Solution to redmine 5917

sGos with report incase GOOSE publish is not supported (Ed2Amd1 TP1.1)

August 23, 2022

Suggest to update the description for some test cases of CB9b: GOOSE subscribe:  
'Expected result': "DUT updates the value and sends a GOOSE message with changed status value" => "DUT updates the changed status value"  
'Test description': "Test engineer configures the DUT with subscribed GOOSE (ping-pong mechanism)" => "Test engineer configures the DUT with the ping-pong mechanism ("the ping-pong mechanism" can either be using GOOSE or RCB)".

The “goose ping-pong mechanism” is specified in detail after the table of abstract test procedures. And then referred to in each test procedure. We don’t need to copy/clarify the mechanism details in each test procedure again. We just improve the following text:

To perform the DUT subscribe test procedures the DUT need to be configured with a GOOSE ping-pong mechanism as follows:

* a data value that is connected to a subscribed GOOSE member, e.g. GGIO.SPS01
* a data set that contains the value of this data point
* a GoCB that publishes this data set or a RCB that sends a data change/quality change report
* the subscribed GOOSE messages have variable length encoding unless specified otherwise (sGos9)

As such the analyzer trace files contain the proof when a subscribed GOOSE message is processed.

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| **sGos1** | **Subscribe GOOSE message with/without VLAN and Reserverd1 R>0** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1, Annex B  PIXIT: Gs8 | | |
| Expected result  1,2,3,4. DUT updates the value and sends a GOOSE message or Report with changed status value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE ping-pong mechanism with destination MAC-Address in the recommended range and Reserved fields all zero  1. Publisher sends GOOSE message with new data value with the VLAN tag  2. Publisher sends GOOSE message with new data value without the VLAN tag  3. Publisher sends GOOSE message with new data value with VLAN ID = 0  4. Publisher sends GOOSE message with new data value with the VLAN tag and Reserved1 R not zero | | |
| Comment | | |

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| **sGos8** | **Subscribe GOOSE message with non-1 as boolean “true” value** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1 | | |
| Expected result   1. DUT updates the value and sends a GOOSE message or Report with status value true (any value >0) | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE ping-pong mechanism   1. Publisher sends GOOSE message with boolean “false” as value 0x00 2. Publisher sends GOOSE message withboolean “true” as value 0x02 | | |
| Comment  Note the goal is to verify that the subscriber accepts any boolean value >0 as “true” | | |

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| **sGos9** | **Subscribe GOOSE message with “fixed length” GOOSE** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause A.3  PIXIT Gs8 | | |
| Expected result   1. DUT updates the value and sends a GOOSE message or Report with changed integer value   4. DUT updates the value and sends a GOOSE message or Report with changed boolean value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE ping-pong mechanism containing a “Beh” structure and an integer value and a boolean value. The pong dataset need not contain every ping attribute.  When INS or ENS subscribe is supported (PIXIT Gs8)   1. Publisher sends “fixed length” GOOSE with initial integer value 2. Publisher sends “fixed length” GOOSE with other integer value   When INS subscribe is not supported  3. Publisher sends “fixed length” GOOSE with initial boolean value  4. Publisher sends “fixed length” GOOSE with other boolean value | | |
| Comment | | |

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| **sGos10** | **Subscribe GOOSE message with ldName** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1 | | |
| Expected result   1. DUT updates the value and sends a GOOSE message or Report with changed status value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE (ping-pong mechanism) from a GoCB with dataset elements from a logical device with a configured ldName.   1. Publisher sends GOOSE messages with boolean “false” value 2. Publisher sends GOOSE messages with boolean “true” value | | |
| Comment | | |

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| **sGos11** | **Subscribe GOOSE message with private DO** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1 | | |
| Expected result   1. DUT updates the value and sends a GOOSE message or Report with changed status value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE (ping-pong mechanism) from a GoCB with dataset elements from a private logical node and private DO.   1. Publisher sends GOOSE messages with boolean “false” value 2. Publisher sends GOOSE messages with boolean “true” value | | |
| Comment | | |

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| **sGos12** | **Process first GOOSE message after state change** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3.6 | | |
| Expected result   1. DUT updates the value and sends a GOOSE message or Report with changed status value within 1 second | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE (ping-pong mechanism)   1. Publisher sends multiple GOOSE messages with incremented sqNum, timeAllowedToLive=2000 milliseconds 2. Publisher sends one GOOSE message with incremented stNum, sqNum=0, timeAllowedToLive=2000 milliseconds and wait for 2 seconds (the publisher does not re-transmit the GOOSE message in these 2 seconds) | | |
| Comment | | |

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| **sGos13** | **Subscribe to “secure” GOOSE message** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1, Annex C | | |
| Expected result  2. DUT updates the value and sends a GOOSE message or Report with changed status value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE (ping-pong mechanism)   1. Publisher sends GOOSE messages with boolean “false” value with, Reserved 1: S=0, R=0 and Reserved Security not zero, Reserved 2 bits not zero and several additional trailing octets outside the GOOSE APDU 2. Publisher sends GOOSE messages with boolean “true” value with the same Reserved bits and trailing octets | | |
| Comment  Reserved 1 field: | | |

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| **sGos14** | **Subscribe to Ed1 GOOSE message without goID** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1, Annex C | | |
| Expected result  2. DUT updates the value and sends a GOOSE message or Report with changed status value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE (ping-pong mechanism)   1. Publisher sends GOOSE messages with boolean “false” value without goID 2. Publisher sends GOOSE messages with boolean “true” value | | |
| Comment | | |

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| **sGos15** | **Subscribe to 2 GOOSE streams with the same AppID value** | Passed  Failed  Inconclusive |
| IEC 61850-7-2 Subclause 18.2.3  IEC 61850-8-1 Subclause 18.1, Annex C | | |
| Expected result  2. DUT updates the first value and sends GOOSE message or Report with changed status value  4. DUT updates the second value and sends GOOSE message or Report with changed status value | | |
| Test description  Test engineer configures the DUT with 2 subscribed GOOSE streams with the same valid AppID value (ping-pong mechanism)   1. Publisher sends GOOSE1 messages with boolean “false” value 2. Publisher sends GOOSE1 messages with boolean “true” value 3. Publisher sends GOOSE2 messages with boolean “false” value 4. Publisher sends GOOSE2 messages with boolean “true” value | | |
| Comment | | |

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| **sGos20** | **GOOSE with existing CDC extended with DA with new FC (K2.2)** | Passed  Failed  Inconclusive |
| IEC 61850-7-1 Annex K2.2  IEC 61850-7-2 Subclause 18.3.2.2  IEC 61850-8-1 Subclause 18.1 | | |
| Expected result  1. DUT ignores the state change (no state change, no quality change)  2. DUT sends GOOSE message or Report with state change reflecting the edition 2 state change  3. DUT ignores the state change (no state change, no quality change)  4. DUT sends GOOSE message or Report with state change reflecting the edition 2 state change | | |
| Test description  Configure a ping-pong mechanism with a future edition .IID file with an FCD and an FCDA dataset element with a new FC and followed by Ed2 dataset element.  1. Publisher changes the value of the FutureEd dataset element as FCD  2. Publisher changes the value of the Ed2 dataset element as FCD  1. Publisher changes the value of the FutureEd dataset element as FCDA  2. Publisher changes the value of the Ed2 dataset element as FCDA | | |
| Comment  Configure GOOSE simulator with future edition CDC=SPS DOtype with FC=MM and DA=futVal as Boolean and instantiate FutInd1 and FutInd2 and configure dataset with:   * Future SPS: FutInd1.ST.stVal and FutInd1.MM.futVal as FCDA * Normal Ed2 SPS: Ind1.ST.stVal and Ind1.ST.q * Future SPS: FutInd2.ST and FutInd2.MM as FCD * Normal Ed2 SPS: Ind2.ST   Configure DUT to subscribe to the normal Ed2 Ind1.ST.stVal and Ind2.ST.stVal | | |

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| **sGos21** | **GOOSE with existing CDC with renamed DA, subDO or subDA (K2.7)** | Passed  Failed  Inconclusive |
| IEC 61850-7-1 Annex K2.7  IEC 61850-7-2 Subclause 18.3.2.2  IEC 61850-8-1 Subclause 18.1 | | |
| Expected result  1. DUT ignores the state change  2. DUT sends GOOSE message or Report with state change reflecting the edition 2 state change  3. DUT ignores the state change  4. DUT sends GOOSE message or Report with state change reflecting the edition 2 state change | | |
| Test description  Configure a ping-pong mechanism with a future edition .IID file with an FCD/FCDA dataset element with a renamed DA/subDO/subDA and followed by Ed2 dataset element.  1. Publisher changes the value of the FutureEd dataset element as FCD  2. Publisher changes the value of the Ed2 dataset element as FCD  3. Publisher changes the value of the FutureEd dataset element as FCDA  4. Publisher changes the value of the Ed2 dataset element as FCDA | | |
| Comment  Configure GOOSE simulator with future edition CDC=SPC with FC=ST and rename DA=q to qNew and instantiate FutInd1 and FutInd2 and configure dataset with:   * Future SPC: FutInd1.ST.stVal and FutInd1.ST.qNew as FCDA * Normal Ed2 SPS: Ind1.ST.stVal and Ind1.ST.q as FCDA * Future SPC: FutInd2.ST as FCD * Normal Ed2 SPS: Ind2.ST as FCD   Configure DUT to subscribe to the normal Ed2 Ind1.ST.stVal and Ind2.ST.stVal | | |

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| **sGos22** | **GOOSE with existing CDC with extended PACKEDLIST (K2.17)** | Passed  Failed  Inconclusive |
| IEC 61850-7-1 Annex K2.17  IEC 61850-7-2 Subclause 18.3.2.2  IEC 61850-8-1 Subclause 18.1 | | |
| Expected result  1. DUT sends GOOSE message or Report with state change reflecting the extended DA state change  2. DUT sends GOOSE message or Report with state change reflecting the edition 2 state change  3. DUT sends GOOSE message or Report with state change reflecting the extended DA state change  4. DUT sends GOOSE message or Report with state change reflecting the edition 2 state change | | |
| Test description  Configure a ping-pong mechanism with a future edition .IID file with an FCD/FCDA dataset element with an extended PACKEDLIST and followed by Ed2 dataset element.  1. Publisher changes the value of the extended dataset element as FCD  2. Publisher changes the value of the Ed2 dataset element as FCD  3. Publisher changes the value of the extended dataset element as FCDA  4. Publisher changes the value of the Ed2 dataset element as FCDA | | |
| Comment  Configure GOOSE simulator with future edition CDC=SPC with FC=ST and extend DA=q to 16bits (extended) and instantiate FutInd1 and FutInd2 and configure dataset with:   * Future SPC: FutInd1.ST.stVal and FutInd1.ST.q as FCDA * Normal Ed2 SPS: Ind1.ST.stVal and Ind1.ST.q as FCDA * Future SPC: FutInd2.ST as FCD * Normal Ed2 SPS: Ind2.ST as FCD   Configure DUT to subscribe to the normal Ed2 Ind1.ST.stVal and Ind2.ST.stVal as well as FutInd1.ST.stVal and FutInd2.ST.stVal | | |

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| **sGos23** | **Verify that the DUT process GOOSE data values with quality test is true when the device is in test, and ignores such values when device is not in test** | **Passed**  **Failed**  **Inconclusive** |
| IEC 61850-7-4 Annex A  PIXIT Sr5, Gs12 | | |
| Expected result  2. and 5. DUT processes the data value flagged with quality test true as described in the PIXIT (for instance: keep last non test value, substitute to a configured value, ...)  Other steps. DUT updates the value and sends a GOOSE message or Report with the changed value | | |
| Test description  Test engineer configures the DUT with subscribed GOOSE with FCDA (ping-pong mechanism)  Force the subscriber Logical Node into Beh = on  1. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  2. SIMULATOR publishes GOOSE message with changed data values flagged quality test true  3. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  Force the subscriber Logical Node into Beh = blocked (when supported)  4. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  5. SIMULATOR publishes GOOSE message with changed data values flagged quality test true  6. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  Force the subscriber Logical Node into Beh = test (when supported)  7. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  8. SIMULATOR publishes GOOSE message with changed data values flagged quality test true  9. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  Force the subscriber Logical Node into Beh = test/blocked (when supported)  10. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  11. SIMULATOR publishes GOOSE message with changed data values flagged quality test true  12. SIMULATOR publishes GOOSE message with changed data values flagged quality test false  . | | |
| Comment | | |