

# IEEE P802.3bn Work Items for July 2014

Status: S = baseline starting point, B = baseline proposal, D = in draft, N/A = not applicable, <blank> = no status

## Downstream PHY Layer

Item	Status	Notes / Comment / References
Downstream TX Block Diagram	D	
Reconciliation	N/A	No changes
1.6 Gb/s at MAC / PLS service interface in 192 MHz, in baseline channel conditions		TD#40: <a href="#">remein 3bn 07 0313.pdf</a> (needs analysis)
<b>PCS (transmitting):</b>		
<ul style="list-style-type: none"> <li>• 64B/66B Encoder / Decoder</li> </ul>	D	TD#20 (65b); TD#46: <a href="#">hajduczenia 3bn 04 0513.pdf</a> TD#50 (continuous vector, no split);
<ul style="list-style-type: none"> <li>• FEC and Data Detector</li> </ul>		TD#4 (LDPC); TD#47: <a href="#">prodan 3bn 01 0513.pdf</a> ; TD#94: <a href="#">hajduczenia 3bn 01a 0913.pdf</a>
<ul style="list-style-type: none"> <li>○ LDPC</li> </ul>	D	TD#81: <a href="#">prodan 3bn 01a 0713.pdf</a> ; TD#95 (FDD codes for Node+N, N≥0)
<ul style="list-style-type: none"> <li>○ MTTFPA</li> </ul>	D	TD#82 (objective); TD#93: <a href="#">prodan 3bn 02a 0913.pdf</a>
<ul style="list-style-type: none"> <li>• NCP generation</li> </ul>	S	TD#51 (PHY LINK Codeword Pointer)
<ul style="list-style-type: none"> <li>• Scrambler</li> </ul>		TD#128: <a href="#">montreuil 3bn 01a 0514.pdf</a>
<ul style="list-style-type: none"> <li>• Gearbox</li> </ul>	S	TD#117 ( <a href="#">boyd 3bn 03 0114.pdf</a> )
<ul style="list-style-type: none"> <li>• IDLE Delete</li> </ul>	S	TD#118 ( <a href="#">boyd 3bn 03 0114.pdf</a> )
<b>PCS (receiving):</b>		
<ul style="list-style-type: none"> <li>• NCP processing</li> </ul>		
<b>PCS / PMA Service Interface</b>		
<b>PMA:</b>		
<ul style="list-style-type: none"> <li>• Symbol Mapper</li> </ul>	D	TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses`</a>
<ul style="list-style-type: none"> <li>○ Constellation Mapping</li> </ul>	D	TD#103: <a href="#">prodan 3bn 02 1113.pdf</a> <a href="#">shen_3bn_01_140226_Constellation.pdf</a> (comment resolution)
<ul style="list-style-type: none"> <li>• Interleaving <ul style="list-style-type: none"> <li>○ Time</li> <li>○ Frequency (Rich, Avi)</li> </ul> </li> </ul>	D	TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a> Frequency interleaving text is preliminary.

<ul style="list-style-type: none"> <li>Pilot Insertion (Avi, Christian, Jin)</li> </ul>	D	TD#29: <a href="#">pietsch 3bn 01 0313.pdf</a> , <a href="#">kliger 3bn 01 0313.pdf</a> ; TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a>
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Pilot structure</li> </ul> </li> </ul>	D	TD#60: <a href="#">kliger 3bn 02 0513.pdf</a> <a href="#">pietsch 3bn 01 0313.pdf</a> ; TD#67: <a href="#">kliger 3bn 02 0513.pdf</a> ; TD#79: <a href="#">kliger 3bn 02a 0713.pdf</a> TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a>
<ul style="list-style-type: none"> <li>IFFT / IDFT</li> </ul>	D	TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a>
<ul style="list-style-type: none"> <li>Cyclic Prefix and Windowing</li> </ul>	D	TD#23: <a href="#">montreuil 01a 0113.pdf</a> ; TD#63: <a href="#">pietsch 3bn 02 0313.pdf</a> ; TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a>
<ul style="list-style-type: none"> <li>Subcarrier Configuration               <ul style="list-style-type: none"> <li>QAM Mapping</li> </ul> </li> <li>Bit Loading</li> </ul>	D	TD#103: <a href="#">prodan 3bn 02 1113.pdf</a> TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a>
<ul style="list-style-type: none"> <li>Pilot Map</li> </ul>	D	TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a> TD#132: <a href="#">Draft 0.5 Comment Approved Responses</a>
<ul style="list-style-type: none"> <li>PMA Other</li> </ul>		
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Exclusion Rules</li> </ul> </li> </ul>	S	TD#5 (exclusions); TD#14 (placement); TD#55 (m, m+1, ...); TD#56 (internal, band edge); TD#57 (2 band-edge); TD#58 (minimum internal 1MHz); TD#59 (fixed number internal in 192 MHz); TD#69 (start, integer number sub-carriers); TD#70 (mapping to sub-carriers); TD#71 (at most 16); TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a>
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Cycle Structure and Initialization</li> </ul> </li> </ul>		NCP, scrambler init coupled to PHY LINK cycle
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Multiple OFDM Channels (Mark, Avi, ...)</li> </ul> </li> </ul>		TD#8 (higher capacity)
<b>PMA / PMD Service Interface</b>	D	TD#127 D0.4 Bulk
<b>PMD:</b>		
<ul style="list-style-type: none"> <li>Electrical Input / Output</li> </ul>	D	
<ul style="list-style-type: none"> <li>Fidelity</li> </ul>	D	TD#104: <a href="#">rahman saif 3bn 02 1113.pdf</a>
<ul style="list-style-type: none"> <li>MDI</li> </ul>	D	
<b>Other:</b>		
<ul style="list-style-type: none"> <li>OFDM Numerology</li> </ul>	D	TD#2 (OFDM); TD#6 (multiple modulation orders); TD#7 (192 MHz, 10.24 MHz); TD#9 (Scaling); TD#30 (granularity of Fc);

		TD#31 (upper bound to 5GHz) TD#35 (minimum contiguous 24 MHz); TD#72 (FDD RF Spectrum); TD#74: <a href="#">rahman saif 3bn 01 0713.pdf</a> ; TD#78: <a href="#">solomon 3bn 02b 0713.pdf</a> ; TD#89 (FDD 5 to 234 MHz );
• Channel Model	D	TD#15: <a href="#">howald 01a 0113.pdf</a>
• CNU and CLT Receive Direction:		
• Rx Idle Deletion	D	TD#42 (Like 10G-EPON)
• Rx Idle Insertion	D	TD#43 (Like 10G-EPON with changes); TD#48: <a href="#">hajduczenia 3bn 01 0513.pdf</a>
• CNU and CLT Transmit Direction:		
• Tx Idle Insertion	B	TD#44 (Like 10G-EPON with changes); TD#49: <a href="#">garavaglia 3bn 02a 0513.pdf</a> See Clause 103.2.2
• Tx Idle Deletion	D	TD#45 (Like 10G-EPON with changes); TD#48: <a href="#">hajduczenia 3bn 01 0513.pdf</a>
• Downstream PHY Block Diagram	D	TD#91: <a href="#">kliger 3bn 01a 0913.pdf</a>
• Subcarrier Clocking, Accuracy	D	TD#110: <a href="#">laubach 3bn 04c 1113.pdf</a>

## Upstream PHY

Item	Status	Notes / Comment / References
Upstream TX Block Diagram	D	TD#107: <a href="#">kliger 3bn 01a 1113.pdf</a> TD#125: <a href="#">laubach 3bn 02 0314.pdf</a>
Reconciliation	N/A	No changes
<b>Upstream OFDM (Super) Frame</b>		
• OFDM frames, Data vs PHY Link, probes		
<b>PCS:</b>		
• Rate Adaptation		
• 64B/66B Encoder / Decoder	D	TD#20 (65b); TD#46: <a href="#">hajduczenia 3bn 04 0513.pdf</a> ; TD#50 (continuous vector, no split);
• FEC Encoder and Data Detector:		TD#47: <a href="#">prodan 3bn 01 0513.pdf</a>
○ FEC Codewords	D	TD#81: <a href="#">prodan 3bn 01a 0713.pdf</a> ; TD#92: <a href="#">shen 3bn 01 0913.pdf</a> ; TD#95 (FDD codes for Node+N, N≥0)
○ Codeword Builder (Rich)	B	TD#103: <a href="#">prodan 3bn 01 1113.pdf</a>
○ MTTFPA	D	TD#82 (objective); TD#93: <a href="#">prodan 3bn 02a 0913.pdf</a>
• Scrambler	B	TD#128: <a href="#">montreuil 3bn 01a 0514.pdf</a>
• Gearbox		Is this the similar to DS?
<b>PCS / PMA Service Interface</b>		
<b>PMA:</b>		
• Symbol Mapper		
○ Constellation Mapping	D	TD#103: <a href="#">prodan 3bn 02 1113.pdf</a>
• Interleaving		
○ Pilot Pattern (Avi, others)	S	TD#61: <a href="#">pietsch 3bn 01 0513.pdf</a> <a href="#">kliger 3bn 01 0313.pdf</a> <a href="#">pietsch 3bn 01 0513.pdf</a>
○ Interleaver (Duane, Avi)		

• Pilot and Marker Insertion		TD#131: <a href="#">montreuil 3bn 05a 0514.pdf</a>
• IFFT / IDFT	D	?same as downstream?
• Pre-Equalization	D	TD#64: <a href="#">montreuil 01 0512.pdf</a> <a href="#">kliger 01a 0912.pdf</a>
• Cyclic Prefix and Windowing	D	TD#23: <a href="#">montreuil 01a 0113.pdf</a> ;
• OFDM (Super) Frame Configuration and Bit Loading		
○ Superframe structure		
○ Burst Structure / Resource Blocks	S	TD#61: <a href="#">pietsch 3bn 01 0513.pdf</a> <a href="#">kliger 3bn 01 0313.pdf</a> <a href="#">pietsch 3bn 01 0513.pdf</a> <a href="#">TD#124 (8, 12, and 16 symbols)</a> TD#80: <a href="#">kliger 3bn 03 0713.pdf</a>
○ Burst Markers	D	TD#25 (start / stop markers); TD#28 (marker definition); TD#97: <a href="#">rahman syed 3bn 01 0913.pdf</a> ; TD#109: <a href="#">rahman syed 3bn 01 1113.pdf</a> TD#126: <a href="#">montreuil 3bn 01b 0314.pdf</a>
• Framing Timing		
• Probe Generator	B	TD#129: <a href="#">montreuil 3bn 02a 0514.pdf</a>
• PMA Other		
○ Exclusion Rules		TD#5 (exclusions); TD#14 (placement); TD#24 ( 192 MHz and exclusions); TD#55 (m, m+1, ...); TD#56 (internal, band edge); TD#57 (2 band-edge); TD#58 (minimum internal 1MHz); TD#59 (fixed number internal in 192 MHz); TD#69 (start, integer number sub-carriers);
○ Multiple OFDM Channels (Mark, Avi, ...)		TD#8 (higher capacity) Consider removing
○ 1D-to-2D subcarrier assignment, etc.	S	TD#121 ( <a href="#">boyd 3bn 02 0114.pdf</a> )
<b>PMA / PMD Service Interface</b>	D	TD#127 D0.4 Bulk
<b>PMD:</b>		
• Electrical Input / Output		
• Fidelity		
• MDI		
<b>Other:</b>		
• OFDM Numerology	S	TD#3 (OFDMA); TD#9 (scaling); TD#17 (25 kHz and 50 kHz spacing); TD#24 ( 192 MHz and exclusions); TD#30 (granularity of Fc); TD#31 (upper bound to 5GHz); TD#72 (FDD RF Spectrum); TD#74: <a href="#">rahman saif 3bn 01 0713.pdf</a> ; TD#78: <a href="#">solomon 3bn 02b 0713.pdf</a> ; TD#89 (FDD 5 to 234 MHz );
• Channel Model	D	See Annex 100A

## MPCP

Item	Status	Notes / Comment / References
<b>MPCP:</b>		
• Rate Adaptation	D	
• FEC Adaptation / Impact (Duane)	D	
• Gate / Report calculation changes	D	
<b>MPCP Interoperation:</b>		
• MAC Discovery and registration verification ( )		Not sure there is anything to do here
• tqSize, OctetsRemaining, PHY_DATA_SIZE & PHY_OVERHEAD_SIZE, fecOffset, packet_initiate_delay, CheckGrantSize, PMD_OverheadT	D	TD#112: <a href="#">remein_3bn_06_1113.pdf</a>

## Downstream PHY Link

Item	Status	Notes / Comment / References
• Performance study		
<b>PHY LINK Framing</b>		TD#38 (PHY Link framing)
• Preamble	D	TD#76: <a href="#">montreuil_3bn_01_0713.pdf</a>
• PHY LinK Frame	D	
<b>PHY LINK Messages and Protocol</b>		
• Content	D	TD#77: <a href="#">kliger_3bn_01b_0713.pdf</a>
• Protocol	D	
• PHY Discovery	D	TD#119 ( <a href="#">remein_3bn_05_0114.pdf</a> )
<b>PHY LINK Insertions:</b>		
• NCP	D	There is just the barest mention of NPC
• Timestamp MB	D	
• EE MB		(no work done – evaluate)
• Trigger MB		(PNM, evaluate PHY impact only (not mgmt.) Do we need this for EPoC?
<b>PHY LINK Numerology:</b>		
• 16 QAM fixed	D	TD#11 (16 QAM)
• CP and sub-carrier spacing same as data channel (Duane, acquisition)	D	TD#13 (same CP/sub-carrier spacing) (requirement to be added against D0.5)
• 400 KHz wide without continuous pilots.	D	TD#39 (as described)
• PHY LINK Placement 3MHz either side	D	TD#62 (3 MHz either side)
<b>PHY Link Receiver</b>		
• CNU auto-detect CP / windowing	D	TD#12 (CP)
<b>FEC</b>		
• Definitions	D	TD#36 (ECC); TD#75: <a href="#">shen_3bn_01_0713.pdf</a> <a href="#">TD#120(shen_3bn_01_0114.docx)</a>
• Use	D	
Scrambler	D	TD#128: <a href="#">montreuil_3bn_01a_0514.pdf</a>
Time Interleaving	D	(needs detail / attention / update)
Symbol Mapper	D	(needs attention / update)

## Upstream PHY Link

Item	Status	Notes / Comment / References
<b>Upstream (super) frame</b>		
<ul style="list-style-type: none"> <li>OFDMA frames, PHY Link signals</li> <li>Frame configuration</li> </ul>		
<b>PHY LINK Signals / Messages:</b>		
<ul style="list-style-type: none"> <li>Messages / Content</li> </ul>	D	TD#77: <a href="#">kliger 3bn 01b 0713.pdf</a>
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Protocol</li> </ul> </li> </ul>	D	
<ul style="list-style-type: none"> <li>PHY Discovery</li> </ul>	D	
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Fixed preamble</li> </ul> </li> </ul>	D	TD#130: <a href="#">montreuil 3bn 03a 0514.pdf</a>
<ul style="list-style-type: none"> <li>Fine ranging</li> </ul>	D	(only FEC)
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Fixed preamble</li> </ul> </li> </ul>		
<b>FEC</b>		
<ul style="list-style-type: none"> <li>Definitions</li> </ul>	D	TD#36 (ECC); TD#75: <a href="#">shen 3bn 01 0713.pdf</a> TD#105: <a href="#">shen 3bn 01 1113.pdf</a> <a href="#">TD#120 (shen 3bn 01 0114.docx)</a>
<ul style="list-style-type: none"> <li>Use</li> </ul>	D	
Scrambler	D	(assumption same as downstream) TD#128: <a href="#">montreuil 3bn 01a 0514.pdf</a>
Symbol Mapper	D	
<b>Wide Band Probing</b>	D	TD#66: <a href="#">montreuil 3bn 01a 0513.pdf</a> ; TD#98: <a href="#">rahman syed 3bn 01 0313.pdf</a> ; TD#106: <a href="#">rahman syed 3bn 02 1113.pdf</a>
<ul style="list-style-type: none"> <li>MPCP impact / coordination</li> </ul>		Needs concept, tied with framing

## PHY Link Other

Item	Status	Notes / Comment / References
PHY LINK Starting Point	D	TD#53: <a href="#">boyd 3bn 02 0513.pdf</a>
PHY LINK Baseline Work	D	TD#99: <a href="#">remein 3bn 03a 0913.pdf</a> ; TD#113: <a href="#">remein 3bn 07 1113.pdf</a> <a href="#">remein 3bn 08 1113.pdf</a>
PHY LINK Transparency, shall not add jitter or latency to the data	D	TD#21 (transparency);
<ul style="list-style-type: none"> <li>No additional buffering</li> </ul>	D	TD#37 (repeat of TD#21 with buffering)
<b>PHY Link and procedures:</b> (Avi, Duane, Jin)		
<ul style="list-style-type: none"> <li>“Bring up” through auto-negotiation to Linked</li> </ul>	D	(beginnings, needs additional detail)
<ul style="list-style-type: none"> <li>“Ranging” and symbol synchronization (Bill, Leo, Avi, Hesham)</li> </ul>	D	(not complete, high level only)
<b>PHY Link acquisition:</b>		
<ul style="list-style-type: none"> <li>“Lock” and acquisition</li> </ul>	D	(needs some work)

## System Issues

Item	Status	Notes / Comment / References
Clocking / jitter		
Time Synchronization (Bill)		
MDIO registers to report on subcarrier or subcarrier group, signal parameters including quality.		TD#34 (MDIO registers to report...) TD#116 (MIDO register baseline material) (some initial work in draft)
Exclusion Bands Configuration		
<ul style="list-style-type: none"> <li>By MDIO</li> </ul>	D	TD#32 (Exclusion bands configured by MDIO) (clause 45 registers) TD#33 (Exclusion bands configured by PHY LINK)
"Lost sync" and recovery / reset procedures		
<b>Performance Analysis:</b>		
<ul style="list-style-type: none"> <li>Baseline Channel Conditions</li> </ul>	D	TD#18: <a href="#">remein_3bn_07_0313.pdf</a>
<ul style="list-style-type: none"> <li>Exemplar Channel Conditions</li> </ul>	N/A	TD#54: <a href="#">howald_3bn_02_0313.pdf</a> (not needed in draft)
<ul style="list-style-type: none"> <li>EPoC Delay evaluation</li> </ul>		TD#41: <a href="#">garavaglia_02_0912.pdf</a>
<ul style="list-style-type: none"> <li>Error analysis</li> </ul>		
<ul style="list-style-type: none"> <li>Jitter</li> </ul>		
Power Saving, study support for configurable mechanism. (Adopt SIEPON and apply to EPoC as appropriate.)		TD#1: <a href="#">hajduczenia_05a_0912.pdf</a> Can we eliminate the EE MB in the PHY Link section above?

## Proactive Network Management

Item	Status	Notes / Comment / References
Below is based on <a href="#">currivan_3bn_01_1113.pdf</a>		Need to update/sync with any changes since then.
<b>CNU Downstream Performance Metrics</b>		
Per Data Channel:		
<ul style="list-style-type: none"> <li>Uncorrectable codewords (CRC-40 fail)</li> </ul>	D	FecCodeWordFail
<ul style="list-style-type: none"> <li>Total number of data FEC codewords</li> </ul>	D	FecCodeWordCount, FecCodeWordSuccess
<ul style="list-style-type: none"> <li>RxMER: Per subcarrier ratio of average power of the equalized QAM constellation to the average error-vector power. For Continuous Pilots, difference between the equalized receive pilot value and the known correct pilot value.</li> </ul>		Need to look at specifically what to put in EPoC PHY draft to support this.
<ul style="list-style-type: none"> <li>Codeword error ratio versus time (seconds): Ratio of number of uncorrectable codewords to total number of codewords in each one-second interval for a rolling 10-minute period (600 values)</li> </ul>		Need to look at specifically what to put in EPoC PHY draft to support this. This should be a higher layer function and not part of the PHY
<ul style="list-style-type: none"> <li>Codeword error ratio versus. time (minutes): Ratio of number of uncorrectable codewords to total number of codewords in each one-minute interval</li> </ul>		Need to look at specifically what to put in EPoC PHY draft to support this. This should be a higher layer function and not part of the PHY

for a rolling 24-hour period (1440 values).		
<ul style="list-style-type: none"> <li>Ending time of rolling period</li> </ul>		Need to look at specifically what to put in EPoC PHY draft to support this. This should be a higher layer function and not part of the PHY
PHY Link:		
<ul style="list-style-type: none"> <li>Uncorrectable codewords (CRC-32 fail)</li> </ul>		
<ul style="list-style-type: none"> <li>Total number of PHY Link codewords</li> </ul>		
<b>CLT Upstream Performance Metrics</b>		
Per Data Channel:		
<ul style="list-style-type: none"> <li>Uncorrectable codewords (CRC-40 fail)</li> </ul>		
<ul style="list-style-type: none"> <li>Total number of data FEC codewords</li> </ul>		
<ul style="list-style-type: none"> <li>Provide the following FEC summaries over a period of up to 10 minutes for any single upstream user <ul style="list-style-type: none"> <li>Total number of seconds</li> <li>Number of errored seconds (seconds during which at least one unreliable codeword occurred)</li> <li>Count of codeword errors (uncorrectable codewords) in each 1-second interval</li> <li>Start and stop time of summary</li> </ul> </li> </ul>		Need to look at specifically what to put in EPoC PHY draft to support this. This should be a higher layer function and not part of the PHY
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PHY Link:		
<ul style="list-style-type: none"> <li>Uncorrectable codewords (CRC-32 fail)</li> </ul>		
<ul style="list-style-type: none"> <li>Total number of PHY Link codewords</li> </ul>		
<b>Other</b>		
<ul style="list-style-type: none"> <li>Downstream PHY Link support for Trigger administration</li> </ul>		Need work to partition what is in the PHY versus what is in the D3.1 trigger "system" and then what needs to go into other CableLabs specifications.



## Objectives

Status: M = met in Task Force draft

Item	Status	Notes / Comment / References
Specify a PHY to support subscriber access networks capable of supporting burst mode and continuous mode operation using the EPON protocol and operating on point-to-multipoint RF distribution plants comprised of either amplified or passive coaxial media.		Evaluate when TF draft is "complete". Note: continuous mode for downstream, burst mode upstream, no changes should be needed.
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.		Evaluate when TF draft is "complete".
Define required plant configurations and conditions within an overall coaxial network operating model.		DS electrical / fidelity and channel model done. Waiting on US for both.
Provide a physical layer specification that is capable of:		
<ul style="list-style-type: none"> <li>A baseline data rate of 1 Gb/s at the MAC/PLS service interface when transmitting in 120 MHz, or less, of assigned spectrum under defined baseline plant conditions;</li> </ul>		Needs analysis.
<ul style="list-style-type: none"> <li>A data rate lower than the baseline data rate when transmitting in less than 120 MHz of assigned spectrum or under poorer than defined plant conditions;</li> </ul>		Needs analysis.
<ul style="list-style-type: none"> <li>A data rate higher than the 1Gb/s baseline data rate and up to 10 Gb/s when transmitting in assigned spectrum and <i>in</i> channel conditions that permit.</li> </ul>		Waiting on multiple OFDM channel architecture.
PHY to support symmetric and asymmetric data rate operation.	M	
PHY to support symmetric and asymmetric spectrum assignment for bidirectional transmission.	M	
PHY to support independent configuration of upstream and downstream transmission operating parameters.	M	
PHY to operate in the cable spectrum assigned for its operation without causing harmful interference to any signals or services carried in the remainder of the cable spectrum.		DS electrical / fidelity / spurious done. Waiting on US.
PHY to have:		
<ul style="list-style-type: none"> <li>a downstream frame error ratio better than <math>10^{-6}</math> at the MAC/PLS service interface;</li> </ul>		Done with FEC analysis?
<ul style="list-style-type: none"> <li>an upstream frame error ratio better than <math>5 \times 10^{-5}</math> at the MAC/PLS service interface.</li> </ul>		Done with FEC analysis?
Define Energy Efficient Ethernet operation for EPON Protocol over Coax PHYs.		Awaiting any draft text on EEE or power saving options for EPoC.
Mean Time To False Packet Acceptance at least equal to $1.4 \times 10^{10}$ years.	M	

**PAR**

Item	Status	Notes / Comment / References
5.2.b.: The project is to amend IEEE Std 802.3 to add physical layer specifications and management parameters for symmetric and/or asymmetric operation of up to 10 Gb/s on point-to-multipoint Radio Frequency (RF) distribution plants comprising either amplified or passive coaxial media. It also extends the operation of Ethernet Passive Optical Networks (EPON) protocols, such as MultiPoint Control Protocol (MPCP) and Operation Administration and Management (OAM).		
8.1: The amendment will comply with IEEE Std 802, IEEE Std 802.1D, and IEEE Std 802.1Q.		