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Gesendet: Mittwoch, 2. Dezember 2020 16:48
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Betreff: IEEE 802.1Q, CFM CCM Protocol, Faster Intervals?

Dear Glenn Parsons,

I write to you as you are the working group chair for the IEEE 802.1Q standard.

I am part of the working group editing the IEC 62439-2 High Availability Automation Networks standard.

We make use of the CFM CCM Protocol at Level 0 to check links between two network devices to detect missing links.

Currently we use the CCM intervals of 10 ms and 3.33 ms for the MRP media redundancy protocol link checks.

To realize faster reconfiguration times we would appreciate if there would exist even faster CCM intervals below 3.33 ms, which the 802.1Q standard currently not supports.

Do you see any chance that the IEEE 802.1 Q standard could be extended to support faster CCM intervals?

If there is a possibility for an extension I would like to draw your attention to the enclosed short presentation of one possible proposal in that direction.

I am looking forward to your feedback,

Best Regards/Mit freundlichen Grüßen
Thomas Weichlein

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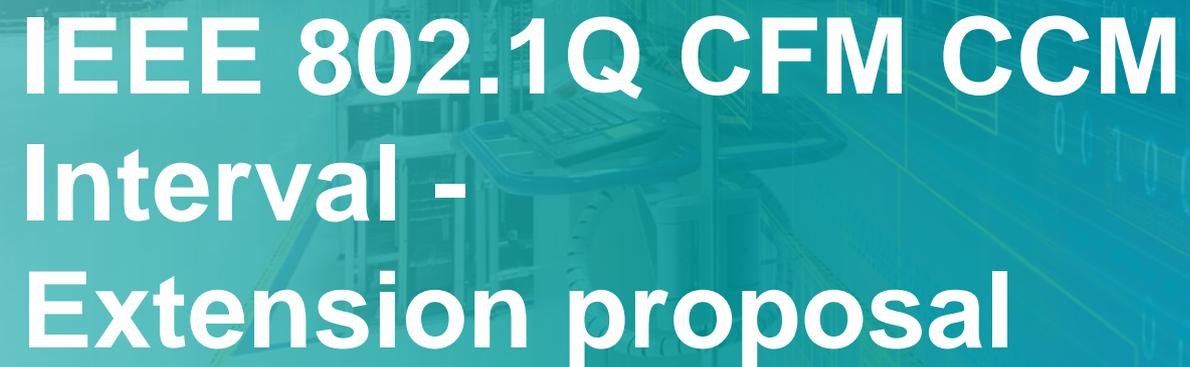
IEEE 802.1Q CFM CCM Interval - Extension proposal

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Change Proposal for IEEE 802.1Q CFM CCM Intervals
- Introduction

- **The IEEE 802.1Q defines the Connectivity Fault Management (CFM) protocol.**

- **Within CFM, the Continuity Check Messages (CCM) are defined.**

- **CCM can be used to check network connections on link basis or path basis.**

- **CCM predefines fixed possible CCM intervals from 3.33 ms to 10 min.**

Change Proposal for IEEE 802.1Q CFM CCM Intervals
- Introduction continued

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- **The IEC 62439-2 standard uses the CCM for link detection in conjunction with the Media Redundancy Protocol (MRP).**

- **To achieve a 200 ms reconfiguration time, CCM with the fastest intervals of 10 ms and 3.33 ms can be used.**

- **But to fulfill enhanced timing requirements of faster reconfiguration profiles of 30 ms and 10 ms for MRP, even faster CCM intervals would be required.**

- **Therefore we would like to propose the introduction of further, faster CCM interval codings.**

Change Proposal for IEEE 802.1Q CFM CCM Interval
- Current CFM CCM Interval status

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- ## The IEEE 802.1Q currently states:

- ## "The least significant 3 bits of the Flags field constitute the CCM Interval field."

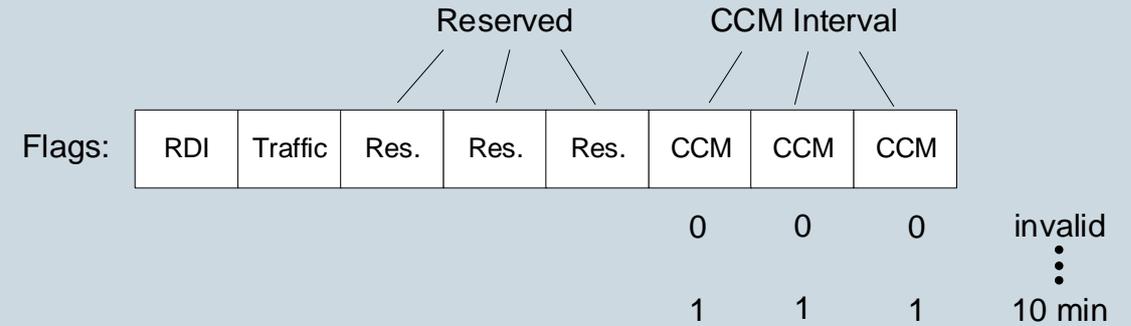- ## "The CCM Interval field is encoded as specified in Table 21-15."

Reserved   CCM Interval

Flags:

RDI	Traffic	Res.	Res.	Res.	CCM	CCM	CCM

| | | | | | 0 | 0 | 0 | invalid |
| | | | | | 1 | 1 | 1 | 10 min |

Table 21-15—CCM Interval field encoding

Transmission Interval	max. CCM Lifetime	min. CCM Lifetime	CCM Interval field
invalid			0
3 1/3 ms (300 Hz)	11 2/3 ms	10 5/6 ms	1
10 ms	35 ms	32.5 ms	2
100 ms	350 ms	325 ms	3
1 s	3.5 s	3.25 s	4
10 s	35 s	32.5 s	5
1 min	3.5 min	3.25 min	6
10 min	35 min	32.5 min	7

Change Proposal for IEEE 802.1Q CFM CCM Interval - Proposal for Interval times coding extension

- **To be able to code additional faster Intervals, it is proposed to use two of the reserved bits for CCM Interval extended[1]:**

Flags:	RDI	Traffic	Res.	CCM	CCM	CCM	CCM	CCM	
				0	0	0	0	0	invalid
				0	1	0	0	0	0.1 ms
				1	0	0	0	0	1 ms
				1	1	0	0	0	2 ms

Reserved | CCM Interval extended | CCM Interval

[1]**This involves also slight text changes e.g. here: chapter 20.1 "The loss of three CCMs can be detected in as little as 10.8 ms (see Table 21-15)."**

-> "…in as little as 0.33 ms"

Thank you for your attention!

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