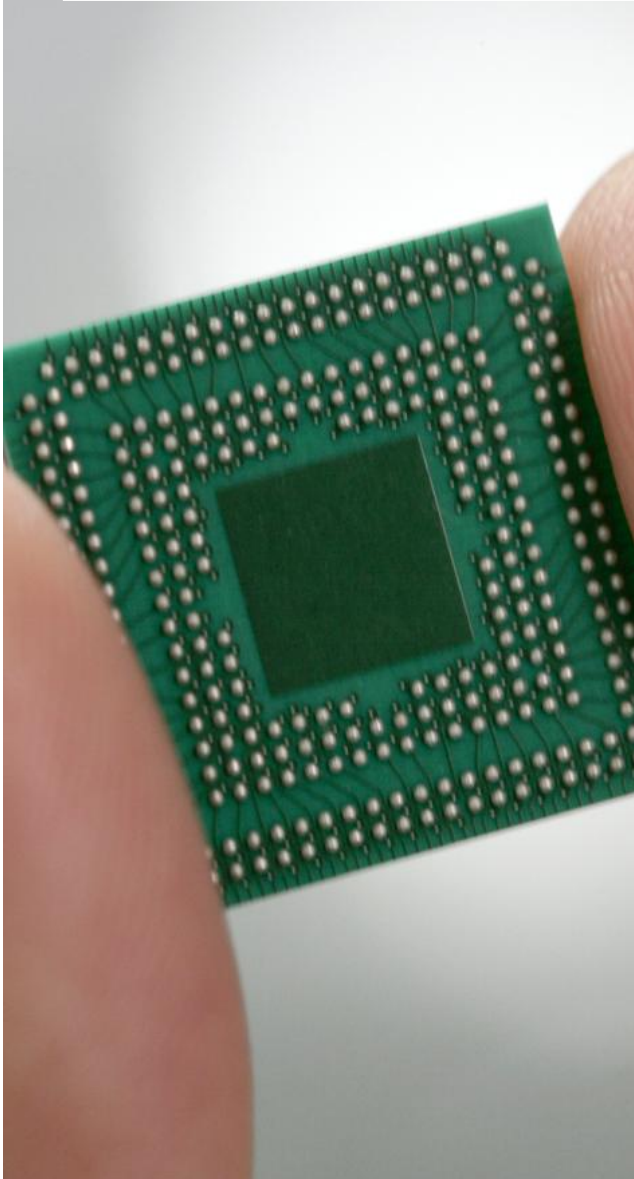**SIEMENS**

Preemption

March 2013

IEEE 802.3 SG DMLT
Orlando (FL)

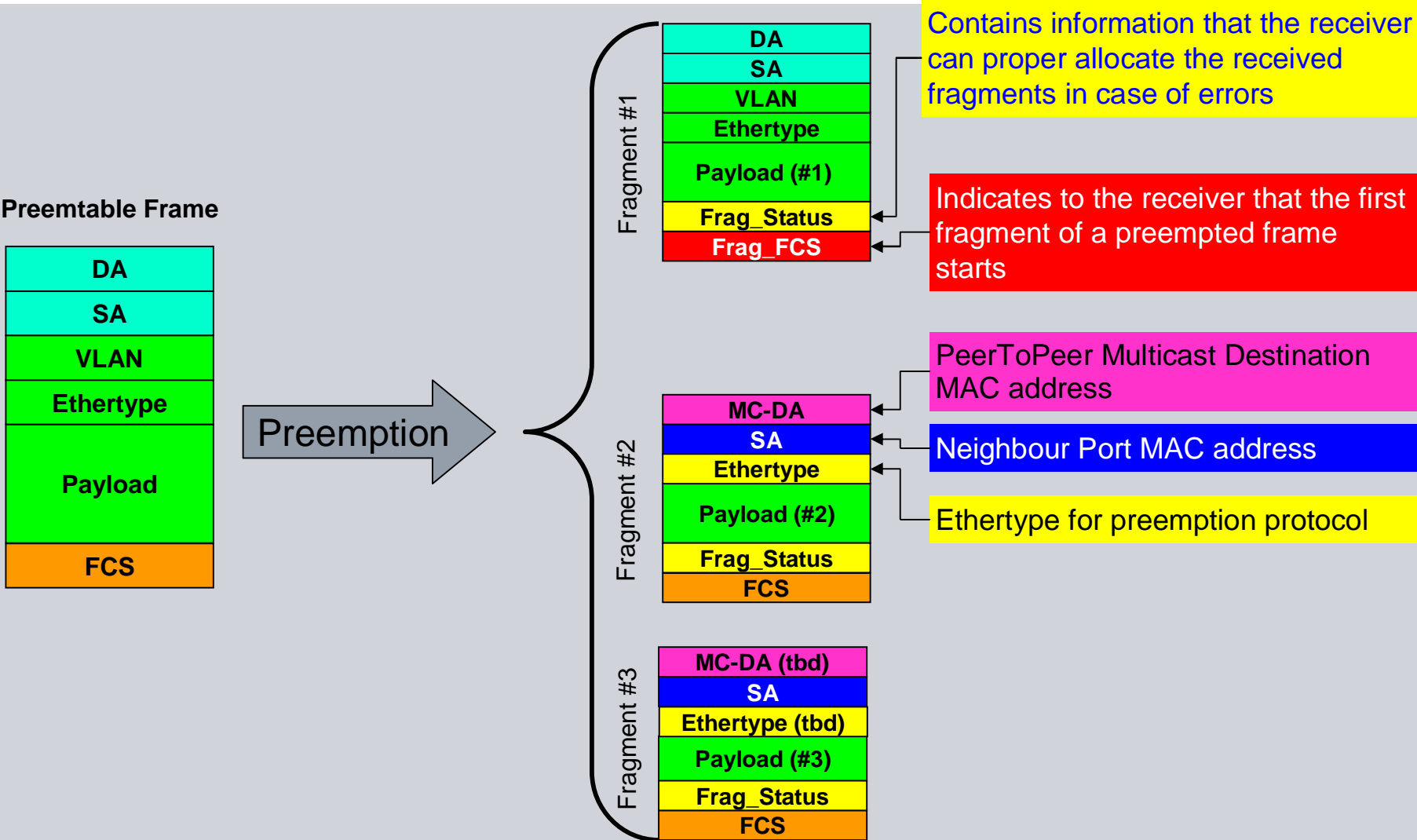Albert Tretter, Siemens AG

Objective of this Presentation

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- Shows some of the expected features of preemption

- Gives an example of a preemption protocol based on the MAC Merge Layer and asks some questions

  - The MAC Merge Layer concept was presented in Phoenix by Pat Thaler:

    http://www.ieee802.org/3/DMLT/public/jan13/Thaler-01-0113-dmlt.pdf

- Should help for the discussion of PAR, 5C and objectives

- It is not the intention to choose a certain solution

Expected Features of Preemption

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- Preemption should operate on a link basis:

    - Preemption should be active if both sides of the link supports preemption.

    - The necessary negotiations may be done with an appropriate peer-to-peer protocol, like LLDP

- A preemptive frame can preempt the transmission of a preemptable frame one or more times

- Only one level of preemption required as proposed by the MAC Merge Layer presentation

- No frame overhead if no preemption occurs

- Minimized overhead at each fragment, respectively avoid padding

Possible Coding of Fragments

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Preemtable Frame

DA
SA
VLAN
Ethertype
Payload
FCS

Preemption →

Fragment #1

DA
SA
VLAN
Ethertype
Payload (#1)
Frag_Status
Frag_FCS

Contains information that the receiver can proper allocate the received fragments in case of errors

Indicates to the receiver that the first fragment of a preempted frame starts

Fragment #2

MC-DA
SA
Ethertype
Payload (#2)
Frag_Status
FCS

PeerToPeer Multicast Destination MAC address

Neighbour Port MAC address

Ethertype for preemption protocol

Fragment #3

MC-DA (tbd)
SA
Ethertype (tbd)
Payload (#3)
Frag_Status
FCS

Coding of the parameter Frag_Status

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Bits	Parameter	Description
7:0	FrameNumber	The same FrameNumber is assigned to all fragments of a preempted frame. The FrameNumber is incremented only if a preemtable frame is preemted.
15:8	FragmentAttributes	Bits 13 to 8: FragmentNumber (0 to 63) Each fragment of a preemted frame gets an ascending FragmentNumber Bit 14: reserved (not used) Bit 15: more follows flag: 0: last fragment 1: more fragments follows

Properties of the proposal

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- All fragments are well formed Ethernet packets, except the first fragment with the Frag_FCS (e. g. inverted FCS)

- In order to avoid padding all fragments have a length greater or equal 64 Bytes

- Preemptable frames with a frame length smaller than 106 Bytes are not preemted

Summary

- Some questions has to be answered:

    - Which parameter (DA, SA, Ethertype, Frag_Status, Frag_FCS) are controllable by the MAC Merge Layer?

    - Are there other attributes which should be negotiated between the link partners:

        - Minimum fragment length: 64Byte, 96Byte, 128Bytes, ..?

        - Fragment alignment: 1Byte, 2 Bytes, 4 Bytes, 8Bytes, ...?

        - Preemption support of the link partner

        - ...

- At some points our proposal may be a little bit over determined, there may be other proposals for a preemption protocol with less overhead

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Thank You

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