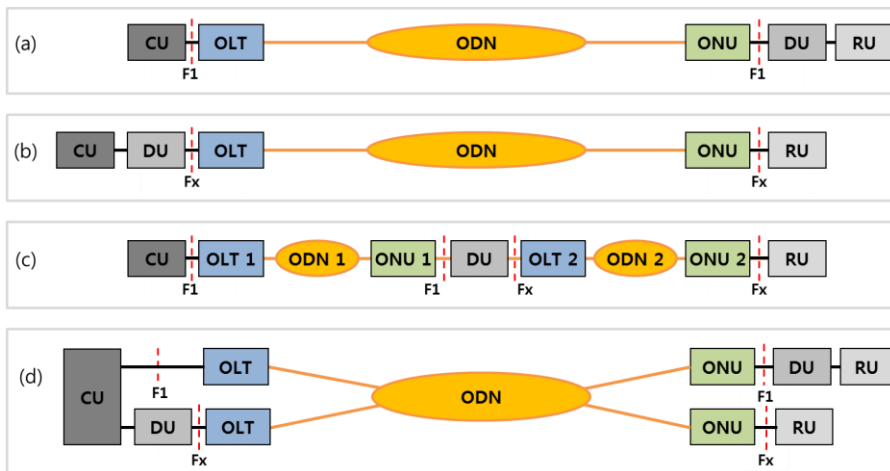


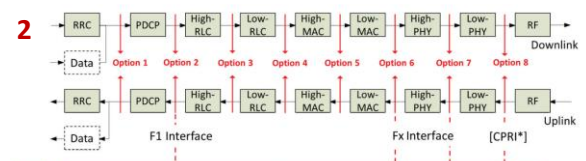
G.Suppl.66 5G wireless fronthaul in a PON context

- First ITU-T study that synthesizes specifications from recent 5G standards into practically realizable access network solutions
- Consider transport requirements from the 5G New Radio (NR) functional split architectures
- Review 5G wireless transport requirements for services, transport capacity, latency, and synchronization
- Discuss PON system designs to meet these requirements
- Provide practical PON implementation examples for back/midhaul (F1) and fronthaul (Fx) interfaces using TDM-PON and WDM-PON

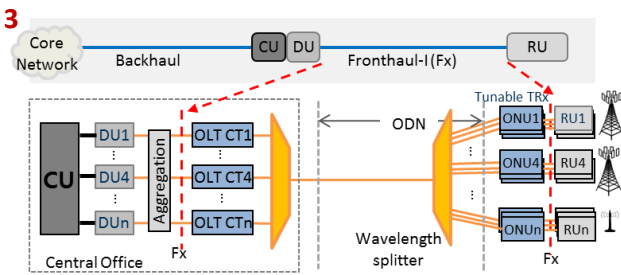
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1. ITU-T G Suppl. 66 - 5G wireless fronthaul requirements in a passive optical network context

Describes the mapping of the wireless CU/DU/RU system to the PON in optical fronthaul architecture. The central unit (CU) / distributed unit (DU) / radio unit (RU) belong to the radio network layer, while optical line terminal (OLT) / optical network unit (ONU) belong to the transport network layer. Four use case scenarios were analysed: high-layer split; b) low layer split; c) cascaded split; and d) parallel split.

2. Functional split options

ITU-T G Suppl. 66 also examines the different wireless functional interfaces in its signal processing chain, and outlines two major types of functional split. The F1 (high-layer split) is defined by 3GPP. Fx (low-layer split) is used in ITU-T G Suppl. 66 as the generic notation for the two low-layer split points (option 6 or 7). Different signal processing functions reside in the central unit (CU), distributed unit (DU), or remote unit (RU), depending on the split points. CPRI is one possible transport protocol for Option 8.

3. Example of WDM-PON implementation for Fx fronthaul interface

ITU-T G Suppl. 66 gives an example of WDM-PON implementation for Fx fronthaul transport. In this system, signals from the OLTs, each on a different wavelength channel, are combined in a wavelength multiplexer before transmitting to the cell sites. In the optical distribution network (ODN), a wavelength multiplexer, typically an array waveguide grating (AWG) device, routes the individual wavelengths to different ONUs, each of which is connected to an RU supporting one of the three sectors of an antenna.