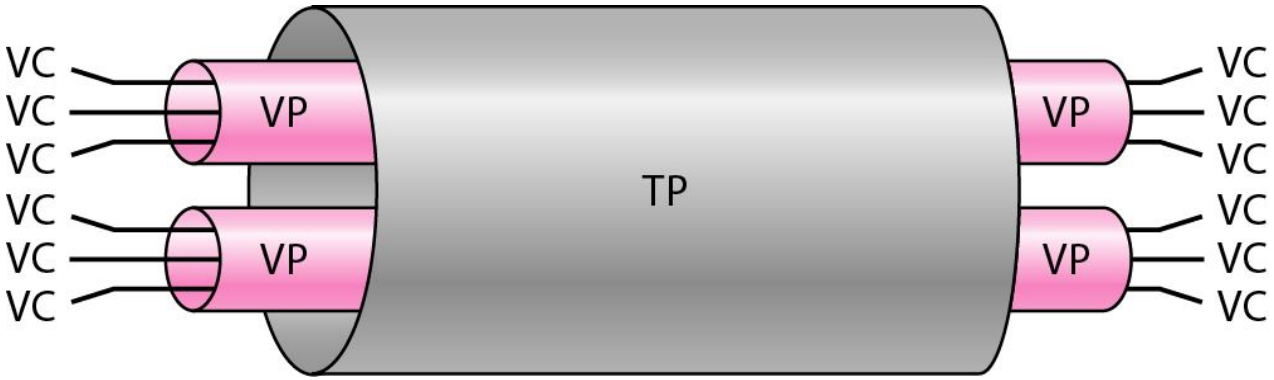
ATM multiplexing



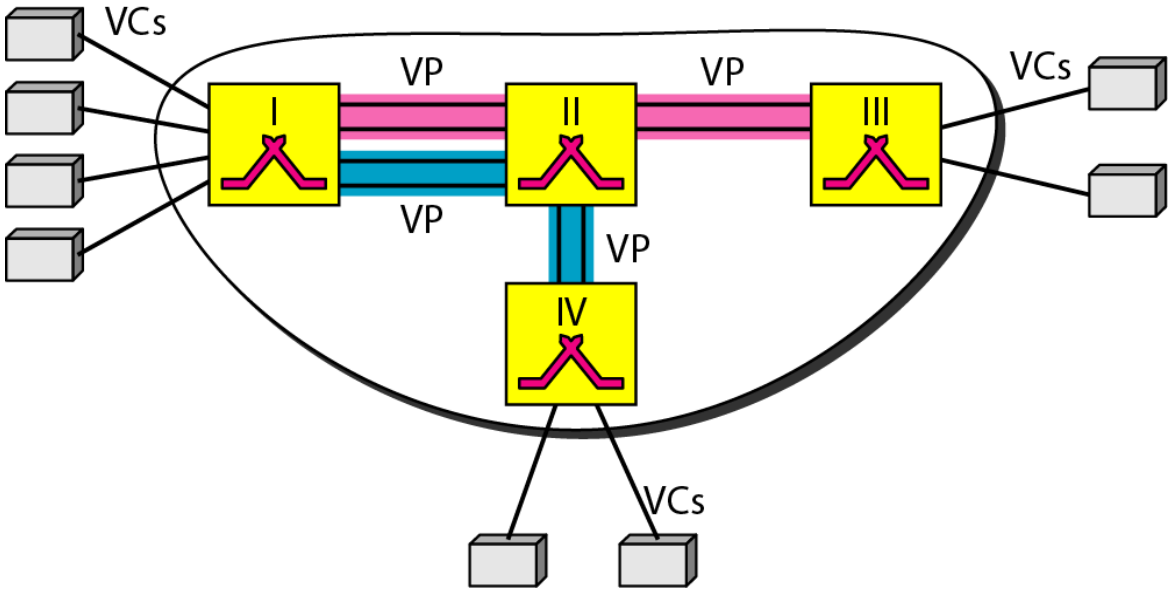
Architecture of an ATM network



TP, VPs, and VCs



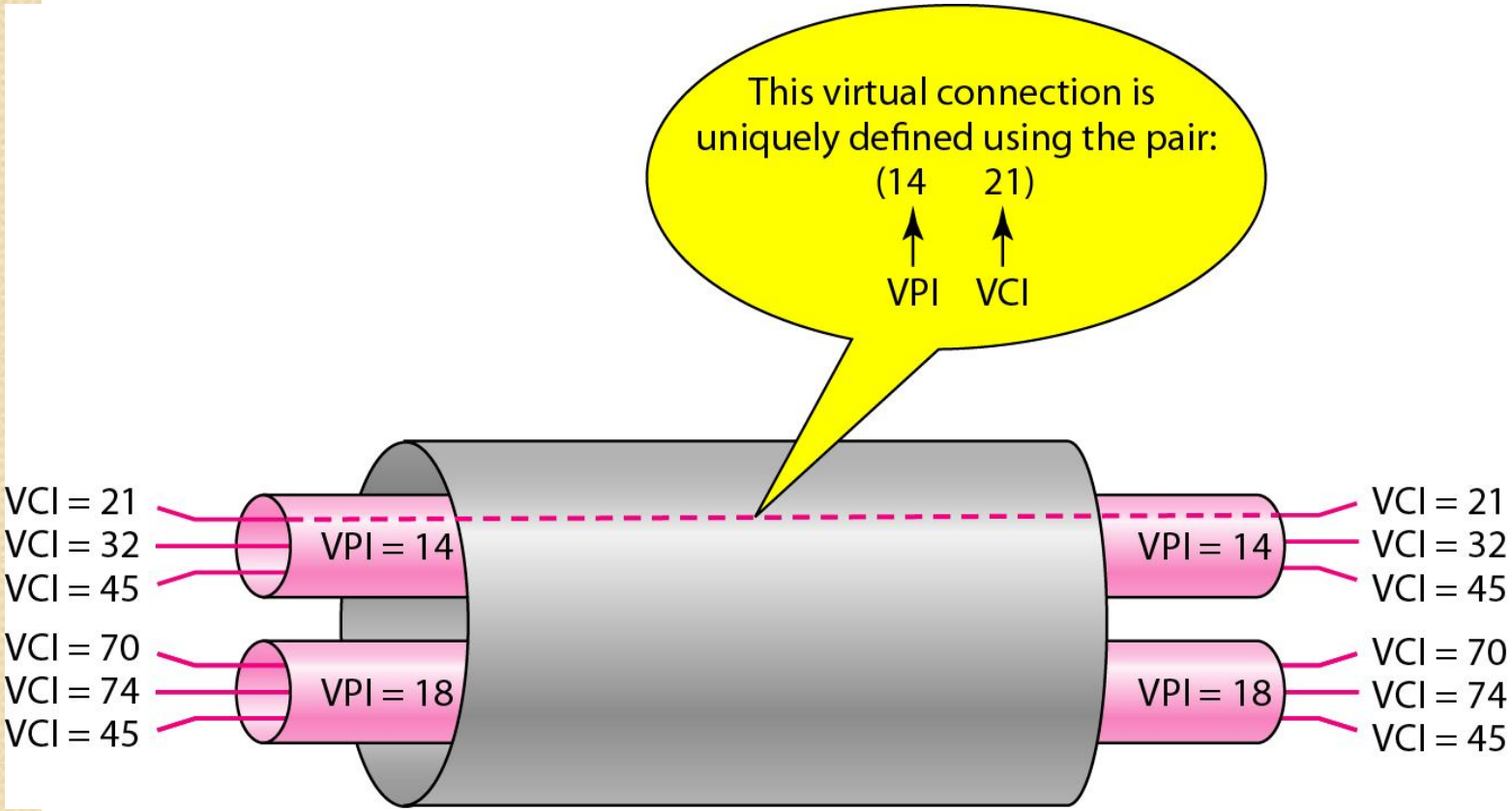
Example of VPs and VCs



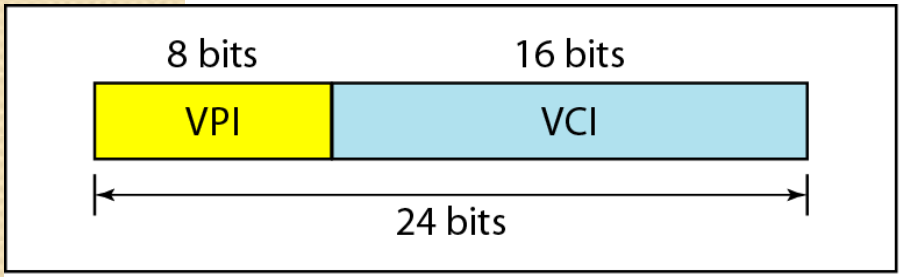
Note

Note that a virtual connection is defined by a pair of numbers:
the VPI and the VCI.

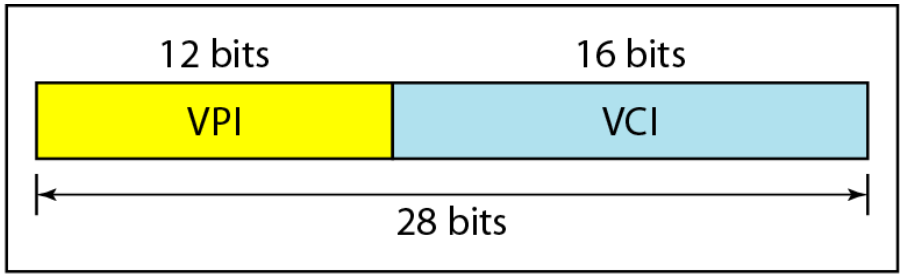
Connection identifiers



Virtual connection identifiers in UNIs and NNIs

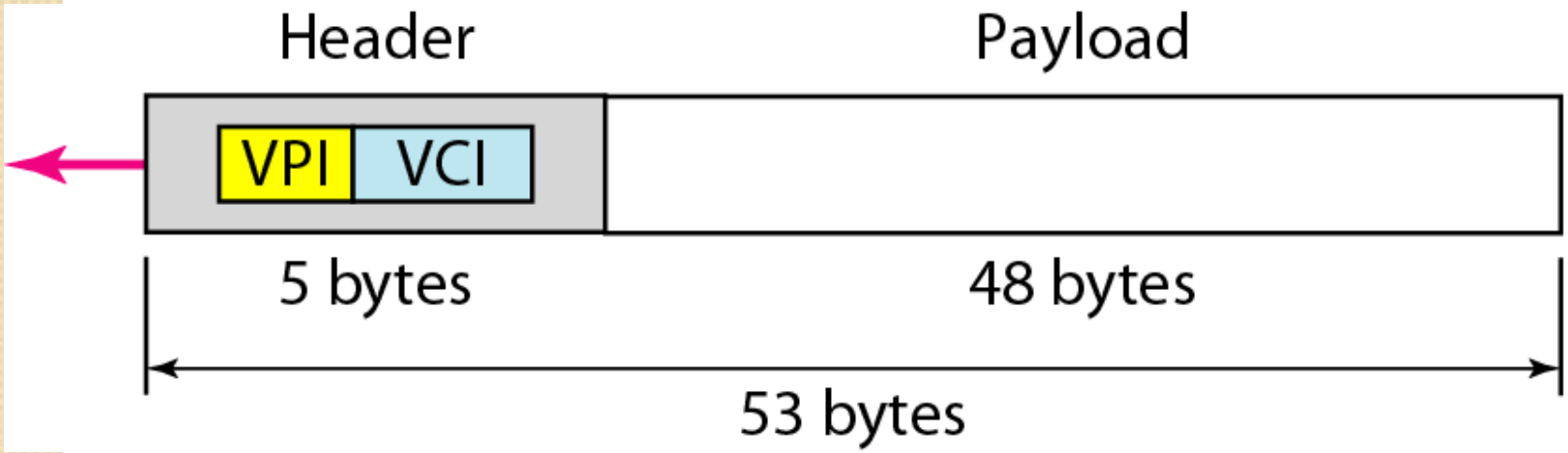


a. VPI and VCI in a UNI

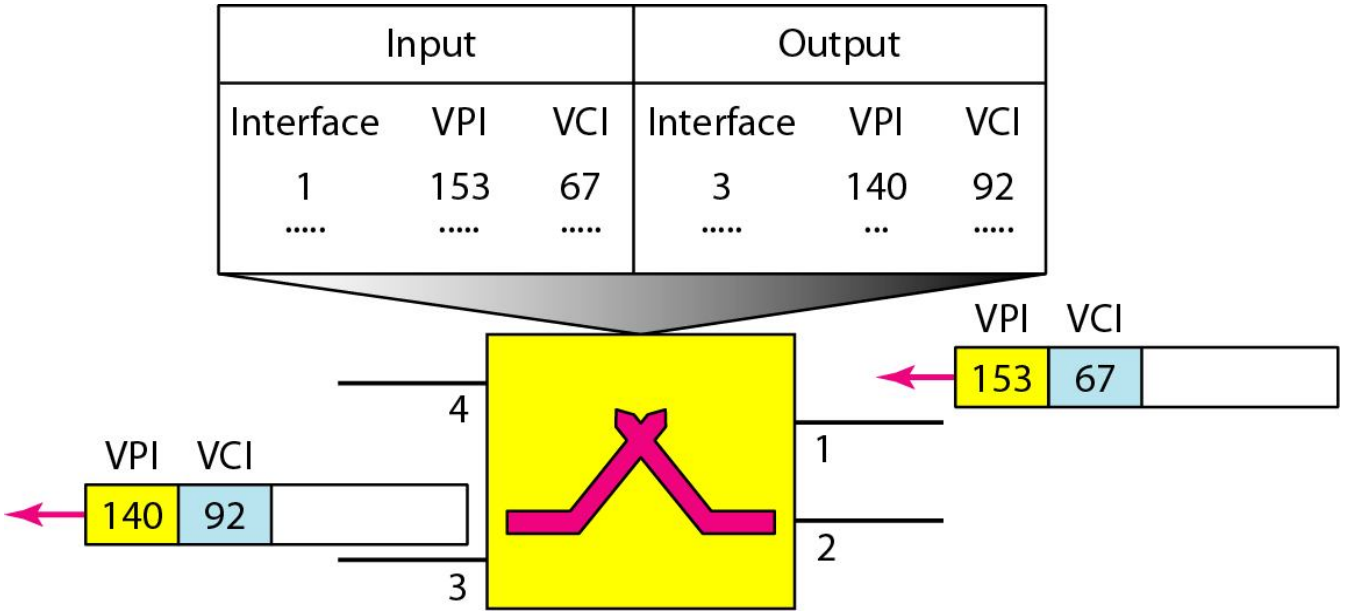


b. VPI and VCI in an NNI

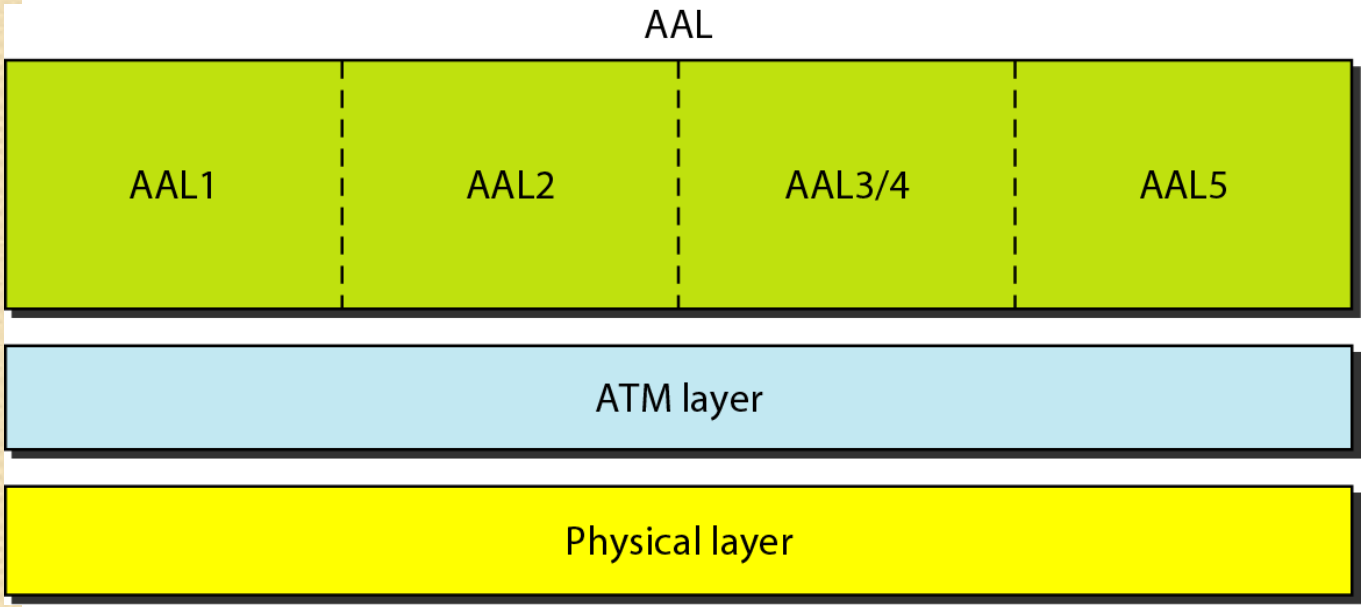
An ATM cell



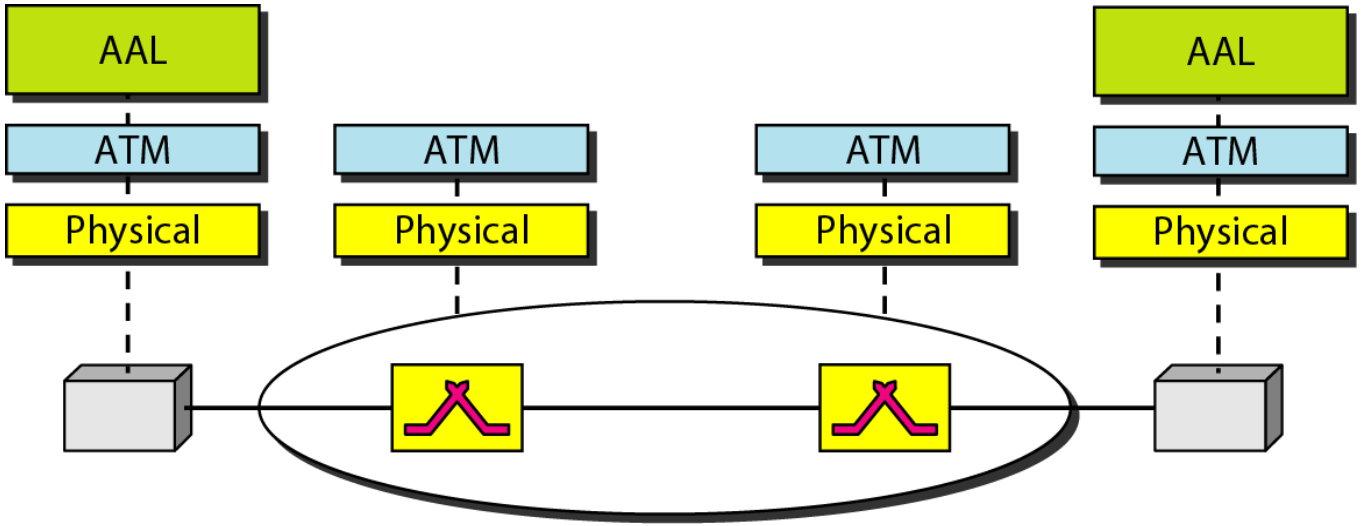
Routing with a switch



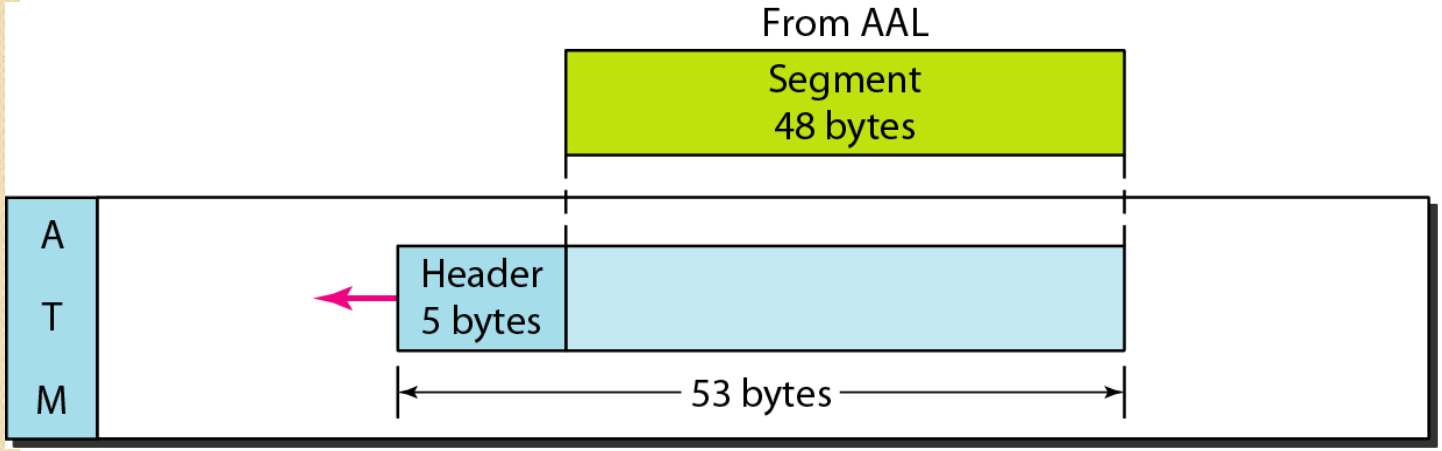
ATM layers



ATM layers in endpoint devices and switches



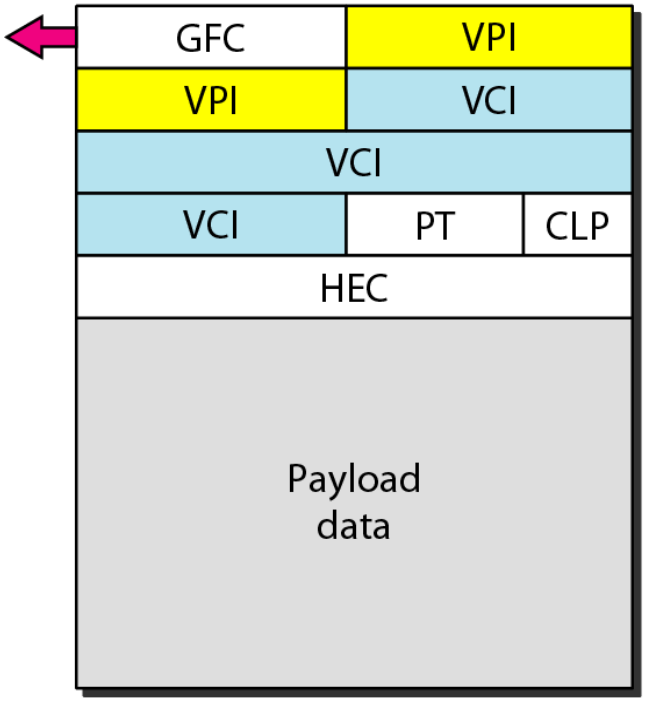
ATM layer



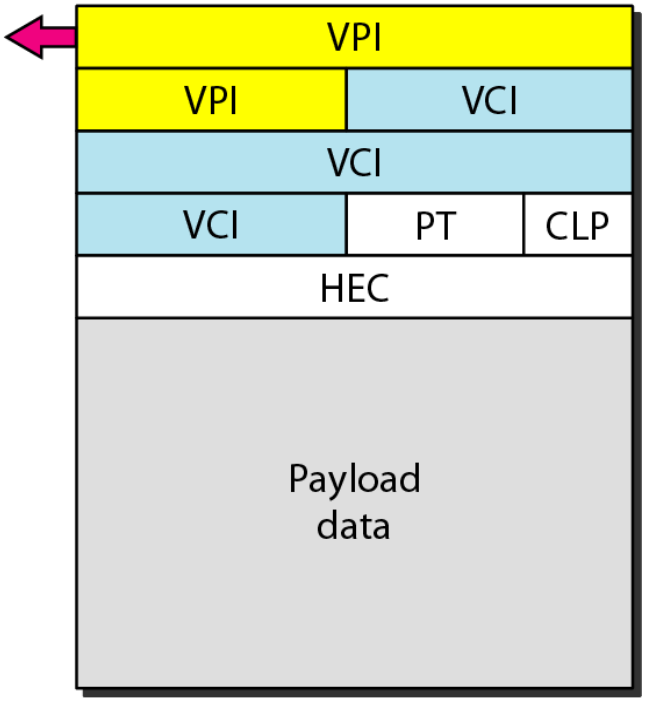
ATM headers

GFC: Generic flow control
VPI: Virtual path identifier
VCI: Virtual circuit identifier

PT: Payload type
CLP: Cell loss priority
HEC: Header error control

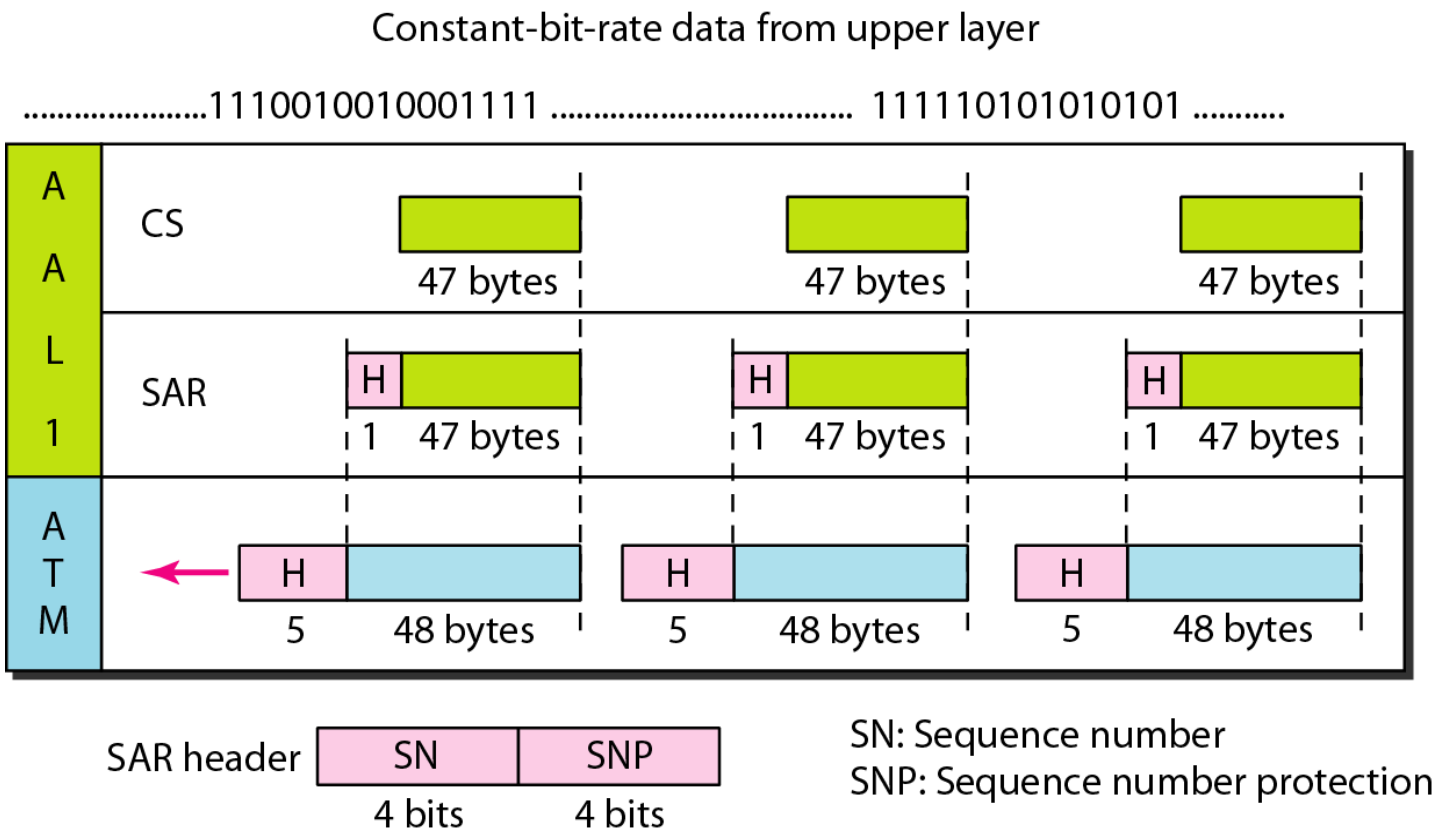


UNI cell

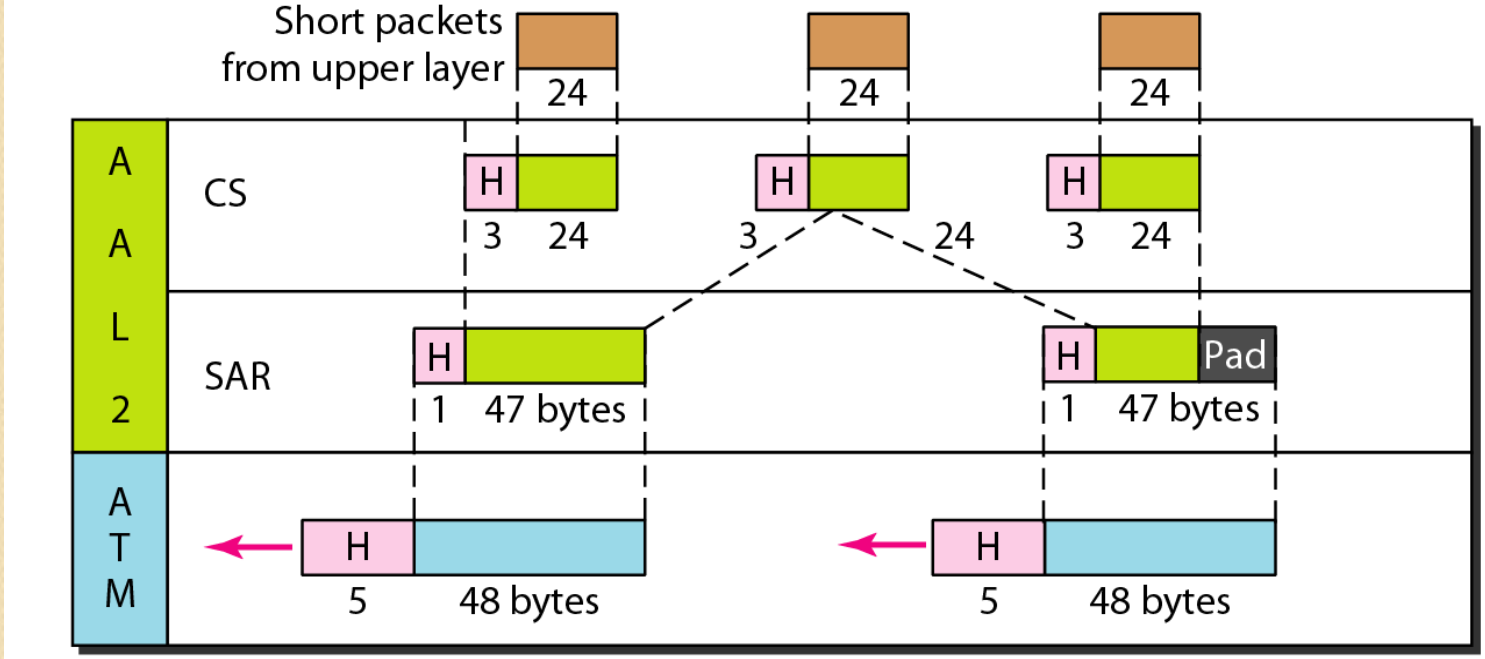


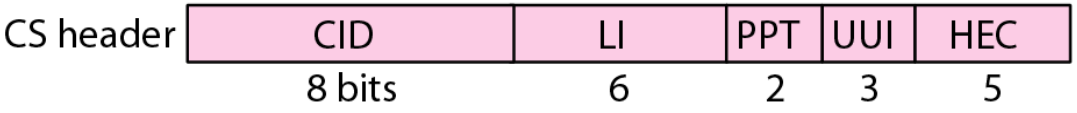
NNI cell

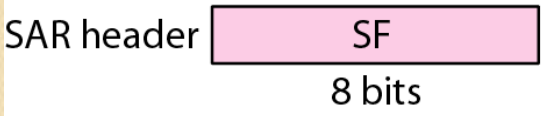
AAL1


Constant-bit-rate data from upper layer
.....1110010010001111 ..... 111110101010101 .....
AAL1
ATM
CS
SAR
47 bytes
47 bytes
47 bytes
H
1
47 bytes
H
1
47 bytes
H
1
47 bytes
H
5
48 bytes
H
5
48 bytes
H
5
48 bytes
SAR header
SN
SNP
4 bits
4 bits
SN: Sequence number
SNP: Sequence number protection

AAL2

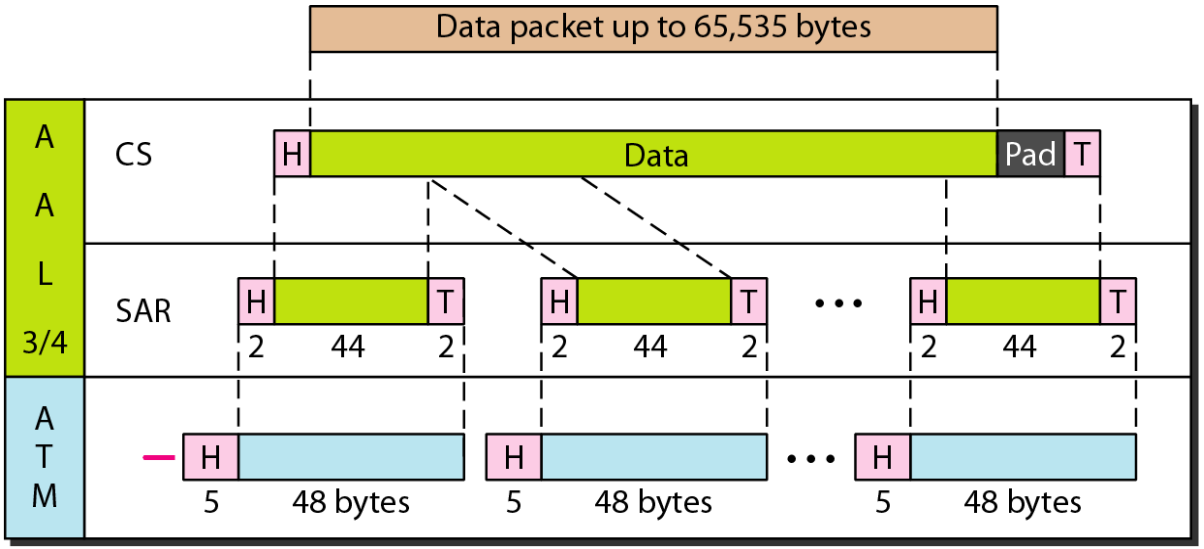


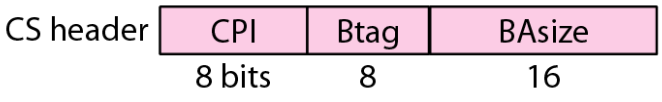




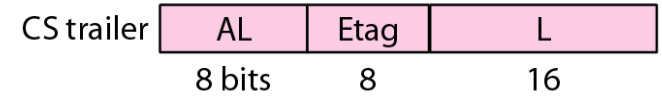
CID: Channel identifier
LI: Length indicator
PPT: Packet payload type
UUI: User-to-user indication
HEC: Header error control
SF: Start field

AAL3/4

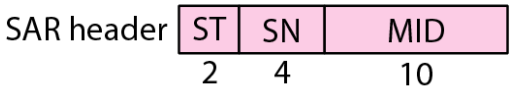




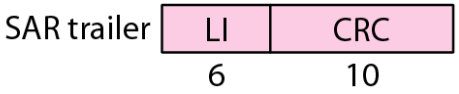
CPI: Common part identifier
Btag: Beginning tag
BAsize: Buffer allocation size



AL: Alignment
Etag: Ending tag
L: Length

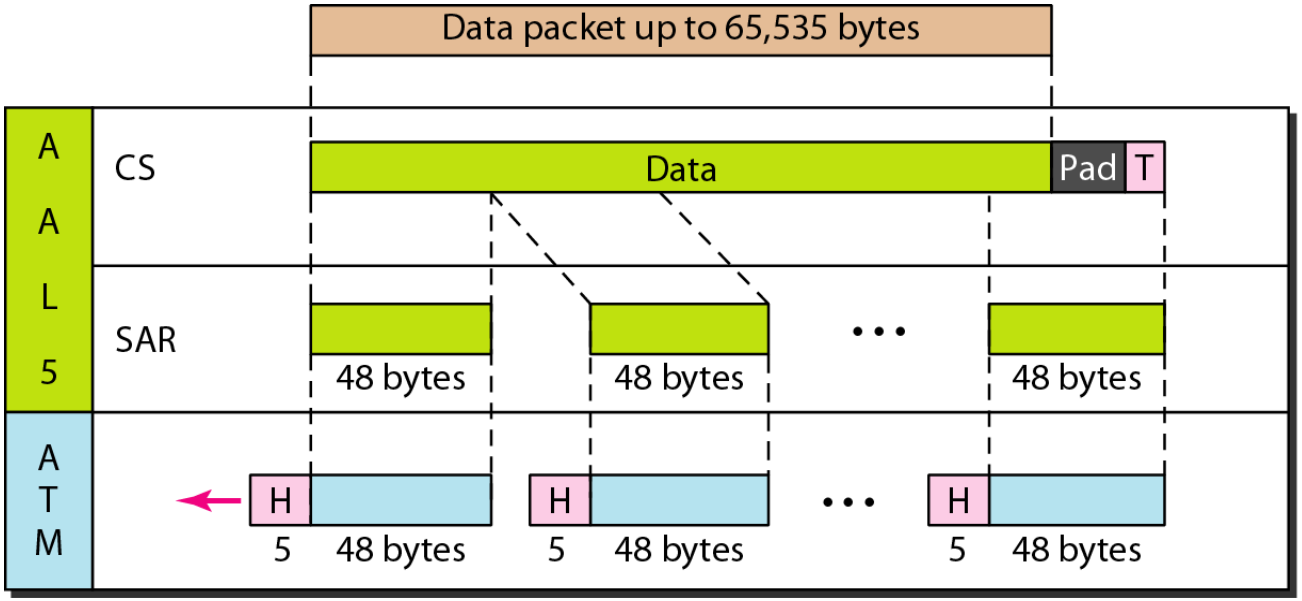


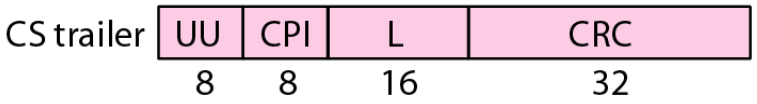
ST: Segment type
SN: Sequence number
MID: Multiplexing identifier



LI: Length identifier
CRC: Error detector

AAL5





UU: Channel identifier
CPI: Common part identifier
L: Length
CRC: Error detector

APPLICATIONS

- ATM was developed to meet the needs of the Broadband Integrated Services Digital Network
- Asynchronous Transfer Mode (ATM) is, according to the ATM Forum, standards for carriage of a complete range of user traffic, including voice, data, and video signals
- It is designed to unify telecommunication and computer networks.
- ATM has functional similarity with both circuit switched networking and small packet switched networking. It was designed for a network that must handle both traditional high-throughput data traffic (e.g., file transfers), and real-time, low-latency content such as voice and video.
- ATM is a core protocol used over the SONET/SDH backbone of the public switched telephone network (PSTN) and Integrated Services Digital Network (ISDN), but its use is

SCOPE OF RESEARCH

- Mobile and wireless ATM Networks

ASSIGNMENT

- Compare Frame Relay and ATM Networks.