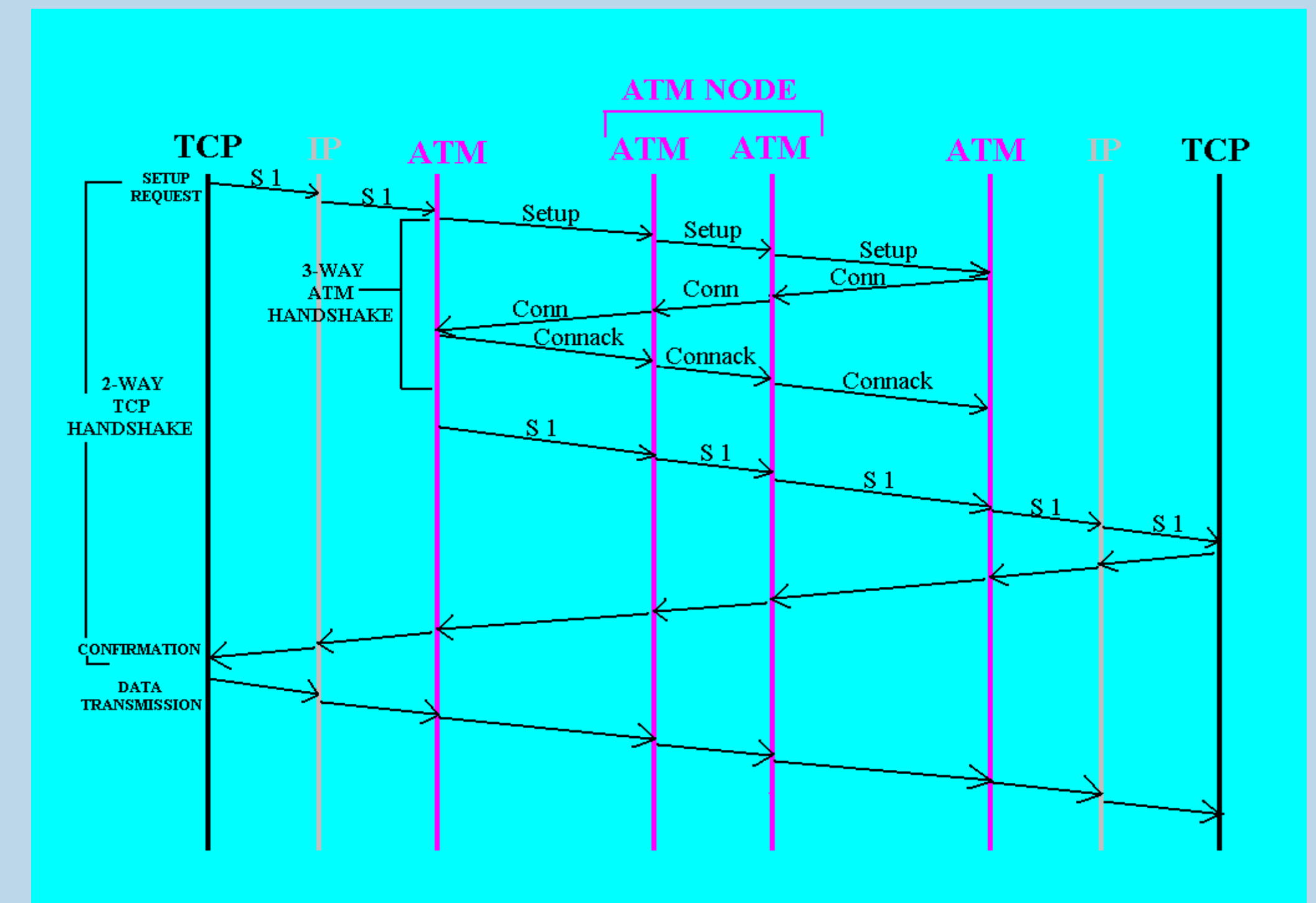
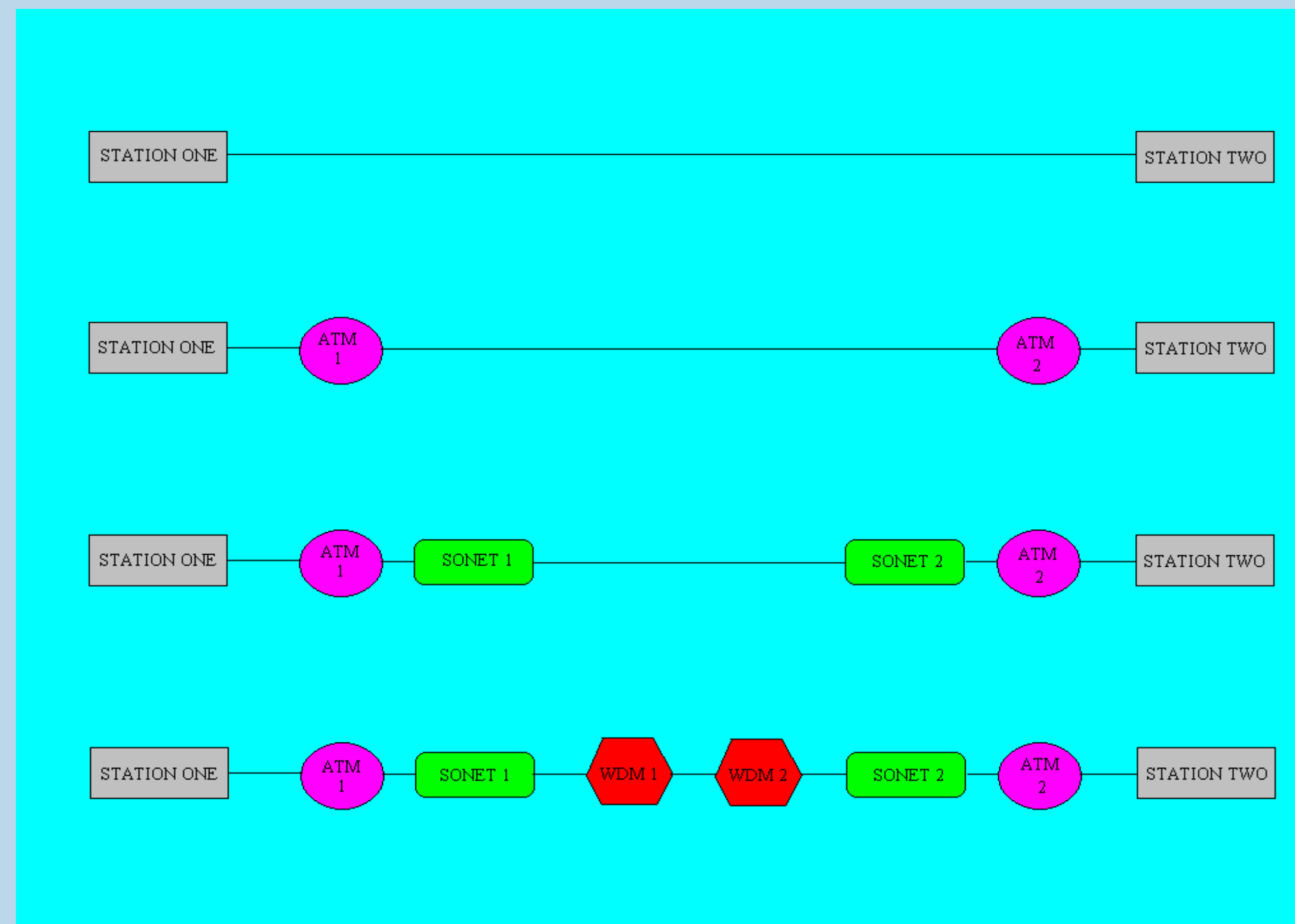


## PRESENT IP DATAGRAM TRANSMISSION BREAKDOWN

( IP Over ATM Over SONET Over WDM )

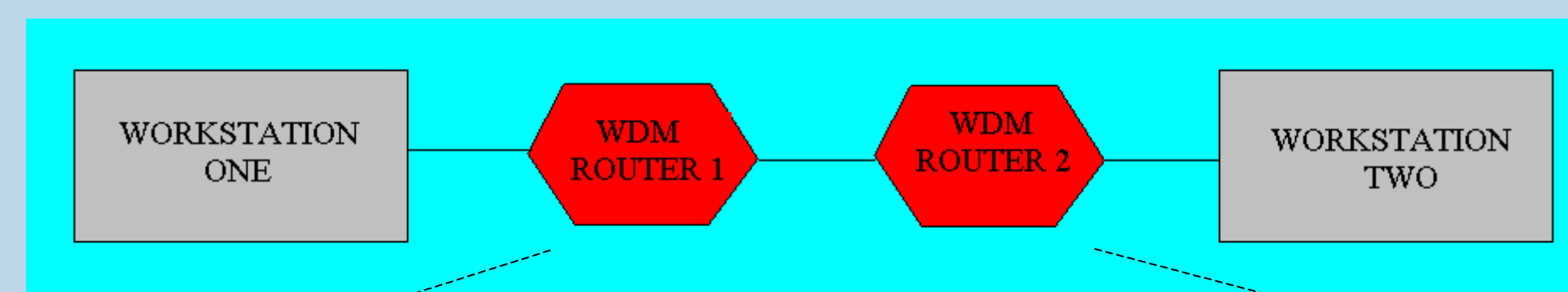
### IN A NUTSHELL !!!

Wavelength Division Multiplexing (WDM) is a fiber optic transmission technique that employs light wavelengths to transmit data simultaneously in parallel channels. Asynchronous Transfer Mode, (ATM) and Synchronous Optical Network (SONET), both of which are present Internet Protocol (IP) transport modes, cannot handle the high consumer demand for service. Hence, IP over WDM. This approach expands transmission rate, yet reducing infra-structural costs. IP over WDM can be done in 3 ways; initially by simply placing a WDM multiplexer-demultiplexer at the SONET/WDM cross-link in the network, or more complexly by using the same present Ethernet or SONET framing but just without ATM or SONET equipment. Thirdly, the most realistic and feasible approach, is by employing Time Division Multiplexing (TDM) which divides an allocated wavelength into time slots. With this approach, it is observed that due to the elimination of the 3-way ATM handshake, packet delay is reduced, hence increase in transmission rate for considerably large sized IP packets.



## TOMORROWS IP DATAGRAM TRANSMISSION BREAKDOWN

( IP Over WDM )



IP over WDM is achieved through 3 methods:

### 1. Single Link:

This is done by simply placing a WDM multiplexer-demultiplexer at SONET/WDM cross link in the network. This is simplest approach being used today. Nevertheless, it does not reflect a true optical network.

### 2. Provision Wavelength:

Here Time Division Multiplexing is employed. Each wavelength is divided into time slot. This is the most realistic and feasible approach towards a true, solely based WDM architectural network. There is much work being done within this field.

### 3. All Optical:

This happens to be the most complex approach as it relies on fully equipped optical devices. This is achieved through using the same Ethernet or SONET framing of today, but just without ATM or SONET equipment. This is a true optical network as from end-point to end-point transmission is of an optical nature.

### Accomplishments

- Insight into IP, ATM, SONET, and WDM protocols/devices in data transmission.
- Understanding the concept of Time Division Multiplexing with respect to WDM.
- Comprehension of 4 levels of the Open Systems Interconnection (OSI) Reference Model.
- Understanding the workings of optical devices, such as lasers, and fibers, and the gradual evolution towards and all optical network.