SIMULATION OF AUTOMATIC SWITCH OPTICAL NETWORK
FROM ANYER TO PANARUKAN


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Abstract— Whenever a user requires more bandwidth, there is a request for a new connection from the user to the service provider. The service provider must then manually plan and configure the route in the network. This is not only time consuming, but also wastes bandwidth if the user sparingly uses the connection. Bandwidth is increasingly becoming a precious resource and expectations from future optical networks are that they should be able to efficiently handle resources as quickly as possible. ASON fulfills some of the requirements of optical networks. ASON (Automatically Switched Optical Network) is a concept for the evolution of transport networks which allows for dynamic policy-driven control of an optical or SDH network based on signaling between a user and components of the network.

Keywords— Ason, Optical Switch

II. ASON (AUTOMATICALLY SWITCHED OPTICAL NETWORK)

ASON (Automatically Switched Optical Network) is a concept for the evolution of transport networks which allows for dynamic policy-driven control of an optical or SDH network based on signaling between a user and components of the network.11 Its aim is to automate the resource and connection management within the network. The IETF defines ASON as an alternative/supplement to NMS based connection management.11

III. LOGICAL ARCHITECTURE OF ASON

Whenever a user requires more bandwidth, there is a request for a new connection from the user to the service provider. The service provider must then manually plan and configure the route in the network. This is not only time consuming, but also wastes bandwidth if the user sparingly uses the connection. Bandwidth is increasingly becoming a precious resource and expectations from future optical networks are that they should be able to efficiently handle resources as quickly as possible. ASON fulfills some of the requirements of optical networks such as:

- Fast and automatic end-to-end provisioning
- Fast and efficient re-routing
- Support of different clients, but optimized for IP
- Dynamic set up of connections
- Support of Optical Virtual Private Networks (OVPNs)
- Support of different levels of quality of service

(These requirements are not restricted to optical networks and can be applied to any transport network (including SDH Networks).)

The logical architecture of an ASON can be divided into 3 planes:

- Transport Plane
- Control Plane
- Management Plane

Figure 1. ASON Logical Architecture[5]
connections. These switches are connected to each other via PI (Physical Interface).

**The Control Plane** is responsible for the actual resource and connection management within an ASN network. It consists of a series of OCC (Optical Connection Controllers), interconnected via NNIs (Network to Network Interfaces). These OCCs have the following functions:

- Network topology discovery (resource discovery)
- Signaling, routing, address assignment
- Connection set-up/tear-down
- Connection protection/restoration
- Traffic engineering
- Wavelength assignment

**The Management Plane** is responsible for managing the Control plane. Its responsibilities include Configuration Management of the Control Plane Resources, Routing Areas, Transport resource in Control Plane and Policy. It also provides Fault Management, Performance Management, Accounting and Security Management functions. The Management Plane contains the Network Management Entity which is connected to an OCC in Control Plane via the NMI-A (Network Management Interface for ASON Control Plane) and to one of the switches via NMI-T (Network Management Interface for the Transport Network).

The traffic from user connected to an ASON network contains data for both Transport and Control Plane. The user is connected to Transport plane via a PI (Physical Interface), while it communicates with the Control plane via a UNI (User Network Interface).

**IV. SIMULATION RESULT**

In paper we simulated Automatic Switch Optical Network (ASON) for optical link from Anyer to Panarukan with the length of fiber 1000 KM.

![Figure 2. Optical link from Anyer to Panarukan with the length of fiber 1000 KM.](image)

This image below is the configuration that we created for ASON simulation with EDFA optical amplifier.

![Figure 3. The configuration for ASON simulation.](image)

From the simulation that we created, we have four input that simulated four different services, for the example two canals for voice and two canals for video.

![Figure 4. These are the pictures showing the four power input and the four power outputs from the first ASON port.](image)

While from the other port of ASON the output showing no power output like the picture below.

![Figure 5. Other port of ASON the output showing no power](image)
We can see the output of demux from the first port from the picture below.

Figure 6. the output of demux from the first port

V. CONCLUSION
From this simulation we get conclusion that the automatic principle of ASON is still dependent on the trigger used. Here all the data from the input is forwarded to first path, it is because all the data is already multiplexed and implementation of switches (ASON) does not function as input breaker.

REFERENCE
[1] Automatically Switched Optical Networks (ASON) and Generalized MPLS (GMPLS, ”Route into Common Future” - Slide 6)