EPON over Coax

TDD Open Items and Checklist

Steve Shellhammer and Andrea Garavaglia
(Qualcomm)

Abstract

- This presentation is for program management of the TDD sub-Task Force
- It captures all the items that need to be accomplished by the TDD sub-Task Force
- It can be used to track progress and to make sure we do not forget anything
- This presentation will be updated periodically to track our progress
- There is one slide listing all the areas of work for the TDD sub-TF
- There is a slide for each area of work providing a breakdown of the task and references to submissions covering those areas

Areas of Work for TDD sub-Task Force

	Area of Work	Description
1	Multipoint MAC Control Enhancements	Add local gate messages and other features to support burst mode in the downstream and restrict transmissions to proper TDD windows
2	PHY Layer extensions	Identification of US/DS windows
3	Permitted TDD Cycles	The standard will allow for a set of possible TDD cycles specifying the DS and US intervals and also the guard intervals
4	Inputs to PHY Link Ad Hoc	Information needs to be sent over the PHY Link channel regarding TDD parameters. This is the input to the PLC Ad Hoc
5	Other Areas???	

Multipoint MAC Control Enhancements

- MPMC decides on downstream operations based on configured TDD cycle in the CLT
- The MPMC layer at the CLT implements local gate messages and signals (transmitAllowed) to set the CLT in RX or TX status according to TDD cycle

Multipoint MAC Control Enhancements (cont.)

- Upstream uses GATE/REPORT mechanism as in the FDD mode
- CLT restricts transmissions based on TDD cycle
  - No DS transmission during US transmit window or during guard intervals
  - For US, GATE assigns grants active only during US transmit window.
- Evaluate extensions in GATE/Report messages
- The above has been considered in [1] and [2]

PHY layer extensions

- Impacts to the CLT PCS
  - Needs to trigger the switch between DS (TX) to US (RX) mode (and vice versa)
    - When the DS window is open the PHY layer can transmit
    - When the US window is open the PHY layer shall not transmit
  - Need to handle idle deletion for TDD cycle timeline (e.g. via configuration of TDD cycle)
  - Data detector in the PCS identifies the DS and US window and provide indications of switching between TX and RX in the PHY
- Impacts to the CNU PCS
  - Mechanism to trigger between reception (DS) and not-receive (US with no grant) required
- The above has been considered in [1]

TDD Cycles Settings

- Need to specify a set of permitted TDD cycles
  - Need to agree on specification for a TDD cycle
  - Then enumerate all permitted TDD cycles
- The permitted values of the US and DS windows may depend on the OFDM burst duration, the OFDM symbol duration (symbol and CP), interleaver, FEC codeword, etc.
  - PHY sub-Task Force working on design of OFDM burst

TDD cycle parameters and PHY Link

- The PHY link protocol is expected to carry some TDD specific information required by the CNU when setting up the PHY link
- The PHY link procedures need to allow all permitted TDD cycles
- This is discussed in [3]

Multipoint MAC Control Enhancements

Item	Submission	Status (Open, Submission or Approved by sub-TF)
CLT Local Gate	garavaglia_02a_0113	Approved by sub-TF as starting point for baseline
CLT Gate Processing	garavaglia_02a_0113	Approved by sub-TF as starting point for baseline
CLT TransmitAllowed	garavaglia_02a_0113	Approved by sub-TF as starting point for baseline
CLT Control Multiplexer based on TransmitAllowed	garavaglia_02a_0113	Approved by sub-TF as starting point for baseline
…		

PHY Layer Extensions

Item	Submission	Status (Open, Submission or Approved by sub-TF)
Trigger in CLT to switch between TX and RX	garavaglia_02a_0113	Approved by sub-TF as starting point for baseline
…		

Permitted TDD Cycles and Configuration

Item	Submission	Status (Open, Submission or Approved by sub-TF)
Format for Specifying TDD Cycle		
Permitted TDD Cycle		
Configuration of TDD Cycle via MDIO		
TDD Cycle communicated to PHY at CNU to aid receiver		

Input to PLC Ad Hoc

Item	Submission	Status (Open, Submission or Approved by sub-TF)
Recommended TDD Cycle Descriptor		
….		

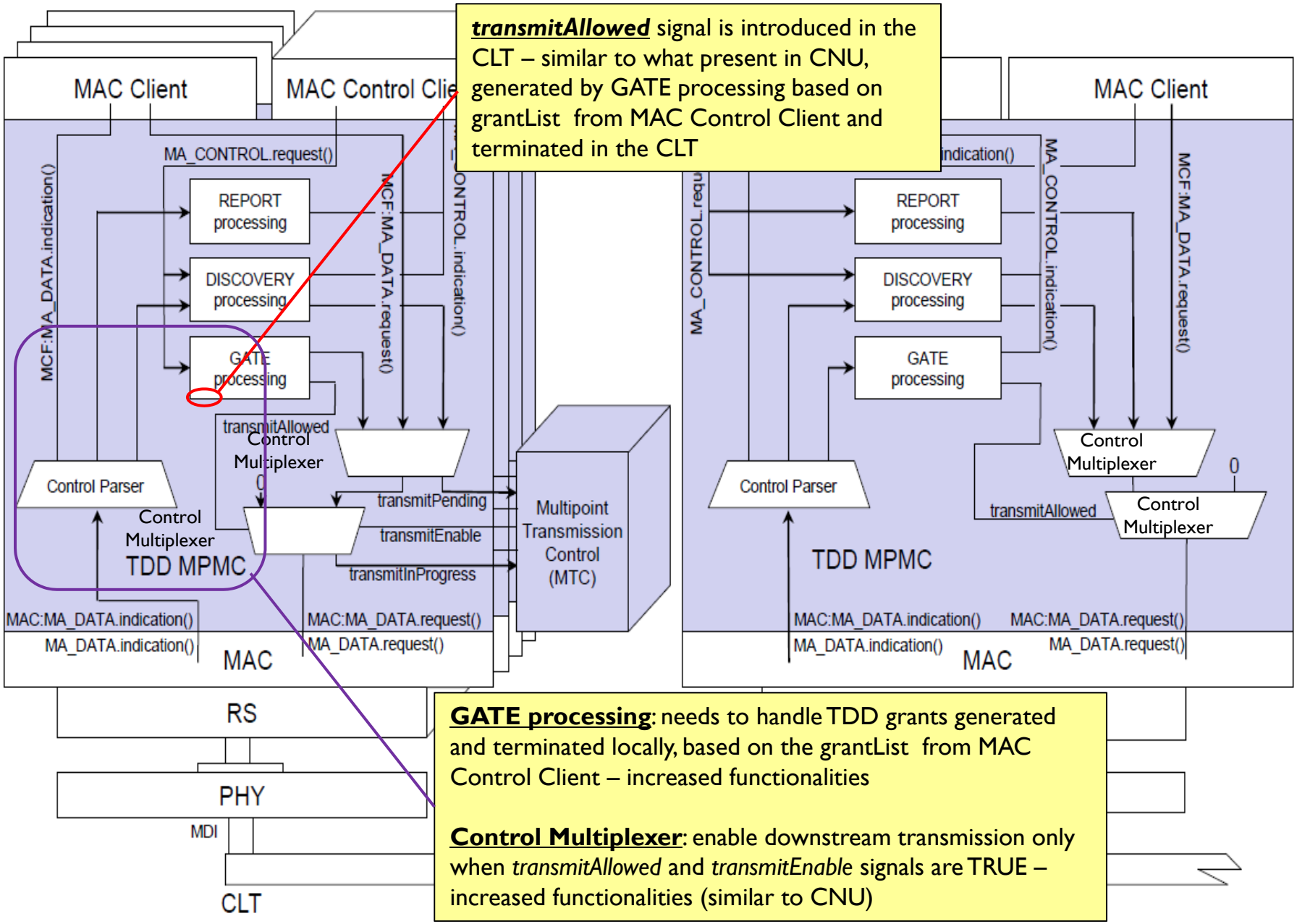
Other Areas

- Other Areas to capture in this plan?

References

1. Andrea Garavaglia and Patrick Stupar, "EPoC TDD (baseline proposal)," garavaglia_02a_0113, January 2013
2. Andrea Garavaglia and Patrick Stupar, Summary Presentation for TDD MPCP Enhancements (baseline proposal), garavaglia_01_0313, March 2013
3. Nicola Varanese, "PHY Link Channel," March 2013

TDD operation – CLT Multipoint MAC Control



transmitAllowed signal is introduced in the CLT – similar to what present in CNU, generated by GATE processing based on grantList from MAC Control Client and terminated in the CLT

GATE processing: needs to handle TDD grants generated and terminated locally, based on the grantList from MAC Control Client – increased functionalities

Control Multiplexer: enable downstream transmission only when *transmitAllowed* and *transmitEnable* signals are TRUE – increased functionalities (similar to CNU)

Multipoint MAC Control – from [2] "IEEE 802.3 Architecture" – law_01a_1112.pdf