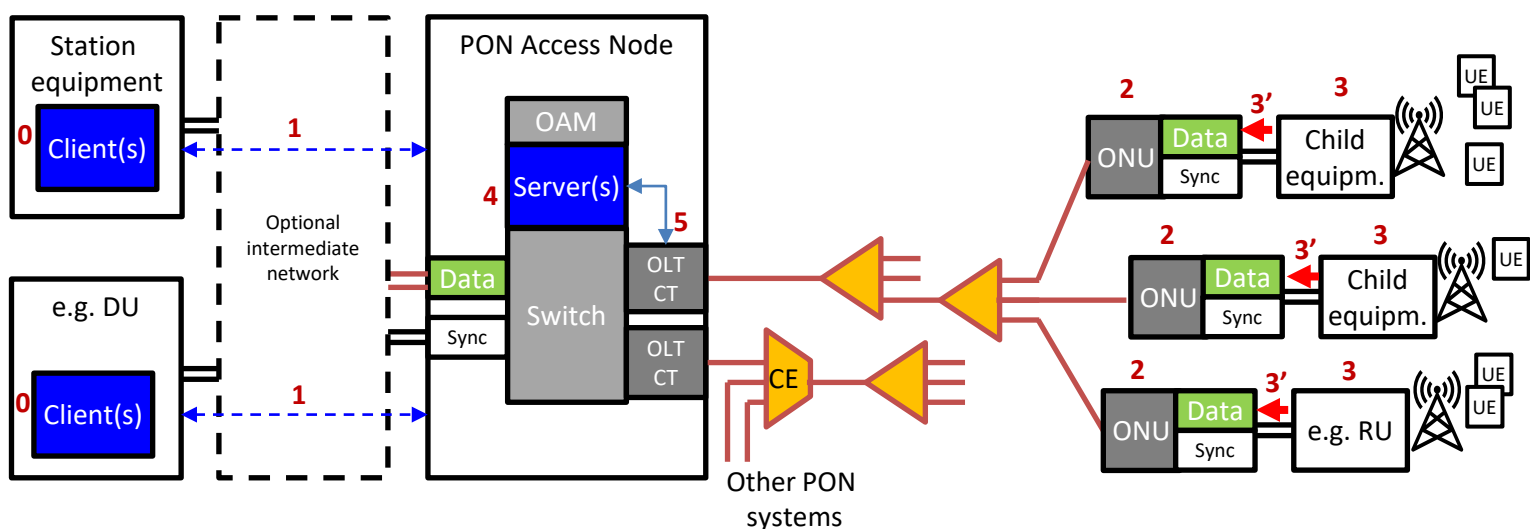


G Suppl. 71 Cooperative Dynamic Bandwidth Allocation

- Cooperative DBA (CO DBA) is a method to reduce the upstream latency in a TDM PON when applying variable bandwidth allocations to follow a variable bitrate traffic pattern, while keeping multiplexing gain.
- CO DBA is notified with information about this traffic from an external entity (station equipment) to the optical line termination (OLT). With this information the OLT applies bandwidth allocations targeted in time and size.
- External entity can be northbound of OLT (as per figure below) or connected to ONU. CO DBA as such is independent of the TDM PON technology.
- The supplement provides an interpretation of the OLT capabilities that are needed to support CO DBA; some are generic, some are specific per use case.
- The use case elaborated in the supplement is Mobile Fronthaul (MFH) using O-RAN's Cooperative Transport Interface (CTI) between OLT and Distributed Unit (DU).



ITU-T G Suppl. 71 describes how CO DBA relates to the interaction between one or multiple protocol **Clients** [0] in station equipment and the protocol **Server(s)** [4] in the OLT, with exchange of **signalling messages** [1].

The Server interprets the received messages and notifies the **CO DBA instance for the corresponding PON Channel Termination (CT)** [5] of the coming **upstream traffic volumes and their timing** [3']. This supposes the Station equipment has knowledge of future traffic occurrences of the **Child equipments** [3] it is managing. CO DBA has to translate them into concrete bandwidth allocations to the corresponding Traffic Containers (T-CONTs) on the corresponding **ONUs** [2]. The document explains the OLT capabilities that CO DBA relies upon.

In general, for any use case the OLT needs at least to contain a protocol server, an interpretation of the protocol messages, and a common time reference with the Station/Child equipment for the timing of the bandwidth allocations.

For the specific use case of **Mobile Fronthaul with O-RAN's CTI**, the Station equipment is a DU with a CTI Client, the Child equipments are RUs, and the OLT harbours a CTI Server. The traffic being reported in CTI messages is fronthaul traffic between RU and DU (the control and user planes). There are different options for sharing the common Time of Day (ToD) reference between the OLT and the mobile network. CTI consists of different types of messages. The CTI Server has to correlate a (set of) identifier(s) present in the message to the corresponding T-CONT. There can be multiple reports inside a single CTI message.

The latency obtained with CO DBA must meet the requirement as set out for each fronthaul flow. An additional feature of CTI is the notification of ranging events by the OLT towards the DU. The CTI Server also needs to be configured and managed, in alignment with the management of the CTI Clients in the DUs.