Cl **00** *SC* **0** *P* **21** *L* **20** # 170
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

what is "full tunability" vs. just tunability?

SuggestedRemedy

strike "full"

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **23** *L* **22** # 171
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Imprecise language - "In this case, the taps nearer the OLT diverts a smaller fraction of power than the taps farther away, resulting in approximately equal portion of power reaching every ONU."

not every ONU get an equal "portion of power", instead each ONU receives at approximately the same power level.

SuggestedRemedy

Change to "In this case, a tap nearer the OLT diverts a smaller fraction of power than a tap farther away, resulting in each ONU receiving approximately equal optical input power from the OLT."

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **23** *L* **28** # 172
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

clean up language - "An added advantage of the ring topology compared to the bus or the tree is that the OLT receives its own transmission signal can detect the ring fiber failure almost instantaneously, instead of relying on ONU protocol timeout."

SuggestedRemedy

"An added advantage of the ring topology compared to the bus or the tree is that the OLT receives its own transmission signal. This allows the OLT to detect a failure in the fiber ring almost instantaneously rather than waiting for a protocol timeout while communicating with the ONU."

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **23** *L* **33** # 173
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

"The advantages of a wavelength routed ODN becomes obvious when one compares the optical power loss of a power splitter to that of a wavelength mux/demux."

Is it really obvious? If so, then why do we need to explain it?

SuggestedRemedy

Change to

"A wavelength routed ODN has clear advantages over a power-split ODN when compared on the basis of power-loss budgets."

Response *Response Status* **C**

ACCEPT.

Strike "clear"

Cl **00** *SC* **0** *P* **25** *L* **16** # 174
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

grammar
"Expecting broadband applications to be deeply integrated into day-to-day life, mobile Internet 16 access to be universally popular by 2020, under the same strategy, China plans for take rates of 17 fixed broadband access and mobile 3G/LTE broadband access to reach 70% and 85%, 18 respectively.The fraction of villages provided with broadband services is expected to reach 98%."

SuggestedRemedy

change to

"China expects broadband applications to be deeply integrated into day-to-day life and mobile Internet access to be univerally available and accepted by 2020. Under the same strategy, China plans for 98% of villages to have access to broadband services with 70%-85% take-rates for fixed and mobile broadband access."

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **25** *L* **25** # 175
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

"H1 2014" - abbreviations for calendar quarters need to be consistent - preference is to spell these out

SuggestedRemedy

Change "H1 2014" to "the first half of 2014"

Response *Response Status* **C**

ACCEPT.

correct entire doc

Cl **00** *SC* **0** *P* **25** *L* **25** # 176
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Speaking of the past as if it is the future.

SuggestedRemedy

Change to "At the end of the 1st half of 2014, the median bandwidth usage per subscriber in North America was ...

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **25** *L* **29** # 177
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

unclear grammar "Note that there is a steady 29 bandwidth consumption growth of more than 30% per year,

SuggestedRemedy

change to "Note that there is a steady 30% per-year growth of bandwidth being consumed...

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

changed per previous comments

Cl **00** *SC* **0** *P* **25** *L* **31** # 178
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

unnecessary phrases
"What is even more interesting is the fact that the large growth in the mean and median bandwidth 32 consumption in fixed access networks (when compared with 2011 numbers as published by the"

SuggestedRemedy

change to "What is even more interesting is that the growth in the mean and median bandwidth consumption in fixed access networks (when compared with 2011 numbers as published by the"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Strike "What is even more interesting is that"

Cl **00** *SC* **0** *P* **26** *L* **3** # 179
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

unnecessary abbrevation of NA

SuggestedRemedy

spell out North America

Response *Response Status* **C**

ACCEPT.

correct in entire doc

Cl **00** *SC* **0** *P* **27** *L* **21** # 180
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

to only one consumer? "to an average consumer"

SuggestedRemedy

change to "the average consumer"

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **27** *L* **24** # 181
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

confusing langauge "The recent emergence of proxy 23 caches allowing Netflix streaming to areas without the official support for Netflix drove the large 24 (5%) increase in Netflix traffic in Latin America, which was previously observed at <1% range as 25 of the end of the H1 2013, as reported by the same source."

SuggestedRemedy

change to "The recent emergence of proxy caches allows Netflix to be consumed in regions without official Netflix support. This development has supported a 5% growth of Netflix streaming in Latin America where the rate observed prior to the first half of 2013 was less than 1%."

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **29** *L* **12** # 182
NOLL, KEVIN TIME WARNER CABL

Comment Type **T** *Comment Status* **A**

"The probability of multiple subscribers executing simultaneous speed tests is negligible"

How does the author come to the conclusion?

SuggestedRemedy

Provide support for this statement.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to

"It is assumed that the probability of multiple subscribers executing simultaneous speed tests is negligible."

Cl **00** *SC* **0** *P* **29** *L* **13** # 183
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **D**

"For example, in 2024, it is expected that under the heavy demand scenario and with 32 13 subscribers, consume approximately 1 Gb/s of downstream peak hour traffic."

What is meant?

SuggestedRemedy

Rewrite

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Request clarification from contributor or ad-hoc

Cl **00** *SC* **0** *P* **30** *L* **20** # 184
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Confusing grammar in footnote 1

SuggestedRemedy

Rewrite to "If a worst-case view is preferred, then assume a 10G-EPON with 32 subscribers each consuming 4 simultaneous streams of UHD-2 "8K" video at 50Mb/s each. The operator would still have enough headroom to support bursts, and therefore a service offering, of more than 2Gbp/s."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

footnote moved to text and replaced with suggested

Cl **00** *SC* **0** *P* **32** *L* **0** # 185
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

figure didnt render in the PDF

SuggestedRemedy

fix

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* **32** *L* **16** # 186
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**
mixed use of "business" user vs. "commercial" user

SuggestedRemedy
pick one and stay uniform

Response *Response Status* **C**
ACCEPT.

editor to change "commercial" to "business" where the context calls for it.

Cl **00** *SC* **0** *P* **32** *L* **16** # 187
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **D**
"with an example of 16 data rates for."

for what?

SuggestedRemedy

Proposed Response *Response Status* **Z**
REJECT.

This comment was WITHDRAWN by the commenter.

Request ad-hoc or contributor to clarify

Cl **00** *SC* **0** *P* **34** *L* **11** # 188
NOLL, KEVIN TIME WARNER CABL

Comment Type **T** *Comment Status* **D**
"The current projections, shown in Figure 15, in terms of bandwidth demand per household (in 11 residential applications) calls for approximately 300 Mb/s around end of year 2016"

Figure 15 does not support this statement, nor does it describe bandwidth demand.

SuggestedRemedy
reword or remove this entire paragraph

Proposed Response *Response Status* **Z**
REJECT.

This comment was WITHDRAWN by the commenter.

Cl **00** *SC* **0** *P* **37** *L* **8** # 189
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **D**
"Service providers currently primarily offer"

SuggestedRemedy
change to "Service providers primarily offer"

Proposed Response *Response Status* **Z**
REJECT.

This comment was WITHDRAWN by the commenter.

Cl **00** *SC* **0** *P* **37** *L* **9** # 190
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **D**
"Projecting based from current users bandwidth demand"

SuggestedRemedy
Change to "Projecting from current users bandwidth demand"

Proposed Response *Response Status* **Z**
REJECT.

This comment was WITHDRAWN by the commenter.

Cl **00** *SC* **0** *P* **59** *L* **13** # 129

Remein, Duane Huawei Technologies

Comment Type **ER** *Comment Status* **A**

Space is needed between the figure and the table to cleanly delineate the figure title from the table.

SuggestedRemedy

Review the report and provide additional white space wherever this condition arises.

Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* *P* **13** *L* **11** # 162

NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Grammar

1G-EPON will soon become a de-facto legacy technology, providing *less-bandwidth intensive* services

SuggestedRemedy

1G-EPON will soon become a de-facto legacy technology, providing *lower-bandwidth* services

Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* *P* **13** *L* **15** # 163

NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Grammar

The NG-EPON would operate at *the* aggregate data rates above 10Gb/s

SuggestedRemedy

The NG-EPON would operate at aggregate data rates above 10Gb/s

Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* *P* **13** *L* **16** # 1

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Higher capacity is clearly a requirement for NG-EPON, but will likely lead to larger physical footprint compared to 1G and 10G EPON. Also, even with more sophisticated power savings strategies, power footprint may very possibly be larger compared to 1G and 10G EPON.

SuggestedRemedy

Suggest physical and power footprints should be *minimized* (i.e. not necessarily reduced from 1G and 10G EPON).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

NG-EPON would operate at the aggregate data rates above 10 Gb/s to provide higher per-subscriber data rates and at the same time minimize the physical footprint and power consumption of the access network.

Cl **01** *SC* *P* **13** *L* **19** # 164

NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Confusing sentence

The largest application areas for EPON include residential and commercial subscriber access (for voice, video and data), and mobile backhaul, offered in triple- and quad-play packages.

SuggestedRemedy

The dominant applications for EPON include triple-play packages for Internet access, voice, and video offered to residential and commercial subscribers, private network access for commercial subscribers, and mobile back0haul for carriers.

Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* *P* **13** *L* **8** # 161

NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

Grammar

"The demand for high-sped data services has driven the market *to* residential service offerings reaching"

SuggestedRemedy

"The demand for high-sped data services has driven the market *for* residential service offerings reaching"

Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* **1** *P* **13** *L* **11** # 58

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **R**

"1G-EPON will soon become a de-facto legacy technology, providing less-bandwidth intensive services"
"will" needs to be avoided, if possible. Also, a platform does not provide services, but delivers services.

SuggestedRemedy

Chaneg to read: "1G-EPON is expected to soon become a de-facto legacy technology, delivering less-bandwidth intensive services to end customers."

Response *Response Status* **C**

REJECT.

There"s nothing wrong with this use of "will".

Cl **01** *SC* **1** *P* **13** *L* **14** # 59

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"The NG-EPON would operate at the aggregate data rates above 10 Gb/s to provide higher per-subscriber data rates and at the same time reduce the physical and power footprint of the access network"

I believe it is fair to say that these are expectations we all agree to

SuggestedRemedy

Change the wording to read: "The NG-EPON is expected to operate at the aggregate data rates (per OLT port) above 10 Gb/s to provide higher per-subscriber data rates and at the same time reduce the physical and power footprint of the PON-based optical access network"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

see comment 1

Cl **02** *SC* *P* **14** *L* **2** # 7

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

FTTB defined here as "Fiber To The Business". Then, in section 3 (p. 16) it is defined as "fiber-to-the-building, -business, or -basement". This is ambiguous: "building" implies a residential MDU, which is a very different application from fiber-to-the-business. Later in the document, FTTB appears to be used with B=building, not B=business. FTTB = fiber-to-the-building is the usual use in the lexicon.

SuggestedRemedy

Suggest to define here FTTB = "Fiber To The Building". And make change in section 3. (Fiber-to-the business I don"t believe has an accepted acronym, it is usually just spelled out).

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* *P* **16** *L* **2** # 2
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

re: "There are a number of WDM-PON-based access architectures"; actually this section is about all PON architectures.

SuggestedRemedy

change "WDM-PON" to "PON"

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* *P* **16** *L* **30** # 4
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Could be semanitics, but I don"t consider "type of optical modulation" to determine optical architecture.

SuggestedRemedy

propose to delete "type of optical modulation."

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* *P* **16** *L* **33** # 5
Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **R**

OFDM is just a particular modulation that can be used for FDM. Propose to use the more generic term.

SuggestedRemedy

change "OFDM" to "FDM".

Response *Response Status* **C**

REJECT.

OFDM is clearly marked as an example only.

Cl **03** *SC* *P* **16** *L* **5** # 3
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

"local office" is an unexpected and ambiguous term for FTTB. And it"s redundant for FTTH and FTTB to be defined here when they are defined again (and more accurately) in the list below.

SuggestedRemedy

Suggest to delete "located in the proximity of the end-subscriber premises (in case of FTTH) 4 or the local office (FTTB)"

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* *P* **16** *L* **7** # 165
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

The descriptions of each architecture are very similar to those in other sources.

For example http://en.wikipedia.org/wiki/Fiber_to_the_x

SuggestedRemedy

Include appropriate citations.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

conributor needs to provide citations

Cl **03** *SC* *P* **17** *L* **2** # 167
NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

reference to Table 1 should be to Figure 1

SuggestedRemedy

fix reference

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* *P* **18** *L* **1** # 6

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

For completeness, need a subsection on TDM PON.

SuggestedRemedy

There"s already a section on TDM PON architecture in section 6.2. As there is for WDM-PON and hybrid PON. Not clear what exactly to propose for TDM PON as I don"t understand the partitioning between sections 3 and 6. Further, it seems that the discussion of TDMA MAC should be in the TDM PON section, and the MSD-WDM-PON and other sections could then refer to it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

section 3 is intended as an introduction to various PON architectures and the names we give them in this document. Section 6 is feasibility of PON architectures as applied to NG-EPON.

However, there may be a misalignment between terms used in 3 and 6, or section 6 may not be complete when compared to the discussion in 3.

DR and EH to collaborate re: 6 &122

Cl **03** *SC* **3** *P* **16** *L* **2** # 61

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

Multiple acronyms that are used in the document and not included in the list right now.

SuggestedRemedy

Update the list of acronyms used in the document with all acronyms present in the text, e.g., L2 is not in the list right now. Scrub the whole document. During the scrub, confirm that the given acronym is used more than 1 time. All acronyms with a single use should be removed from the document and full name of the term should be used.

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3** *P* **16** *L* **2** # 60

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **R**

Orphan text with no subheading

SuggestedRemedy

Insert subclause 3.1 with the heading "Taxonomy of PON access architectures"

Response *Response Status* **C**

REJECT.

No subheading required

Cl **03** *SC* **3** *P* **16** *L* **32** # 62

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

Acronyms need to be expanded on the first use, e.g., PHY, OFDM, CDM. etc.

SuggestedRemedy

Scrub teh document. Make sure that the acronyms are expanded on the first use.

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3** *P* **17** *L* **0** # 66

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **R**

Table 1 needs some editorial work. Last column should be made wider, and columns 1, 2, 3 can be made more narrow to compenasate for wider column 4. Alternatively, multiple entries in column 4 should be done one per line

SuggestedRemedy

Pick one option, and implement

Response *Response Status* **C**

REJECT.

Narrowing 1,2,3 causes the headings to be unreadable. Please suggest alternate headings if the table is to be resized.

Cl **03** *SC* **3** *P* **17** *L* **1** # 63

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

Captions for tables under the table are not very readable.

SuggestedRemedy

Move all captions for tables to location over the table and not under it.

Response *Response Status* **C**

ACCEPT.

Group requested to change table captions to top since there is no specific requirement in the ICCom template.

Cl **03** *SC* **3** *P* **17** *L* **2** # 64

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

"Table 1 illustrates different types of PON architectures" -= I think "Figure 1" is meant here

SuggestedRemedy

Change to "Figure 1 illustrates different types of PON architectures"

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3** *P* **17** *L* **3** # 65

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"Note that each line connecting the OLT and ONU represents a pair of wavelength channels one wavelength channel in the downstream direction and one wavelength channel in the upstream direction." is contradictory with the note under Figure 1: "Each color represents an independent communication channel of one or more wavelengths per direction"

SuggestedRemedy

Either a single line (and colour) is one bidirectional wavelength pair, or not. Which is it then? Align both notes, and at best, remove the one under Figure 1 and leave it only in text.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Strike note from text as the note is now in the figures

Fig 1 to be replaced with NGEPON_0215_KRAMER_01.PDF

(20150205) Editor has requested updated text from EH and GK to reflect new Fig2. Revisit after receiving text.

Cl **03** *SC* **3.0** *P* **18** *L* **2** # 120

Remein, Duane Huawei Technologies

Comment Type **ER** *Comment Status* **R**

Figure 1 is no longer referenced from the text.

SuggestedRemedy

Remove the figure.

Response *Response Status* **C**

REJECT.

reference is incorrect. See comment #64

Cl **03** *SC* **3.0** *P* **18** *L* **3** # 122

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

It would be good if we described the most common PONs deployed (TDM-PON)

SuggestedRemedy

Add at 3.1, renumbering as required
TDM-PON
A TDM-PON provided all ONUs with the same wavelength pair (one downstream and one upstream) over a single fiber. This provides virtual P2P links to each ONU over a P2MP media by multiplexing data to each ONU in both directions in time, Hence the term TDM-PON. Most PONs deployed to date, including 1G-EPON and 10G-EPON, fall into this category.

Response *Response Status* **C**

ACCEPT.

see contribution ngepon_0215_noll_01

Cl **03** *SC* **3.1** *P* **18** *L* **11** # 121

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

customer, end-customer, subscriber, end-subscriber
These all refer to the same thing, perhaps we can settle on a single term

SuggestedRemedy

use subscriber exclusively

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3.1** *P* **18** *L* **5** # 67

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

"dedicated pair of wavelength channels, (one downstream and one upstream), creating logical" - no need for "," around paras

SuggestedRemedy

Change to "dedicated pair (one downstream and one upstream) of wavelength channels, creating logical"
Similar change on page 19, line 3

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3.2.1** *P* **19** *L* **16** # 68

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **R**

Figure 2 preceeds text and reference within it.

SuggestedRemedy

Move Figure 2 to line 26.5, since it is first referenced in line 26 right now. Similarly, Figure 3 should be moved to line 11.5, page 20, and Figure 4 to line 16.5, page 21.

Response *Response Status* **C**

REJECT.

As long as it is consistent throughout the doc (these are the only two that are not), this is a common style (figures/tables appear before their first reference) for profession publications.

Cl **03** *SC* **3.2.1** *P* **19** *L* **24** # 69

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"No other ONU is allowed to transmit during the same window of time." - this is only true for the ONU sharing the same wavelength

SuggestedRemedy

Change text to read "No other ONU >>sharing the same wavelength channel<< is allowed to transmit during the same window of time."

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3.3** *P* **21** *L* **24** # 123

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

Figure input

SuggestedRemedy

see figure in ngepon_remein_1_0215
Add the following ref. text at the bottom of section 3.3
The above topologies can be used with either WDM-PONs or TDM-PONs. For PONs using WDM these topologies can be further categorized as wavelength selected or wavelength routed (see figure xxx).
The wavelength selected category utilizes power splitters in the ODN as above. In the ONU a wavelength filter is used to select the desired downstream wavelength and a tunable laser is used to produce the correct upstream wavelength.
The wavelength routed category utilizes WDM mux/demux components in the ODN in lieu of power splitters. In the ONU a wideband receiver can be used as the desired downstream wavelength is determined by the ODN. A tunable laser is used to produce the correct upstream wavelength.

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **3.3** *P* **22** *L* **1** # 70

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

Figure 5 has two issues;
a) it preceeds references to individual elements within the followign text, and
b) it is composed of three sep[arate figures (a, b, c) that would be better off placed closer to callout in text.

SuggestedRemedy

Break Figure 5 into three separate figures (5, 6, 7) and renumber following figures and update their references.
Move new Figure 5 to page 23, line 13.5. Move new Figure 6 to page 23, line 23.5. Move new Figure 7 to page 23, line 27.5.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Final location of figures is slightly different than requested.

Cl **03** *SC* **3.3** *P* **23** *L* **31** # 57

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"It should be noted that, for WDM-based systems"

SuggestedRemedy

Unnecessary use of keyword "should". Change to "For WDM-based systems"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

CHange to "In WDM-based systems"

Cl **03** *SC* **3.3** *P* **23** *L* **35** # 72

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"Power splitters typically lose approximately Nx3 dB for a 2 N split whereas a wavelength mux/demux may lose only 0.7dB to 2.5dB regardless of the port count."
The quoted loss numbers are on the ideal side. Actual devices have insertion loss even as high as 4dB, excluding connectors. Also, since we already list just advantaged, disadvantages should be noted as well, including narrow pass pand and requirement for athermal operation when field deployed.

SuggestedRemedy

Change the text to read: "Power splitters feature insertion loss of approximately Nx3 dB for a 2^N split, whereas a wavelength mux/demux feature insertion loss between 1 dB and 4 dB, depending on manufacturing technique, tolerances, etc. Simultaneously, a wabelength mux/demux features a strong temperature dependence of their wavelength passbands, requiring special measures for athermal operation in a typical field deployment. "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"Symmetrical power splitters exhibit insertion loss of approximately Nx3 dB for a 2^N split, whereas a wavelength mux/demux will exhibit an insertion loss between 1 dB and 4 dB with the exact value dependent upon manufacturing technique, tolerances, and other factors. The passband of a wavelength mux/demux is strongly dependent upon operating temperature. Therefore, special measures must be taken to ensure thermal stability in a typical field deployment. "

Cl **03** *SC* **3.3** *P* **23** *L* **36** # 71

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

"split whereas a wavelength mux/demux may lose only 0.7dB to 2.5dB regardless of the port" - space missing between numeric value and units

SuggestedRemedy

Change to "split whereas a wavelength mux/demux may lose only 0.7 dB to 2.5 dB regardless of the port". Make sure space is non-breakable.

Response *Response Status* **C**

ACCEPT.

Cl **03** *SC* **Table-1** *P* **17** *L* **0** # 166

NOLL, KEVIN TIME WARNER CABL

Comment Type **T** *Comment Status* **A**

Last line in the table suggests "mix" for PHY channel connectivity type and has "?" as the name of the network type.

SuggestedRemedy

Remove this line or add some names.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Ad-Hoc needs to provide a name for this

Cl **04** *SC* **2** *P* **25** *L* **25** # 8

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

the section title indicates Internet bandwidth, but the text below does not.

SuggestedRemedy

Change "bandwidth usage" to "Internet bandwidth usage", at least in the first sentence.

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **2** *P* **26** *L* **12** # 9

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

the section title indicates Internet bandwidth, but the text below does not.

SuggestedRemedy

replace "bandwidth consumption" with "Internet bandwidth consumption"

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **2** *P* **27** *L* **3** # 10

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

re: "This fact is mostly attributed to pervasive xDSL 3 access in Europe, and slower adoption of higher-speed copper and fiber-based access 4 technologies." Without any attributions, this assertion seems to contradict a conclusion to be drawn from the preceding and following text, that the reason is because Europe is a few years behind in Netflix adoption.

SuggestedRemedy

remove the assertion

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4** *P* **30** *L* **16** # 11

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Title of section is "Bandwidth Consumption Operator Data". It is specifically data representing only DOCSIS traffic for a NA MSO. An IPTV operator would see much larger traffic growing more slowly.

SuggestedRemedy

Rename section "Bandwidth consumption - NA MSO". State in the first sentence that this section considers only DOCSIS traffic: i.e. Internet traffic and managed unicast video, but does not include linear TV.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add sentence to beginning of section to indicate NA-sourced data.

"The presented data includes Internet traffic and managed unicast video, but does not include managed broadcast/multicast linear TV (i.e., traditional scheduled non-time-shifted television service)"

Cl **04** *SC* **4.2** *P* **25** *L* **24** # 73

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"Consumption of Internet Traffic" - likely, it should read "Regional Consumption of Internet Traffic", to represent correctly the fact that the section indeed presents views for individual regions.

SuggestedRemedy

Per comment

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.2** *P* **25** *L* **25** # 147

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

In this section the term bandwidth is used while referring to GB & TB.

SuggestedRemedy

Replace "bandwidth" with "data" throughout this section.

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.2** *P* **25** *L* **31** # 74

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"irrespective of the access technology they use in their first mile networks" - we already have a section that speaks about data from one of providers. Reference would be welcome.

SuggestedRemedy

"irrespective of the access technology they use in their first mile networks - see also 4.4 for an example of operator data."

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.2** *P* **26** *L* **11** # 76

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **R**

Figure 7 is placed ahead of its reference in text.

SuggestedRemedy

Move Figure 7 to page 27, line 11.5
Similarly, Figure 8 and 9 should be moved to page 27, line 26.5

Response *Response Status* **C**

REJECT.

Cl **04** *SC* **4.2** *P* **26** *L* **5** # 75

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

A reference to 4k content avaliability would be welcome.

SuggestedRemedy

Reference to be used (one of many avaliable): http://blog.netflix.com/2014/05/netflix-now-streaming-in-ultra-hd-4k.html

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.2** *P* **27** *L* **15** # 77

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

Description for South America and APAC is merged together.

SuggestedRemedy

Remove "When compared with NA, the average bandwidth consumption in the APAC region (Figure 9) is lower"

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.3** *P* **28** *L* **13** # 83

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Subclause 4.3 is all about downstream bandwidth consumption. It does not mention upstream bandwidth consumption even once.

SuggestedRemedy

Change the title of 4.3 to "Downstream Bandwidth Consumption Forecast Residential Access"
Also, to provide current data first and then models for the future, I suggest we move 4.3 to after current section 4.6

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.3** *P* **29** *L* **1** # 80

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Looking at Figure 10 and 11, the difference between moderate and heavy demand scenarios is not immediately obvious.

SuggestedRemedy

Merge figures 10 and 11, showing moderate and heavy scenario for the given subscriber population in a single chart.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

WIll need EH to provide updated figure

EH to regenerate with common scale

Cl **04** *SC* **4.3** *P* **29** *L* **7** # 81

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"To complete the demand picture, it is necessary to add the maximum individual peak burst demand, which requires additional bandwidth for headroom, the size of which needs to accommodate a least one successful speed test run by a subscriber already receiving the maximum offered service level. This extra bandwidth is necessary because subscribers expect to be able to successfully complete a speed test even during peak hour traffic." - this statement is unnecesssarily complex.

SuggestedRemedy

Change to read: "To complete the bandwidth demand picture, it is necessary to further add the maximum peak burst demand needed to accommodate a least one successful speed test run by a subscriber already receiving the maximum offered service level. Subscribers typically expect to be able to successfully complete a speed test even during peak hour and when simultanously consuming other digital content."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"The assessment of demanded bandwidth is incomplete without an including the bandwidth used by subscribers executing Internet speed tests. Accomodation must be made for at least one subscriber running a successful speed test at the maximum offered rate even during the peak hour and when simultanously consuming other digital content."

Cl **04** *SC* **4.3** *P* **30** *L* **4** # 82

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

The footnote to text "demand in residential access up to the year 2024" is pretty legthy. I suggest to have it moved to the end of the paragraph instead.

SuggestedRemedy

Move "If, instead of a statistical view a worst-case view is preferred, a 10G-EPON could support subscribers, each streaming four simultaneous streams of UHD-2 8k video at 50 Mb/s each, and still have enough headroom to support bursts, and therefore a service offer, of more than 2 Gb/s." to page 30, end of line 6.

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.4** *P* **32** *L* **1** # 78

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

Figure 14 is missing.

SuggestedRemedy

It is OK in Word document, yet missing in PDF version. Please bring it back.

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.4** *P* **32** *L* **1** # 148

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Missing figure

SuggestedRemedy

Add figure or remove para referencing figure 14.

Response *Response Status* **C**

ACCEPT.

figure didnt render in the PDF

Cl **04** *SC* **4.4** *P* **32** *L* **1** # 40

Powell, Bill Alcatel-Lucent

Comment Type **ER** *Comment Status* **A**

The actual Fig. 14 seems to be missing from the PDF, but is contained in the companion MS Word file.

Add Fig. 14 from NGEPON D1.0 TR - MS Word file

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.5** *P* **32** *L* **15** # 150

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Does 20+ years qualify as "Over the last few years"?

SuggestedRemedy

Strike the phrase. Add historical to the sentence so it reads "There has been a clear historical trend for a ..."

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.5** *P* **32** *L* **17** # 149

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Stranded phrase: "with an example of 16 data rates for"

SuggestedRemedy

Strike phrase.

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.5** *P* **34** *L* **12** # 56

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"Should the same trend in bandwidth consumption (...) be"

SuggestedRemedy

Unnecessary use of a keyword "should". Change to "If the same trend in bandwidth consumption (...) is"

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.6** *P* **34** *L* **36** # 84

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

This is not a magazine paper, lengthy intro is not needed: "In contrast to the previous section on forecasted bandwidth consumption, this section addresses forecasting of bandwidths offered to residential subscribers, which is in principle independent of actual bandwidth demands."

SuggestedRemedy

Change to read: "This subclause presents a forecast model for offered bandwidth in residential access, which is independent from the actual observed bandwidth demand."

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.6** *P* **35** *L* **12** # 86

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Remove the royal "we" from the text, including all abbrevatiations, and make it read less like a science paper: "We next suggest that more than Gigabit service will not be offered until there is something faster than Gigabit Ethernet in the home, because again those higher service offerings couldn t be tested in a speed test.
Therefore, we posit: once offered bandwidths reach the maximum capability of subscriber end terminals in the home network (which has already happened for FTTH networks), the maximum offered bandwidth will be governed by the maximum bandwidth capability of subscriber end terminals in the home network. The latter is examined next."

SuggestedRemedy

Change to read: "Given the lack of subscriber driven demand for access rates exceeding 1 Gb/s, as well as lack of technical options to increase network rates within homes without a major investment into home networking, the maximum offered bandwidth remains limited by the maximum network rate of subscriber end terminals and their home network. "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"A reasonable assumption can be made that operators will not offer tiers exceeding 1Gb/s until home-networking equipment is available that can exceed this data rate."

Cl **04** *SC* **4.6** *P* **35** *L* **21** # 87

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **R**

Text requires simplification and technical cleanup: "The adoption of Ethernet LAN over UTP bandwidths in the home is approximated by the solid red line in Figure 13. Extrapolating this adoption trend predicts 10G Ethernet over UTP in the home within the next 10 years. Alternatively, intermediate Ethernet speeds over cat-5 UTP are under consideration in IEEE 802.3 Working Group: 2.5G and 5G. Finally, it s possible that none of these higher speed technologies gain significant traction in the home, maybe because of the proliferation of wireless devices at the expense of wired devices. These four possibilities are represented by the dashed red lines in Figure 16".

SuggestedRemedy

Change the text to read: "Figure 16 (solid red line) demonstrates the evolution of wired Ethernet speeds in home LANs. Assuming that the speed evolution continues in the future, 10 Gb/s Ethernet is expected to become popular in home LANs within the next 10 years, though do require re-cabling of homes and upgrades of end terminals. There are also two alternative wired Ethernet speeds under development within IEEE 802.3 WG, i.e., 2.5 Gb/s and 5 Gb/s, which promise the reuse of the existing category 5/5e cabling, and likely allow for coexistence of 1 Gb/s, 2.5 Gb/s, and 5 Gb/s PHYs on the same network. These four possibilities are represented by the dashed red lines in Figure 16."

Response *Response Status* **C**

REJECT.

Text is readable/understandable as-

Cl **04** *SC* **4.6** *P* **35** *L* **22** # 151

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

Incorrect ref to Figure 13

SuggestedRemedy

change to Figure 16,

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.6** *P* **35** *L* **7** # 85

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Remove the royal "we" from "We suggest that operators would never offer speeds that cannot be realized and speed-tested by subscriber end terminals in the home network. The maximum that can be speed-tested in the home today is approximately 1 Gb/s, using a Gigabit Ethernet home network and Gigabit
Ethernet end terminals. We note that current Gigabit service offerings are the first time that offered bandwidth equals the capability of subscriber end terminals in the home network."

SuggestedRemedy

Change to read: "Operators would only offer access speeds that can be realized using existing in-home networking solutions and then successfully speed-tested by a subscriber using the appropriate end terminals. Given the very slow rate of adoption of 10 Gb/s Ethernet in home networking, 1 Gb/s (and slower) wired Ethernet and wireless Ethernet solutions (cabling and terminals) remain predominant in most homes. This means, in practice, that the current gigabit rate offerings already match the theoretical maximum network throughput of user terminals and home networks, leaving little justification for further increase in offered data rates."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"Operators would only offer access speeds that can be realized using existing in-home networking solutions and also successfully speed-tested by a subscriber. Given the very slow rate of adoption of 10 Gb/s Ethernet in home networking, 1 Gb/s (and slower) wired Ethernet and wireless Ethernet solutions (cabling and terminals) remain predominant in most homes. This means, in practice, that the current gigabit rate offerings already match the theoretical maximum network throughput of user terminals and home networks, leaving little justification for further increase in offered data rates."

Cl **04** *SC* **4.6** *P* **36** *L* **1** # 88

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Rewording plus updating technical facts in the text: "In parallel, the approximate real world peak speeds of IEEE Std 802.11b, .g, .n, and early .ac
wireless LANs (for a single end user device) in the home are indicated by the solid blue curve. A
linear extrapolation (on a semi-log scale) is shown by the dashed blue line, and predicts a 3 Gb/s
peak speed in 10 years. However, this is speculative, as there is no plan in IEEE 802.11 to achieve
this peak speed in the home; it is not clear if even 1 Gb/s becomes practical."

SuggestedRemedy

Change to read: "Figure 16 also shows the evolution of wireless Ethernet (802.11)speeds in home LANs, covering 802.11b, .g, .n, and early .ac devices. A linear extrapolation (shown with a dashed blue line) indicates that a 3 Gb/s peak data rate should become available for the use in wireless home LANs within the next 10 years. However, at this time there is no demonstrated 802.11 technology able to support such data rates within wireless home LANs and it is not clear whether sustained 1 Gb/s data rates over wireless LAN are practical."

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **4.6** *P* **36** *L* **6** # 89

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **R**

Text in lines 6-12 is highly repetetive from previous observations in the same section

SuggestedRemedy

Change text in lines 6-12 to read as follows: "Considering previous observations on maximum offered data rates with the anticipated availability of wired and wireless home LAN solutions exceeding 1 Gb/s data rates, the maximum offered data rates for residential customers are expected to fall between 1 Gb/s and 10 Gb/s, depending primarily on the availability of cost-effective solutions to deploy multi-gigabit network infrastructure and terminals at homes. Given the shift towards the use of more convenient wireless LANs in home environment, and the lack of clear technical path towards 1+ Gb/s data rates, there is a good chance that the delivery of multi-gigabit data rates to residential subscribers may be overly aggressive and be limited only to power users and early adopters. "

Response *Response Status* **C**

REJECT.

The paragraph is summarizing with intent to draw a conclusion

Cl **04** *SC* **4.7** *P* **36** *L* **13** # 90

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Text on split ratios should be cleaned up to avoid repetition and focus the section just on conclusions

SuggestedRemedy

Use tracked changes per ngepon_0215_hajduczenia_1.pdf

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **5** *P* **32** *L* **14** # 12

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **R**

Section title "Bit rate trends" implies a wide scope of trends, however the scope of this section is limted to Internet traffic.

SuggestedRemedy

Propose to rename section "Bit rate trends - Internet traffic".

Response *Response Status* **C**

REJECT.

"Internet traffic" does not distinguish the section from any other section.

Cl **04** *SC* **5** *P* **32** *L* **15** # 13

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Text says that Figure 15 shows "bandwidth consumption". Isn"t it really showing maximum offerable Internet bandwidth? (a different thing)

SuggestedRemedy

Propose to replace first sentence as follows:
"Over the last few years, there has been a clear trend for a steady increase in bandwidth consumption for residential and business customers. Figure 15, which shows maximum offerable Internet bandwidth of NA MSOs, is indicative of this trend."

Response *Response Status* **C**

ACCEPT.

Cl **04** *SC* **5** *P* **34** *L* **11** # 19

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

re "The current projections, shown in Figure 15, in terms of bandwidth demand per household (in residential applications) calls for approximately 300 Mb/s around end of year 2016." But Figure 15 shows maximum permitted Internet bandwidth, not demand. The rest of the paragraph mentions both bandwidth demand/consumption and offered bandwidth (Nielsen).

SuggestedRemedy

Propose to replace mentions of bandwidth demand/consumption with "offered bandwidth".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to "permitted bandwidth" vs. "offered" because "offered" could be interpreted to mean that offered by the customer to the network or to mean what is being sold to the customer

need to update other sections to ensure consistency (editor and EH)

permitted BW = what is sold to the sub
offered load = what the sub actually uses
offered BW = replace in doc for clarity
bandwidth demand = offered load

Cl **04** *SC* **5** *P* **34** *L* **16** # 16

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

re "For NG-EPON to be suitable to provide services around 2020 and beyond, it is necessary to support delivery of at least 1 Gb/s (on average) per household (in a residential scenario), as well as the ability to scale up to 10 Gb/s per household (burstable)". This seems like one of the most important requirements for NG-EPON in the document. Is this section the best place to put it?

SuggestedRemedy

Propose to move this requirement to section 5, Requirements for NG-EPON.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

move "For NG-EPON to be suitable to provide services around 2020 and 15 beyond, it is necessary to support delivery of at least 1 Gb/s (on average) per household (in a 16 residential scenario), as well as the ability to scale up to 10 Gb/s per household (burstable) to 17 support the possibility that consumer-grade electronics with either a single 10 Gb/s or multiple 18 1 Gb/s interfaces become commonplace in the following years."

to

5.2 ONU Capacity

editor to integrate with input from commenter

Cl **04** *SC* **7** *P* **36** *L* **29** # 14

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Shipment reports give an indication of how many ONUs are connected to each OLT port, but do not directly indicate optical split ratio, since we don"t know the splitter fill%. E.g., an 8:1 shipment ratio could equally imply 1:16 optical split at 50% fill, 1:32 optical split at 25% fill, or 1:64 optical split at 12.5% fill.

SuggestedRemedy

I think it"s safer to just indicate that shipment data indicates the ratio of ONUs to OLT ports ranges from 4:1 to 16:1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

change

"it is possible to conclude that a rather low split ratio is most 29 commonly used, ranging from 1:4 to 1:16"

to

"it is possible to conclude that a rather low ONU-to-OLT ratio is most commonly used, ranging from 4:1 to 16:1"

Cl **04** *SC* **7** *P* **36** *L* **31** # 15

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

re "Most new FTTx projects assume 1:16 or 1:32 split ratios", data I have access to shows that over recent years, the most commonly deployed split ratio is 1:64

SuggestedRemedy

Reword as "Most new FTTx projects assume 1:16, 1:32 or 1:64 split ratios"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "Most new FTTx projects assume 1:16 or 1:32 split ratios"

to

"Most new FTTx projects assume at least 1:16 up to 1:64 split ratios.

Cl **05** *SC* **1** *P* **37** *L* **6** # 18

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

re "the aggregate capacity required to support residential users over the next 10 years is expected to reach at least 55 Gb/s in the downstream direction"... I recall in Atlanta that there was a request for the justification of this number, which I don"t see. In the document so far I do see:
(1) section 4.2: power users exceed 5 TB/month of Internet traffic. This averages to 2 Mb/s. Could be more in peak hour, let"s say 10 Mb/s. 30% CAGR is mentioned. If that continued for 10 years, in 2024 power users would consume approx.140 Mb/s.
(2) section 4.3: bandwidth demand modeling using "worst case" assumptions forecasts 1 Gb/s peak hour traffic for 32 subscribers on a PON. For FTTB/512 subscribers, 13 Gb/s.
(3) section 4.4: DOCSIS traffic, for example 70 Mb/s per subscriber in year 2020.
(4) section 4.5: 600 Mb/s maximum permitted Internet traffic in 2020. Requirements stated: NG-EPON to support 1 Gb/s (average) and 10 Gb/s (peak).
(5) section 4.6: maximum forecasted service offering out to 2024: 10 Gb/s (although could be less). Adding 10 Gb/s to the aggregate demand in section 4.3 yield 11 Gb/s (FTTH) and 23 Gb/s (FTTB).

SuggestedRemedy

suggest to add explanation for 55 Gb/s some where in section 4. Or, replace it with the biggest number in section 4: 23 Gb/s.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

updated per group discussion

"5.1PON Capacity
NG-EPON aggregate system capacity requirements are driven by a number of factors, including the mix of services offered by the given service provider, customer population and demographics, etc. The evolution of existing services, as well as anticipated future service types, drive the need for different sustained and peak data rates, as well as different symmetry ratios between upstream and downstream data rates.
To address a cost-effective delivery of differentiated services over optical access networks, service providers expect to deliver services to both residential and business customers on the same access platform. In this case, requirements for the aggregate bandwidth supported by NG-EPON are primarily driven by business customers and growing bandwidth demand. Business customers are typically provided with symmetric service rates, while residential customers are typically provided with asymmetric service rates, thus NG-EPON is expected to support both symmetric and asymmetric data rates.
Projecting based on premium-tier offerings and market drivers in the business services market, NG-EPON is expected to support the aggregate capacity of at least 40 Gb/s in the downstream and upstream directions. Given that it is impossible to precisely predict future service evolution within the next decade, especially in terms of emergence of new disruptive services, NG-EPON needs to be designed in a scalable fashion to support also higher data rates up to at least 100 Gb/s. "

Cl **05** *SC* **4** *P* **38** *L* **6** # 41

Powell, Bill Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

If no one has a suggestion for a reference number, suggest simply removing the "[reference needed]" note, since the current text seems OK without a specific reference.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.10** *P* **47** *L* **4** # 155

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Several grammatical issues:
"mechanisms ... is"
"support ... support"

SuggestedRemedy

Change sentence to read:
"NG-EPON is expected to support all the mechanisms necessary to implement differentiated QoS that are necessary for delivery of residential and business service types."

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.10.4** *P* **50** *L* **10** # 156

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Fig 27 illustrates WiFi not residential services:
"The public WiFi backhaul service is very similar to the residential service (see Figure 27),"

SuggestedRemedy

Change to read:
"The public WiFi backhaul service (see Figure 27) is very similar to the residential service,"

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.10.5** *P* **51** *L* **8** # 157

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

EVPL used once and not defined

SuggestedRemedy

please spell out the acronym

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.10.6** *P* **51** *L* **15** # 42

Powell, Bill Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Since subsection 5.10.6 is in "Section 5.10 Service Types" - suggest changing the title of 5.10.6 to "Service Requirements for NG-EPON" since this section is not just enumerating generic NG-EPON requirements.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.12.1** *P* **52** *L* **16** # 158

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **D**

This para discussing cost is nearly duplicated in section 7.3 pg 86. There is no need for this duplication.

SuggestedRemedy

Replace entire section 5.12 with the following:
The system cost for various access technologies can be examined in a number of ways. Two common methods are to compare equipment costs or to compare service delivery costs (e.g., cost per 1 Gb/s of service). Both of these are discusses further in subclause 7. It is expected that the service delivery cost in NG-EPON (when such systems become commercially available) is similar to 1G-EPON and 10G-EPON, while providing higher density (higher number of connected customers) and higher aggregate capacity.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

These two sections are discussing economics from two different directions. Section 5 is requirements, section 7 is feasibilty.

Perhaps the commenter would propose additional text that would include the 5.2 information in section 7?

Cl **05** *SC* **5.12.1** *P* **52** *L* **18** # 104

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

The original contribution quoted incorrectly 10/10G-EPON. Calculations were done for 10/1G-EPON, as quoted by the report.

SuggestedRemedy

Change "10/10G-EPON" to "10/1G-EPON" in 5.12.1

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.13** *P* **53** *L* **1** # 159
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

"10/10G-EPON is expected to run of bandwidth" is this like a run on a bank? Will we see a bandwidth depression? Or is this more like a marathon?

SuggestedRemedy

add "out" to it reads: "10/10G-EPON is expected to run out of bandwidth"

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.13** *P* **53** *L* **3** # 160
Remein, Duane Huawei Technologies

Comment Type **TR** *Comment Status* **A**

This statement strikes me as disingenuous:
"Some of the emerging business-class applications, such as cell tower fronthaul, are expected to drive bandwidth exhaustion in 10G-EPON and push forward the development and then deployment of NG-EPON."
Everything I read about front haul indicates it cannot be supported by TDM-PON systems. Here are a few statements in a very recent report:

Fronthaul CoE is DOA!

The definitive stand on the use of CPRI over Ethernet (CoE) comes from the Metro Ethernet Forum (MEF) Mobile Backhaul Implementation Agreement (IA). [MEF 22.1.1, Mobile Backhaul Phase 2, Amendment 1-Small Cells, July 2014.] Its Section 4.1.1 Radio Coordination lists coordination requirements from "no coordination" to "very tight coordination". Both Fronthaul and CPRI have very tight coordination requirements. This level of coordination is out of scope for the current IA, because "MEF Ethernet Services cannot currently support the fronthaul of CPRI." This is a sound conclusion based on Fronthaul requirements such as "highly stringent performance characteristics, such as extremely low latency and jitter"

SuggestedRemedy

Strike the sentence.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

strike the phrase "drive bandwidth exhaustion in 10G-EPON and"

Cl **05** *SC* **5.2** *P* **37** *L* **16** # 92
Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

Speak of needs, and not what will happen

SuggestedRemedy

Change "NG-EPON will provide service to two general classes of users" to "NG-EPON is expected to provide service to two general classes of users".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

If the desire is to clarify the statement, then change to "Operators expect to use NG-EPON to provide service to two general classes of user"

Cl **05** *SC* **5.2** *P* **37** *L* **20** # 55
Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **R**

"NG-EPON should support each of these user classes by enabling flexible ONU configurations. "

SuggestedRemedy

Avoid normative language in the report. Change to "NG-EPON is expected to support both aforementioned user classes by enabling flexible ONU configurations. "

Response *Response Status* **C**

REJECT.

Text was removed per previous comments.

Cl **05** *SC* **5.2** *P* **37** *L* **21** # 94
Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"a hybrid-TWDM approach" - I do not belueve we use this term anymore.

SuggestedRemedy

change to "a hybrid PON approach (see 3.2)"

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.2** *P* **37** *L* **27** # 54

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"NG-EPON should enable such flexible ONU configurations and the coexistence of varying configurations on the same PON."

SuggestedRemedy

Avoid normative language in the report. Change to: "NG-EPON is expected to support such flexible ONU configurations and the coexistence of varying configurations on the same PON."

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.3** *P* **37** *L* **31** # 152

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Missing conjunction: "NG-EPON is expected to operate with that same split ratio should support higher split ratios."

SuggestedRemedy

Change to read:
"NG-EPON is expected to operate with that same split ratio
and should support higher split ratios."
^^^

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.3** *P* **37** *L* **31** # 53

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Unclear wording in "Today operators require support of 1:32 split ratio on their PONs. NG-EPON is expected to operate with that same split ratio should support higher split ratios. "

SuggestedRemedy

Avoid the use of normative language in report. Also, need to clarify the language in the second sentence. Change to: "Today operators deploying PON typically require the support for the split ratio of at least 1:32. NG-EPON is expected to support at least the same split ratio as 1G-EPON and 10G-EPON, or (preferably) a higher split ratio to increase customer density per OLT port. "

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.4** *P* **38** *L* **2** # 93

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

"as well as placement of OLT locations relative to population centers." - the word "locations" is not really needed here.

SuggestedRemedy

Remove "locations" in the highlighted text. It is meaningless

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.4** *P* **38** *L* **6** # 95

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

Reference needed ...

SuggestedRemedy

Use the following reference: Martin Carroll, "NG-PON2 & Opportunities for Operators", presented at ECOC NG-PON2 Workshop, September 2014, Cannes

Response *Response Status* **C**

ACCEPT.

offending text seems to be gone after previous edits

Cl **05** *SC* **5.5** *P* **38** *L* **25** # 96

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

"<=" character got separated from the rest of the text.

SuggestedRemedy

Make sure that there is a non-breakable space between "<=" and the following number. THis applies to line 22, 25, 28, 31.

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.5** *P* **38** *L* **26** # 153

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

Given that the bullet point starts with Medium power budget class I believe the following statement should also be about med. pwr budget class:
"The low power budget is typically implemented in the form of PON ODN with the split ratio of at least 1:32 and the reach of at least 10 km."

Likewise line 29 and 32 are not about low power budget

SuggestedRemedy

Line 26 Change "low" to "medium" so the statement reads:
"The medium power budget is typically implemented in the form of PON ODN with the split ratio of at least 1:32 and the reach of at least 10 km."
Line 29 Change "low" to "high"
Line 32 Change "low" to "extended"

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.5** *P* **38** *L* **38** # 154

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

"insertions loss" need not be plural

SuggestedRemedy

change to "insertion loss"

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.7** *P* **39** *L* **16** # 97

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **R**

No need for future tense here: "Many operators expect that NG-EPON will maintain the ability to coexist" - it is a statement of a fact

SuggestedRemedy

Change to "Many operators expect that NG-EPON maintains the ability to coexist"

Response *Response Status* **C**

REJECT.

NG-EPON is in the future. The proposed change brings NG-EPON into the present.

Cl **05** *SC* **5.7.2** *P* **42** *L* **4** # 98

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Sentence is unnecessarily complex: "The migration to NG-EPON needs to assume that at the time NG-EPON becomes commercially available, the access network is expected to include a mixture of 1G-EPON and 10G-EPON devices, operating with either dual-rate OLT ports, or dedicated 1G-EPON and 10G-EPON OLT ports with external wavelength splitter / combiner."

SuggestedRemedy

Change to read: "When NG-EPON becomes commercially available, it is expected that in many cases, the access network includes a mixture of 1G-EPON and 10G-EPON devices, deployed in either of the coexistence modes discussed in 5.4.6."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"When evaluating migration scenarios for NG-EPON, NG-EPON designers need to assume that the access network will include a mixture of 1G-EPON and 10G-EPON devices. They should also assume that these devices will be deployed in either of the coexistence modes discussed in 5.4.6."

Cl **05** *SC* **5.7.3** *P* **43** *L* **13** # 99

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

Cumbersome wording: "to be critical for acceptance of an NG-EPON" ...

SuggestedRemedy

Change to "to be critical for NG-EPON"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"Some operators consider a critical charateristic of NG-EPON to be backward compatibility and coexistence with 1G-EPON, 10G-EPON and RF overlay systems on the same ODN."

Cl **05** *SC* **5.7.3.4** *P* **45** *L* **7** # 100

Hajduczenia, Marek Bright House Network

Comment Type **TR** *Comment Status* **A**

Part of the text from R09 in 5.11.4 is missing.

SuggestedRemedy

Add :", NG-EPON needs to simultaneously meet requirements listed in 5.7.3.2 and 5.7.3.3." at the end of line 7.

Response *Response Status* **C**

ACCEPT.

Text was removed per comments and approved resolutions on R09. See R09 Comment 89 from DR

EDITOR TO REVIEW IF Whole sentence to be removed or not.

Cl **05** *SC* **5.7.3.6** *P* **45** *L* **11** # 101

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

5.7.3.6 is likely named incorrectly.

SuggestedRemedy

Change title of 5.7.3.6 to "NG-EPON Coexisting with 1G-EPON, 10G-EPON, but no RF overlay", Move 5.7.3.6 to 5.7.3.5.

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.7.3.7** *P* **46** *L* **4** # 102

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

WDM PON should WDM-PON

SuggestedRemedy

Per comment

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.7.3.7** *P* **46** *L* **7** # 52

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"The operation of the wavelength configuration protocol should be reliable and prevent a situation in which an ONU after a reboot / reset impacts other customers by transmitting on incorrect upstream wavelength channels."

SuggestedRemedy

Avoid the use of normative language in the report. Change to "The operation of the wavelength configuration protocol needs to be reliable and prevent a situation in which an ONU after a reboot / reset impacts other customers by transmitting on incorrect upstream wavelength channels."

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.9** *P* **46** *L* **33** # 51

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"The power-saving mechanism should be fully configurable on per ONU or OLT port basis, providing the operator with full control of the sleep period, detection threshold for ONU inactivity, etc. "

SuggestedRemedy

Avoid normative language in the report. Change to "The power-saving mechanism needs to be fully configurable on per ONU or OLT port basis, providing the operator with full control of the sleep period, detection threshold for ONU inactivity, etc. "

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.9** *P* **46** *L* **35** # 50

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"The NG-EPON OLT should support a mix of ONUs with enabled power-saving mechanism and with disabled power-saving mechanism on the same OLT port. "

SuggestedRemedy

Avoid normative language in the report. Change to "The NG-EPON OLT is expected to support a mix of ONUs with enabled power-saving mechanism and with disabled power-saving mechanism on the same OLT port. "

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.9** *P* **46** *L* **37** # 49

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"The NG-EPON OLT should support different configuration parameters for the power-saving mechanism for different groups of ONUs on the same OLT port."

SuggestedRemedy

Avoid normative language in the report. Change to "The NG-EPON OLT is expected to support different configuration parameters for the power-saving mechanism for different groups of ONUs on the same OLT port."

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **5.9** *P* **46** *L* **39** # 103

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

"At the same time, it is also expected that NG-EPON OLT implement" should be "At the same time, it is also expected that NG-EPON OLT implement>>s<<"

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **7** *P* **44** *L* **1** # 191

Tanaka, Kazuki KDDI R&D Laboratorie

Comment Type **T** *Comment Status* **A**

Draft says: "Unidirectional (downstream-only, with center wavelength at 1550 nm) RF overlay". But the wavelength seems to be imprecise.

SuggestedRemedy

The sentence should be changed to: "Unidirectional (downstream-only, with wavelength range from 1550 nm to 1560 nm) RF overlay".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

will resolve with other comments on this text

Cl **05** *SC* **7** *P* **44** *L* **3** # 192

Tanaka, Kazuki KDDI R&D Laboratorie

Comment Type **T** *Comment Status* **A**

Draft says: "Bidirectional (with downstream center wavelength at 1550 nm and upstream center wavelength at 1610 nm)". But the wavelength seems to be imprecise.

SuggestedRemedy

The sentence should be changed to: "Bidirectional (with downstream wavelength range from 1550 nm to 1560 nm and upstream wavelength range from 1550 nm to 1610 nm)".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

will resolve with other comments on this text

commenter correction - upstream = 1600 - 1620nm

Cl **05** *SC* **7** *P* **45** *L* **2** # 193

Tanaka, Kazuki KDDI R&D Laboratorie

Comment Type **E** *Comment Status* **A**

Since this sub-section describes "NG-EPON Coexisting with 10G-EPON and Optional RF Overlay, "1G-EPON" in line 2 must be a typographical error.

SuggestedRemedy

Replace "1G-EPON" by "10G-EPON".

Response *Response Status* **C**

ACCEPT.

Cl **05** *SC* **7.3.3** *P* **44** *L* **28** # 17

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

References to "RF overlay" in section title and following text remain. As discussed in Atlanta, there is no definition for "RF overlay" in the document, and the term seems to be used interchangeably with RFoG. I believe we agreed to use RFoG, which is defined.

SuggestedRemedy

Replace "RF overlay" with "RFoG" everywhere.

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **2** *P* **54** *L* **13** # 20
Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Propose to add subsection 6.2.1.1 on bit-interleaving, which can facilitate the implementation of high speed TDM PONs.

SuggestedRemedy

Text will be sent in a separate contribution: ngepon_0215_harstead_01

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

ngepon_0215_harstead_01a

Cl **06** *SC* **2.3** *P* **55** *L* **17** # 21
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

re: "complete reuse of the currently existing TDM-PON solutions per wavelength." "Complete" is an overstatement, as 10G EPON OLT and ONU optics will likely not be re-usable.

SuggestedRemedy

Delete the sentence.

Response *Response Status* **C**

ACCEPT.

Also delete "slightly" in the previous sentence

Cl **06** *SC* **2.3** *P* **56** *L* **15** # 22
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

gratuitous salesmanship in "This particular arrangement is therefore ideal for supporting both residential and commercial services on a single access platform."

SuggestedRemedy

replace "is therefore ideal for supporting" with "can support"

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **2.3** *P* **56** *L* **17** # 23
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

gratuitous salesmanship in "Hybrid PON access systems are natural candidates for stacking multiple 10G-EPON systems in either symmetric or asymmetric configurations."

SuggestedRemedy

delete "are natural candidates for stacking" with "stack".

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **2.3** *P* **57** *L* **2** # 24
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

gratuitous salesmanship in "Such data channels are ideal to provide multi-Gb/s access service to commercial customers."

SuggestedRemedy

replace "are ideal to" with "can".

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **3** *P* **57** *L* **20** # 28
Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Should be clear that in the interest of low cost, only direct detection is considered (vs. coherent detection).

SuggestedRemedy

After "...more than one bit to be encoded into a single baud." add this sentence: "To meet the requirements of low cost, only direct detection systems are considered in the following sections."

Response *Response Status* **C**

ACCEPT.

Add "To meet the requirements of low cost, only direct detection systems are considered in the following sections."

note to editor: delete following sentence per c#25

Cl **06** *SC* **3** *P* **57** *L* **20** # 25

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

disagree with "While a number of more spectrally efficient modulation schemes have been proposed to-date [references needed], the level of their technical maturity at this time would likely not allow for their immediate application into the optical access network, primarily because of the resulting cost and complexity of optical modules, specifically on the ONU side." The subsequent sections propose simple duobinary and PAM-4 modulation schemes that could be cost-effective in ONUs when compared to the cost of tunable lasers required by some other NG-EPON candidate technologies. 25 Gb/s duobinary in particular uses the same (non-tunable) ONU optics as 10G EPON.

SuggestedRemedy

propose to delete this text.

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **3.6** *P* **68** *L* **3** # 26

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

6.3.6 is actually not a new section, it is part of 6.3.5 (OFDM)

SuggestedRemedy

delete 6.3.6 section title

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

see comment 134

Cl **06** *SC* **5** *P* **72** *L* **26** # 27

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

in Figure 49, correct downstream spectrum for RFoG is still not indicated (1540-1565). Also RFoG upstream spectrums are not correct: should be 1600-1620 and 1260-1360.

SuggestedRemedy

correct the figure. Also, show RFoG spectra in Table 7, to be consistent with other items.

Response *Response Status* **C**

ACCEPT.

figure source to be fixed
table 7 to be changed to read 1540-1560, 1600-1620/1300-1320

Cl **06** *SC* **6** *P* **74** *L* **10** # 194

Tanaka, Kazuki KDDI R&D Laboratorie

Comment Type **T** *Comment Status* **A**

In the section 5.7.2, the draft says "the NG-EPON may partially or completely reuse 1G-EPON downstream and/or upstream spectrum". However, the section 6.6 does not mention about this.

SuggestedRemedy

To keep consistency with the section 5.7.2, add the following sentence (which is based on the section 5.7.2) after the line 10 on page 74.

"Once all 1G-EPON active devices have been removed from the given ODN, the NG-EPON may partially or completely reuse 1G-EPON downstream and/or upstream spectrum, assuming that TDM or WDM separation between 10G-EPON and NG-EPON upstream channels is possible."

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6** *P* **74** *L* **28** # 31

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **R**

Not sure why I understand that Plan B, which does not require co-existence with 1G-EPON, does not take advantage of the O-band (while Plan D, which must require 1G-EPON co-existence, does use the O-band and causes overlap). Again, 20 nm and 10 nm spectral widths seem arbitrary.

Also don"t understand why "existing wavelength filters on 1G-EPON devices" is relevant in this scenario that does not require 1G-EPON coexistence.

SuggestedRemedy

not sure, not sure what the authors had in mind here.

Response *Response Status* **C**

REJECT.

please propose changes

Cl **06** *SC* **6.1** *P* **74** *L* **14** # 29

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Plan A is for NG-EPON coexistence with 1G-EPON (1260-1360 upstream) and 10G-EPON. It proposes NG-EPON to be 10 nm 1550-1560 downstream and 10 nm 1530-1540 upstream. But why 10 nm? Seems arbitrary. TDM-PON would probably require less, TWDM-PON upstream probably more, and WDM-PON definitely more. According to ngepon_0115_harstead_03a.pdf, in this scenario the spectrum available is:
upstream: 1524-1560 and 1596-1625 nm
downstream: 1539-1560 and 1596-1625 nm
(then, once the NG-EPON technology is selected and required amount of spectrum is determined, then can choose from the above.

SuggestedRemedy

propose to replace 10 nm 1550-1560 downstream and 10 nm 1530-1540 with upstream: 1524-1560 and 1596-1625 nm
downstream: 1539-1560 and 1596-1625 nm

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add CR/LF in front of "Examples of wavelength allocation plans are included in the following sections and shown in Figure 49."

Change "The wavelength plan" to "a wavelength plan"

similar changes to 74/L12, L26, 75/L2,L13

Cl **06** *SC* **6.2** *P* **53** *L* **27** # 124

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

"CDM-PON, or"
While we have a description of OFDM-PON there is no such thing for CDM-PON, this is the only place it is mentioned in the report.

SuggestedRemedy

Strike "CDM-PON, or"

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.2** *P* **74** *L* **27** # 30

Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

inappropriate terminology: "RF overlay" here and throughout section 6.6

SuggestedRemedy

replace with "RFoG"

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.2.1** *P* **53** *L* **36** # 105

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"as shown in Figure 1 [eh2]."

SuggestedRemedy

Figure 1 should be Figure 29 (likely)
Reference [eh2] is also incorrect and needs to be updated

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.2.1** *P* **54** *L* **35** # 125

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

"Throughout this history, commercially deployed TDM PON bit rates have consistently doubled every two years"
I know of no 2 Gpbs or 4 Gbps or 8 Gbps PON systems. The trend line does not reflect actual PON rates

SuggestedRemedy

Change to read:
"On average commercially deployed TDM PON bit rates tend to double once every two years if plotted over the last 20 years."

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.2.3** *P* **55** *L* **15** # 106

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

We have a name for "a hybrid TDM-PON / WDM-PON system" - it is a "hybrid PON"

SuggestedRemedy

Change "hybrid TDM-PON / WDM-PON" to "hybrid PON" within 6.2.3

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3** *P* **57** *L* **9** # 126

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

This first para with it"s four bullets is nearly identical to 6.2.1.

SuggestedRemedy

Change 6.3 as follows:
Strike the 1st para and it"s bullets.
Reword 1st sentence of 2nd para from:
"While it may be possible to achieve the next step in speed with NRZ transmission, penalties resulting from increasing line rate could be offset to some extent by using more advanced, non-NRZ modulation schemes that allow more than one bit to be encoded into a single baud."
To:
"While it may be possible to overcome the issues outlined in 6.2.1 and achieve the next TDM-PON speed step with NRZ transmission, increased penalties due to the higher line rate could be offset to some extent by using more advanced, non-NRZ modulation schemes. Such schemes allow more than one bit to be encoded into a single baud. "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

see contribution with text (ngepon_harstead_04)

Cl **06** *SC* **6.3** *P* **57** *L* **9** # 107

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Text in lines 9-13 seems to be a repetition of text from introduction to 6.2.1. It is best if we avoid repetition of text, unless it is strictly needed.

SuggestedRemedy

Mark the text for removal, or reference 6.2.1 for challenges of TDM PON.
Similarly first sentence on page 57, line 26 should be changed to read: "NRZ modulation is the simplest and lowest cost way to transmit data over optical fiber."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

chnage 57L26 per comment

Cl **06** *SC* **6.3** *P* **75** *L* **1** # 32

Harstead, Ed Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Plan C is the most constrained case. When the correct spectra for RFoG are considered, the available spectrum to avoid overlap are:
upstream: 1524-1539
downstream: 1596-1599
as indicated in ngepon_0115_harstead_03a.pdf
(Again, 10 nm spectra mentioned are arbitrary).

SuggestedRemedy

replace 1595-1605/1530-1540 with 1596-1599/1524-1539.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

see c#29

Cl **06** *SC* **6.3.1** *P* **57** *L* **26** # 108

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **R**

It is not clear why the whole text is written in Past Simple tense.

SuggestedRemedy

Convert the statement into Present Simple.

Response *Response Status* **C**

REJECT.

The text refers to events in the past. How do you expect to convert that to present tense?

Cl **06** *SC* **6.3.1** *P* **57** *L* **37** # 109

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

Avoid breaking tables across pages

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.1** *P* **58** *L* **18** # 127

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

wording improvement:
"For the upstream direction, 10GBASE-PR(X)-D4 has 0.5 dB worse sensitivity, so ONU launch
powers will need to be 0.5 dB higher."

SuggestedRemedy

change to:
"In the upstream direction, the 10GBASE-PR(X)-D4 receive sensitivity is 0.5 dB worse, so ONU launch powers will need to be 0.5 dB higher."

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.1** *P* **58** *L* **20** # 128

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

missing space: "25 Gb/sand"

SuggestedRemedy

to: "25 Gb/s and"
^

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.1** *P* **58** *L* **6** # 110

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

It is not clear why the NOTE text is in paren

SuggestedRemedy

Remove () around the note. It can be part of the main text without any problems.

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.2** *P* **59** *L* **0** # 48

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"To cost-optimize a TDM-PON, the lowest bandwidth components should be placed in the ONU, i.e., the duobinary encoding should be done by the ONU receiver for downstream"

SuggestedRemedy

Avoid normative language in the report. Change to: "To cost-optimize a TDM-PON, the lowest bandwidth components need to be placed in the ONU, i.e., the duobinary encoding is performed within the ONU receiver for the downstream direction."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"A TDM-PON can be cost-optimized by placing low bandwidth components in the ONU. When using duobinary encoding, this would imply that the encoding is performed at the ONU receiver for downstream transmission."

Cl **06** *SC* **6.3.2** *P* **59** *L* **13** # 111

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

Format of Table 4 is different than any other table in the document (1, 2, 3)

SuggestedRemedy

Align formats of all tables in the document to make them consistent.

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.2** *P* **60** *L* **27** # 112

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **R**

It is not clear why the text on page 60, lines 27-31 and following page, lines 1-8 is bulleted.

SuggestedRemedy

Convert the target text into regular paragraphs.

Response *Response Status* **C**

REJECT.

Bullets assist in readability of the three options mentioned in the preceding paragraph

Cl **06** *SC* **6.3.2** *P* **61** *L* **12** # 113

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"dispersion compensation for the considered bit rates" - I believe early on we define the acronym DC for Dispersion Compensation. It is not userd consistently, though, in the draft

SuggestedRemedy

Replace all instances of "dispersion compensation" when the name of a function is implied, with "DC".

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.2** *P* **61** *L* **13** # 114

Hajduczenia, Marek Bright House Network

Comment Type **E** *Comment Status* **A**

Some garbage "PAM-4 Modulation" text leaft begind in line 13

SuggestedRemedy

Remove

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.2** *P* **61** *L* **13** # 131

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Stray PAM-4 Modulation

SuggestedRemedy

strike

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.2** *P* **61** *L* **5** # 130

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

Undefined term "FBG"
Also I don"t then we want dispersion compensation_s_

SuggestedRemedy

Change to Fiber Bragg grating base DC

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.3** *P* **62** *L* **2** # 115

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

"This leads to a signal with about half the signal spectrum, requiring components with about half the bandwidth (see Table 5), while improving dispersion tolerance. All of this with perhaps a manageable increase in complexity." - this sentence could be simplified and combined into a single sentence.

SuggestedRemedy

Change to "This leads to a signal with about half the signal spectrum, requiring components with about half the bandwidth (see Table 5), while improving dispersion tolerancec with a manageable increase in complexity."

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.4.1** *P* **62** *L* **27** # 116

Hajduczenia, Marek Bright House Network

Comment Type **T** *Comment Status* **A**

Note "(25 Gb/s NRZ requires about 17.5 GHz, and is therefore unworkable with a 7 GHz receiver)" has nothing to do with the comparison of PAM-4 and duobinary

SuggestedRemedy

Remobve the note

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.4.2** *P* **64** *L* **6** # 47

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"PAM-4 has half the baud rate as duobinary, which should lead to superior dispersion tolerance."

SuggestedRemedy

Avoid normative language in the report. Change to: "PAM-4 has half the baud rate as duobinary, which is expected to lead to superior dispersion tolerance."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "which should lead to superior dispersion tolerance"

to

"which leads to "

Cl **06** *SC* **6.3.4.2** *P* **64** *L* **7** # 43

Powell, Bill Alcatel-Lucent

Comment Type **ER** *Comment Status* **A**

Replace editor note "[REF]" with reference "[21]"

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.4.3** *P* **64** *L* **19** # 46

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"should be more than offset by reduced signal distortion"

SuggestedRemedy

Avoid normative language in the report. Change to "is expected to be at least offset by reduced signal distortion"

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.5** *P* **65** *L* **17** # 132

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

"A cyclic prefix is added to minimize inter-symbol interference (ISI)"
I don"t think the CP minimizes the ISI rather it mitigates it"s impact.
ISI is not use anywhere else in the doc and does note need it"s own TLA

SuggestedRemedy

Change to: "A cyclic prefix is added to mitigate inter-symbol interference"

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.5** *P* **65** *L* **24** # 133

Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

"After equalization the FFT the signal is sent"
wording

SuggestedRemedy

Change to: "After equalization and FFT the signal is sent"
^^^

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.5** *P* **65** *L* **26** # 45
Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"In addition, one point should be explained"

SuggestedRemedy

Avoid normative language in the report. Remove the statement: " In addition, one point should be explained" altogether.

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.6** *P* **68** *L* **3** # 134
Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

It is not obvious to me from the previous 2 drafts and comments where these two paragraphs came from. There is some similarity to material submitted in tao_ngepon_01a_1501 but there are also significant differences. Should this be part of 6.3.5?

SuggestedRemedy

Subtend this section to the OFDM section.

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.3.6** *P* **68** *L* **3** # 117
Hajduczenia, Marek Bright House Network

Comment Type **TR** *Comment Status* **A**

Unknown reference [NG-PON2 WP]

SuggestedRemedy

Provide the reference to this paper

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Reference was requested in the last meeting.

removed per previous commetns

Cl **06** *SC* **6.4.1** *P* **68** *L* **18** # 35
Powell, Bill Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Add reference [8] to Figure caption at end of line (right after "Type"), or after "Figure 43" in line 19.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.4.3** *P* **70** *L* **26** # 135
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **R**

wording: "employ some of sort of a WDM router"

SuggestedRemedy

change to "employ a WDM router or multiplexer"

Response *Response Status* **C**

REJECT.

Commenter previously requested that "multipelexer" be replaced with "wavelength router"

Cl **06** *SC* **6.4.3** *P* **72** *L* **3** # 44
Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

"two different output ports should be assigned to an ONU and a 2 N AWG should be used at the RN, as depicted in Figure 48.b"

SuggestedRemedy

Avoid normative language in report. Change to: "two different output ports need to assigned to an ONU and a 2 N AWG is then used at the RN, as depicted in Figure 48.b"

Response *Response Status* **C**

ACCEPT.

Cl **06** *SC* **6.5** *P* **72** *L* **27** # 136
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**
Figure and title split across page.

SuggestedRemedy
Don''t do that! Adjust text and figure so that both the figure and the title are on the same page.

Response *Response Status* **C**
ACCEPT.

Cl **06** *SC* **6.5** *P* **73** *L* **1213** # 36
Powell, Bill Alcatel-Lucent

Comment Type **TR** *Comment Status* **A**
In Table 7, change RFoG wavelengths as follows:

Downstream:
- Change 1550 to 1540-1565
- Add table note [4] beside new values
- Add Note [4] below table pointing to the SCTE 174 2010 RFoG reference [50]

Upstream:
- Change 1310/1610 to:
RFoG1 - 1260-1360 + add table note [4] beside new values
RF0G2 - 1600-1620 + add table note [4] beside new values

SuggestedRemedy

Response *Response Status* **C**
ACCEPT.

see comment 27

Cl **06** *SC* **6.5** *P* **73** *L* **13** # 137
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**
Can table footnotes be aligned to 1st column of table? left margin alignment makes it look like these are separate from the table.

SuggestedRemedy
Please do so.

Response *Response Status* **C**
ACCEPT.

Cl **06** *SC* **6.6.2** *P* **74** *L* **38** # 91
Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**
"The transition from 1G to 10G lasers should be relatively straightforward"

SuggestedRemedy
Avoid normative 802.3 language in a report. Change to "The transition from 1G to 10G lasers is expected to be relatively straightforward"

Response *Response Status* **C**
ACCEPT.

Cl **06** *SC* **6.6.3** *P* **75** *L* **10** # 138
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**
Excess white space
"Off- the-shelf"
^

SuggestedRemedy
change to "Off-the-shelf"

Response *Response Status* **C**
ACCEPT.

Cl **06** *SC* **6.6.5** *P* **75** *L* **39** # 139
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**
Try not to split the table across pages, if necessary to do so, the header should be duplicated.

SuggestedRemedy
Review report for split tables and rearrange so they don''t split across pages or duplicate the header.

Response *Response Status* **C**
ACCEPT.

Cl **06** SC **6.8.1** P **79** L **1** # 140
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**
Table footnotes not associated with table

SuggestedRemedy
Avoid splitting footnotes with other doc text.

Response *Response Status* **C**
ACCEPT.

(look at the bottom of the page)

Cl **06** SC **6.8.2** P **80** L **1** # 141
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**
Orphaned table title.

SuggestedRemedy
Keep all table titles and tables on the same page

Response *Response Status* **C**
ACCEPT.

Cl **06** SC **6.9** P **83** L **19** # 119
Hajduczenia, Marek Bright House Network

Comment Type **TR** *Comment Status* **A**
Seems that the text at the end of line 19 got truncated.

SuggestedRemedy
Change text in line 19 to read: "only at layer 2, but also at layers above." - taken from D09

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

Change to "minimize the transmission overhead at layer-2 and above." for better grammar.

Cl **06** SC **6.9** P **83** L **9** # 118
Hajduczenia, Marek Bright House Network

Comment Type **TR** *Comment Status* **A**
There are two sections in the report with MTU discussion: 5.11 and 6.9

SuggestedRemedy
Change title of 6.9 to "Support for MTU of >2kB"

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

changed to "Support for Larger MTU"

Cl **06** SC **6.9** P **83** L **9** # 142
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **D**
This section on MTU size appears to be more of a requirement than a technical feasibility.

SuggestedRemedy
Move to section 5 (probably 5.14).

Proposed Response *Response Status* **Z**
REJECT.

This comment was WITHDRAWN by the commenter.

see #118

Cl **07** SC **2** P **86** L **15** # 33
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**
re "Depending on the wavelength agility of NG-EPON ONUs" assumes NG-EPON = hybrid- or WDM-PON.

SuggestedRemedy
Add to beginning of sentence: "If NG-EPON employs hybrid- or WDM-PON technology, then...".
Then, add to end of paragraph: "If NG-EPON employs TDM-PON technology, then there is no change to existing configuration processes."

Response *Response Status* **C**
ACCEPT.

Cl **07** *SC* **7.3** *P* **87** *L* **7** # 144
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

The section is discussing cost not value:
"is hard to speculate on the relative value of such a device."

SuggestedRemedy

Change "value" to "cost"

Response *Response Status* **C**

ACCEPT.

Cl **08** *SC* *P* **88** *L* **3** # 34
Harstead, Ed Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

re: "increase in the bandwidth consumption (around 50% CAGR per year)", I believe the 50% CAGR specifically derives from the residential unicast traffic in section 4.4.

SuggestedRemedy

Add "unicast" to the sentence: "increase in the residential unicast bandwidth consumption". Or, leave it less specific by deleting "(around 50% CAGR per year)".

Response *Response Status* **C**

ACCEPT.

Cl **08** *SC* **8** *P* **88** *L* **21** # 146
Remein, Duane Huawei Technologies

Comment Type **E** *Comment Status* **A**

We shouldn"t over indulge in hyperbole: "and universally accepted". Nothing we could do will be universally accepted.

SuggestedRemedy

strike the phrase.

Response *Response Status* **C**

ACCEPT.

Cl **08** *SC* **8** *P* **88** *L* **4** # 145
Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

"the need for optical access is evident" - but we already have that with 1G and 10G-epon

SuggestedRemedy

Add "higher speed" so the statement reads: "the need for higher speed optical access is evident"

Response *Response Status* **C**

ACCEPT.

Cl **09** *SC* *P* **89** *L* **18** # 37
Powell, Bill Alcatel-Lucent

Comment Type **ER** *Comment Status* **A**

Change "Power" to "Powell"

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **09** *SC* *P* **91** *L* **1** # 39
Powell, Bill Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Is this note about [41] or some other reference? I was able to access reference [41] just fine...

Suggest changing to a reference that the note applies to or remove note.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

remove citation #47 and references P68L3

remove 6.3.6 heading (opposing previsou comment)

Cl **09** *SC* *P* **91** *L* **21** # 38

Powell, Bill Alcatel-Lucent

Comment Type **ER** *Comment Status* **A**

Change Ref. [50] to read:
SCTE 174 2010, Radio Frequency over Glass Fiber-to-the-Home Specification, http://www.scte.org/documents/pdf/standards/SCTE 174 2010.pdf

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **3.2** *SC* *P* **19** *L* **8** # 168

NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

"For simplicity" is incorrect. The explanations are reduced for brevity. In fact, though, each sub-section DOES mention how the downstream works.

SuggestedRemedy

CHange to "For brevity" or remove the sentence.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

which one?
"brevity"

Cl **3.2.2** *SC* *P* **20** *L* **10** # 169

NOLL, KEVIN TIME WARNER CABL

Comment Type **E** *Comment Status* **A**

clarity in grammar - " on all upstream wavelength channels at a time"

SuggestedRemedy

change to "simultaneously transmits on all upstream wavelength channels "

Response *Response Status* **C**

ACCEPT.

Cl **67** *SC* **7.3** *P* **86** *L* **29** # 143

Remein, Duane Huawei Technologies

Comment Type **T** *Comment Status* **A**

The following statements appear contradictory:
"It is expected that the price of a single wavelength NG-EPON ONU be comparable to the price of 10/10G-EPON ONU, with the premium attributed primarily to the tunable optics (if used by operators)."
and later in the same para:
"It is probably reasonable to expect the first generation of NG-EPON ONUs cost 4 times more than current 10/10G-EPON ONUs, with additional premium for tunable optics (if used by operators)."

SuggestedRemedy

Change the second sentence to read:
"... first generation of multi-wavelength NG-EPON ONUs cost 4 times ..."

Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* **99** *P* **7** *L* **1** # 79

Hajduczenia, Marek Bright House Network

Comment Type **ER** *Comment Status* **A**

TOC contains references to Tables and Figures - that makes looking through it harder.

SuggestedRemedy

Separate TOC into three lists:
a) table of contents (with headers only)
b) list of tables
c) list of figures

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to inquire ICCom, SA editors

Tables generated. Based on notes from 802.3 chair, ICCom format will not be used. Document to be re-formatted before completion.