Resolving D2.1 Comments 103, 182, 190

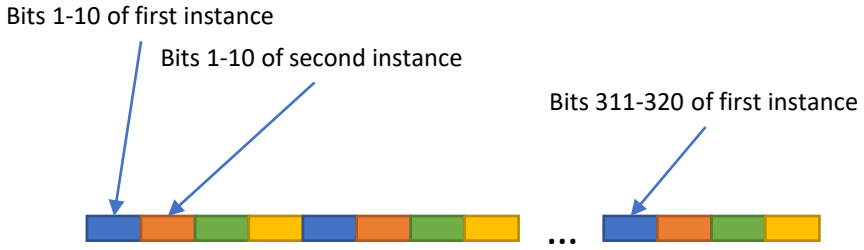
Tom Huber, Nokia
Leon Bruckman, Huawei

Summary of comments

- #103 – 155.2.5.5.4, p47, line 30
  - Comment
    "The 400GBASE-ZR frame contains 1280-bit OH fields. This field is logically composed of“ inconsistent singular/plural
  - Suggested Remedy
    Replace: "The 400GBASE-ZR frame contains 1280-bit OH fields. This field is logically composed of" with: "The 400GBASE-ZR frame contains 1280-bit OH fields. These fields are logically composed of“
- #182 – 155.2.5.5.4, p47, line 30
  - Comment
    The first two sentences can be combined and made clearer
  - Suggested Remedy
    Rewrite as: The 128-bit OH field in the 400GBASE-ZR frame is logically composed of four 320-bit structures…
- #190 - 155.2.6.7, p53, line 15
  - Comment
    There is only one 1280-bit overhead field
  - Suggested Remedy
    Change "overhead fields" to "overhead field“
- While this appears to be a simple issue of singular vs. plural, it is more complicated, and concerns the structure of the 400GBASE-ZR frame

400GBASE-ZR frame structure

- Figure 155-4 shows the overall 400GBASE-ZR frame structure, which includes a 1280-bit field for overhead
  - That structure is being reused from OIF 400ZR, which reuses ITU-T G.709.3
- ITU developed this frame in the context of inverse multiplexing beyond-100G signals over 100G interfaces
  - The basic frame structure supports 100G
  - The 400G version of the frame is constructed by 10-bit interleaving four 100G frames
  - As such, the 1280 bit OH field is formed by interleaving four 320-bit structures
  - In the ITU inverse multiplexing application, each of those 320-bit structures needs to have separate overhead
  - In the 400GBASE-ZR application, there is no inverse multiplexing, and there is no value in writing the description around inverse multiplexing
  - Only the first 320-bit structure is used to carry overhead; the other three are all zeros



Construction of OH field within the 400GBASE-ZR frame

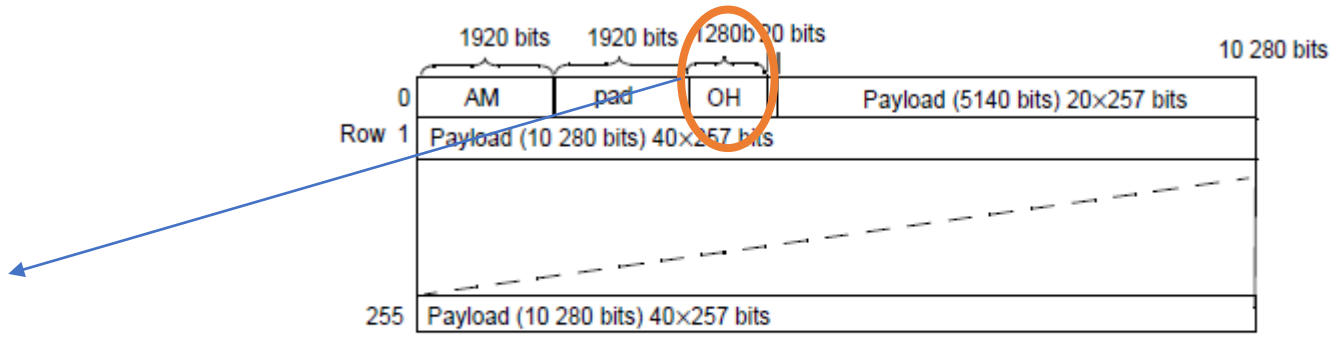


Figure 155–4—400GBASE-ZR frame structure

Contents of the 400GBASE-ZR overhead

- 400GBASE-ZR uses only a small part of the overhead that ITU-T G.709.3 defines
- ITU-T G.709.3 defines the overhead based on the 100G frame (i.e., the 320-bit structure)
  - That frame itself uses a multi-frame because not all the overhead elements need to be present in every frame
- Figure 155-5 shows 4-frame multiframe that 400GBASE-ZR uses

- 155.2.5.5.[1-3] describe the 3 overhead elements (MFAS, STAT, JCn)
- 155.2.5.4 describes how this is encoded into the 1280-bit overhead area based on the four 320-bit structures

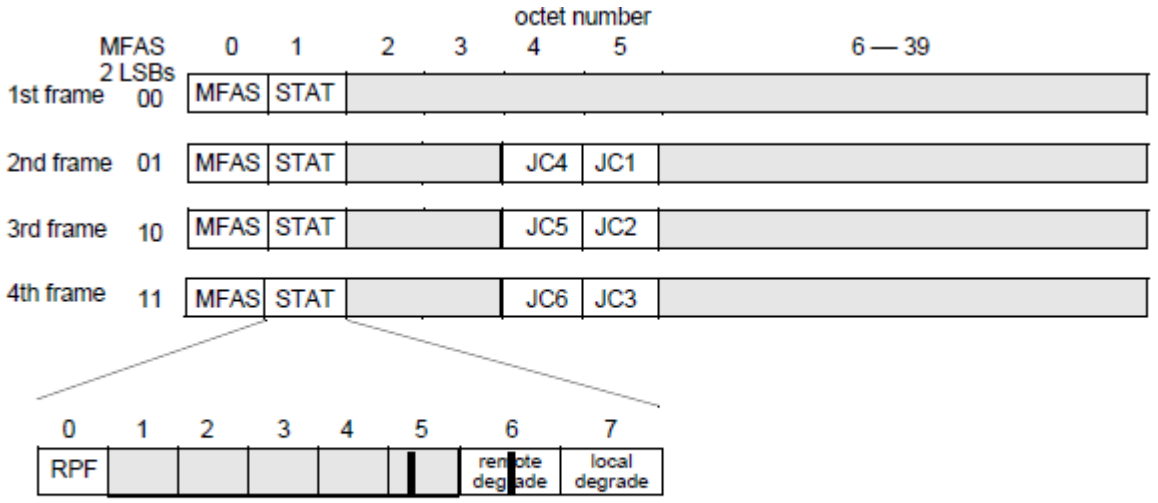


Figure 155–5—Contents of OH fields in four-frame multi-frame

Relating figure 155-4 to 155-5

MFAS bits 7-8

Bit numbers

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	42	44	45	46	47	48	49	50	51	52	53	54	55	56		313	314	315	316	317	318	319	320
0	0	MFAS								STAT																																														...								
0	1	MFAS								STAT																								JC4								JC1																...								
1	0	MFAS								STAT																								JC5								JC2																...								
1	1	MFAS								STAT																								JC6								JC3																...								

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	42	44	45	46	47	48	49	50	51	52	53	54	55	56		313	314	315	316	317	318	319	320
0	0																																																							...								
0	1																																																							...								
1	0																																																							...								
1	1																																																							...								

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	42	44	45	46	47	48	49	50	51	52	53	54	55	56		313	314	315	316	317	318	319	320
0	0																																																							...								
0	1																																																							...								
1	0																																																							...								
1	1																																																							...								

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	42	44	45	46	47	48	49	50	51	52	53	54	55	56		313	314	315	316	317	318	319	320
0	0																																																							...								
0	1																																																							...								
1	0																																																							...								
1	1																																																							...								

Four instances of the 320-bit frame structure, with overhead only in the first one

10-bit interleaving into the 1280-bit OH field – top row showing bit numbers in that field, second row showing bits of each instance

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	11	12	13	14	15	16	17	18	19	20
MFAS								stat.1-2																																stat.3-8																			

Resolving the comments

- Per Figure 155-4, there is a single 1280-bit field called “OH”
- Per clause 155.2.5.5, there are several “overhead fields” (MFAS, STAT, JCn) that are in specific locations within that 1280-bit field, as described on slides 4-5 of this presentation
  - Figure 155-5 is not a simple magnified of the 1280-bit OH field
- The underlying issue is ambiguity created by using “OH field(s)” to refer to both the 1280-bit field and to set of overhead elements/components (MFAS, STAT, JCn) within that field
- Proposal: use ‘OH field’ to refer to the 1280-bit field in Figure 155-4, and use ‘overhead elements’ or ‘overhead components’ to refer to the contents
  - This impacts text in 155.2.2, 155.2.5.5[.x], and 155.2.6.7[.x]
  - Give the editor license to make the appropriate changes in these subclauses