

SONET Network Configurations

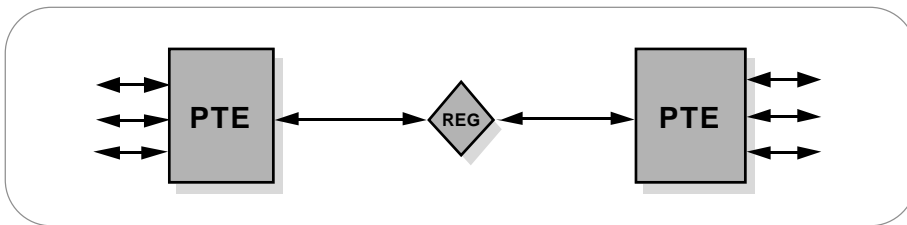
Point-to-Point

The SONET multiplexer, an entry level path terminating terminal multiplexer, acts as a concentrator of DS1s as well as other tributaries. Its simplest deployment involves two terminal multiplexers linked by fiber with or without a regenerator in the link. This implementation represents the simplest SONET configuration.

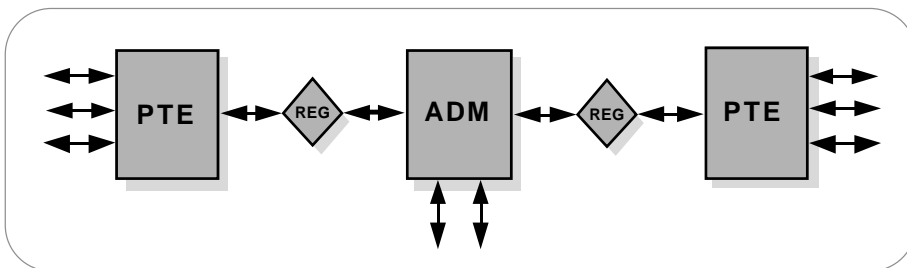
In this configuration (Figure 25), the SONET path and the Service path (DS1 or DS3 links end-to-end) are identical and this synchronous island can exist within an asynchronous network world. In the future, point-to-point service path connections will span across the whole network and will always originate and terminate in a multiplexer.

Point-to-Multipoint

A point-to-multipoint (linear add/drop) architecture includes adding and dropping circuits along the way. The SONET ADM (add/drop multiplexer) is a unique network element specifically designed for this task. It avoids the current cumbersome network architecture of demultiplexing, cross-connecting, adding and dropping channels, and then remultiplexing. The ADM is typically placed along a SONET link to facilitate adding and dropping tributary channels at intermediate points in the network. See Figure 26.



► **Figure 25.** Point-to-point.



► **Figure 26.** Point-to-multipoint.

SONET Telecommunications Standard

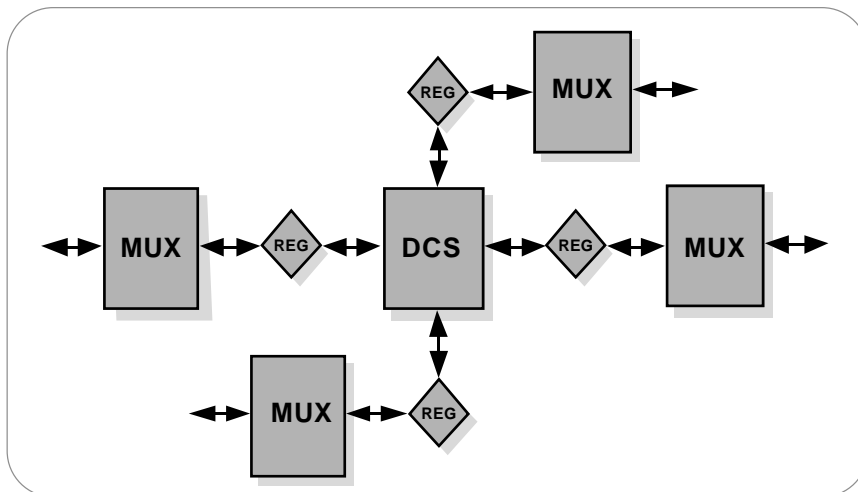
► Primer

Hub Network

The hub network architecture accommodates unexpected growth and change more easily than simple point-to-point networks. A hub (Figure 27) concentrates traffic at a central site and allows easy re provisioning of the circuits.

There are two possible implementations of this type of network:

1. Using two or more ADMs, and a wideband cross-connect switch which allows cross-connecting the tributary services at the tributary level.
2. Using a broadband digital cross-connect switch which allows cross-connecting at both the SONET level and the tributary level.

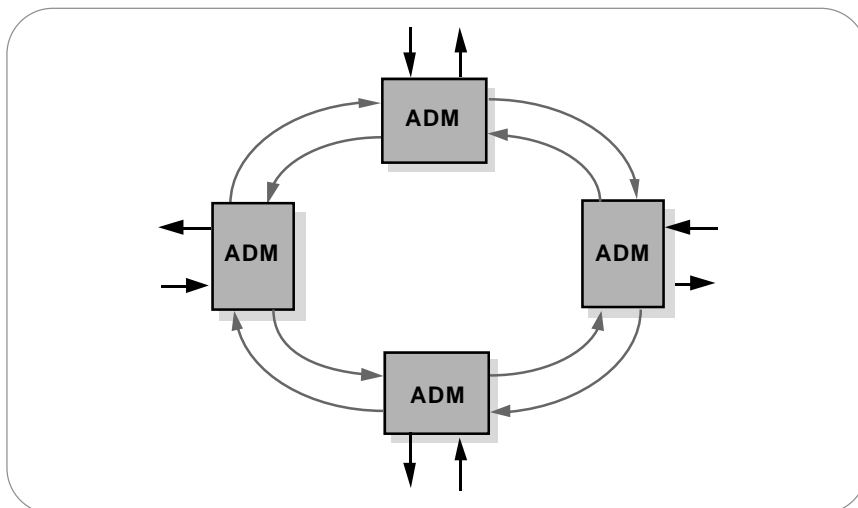


► **Figure 27.** Hub network.

Ring Architecture

The SONET building block for a ring architecture is the ADM. Multiple ADMs can be put into a ring configuration for either bi-directional or uni-directional traffic (see Figure 28). The main advantage of the ring topology is its survivability; if a fiber cable is cut, the multiplexers have the intelligence to send the services affected via an alternate path through the ring without interruption.

The demand for survivable services, diverse routing of fiber facilities, flexibility to rearrange services to alternate serving nodes, as well as automatic restoration within seconds, have made rings a popular SONET topology.



► **Figure 28.** Ring architecture.