

OAM Discussion

July 26, 2018

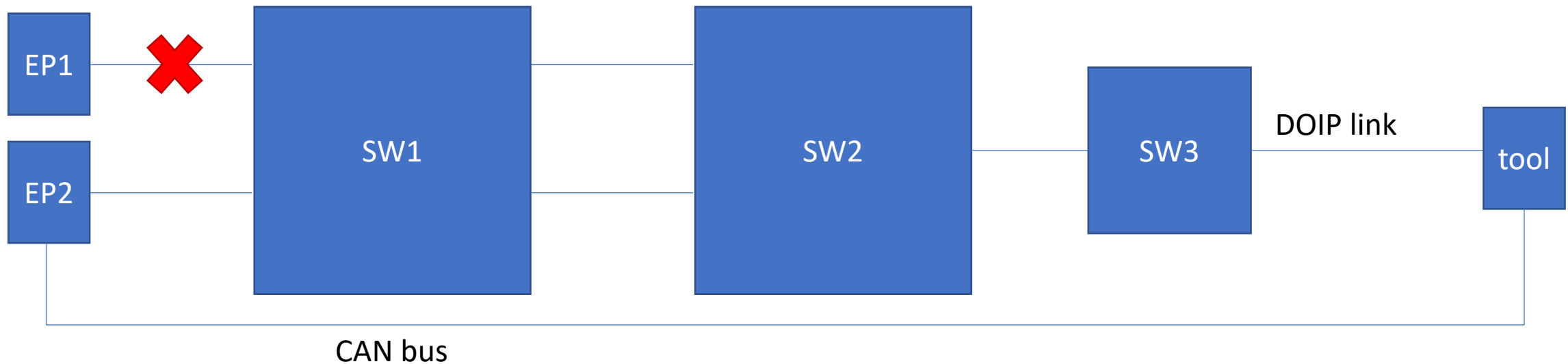
IEEE802.3ch

Problem Statement

- Need a simple method to detect all link state failures
- Need a simple method to detect link state failures between link partners
- Need a standard method to read failed states
- Need status even when micro is “out to lunch” – no communication between MAC/PHY interface

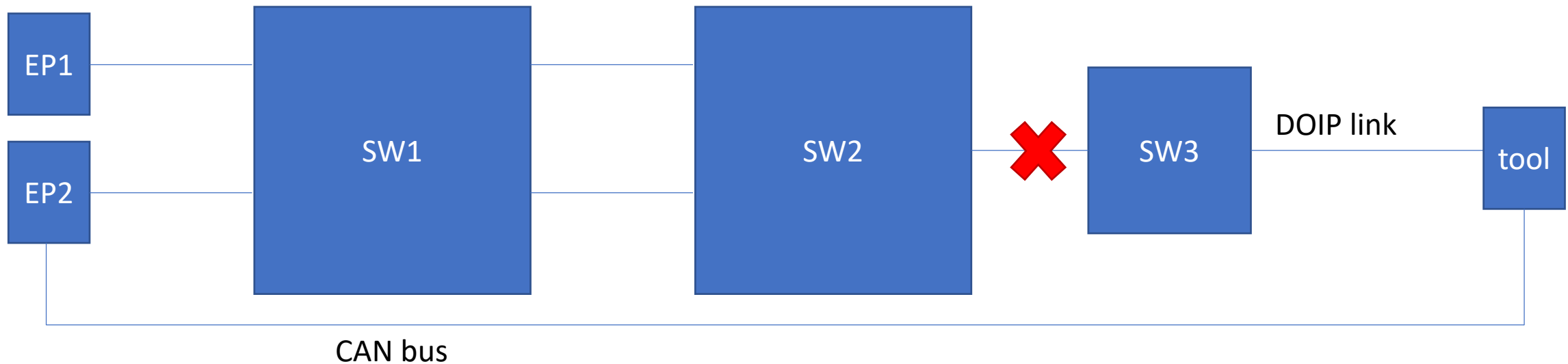
Fault Scenarios

- Fault in Link Segment EP1 - SW1
 - SW1 link segment diagnostics detects the fault
 - SW1 reports the fault to tool through SW2 and SW3
 - Link Segment is replaced



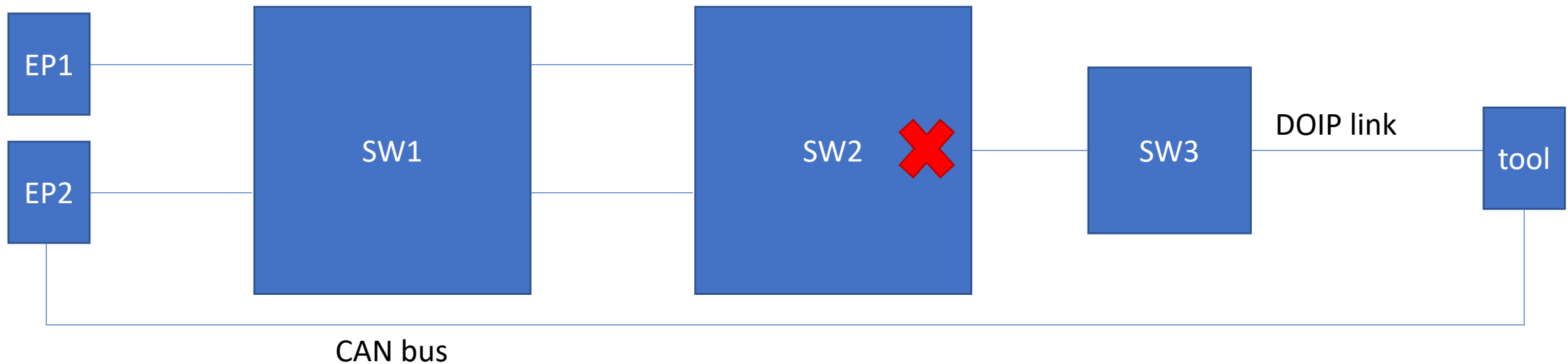
Fault Scenarios

- Fault in Link Segment SW2 – SW3
 - Path to tool is broken
 - SW2 link segment diagnostics detects the fault
 - SW2 reports the fault to tool through SW1 and EP2 which provides status through CAN
 - Link segment is replaced



Fault Scenarios

- Fault in SW2 – micro is down
 - SW3 OAM is needed
 - SW3 link diagnostics don't see an issue
 - SW2 PHY is able to send OAM and report it has an internal ECU failure
 - SW1 reports the fault to tool
 - SW2 is replaced



Fixed bits (new) or configurable (Clause 97)?

- FYI – Clause 97 OAM defined in 97.3.8
- More discussion required – See page 8 for outcome of discussion on proposed bits from July

OAM Bit usage

- Define standard usage of OAM bits
- No “RAM” associated with OAM
- OAM is not configurable
- OAM data is stored in a predefined register
- OAM is not divided across multiple message frames
- Use Parity bit(s) to fault check OAM
- Backward compatibility to Clause 97 is not maintained
 - 2.5GBASE-T1 PHY capable of 1000BASE-T1 communication when 1000BASE-T1 does not implement OAM (or implements Multi-Gig OAM, if possible)

OAM Faults Reported

(In order of importance)

- Local Link Status – Up, Down – **No possible way for one side to be up and the other down**
- Remote Failure Indication – The peer is not available – True, False – **If there's a failure there's no info available**
- Remote Loopback Status – True, False – **Can be read by local registers**
- PHY frame error rate at limit (e.g. 97 RFER) – True, False
- Cable Fault; Open, Short (determined by reading a register) – True, False – **May want to consider a new CFI to define registers and behavior for BASE-T1**
- Supply voltage low – True, False
- Polarity correction active – True, False