

ABSTRACT

Transmission technology has changed to accommodate advanced services and customer growth. For data and IP traffic demand anticipation, some solutions have been defined for easier network designed by the network provider, such as *IP over ATM*, *IP over SDH*, and *IP over WDM/optical layer*.

Each technology solutions have been selected as the best solution to carry IP traffic on their time. For example, *IP over SDH* has been proven to:

- Connect *IP Gigabit router* to SDH machine
- Give a protection on IP or SDH layer
- Provide 2 percent overhead from payload
- Provide a Good performance in routing system, monitoring, and service protection in transport network.

Technically, SDH reliability as a backbone network or core network on some operator has been proven in some network operator and consortium in the world. But couples of issues like flexibility in terms of service demand, capacity, and economical factors make it a second choice.

Considering the high risk factors of technology implementation in TELKOM IP over WDM backbone network,

study and deep analysis especially relating to economic and technical factors of the impact of implementation of this new technology is mandatory. By this research, it was found that by using IP over WDM, CAPEX Savings obtained by 183% compared with the existing technology. As well as network performance conditions in accordance with standards set by the ITU-T is 100% *throughput*, no *packet loss*, latency is still below 40 ms. Likewise, the interoperability with MPLS protocols can all be done well, including the scheme MPLS Fast Reroute protection can provide a number below 50 ms.