

Initial Deployment and Growth Scenarios for EPoC

Jorge Salinger

Matt Schmitt

802.3bn Task Force
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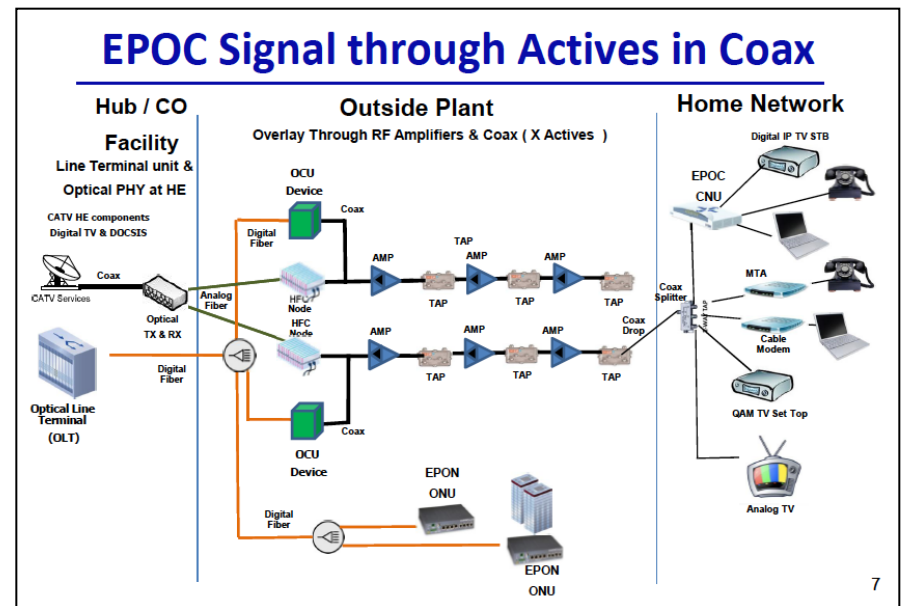
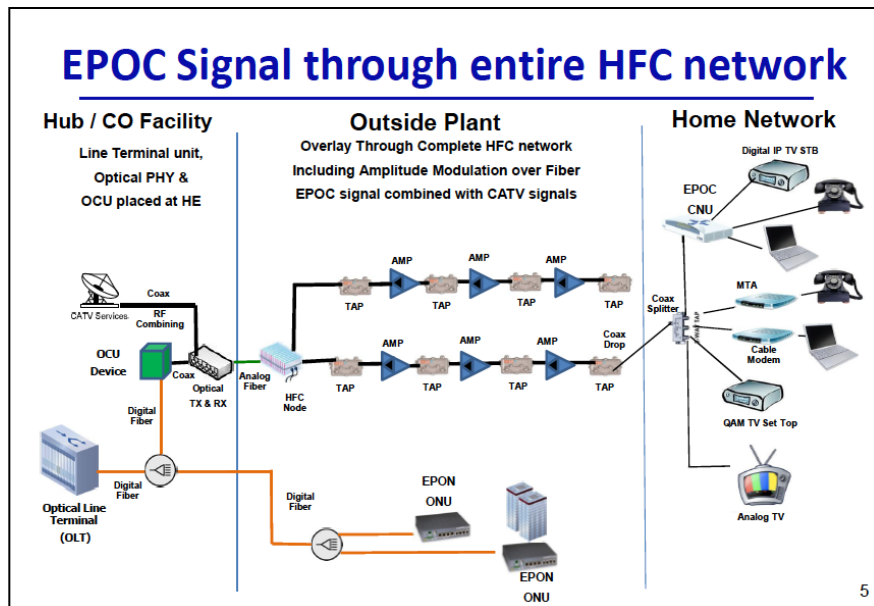
Supporters

- John Dickinson, BrightHouse Networks
- Ed Mallette, BrightHouse Networks
- Curtis Knittle, CableLabs
- Mike Darling, Shaw Cable
- George Hart, Rogers
- Saif Rahman, Comcast
- Kirk Erichsen, Time Warner Cable
- Kevin Noll, Time Warner Cable

Overview

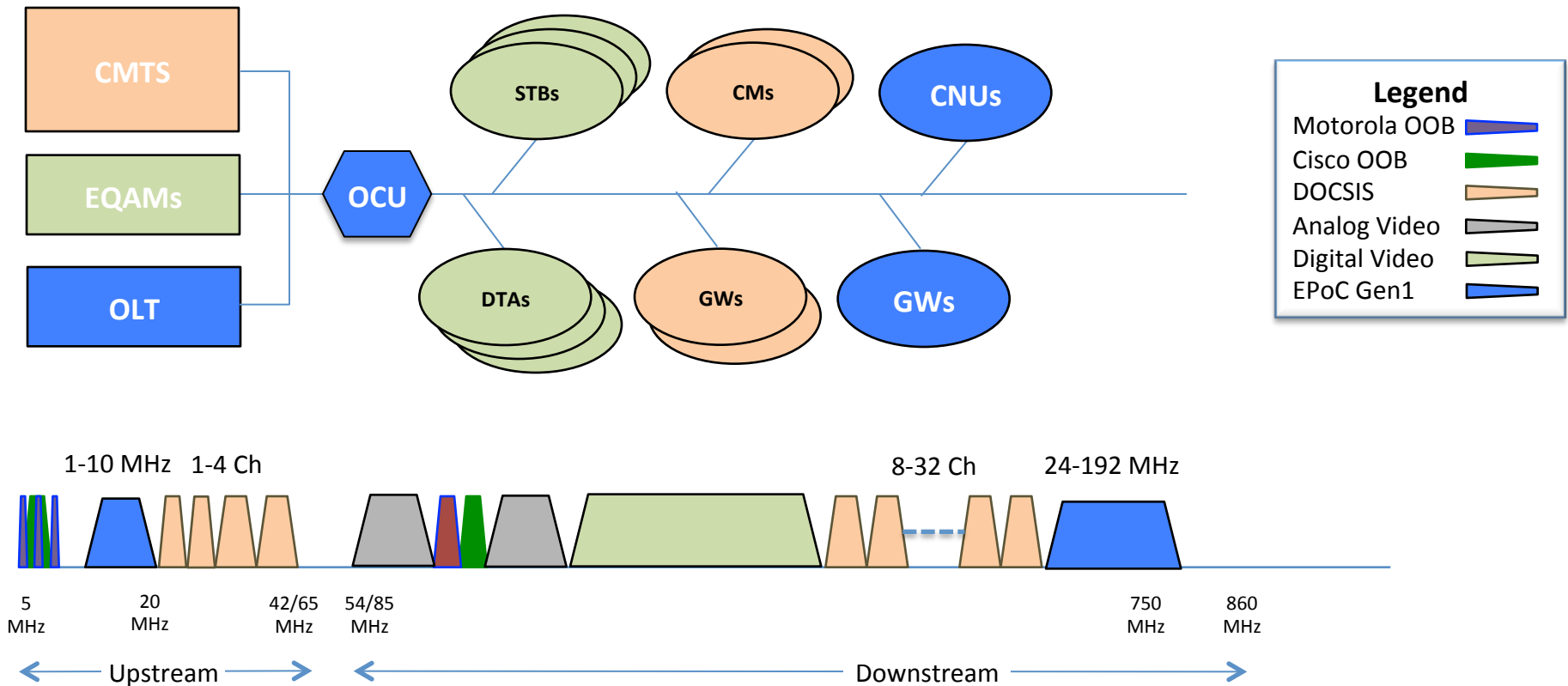
- Upon initial deployment, CNUs and OCUs will support a given amount of spectrum that is less than the maximum possible
- Over time, as additional capacity and peak speeds are needed to support growth, and/or additional spectrum becomes available, CNUs and OCUs will support increased spectrum
- Eventually, as capacity and allocated spectrum are increased, new higher capacity OLT, OCU and CNUs will be deployed
- Given operational considerations, such as the need to support a smooth migration and/or to amortize the deployed equipment, it is necessary for the OLT, OCUs and CNUs to provide backward and forward compatibility
- This presentation outlines use cases where compatibility is required, and presents a motion to support such compatibility

The use case for this discussion focuses on the FDD use cases described in “MSO Use Case Topologies for EPoC” presented by Ed Mallette on behalf of MSOs on March 2012 Plenary (see below), in which the signals generated by the OCU are transmitted through the active components of the HFC network in two typical scenarios



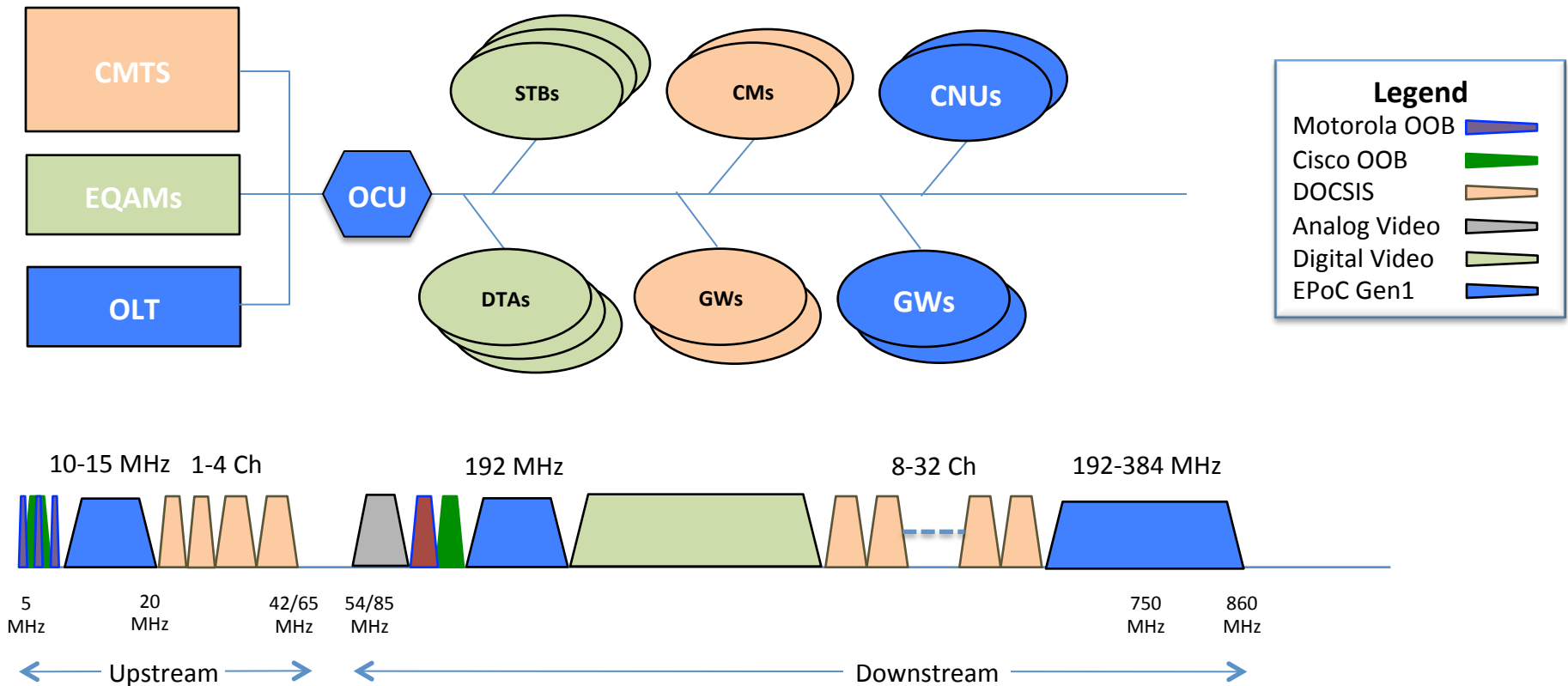
NOTE: The same deployment and growth scenario would also apply to TDD

FDD System Example – Initial Deployment



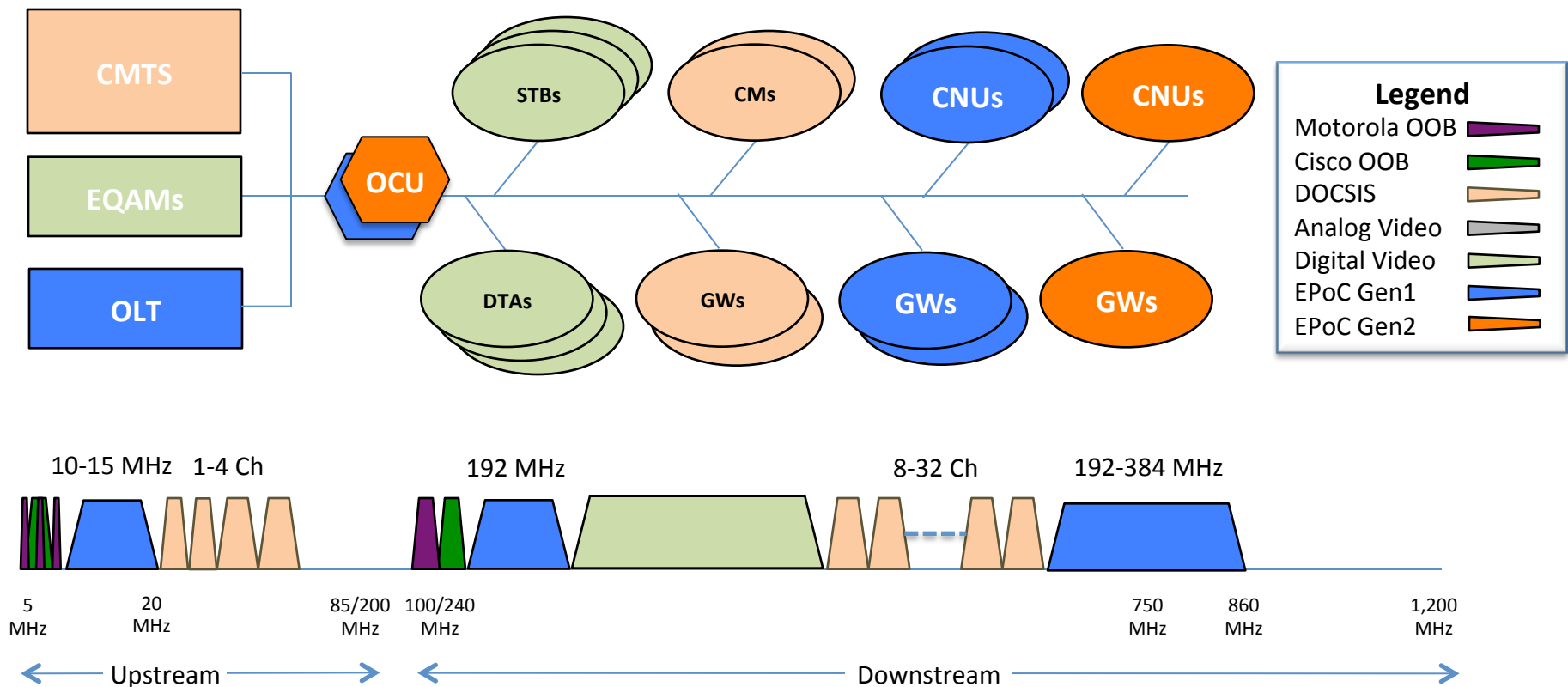
- 42 MHz or 65 MHz upstream and 750 MHz or 860 MHz downstream systems
- Little upstream and downstream spectrum available
- Legacy out-of-band (Moto: 3 x 0.2 MHz US & 1.5 MHz DS; Cisco: 2 MHz US & 2 MHz DS)
- Lots of spectrum allocated to set-top boxes and digital terminal adapters
- Considerable upstream and downstream allocated to DOCSIS cable modems and gateways
- Some upstream and downstream spectrum allocated to EPoC CNU and gateways

FDD System Example – Some EPoC Growth



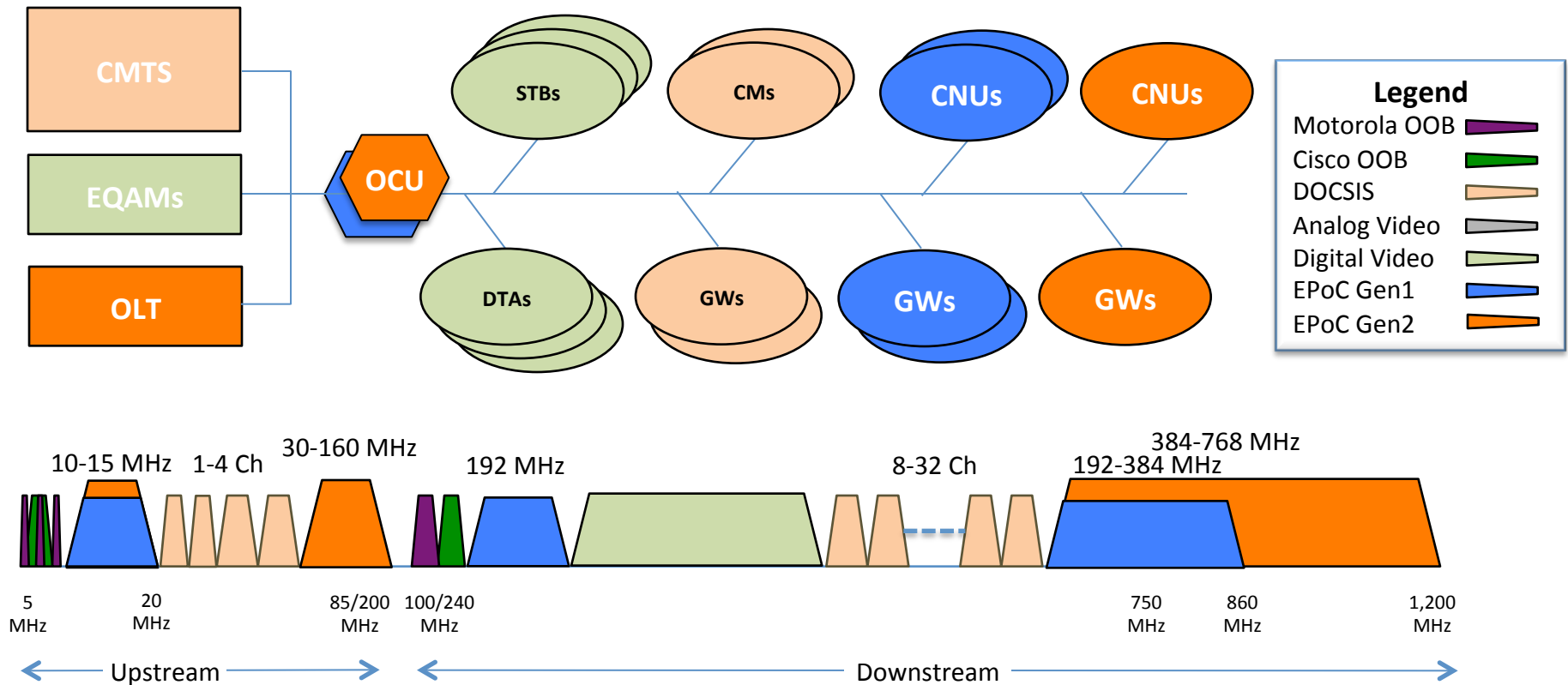
- Spectrum becomes available, such as when less spectrum is used by analog channels
- Therefore, more upstream and downstream spectrum is allocated to EPoC CNUs and gateways, but still supported by the initially deployed OCU and CNUs
- More EPoC CNUs and gateways deployed to support penetration growth

FDD System Example – Prepare Additional Growth



- Expansion of the available upstream and downstream spectrum in the network could be implemented, but still not used (in preparation for expected capacity and peak rate growth)
- New generation OCUs are deployed (or current ones upgraded) to support the expected expanded spectrum capacity, but operate within the currently used spectrum
- New generation EPoC CNUs and gateways are deployed which use the existing spectrum
- Older and newer generation OCUs support older and newer generation CNUs simultaneously
- Currently deployed OLT supports older and newer generation OCUs simultaneously

FDD System Example – Considerable EPoC Growth



- New generation OLT is deployed to support the needed capacity and peak speed growth
- Upstream and downstream capacity in the expanded spectrum is now allocated to EPoC CNUs and gateways
- New generation OLT is supported by the older and newer OCU and CNUs simultaneously
- Newer generation OCUs and CNUs are able to use the entire spectrum originally allocated for older generation OCUs and CNUs as well as the newly allocated spectrum

Summary of Scenario

- Gen1 CNUs and OCUs will support a given amount of spectrum that is less than the maximum possible
- As additional spectrum is allocated, Gen 1 CNUs and OCUs should support increased spectrum up to the implemented amount
- Eventually more spectrum is allocated than Gen 1 OCUs and CNUs are implemented to support, so higher capacity Gen 2 OCU and CNUs are deployed

Existing Objectives and Motions

- One of our Objectives states: “Maintain compatibility with 1G-EPON and 10G-EPON, as currently defined in IEEE Std. 802.3 with minimal augmentation to MPCP and/or OAM if needed to support the new PHY”, and
- And, a Motion adopted in our Geneva meeting indicates: “The standard shall support the ability for higher capacity by combining multiple 192 MHz OFDM channels”.
- However, the above Objective and Motion do not outline requirements to support compatibility between components; we believe that additional functionality is needed to ensure OCU and CNU compatibility through multiple generations

Planned Motion

- The standard shall provide backward and forward compatibility such that new generation EPoC devices (e.g., OCUs and CNU) supporting additional spectrum capacity can simultaneously interoperate with newer and older generation EPoC devices with varying spectrum capacities
- Moved: Jorge Salinger
- Seconded: Matt Schmitt
- Type:
- YES:
- NO:
- Abstain: