Towards merged optical metro-access networks

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For decades optical transmission systems have now successfully been deployed in longhaul and metro networks. It has been only recently that they started also being deployed on a wider scale in access networks. Presently their extension is being adapted to the requirements of existing access networks the architecture of which had been motivated by the limited capabilities of copper links. But besides providing higher bandwidth than copper networks optical transmission systems can also bridge much longer distances. On the other hand fiber deployment is expensive so that available links and cables have to be simultaneously used for multiple purposes if possible.
So over time optical access networks will likely be transformed into more complex architectures and eventually merge with the metro network. The number of large nodes in conventional last mile networks will be reduced. At the same time the infrastructure will carry heterogeneous services for different customers of multiple operators by exploiting a multitude of optical network design parameters. The introduction of smart optical elements like amplifiers or switches into the fiber infrastructure will help making the network design and utilization of fiber and bandwidth resources efficient and flexible.

The presentation will highlight some aspects of this anticipated evolution from today's GPON and EPON systems and their respective 10G successors over first WDM based solutions towards merged optical metro-access networks, both from a networking as well as from a photonic technology perspective.