

Clarification Request

References: “e.g” BTL Specified Tests 14.YY.1.2.2

Date of BTL-WG Response: 2023-March-02

Background: “e.g” BTL Specified Tests 14.YY.1.2.2 Malformed BVLC Test, CR-0513 14.YY.1.2.2 Malformed BVLC Test

Using the response from CR-0513, which changes Steps 10 and 11, the current test looks as shown below:

1. 14.YY.1.2.2 Malformed BVLC Test

Reference YY.3.1.5

Purpose: Verify that device NAKs malformed / unknown unicast BVLC and ignores malformed / unknown broadcast BVLC.

Test Concept: With the IUT connected to the BACnet/SC network, send a sequence of malformed unicast and broadcast BVLCs to the IUT. Verify that the IUT responds with an appropriate NAK to each unicast one and does not process nor route the messages.

Configuration Requirements: The IUT is connected to the BACnet/SC network as a node or hub.

Test Steps:

-- Invalid BVLC function

1. TRANSMIT

'BVLC Function' = (IV: an invalid 1-octet value),

'Message ID' = (M1: any valid value),

-- 'Originating Virtual Address' absent

-- 'Destination Virtual Address' absent

-- 'Destination Options' absent

-- 'Data Options' absent

2. RECEIVE BVLC-Result,

'Message ID' = M1,

-- 'Originating Virtual Address' absent

-- 'Destination Virtual Address' absent

'Destination Options' = (absent or a valid list of options),

-- 'Data Options' absent

'Result for BVLC Function' = IV, -- the supplied invalid BVLC function from the request

'Result Code' = X'01', -- NAK

'Error Header Marker' = X'00', -- not a header option problem

'Error Class' = COMMUNICATION,

'Error Code' = BVLC_FUNCTION_UNKNOWN

3. CHECK(that the IUT did not process nor forward the request)

-- Inclusion of an Originating Virtual Address when it is required to be absent

4. TRANSMIT Disconnect-Request,

'Message ID' = (M2: any valid value),

'Originating Virtual Address' = D3,

-- 'Destination Virtual Address' absent

'Destination Options' = (absent or a valid list of options),

-- 'Data Options' absent

5. RECEIVE BVLC-Result,

'Message ID' = M2,

-- 'Originating Virtual Address' absent

'Destination Virtual Address' = D3

- 'Destination Options' = (absent or a valid list of options),
 -- 'Data Options' absent
 'Result for BVLC Function' = X'08', -- Disconnect-Request
 'Result Code' = X'01', -- NAK
 'Error Header Marker' = X'00', -- not a header option problem
 'Error Class' = (COMMUNICATION or SERVICES),
 'Error Code' = (HEADER_ENCODING_ERROR, INCONSISTENT_PARAMETER,
 PARAMETER_OUT_OF_RANGE or OTHER)
6. CHECK(that the IUT did not process the request)
- Inclusion of a 'Destination Virtual Address when it is required to be absent
7. TRANSMIT Disconnect-Request,
 'Message ID' = (M3: any valid value),
 -- 'Originating Virtual Address' absent,
 'Destination Virtual Address' = (IUT's VMAC),
 'Destination Options' = (absent or a valid list of options),
 -- 'Data Options' absent
8. RECEIVE BVLC-Result,
 'Message ID' = M3,
 -- 'Originating Virtual Address' absent
 -- 'Destination Virtual Address' absent
 'Destination Options' = (absent or a valid list of options),
 -- 'Data Options' absent
 'Result for BVLC Function' = X'08', -- Disconnect-Request
 'Result Code' = X'01', -- NAK
 'Error Header Marker' = X'00', -- not a header option problem
 'Error Class' = (COMMUNICATION or SERVICES),
 'Error Code' = (HEADER_ENCODING_ERROR, INCONSISTENT_PARAMETER,
 PARAMETER_OUT_OF_RANGE or OTHER)
9. CHECK(that the IUT did not process the request)
- A truncated message
10. TRANSMIT Encapsulated-NPDU,
 'Message ID' = (M4: any valid value),
 'Originating Virtual Address' = (~~OVA: absent, or D3 if IUT is configured as a hub~~),
 (OVA: D3, or absent if IUT is configured as a hub),
 'Destination Virtual Address' = (IUT's VMAC),
 -- 'Destination Options' absent
 -- 'Data Options' absent
 -- no NPDU included in the message
11. RECEIVE BVLC-Result,
 'Message ID' = M4,
~~'Originating Virtual Address' absent~~
 'Originating Virtual Address' = (absent, or the IUT's VMAC if the IUT is configured as a hub),
 'Destination Virtual Address' = OVA,
 'Destination Options' = (absent or a valid list of options),
 -- 'Data Options' absent
 'Result for BVLC Function' = X'01', -- Encapsulated-NPDU
 'Result Code' = X'01', -- NAK
 'Error Header Marker' = X'00', -- not a header option problem
 'Error Class' = COMMUNICATION,
 'Error Code' = MESSAGE_INCOMPLETE | PAYLOAD_EXPECTED
12. CHECK(that the IUT did not process the request)
 ...(More steps follow but omitted because they are not relevant to the CR))

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The test plan calls out this test in 3 sections – as a basic node, with the IUT configured as a Hub, and with the IUT having a direct connection with the TD.

For the case of when the IUT is **configured as a basic node**, we refer to the following diagram/text from BTL Specified Tests:

This group of tests verifies secure connect devices operating in a non-hub mode. The logical configuration of the network used for these tests is shown in Figure X1. The test descriptions in this clause assume that the TD plays the role of all of the other devices in the network configuration. For the tests in this section, unless specified through a PORT parameter, messages specified by the test are on the IUT to TD hub WebSocket connection (primary or failover).

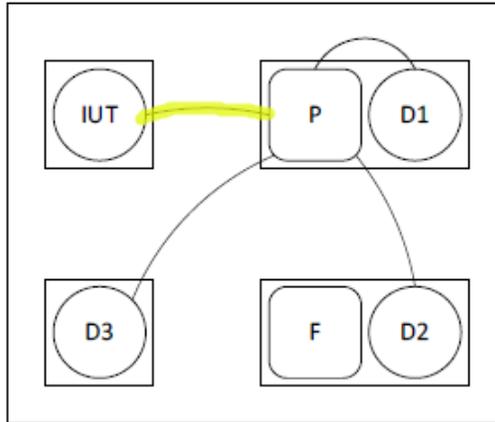


Figure X1: Network setup for basic node tests showing connections when the primary hub is active.

For the case of when the **IUT is configured as a hub**, we refer to the following diagram from BTL Specified Tests and allow the TD to be any of the devices other than the IUT:

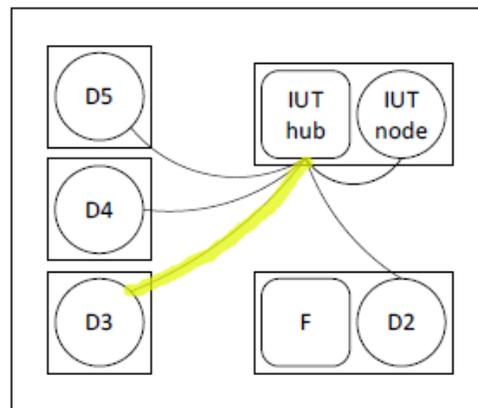


Figure X3: Network setup for hub function tests when the IUT is playing the role of the primary hub.

For the case of when the IUT is using a **direct connection**, we refer the following diagram/text from BTL Specified Tests:

This group of tests verifies secure connect devices using direct connections. The logical configuration of the network used for these tests is shown in Figure X6. The test descriptions in this clause assume that the TD plays the role of all of the other

devices in the network configuration. For the tests in this section, unless specified through a PORT parameter, messages specified by the test are on the IUT to peer device direct connection WebSocket.

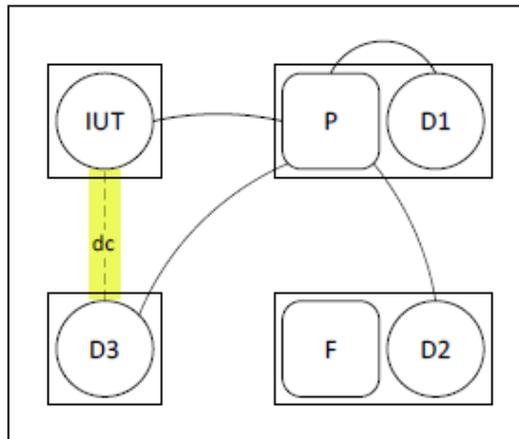


Figure X6: Network setup for basic node tests showing connections when the primary hub is active.

Direction regarding the presence of OVA and DVA comes from the following excerpt from the BACnet standard (clause AB.2.1):

The optional 6-octet 'Originating Virtual Address' field indicates the VMAC address of the node that originally initiated the BVLC message. If the sender of the message is also the originator of the message, then the 'Originating Virtual Address' field shall be omitted and the receiver shall assume the 'Originating Virtual Address' to be the VMAC of the sender.

The optional 6-octet 'Destination Virtual Address' field indicates the VMAC address of the destination node or the broadcast VMAC. If the immediate receiver of a unicast BVLC message is also the final destination of the message, then the 'Destination Virtual Address' field shall be omitted.

Problems:

Step 10 and 11 do not seem to account for the case when the IUT is directly connected to the TD. In this case I would expect OVA & DVA to be absent in both the TRANSMIT and RECEIVE steps.

Step 11 appears to be incorrect when the IUT is acting as a Hub. In this case I would expect DVA to be absent (not OVA)

Question:

- 1) Is the test incorrect in Steps 10 and 11 when the IUT is directly connected to the TD?
- 2) Is the test incorrect in Step 11 when the IUT is acting as a Hub?

Response

- 1) Yes. The "Originating Virtual Address" and "Destination Virtual Address" should be absent for steps 10 and 11 when the IUT has a direct connection to the TD.
- 2) Yes. The "Destination Virtual Address" should be absent for step 11 when the IUT is acting as the hub.