SDH/SONET

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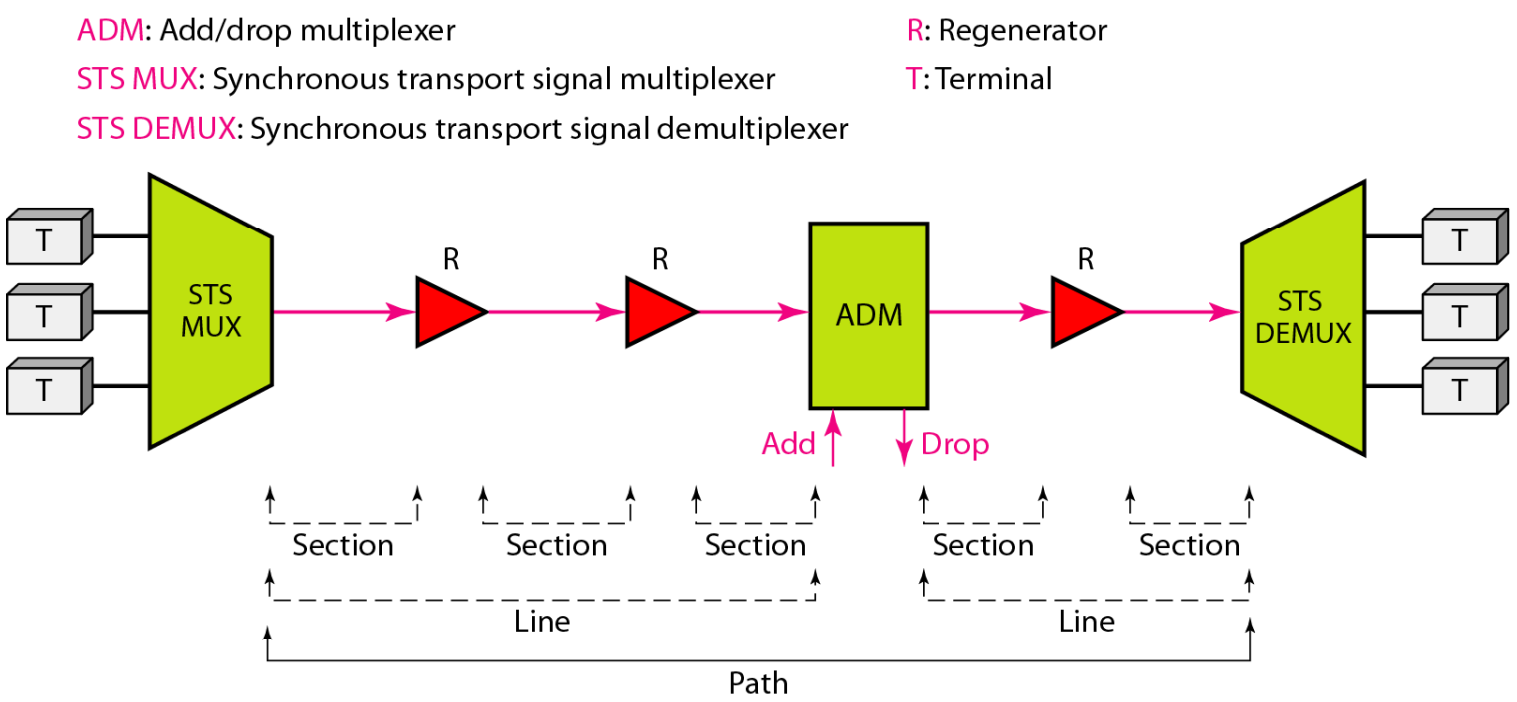
INTRODUCTION TO SDH

- The basis of Synchronous Digital Hierarchy (SDH) is synchronous multiplexing that is data from multiple tributary sources are byte interleaved.
- In SDH the multiplexed channels are in fixed locations relative to the framing byte.
- Demultiplexing is achieved by gating out the required bytes from the digital stream.
- This allows a single channel to be 'dropped' from the data stream without demultiplexing intermediate rates

SONET/SDH ARCHITECTURE

- SONET devices: STS multiplexer/demultiplexer, regenerator, add/drop multiplexer, terminals

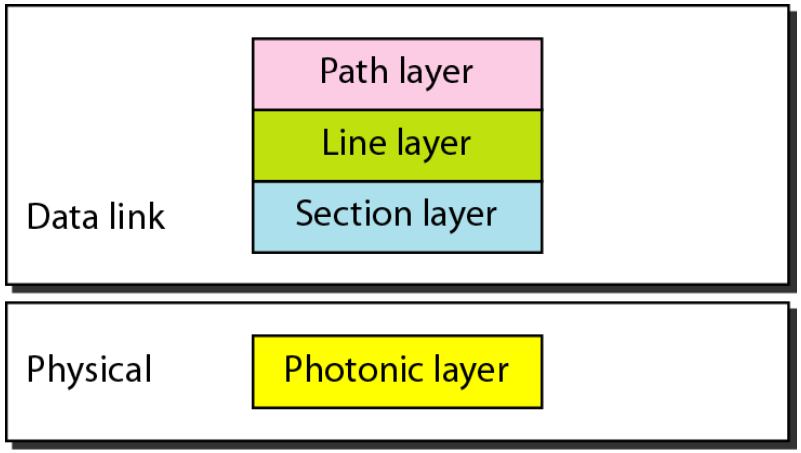


SONET/SDH ARCHITECTURE

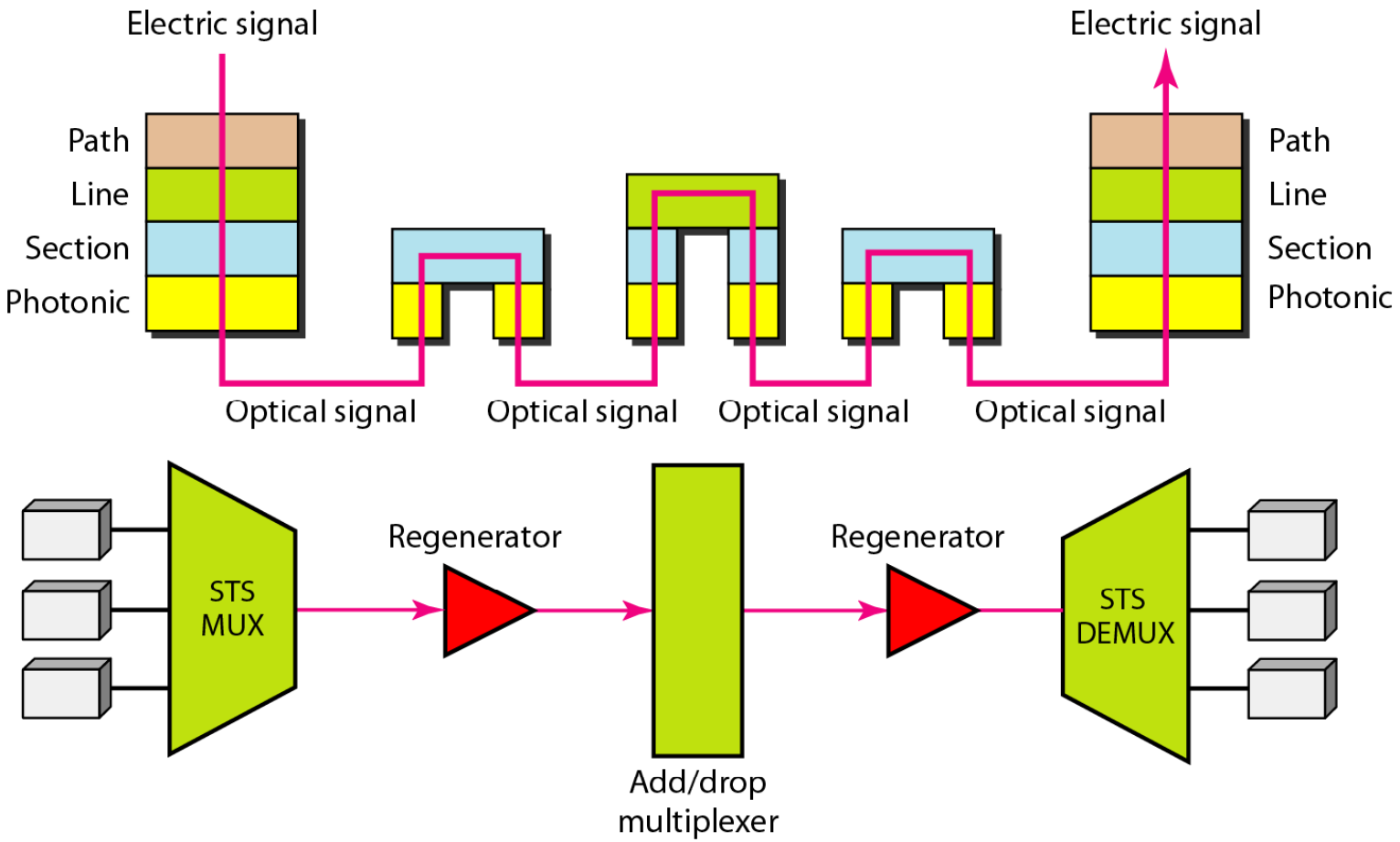
- **Connections:** SONET devices are connected using *sections*, *lines*, and *paths*
- *Section:* optical link connecting two neighbor devices: mux to mux, mux to regenerator, or regenerator to regenerator
- *Lines:* portion of network between two multiplexers
- *Paths:* end-to-end portion of the network between two STS multiplexers

SONET LAYERS

- SONET defines four layers: path, line, section, and photonic
- Path layer is responsible for the movement of a signal from its optical source to its optical destination
- Line layers is for the movement of a signal across a physical line
- Section layer is for the movement of a signal across a physical section, handling framing, scrambling, and error control
- Photonic layer corresponds to the physical layer of OSI model



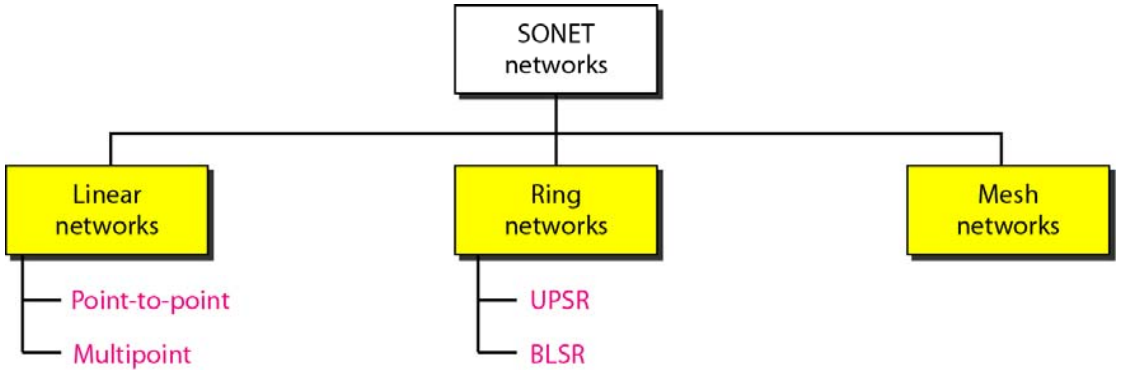
DEVICE-LAYER RELATIONSHIP IN SONET



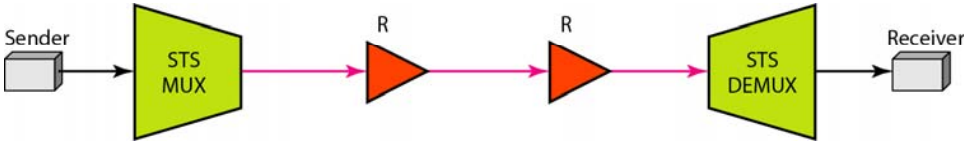
SONET/SDH

- Digital transmission standards for fiber-optic cable
- Independently developed in USA & Europe
  - SONET (Synchronous Optical Network) by ANSI
  - SDH (Synchronous Digital Hierarchy) by ITU-T
- Synchronous network using synchronous TDM multiplexing
- All clocks in the system are locked to a master clock
- It contains the standards for fiber-optic equipments
- Very flexible to carry other transmission systems (DS-0, DS-1, etc)

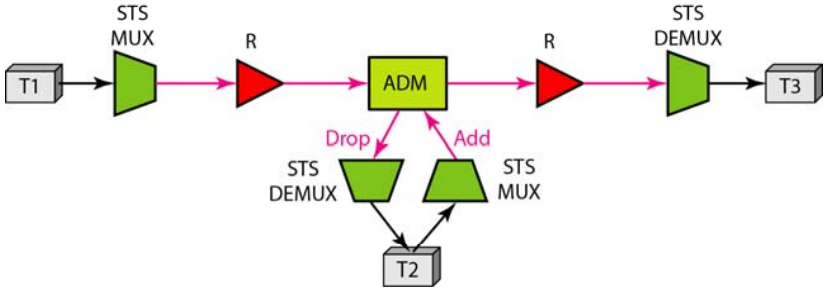
SONET NETWORK



- Point-to-point network



- Multipoint network



APPLICATIONS

- SONET is used for connecting different LANs using optical fiber
- To connect different campuses or buildings with optical fiber cables

SCOPE OF RESEARCH

- SONET based network architectures.

ASSIGNMENT 23

- How multiplexing is done in SONET?
- Why don't we use Ethernet for long distance connection instead of SONET?

Thank
You