



Question(s): 6, 12, 14/15

LIAISON STATEMENT

Source: ITU-T Study Group 15

Title: LS/r on flexible grid (reply to IETF-CCAMP-LS012)

LIAISON STATEMENT

For action to: -

For comment to: -

For information to: IETF CCAMP Working Group

Approval: ITU-T SG15 meeting (Geneva, 4 April 2014)

Deadline: -

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ITU-T Study Group 15 would like to thank the CCAMP Working Group of IETF for their liaison dated 22 March 2014 on the topic of flexible grid.

The items that you requested comments/clarification on are shown below in *italic* font followed by the SG15 responses in plain font.

• *Please comment on future changes regarding the values of nominal central frequency (NCF) granularity [NCFG, currently 6.25 GHz] and slot width granularity [currently 12.5 GHz], as defined in G.694.1. Is ITU-T considering alternative values (e.g. 3.125 GHz) for NCFG in the foreseeable future? If yes, is it correct to assume, that the following always holds, w.r.t. slot width granularity and NCF granularity?*

*SWG = 2 * NCFG [Note: changes in these values may require additional code-points within encodings at control plane protocols.]*

Currently, there have been no proposals made to Q6/15 to standardize a flexible grid with different granularity of slot width or nominal central frequency. If such a proposal is made in the future, it is more likely that a second flexible grid with different granularity will be defined in addition to the existing grid rather than changes made to the current flexible grid.

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One of the reasons behind the 2:1 relationship between the slot width granularity and the nominal central frequency granularity in the current flexible grid is to be able to describe any of the existing fixed spacing grids in Recommendation ITU-T G.694.1 using the flexible grid. If in future a flexible grid with finer granularity is introduced, the same 2:1 relationship should not be assumed.

- *Clarification on the maximum values of the slot width (m parameter) and the expected use cases (e.g. to cover the whole C band).*

[Note: Knowing these values is required since it has an impact on their encoding.]

ITU-T Recommendation G.694.1 does not define any upper limit on the slot width parameter.

However, ITU-T Recommendation G.872 assigns media channels to elements such as fibre segments or amplifiers. The slot widths associated with such media channels could be at least as wide as the C band plus the L band. This would be equivalent to an “m” value of 916.

We understand that there have been proposals within CCAMP for the use of 16 bits to represent the value of “m” which seems to be adequate.

- *Opinion / Clarification on the data plane “hitless” and “hitless” capabilities. Is ITU-T considering any hitless procedure, such as resizing / restoration of a network media channel (in terms of its frequency slot)? Examples of cases where hitless capabilities may be considered are:*

- o *Case 1: Recovery where the new network media channel uses a diverse path*

- o *Case 2: shrink / enlarge frequency slot width, invariant NCF (n)*

- o *Case 3: shift the NCF (n), maintaining the frequency slot width (m)*

Currently we see no need to resize a media channel while the signal it is carrying is in-service. The current agreements are that B100G OTN, will be defined with a modular structure of $n \times 100G$. This not intended to be a signal that supports in-service resizing. Note that not all values of n will be standardized, the initial work is addressing the case of $n = 4$.

- *Clarification on the case where an OTUCn is carried by a (co-routed) group of network media channels which must be managed as a single entity (including set up, recovery, and hardware cross-connection). If this is in scope, what is the estimated availability of ITU-T Recommendation covering this new requirement?*

[Note: CCAMP has considered so far the following requirement: “The control plane architecture SHOULD allow multiple media channels to be logically associated. The control plane SHOULD allow the co-routing of a set of media channels logically associated”. If ITU-T covers this new requirement, it may have an impact on the control plane representation and related procedures.]

Although OTUCn is under discussion, it is not yet standardized and we are not at the stage of defining the case of carriage in multiple network media channels. Our current working assumption is that all the component signals will be carried by a single fibre but the Recommendations to describe this are currently under development.

- *G.872 defines that a media channel may carry more than one OCh-P signal. It also defines that a network media channel is the end-to-end channel allocated to transport a single OCh-P. We would appreciate clarification on the application of network media channel with respect to media channel related to management and configuration aspects.*

A media channel is defined in G.872/G.870 as: “A media association that represents both the topology (i.e., the path through the media) and the resource (frequency slot) that it occupies.”

The network media channel is a specific type of media channel that extends from an optical signal source to an optical signal sink and as such carries a single OCh signal payload. It is the result of constructing a serial concatenation of media channels that exist along the path. Whilst this is useful in describing the architecture, it may not be necessary to “map” this artefact to an LSP.

As SG15 further progresses with the work on this topic, we would be happy to inform CCAMP about the progress made. Q6, Q12 and Q14 of SG15 look forward to future fruitful exchanges of information with the CCAMP Working Group of IETF.
