Desirable Features for EPOC

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EPON over Coax

Outline

- Desirable features for EPoC

- Resource management

- Extending MPCP

Desirable Features for EPoC

1. <u>Packet filtering</u>: selection of packets destined to users on the coax plant

2. <u>Resource management</u>: allocate resources on the coax link depending on
   - Resource allocation on optical link
   - Coax link quality for each CNU

3. <u>Rate adaptation procedures</u>
   - Capabilities of each CNU depend on coax link quality

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Resource Management

Allocate resources on the coax link depending on:

- Resource allocation on optical link
  - The OLT is the master of the overall resource allocation
  - The OLT is able to control each CNU individually

- Coax link quality
  - Different for different users
  - Frequency-dependent
  - Noisy environment
    - Burst noise
    - Amplifiers

The DOCSIS approach: Conversion from time resources to time/code resources

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Resource Management

- Argument 1:

In order to enable all the desirable features of EPoC, <u>a fixed resource conversion table is not enough</u>

- Argument 2 :

We need to put <u>intelligence at the transition between optical and coax domains</u>

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Resource Management

- Argument 1: Expected performance
  - EPoC is <u>more ambitious</u> than DOCSIS
    - larger bandwidth: from 6/8MHz to 100+MHz
    - spectral efficiency: from 7+bps/Hz to 10+bps/Hz

- Argument 2 : Required intelligence
  - This is not possible with a 802.1 bridge.
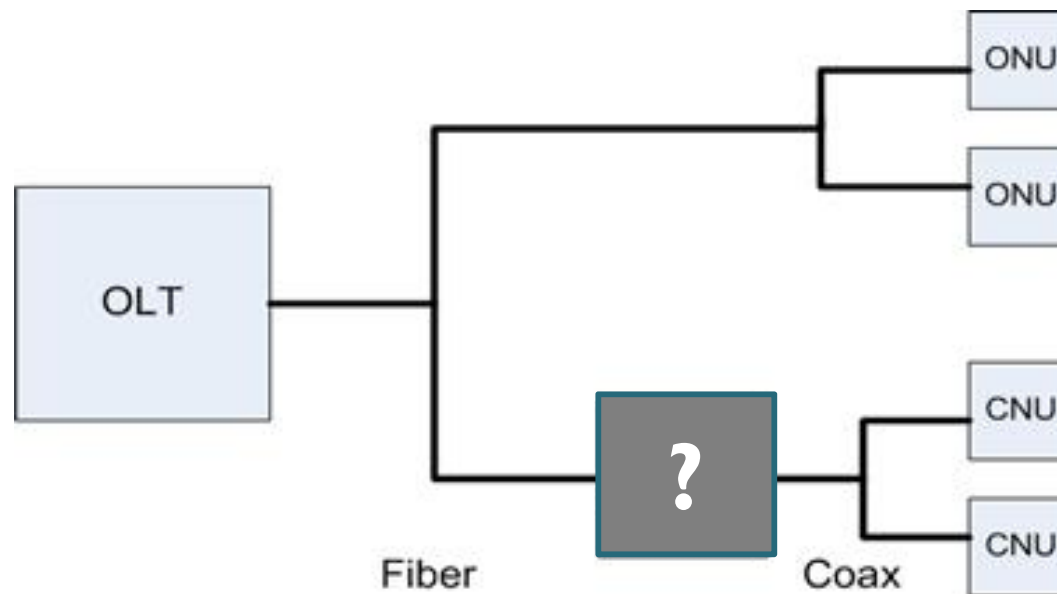 - This would likely require <u>extensions to the MPCP</u>.

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Extending MPCP

- The first figure in the MPCP original specification (clause 77 of 802.3av) represents the EPON network
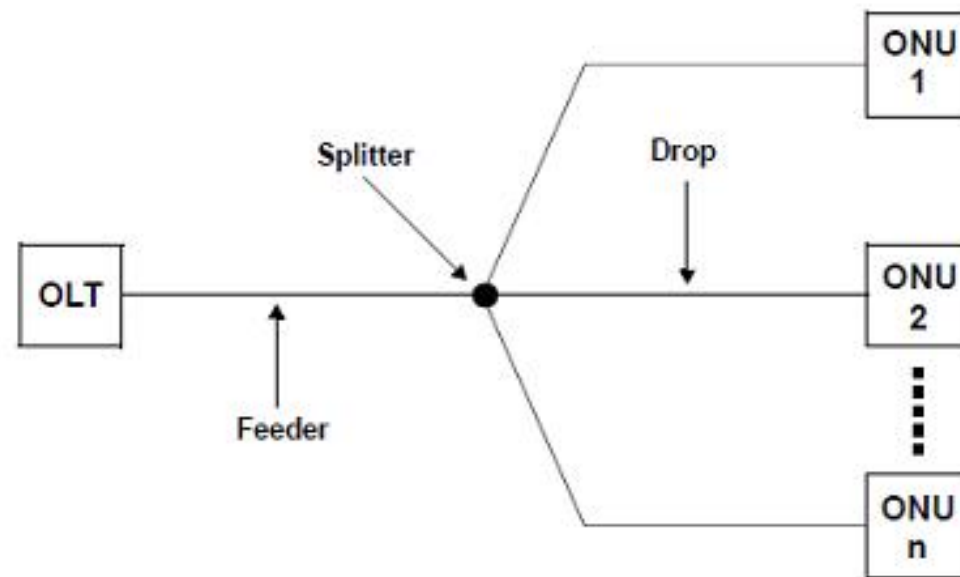
Extending MPCP

- In the MPCP extension, we would add the same representation for EPON/EPoC,

Extending MPCP

- The unit at the optical/coax transition is a <u>new network element</u>
  - Optical Coax Relay (OCR)

- The OCR implements a well-defined set of <u>functionalities</u>
  - Packet filtering
  - <u>Implementing convergence</u> between resources on the optical and the coax links (not a simple conversion table!)
    - Option 1: EPoC resources allocated via PHY-layer control;
    - Option 2: MPCP_opt messages are <u>translated</u> (rather than terminated) to MPCP_coax messages.