

# CableLabs<sup>®</sup>

10G Platform:

Not Your Father's Cable Network Anymore

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# 10G



**10Gbps symmetric,  
reliable, secure, and low  
latency service to  
consumers**



**10x Speed**

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**More Reliable**



**Better Security**

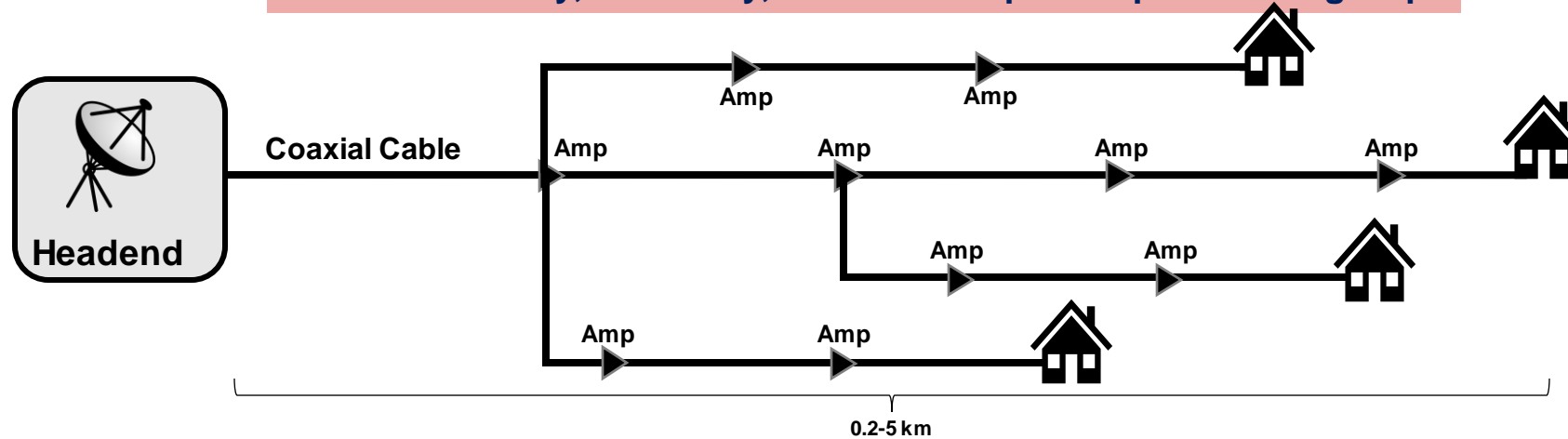


**Lower Latency**

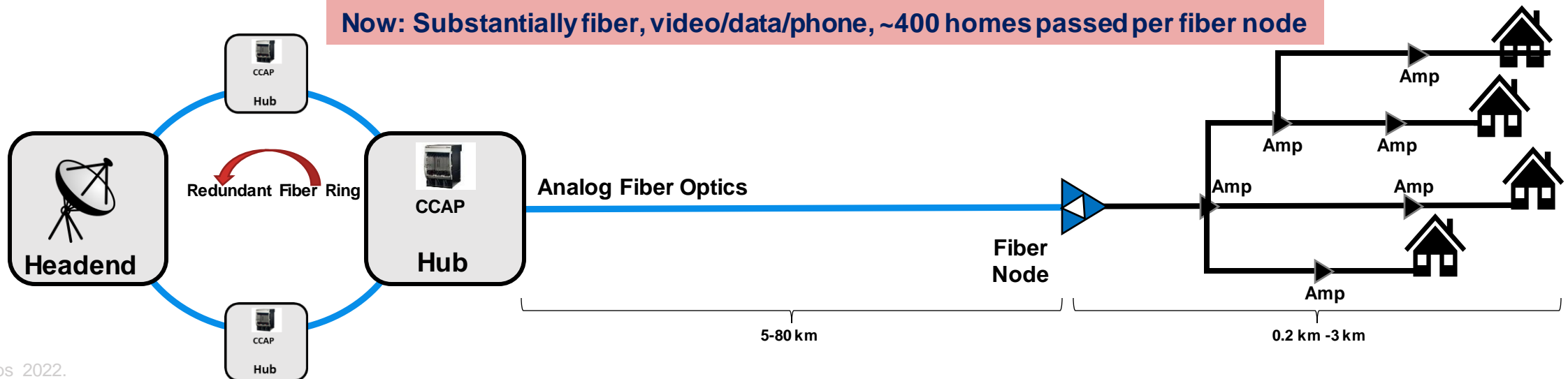


# Cable Networks: Then and Now

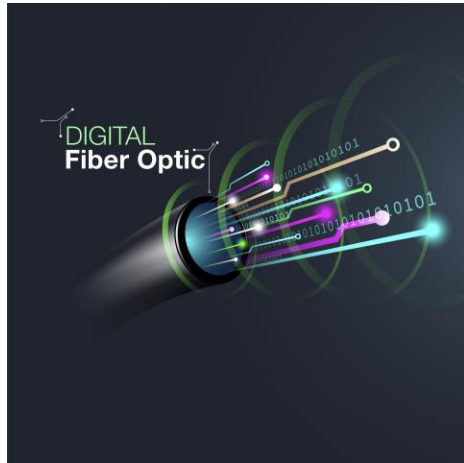
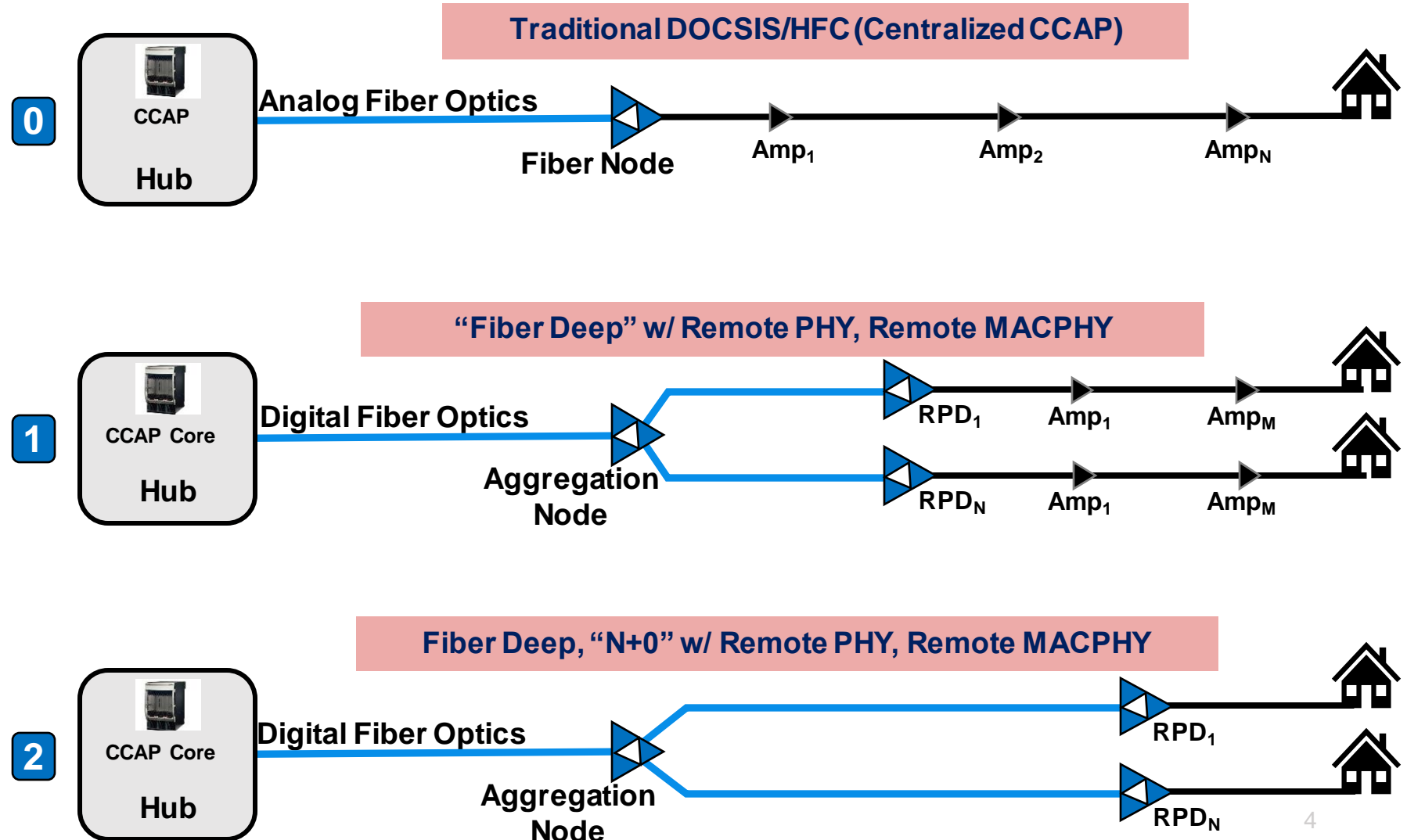
Then: Coax only, video only, ~2000 homes passed per service group



Now: Substantially fiber, video/data/phone, ~400 homes passed per fiber node



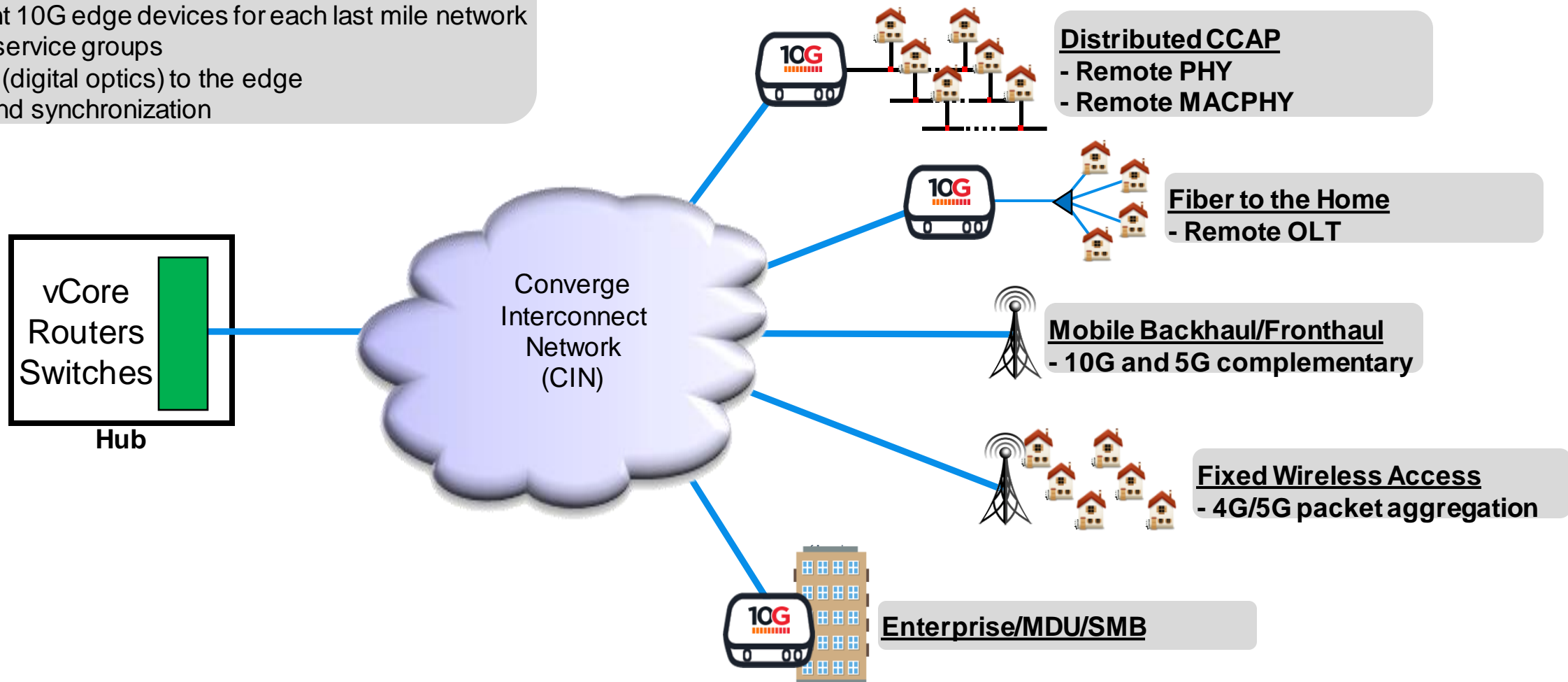
# HFC Continuing Evolution – Distributed CCAP



# Distributed Access Architecture

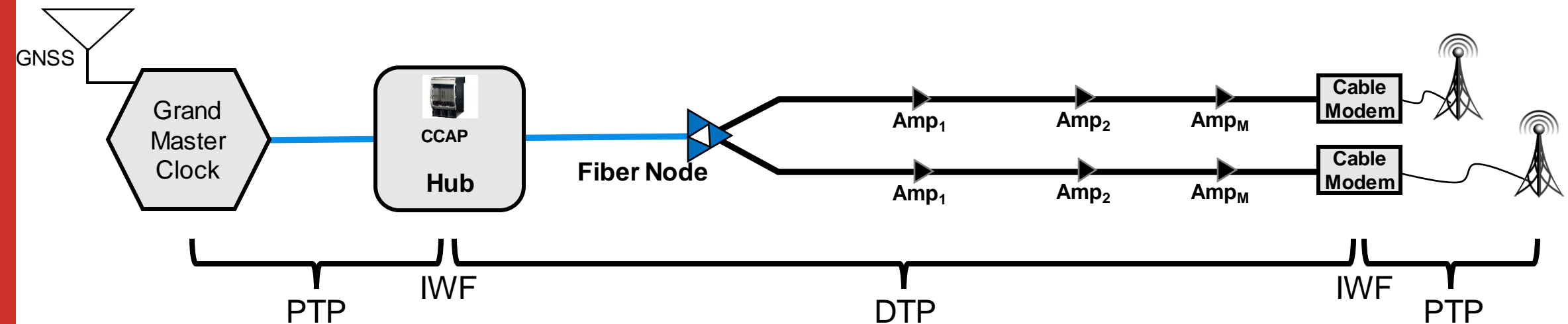
## *Distributed Access*

- Fiber deep
- Intelligent 10G edge devices for each last mile network
- Smaller service groups
- Ethernet (digital optics) to the edge
- Timing and synchronization



# What is DTP?

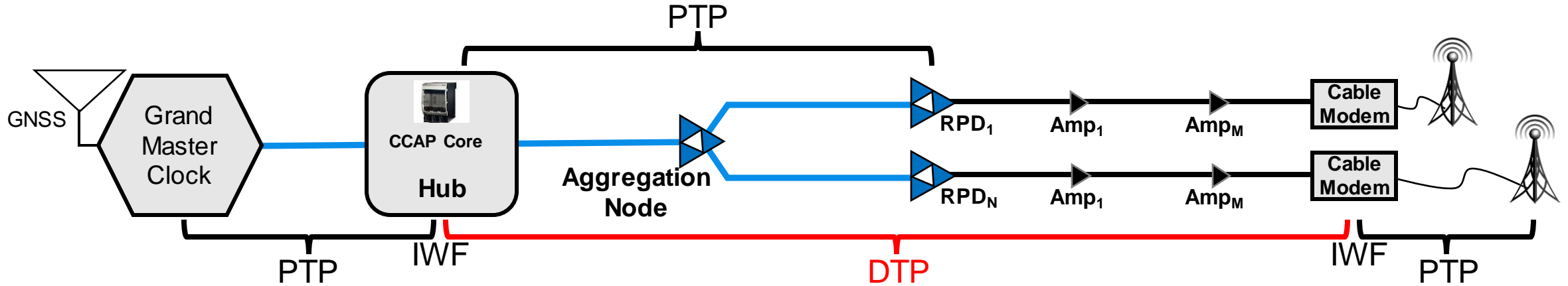
- DTP (DOCSIS Time Protocol) is a time protocol that provides a high-accuracy synchronization signal for a DOCSIS network
  - HFC as mobile Xhaul
  - DTP over HFC meets 3GPP synchronization requirement:  $1.5 \mu\text{s}$  for base stations (BS)



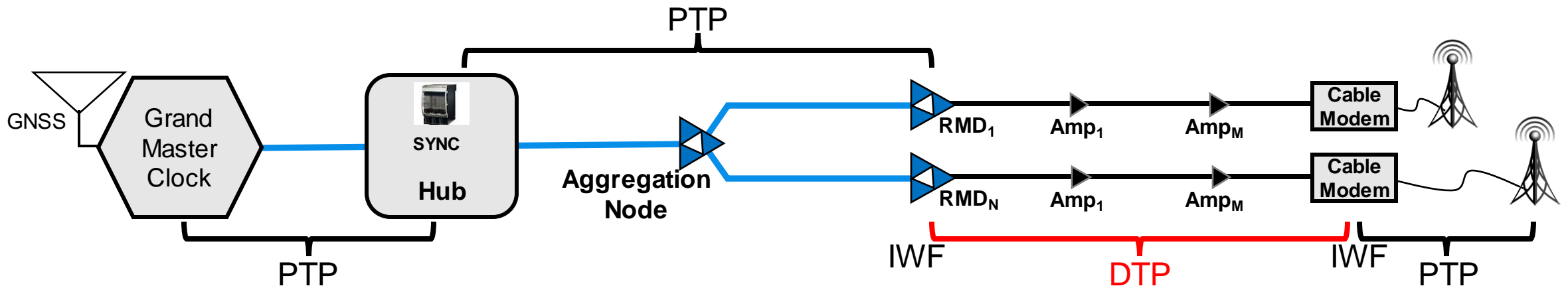
*PTP: ITU-T G.8275.1 or G.8275.2 PTP Profiles  
IWF: DOCSIS to PTP Interworking Function (T-BC)*

# DTP in Distributed CCAP

Remote-PHY devices (RPDs) coordinate with CCAP Core to transfer timing information to cable modem



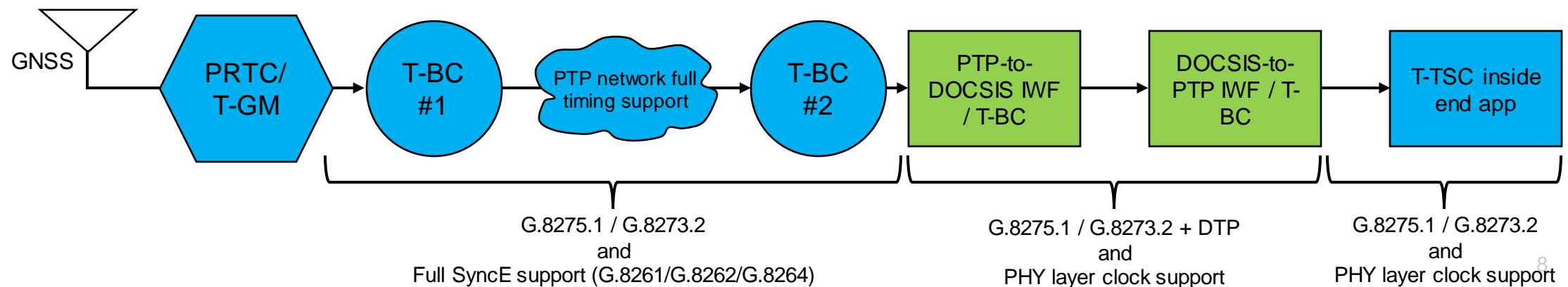
Remote-MACPHY devices (RMDs) transfer timing information directly to cable modem



PTP: ITU-T G.8275.1 or G.8275.2 PTP Profiles  
IWF: DOCSIS to PTP Interworking Function (T-BC)

# Synchronization Techniques for DOCSIS® Technology

- CableLabs specification CM-SP-SYNC-I02-210407 defines all elements of synchronization for cable services
  - DOCSIS Time Protocol (DTP)
  - Interworking functions (IWF) to assure end-to-end synchronization integrity
    - DOCSIS to PTP IWF, and PTP to DOCSIS IWF
    - DOCSIS to SyncE IWF, and SyncE to DOCSIS IWF
  - Reference sync architectures (example below for 5G mobile backhaul)





# CableLabs Specs and Reports

CableLabs®

**Data-Over-Cable Service Interface Specifications  
Mobile Applications**

**Synchronization Techniques for DOCSIS® Technology  
Specification**

**CM-SP-SYNC-I02-210407**

**ISSUED**

<https://www.cablelabs.com/specifications/CM-SP-SYNC>

**Data-Over-Cable Service Interface Specifications  
Mobile Applications**

**DOCSIS Time Protocol Proof of Concept Phase II  
Technical Report**

**CM-TR-DTP-Phase2-V01-220307**

**RELEASED**

<https://www.cablelabs.com/specifications/CM-TR-DTP-Phase2>



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