amazon sidewalk

Amazon Sidewalk Test Specification

Protocol Stack 1.0, Document Revision A.10

February 6, 2026

Contents

Chapter 1

Introduction

1.1 Scope

This document provides the Amazon Sidewalk reference test cases for certification of compliance with the Amazon Sidewalk specification.

1.1.1 Application

The specification includes test cases for Endpoint products, referred to as the Device Under Test (DUT). At this time there is no requirement for gateway certification, as all gateways on the Amazon Sidewalk network are Amazon devices, such as Echo and Ring products.

1.1.2 Naming Convention

Each test case has a short, unique identifier, and a title. The general format of a test case identifier is:

`<AREA>/<ROLE>/<FEATURE>/<FUNCTION>/<CLASS>-<ID>`

- `<AREA>` can be: CMN (Common), BLE, FSK, LORA, or MULTI (multi-radio)
- `<ROLE>` can be: EP (Endpoint), or GW (Gateway, reserved for future use)
- `<FEATURE>` can be: BCN, CONN, DATA, API
- `<FUNCTION>` is `<FEATURE>` dependent
- `<CLASS>` can be: BV (Behaviour Valid), or BI (Behaviour Invalid)
- `<ID>` is a unique integer to differentiate multiple test cases under the preceding fields

For example FSK/EP/BCN/JOIN/BV-01 - an FSK Endpoint test case for discovering a beacon, with valid behavior.

1.1.2.1 Behaviour Valid (BV) Tests

These tests verify that the DUT reacts in conformity with the specification when receiving valid message sequences.

1.1.2.2 Behaviour Invalid (BI) Tests

These tests verify that the DUT reacts in conformity with the specification when receiving sequences containing invalid messages, missing messages, messages of incorrect type or content, and is expected to recover and resume the protocol function.

1.2 General Test Requirements

Each test case has an **Expected Results** section. In all cases this will describe the criteria for a Pass Verdict. In some cases it may also describe criteria that could lead to an Inconclusive Verdict - this refers to a result that is not recorded as a fail but may indicate an undetected or undesirable condition and should be reviewed.

If a DUT cannot achieve a Pass Verdict or Inconclusive Verdict then it is automatically classified as a test failure, however in some cases additional specific details may be provided under Fail Verdict indicating why a test could fail. For example a test that attempts to send 10 data packets may explicitly state that a Fail Verdict is recorded if the Tester receives 9 or fewer packets.

1.3 Test Environment

The test specification requires one or two tester ”roles” - the Upper Tester and the Lower Tester. These refer to the roles undertaken by the test equipment to drive the upper (top of stack) and lower (bottom of stack) interfaces to the Device Under Test. The roles do not mandate a particular physical implementation of the test equipment. Typically a single piece of test equipment would implement both roles, however for some test cases it may be possible to separate the roles across two independent entities.

The DUT lower interface is the radio, therefore the Lower Tester will reproduce the functionality and required behavior of a standard Amazon Sidewalk Gateway.

The DUT upper interface is the on-chip Amazon Sidewalk application API (e.g. the sid_init, sid_start etc. API calls). It is the responsibility of the test equipment provider to specify how the Upper Tester role within the test equipment will communicate with the on-chip API (e.g. via command-line interface, binary transport, or some other mechanism).

Chapter 2

Common Test Cases

2.1 CMN/EP/API/INF/BV/01: Endpoint has correct MCU version after launching Sidewalk application.

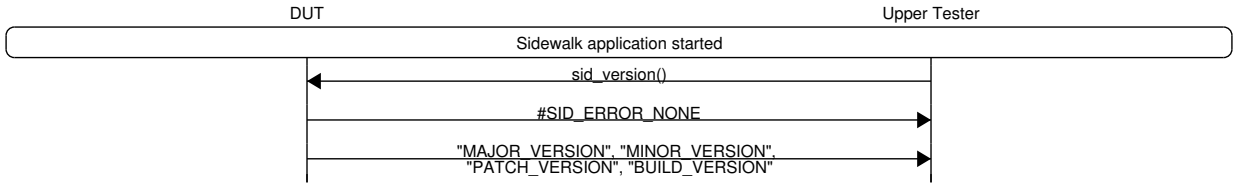
2.1.1 Test Purpose

DUT is able to start Sidewalk application and capture all values related to the MCU version. Captured values are consistent with the MCU build used by the DUT.

2.1.2 Initial Conditions

- DUT is flashed with a valid MCU build.

2.1.3 Test Procedure



2.1.4 Expected Results

2.1.4.1 Pass Verdict

DUT can successfully start the Sidewalk application.

DUT is able to utilize ”sid_version” API call and capture the following values related to the MCU version: ”MAJOR_VERSION”, ”MINOR_VERSION”, ”PATCH_VERSION”, ”BUILD_VERSION”.

All obtained values are in line with the MCU build that is flashed on the DUT.

Chapter 3

BLE Test Cases

3.1 BLE/EP/CONN/REG/BV/01: An unregistered Endpoint successfully completes Sidewalk device registration over BLE.

3.1.1 Test Purpose

An unregistered DUT configures the Sidewalk stack in BLE mode. It accepts a BLE connection from the Lower Tester and completes registration. After it has registered it uses BLE radio for Amazon Sidewalk network activities.

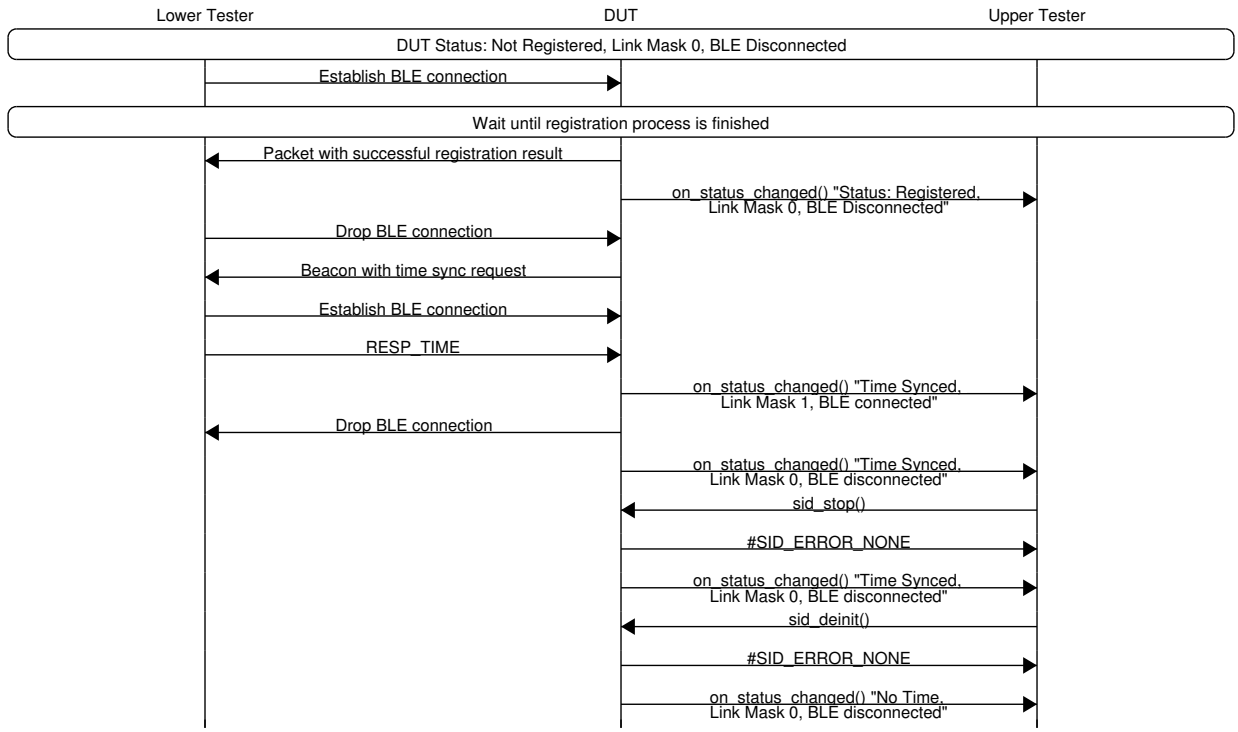
3.1.2 Initial Conditions

- DUT is not registered with Amazon Sidewalk network.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- Lower Tester operates in BLE mode.

3.1.3 Test Procedure



3.1.4 Expected Results

3.1.4.1 Pass Verdict

DUT with Sidewalk stack (BLE) initialized is successfully registered with Amazon Sidewalk network.

Afterwards, DUT completes time synchronization over BLE.

3.2 BLE/EP/CONN/REG/BV/02: An unregistered Endpoint successfully completes Sidewalk device registration with use of FFN.

3.2.1 Test Purpose

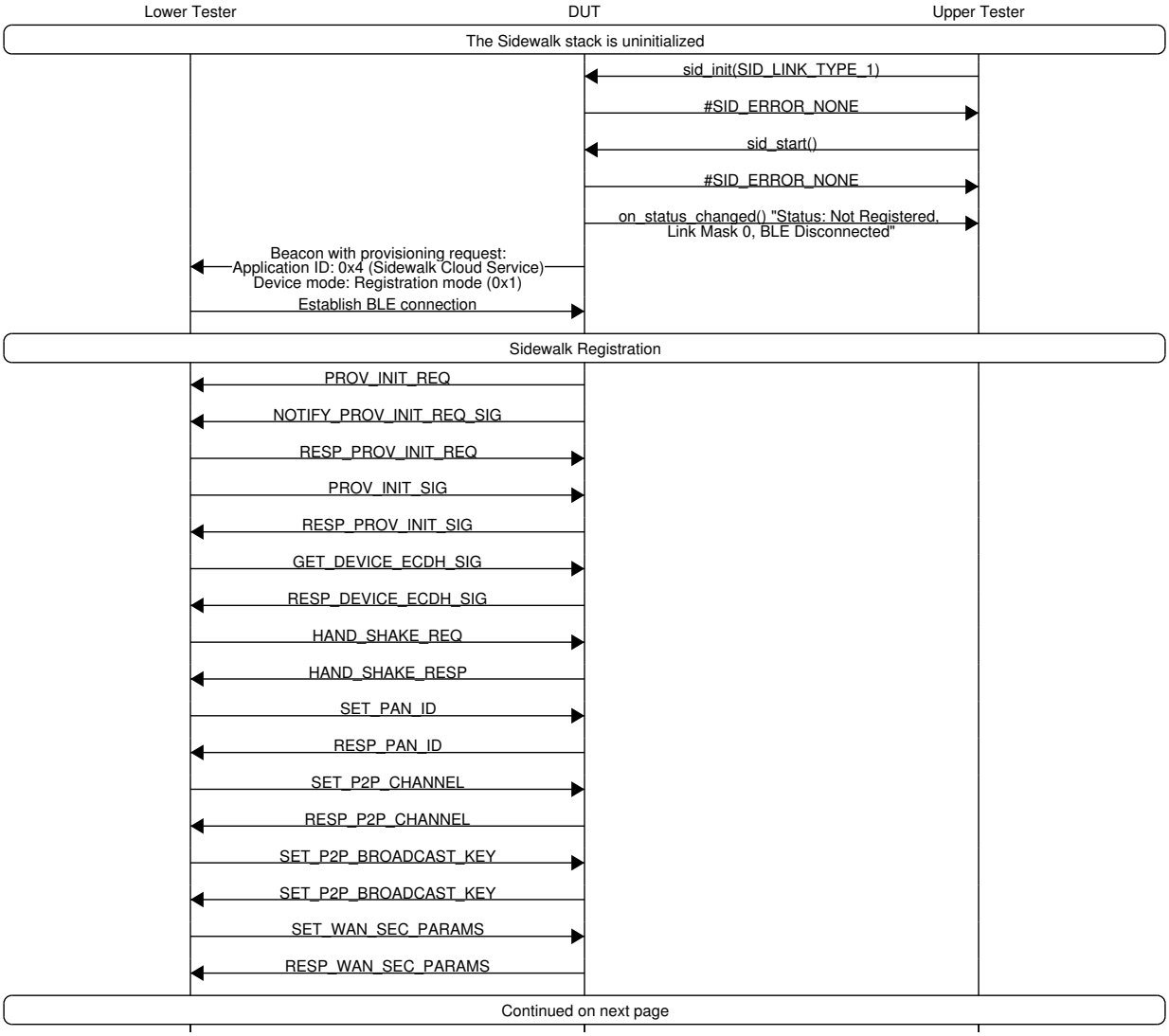
An unregistered DUT configures the Sidewalk stack in BLE mode. Lower tester establishes BLE connection after detecting beacon with provisioning request. DUT starts registration flow by sending "PROV_INIT_REQ" packet to Lower Tester. At the end of the registration flow, DUT receives SET_CONFIGURATION_COMPLETE packet from Lower Tester and responds with RESP_CONFIGURATION_COMPLETE packet, which is a sign of successful device registration. After that BLE connection is dropped and DUT continues to work using BLE radio for Amazon Sidewalk network activities.

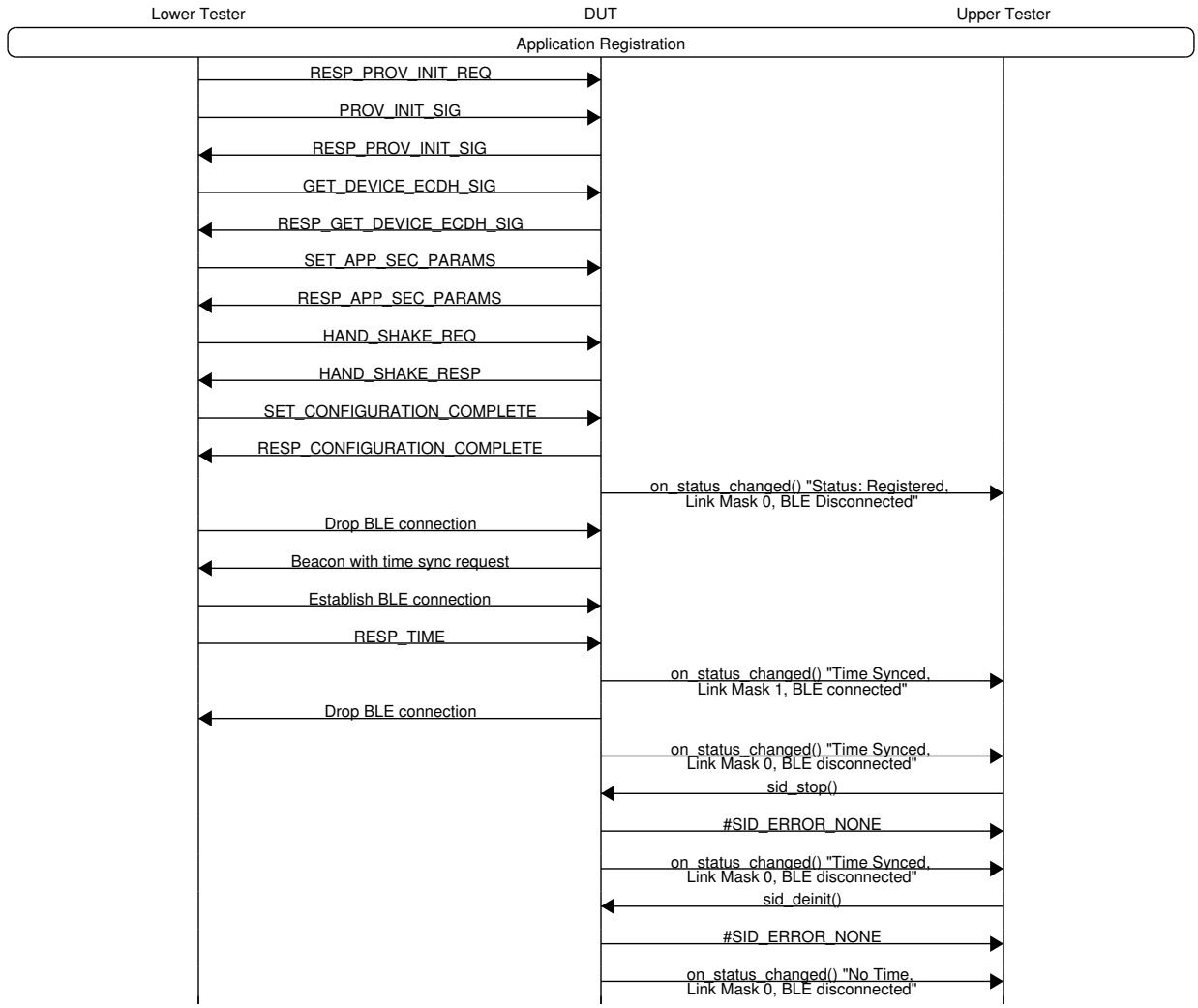
3.2.2 Initial Conditions

- DUT is fully unregistered from Amazon Sidewalk network (both Cloud and DUT side)

- Lower Tester operates in BLE mode.

3.2.3 Test Procedure





3.2.4 Expected Results

3.2.4.1 Pass Verdict

Before registration, DUT is transmitting beacons with provisioning request. This information is located in:
"Application ID" - 5th octet of Manufacturing Data - 0x4 (Sidewalk Cloud Service)
"Device State" - second and third bit in 6th octet of Manufacturing Data - Registration mode (0x1).

There may be more than one beacon transmitted by DUT before the BLE connection with Lower Tester is established, however this should not negatively affect the registration process.

Lower Tester establishes BLE connection with DUT, after detecting a beacon with provisioning request.

DUT sends "PROV_INIT_REQ" packet to initiate the registration flow.

Every registration related packet is successfully exchanged between Lower Tester and DUT.

DUT receives "SET_CONFIGURATION_COMPLETE" packet from Lower Tester and responds with "RESP_CONFIGURATION_COMPLETE". Those two packets signify that DUT is successfully registered with Amazon Sidewalk network with use of FFN.

Registration status on DUT changes to: "Registered".

Afterwards, DUT completes time synchronization over BLE.

3.3 BLE/EP/CONN/REG/BV/03: Endpoint can be deregistered from Sidewalk network.

3.3.1 Test Purpose

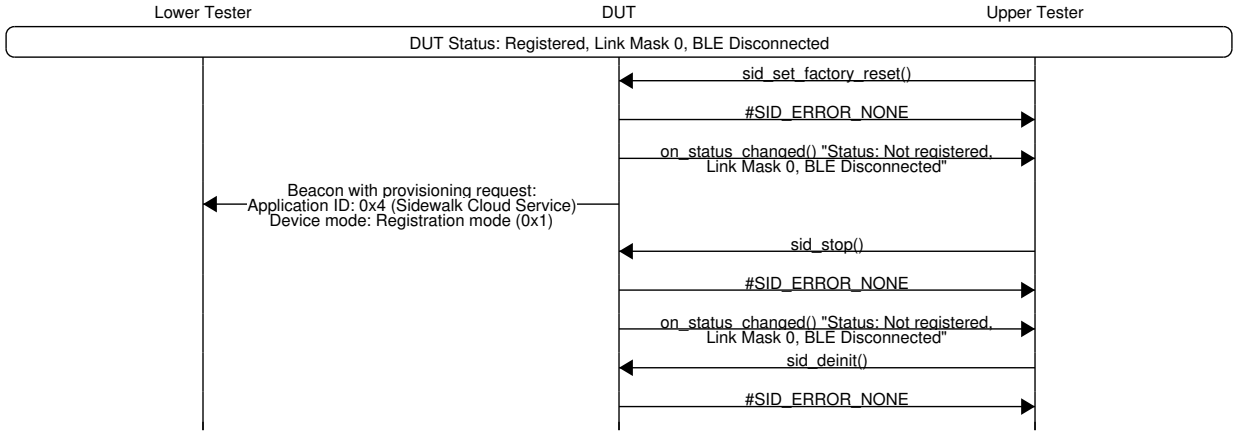
To verify that the DUT is able to be deregistered from the Amazon Sidewalk network. After deregistration DUT starts transmitting beacons with provisioning request.

3.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

3.3.3 Test Procedure



3.3.4 Expected Results

3.3.4.1 Pass Verdict

Calling the sid_set_factory_reset method should force the change in registration status of DUT to ”not registered”.

After deregistration, DUT starts transmitting beacons with provisioning request. This information is located in:
”Application ID” - 5th octet of Manufacturing Data - 0x4 (Sidewalk Cloud Service)
”Device State” - second and third bit in 6th octet of Manufacturing Data - Registration mode (0x1).

3.4 BLE/EP/DATA/DL/BV/01: Endpoint receives downlink packets with various sizes of Command data.

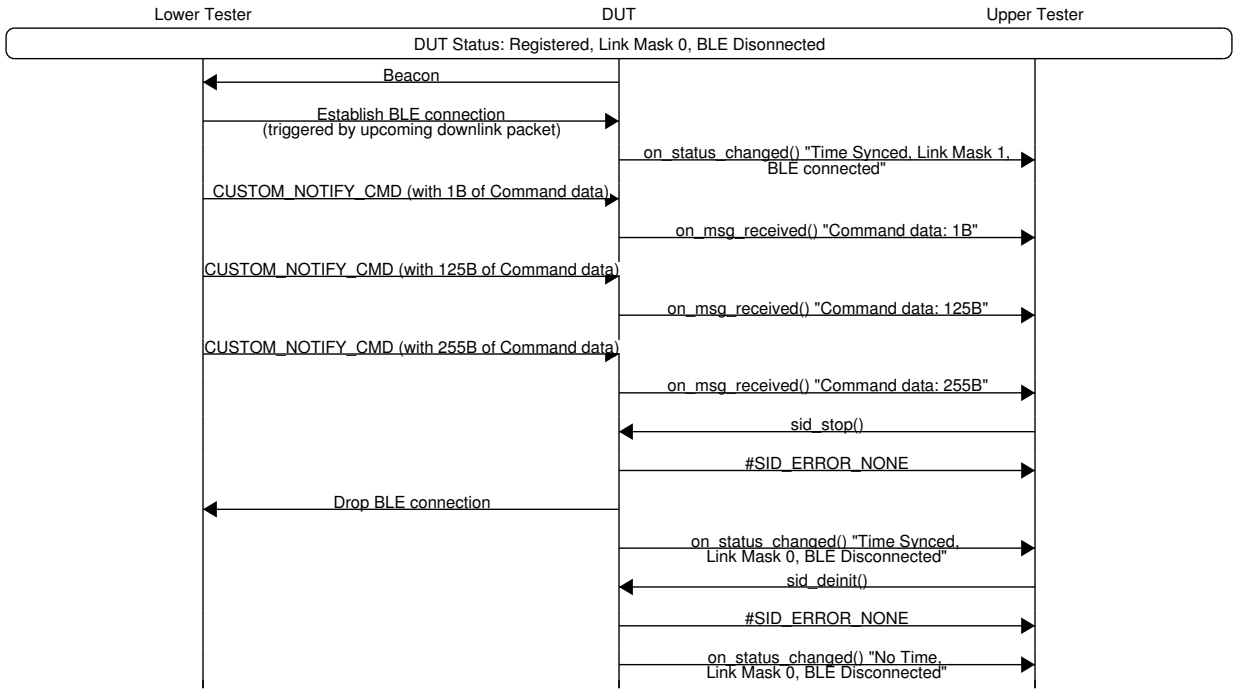
3.4.1 Test Purpose

DUT is able to receive downlink packets with various sizes of Command data (1B, 125B, 255B) sent from the Lower Tester.

3.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT has completed the time synchronization.

3.4.3 Test Procedure



3.4.4 Expected Results

3.4.4.1 Pass Verdict

Packets with various sizes of Command data sent by Lower Tester are able to reach the DUT.

The Command data content shall be verified for correctness on the Upper Tester side.

3.5 BLE/EP/DATA/UL/BV/01: Gateway receives uplink packets with various sizes of Command data from Endpoint.

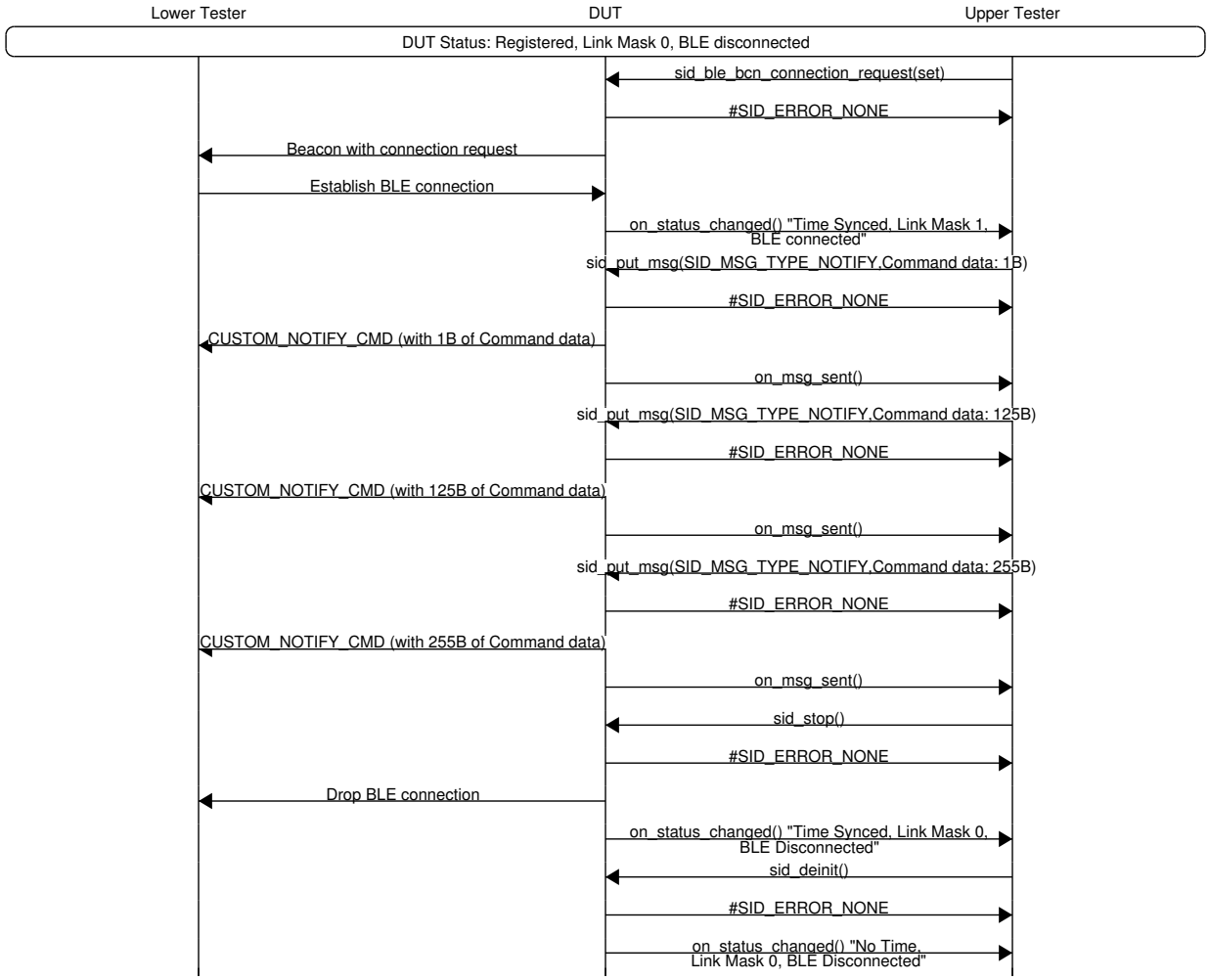
3.5.1 Test Purpose

Lower Tester is able to receive uplink packets with various sizes of Command data(1B, 125B, 255B) sent from the DUT.

3.5.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT has completed the time synchronization.

3.5.3 Test Procedure



3.5.4 Expected Results

3.5.4.1 Pass Verdict

Packets with various sizes of Command data sent by DUT are able to reach the Lower Tester.

The Command data content of each packet shall be verified for correctness on the Lower Tester side.

3.6 BLE/EP/CONN/EST/BV/01: Gateway establishes BLE connection on Endpoint's request.

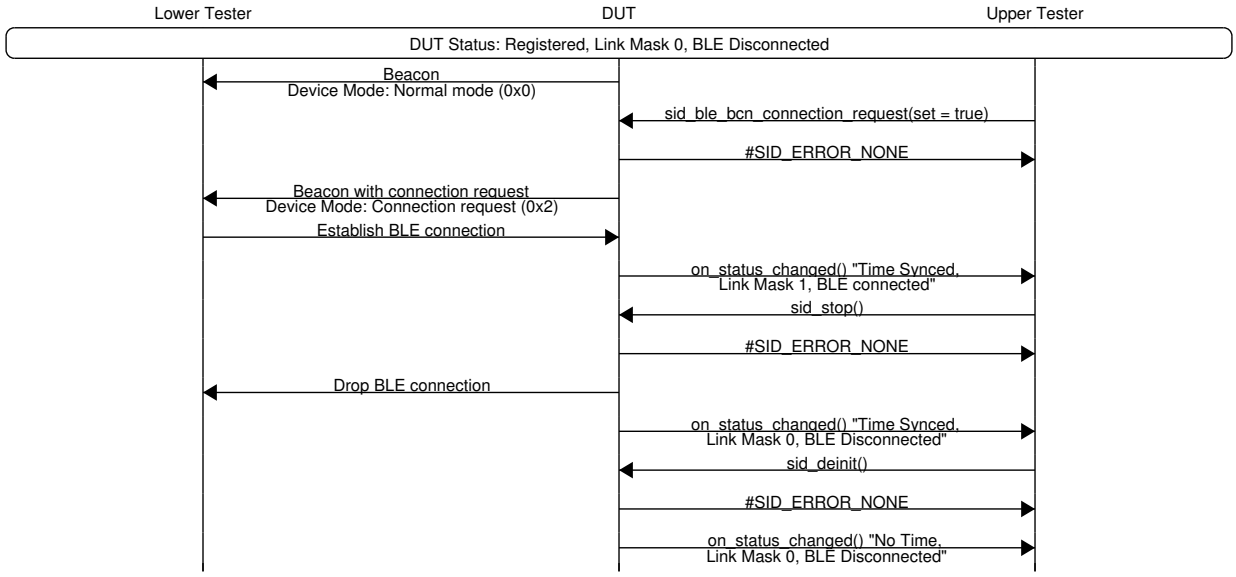
3.6.1 Test Purpose

To verify that Lower Tester successfully establishes BLE connection with DUT, after detecting connection request in the payload of the DUT's advertising beacon.

3.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT has completed the time synchronization.

3.6.3 Test Procedure



3.6.4 Expected Results

3.6.4.1 Pass Verdict

When BLE connection is requested, DUT should change beacon payload to include connection request. Change occurs in Device State - 6th octet of Manufacturing Data in the beacon. Within the Device State, second and third bits signify Device Mode, where: 0x0 - Normal mode, 0x2 - Connection request. Payload of the beacons to be checked with BLE sniffer on Lower Tester side.

Device Mode before setting the connection request: Normal mode (0x0).

Device Mode after setting the connection request: Connection request (0x2).

Lower Tester establishes BLE connection with DUT, after receiving beacon with connection request.

After BLE connection is established, DUT triggers ”on_status_changed()” with ”Link Mask” value of 1, which indicates that the BLE connection was established.

3.7 BLE/EP/CONN/EST/BV/02: Endpoint can connect with Gateway via BLE, after reinitializing Sidewalk library.

3.7.1 Test Purpose

To verify that DUT and Lower Tester can establish a BLE connection, after Sidewalk library is reinitialized.

3.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

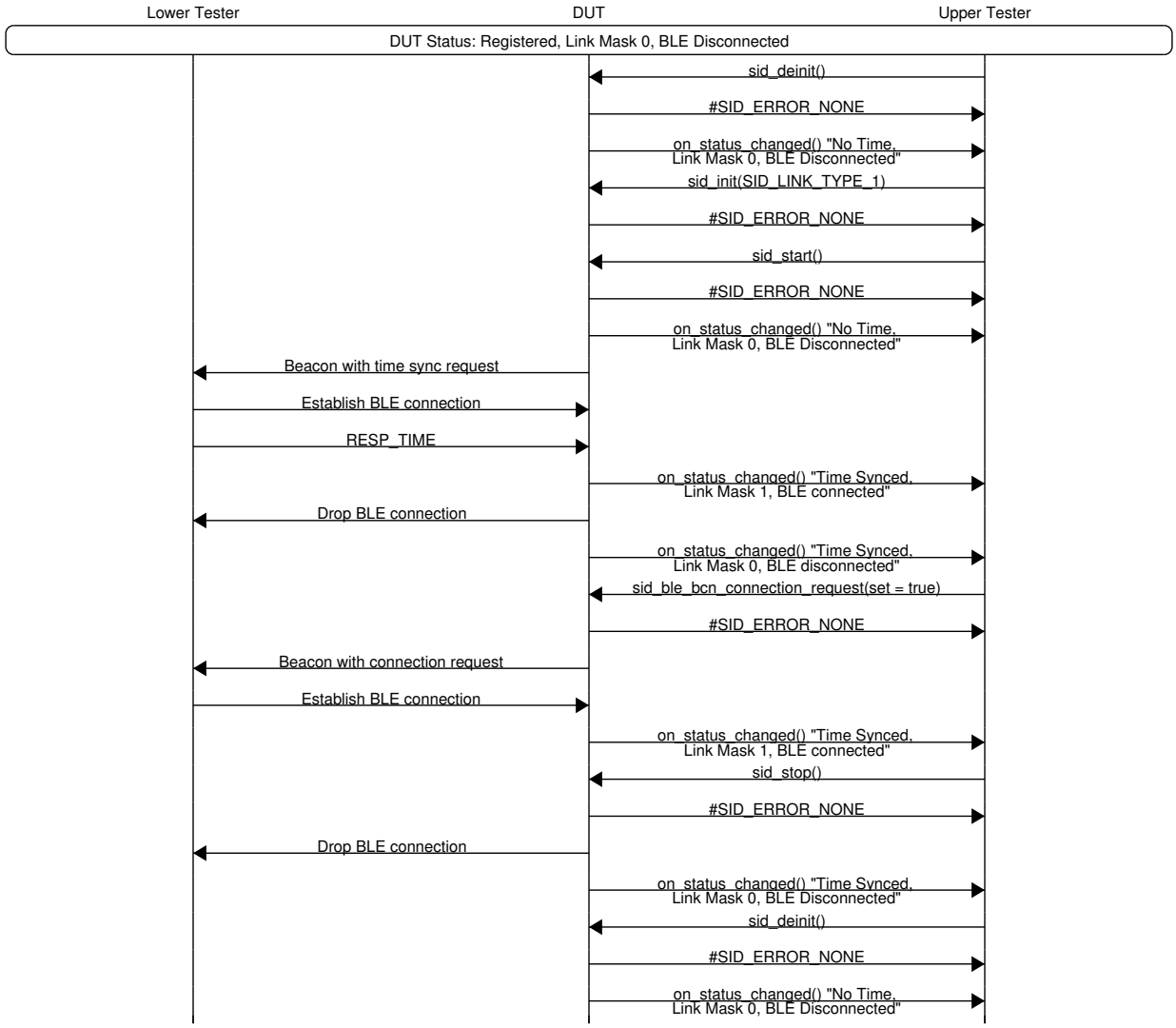
- Lower Tester operates in BLE mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

3.7.3 Test Procedure



3.7.4 Expected Results

3.7.4.1 Pass Verdict

After reinitializing Sidewalk library DUT and Lower Tester establish BLE connection to complete time synchronization.

DUT is able to request and establish BLE connection with Lower Tester, when the time synchronization is completed.

During time synchronization and after requesting BLE connection, DUT triggers ”on_status_changed()” with ”Link Mask” value of 1, which indicates that the BLE connection was established.

3.8 BLE/EP/CONN/EST/BV/03: Endpoint can connect with Gateway via BLE, after restarting Sidewalk library.

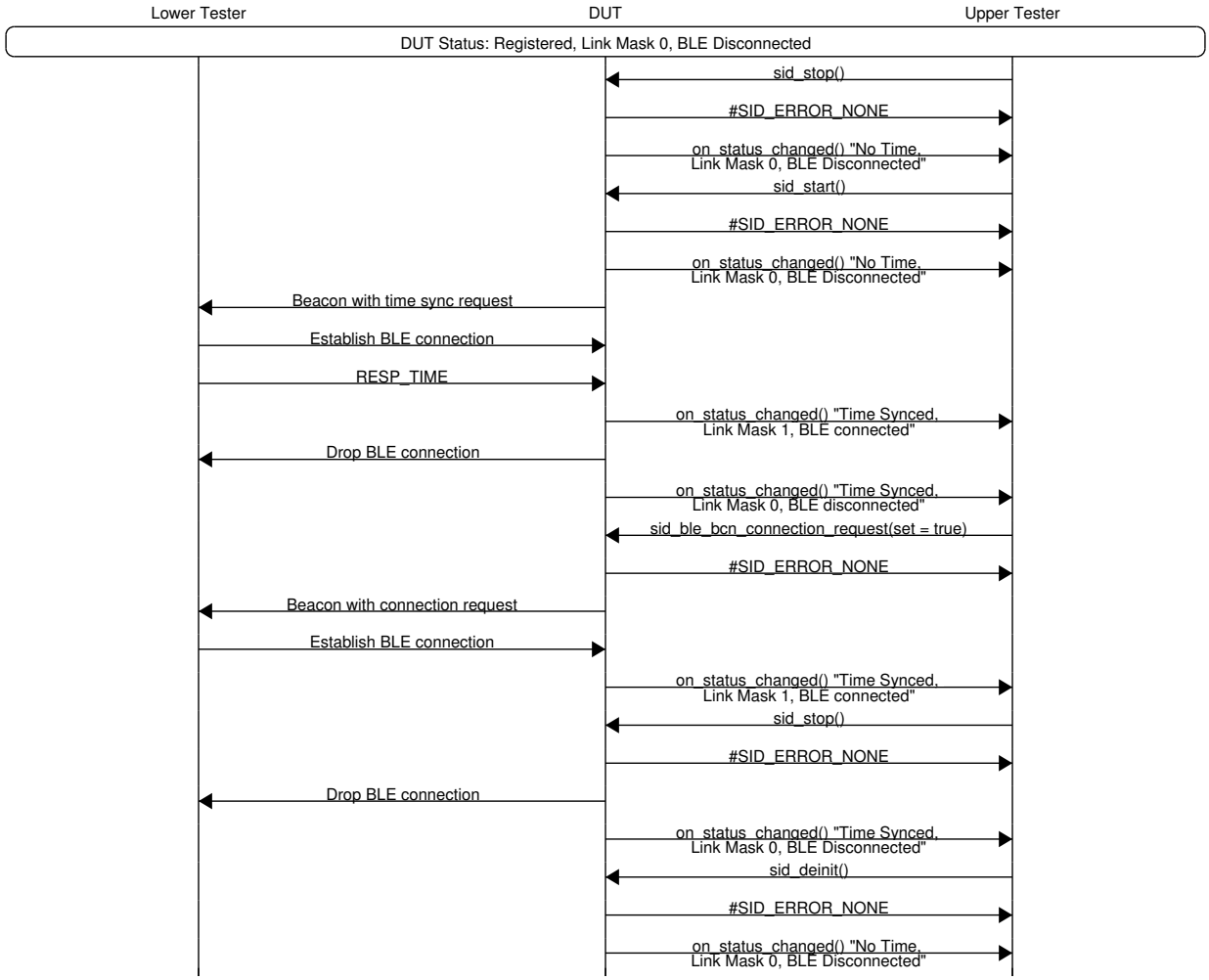
3.8.1 Test Purpose

To verify that DUT and Lower Tester can establish a BLE connection, after Sidewalk library is restarted.

3.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT has completed the time synchronization.

3.8.3 Test Procedure



3.8.4 Expected Results

3.8.4.1 Pass Verdict

After restarting Sidewalk library DUT and Lower Tester establish BLE connection to complete time synchronization.

DUT is able to request and establish BLE connection with Lower Tester, when the time synchronization is completed.

During time synchronization and after requesting BLE connection, DUT triggers ”on_status_changed()” with ”Link Mask” value of 1, which indicates that the BLE connection was established.

3.9 BLE/EP/CONN/DSC/BV/01: BLE connection between Gateway and Endpoint is dropped after 30 seconds of being idle.

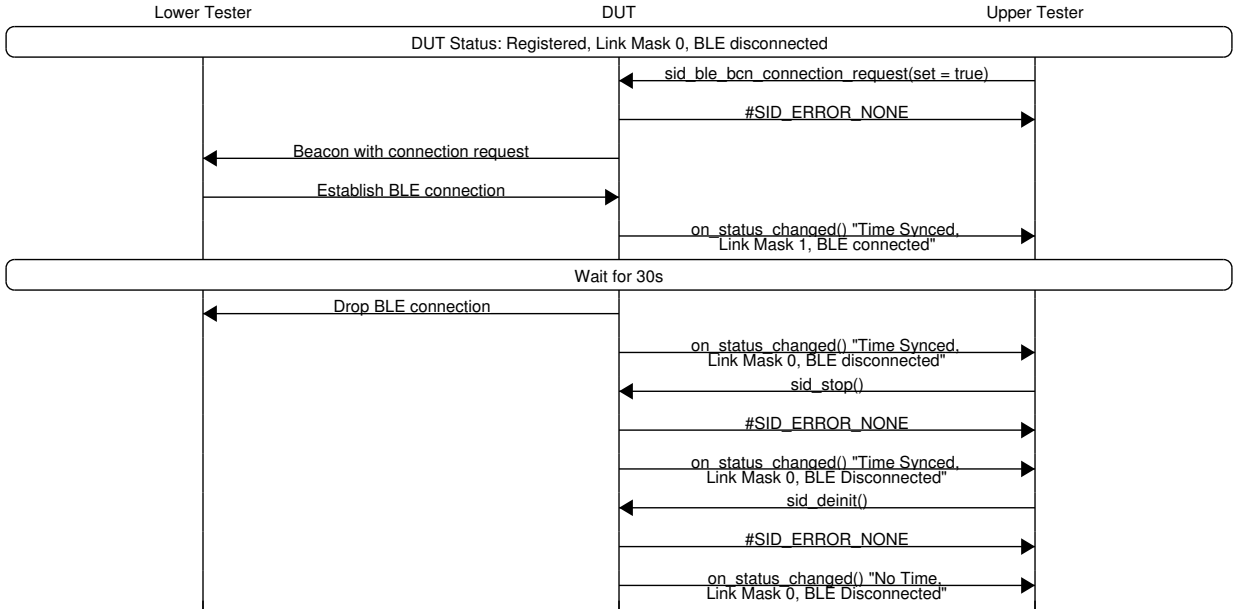
3.9.1 Test Purpose

To verify that BLE connection is dropped after 30 seconds, if there is no uplink/downlink traffic generated.

3.9.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT has completed the time synchronization.

3.9.3 Test Procedure



3.9.4 Expected Results

3.9.4.1 Pass Verdict

BLE connection is dropped after 30 seconds, from the time it was established.

There should be no connection drops and reconnects before the 30 seconds timeout is reached.

After the timeout, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.10 BLE/EP/CONN/DSC/BV/02: BLE connection between Gateway and Endpoint is extended by uplink packet and dropped after additional 30 seconds.

3.10.1 Test Purpose

To verify that BLE connection is dropped 30 seconds after uplink packet transmission was finished, which results in extending total time the devices are connected.

3.10.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

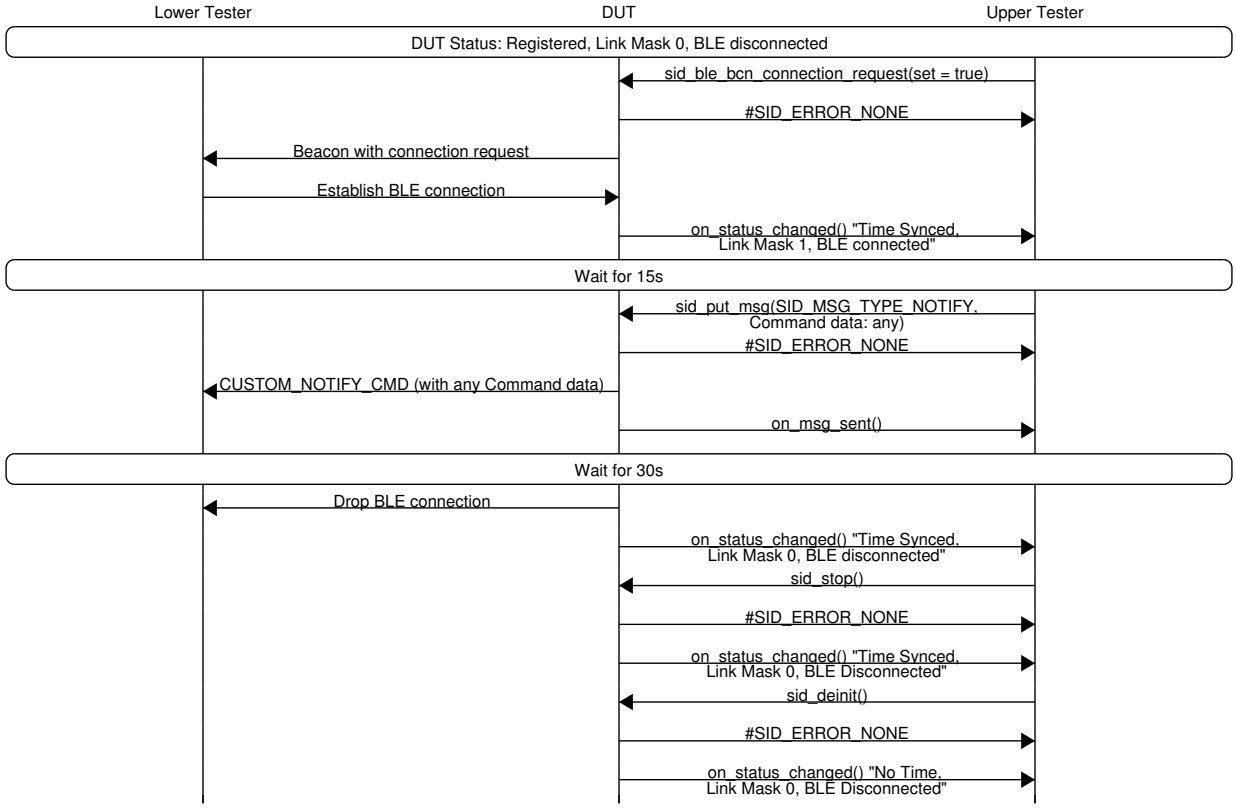
- Lower Tester operates in BLE mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

3.10.3 Test Procedure



3.10.4 Expected Results

3.10.4.1 Pass Verdict

BLE connection is dropped after 30 seconds, from the time the uplink packet transmission was finished.

There should be no connection drops and reconnects before the 30 seconds timeout is reached.

After the timeout, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.11 BLE/EP/CONN/DSC/BV/03: BLE connection between Gateway and Endpoint is extended by downlink packet and dropped after additional 30 seconds.

3.11.1 Test Purpose

To verify that BLE connection is dropped 30 seconds after downlink packet transmission was finished, which results in extending total time the devices are connected.

3.11.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

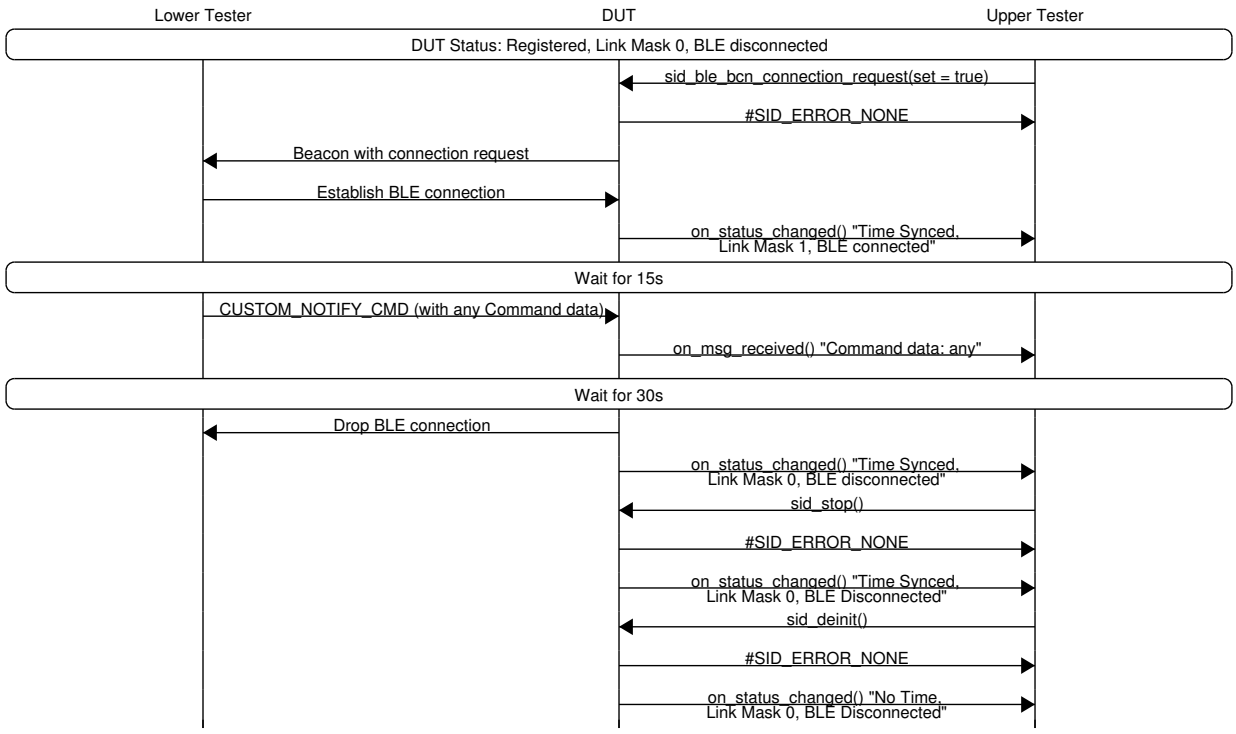
- Lower Tester operates in BLE mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

3.11.3 Test Procedure



3.11.4 Expected Results

3.11.4.1 Pass Verdict

BLE connection is dropped after 30 seconds, from the time the downlink packet transmission was finished.

There should be no connection drops and reconnects before the 30 seconds timeout is reached.

After the timeout, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.12 BLE/EP/CONN/DSC/BV/06: Endpoint drops BLE connection after stopping Sidewalk library.

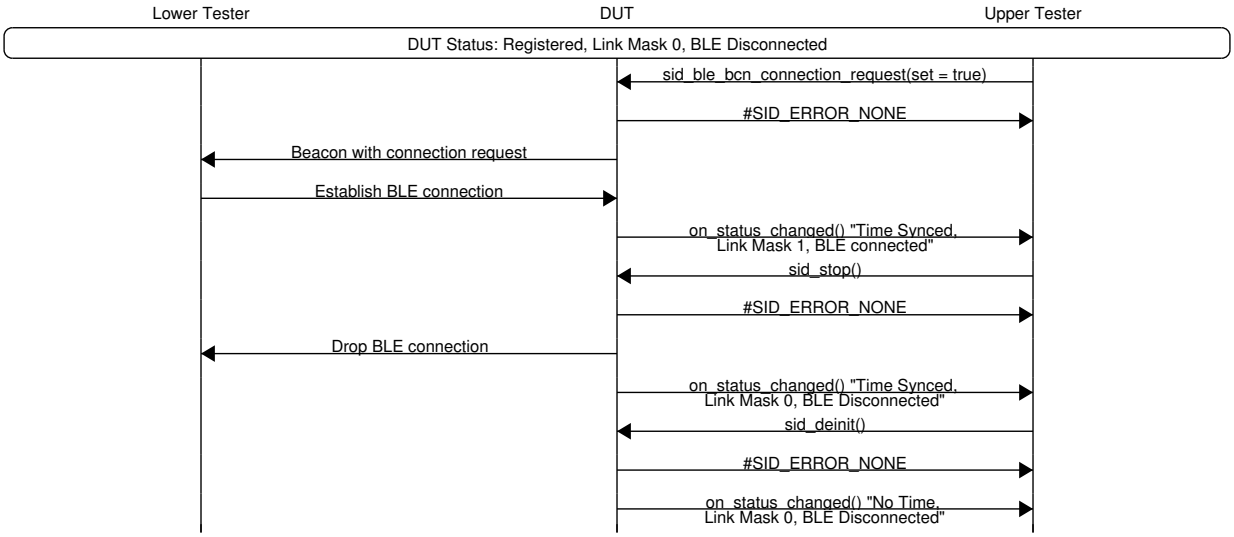
3.12.1 Test Purpose

To verify that DUT drops BLE connection if Sidewalk library is stopped.

3.12.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT has completed the time synchronization.

3.12.3 Test Procedure



3.12.4 Expected Results

3.12.4.1 Pass Verdict

After sending the command to stop Sidewalk library, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.13 BLE/EP/CONN/DSC/BV/07: Endpoint drops BLE connection after deinitializing Sidewalk library.

3.13.1 Test Purpose

To verify that DUT drops BLE connection if Sidewalk library is deinitialized.

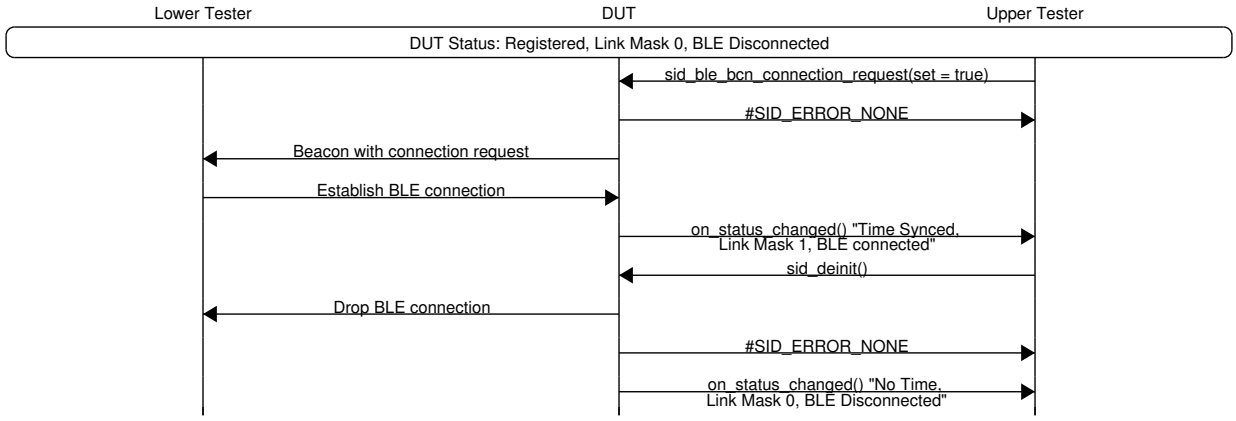
3.13.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

3.13.3 Test Procedure



3.13.4 Expected Results

3.13.4.1 Pass Verdict

After sending the command to deinitialize Sidewalk library, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.14 BLE/EP/CONN/BCN/BV/01: Endpoint transmits beacons only when BLE connection is not established.

3.14.1 Test Purpose

To verify that DUT transmits beacons before establishing BLE connection and after disconnecting. During the active connection, no beacons should be transmitted.

3.14.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

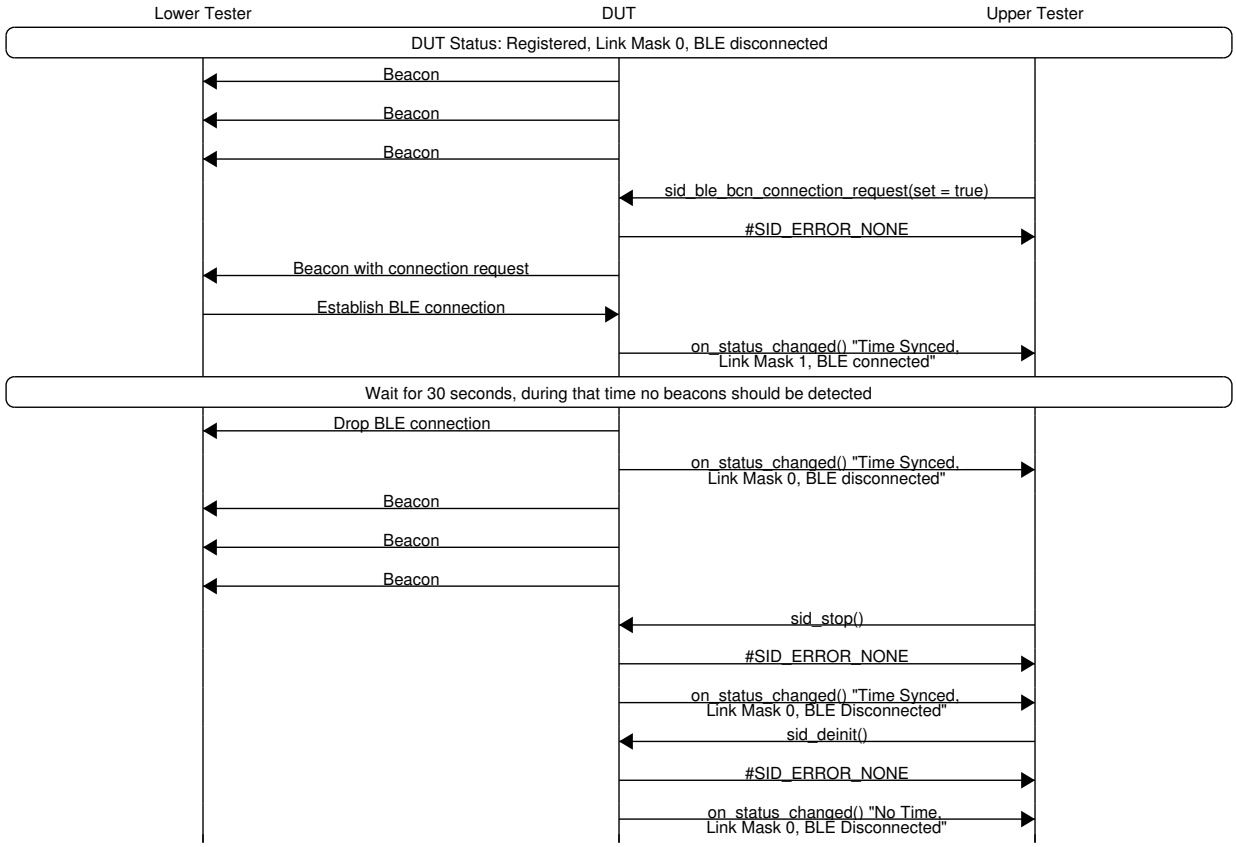
- Lower Tester operates in BLE mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

3.14.3 Test Procedure



3.14.4 Expected Results

3.14.4.1 Pass Verdict

DUT transmits beacons before establishing BLE connection.

DUT stops transmitting beacons after establishing BLE connection.

DUT starts transmitting beacons again after disconnecting from the BLE connection.

All the beaconing activities to be checked with BLE sniffer on Lower Tester side.

3.15 BLE/EP/CONN/BCN/BV/02: Endpoint transmits beacons that contain Identifier (TX-ID), which changes every 15 minutes.

3.15.1 Test Purpose

To verify that DUT transmits beacons with Identifier (TX-ID). The Identifier is changed every 15 minutes, which can be verified in the application specific data of subsequent beacons.

3.15.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

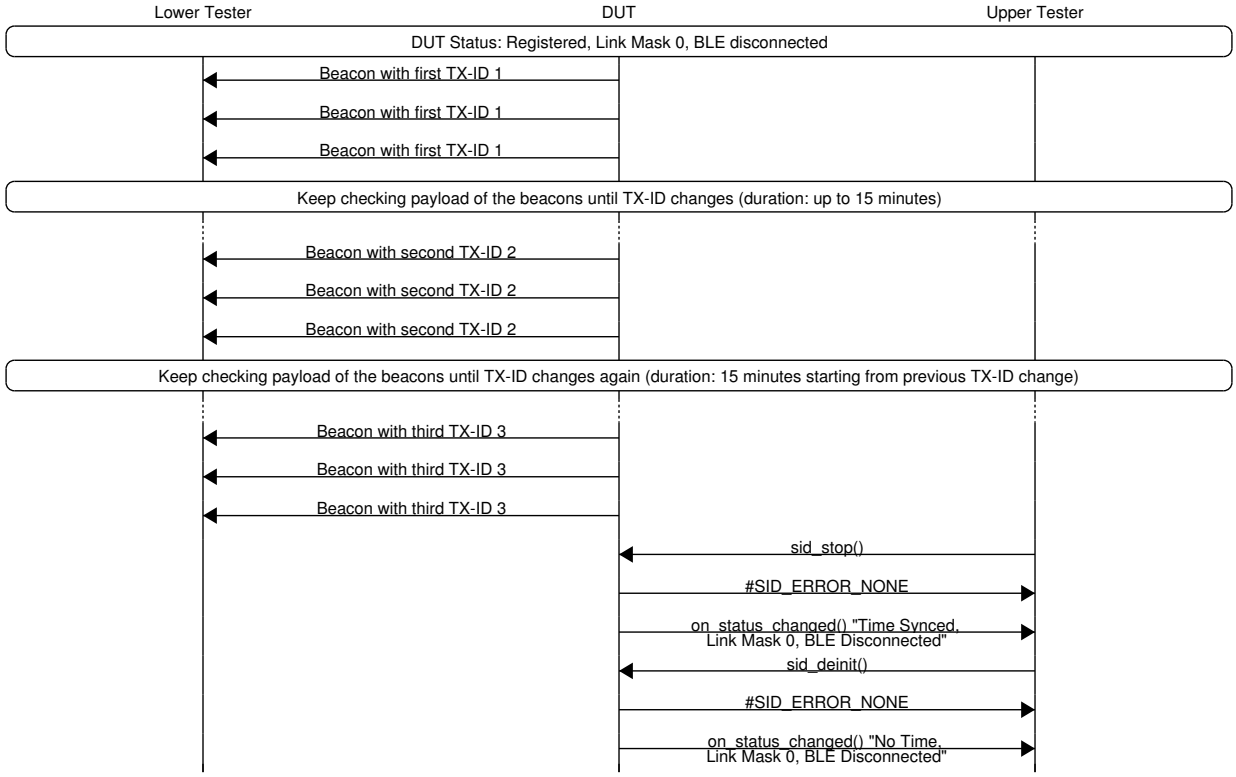
- Lower Tester operates in BLE mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

3.15.3 Test Procedure



3.15.4 Expected Results

3.15.4.1 Pass Verdict

DUT transmits beacons with payload that contains TX-ID.
TX-ID is 5 bytes long and is located in 2nd-6th octets of the ”Application Specific Data”, in ”Manufacturing Data” section of the beacon.

First TX-ID change occurs within 15 minutes and is used as a starting point of second TX-ID change duration.

Second TX-ID change occurs 15 minutes after the first one.

There should be no additional changes in the data of TX-ID.

All the beaconing activities to be checked with BLE sniffer on Lower Tester side.

3.16 BLE/EP/CONN/BCN/BV/03: Endpoint transmits beacons with 160ms interval for the first 30 seconds after starting BLE protocol.

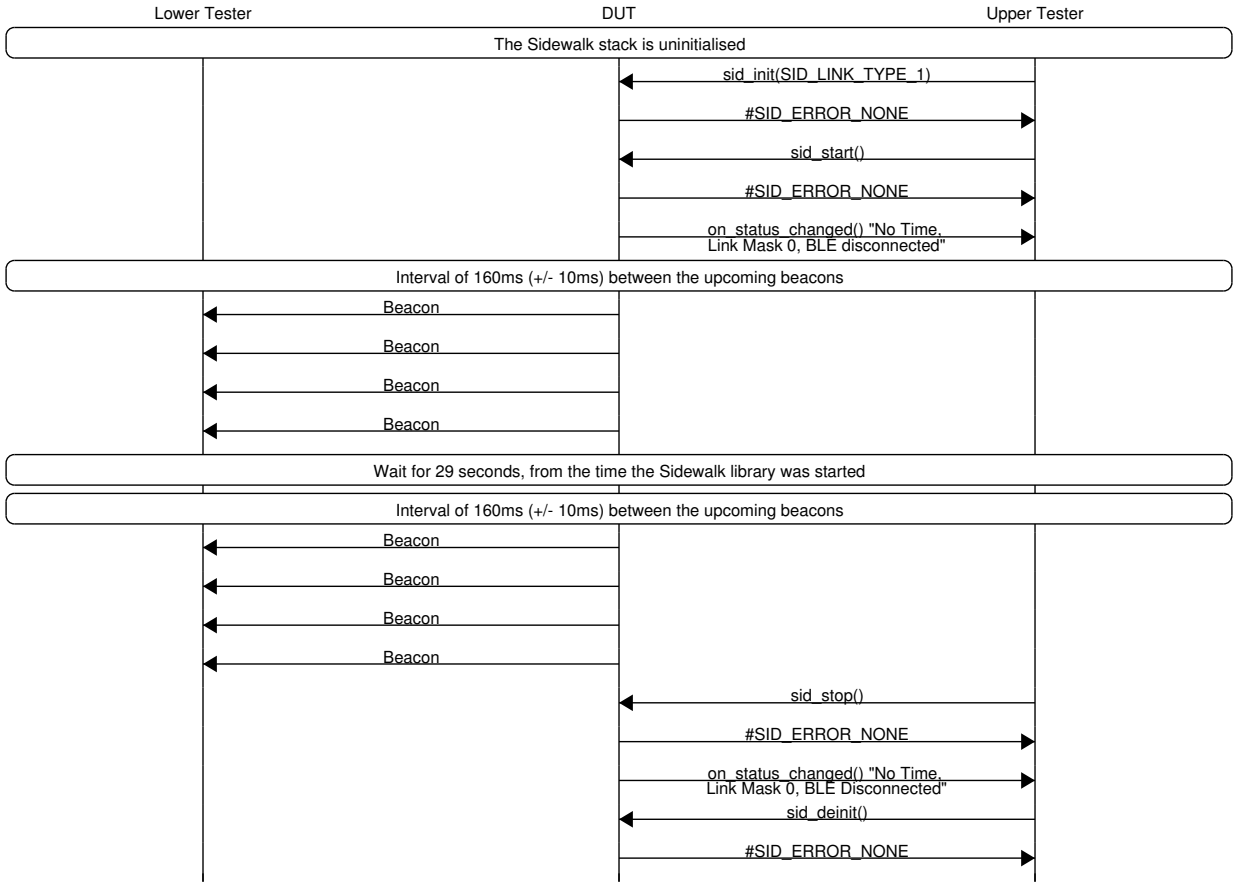
3.16.1 Test Purpose

To verify that DUT transmits a beacon every 160ms, with +/-10ms of acceptable range (150ms-170ms) for the first 30 seconds after starting BLE protocol. Lower Tester should not react to the beacons with BLE connection establishment, so that the beacon transmission interval stays uninterrupted.

3.16.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

3.16.3 Test Procedure



3.16.4 Expected Results

3.16.4.1 Pass Verdict

The interval of 160ms (+/- 10ms) in beacon transmission is respected by DUT for the first 30 seconds after starting Sidewalk library.

At least 4 beacons to be verified in terms of the valid interval in both cases: immediately after starting Sidewalk library, and 29 seconds after starting Sidewalk library.

All the beaconing activities to be checked with BLE sniffer on Lower Tester side.

3.17 BLE/EP/CONN/BCN/BV/04: Endpoint transmits beacons with customized interval, 30 seconds after starting BLE protocol.

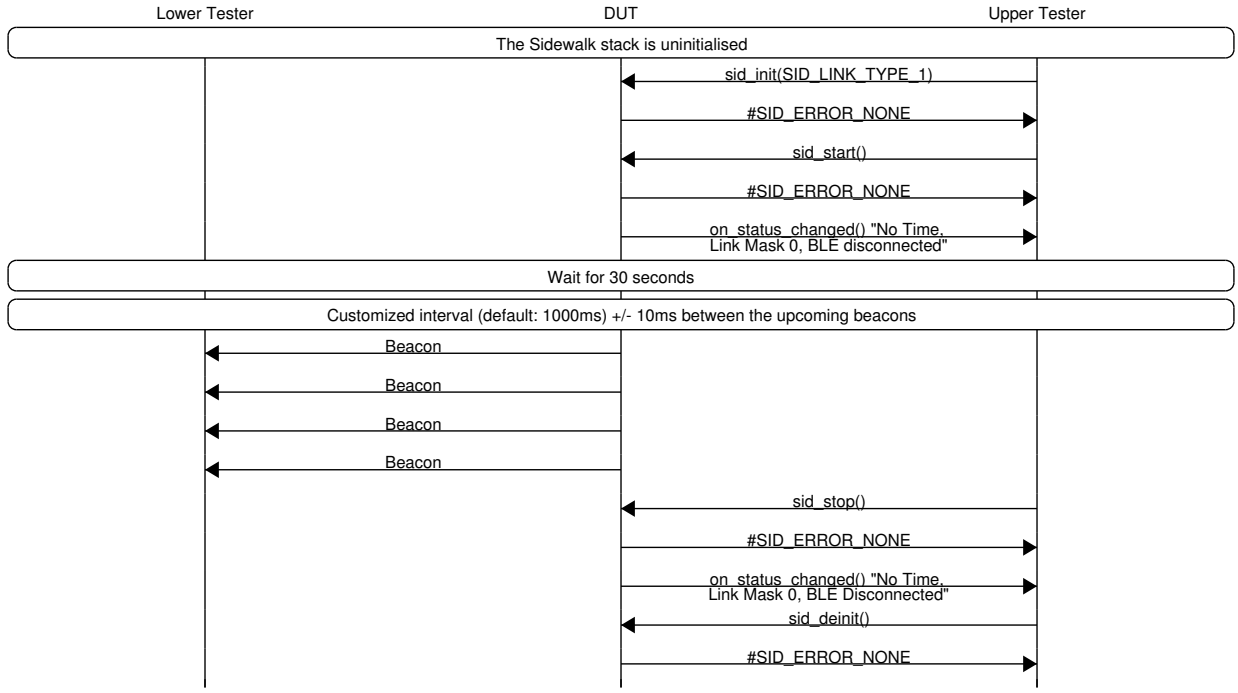
3.17.1 Test Purpose

To verify that DUT transmits a beacon with customized interval (default: every 1000ms) with +/-10ms of acceptable range, 30 seconds after starting BLE protocol. Lower Tester should not react to the beacons with BLE connection establishment, so that the beacon transmission interval stays uninterrupted.

3.17.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

3.17.3 Test Procedure



3.17.4 Expected Results

3.17.4.1 Pass Verdict

The customized beacon transmission interval (default: 1000ms) +/- 10ms is respected by the device under test (DUT) 30 seconds after starting the Sidewalk library.

At least 4 beacons to be verified in terms of the valid interval.

All the beaconing activities to be checked with BLE sniffer on Lower Tester side.

3.18 BLE/EP/CONN/DUP/BV/01: BLE connection is closed after Endpoint receives 10 packets with duplicate SEQ number within one minute (filter duplicates enabled).

3.18.1 Applicability

This test case applies to devices compliant with the Amazon SidewalkSpecification v1.14 and later.

3.18.2 Test Purpose

To verify that DUT closes BLE connection after total of 10 packets with duplicate sequence number reach it within one minute. To confirm this behavior ”filter duplicates” option has to be enabled on DUT.

3.18.3 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

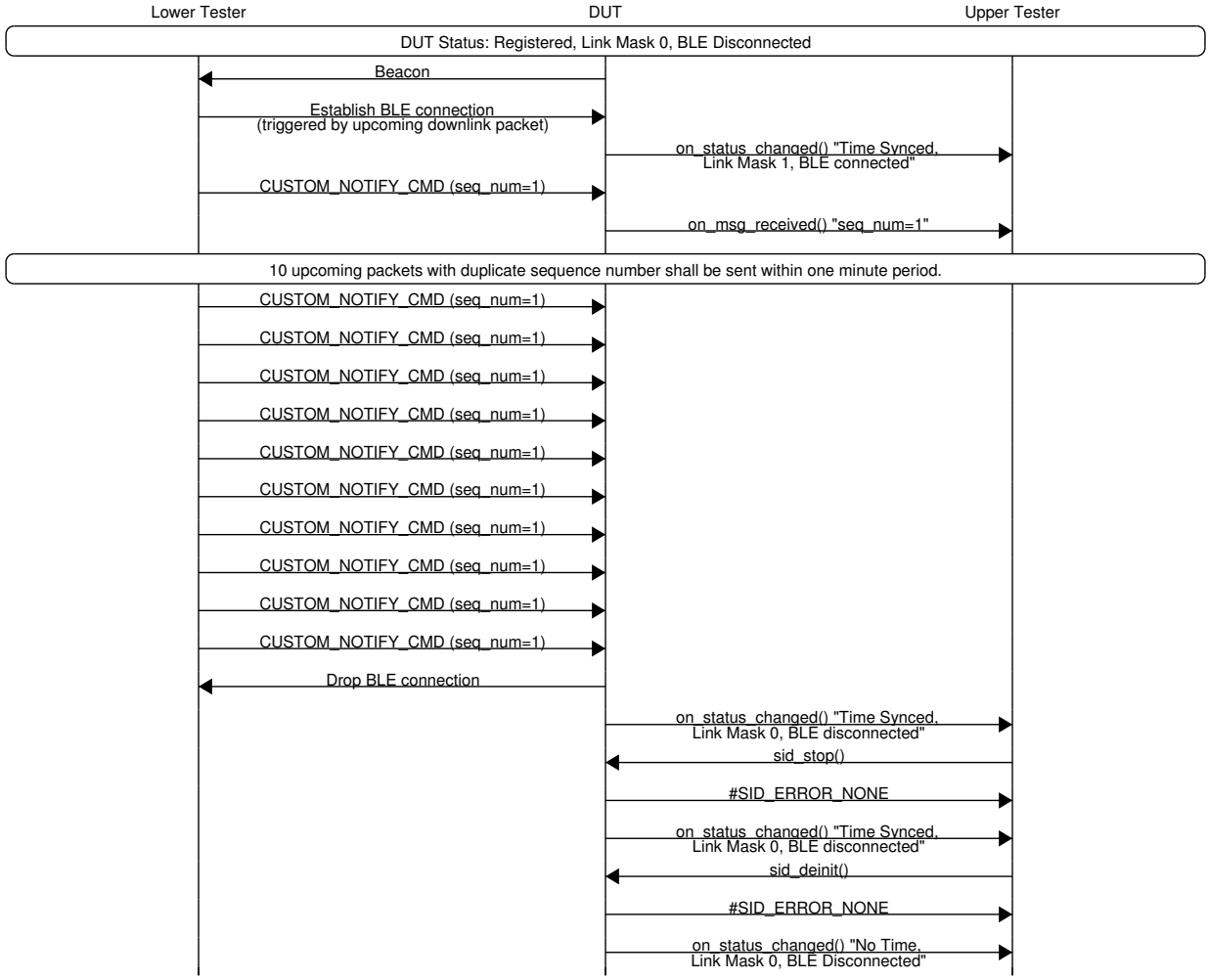
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

- ”Filter duplicates” option enabled on the DUT.

3.18.4 Test Procedure



3.18.5 Expected Results

3.18.5.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet with sequence number equal to 1 should be sent from the Lower Tester, correctly decoded and verified against the seq_num on the DUT side. Information about this packet should be reported on the Upper Tester side.

Ten CUSTOM_NOTIFY_CMD packets with duplicate sequence number equal to 1 shall be sent from Lower within the one minute period.
One minute period starts after Lower Tester finishes transmission of the first downlink packet with duplicate sequence number.

All packets with duplicate sequence number are rejected by DUT. Information about them will not be reported on the Upper Tester side.

Upon arrival of the last CUSTOM_NOTIFY_CMD packet, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.19 BLE/EP/CONN/DUP/BV/02: BLE connection is closed after Endpoint receives 10 packets with various duplicate SEQ numbers within one minute (filter duplicates enabled).

3.19.1 Applicability

This test case applies to devices compliant with the Amazon SidewalkSpecification v1.14 and later.

3.19.2 Test Purpose

To verify that DUT closes BLE connection after total of 10 packets with various duplicate sequence numbers reach it within one minute. To confirm this behavior ”filter duplicates” option has to be enabled on DUT.

3.19.3 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

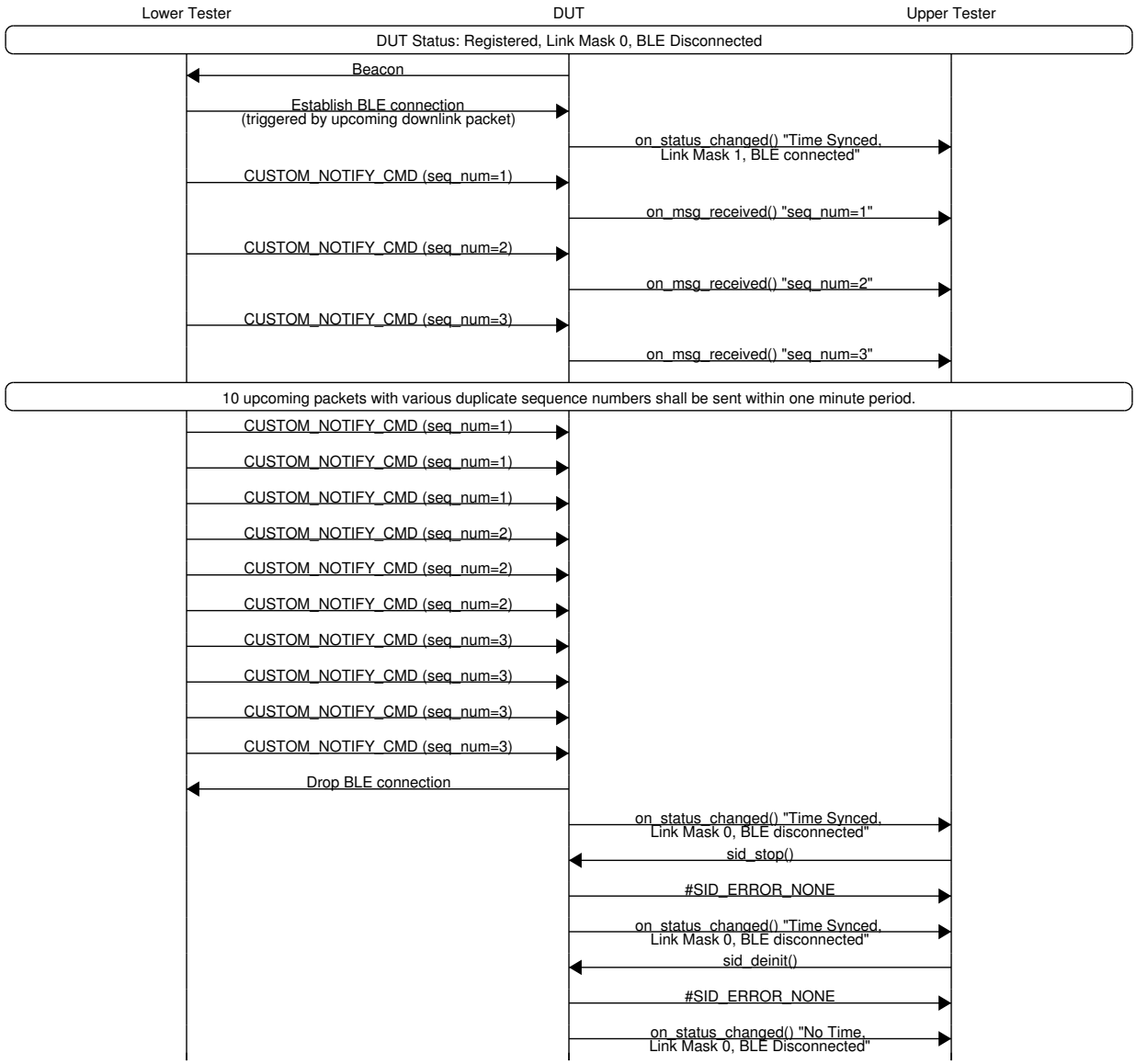
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

- ”Filter duplicates” option enabled on the DUT.

3.19.4 Test Procedure



3.19.5 Expected Results

3.19.5.1 Pass Verdict

The first three CUSTOM_NOTIFY_CMD packets with sequence numbers increasing sequentially from 1 to 3 should be sent from the Lower Tester, correctly decoded and verified against the seq_num on the DUT side. Information about all three of these packets should be reported on the Upper Tester side.

Ten CUSTOM_NOTIFY_CMD packets with various duplicate sequence numbers ranging from 1 to 3, sent from the Lower Tester within the one minute period.
One minute period starts after Lower Tester finishes transmission of the first downlink packet with duplicate sequence number.

All packets with duplicate sequence number are rejected by DUT. Information about them will not be reported on the Upper Tester side.

Upon arrival of the last CUSTOM_NOTIFY_CMD packet, DUT triggers ”on_status_changed()” with ”Link Mask” value of 0, which indicates that the BLE connection was dropped.

3.20 BLE/EP/CONN/DUP/BV/03: BLE connection is not closed after Endpoint receives 10 packets with duplicate SEQ number within one minute (filter duplicates disabled).

3.20.1 Applicability

This test case applies to devices compliant with the Amazon SidewalkSpecification v1.14 and later.

3.20.2 Test Purpose

To verify that DUT does not close BLE connection after total of 10 packets with duplicate sequence number reach it within one minute. To confirm this behavior ”filter duplicates” option has to be disabled on DUT.

3.20.3 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

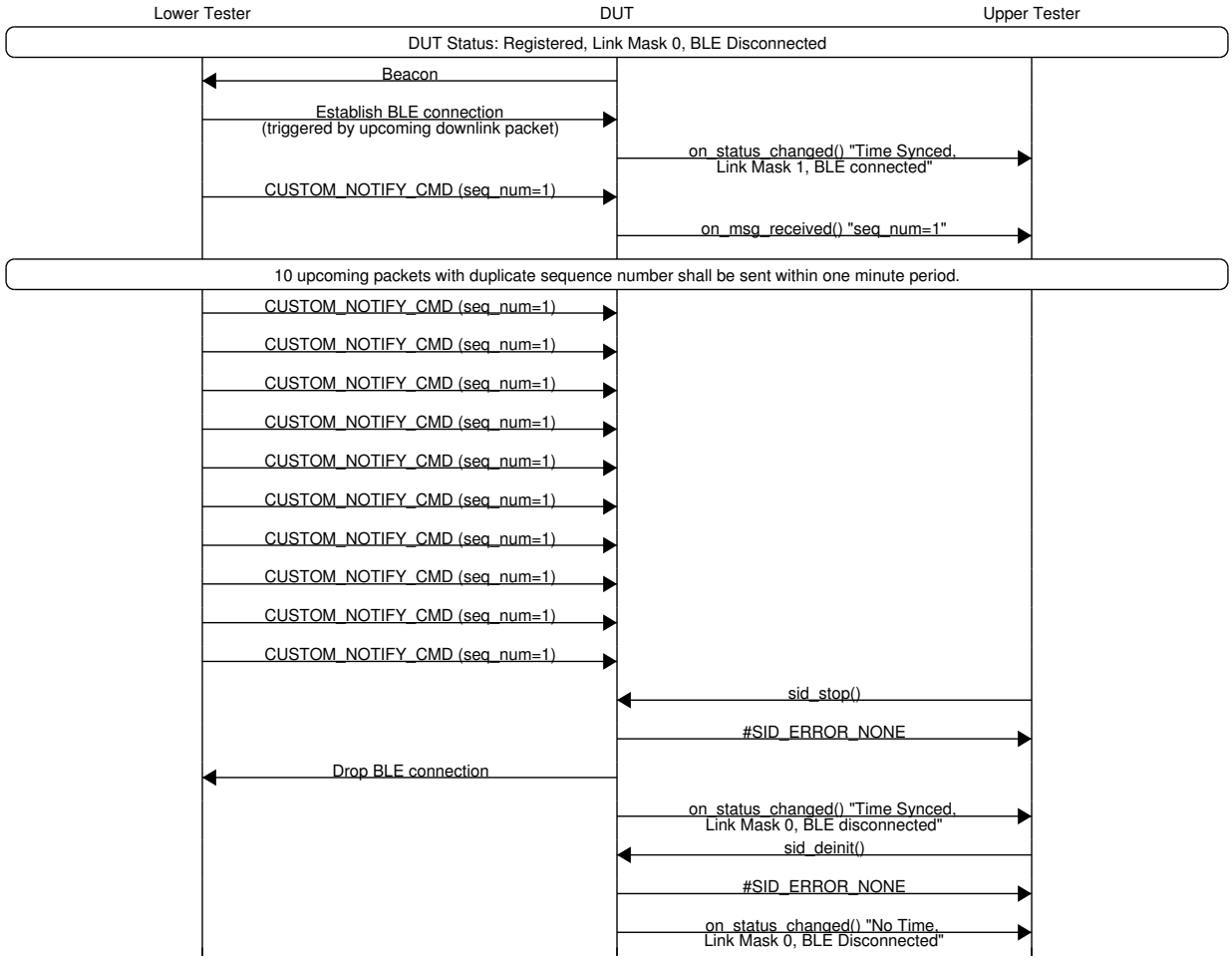
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

- ”Filter duplicates” option disabled on the DUT.

3.20.4 Test Procedure



3.20.5 Expected Results

3.20.5.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet with sequence number equal to 1 should be sent from the Lower Tester, correctly decoded and verified against the seq_num on the DUT side. Information about this packet should be reported on the Upper Tester side.

Ten CUSTOM_NOTIFY_CMD packets with duplicate sequence number equal to 1 shall be sent from Lower within the one minute period.
One minute period starts after Lower Tester finishes transmission of the first downlink packet with duplicate sequence number.

All packets with duplicate sequence number are rejected by DUT. Information about them will not be reported on the Upper Tester side.

Upon arrival of the last CUSTOM_NOTIFY_CMD packet, DUT does not trigger ”on_status_changed()”, which means that ”Link Mask” value remains unchanged and the BLE connection was not dropped.

3.21 BLE/EP/CONN/DUP/BV/04: BLE connection is not closed after Endpoint receives 10 packets with various duplicate SEQ numbers within one minute (filter duplicates disabled).

3.21.1 Applicability

This test case applies to devices compliant with the Amazon SidewalkSpecification v1.14 and later.

3.21.2 Test Purpose

To verify that DUT does not close BLE connection after total of 10 packets with various duplicate sequence numbers reach it within one minute. To confirm this behavior ”filter duplicates” option has to be disabled on DUT.

3.21.3 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

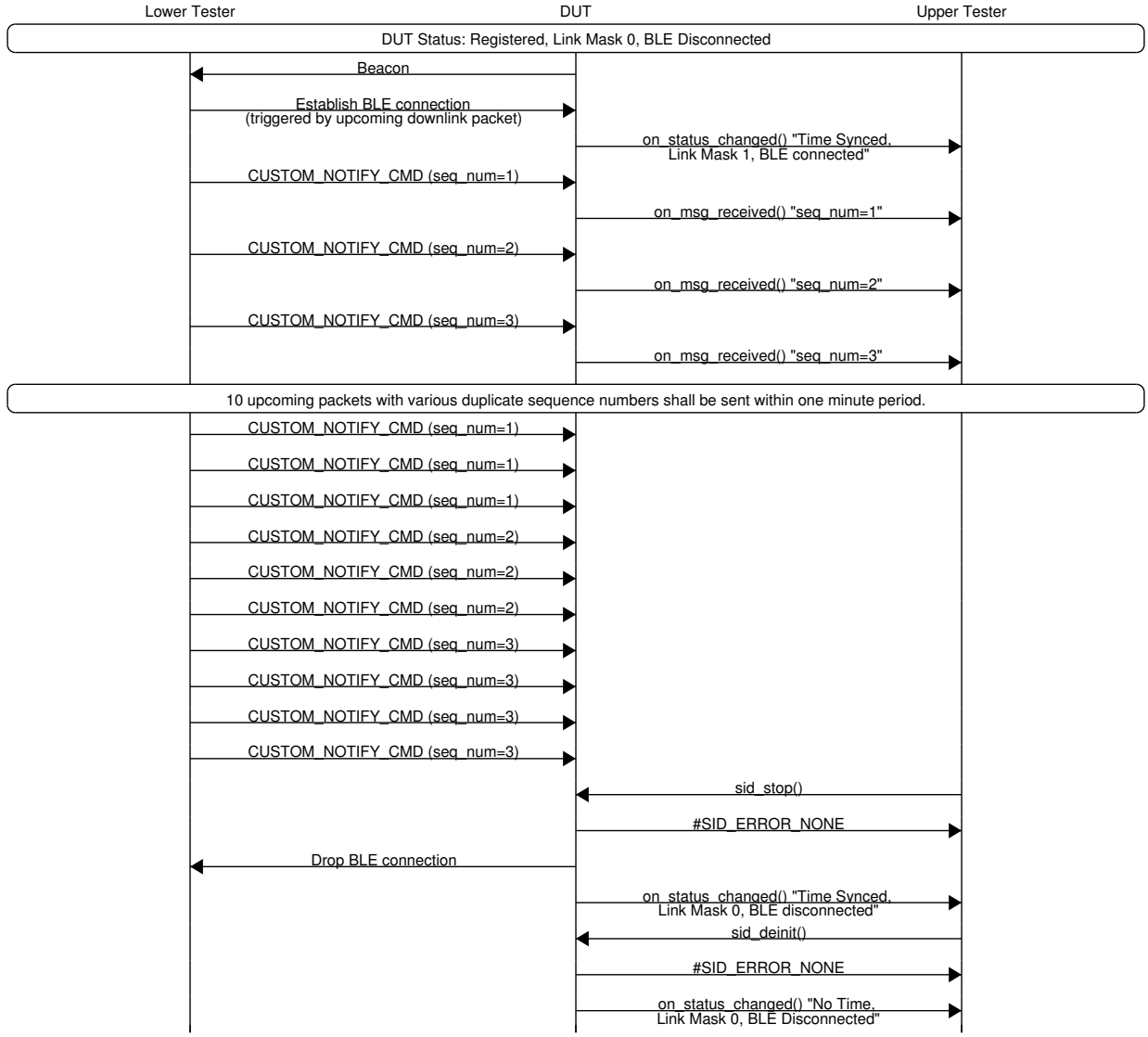
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

- ”Filter duplicates” option disabled on the DUT.

3.21.4 Test Procedure



3.21.5 Expected Results

3.21.5.1 Pass Verdict

The first three CUSTOM_NOTIFY_CMD packets with sequence numbers increasing sequentially from 1 to 3 should be sent from the Lower Tester, correctly decoded and verified against the seq_num on the DUT side. Information about all three of these packets should be reported on the Upper Tester side.

Ten CUSTOM_NOTIFY_CMD packets with various duplicate sequence numbers ranging from 1 to 3, sent from the Lower Tester within the one minute period.
One minute period starts after Lower Tester finishes transmission of the first downlink packet with duplicate sequence number.

All packets with duplicate sequence number are rejected by DUT. Information about them will not be reported on the Upper Tester side.

Upon arrival of the last CUSTOM_NOTIFY_CMD packet, DUT does not trigger ”on_status_changed()”, which means that ”Link Mask” value remains unchanged and the BLE connection was not dropped.

3.22 BLE/EP/CONN/DUP/BV/05: BLE connection is not closed after 10 packets with duplicate SEQ number reach Endpoint, if not all of those packets are sent within one minute.

3.22.1 Applicability

This test case applies to devices compliant with the Amazon SidewalkSpecification v1.14 and later.

3.22.2 Test Purpose

To verify that DUT does not close BLE connection, when 10th packet with duplicate SEQ number is received by Endpoint more than one minute after the first one. DUT will reset the counter of duplicates after a minute passes, starting from the first packet with duplicate sequence number reaching DUT. To confirm this behavior ”filter duplicates” option has to be enabled on DUT.

3.22.3 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

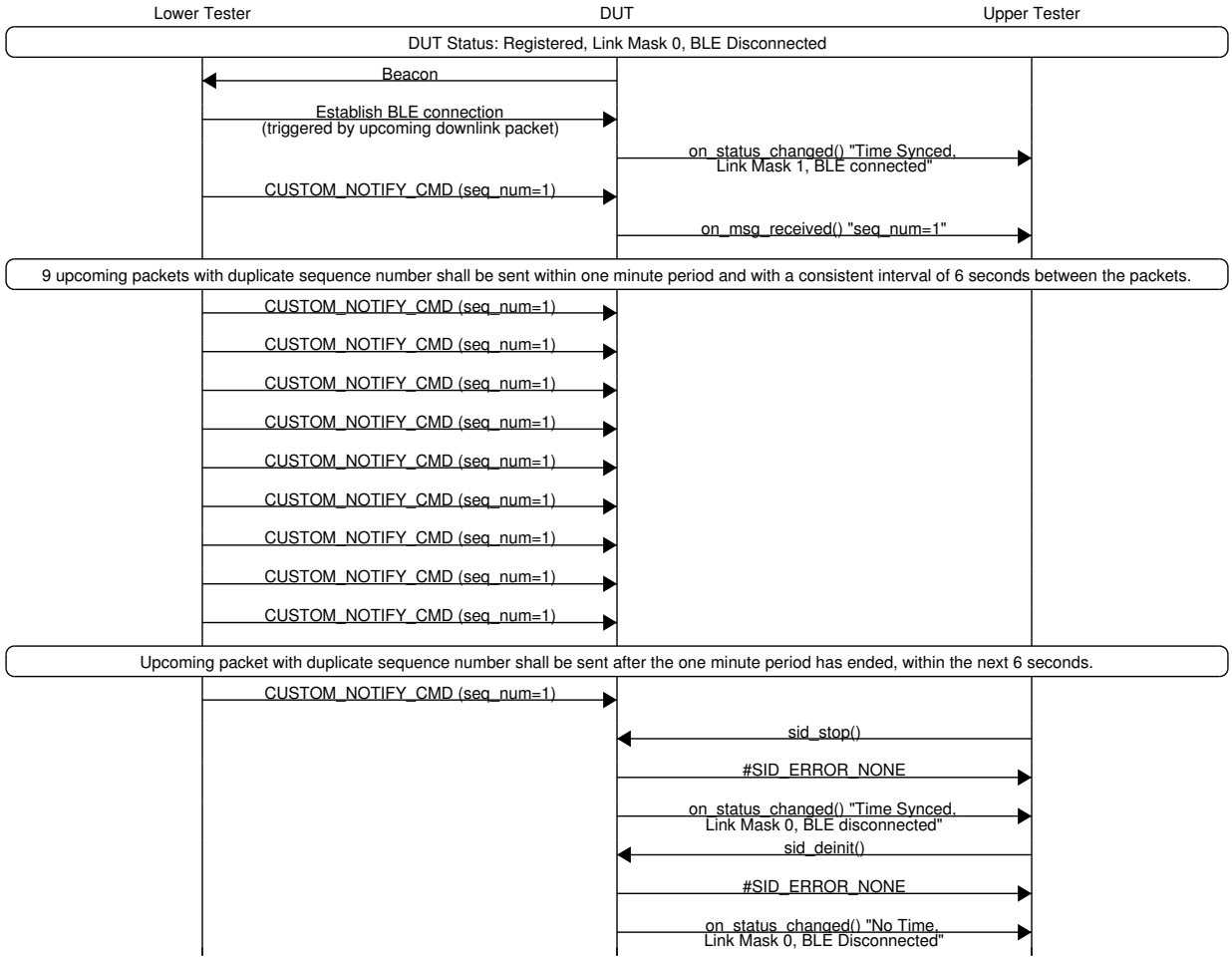
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT has completed the time synchronization.

- ”Filter duplicates” option enabled on the DUT.

3.22.4 Test Procedure



3.22.5 Expected Results

3.22.5.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet with sequence number equal to 1 should be sent from the Lower Tester, correctly decoded and verified against the seq_num on the DUT side. Information about this packet should be reported on the Upper Tester side.

Ten CUSTOM_NOTIFY_CMD packets with duplicate sequence number equal to 1 shall be sent from Lower Tester, where:
Nine CUSTOM_NOTIFY_CMD packets are sent within the one minute period and with a consistent interval of 6 seconds between the packets. One CUSTOM_NOTIFY_CMD packet is sent after the one minute period has ended, within the next 6 seconds.
One minute period starts after Lower Tester finishes transmission of the first downlink packet with duplicate sequence number.

All packets with duplicate sequence number are rejected by DUT. Information about them will not be reported on the Upper Tester side.

Upon arrival of the last CUSTOM_NOTIFY_CMD packet, DUT does not trigger ”on_status_changed()”, which means that ”Link Mask” value remains unchanged and the BLE connection was not dropped.

3.23 BLE/EP/NW/SYNC/TIME/BV/01: Endpoint completes the initial time sync procedure.

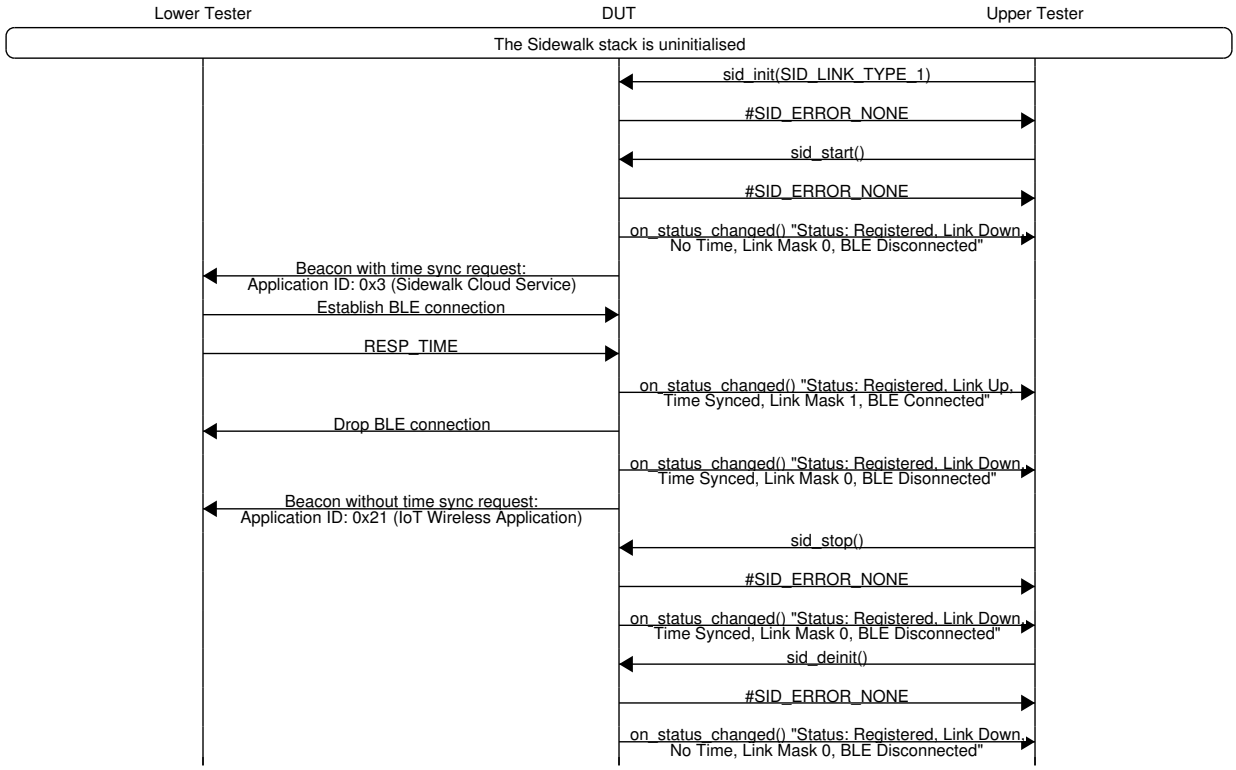
3.23.1 Test Purpose

DUT is able to pass the initial time synchronization procedure. Payload of the beacons transmitted by DUT is appropriate to the time sync state.

3.23.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.

3.23.3 Test Procedure



3.23.4 Expected Results

3.23.4.1 Pass Verdict

Depending on the time sync state of DUT, advertising beacon may contain the time sync request. This information is located in ”Application ID” - 5th octet of Manufacturing Data in the beacon. Value of the Application ID signifies whether DUT is requesting time sync (0x3 - Sidewalk Cloud Service) or if it was already completed (0x21 - IoT Wireless Application). Payload of the beacons to be checked with BLE sniffer on Lower Tester side.

Before starting time sync procedure, DUT transmits beacons with time sync request - Application ID: 0x3 (Sidewalk Cloud Service).

There may be more than one beacon transmitted by DUT before the BLE connection with Lower Tester is established, however this should not negatively affect the time synchronization procedure.

Lower Tester establishes BLE connection with DUT after receiving beacon with time sync request.

The RESP_TIME packet will be sent to DUT right after establishing the BLE connection.

DUT is able to acquire time from the network.

No other UL transmission should take place until the DUT receives a correct RESP_TIME packet which will be reported via Time Status: synced.

After completing time synchronization procedure, DUT triggers ”on_status_changed()” twice:
With ”Link Mask” value of 1, Link status Up and Time synced, which indicate that the BLE connection was established and time synchornization was completed.
With ”Link Mask” value of 0 and Link status Down, which indicate that the BLE connection was dropped right after.

Completion of the time synchronization procedure should also result in DUT transmitting beacons to the app server (without time sync request) - Application ID: 0x21 (IoT Wireless Application).

Chapter 4

FSK (900MHz) Test Cases

4.1 FSK/EP/BCN/DISCO/BV/01: FSK-WAN Endpoint discovers neighbor Gateway and synchronizes with it if roaming is allowed.

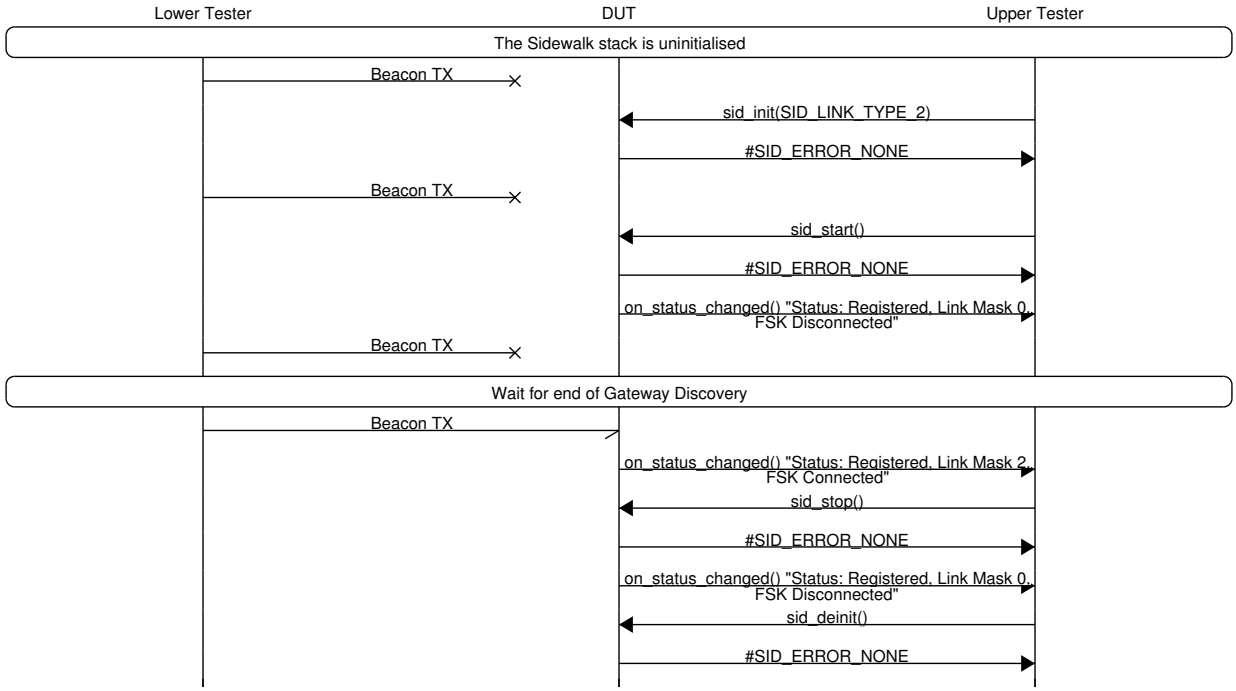
4.1.1 Test Purpose

DUT is able to discover and synchronize with neighbor Gateway if roam_opt flag is set to 1 in Beacon.

4.1.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

4.1.3 Test Procedure



4.1.4 Expected Results

4.1.4.1 Pass Verdict

DUT is able to detect Beacon and synchronize with the neighbor Gateway that allows roaming. Detection of Beacon and synchronization with GW should take place within 40 seconds of starting the Sidewalk stack.

In result the FSK stack goes connected state which means that synchronization on PHY layer has been achieved.

4.2 FSK/EP/BCN/DISCO/BV/02: FSK-WAN Endpoint discovers home Gateway and synchronizes with it even if roaming is forbidden.

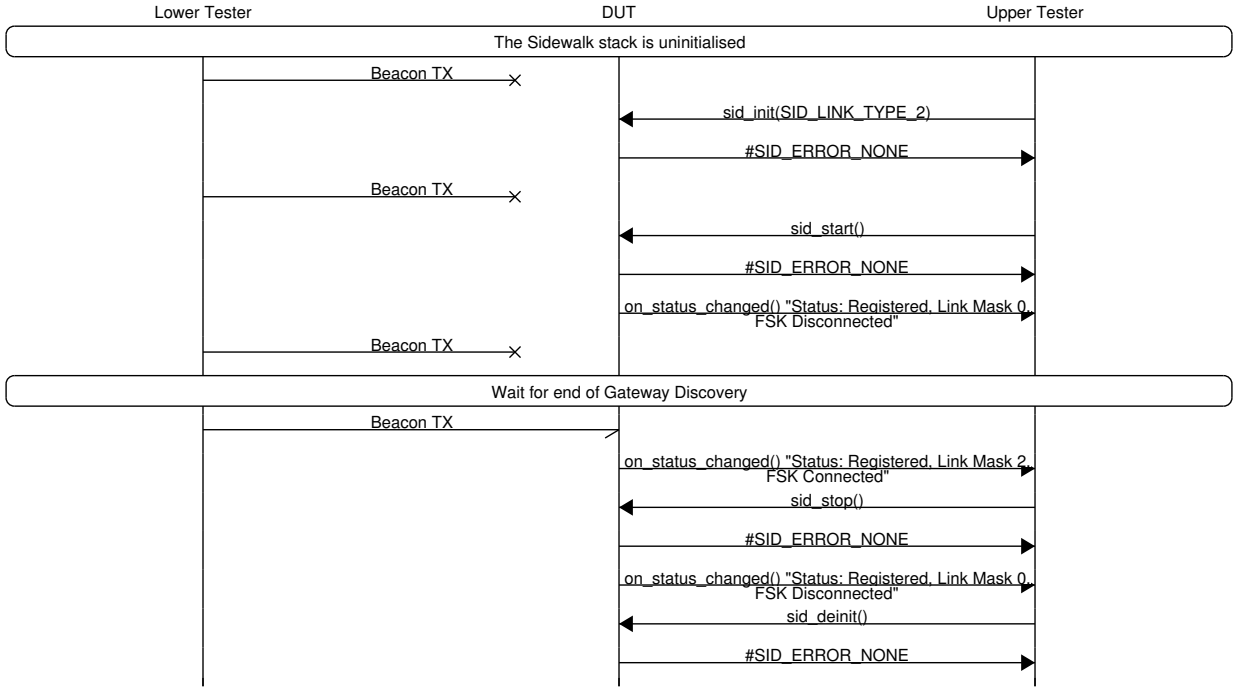
4.2.1 Test Purpose

DUT is able to discover and synchronize with home Gateway even if roam_opt flag is set to 0 in Beacon.

4.2.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is disabled on Lower Tester.

4.2.3 Test Procedure



4.2.4 Expected Results

4.2.4.1 Pass Verdict

DUT is able to detect Beacon and synchronize with the home Gateway that does not allow roaming. Detection of Beacon and synchronization with Lower Tester should take place within 40 seconds of starting the Sidewalk stack.

In result the FSK stack goes connected state which means that synchronization on PHY layer has been achieved.

4.3 FSK/EP/BCN/DISCO/BV/03: FSK-WAN Endpoint detects a neighbor Gateway Beacon but continues with the Gateway discovery process if roaming is forbidden.

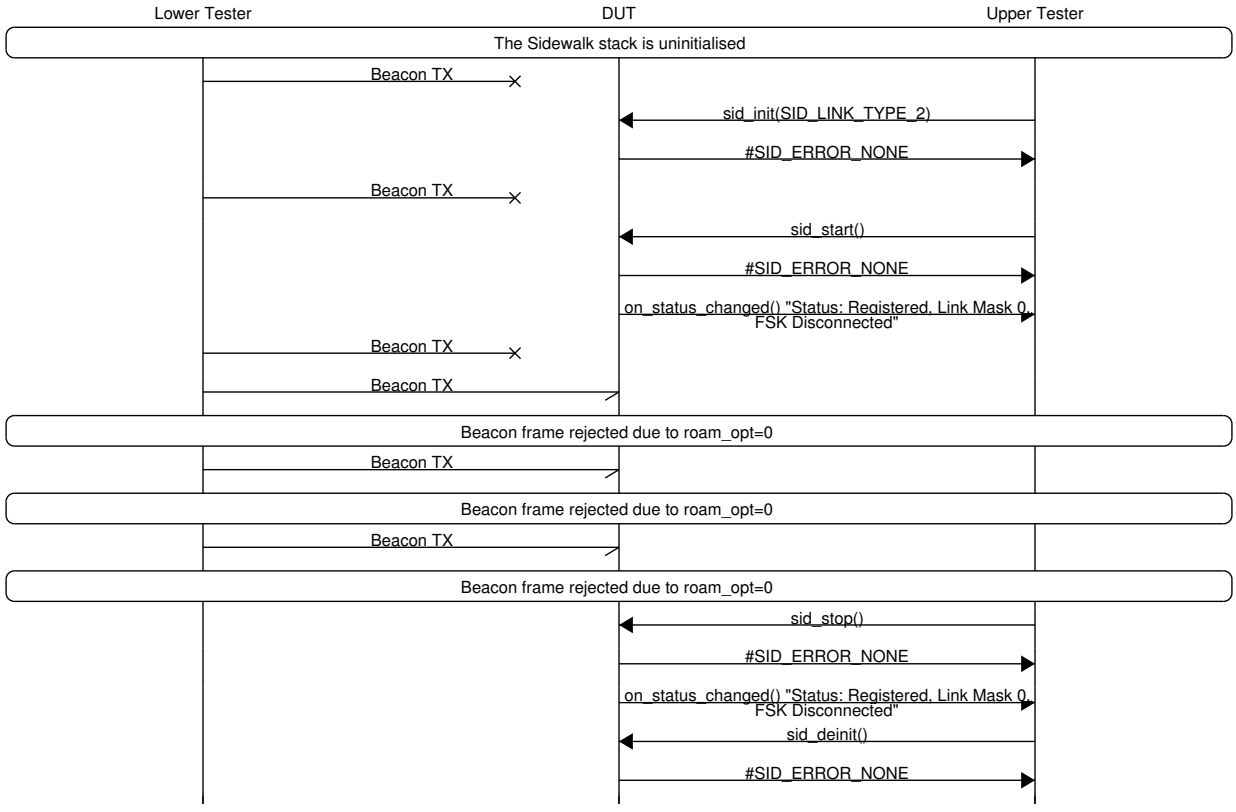
4.3.1 Test Purpose

DUT is able to detect Beacon frame but continues with the Gateway discovery process if roam_opt flag is set to 0 in Beacon.

4.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network using different user accounts.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is disabled on the Lower Tester.

4.3.3 Test Procedure



4.3.4 Expected Results

4.3.4.1 Pass Verdict

DUT is able to detect a Beacon, but the Gateway discovery procedure is continued and should not be successful due to disabled SidewalkNetworkFlag.

DUT should reject three consecutive Beacon frames which were received after stack is started. In result change of SID application status should not be observed and FSK stack should remain in disconnected state all the time.

No transmission of a UL packet should occur during the entire test as DUT is involved in a passive way in Beacon detection for most of time.

4.4 FSK/EP/CONN/REG/BV/02: Endpoint can be deregistered from Sidewalk network.

4.4.1 Test Purpose

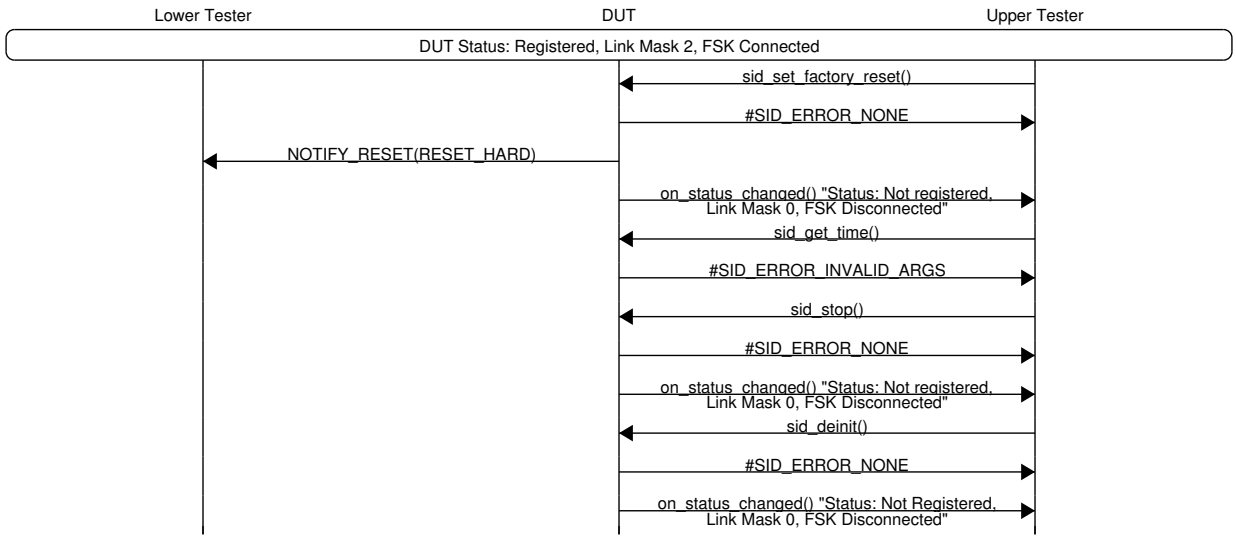
To verify that the DUT is able to be deregistered from the Amazon Sidewalk network.

4.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- The Sidewalk stack (FSK) is initialized and started on the DUT.

4.4.3 Test Procedure



4.4.4 Expected Results

4.4.4.1 Pass Verdict

Calling the sid_set_factory_reset method should force the DUT to send the packet NOTIFY_RESET (with RESET_HARD parameter) to the Lower Tester. Then the DUT should report to the Upper Tester the change in registration status to ”Not registered”.

After successful deregistration, the attempt to send the GET_TIME packet should fail with the SID_ERROR_INVALID_ARGS returned to the Upper Tester.

4.5 FSK/EP/CONN/REG/BV/03: An unregistered Endpoint successfully completes Sidewalk device registration with use of FFN.

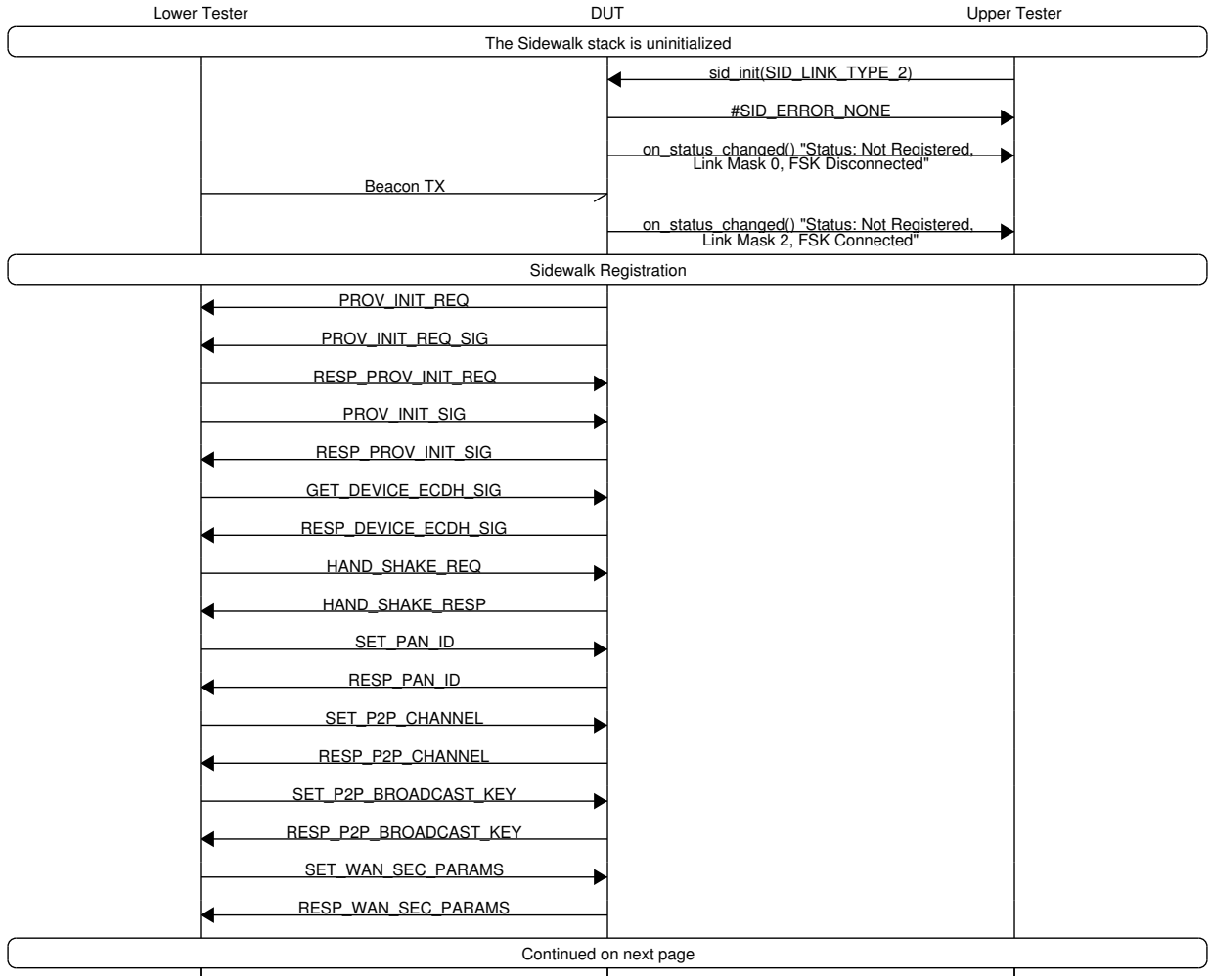
4.5.1 Test Purpose

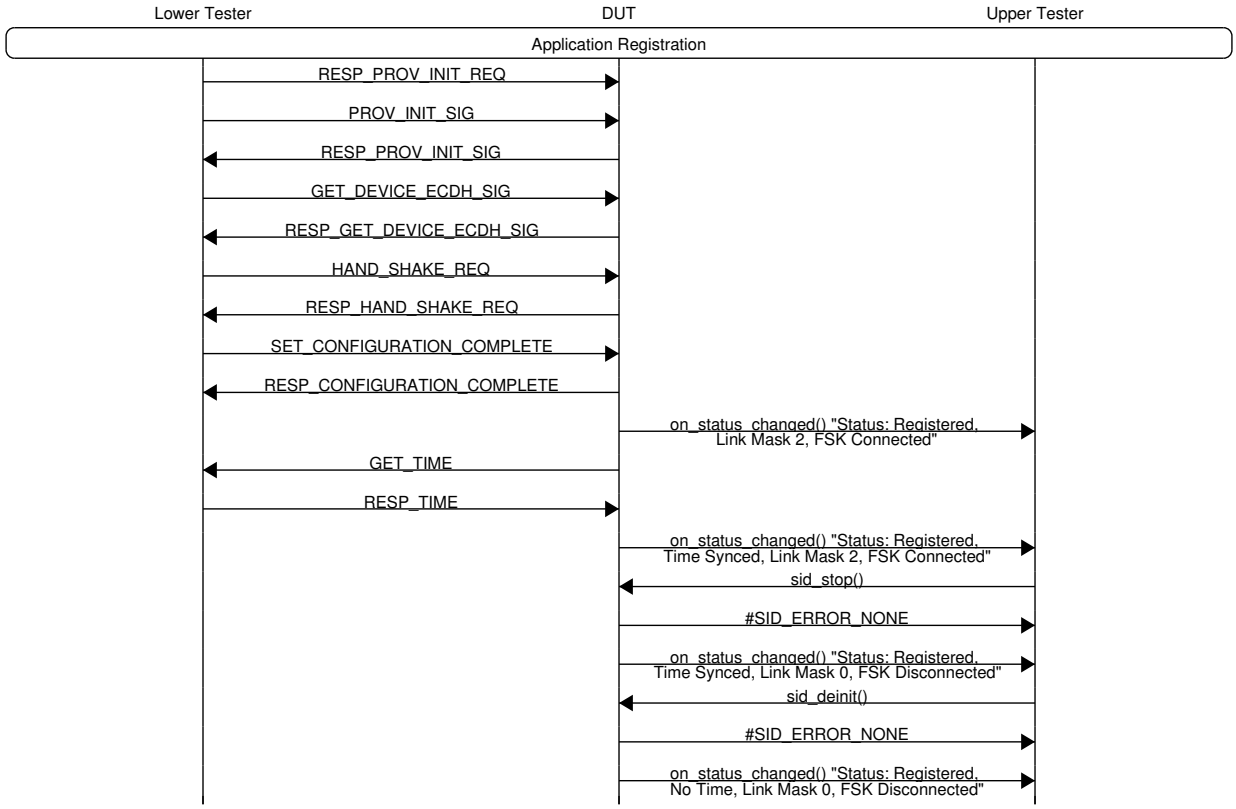
An unregistered DUT configures the Sidewalk stack in FSK mode. DUT synchronizes with Lower Tester (by detecting a Beacon) and starts registration flow by sending "PROV_INIT_REQ" packet to Lower Tester. At the end of the registration flow, DUT receives SET_CONFIGURATION_COMPLETE packet from Lower Tester and responds with RESP_CONFIGURATION_COMPLETE packet, which is a sign of successful device registration. After that DUT continues to work using FSK radio for Amazon Sidewalk network activities.

4.5.2 Initial Conditions

- DUT is fully unregistered from Amazon Sidewalk network (both Cloud and DUT side)

4.5.3 Test Procedure





4.5.4 Expected Results

4.5.4.1 Pass Verdict

Registration process is triggered by DUT, after detecting a Beacon and synchronizing with Lower Tester.

DUT sends "PROV_INIT_REQ" packet to initiate the registration flow.

Every registration related packet is successfully exchanged between Lower Tester and DUT.

During the process of registration, DUT does not change Sidewalk stack.

DUT receives "SET_CONFIGURATION_COMPLETE" packet from Lower Tester and responds with "RESP_CONFIGURATION_COMPLETE". Those two packets signify that DUT is successfully registered with Amazon Sidewalk network with use of FFN.

Afterwards, DUT completes time synchronization over FSK.

4.6 FSK/EP/CONN/SEQ/BV/01: Uplink packets contain SEQ number.

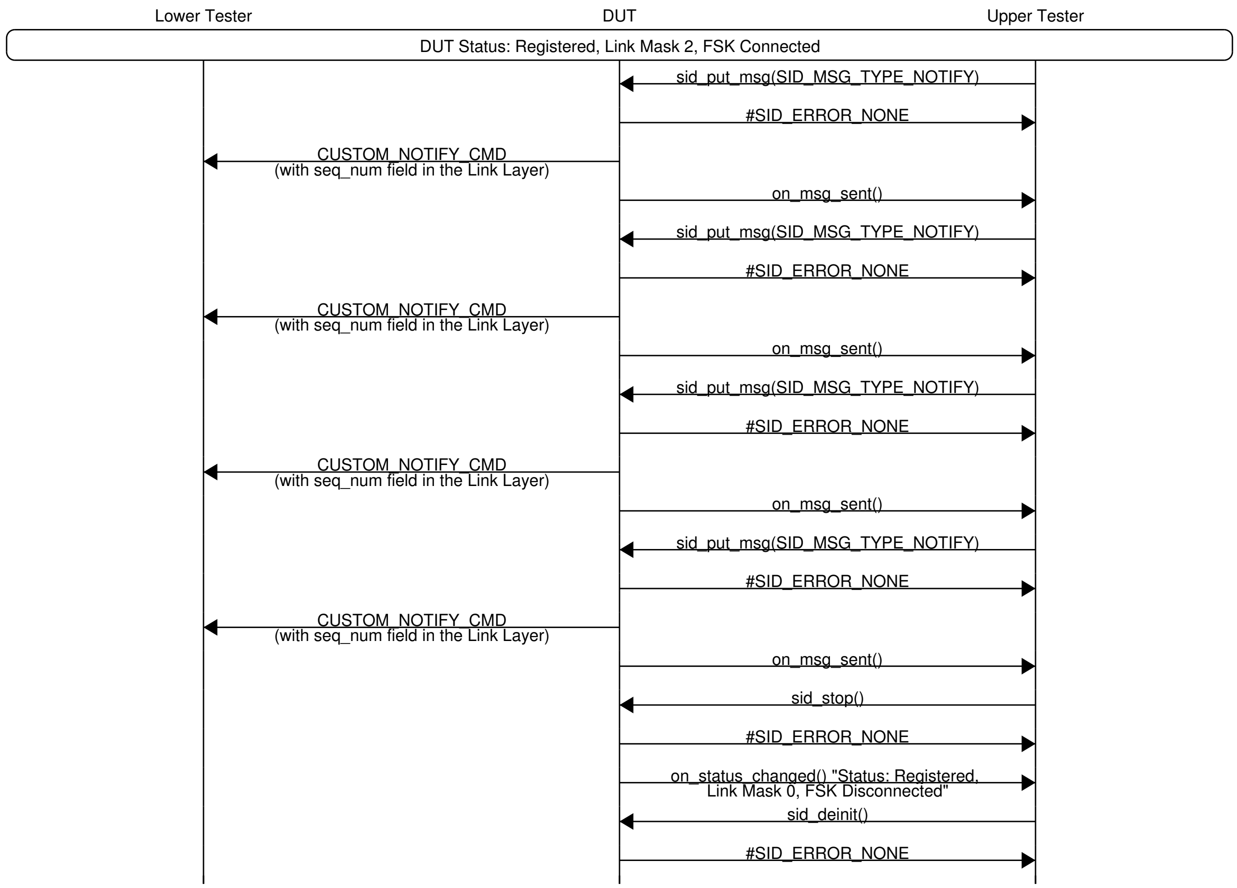
4.6.1 Test Purpose

To verify that the uplink packets sent by the DUT contain the sequence number written in the seq_num field in the Link Layer. With each subsequent sent packet, the value of seq_num should be incremented by one.

4.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.6.3 Test Procedure



4.6.4 Expected Results

4.6.4.1 Pass Verdict

The seq_num field is properly filled in the Link Layer of each CUSTOM_NOTIFY_CMD packet sent by DUT. Moreover, seq_num of each CUSTOM_NOTIFY_CMD packet should be incremented by one relative to the seq_num of the previous transmitted packet.

As the packet sequence number is sent as plain text in the Link Layer, the above condition can be validated on the Lower Tester side.

4.7 FSK/EP/CONN/SEQ/BV/02: Endpoint increments uplink SEQ number until UUID changes.

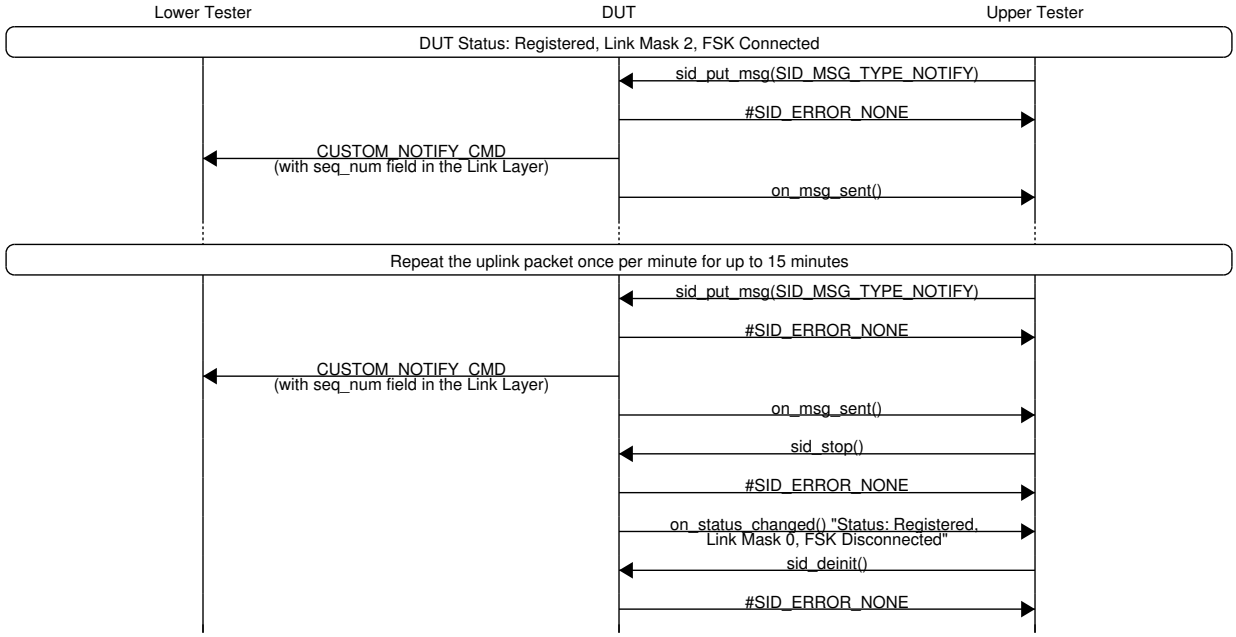
4.7.1 Test Purpose

To verify that the DUT increments the uplink packet sequence number until the UUID is changed. After the UUID is changed, the DUT should generate a new sequence number in the range between 0 and 16383.

4.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.7.3 Test Procedure



4.7.4 Expected Results

4.7.4.1 Pass Verdict

The seq_num field should be properly incremented by one for each subsequent packet sent by DUT within a maximum of 15 minutes from the previous UUID change, then a new sequence number should be generated in the range between 0 and 16383.

As the packet sequence number is sent as plain text in the Link Layer, all CUSTOM_NOTIFY_CMD packets can be verified for seq_num field content on the Lower Tester side.

4.8 FSK/EP/CONN/SEQ/BV/03: Endpoint accepts and decodes downlink packets with increased and decreased SEQ.

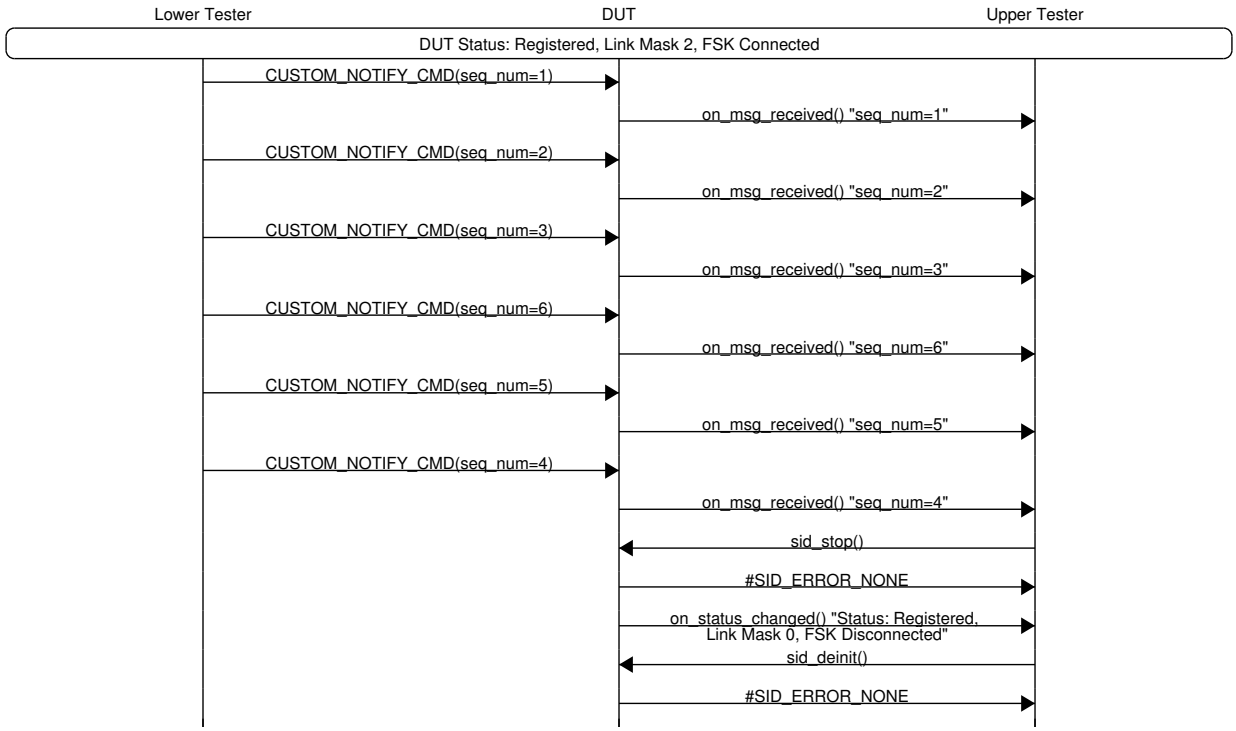
4.8.1 Test Purpose

To verify that the downlink packets with both increasing and decreasing sequance number can be decoded by the DUT.

4.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.8.3 Test Procedure



4.8.4 Expected Results

4.8.4.1 Pass Verdict

The first three CUSTOM_NOTIFY_CMD packets sent by Lower Tester to the DUT contain an increasing sequence number ranging from 1 to 3. The next three CUSTOM_NOTIFY_CMD packets contain a decreasing sequence number ranging from 6 to 4. All sent packets should be accepted and properly decoded by the DUT which should manifested by reporting all six events to the Upper Tester.

4.9 FSK/EP/CONN/SEQ/BV/05: Endpoint rejects downlink packet with duplicated SEQ.

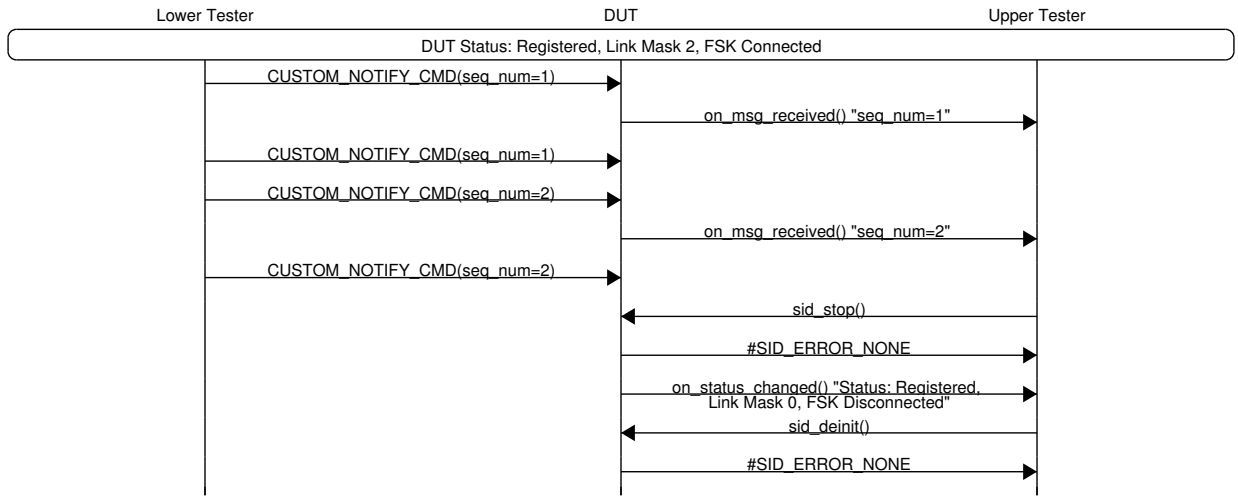
4.9.1 Test Purpose

To verify that a downlink packet which contains a duplicated sequence number is rejected by the DUT.

4.9.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.9.3 Test Procedure



4.9.4 Expected Results

4.9.4.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet sent by the Lower Tester containing sequence number equal to 1 should be decoded correctly and information about this event should be visible on the Upper Tester side. However, another CUSTOM_NOTIFY_CMD packet sent by the Lower Tester also containing the same sequence number should be rejected by the DUT.

The third CUSTOM_NOTIFY_CMD packet containing parameter seq_num increased by one should be decoded correctly and information about this event should again be visible on the Upper Tester side. The fourth CUSTOM_NOTIFY_CMD packet with a duplicated seq_num equal to 2 should be rejected by the DUT.

In the case of duplicate packets, information about this event should not be visible on the Upper Tester side.

4.10 FSK/EP/CONN/SEQ/BV/06: Endpoint rejects downlink packet with duplicated SEQ range.

4.10.1 Test Purpose

To verify that a group of five downlink packets which contain a duplicate sequence number are rejected by the DUT.

4.10.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

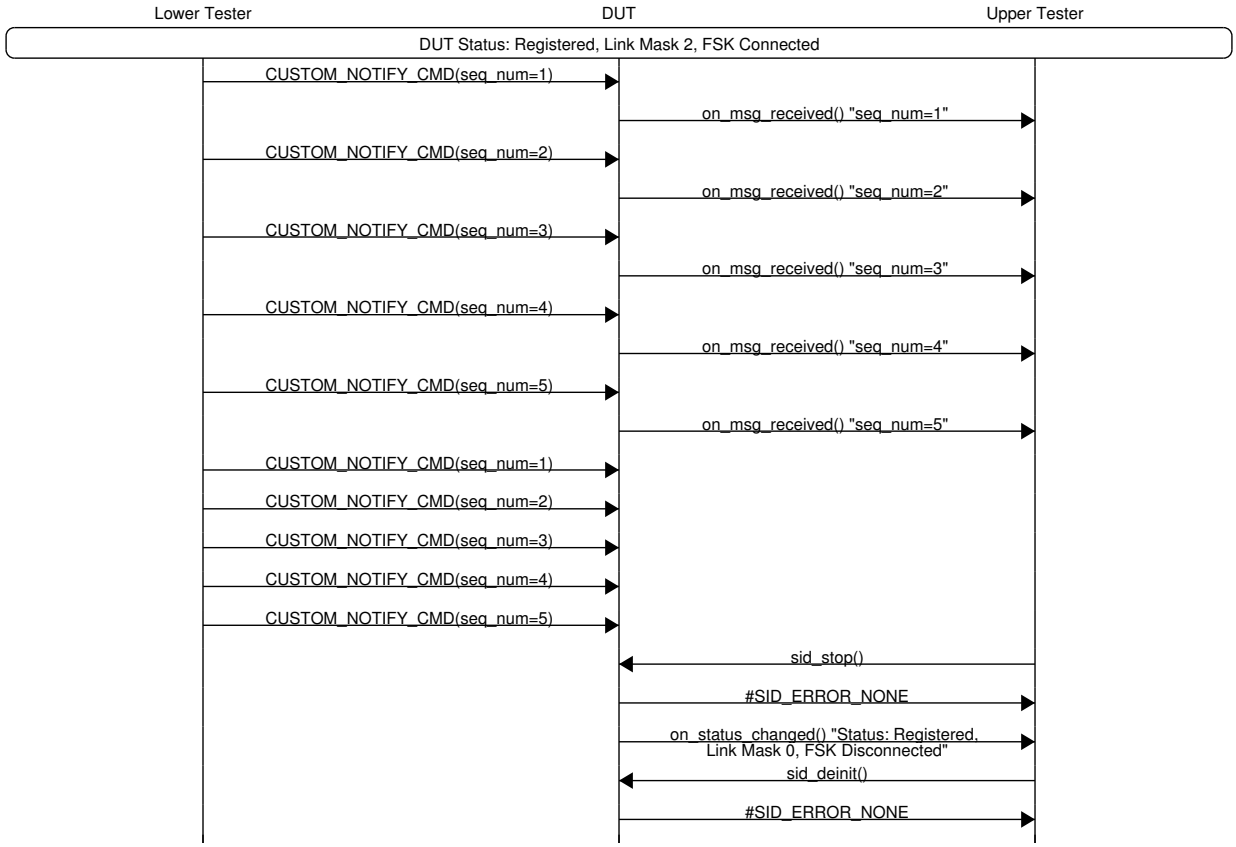
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (FSK) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

4.10.3 Test Procedure



4.10.4 Expected Results

4.10.4.1 Pass Verdict

The first five CUSTOM_NOTIFY_CMD packets with sequence numbers increasing sequentially from 1 to 5 should be sent from the Lower Tester and correctly decoded on the DUT side. Receipt of all five of these packets should be reported on the Upper Tester side.

After re-sending from the Lower Tester the same packets containing sequence numbers from 1 to 5, all of them should be rejected by the DUT. Information on these five events should not be visible on the Upper Tester side.

4.11 FSK/EP/CONN/SEQ/BV/07: SEQ number can be accepted again after getting 10 other messages.

4.11.1 Test Purpose

DUT is able to receive downlink packet with already used SEQ number, after receiving at least 10 additional packets with different, unique SEQ number.

4.11.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

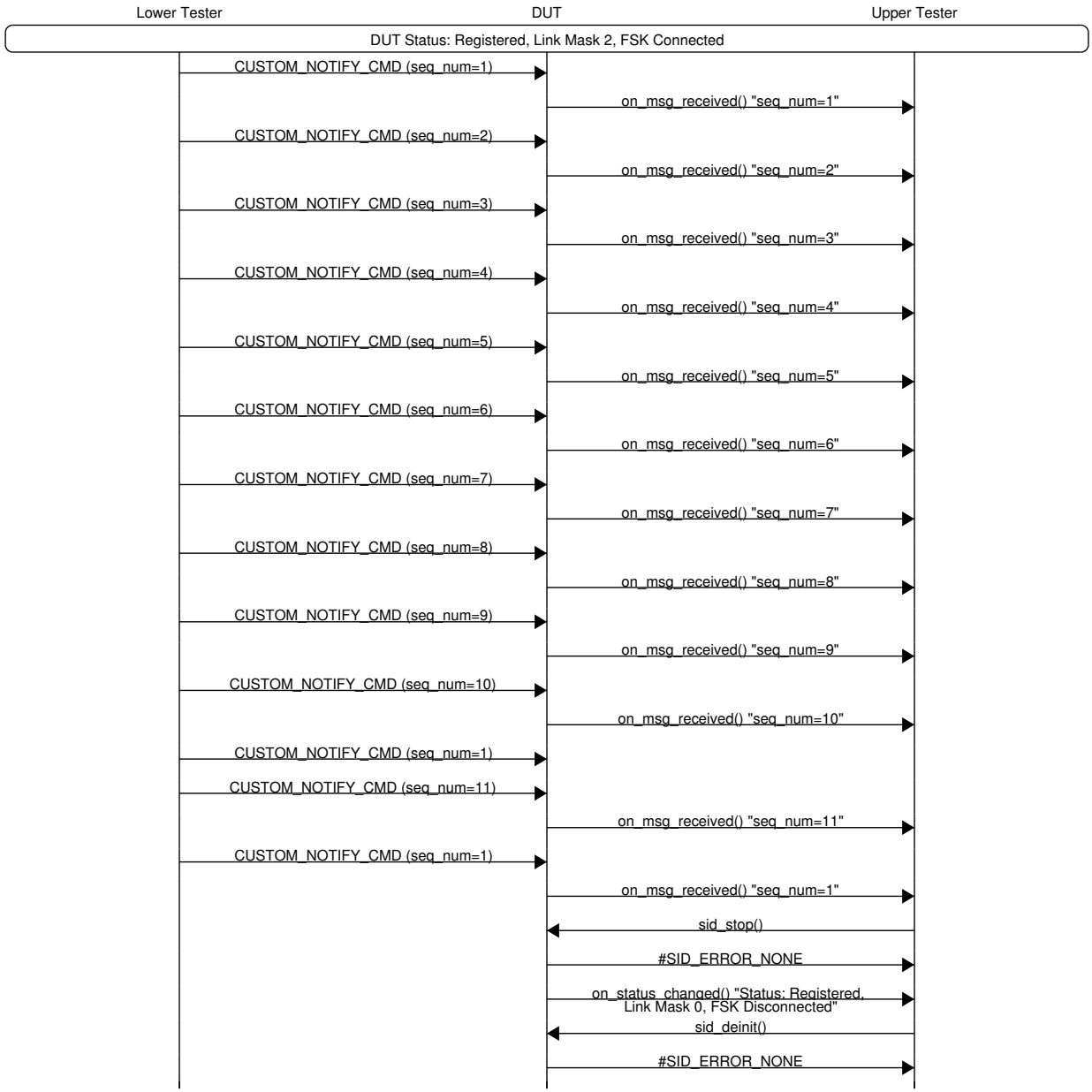
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (FSK) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

4.11.3 Test Procedure



4.11.4 Expected Results

4.11.4.1 Pass Verdict

First, eleventh and thirteenth CUSTOM_NOTIFY_CMD packet contain the same SEQ number.

All the other CUSTOM_NOTIFY_CMD packets contain different, unique SEQ number.

Due to the fact that 10 additional packets have to be received by DUT before SEQ number can be reused: Eleventh CUSTOM_NOTIFY_CMD packet should be rejected by DUT (after 9 additional packets received). Thirteenth CUSTOM_NOTIFY_CMD packet should be received and decoded properly by DUT (after 10 additional packets received).

4.12 FSK/EP/CONN/SEQ/BV/08: SEQ number can be accepted again after Sidewalk stack reinitialization.

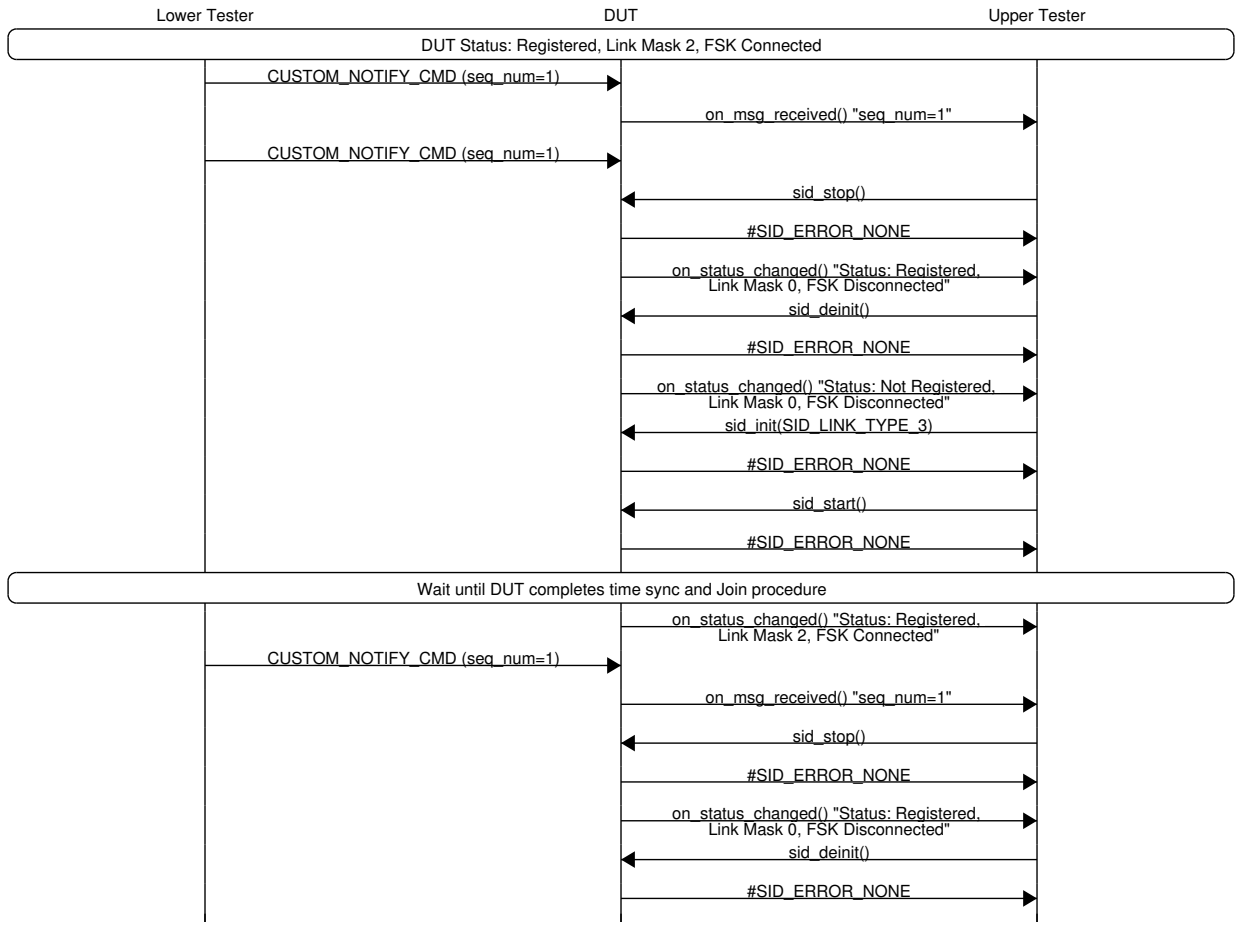
4.12.1 Test Purpose

DUT is able to receive downlink packet with already used SEQ number, after reinitialization of Sidewalk stack.

4.12.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.12.3 Test Procedure



4.12.4 Expected Results

4.12.4.1 Pass Verdict

First and third CUSTOM_NOTIFY_CMD packets should be received and decoded properly by DUT, despite having the same SEQ number.

Since there was no stack reinitialization before second CUSTOM_NOTIFY_CMD packet, it should be rejected by DUT because of repeating SEQ number.

4.13 FSK/EP/CONN/SEQ/BV/09: Endpoint drops the packet with SEQ which is out of range.

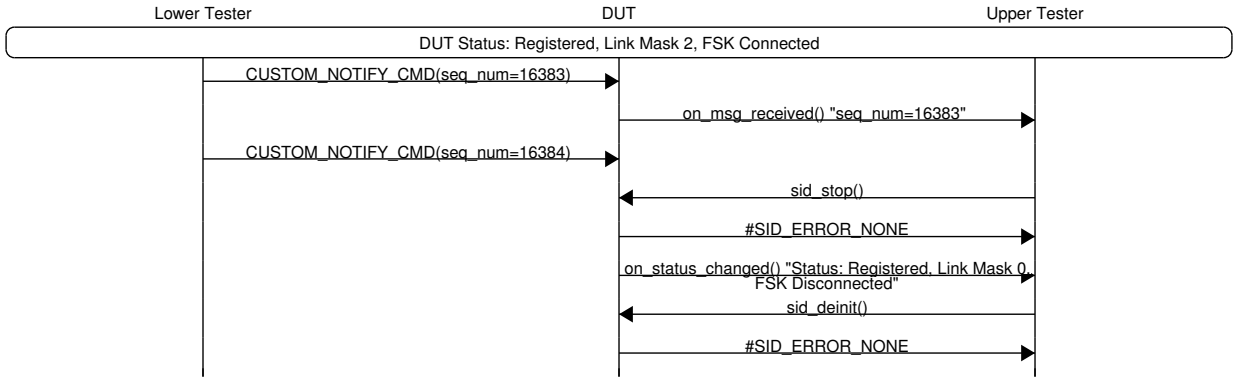
4.13.1 Test Purpose

To verify that a downlink packet which contains an out of range sequence number is dropped by the DUT.

4.13.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.13.3 Test Procedure



4.13.4 Expected Results

4.13.4.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet sent by the Lower Tester containing the maximum allowed sequence number (16383) should be decoded correctly and information about this event should be visible on the Upper Tester side.

The second CUSTOM_NOTIFY_CMD packet sent by the Lower Tester should be dropped by the DUT due to the seq_num parameter being exceeded and therefore this event should not be reported to the Upper Tester.

4.14 FSK/EP/DATA/DL/BV/01: Endpoint receives downlink packets with various sizes of Command data.

4.14.1 Test Purpose

DUT is able to receive downlink packets with various sizes of Command data (1B, 100B, 200B) sent from the Lower Tester.

4.14.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

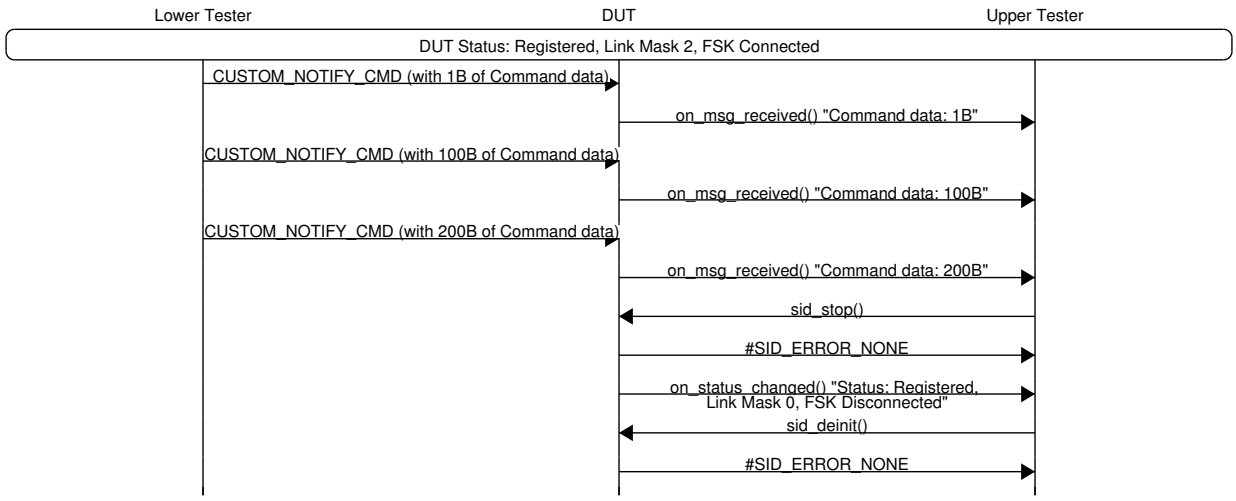
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (FSK) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

4.14.3 Test Procedure



4.14.4 Expected Results

4.14.4.1 Pass Verdict

Packets with various sizes of Command data sent by Lower Tester are able to reach the DUT.

The Command data content must be verified for correctness on the Upper Tester side.

4.15 FSK/EP/DATA/UL/BV/01: Gateway receives uplink packets with various sizes of Command data from Endpoint.

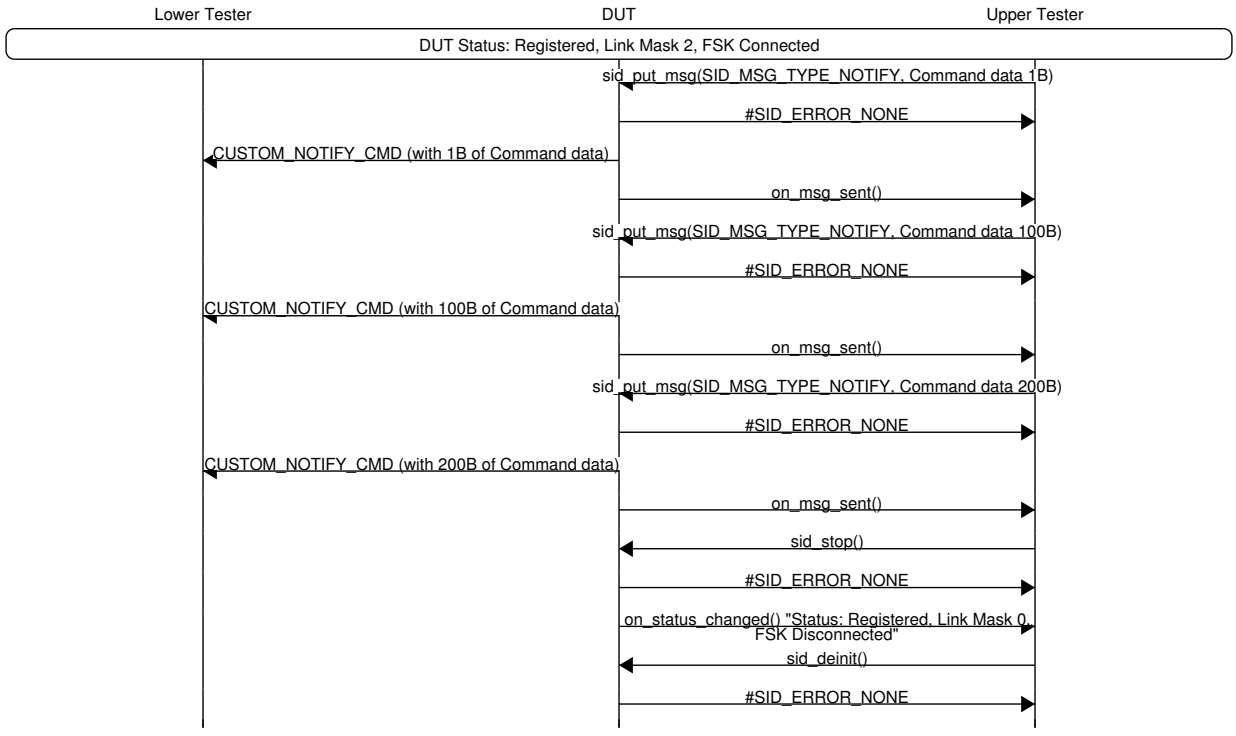
4.15.1 Test Purpose

Lower Tester is able to receive uplink packets with various sizes of Command data (1B, 100B, 200B) sent from the DUT.

4.15.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

4.15.3 Test Procedure



4.15.4 Expected Results

4.15.4.1 Pass Verdict

Packets with various sizes of Command data sent by DUT are able to reach the Lower Tester.

The Command data content of each packet must be verified for correctness on the Lower Tester side.

4.16 FSK/EP/NW/SYNC/TIME/BV/01: Endpoint completes the initial time sync procedure.

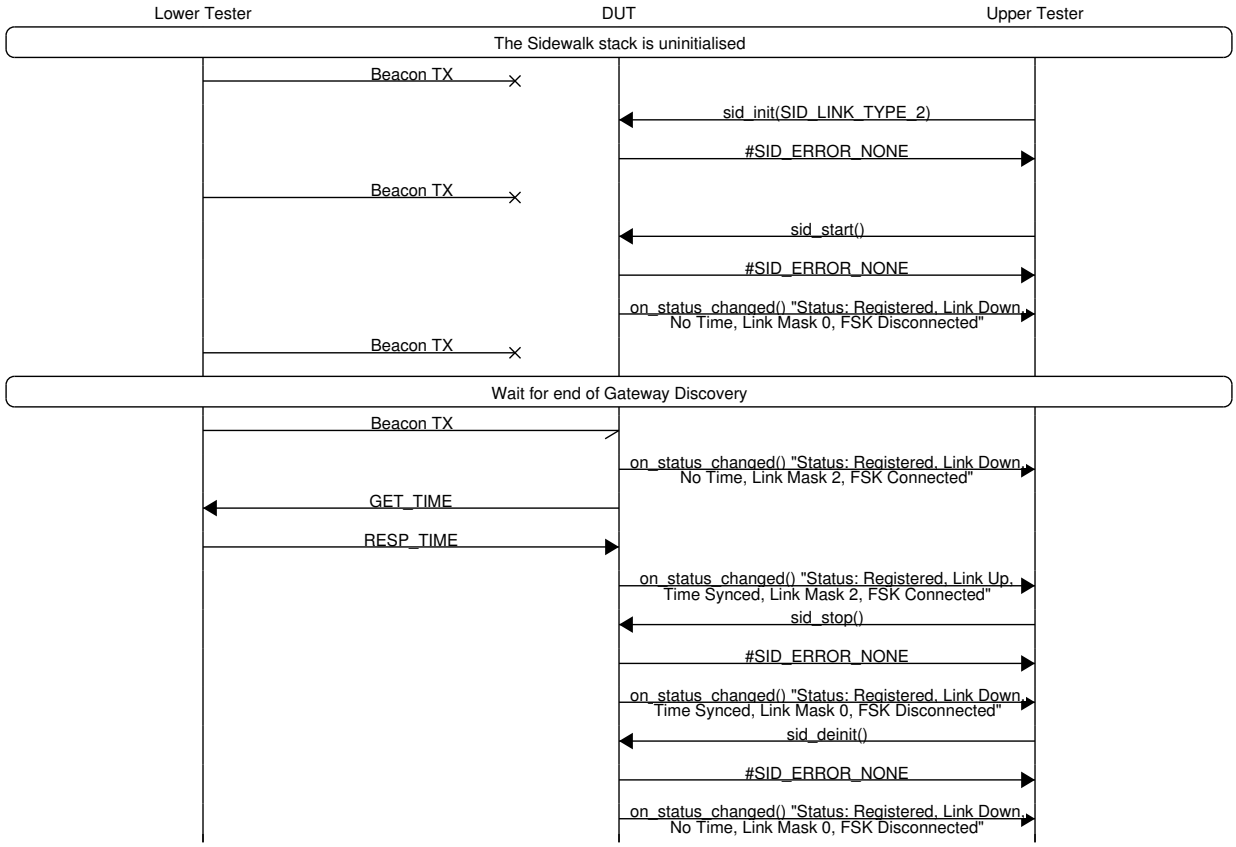
4.16.1 Test Purpose

DUT is able to pass the initial time synchronization procedure.

4.16.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

4.16.3 Test Procedure



4.16.4 Expected Results

4.16.4.1 Pass Verdict

DUT is able to acquire time from the network.

Moreover, the GET_TIME packet must be the first UL transmission right after detecting the Beacon and synchronizing with the Lower Tester. The RESP_TIME packet will be sent to DUT within 30 seconds and no re-transmission of the GET_TIME packet should occur during this time.

No other UL transmission should take place until the DUT receives a correct RESP_TIME packet which will be reported via Time Status: Synced. Completion of the time synchronization procedure should also change the Link Status to Up.

4.17 FSK/EP/NW/SYNC/JOIN/BV/01: Endpoint completes the initial Join procedure.

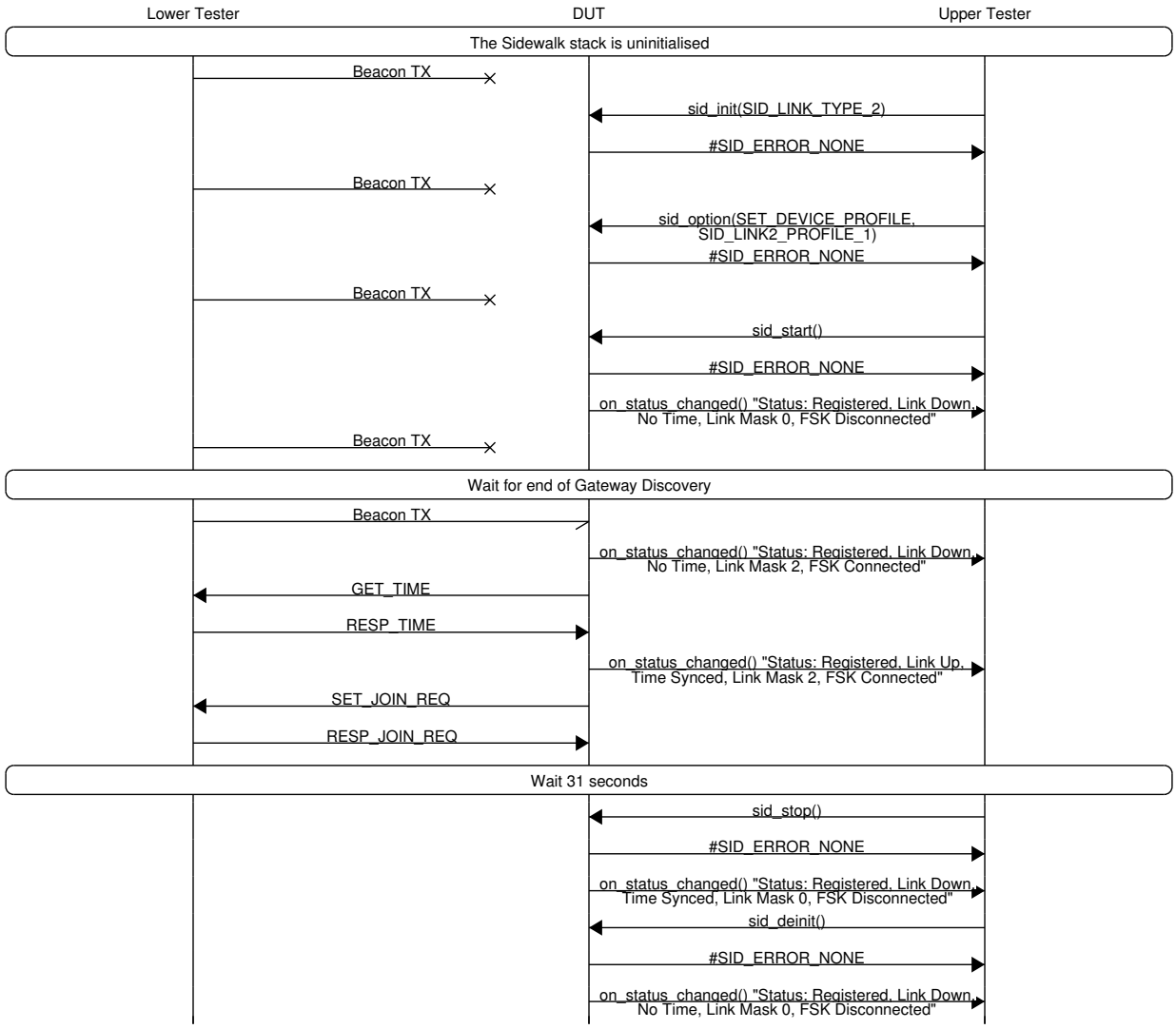
4.17.1 Test Purpose

DUT is able to pass the initial Join procedure.

4.17.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile 1 (FSK-WAN ADHOC).
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

4.17.3 Test Procedure



4.17.4 Expected Results

4.17.4.1 Pass Verdict

DUT is able to acquire positive Join response from the network.

Moreover, the GET_TIME packet must be the first UL transmission right after detecting the Beacon and synchronizing with the Lower Tester. The RESP_TIME packet will be sent to DUT within 30 seconds and no re-transmission of the GET_TIME packet should occur during this time.

Also no other UL transmission is allowed before the DUT receives the RESP_TIME packet which will be reported via Time Status: Synced. Completion of the time synchronization procedure should also change the Link Status to Up.

DUT should send the SET_JOIN_REQ packet right after the time synchronization procedure is complete. The RESP_JOIN_REQ packet will be sent back to DUT within 31 seconds and until then DUT should not repeat the transmission of the next SET_JOIN_REQ commands. This means the Join procedure completes as expected.

As the SET_JOIN_REQ carries requested link characteristics for both UL and the DL messaging expected on the end device, its content must be verified against the declared capabilities of the DUT.

4.18 FSK/EP/NW/SYNC/JOIN/BV/02: Endpoint keeps synchronization with the network by periodic transmission of Join request.

4.18.1 Test Purpose

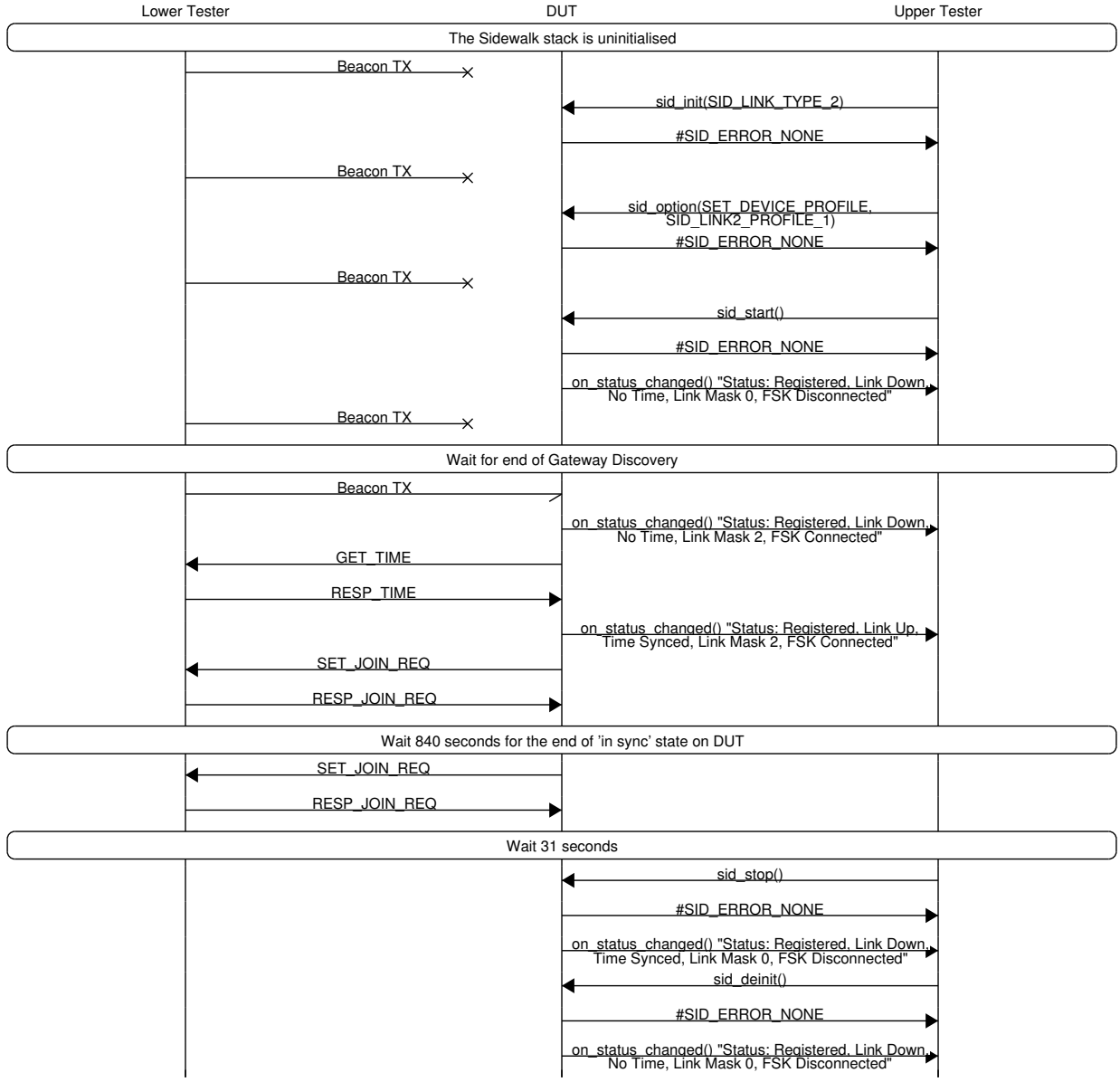
DUT is able to keep synchronization with the network by periodic transmission of Join request.

When the time sync and Join procedure is completed device is automatically synchronized with the network. Then after a period of 840 seconds of uplink inactivity (no data is transmitted), the DUT should send another Join request command to keep link with the network active/alive.

4.18.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile 1 (FSK-WAN ADHOC).
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

4.18.3 Test Procedure



4.18.4 Expected Results

4.18.4.1 Pass Verdict

DUT is able to acquire positive response from the network when Join request is sent during the active synchronization process.

The GET_TIME packet must be the first uplink transmission right after detecting the Beacon and synchronizing with the Lower Tester. The RESP_TIME packet will be sent to DUT within 30 seconds and no re-transmission of the GET_TIME packet should occur during this time.

Also no other uplink transmission is allowed before the DUT receives the RESP_TIME packet which will be reported via Time Status: Synced. Completion of the time synchronization procedure should also change the Link Status to Up.

DUT should send the SET_JOIN_REQ packet right after the time synchronization procedure is complete. The RESP_JOIN_REQ packet should be sent back to DUT within 31 seconds and until then DUT should not repeat the transmission of the next SET_JOIN_REQ commands.

After sending the first RESP_JOIN_REQ, wait 840 seconds after which DUT should send the second SET_JOIN_REQ packet to keep synchronization with the network. No uplink transmission should occur during this period.

After sending the second RESP_JOIN_REQ, wait 31 seconds and verify that DUT has not resent SET_JOIN_REQ. This means that the DUT is able to maintain synchronization with the network by periodic transmission of Join request.

As the initial SET_JOIN_REQ carries requested link characteristics for both uplink and the downlink messaging expected on the end device, its content must be verified against the declared capabilities of the DUT. In the case of the second SET_JOIN_REQ (Join request related to Network Synchronization), the only content that must be verified is the GWID field.

4.19 FSK/EP/SEC/UUID/BV/01: Endpoint rotates UUID immediately after time sync.

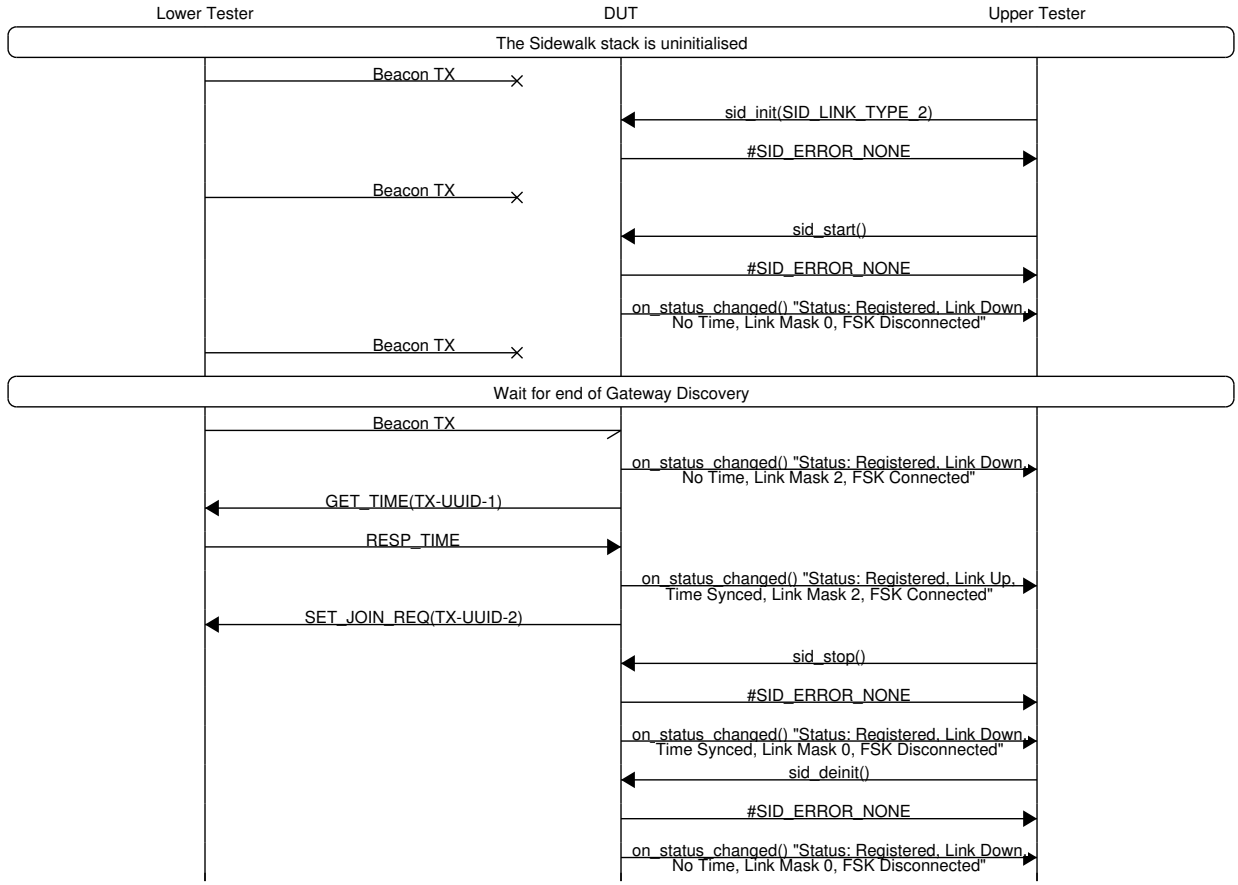
4.19.1 Test Purpose

DUT is able to change the current UUID and use it right after the time synchronization procedure is completed.

4.19.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.

4.19.3 Test Procedure



4.19.4 Expected Results

4.19.4.1 Pass Verdict

UUID of the Endpoint should change right after successful time synchronization procedure, therefore the value of TX-UUID sent as part of the GET_TIME packet should be different from the TX-UUID sent in the SET_JOIN_REQ packet.

As the source device ID information is sent as plain text in the link layer, the above condition can be validated on the Lower Tester side.

4.20 FSK/EP/SEC/UUID/BV/02: UUID rotates every 15 minutes after time sync.

4.20.1 Test Purpose

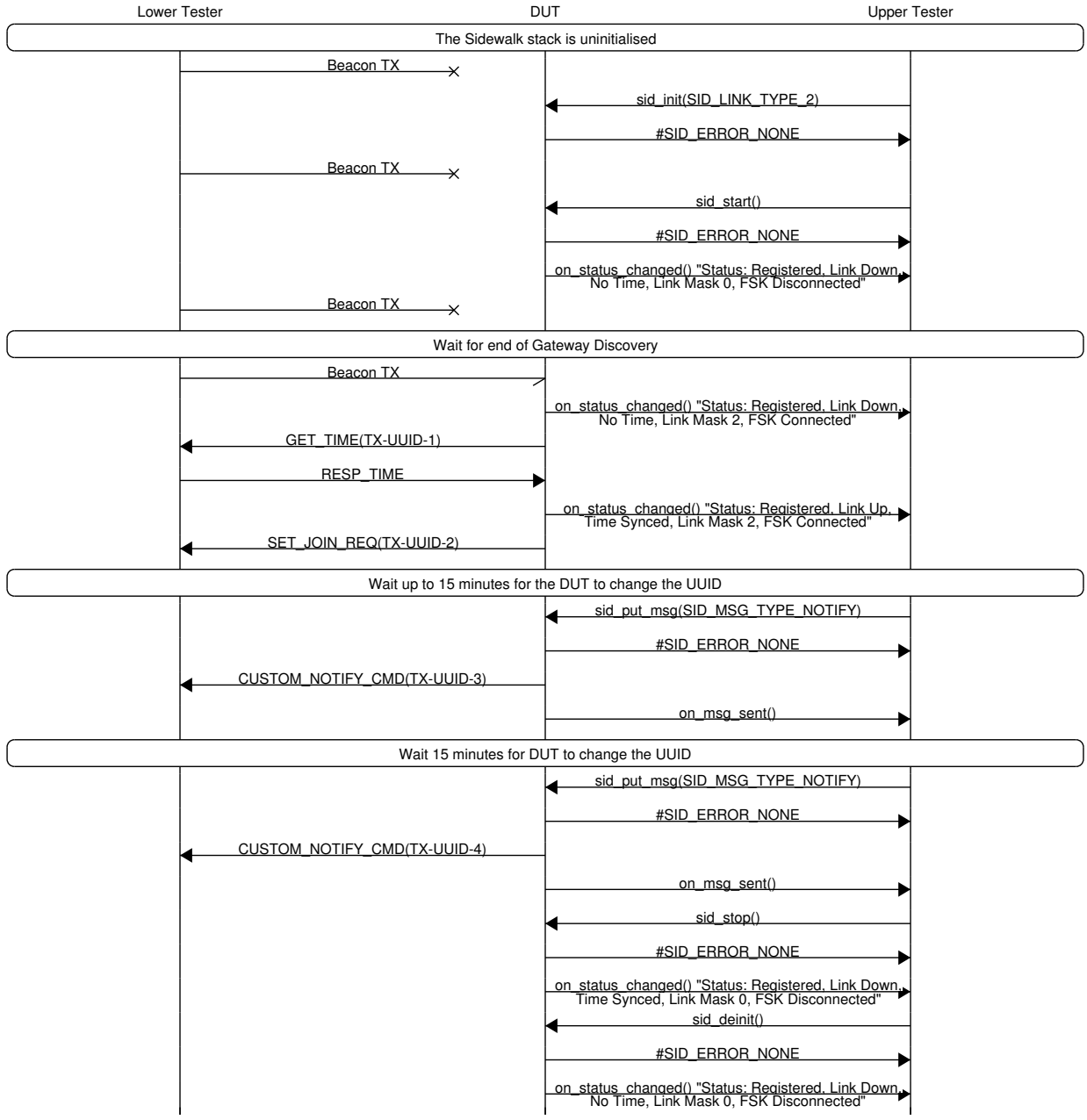
DUT is able to change the UUID every 15 minutes after the time synchronization procedure is completed.

4.20.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.

4.20.3 Test Procedure



4.20.4 Expected Results

4.20.4.1 Pass Verdict

After successful time synchronization procedure, the UUID of the DUT should change every 15 minutes (the first change may occur earlier). Therefore, the TX-UUID value sent as part of the SET_JOIN_REQ packet

should be different from the TX-UUID sent up to 15 minutes later in the CUSTOM_NOTIFY_CMD packet.

The next CUSTOM_NOTIFY_CMD packet sent exactly 15 minutes after the previous UUID change should contain the new UUID.

As the source device ID information is sent as plain text in the link layer, the above condition can be validated on the Lower Tester side.

4.20.4.2 Fail Verdict

A test failure will occur if the DUT re-uses an older TX-UUID at any point during the test.

4.21 FSK/EP/SEC/UUID/BV/03: Endpoint can exchange UL/DL during UUID rotation.

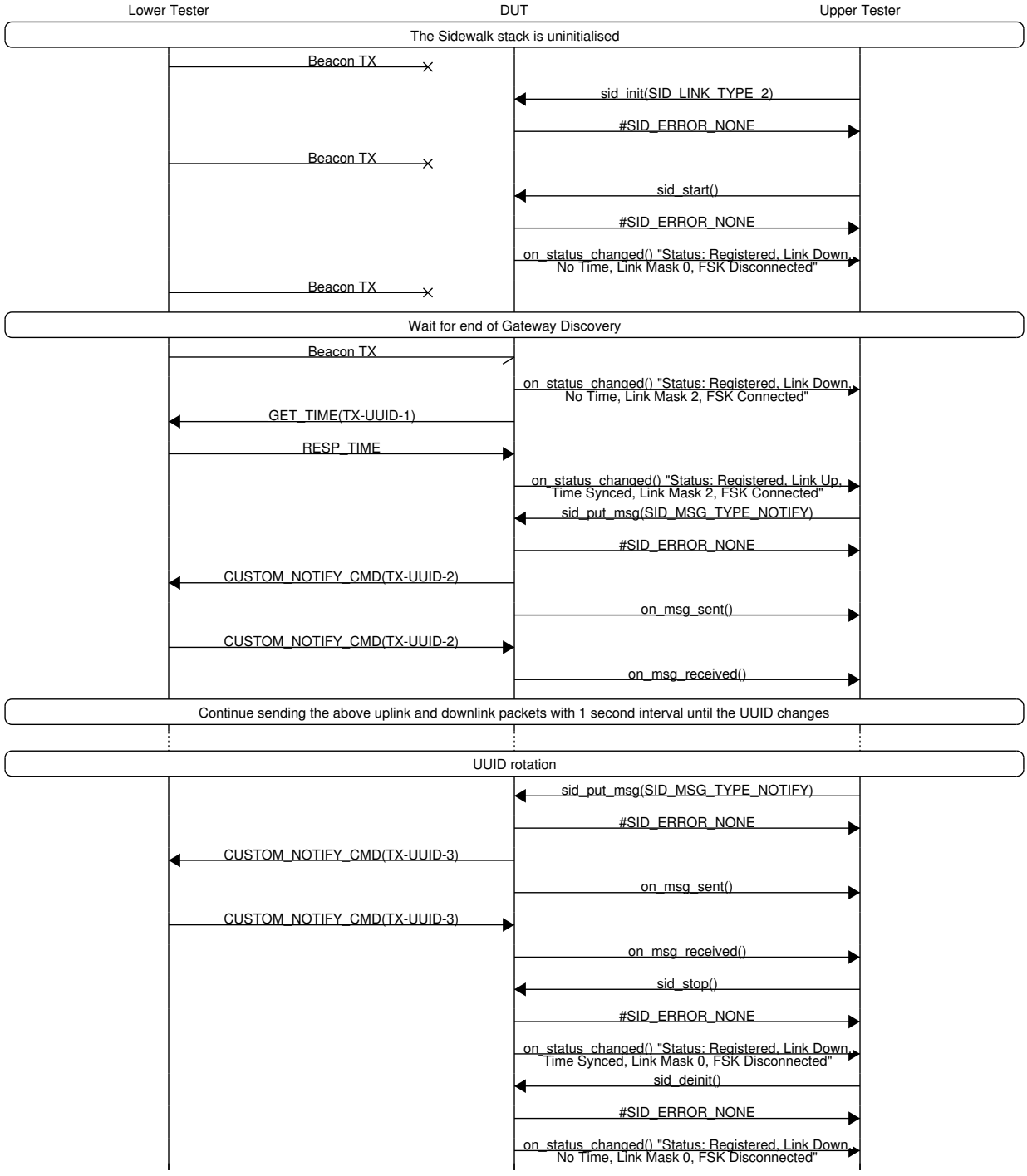
4.21.1 Test Purpose

DUT is able to exchange the uplink and downlink packets during UUID rotation.

4.21.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.

4.21.3 Test Procedure



4.21.4 Expected Results

4.21.4.1 Pass Verdict

After successful time synchronization procedure, the UUID of the DUT should change every 15 minutes. All packets, both uplink and downlink, transmitted around the moment of UUID rotation should be handled

correctly and reach the destination.

Chapter 5

LoRa (900MHz) Test Cases

5.1 LORA/EP/DATA/DL/BV/01: Endpoint receives downlink packets with various sizes of Command data.

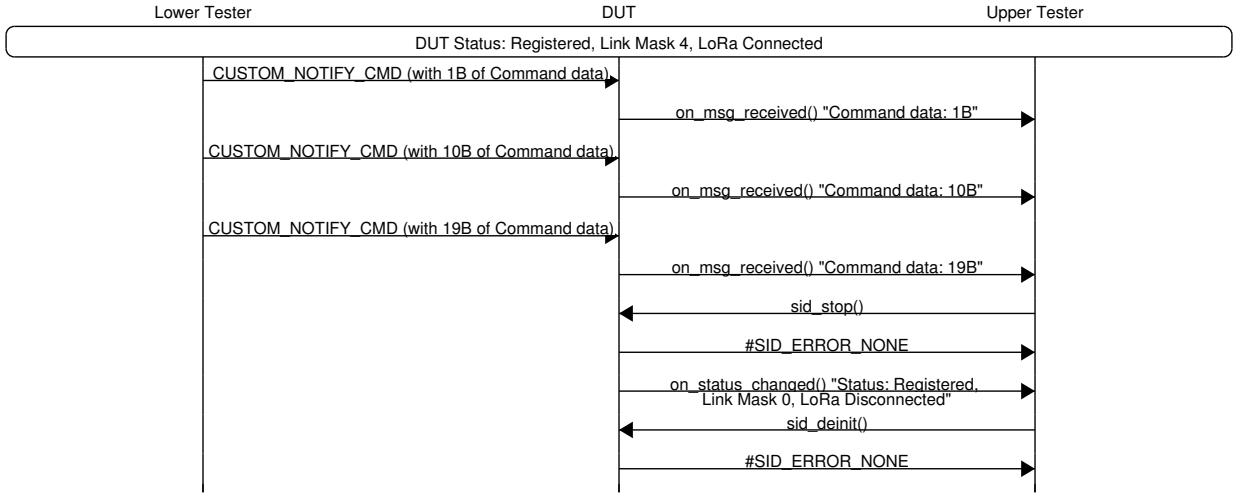
5.1.1 Test Purpose

DUT is able to receive downlink packets with various sizes of Command data (1B, 10B, 19B) sent from the Lower Tester.

5.1.2 Initial Conditions

- DUT is configured as profile B.
- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operate on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

5.1.3 Test Procedure



5.1.4 Expected Results

5.1.4.1 Pass Verdict

Packets with various sizes of Command data sent by Lower Tester are able to reach the DUT.

The Command data content must be verified for correctness on the Upper Tester side.

5.2 LORA/EP/DATA/UL/BV/01: Gateway receives uplink packets with various Command data sizes from Endpoint.

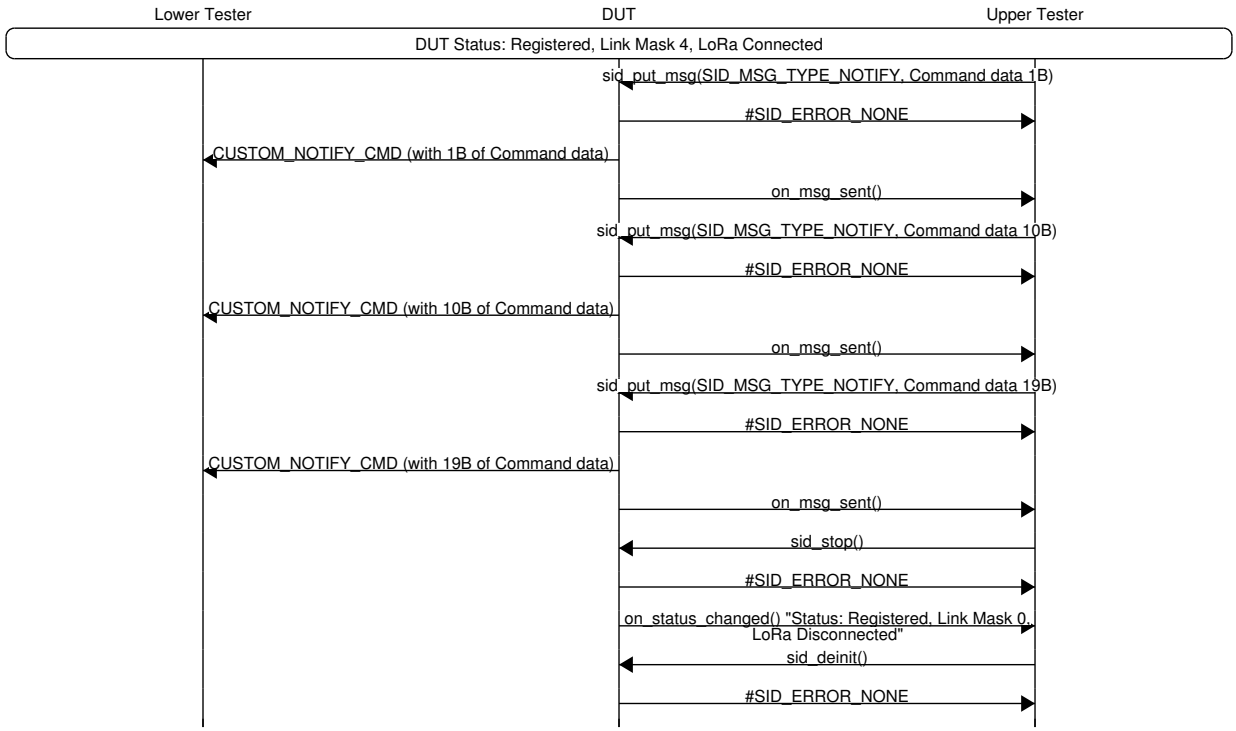
5.2.1 Test Purpose

Lower Tester is able to receive uplink packets with various Command data sizes (1B, 10B, 19B) sent from the DUT.

5.2.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

5.2.3 Test Procedure



5.2.4 Expected Results

5.2.4.1 Pass Verdict

Packets with various sizes of Command data sent by DUT are able to reach the Lower Tester.

The Command data content of each packet must be verified for correctness on the Lower Tester side.

5.3 LORA/EP/SEC/UUID/BV/01: Endpoint rotates UUID immediately after time sync.

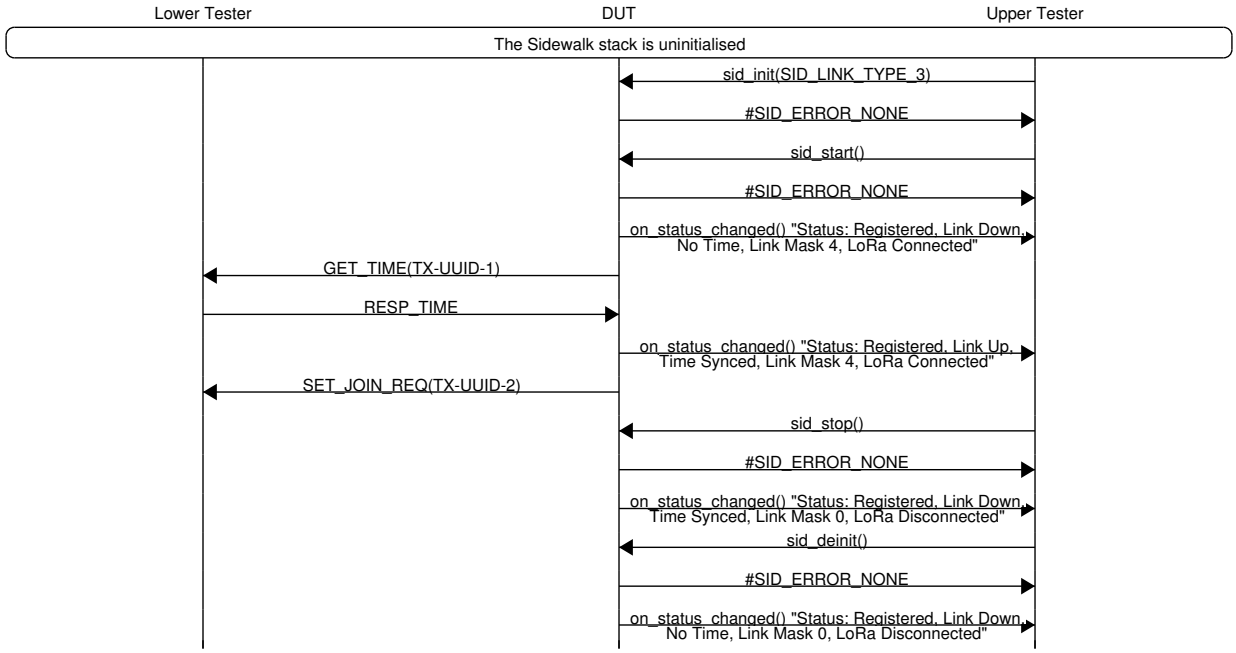
5.3.1 Test Purpose

DUT is able to change the current UUID and use it right after the time synchronization procedure is completed.

5.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

5.3.3 Test Procedure



5.3.4 Expected Results

5.3.4.1 Pass Verdict

UUID of the Endpoint should change right after successful time synchronization procedure, therefore the value of TX-UUID sent as part of the GET_TIME packet should be different from the TX-UUID sent in the SET_JOIN_REQ packet.

As the source device ID information is sent as plain text in the link layer, the above condition can be validated on the Lower Tester side.

5.4 LORA/EP/SEC/UUID/BV/02: UUID rotates every 15 minutes after time sync.

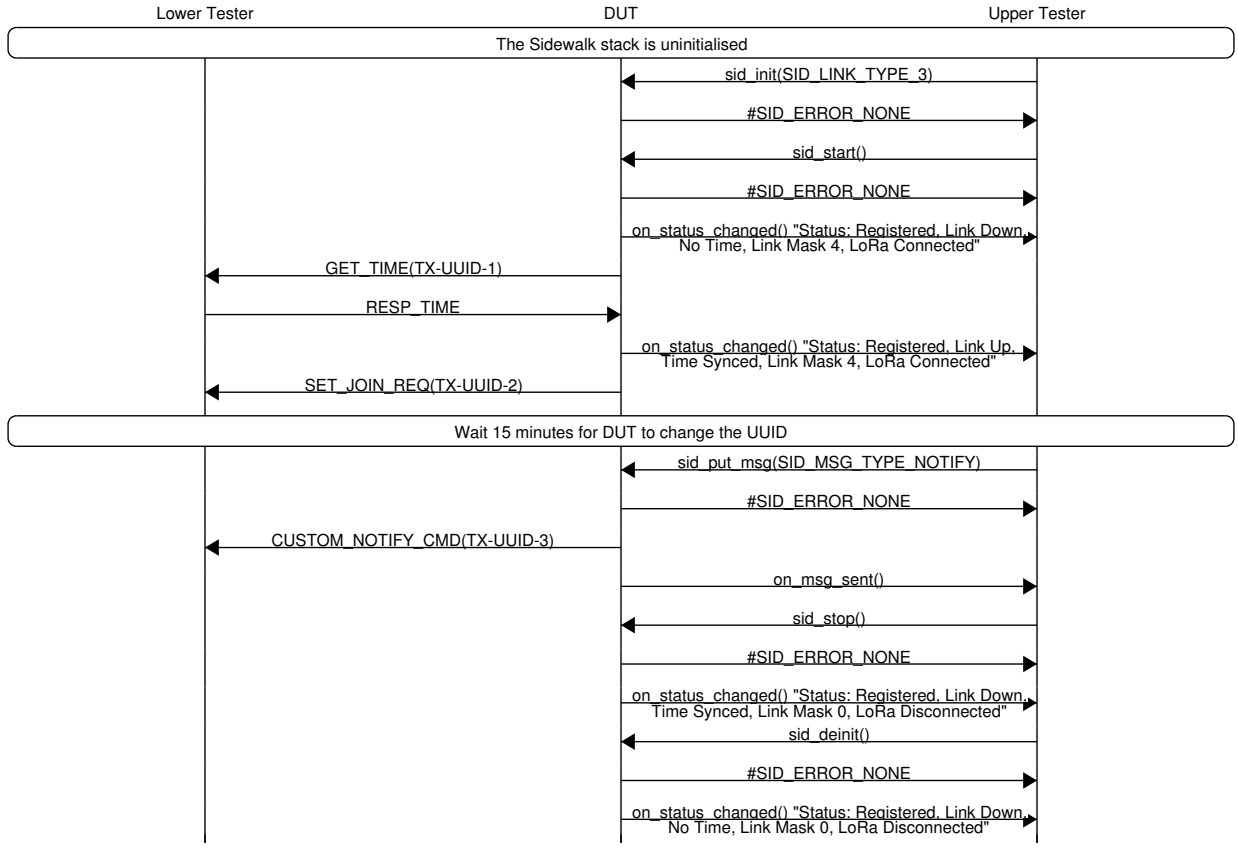
5.4.1 Test Purpose

DUT is able to change the UUID every 15 minutes after the time synchronization procedure is completed.

5.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

5.4.3 Test Procedure



5.4.4 Expected Results

5.4.4.1 Pass Verdict

After successful time synchronization procedure, the UUID of the DUT should change every 15 minutes. Therefore, the TX-UUID value sent as part of the SET_JOIN_REQ packet should be different from the TX-UUID sent 15 minutes later in the CUSTOM_NOTIFY_CMD packet.

As the source device ID information is sent as plain text in the link layer, the above condition can be validated on the Lower Tester side.

5.4.4.2 Fail Verdict

A test failure will occur if the DUT re-uses an older TX-UUID at any point during the test.

5.5 LORA/EP/SEC/UUID/BV/03: Endpoint can exchange UL/DL during UUID rotation.

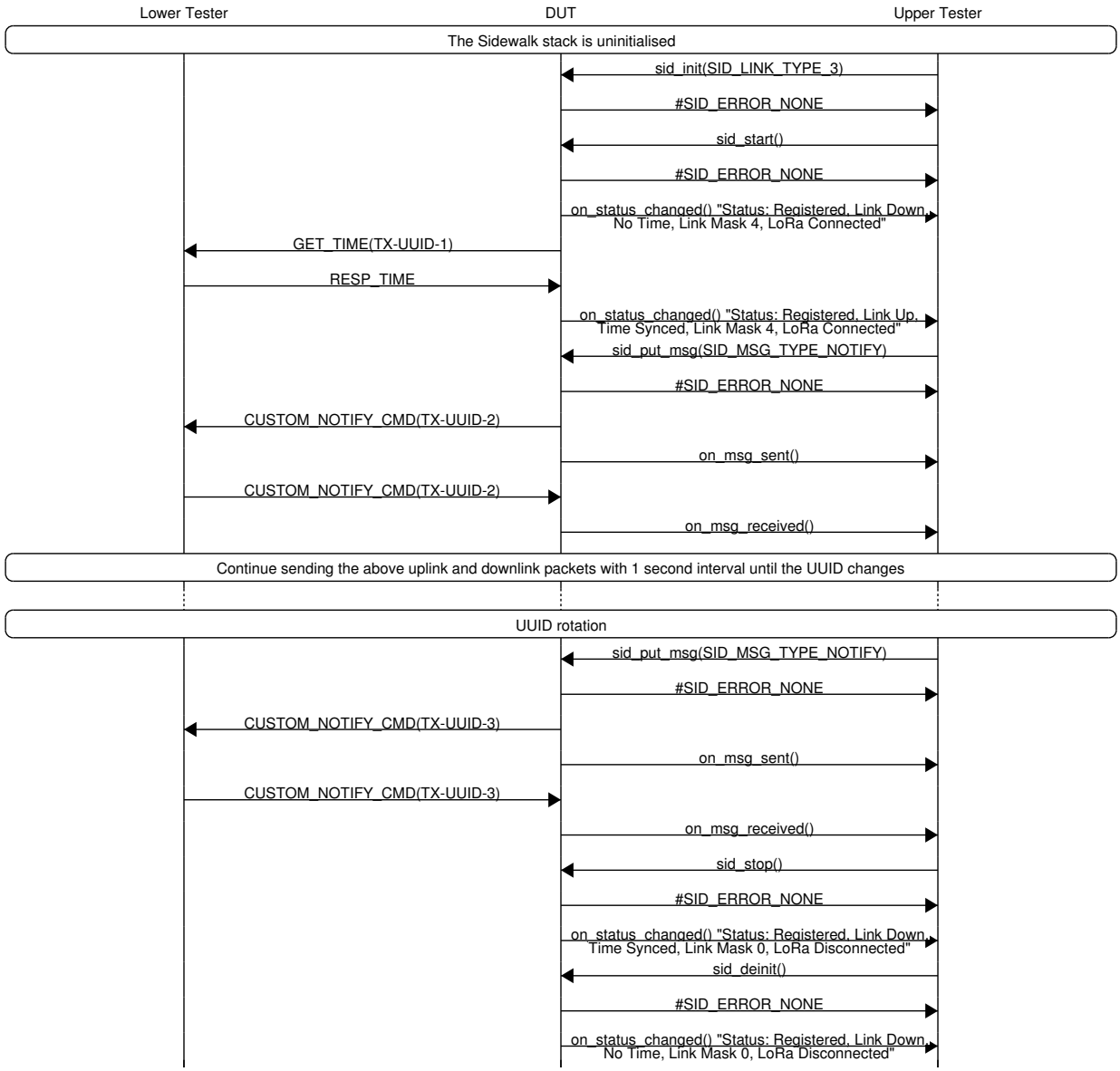
5.5.1 Test Purpose

DUT is able to exchange the uplink and downlink packets during UUID rotation.

5.5.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

5.5.3 Test Procedure



5.5.4 Expected Results

5.5.4.1 Pass Verdict

After successful time synchronization procedure, the UUID of the DUT should change every 15 minutes. All packets, both uplink and downlink, transmitted around the moment of UUID rotation should be handled correctly and reach the destination.

5.6 LORA/EP/CONN/REG/BV/02: Endpoint can be deregistered from Sidewalk network.

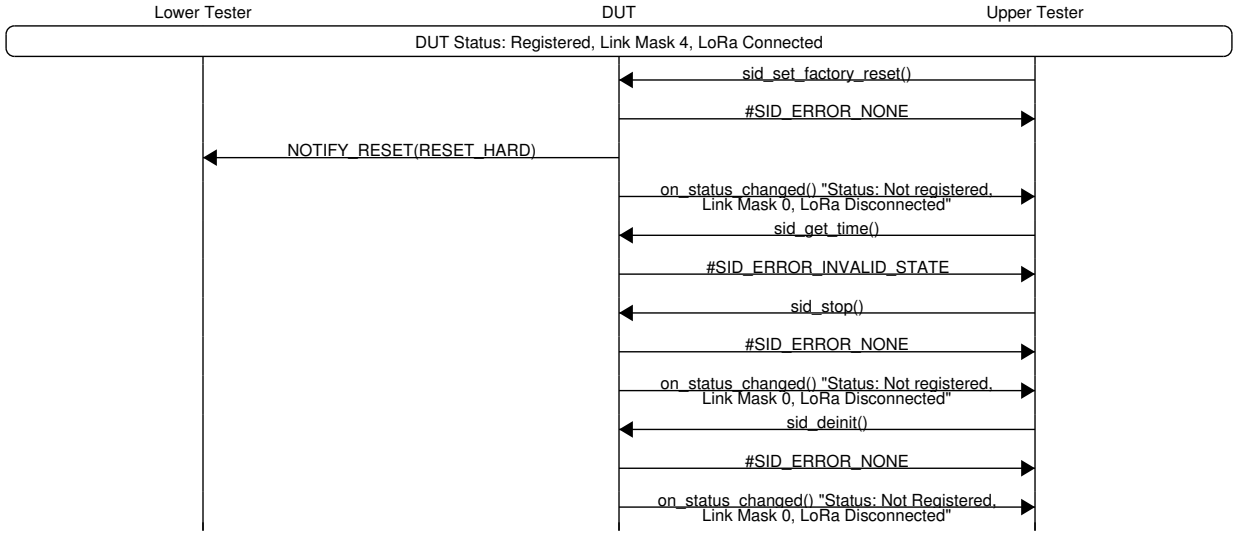
5.6.1 Test Purpose

To verify that the DUT is able to be deregistered from the Amazon Sidewalk network.

5.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.

5.6.3 Test Procedure



5.6.4 Expected Results

5.6.4.1 Pass Verdict

Calling the sid_set_factory_reset method should force the DUT to send the packet NOTIFY_RESET (with RESET_HARD parameter) to the Lower Tester. Then the DUT should report to the Upper Tester the change in registration status to ”Not registered”.

After successful deregistration, the attempt to send the GET_TIME packet should fail with the SID_ERROR_INVALID_STATE returned to the Upper Tester.

5.7 LORA/EP/CONN/LP/BV/01: Endpoint can select Profile A and complete Join procedure.

5.7.1 Test Purpose

DUT is able to set Profile A and complete Join procedure triggered after profile selection. DUT and Lower Tester can exchange data after successful Join procedure.

5.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

- The protocol is enabled on the Lower Tester.

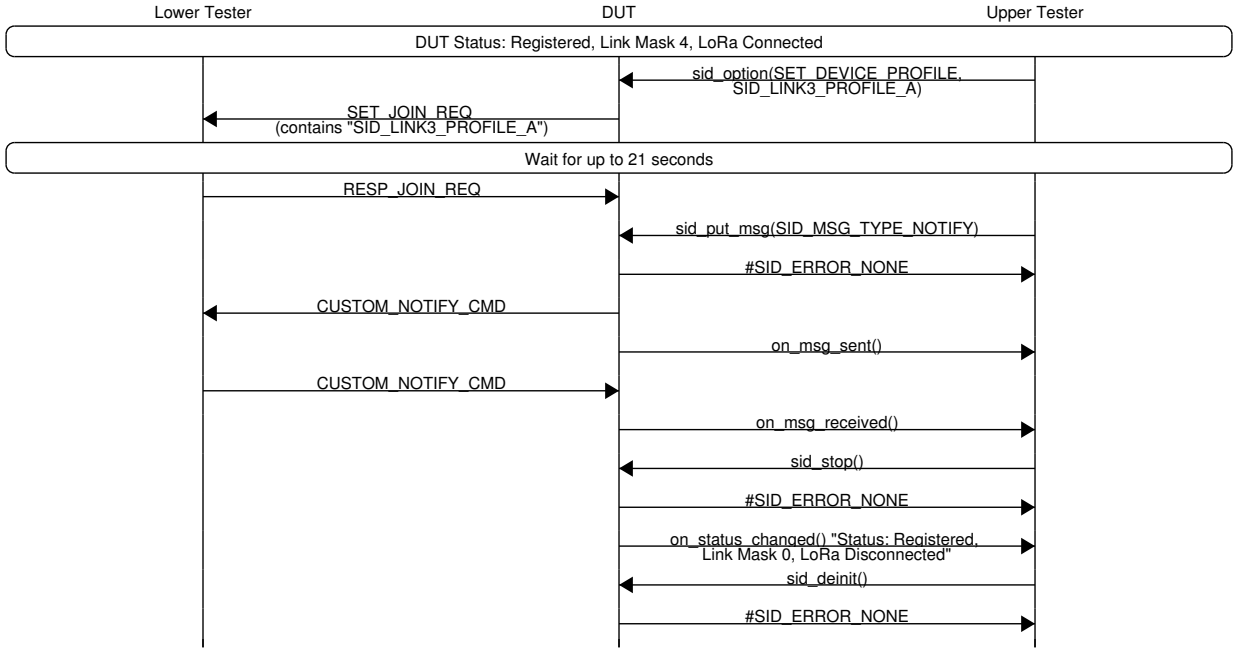
- SidewalkNetworkFlag is enabled on Lower Tester.

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- Both DUT and Lower Tester operate on the same LDR channel.

- DUT has completed the time synchronization.

5.7.3 Test Procedure



5.7.4 Expected Results

5.7.4.1 Pass Verdict

Transmission of ”SET_JOIN_REQ” is triggered after setting the Profile A.

Content of the ”SET_JOIN_REQ” packet must be verified in terms of wether it contains Profile A data.

”RESP_JOIN_REQ” packet must be sent back to DUT (within 21 seconds), confirming that Join procedure finished successfully.

After completing Join procedure DUT and Lower Tester can exchange data (UL and DL packet).

5.8 LORA/EP/CONN/LP/BV/02: Endpoint can select Profile B and complete Join procedure.

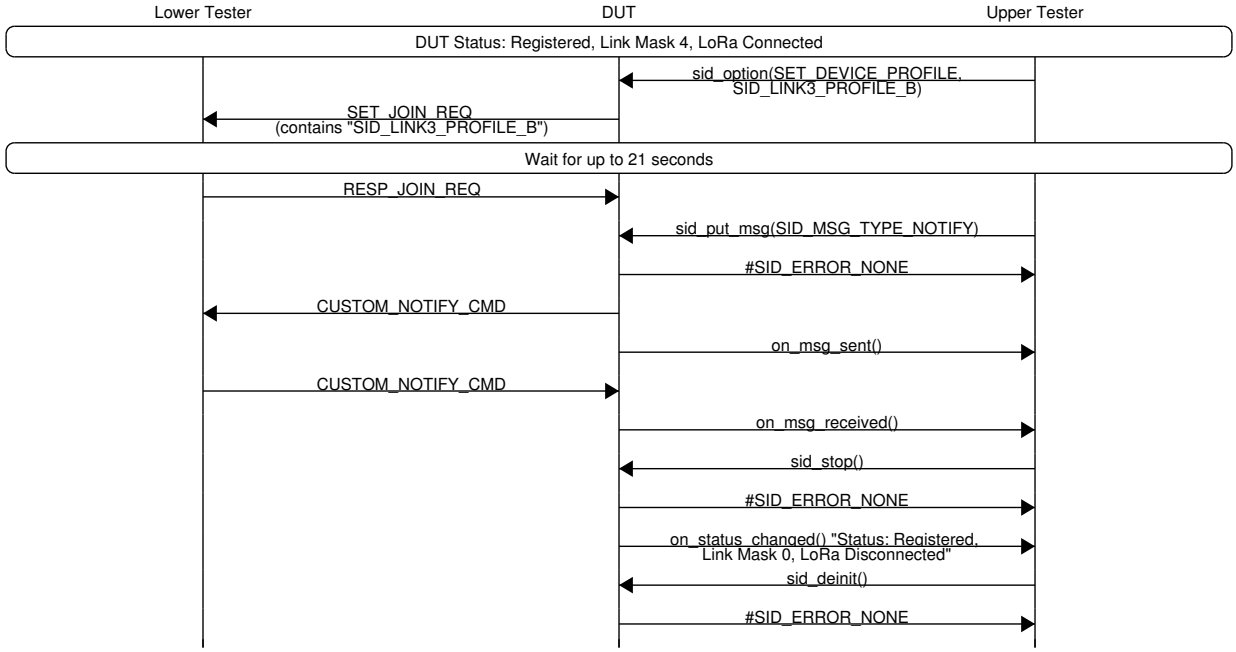
5.8.1 Test Purpose

DUT is able to set Profile B and complete Join procedure triggered after profile selection. DUT and Lower Tester can exchange data after successful Join procedure.

5.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- Both DUT and Lower Tester operate on the same LDR channel.
- DUT has completed the time synchronization.

5.8.3 Test Procedure



5.8.4 Expected Results

5.8.4.1 Pass Verdict

Transmission of "SET_JOIN_REQ" is triggered after setting the Profile B.

Content of the "SET_JOIN_REQ" packet must be verified in terms of wether it contains Profile B data.

"RESP_JOIN_REQ" packet must be sent back to DUT (within 21 seconds), confirming that Join procedure finished successfully.

After completing Join procedure DUT and Lower Tester can exchange data (UL and DL packet).

5.9 LORA/EP/CONN/SEQ/BV/01: Uplink packets contain SEQ number.

5.9.1 Test Purpose

To verify that the uplink packets sent by the DUT contain the sequence number written in the seq_num field in the Link Layer. With each subsequent sent packet, the value of seq_num should be incremented by one.

5.9.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

- Both DUT and Lower Tester operates on the same LDR channel.

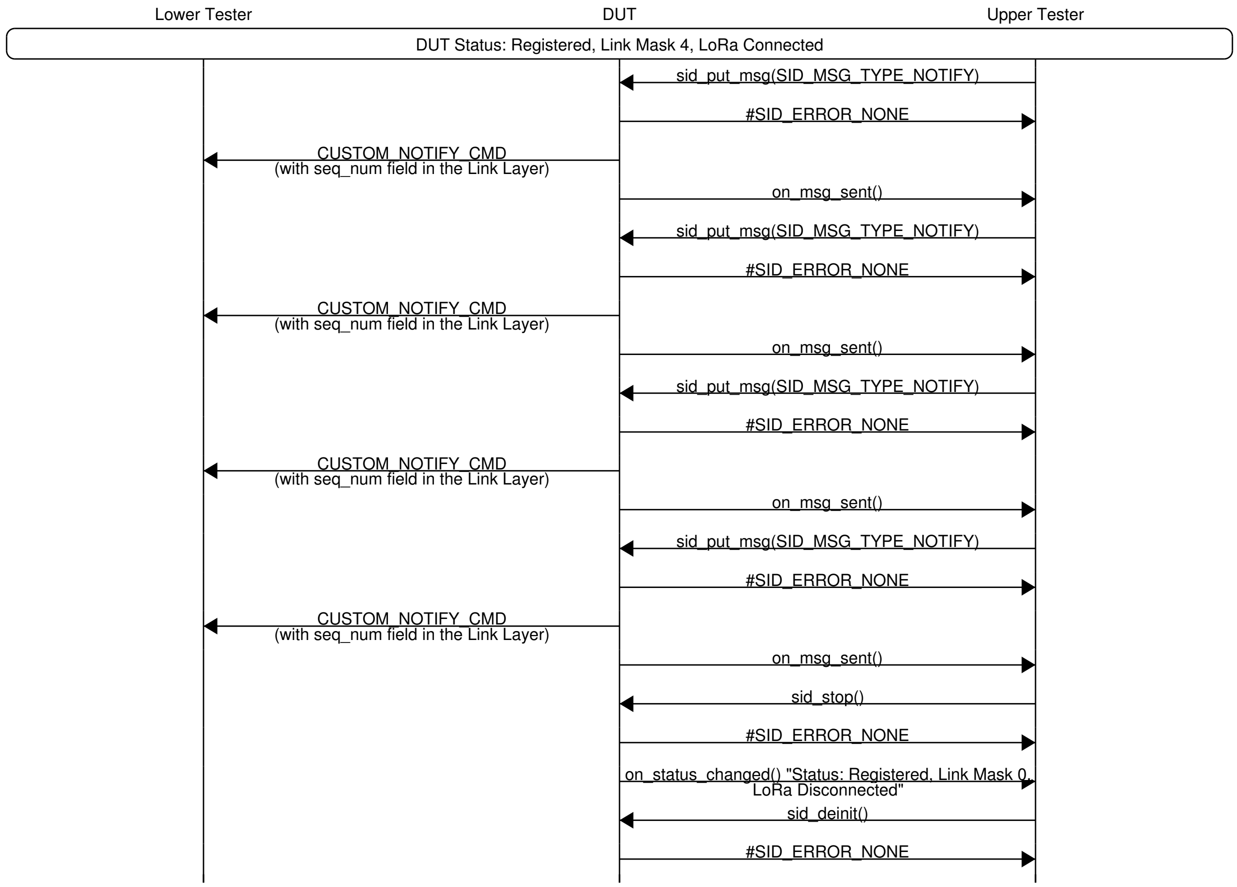
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on Lower Tester.

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

5.9.3 Test Procedure



5.9.4 Expected Results

5.9.4.1 Pass Verdict

The seq_num field is properly filled in the Link Layer of each CUSTOM_NOTIFY_CMD packet sent by DUT. Moreover, seq_num of each CUSTOM_NOTIFY_CMD packet should be incremented by one relative to the seq_num of the previous transmitted packet.

As the packet sequence number is sent as plain text in the Link Layer, the above condition can be validated on the Lower Tester side.

5.10 LORA/EP/CONN/SEQ/BV/02: Endpoint increments uplink SEQ number until UUID changes.

5.10.1 Test Purpose

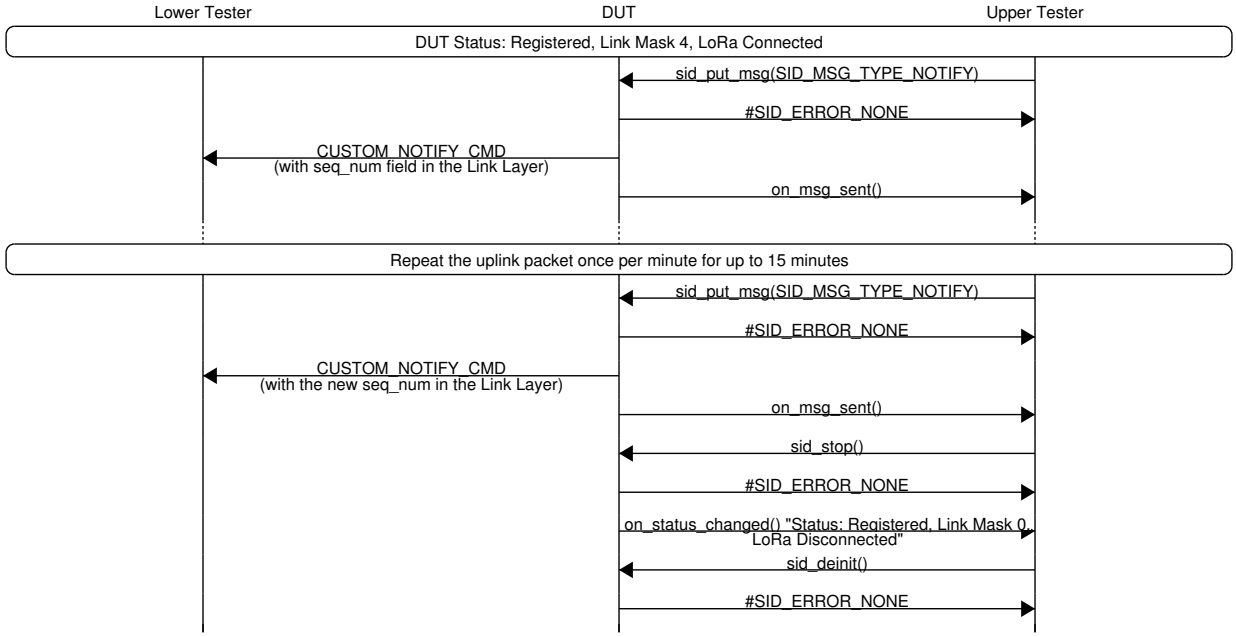
To verify that the DUT increments the uplink packet sequence number until the UUID is changed. After the UUID is changed, the DUT should generate a new sequence number in the range between 0 and 16383.

5.10.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

5.10.3 Test Procedure



5.10.4 Expected Results

5.10.4.1 Pass Verdict

The seq_num field should be properly incremented by one for each subsequent packet sent by DUT within a maximum of 15 minutes from the previous UUID change, then a new sequence number should be generated in the range between 0 and 16383.

As the packet sequence number is sent as plain text in the Link Layer, all CUSTOM_NOTIFY_CMD packets can be verified for seq_num field content on the Lower Tester side.

5.11 LORA/EP/CONN/SEQ/BV/03: Endpoint accepts and decodes downlink packets with increased and decreased SEQ.

5.11.1 Test Purpose

To verify that the downlink packets with both increasing and decreasing sequance number can be decoded by the DUT.

5.11.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

- Both DUT and Lower Tester operates on the same LDR channel.

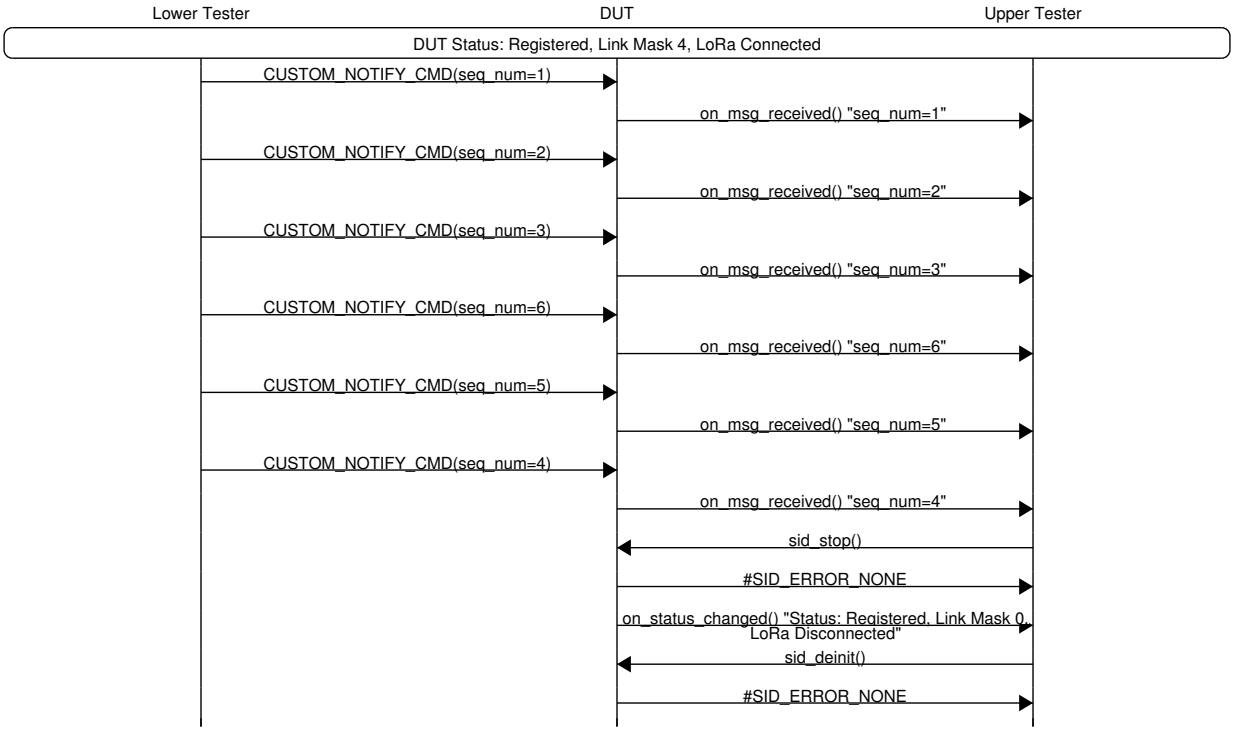
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on Lower Tester.

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

5.11.3 Test Procedure



5.11.4 Expected Results

5.11.4.1 Pass Verdict

The first three CUSTOM_NOTIFY_CMD packets sent by Lower Tester to the DUT contain an increasing sequence number ranging from 1 to 3. The next three CUSTOM_NOTIFY_CMD packets contain a decreasing sequence number ranging from 6 to 4. All sent packets should be accepted and properly decoded by the DUT which should manifested by reporting all six events to the Upper Tester.

5.12 LORA/EP/CONN/SEQ/BV/05: Endpoint rejects downlink packet with duplicated SEQ.

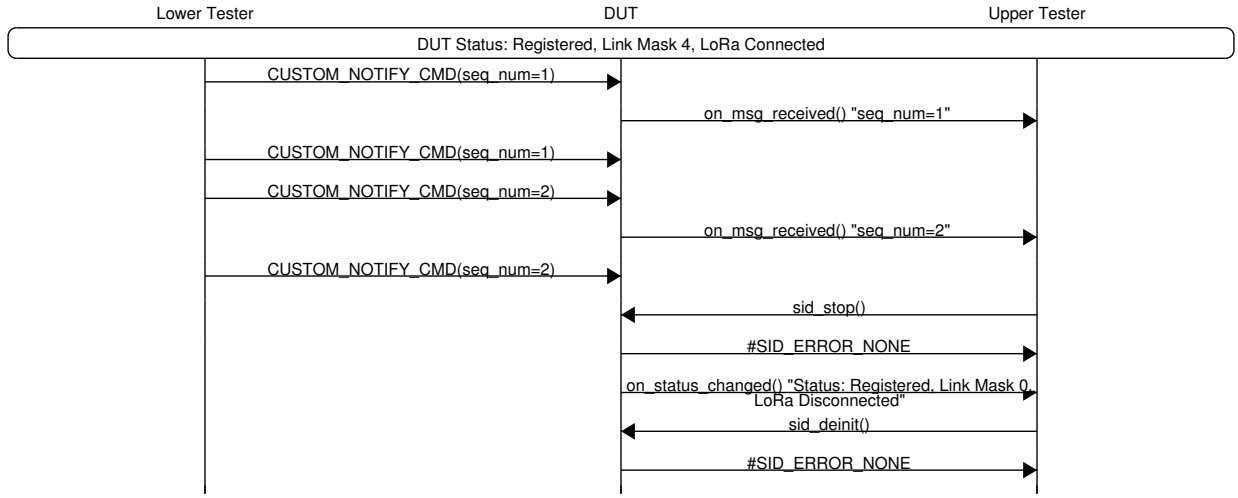
5.12.1 Test Purpose

To verify that a downlink packet which contains a duplicated sequence number is rejected by the DUT.

5.12.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

5.12.3 Test Procedure



5.12.4 Expected Results

5.12.4.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet sent by the Lower Tester containing sequence number equal to 1 should be decoded correctly and information about this event should be visible on the Upper Tester side. However, another CUSTOM_NOTIFY_CMD packet sent by the Lower Tester also containing the same sequence number should be rejected by the DUT.

The third CUSTOM_NOTIFY_CMD packet containing parameter seq_num increased by one should be decoded correctly and information about this event should again be visible on the Upper Tester side. The fourth CUSTOM_NOTIFY_CMD packet with a duplicated seq_num equal to 2 should be rejected by the DUT.

In the case of duplicate packets, information about this event should not be visible on the Upper Tester side.

5.13 LORA/EP/CONN/SEQ/BV/06: Endpoint rejects downlink packet with duplicated SEQ range.

5.13.1 Test Purpose

To verify that a group of five downlink packets which contain a duplicate sequence number are rejected by the DUT.

5.13.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

- Both DUT and Lower Tester operates on the same LDR channel.

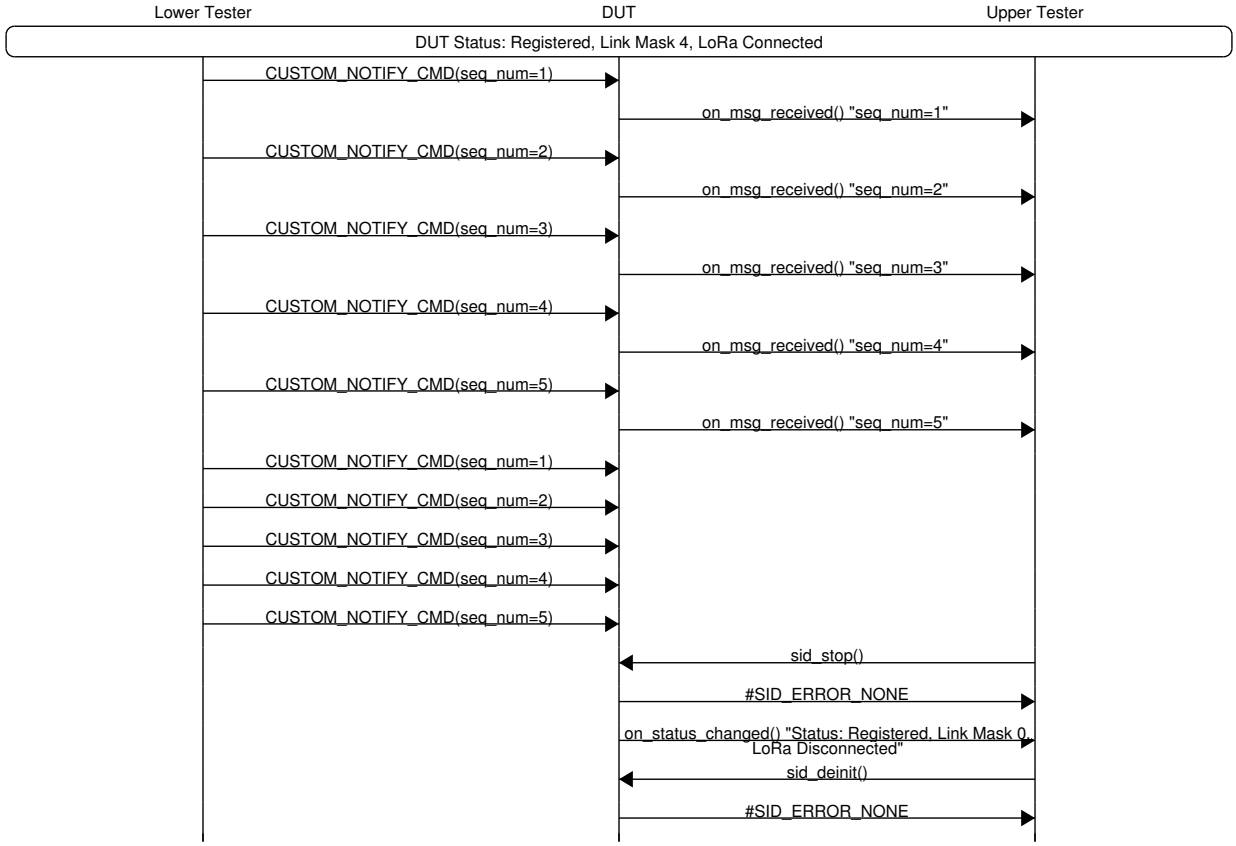
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on Lower Tester.

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

5.13.3 Test Procedure



5.13.4 Expected Results

5.13.4.1 Pass Verdict

The first five CUSTOM_NOTIFY_CMD packets with sequence numbers increasing sequentially from 1 to 5 should be sent from the Lower Tester and correctly decoded on the DUT side. Receipt of all five of these packets should be reported on the Upper Tester side.

After re-sending from the Lower Tester the same packets containing sequence numbers from 1 to 5, all of them should be rejected by the DUT. Information on these five events should not be visible on the Upper Tester side.

5.14 LORA/EP/CONN/SEQ/BV/07: SEQ number can be accepted again after getting 10 other messages.

5.14.1 Test Purpose

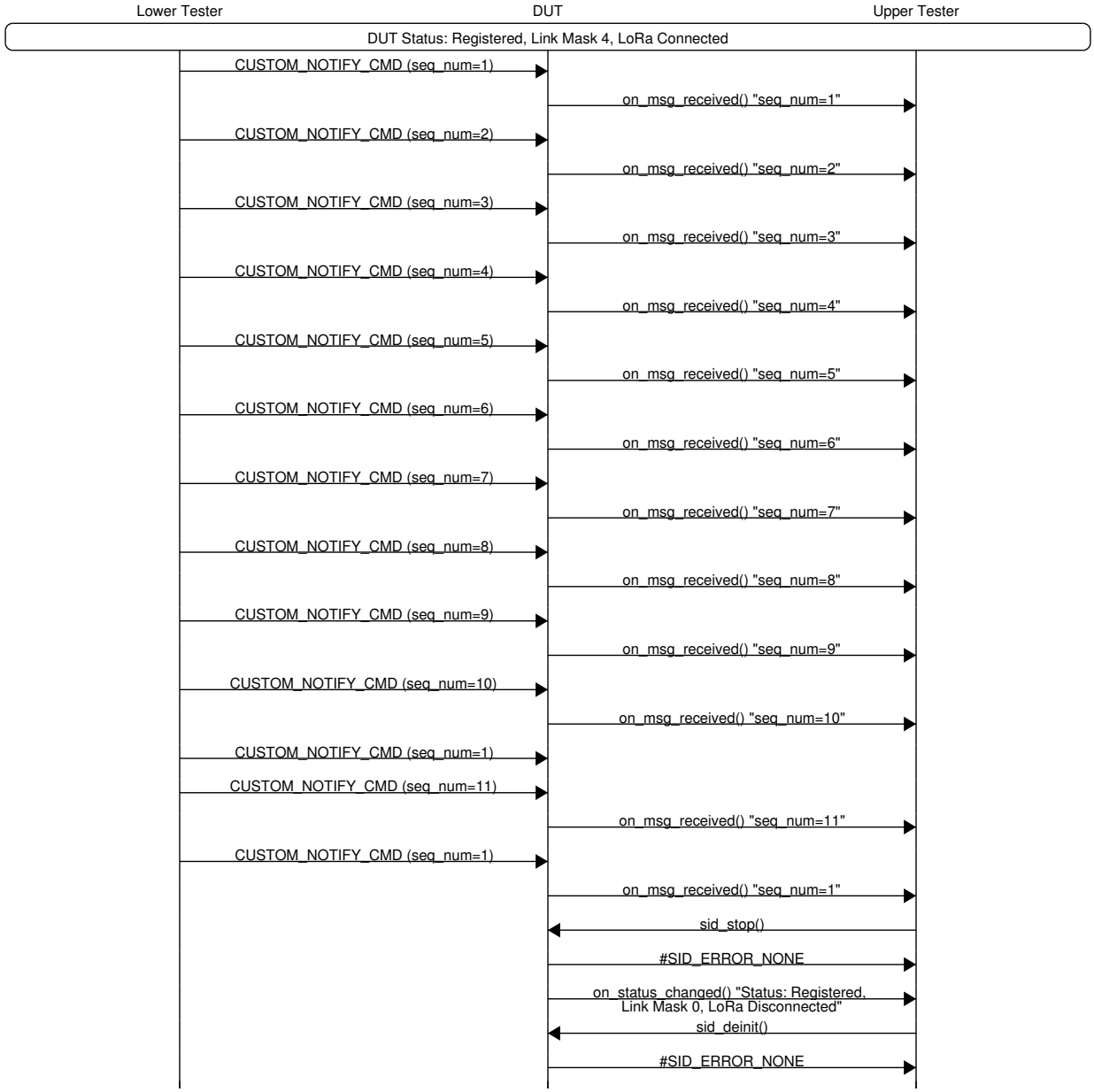
DUT is able to receive downlink packet with already used SEQ number, after receiving at least 10 additional packets with different, unique SEQ number.

5.14.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operate on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

5.14.3 Test Procedure



5.14.4 Expected Results

5.14.4.1 Pass Verdict

First, eleventh and thirteenth CUSTOM_NOTIFY_CMD packet contain the same SEQ number.

All the other CUSTOM_NOTIFY_CMD packets contain different, unique SEQ number.

Due to the fact that 10 additional packets have to be received by DUT before SEQ number can be reused: Eleventh CUSTOM_NOTIFY_CMD packet should be rejected by DUT (after 9 additional packets received). Thirteenth CUSTOM_NOTIFY_CMD packet should be received and decoded properly by DUT (after 10 additional packets received).

5.15 LORA/EP/CONN/SEQ/BV/08: SEQ number can be accepted again after Sidewalk stack reinitialization.

5.15.1 Test Purpose

DUT is able to receive downlink packet with already used SEQ number, after reinitialization of Sidewalk stack.

5.15.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.

- Lower Tester operates in the default mixed (MULTI_RATE) mode.

- Both DUT and Lower Tester operate on the same LDR channel.

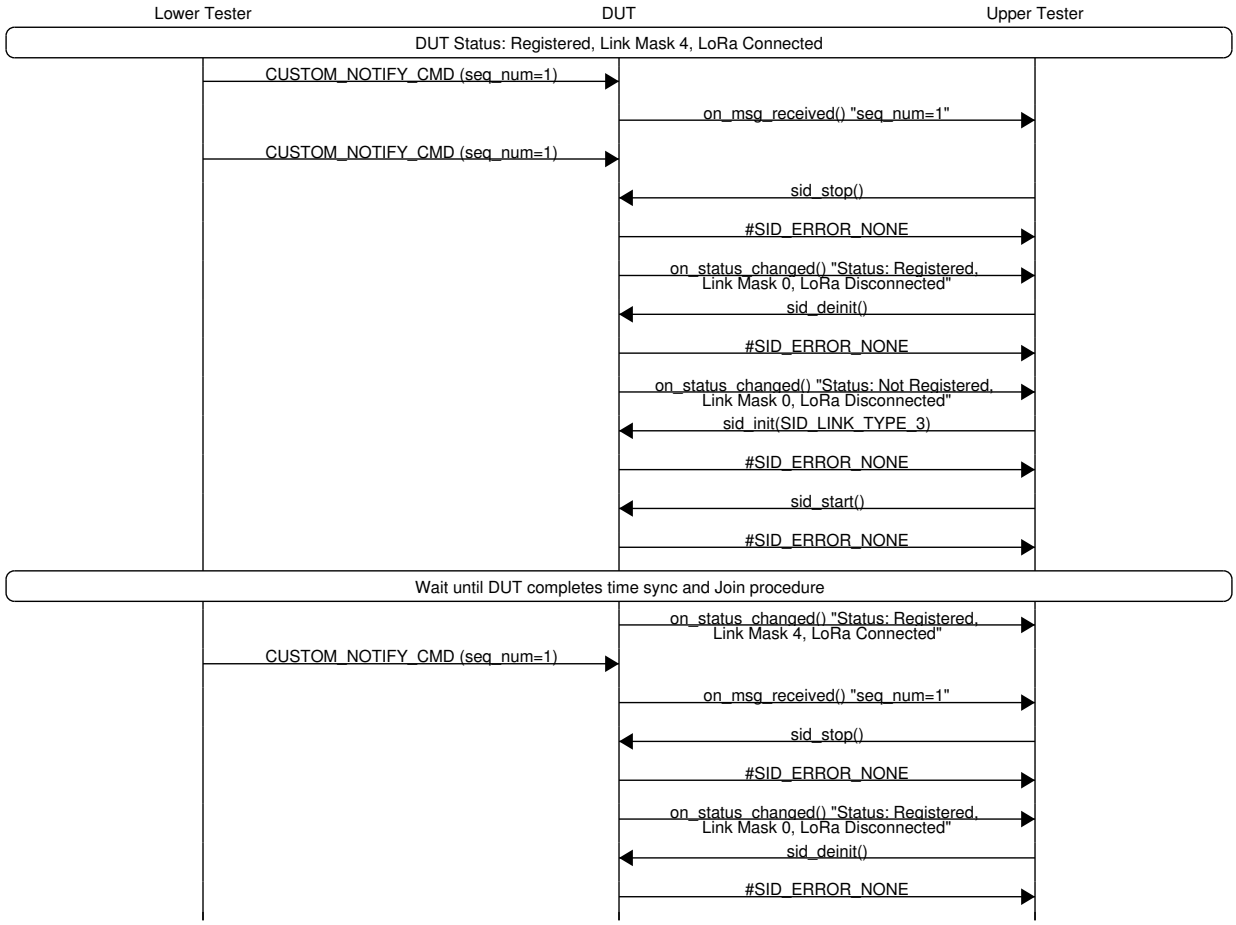
- The protocol is enabled on the Lower Tester.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization and the Join procedure.

5.15.3 Test Procedure



5.15.4 Expected Results

5.15.4.1 Pass Verdict

First and third CUSTOM_NOTIFY_CMD packets should be received and decoded properly by DUT, despite having the same SEQ number.

Since there was no stack reinitialization before second CUSTOM_NOTIFY_CMD packet, it should be rejected by DUT because of repeating SEQ number.

5.16 LORA/EP/CONN/SEQ/BV/09: Endpoint drops the packet with SEQ which is out of range.

5.16.1 Test Purpose

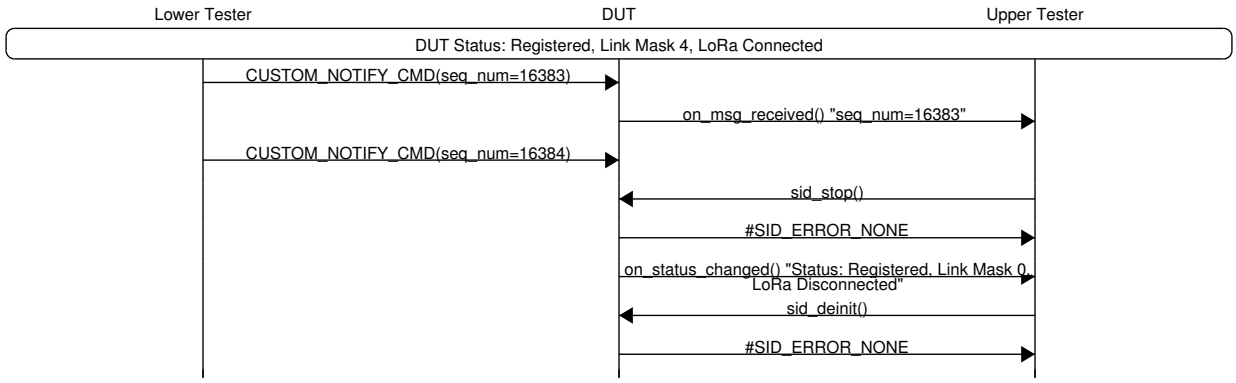
To verify that a downlink packet which contains an out of range sequence number is dropped by the DUT.

5.16.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.
- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization and the Join procedure.

5.16.3 Test Procedure



5.16.4 Expected Results

5.16.4.1 Pass Verdict

The first CUSTOM_NOTIFY_CMD packet sent by the Lower Tester containing the maximum allowed sequence number (16383) should be decoded correctly and information about this event should be visible on the Upper Tester side.

The second CUSTOM_NOTIFY_CMD packet sent by the Lower Tester should be dropped by the DUT due to the seq_num parameter being exceeded and therefore this event should not be reported to the Upper Tester.

5.17 LORA/EP/NW/SYNC/JOIN/BV/02: Endpoint keeps synchronization with the network by periodic transmission of Join request.

5.17.1 Test Purpose

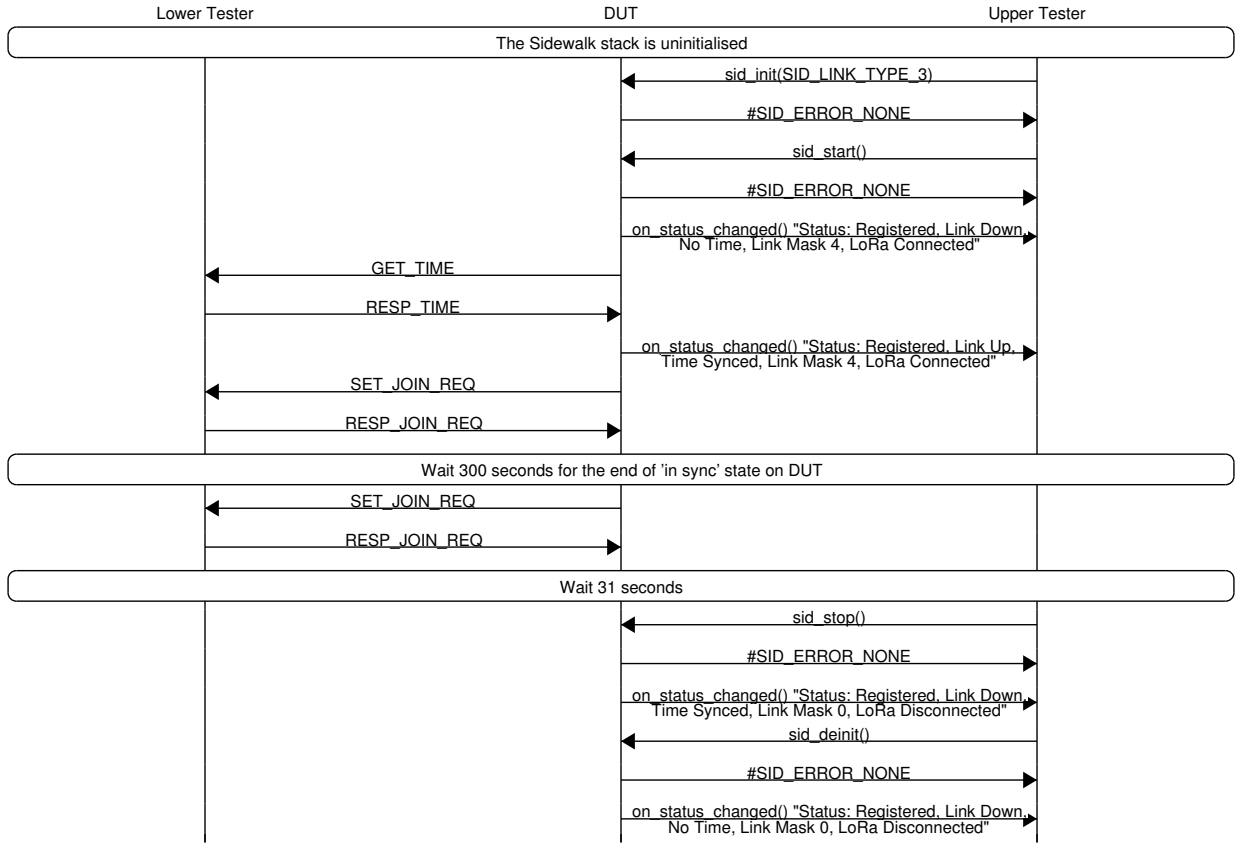
DUT is able to keep synchronization with the network by periodic transmission of Join request.

When the time sync and Join procedure is completed device is automatically synchronized with the network. Then after a period of 300 seconds of uplink inactivity (no data is transmitted), the DUT should send another Join request command to keep link with the network active/alive.

5.17.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

5.17.3 Test Procedure



5.17.4 Expected Results

5.17.4.1 Pass Verdict

DUT is able to acquire positive response from the network when Join request is sent during the active synchronization process.

The GET_TIME packet must be the first uplink transmission right after initializing the Sidewalk stack with LoRa modulation. The RESP_TIME packet will be sent to DUT within 30 seconds and no re-transmission of the GET_TIME packet should occur during this time.

Also no other uplink transmission is allowed before the DUT receives the RESP_TIME packet which will be reported via Time Status: Synced. Completion of the time synchronization procedure should also change the Link Status to Up.

DUT should send the SET_JOIN_REQ packet right after the time synchronization procedure is complete. The RESP_JOIN_REQ packet should be sent back to DUT within 20 seconds and until then DUT should not repeat the transmission of the next SET_JOIN_REQ commands.

After sending the first RESP_JOIN_REQ, wait 300 seconds after which DUT should send the second SET_JOIN_REQ packet to keep synchronization with the network. No uplink transmission should occur during this period.

After sending the second RESP_JOIN_REQ, wait 20 seconds and verify that DUT has not resent SET_JOIN_REQ. This means that the DUT is able to maintain synchronization with the network by periodic transmission of Join request.

As the SET_JOIN_REQ carries requested async profile attributes, its content must be verified against the declared capabilities of the DUT.

5.18 LORA/EP/NW/SYNC/JOIN/BV/03: Endpoint keeps synchronization with the network by embedded sync request.

5.18.1 Test Purpose

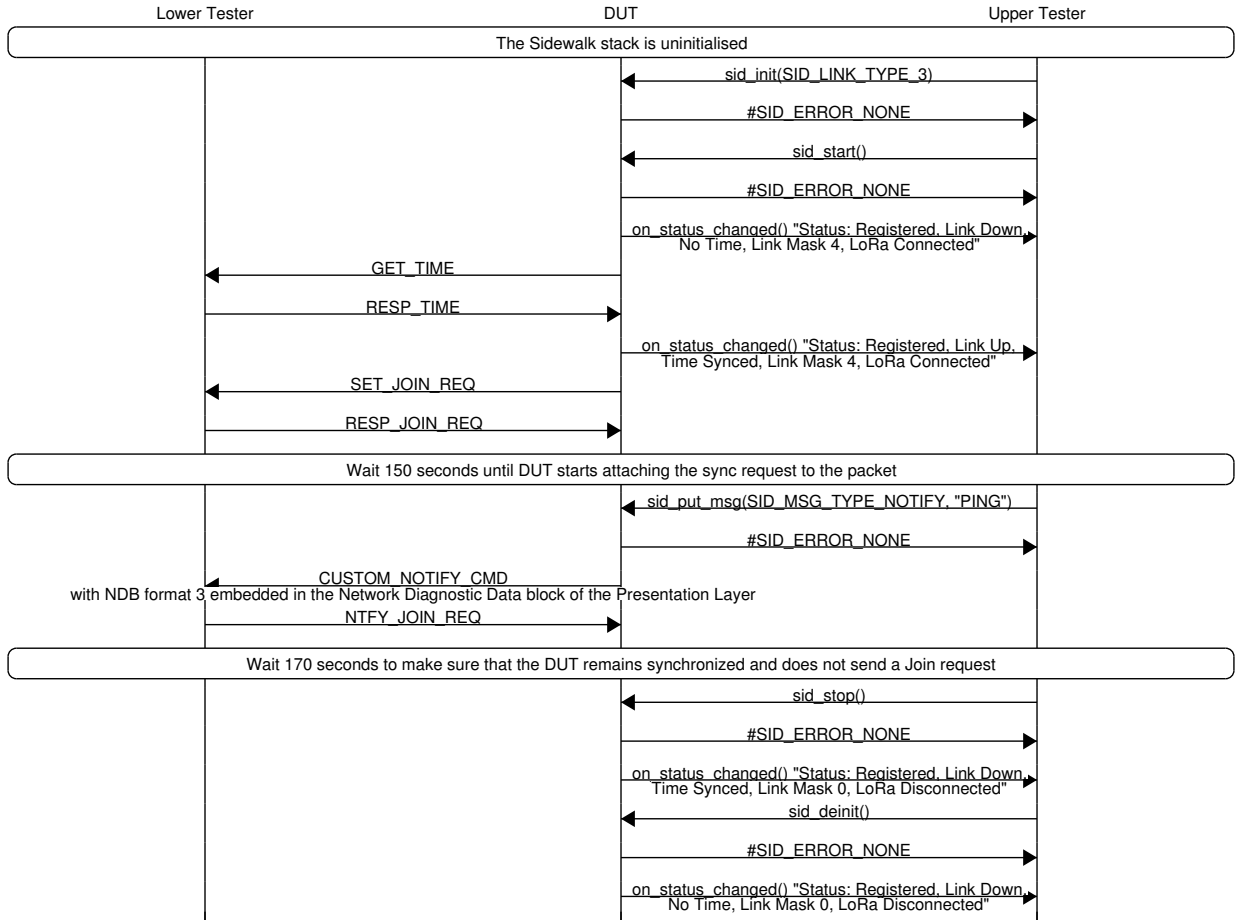
DUT is able to keep synchronization with the network with the use of embedded sync request.

When the time sync and Join procedure is completed device is automatically synchronized with the network. However, 150 seconds after a successful synchronization, the DUT should start attaching a sync request to each uplink packet in order to maintain the synchronization without the need to send a separate Join request, which reduces signalling.

5.18.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- DUT is configured as Profile B.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- Both DUT and Lower Tester operates on the same LDR channel.
- The protocol is enabled on the Lower Tester.
- SidewalkNetworkFlag is enabled on Lower Tester.

5.18.3 Test Procedure



5.18.4 Expected Results

5.18.4.1 Pass Verdict

DUT is able to acquire Join notify from the network when synchronization request is embedded in uplink data.

The GET_TIME packet must be the first uplink transmission right after initializing the Sidewalk stack with LoRa modulation. The RESP_TIME packet will be sent to DUT within 30 seconds and no re-transmission of the GET_TIME packet should occur during this time.

Also no other uplink transmission is allowed before the DUT receives the RESP_TIME packet which will be reported via Time Status: Synced. Completion of the time synchronization procedure should also change the Link Status to Up.

DUT should send the SET_JOIN_REQ packet right after the time synchronization procedure is complete. The RESP_JOIN_REQ packet should be sent back to DUT within 20 seconds and until then DUT should not repeat the transmission of the next SET_JOIN_REQ commands.

After sending the RESP_JOIN_REQ, wait 150 seconds, then the Upper Tester must trigger sending uplink data on the DUT (CUSTOM_NOTIFY_CMD with ”PING” as the Command data). As a result, the mentioned packet will be sent to the network. The uplink data must include TLV key 0x01 synchronization request in Network Data Blob format 3 and it must be verified on the Lower Tester side. The NTFY_JOIN_REQ packet should be sent back to DUT within 25 seconds.

After sending the NTFY_JOIN_REQ, wait another 170 seconds and verify that DUT does not send SET_JOIN_REQ during this period. This means that the DUT is able to maintain synchronization with the network by embedded sync request during transmission of regular data.

As the SET_JOIN_REQ carries requested async profile attributes, its content must be verified against the declared capabilities of the DUT.

5.19 LORA/EP/NW/SYNC/TIME/BV/01: Endpoint completes the initial time sync procedure.

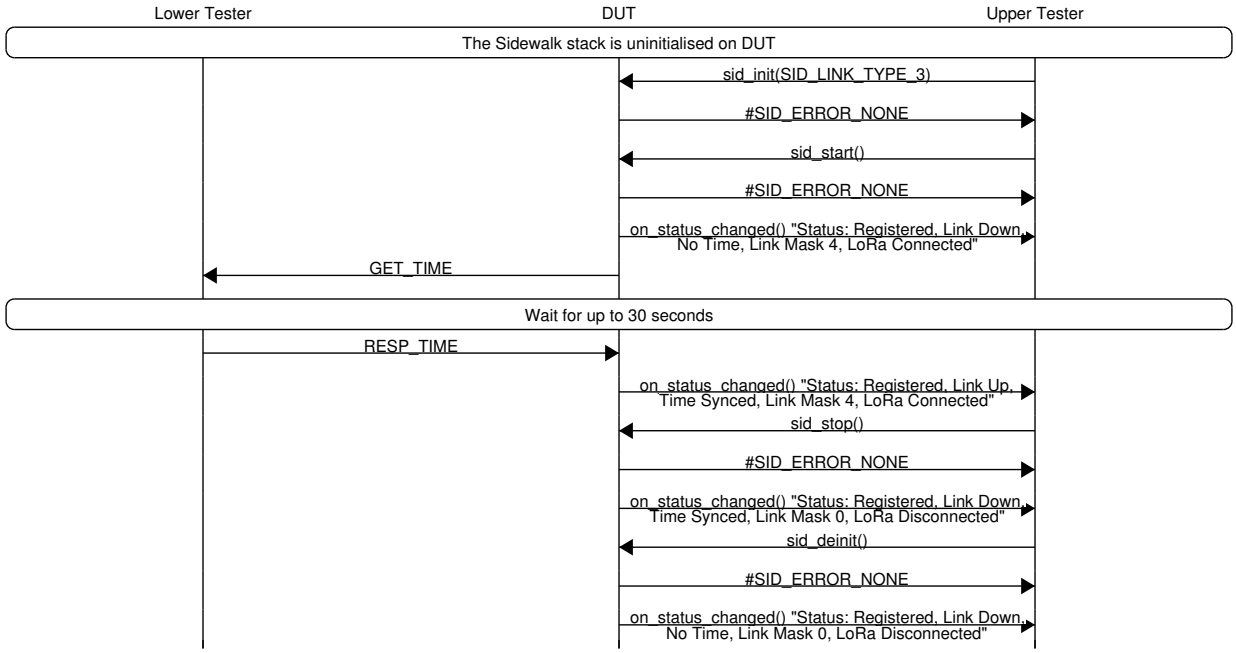
5.19.1 Test Purpose

DUT is able to pass the initial time synchronization procedure.

5.19.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in the default mixed (MULTI_RATE) mode.
- The protocol is enabled on the Lower Tester.
- Both DUT and Lower Tester operate on the same LDR channel.
- SidewalkNetworkFlag is enabled on Lower Tester.

5.19.3 Test Procedure



5.19.4 Expected Results

5.19.4.1 Pass Verdict

DUT is able to acquire time from the network.

The RESP_TIME packet will be sent to DUT within 30 seconds and no re-transmission of the GET_TIME packet should occur during this time.

No other UL transmission should take place until the DUT receives a correct RESP_TIME packet which will be reported via Time Status: Synced.

Completion of the time synchronization procedure should also change the Link Status to Up.

Chapter 6

Multi-radio Test Cases

6.1 MULTI/EP/API/INIT/BV/01: Switch between 900MHz and BLE stack multiple times.

6.1.1 Test Purpose

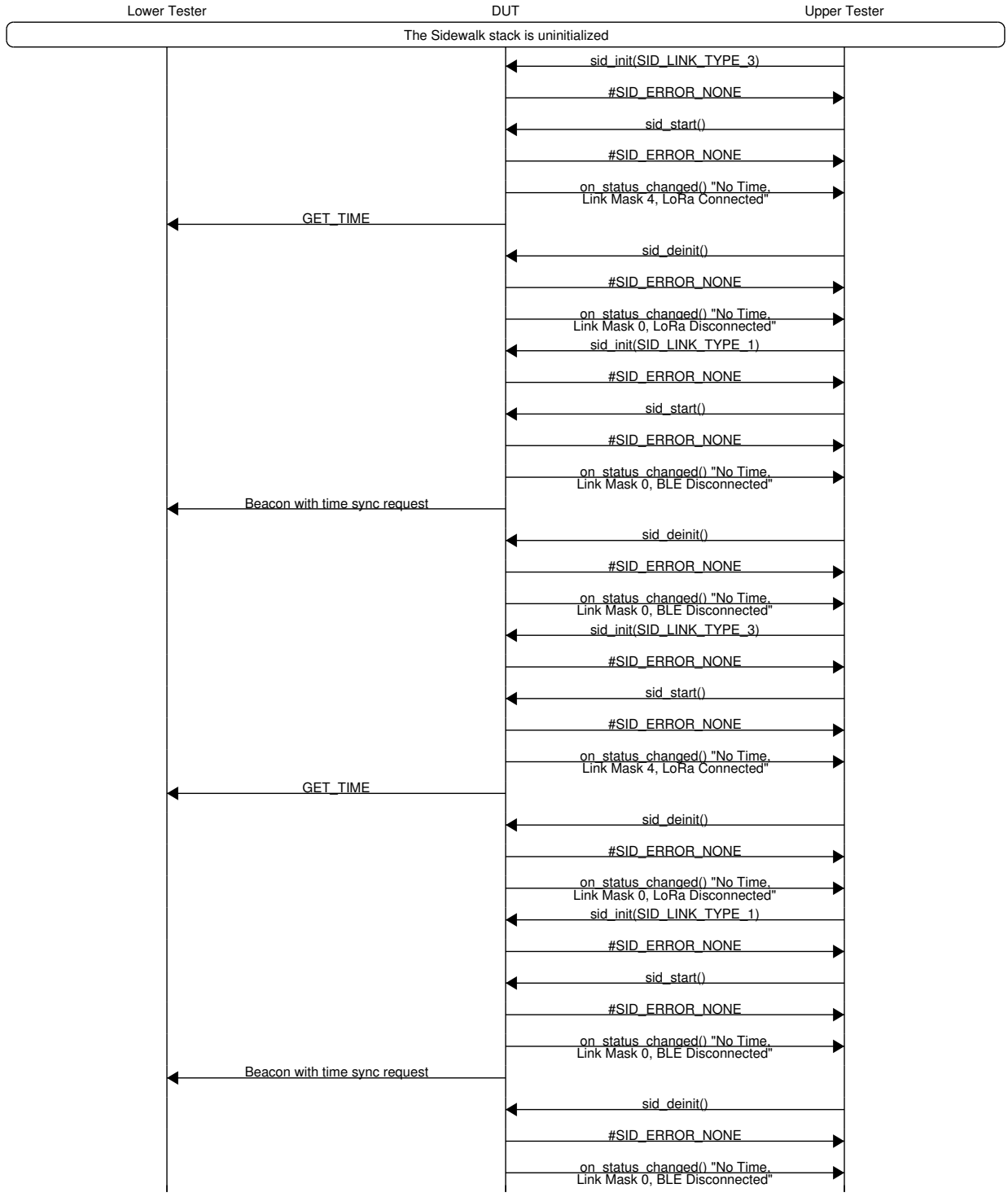
To verify that DUT is able to switch between 900MHz (LoRa) and BLE stack multiple times and the stack is initialized correctly each time.

6.1.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- The Sidewalk stack is not initialized on the DUT.

6.1.3 Test Procedure



6.1.4 Expected Results

6.1.4.1 Pass Verdict

The DUT should correctly switch between the 900MHz (LoRa) and BLE stacks.

Each time after initializing and starting the 900MHz (LoRa) stack, the DUT should send a GET_TIME packet via LoRa.

In turn, after each initialization and start of the BLE stack, the DUT should start broadcasting Beacons containing a request for time synchronization.

6.2 MULTI/EP/CONN/DL/BV/01: Endpoint is able to receive a downlink packet using BLE.

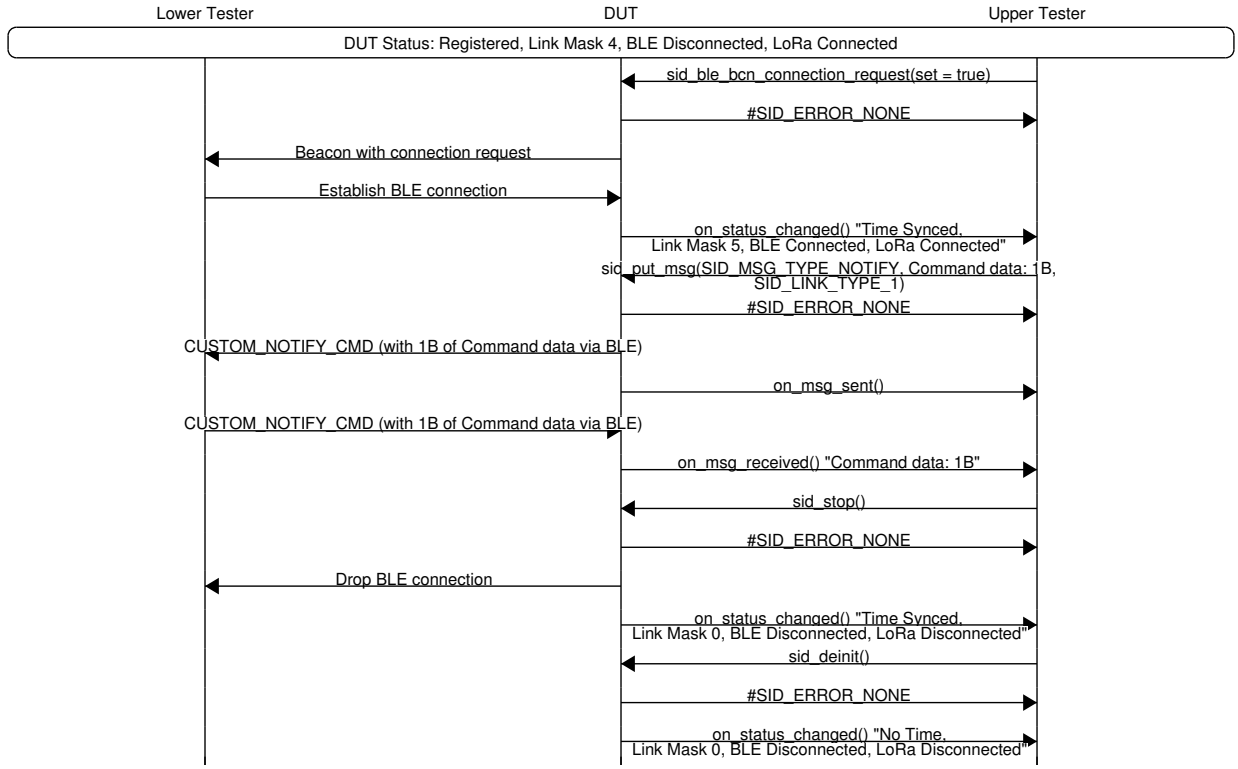
6.2.1 Test Purpose

To verify that the DUT is able to receive a downlink packet over BLE when the last uplink packet was sent also over BLE.

6.2.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization.

6.2.3 Test Procedure



6.2.4 Expected Results

6.2.4.1 Pass Verdict

When the DUT sends an uplink packet over BLE, it should expect a response in downlink direction to arrive using the same technology and should be able to receive it.

6.3 MULTI/EP/CONN/DL/BV/02: Endpoint is able to receive a downlink packet using LoRa

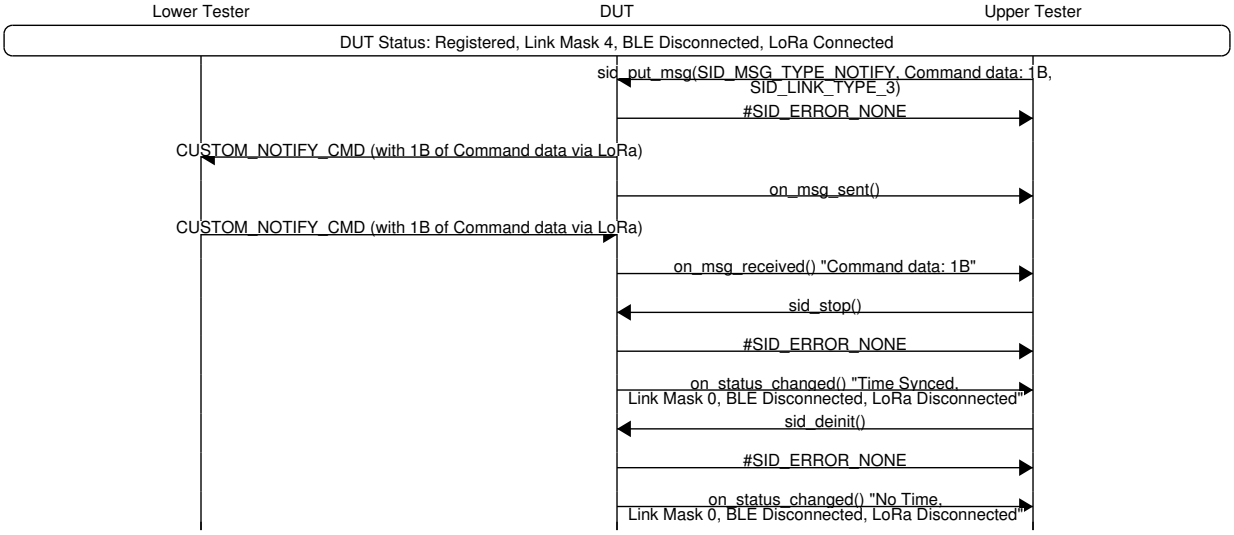
6.3.1 Test Purpose

To verify that DUT receives a downlink packet through LoRa, when multi-radio (BLE + LoRa) is initialized.

6.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE + LoRa mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization.
- DUT has completed join procedure for LoRa stack

6.3.3 Test Procedure



6.3.4 Expected Results

6.3.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized, DUT is able to receive a downlink packet using LoRa.

The CUSTOM_NOTIFY_CMD downlink packet should be verified on the DUT and Lower Tester side:
For Lower Tester: downlink packet was successfully transmitted using correct technology (LoRa)
For DUT: downlink packet was received.

To make sure that the downlink packet will be sent using correct technology, DUT has to send an additional uplink packet via LoRa first.

6.4 MULTI/EP/CONN/DL/BV/03: Endpoint is able to receive a downlink packet using LoRa, while BLE connection with Gateway is established.

6.4.1 Test Purpose

To verify that DUT receives a downlink packet through LoRa, when multi-radio (BLE + LoRa) is initialized and BLE connection is established between DUT and Lower Tester.

6.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE + LoRa mode.

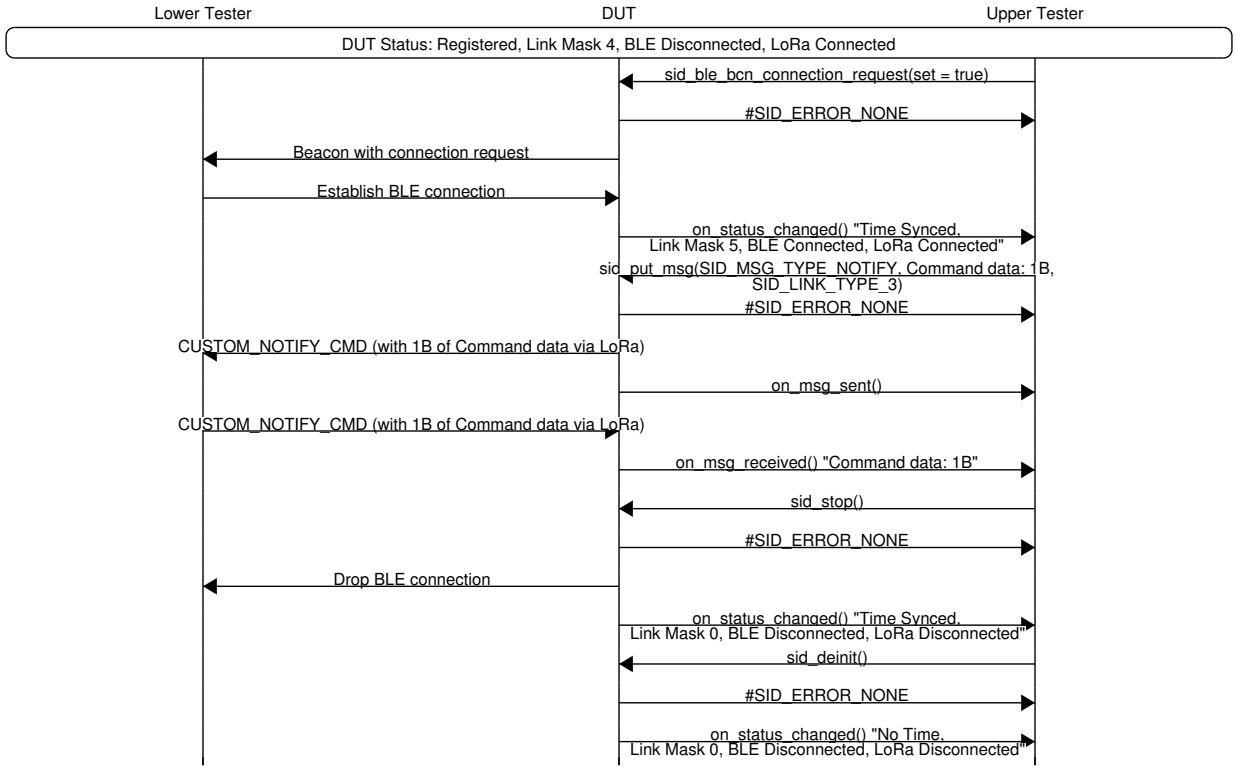
- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization.

- DUT has completed join procedure for LoRa stack

6.4.3 Test Procedure



6.4.4 Expected Results

6.4.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized and BLE connection established between DUT and Lower Tester, DUT is still able to receive a downlink packet using LoRa.

The CUSTOM_NOTIFY_CMD downlink packet should be verified on the DUT and Lower Tester side:
For Lower Tester: downlink packet was successfully transmitted using correct technology (LoRa)
For DUT: downlink packet was received.

To make sure that the downlink packet will be sent using correct technology, DUT has to send an additional uplink packet via LoRa after establishing BLE connection and before the downlink packet is scheduled.

6.5 MULTI/EP/CONN/SEND/LINK/BV/01: Uplink performed through BLE, when send_link 0 and active BT connection.

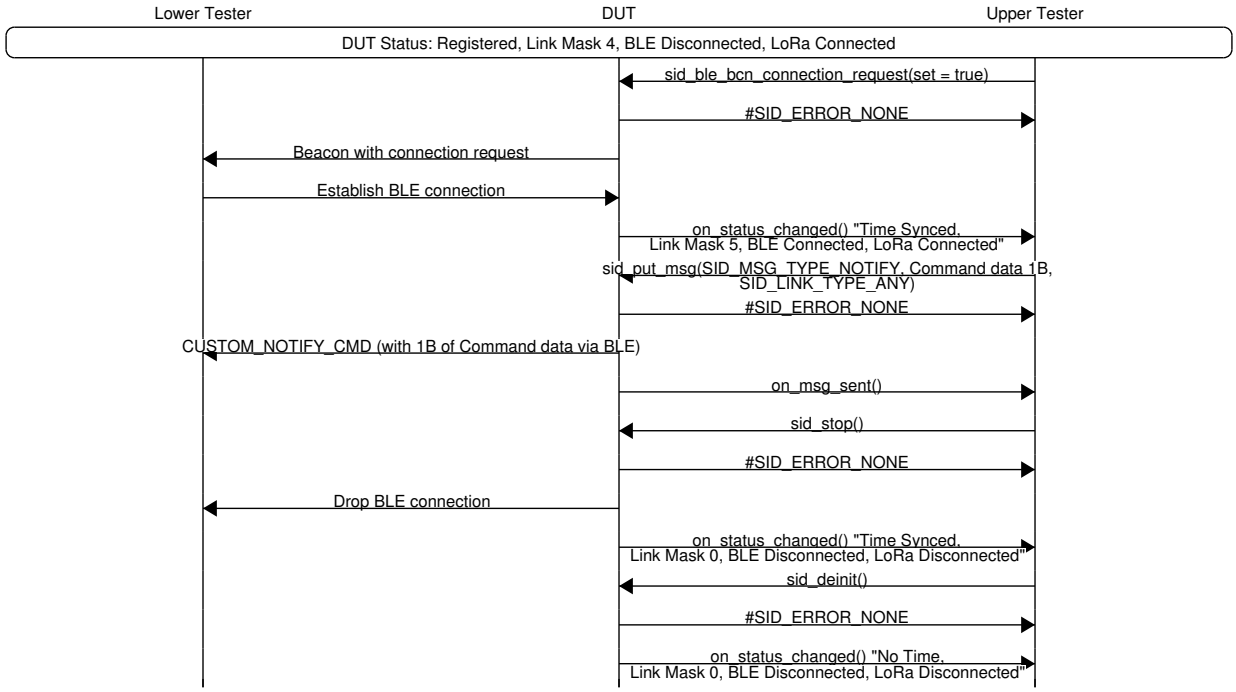
6.5.1 Test Purpose

To verify that DUT sends uplink packet through BLE when Multi-radio (BLE + LORA) is initialized, the send_link is set to SID_LINK_TYPE_ANY and there is an active BLE connection.

6.5.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE + LoRa mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization.

6.5.3 Test Procedure



6.5.4 Expected Results

6.5.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized, the link type is set to SID_LINK_TYPE_ANY and both BLE and LoRa are connected, the DUT should use BLE to send any uplink packet.

The CUSTOM_NOTIFY_CMD packet should be verified on the Lower Tester side against the technology in which it was received (BLE).

6.6 MULTI/EP/CONN/SEND/LINK/BV/02: Uplink performed through BLE, when send_link 1 and active BT connection.

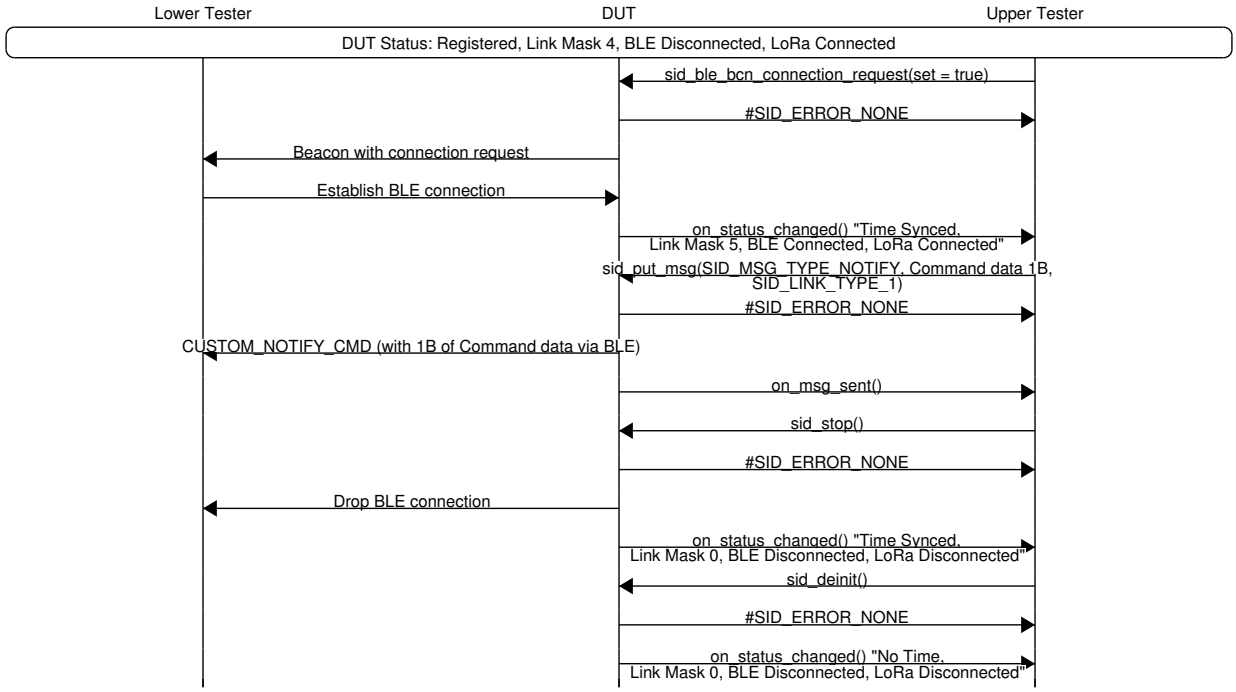
6.6.1 Test Purpose

To verify that DUT sends uplink packet through BLE when Multi-radio (BLE + LORA) is initialized, the send_link is set to SID_LINK_TYPE_1 (BLE) and there is an active BLE connection.

6.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE + LoRa mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization.

6.6.3 Test Procedure



6.6.4 Expected Results

6.6.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized, the link type is set to SID_LINK_TYPE_1 (BLE) and both BLE and LoRa are connected, the DUT should use BLE to send any uplink packet.

The CUSTOM_NOTIFY_CMD packet should be verified on the Lower Tester side against the technology in which it was received (BLE).

6.7 MULTI/EP/CONN/SEND/LINK/BV/03: Uplink performed through LoRa, when send_link 3 and active BT connection.

6.7.1 Test Purpose

To verify that DUT sends uplink packet through LoRa when Multi-radio (BLE + LORA) is initialized, the send_link is set to SID_LINK_TYPE_3 (LoRa) and there is an active BLE connection.

6.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

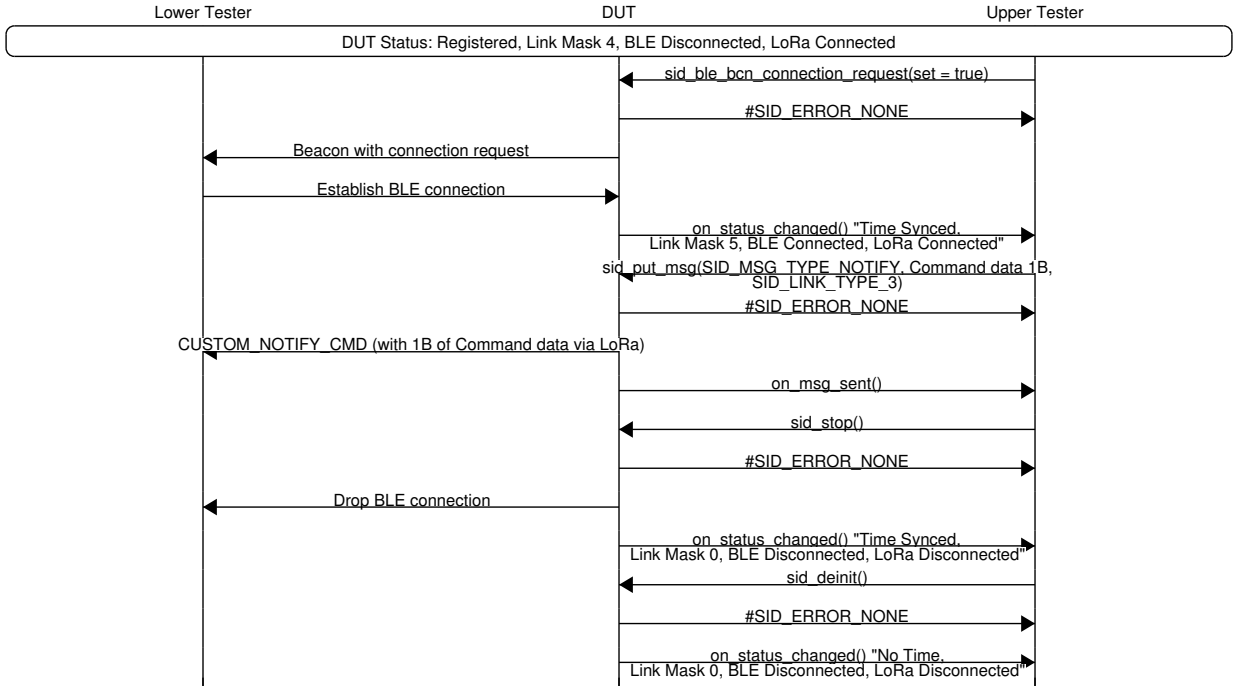
- Lower Tester operates in BLE + LoRa mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization.

6.7.3 Test Procedure



6.7.4 Expected Results

6.7.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized, the link type is set to SID_LINK_TYPE_3 (LoRa) and both BLE and LoRa are connected, the DUT should use LoRa to send any uplink packet.

The CUSTOM_NOTIFY_CMD packet should be verified on the Lower Tester side against the technology in which it was received (LoRa).

6.8 MULTI/EP/CONN/SEND/LINK/BV/04: Uplink performed through LoRa, when send_link 0 and terminated BT connection.

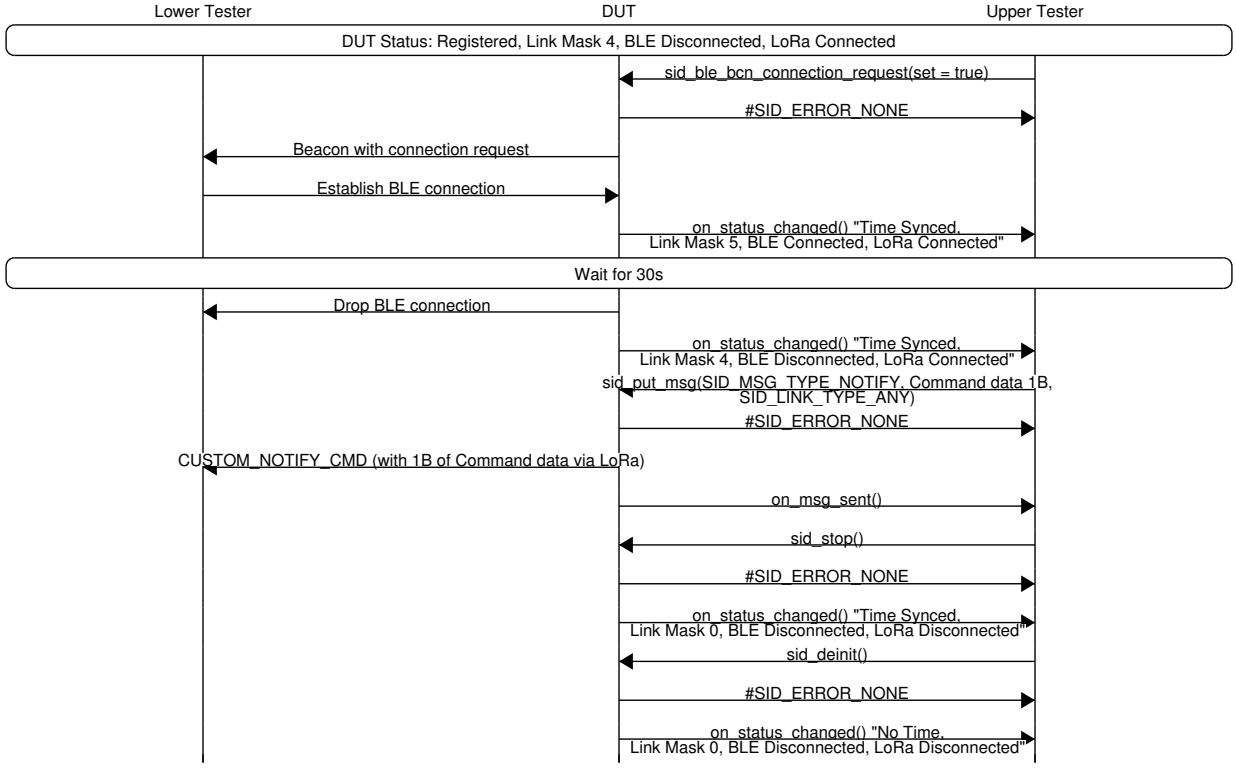
6.8.1 Test Purpose

To verify that DUT sends uplink packet through LoRa when Multi-radio (BLE + LORA) is initialized, the send_link is set to SID_LINK_TYPE_ANY and the BLE is disconnected.

6.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester operates in BLE + LoRa mode.
- SidewalkNetworkFlag is enabled on the Lower Tester.
- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.
- DUT has completed the time synchronization.

6.8.3 Test Procedure



6.8.4 Expected Results

6.8.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized, the link type is set to SID_LINK_TYPE_ANY, BLE is terminated but LoRa is connected, the DUT should use LoRa to send any uplink packet.

The CUSTOM_NOTIFY_CMD packet should be verified on the Lower Tester side against the technology in which it was received (LoRa).

6.9 MULTI/EP/CONN/SEND/LINK/BV/05: Uplink not performed, when send_link 1 and terminated BT connection.

6.9.1 Test Purpose

To verify that DUT does not send uplink packet when Multi-radio (BLE + LORA) is initialized, the send_link is set to SID_LINK_TYPE_1 (BLE) and the BLE is disconnected.

6.9.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

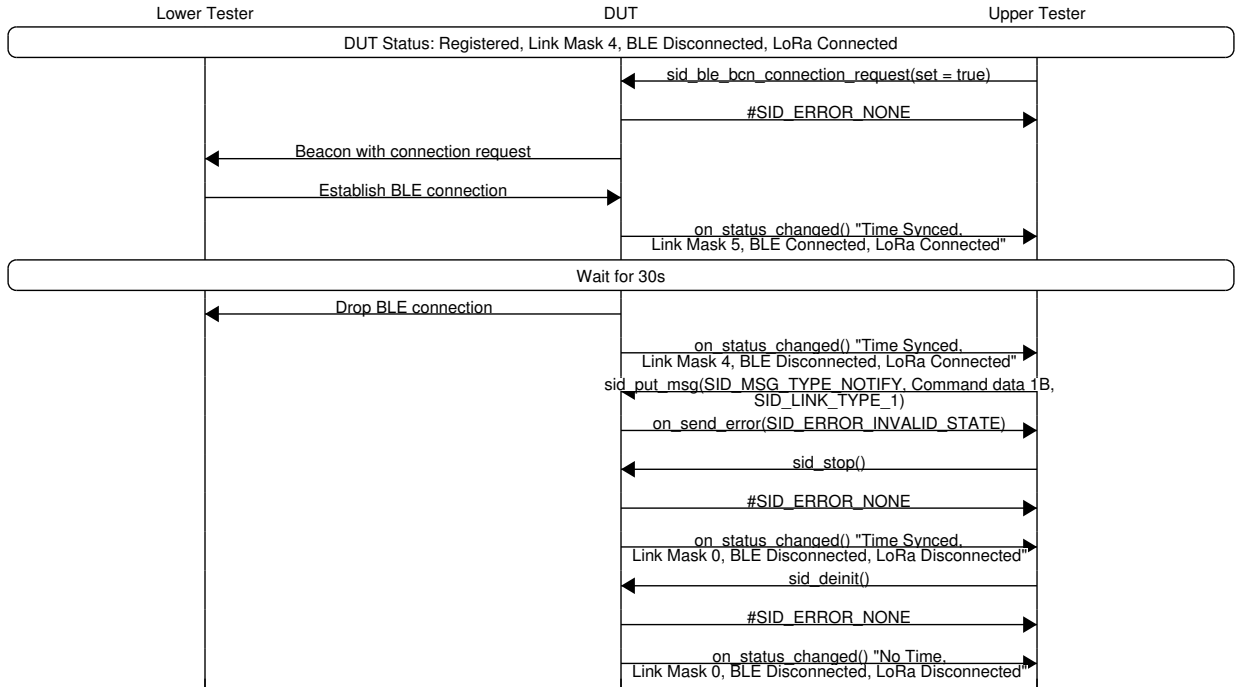
- Lower Tester operates in BLE + LoRa mode.

- SidewalkNetworkFlag is enabled on the Lower Tester.

- The Sidewalk stack (BLE + LoRa) is initialized and started on the DUT.

- DUT has completed the time synchronization.

6.9.3 Test Procedure



6.9.4 Expected Results

6.9.4.1 Pass Verdict

When the Sidewalk multi-radio stack (BLE + LoRa) initialized, the link type is set to SID_LINK_TYPE_1 (BLE) but BLE connection is terminated, then it should not be possible to send any uplink packet. The DUT should return an appropriate error indicating that the requested stack is in the invalid state.

Additional verification should be done on the Lower Tester side to make sure that no packet has been received.

Chapter 7

Multi-link Test Cases

7.1 MULTI-LINK/EP/BLE-AUTO-CONNECT/UL/BI/01: Send UL without auto-connect, DUT is BLE disconnected (Link_Mask 0).

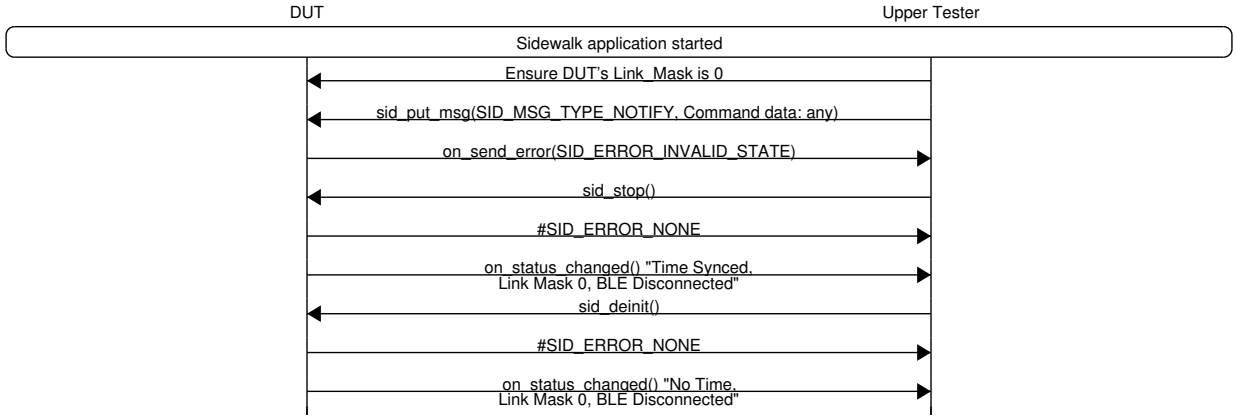
7.1.1 Test Purpose

A registered DUT without enabling BLE auto-connect shouldn't attempt to establish a BLE connection with the Lower Tester and send uplink via BLE when sending an uplink with a Link_Mask 0 status. Instead, the DUT should report a proper error message to the Upper Tester.

7.1.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.

7.1.3 Test Procedure



7.1.4 Expected Results

7.1.4.1 Pass Verdict

The DUT should report the proper error message, SID_ERROR_INVALID_STATE, to the Upper Tester.

7.2 MULTI-LINK/EP/BLE-AUTO-CONNECT/UL/BV/02: Send UL with auto-connect, ack is true, retry is 3, TTL is 60.

7.2.1 Test Purpose

A registered DUT enabling BLE auto-connect should attempt to establish a BLE connection with the Lower Tester and send uplink via BLE when sending an uplink with a Link_Mask 0 status.

7.2.2 Initial Conditions

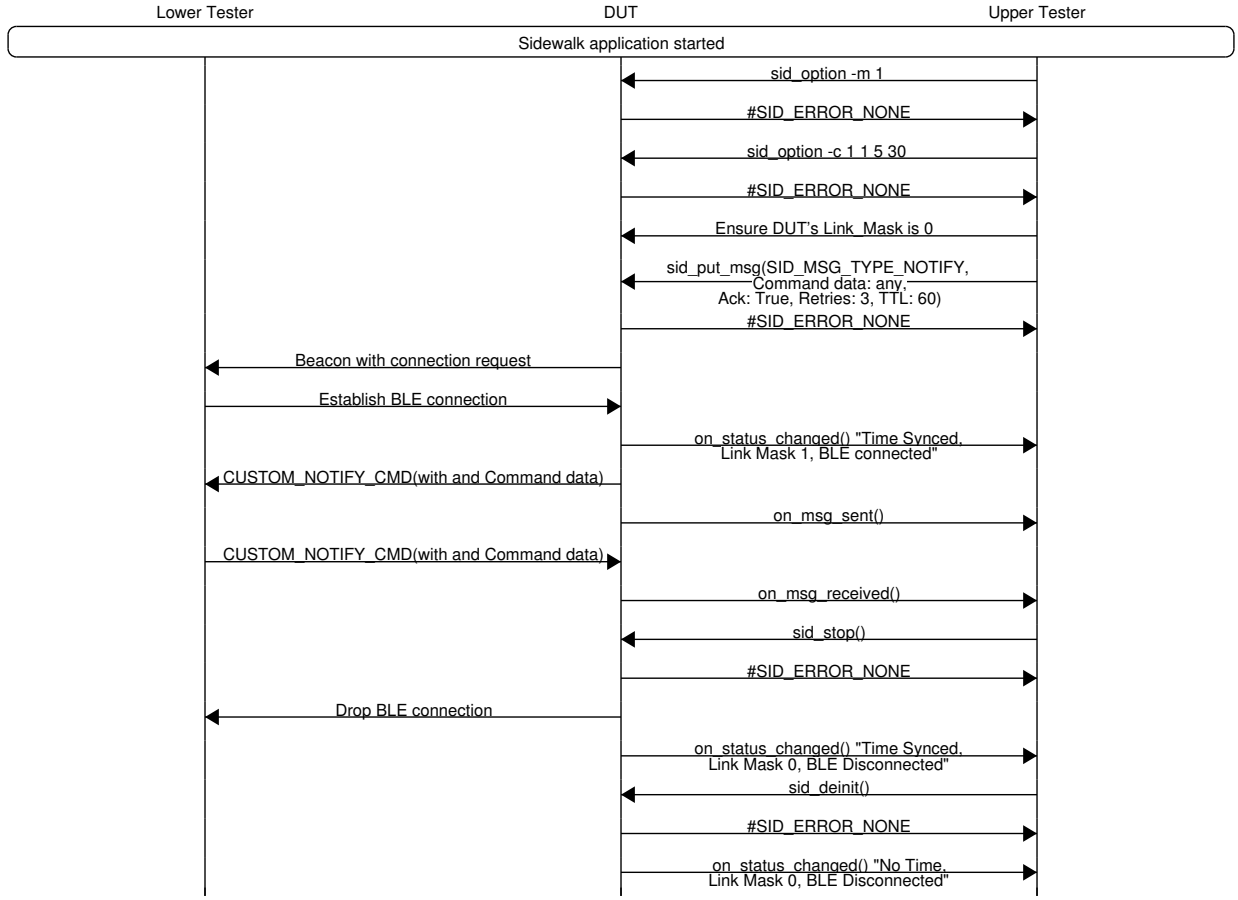
- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

7.2.3 Test Procedure



7.2.4 Expected Results

7.2.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.3 MULTI-LINK/EP/FSK-AUTO-CONNECT/UL/BI/01: Send UL without auto-connect, DUT is FSK disconnected (Link_Mask 0).

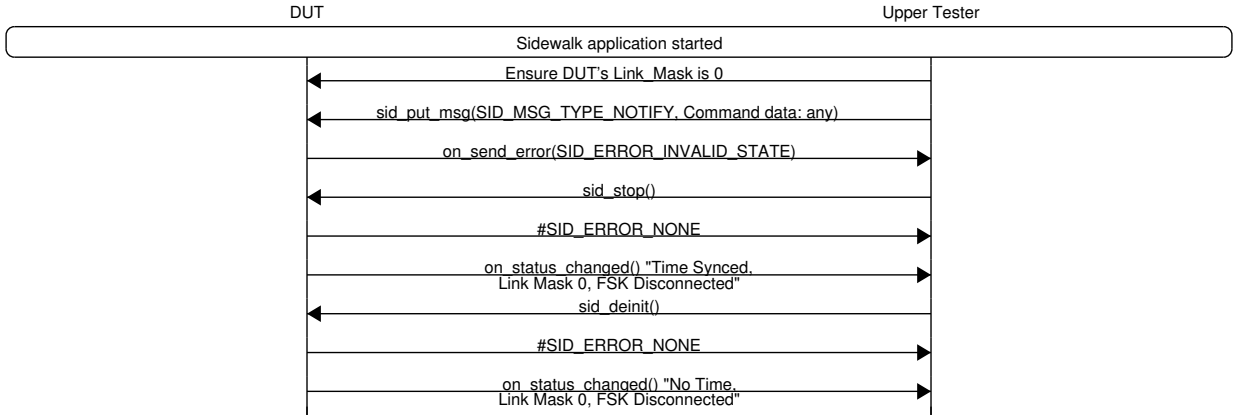
7.3.1 Test Purpose

A registered DUT without enabling FSK auto-connect shouldn't attempt to establish a FSK connection with the Lower Tester and send uplink via FSK when sending an uplink with a Link_Mask 0 status. Instead, the DUT should report a proper error message to the Upper Tester.

7.3.2 Initial Conditions

- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in FSK mode.

7.3.3 Test Procedure



7.3.4 Expected Results

7.3.4.1 Pass Verdict

The DUT should report the proper error message, SID_ERROR_INVALID_STATE, to the Upper Tester.

7.4 MULTI-LINK/EP/FSK-AUTO-CONNECT/UL/BV/02: Send UL with auto-connect, ack is true, retry is 3, TTL is 60.

7.4.1 Test Purpose

A registered DUT enabling FSK auto-connect should attempt to establish a FSK connection with the Lower Tester and send uplink via FSK when sending an uplink with a Link_Mask 0 status.

7.4.2 Initial Conditions

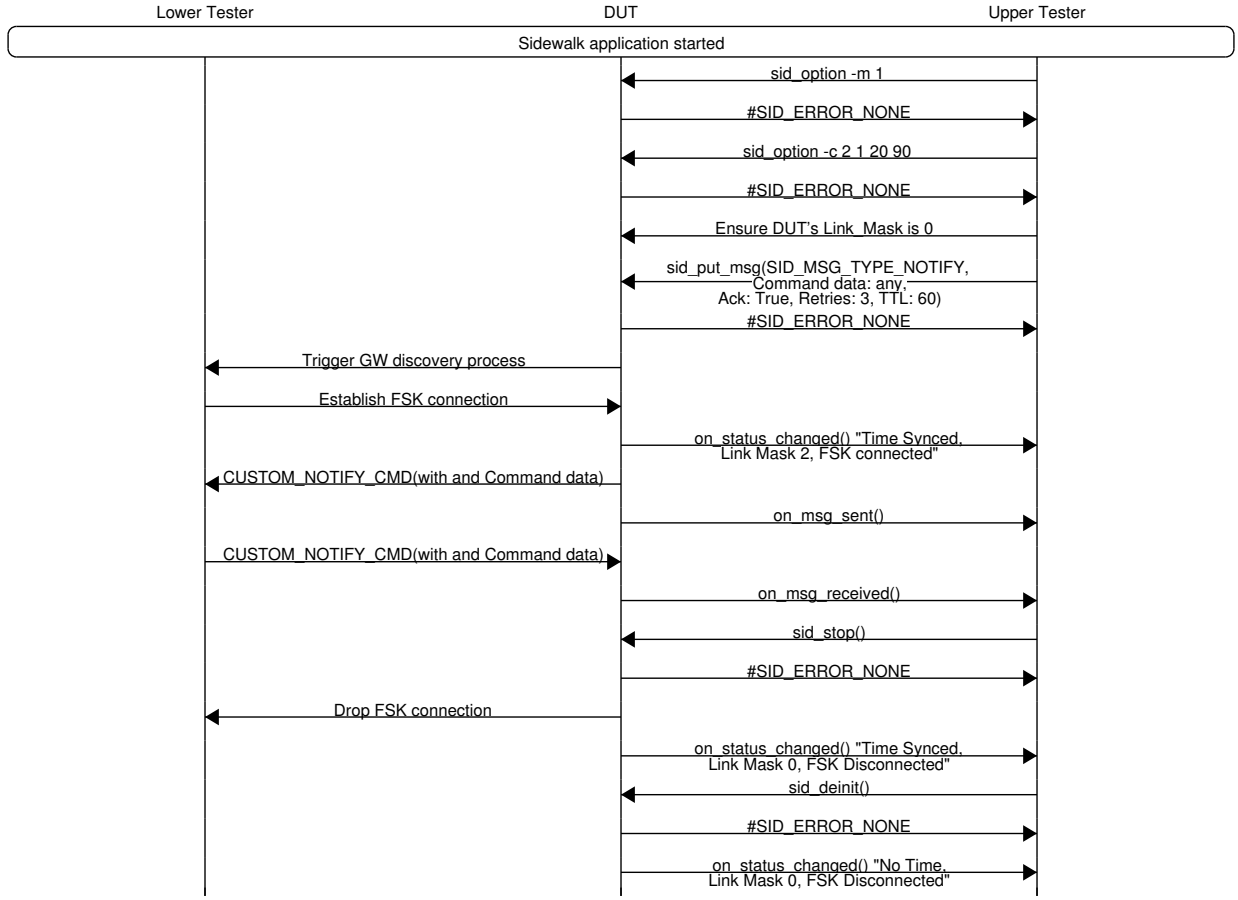
- The Sidewalk stack (FSK) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode.

7.4.3 Test Procedure



7.4.4 Expected Results

7.4.4.1 Pass Verdict

A registered DUT should successfully establish a FSK connection with the Lower Tester and send an uplink.

7.5 MULTI-LINK/EP/LoRa-AUTO-CONNECT/UL/BI/01: Send UL without auto-connect, DUT is LoRa disconnected (Link_Mask 0).

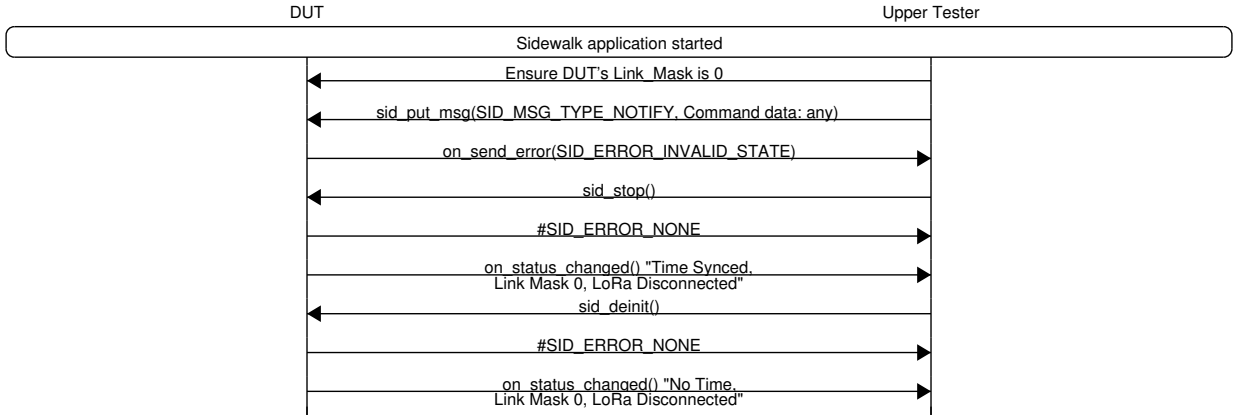
7.5.1 Test Purpose

A registered DUT without enabling LoRa auto-connect shouldn't attempt to establish a LoRa connection with the Lower Tester and send uplink via LoRa when sending an uplink with a Link_Mask 0 status. Instead, the DUT should report a proper error message to the Upper Tester.

7.5.2 Initial Conditions

- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in LoRa mode.

7.5.3 Test Procedure



7.5.4 Expected Results

7.5.4.1 Pass Verdict

The DUT should report the proper error message, SID_ERROR_INVALID_STATE, to the Upper Tester.

7.6 MULTI-LINK/EP/LoRa-AUTO-CONNECT/UL/BV/02: Send UL with auto-connect, ack is true, retry is 3, TTL is 60.

7.6.1 Test Purpose

A registered DUT enabling LoRa auto-connect should attempt to establish a LoRa connection with the Lower Tester and send uplink via LoRa when sending an uplink with a Link_Mask 0 status.

7.6.2 Initial Conditions

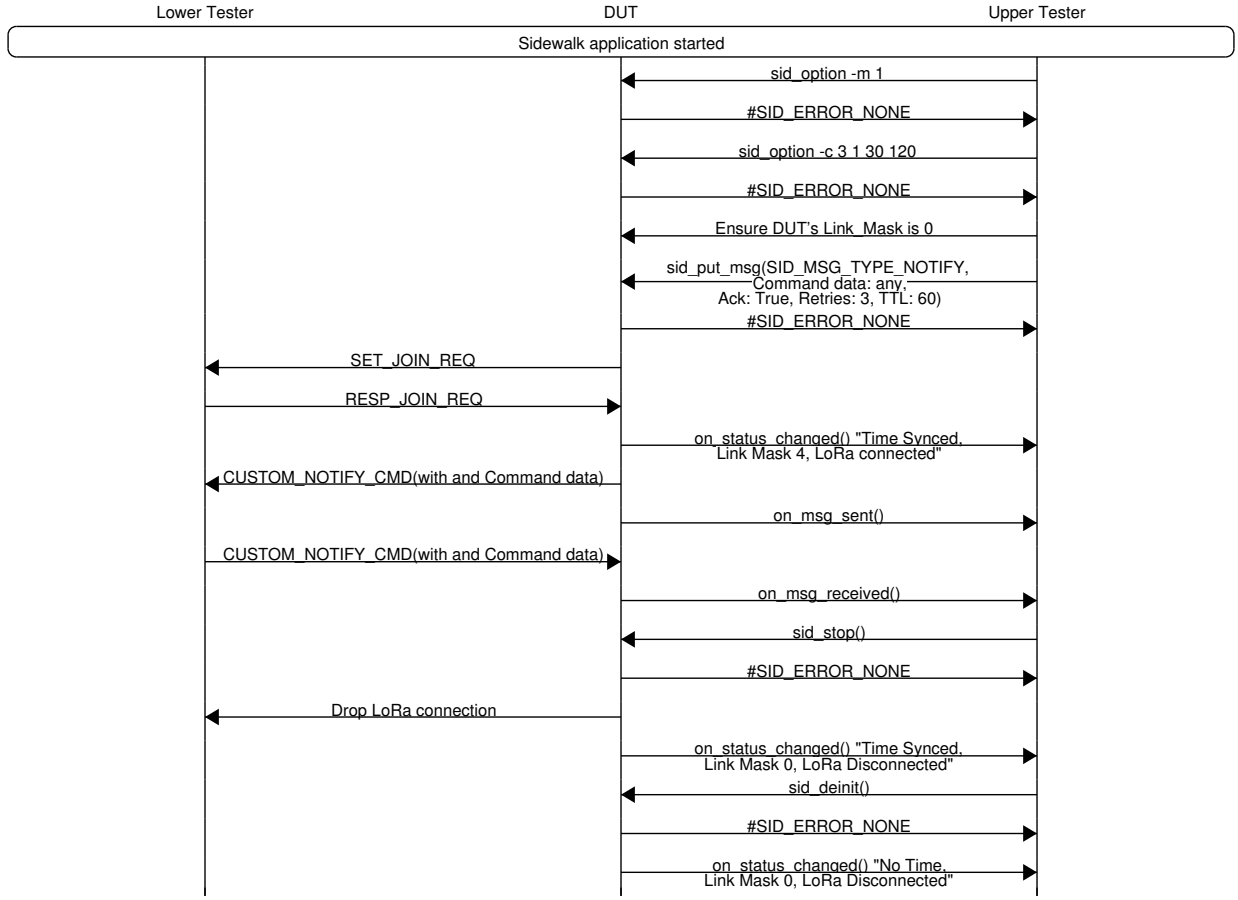
- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode.

7.6.3 Test Procedure



7.6.4 Expected Results

7.6.4.1 Pass Verdict

A registered DUT should successfully establish a LoRa connection with the Lower Tester and send an uplink.

7.7 MULTI-LINK/EP/BLE-LoRa-AUTO-CONNECT/UL/BV/01: Send UL with auto-conenct when BLE link priority is higher than LoRa, EN Link_Mask is 0, Specify BLE+LoRa link.

7.7.1 Test Purpose

A registered DUT that enables BLE, and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. Given the BLE>LoRa link priority and enabling BLE on the Lower Tester, the DUT should attempt to establish a BLE connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status.

7.7.2 Initial Conditions

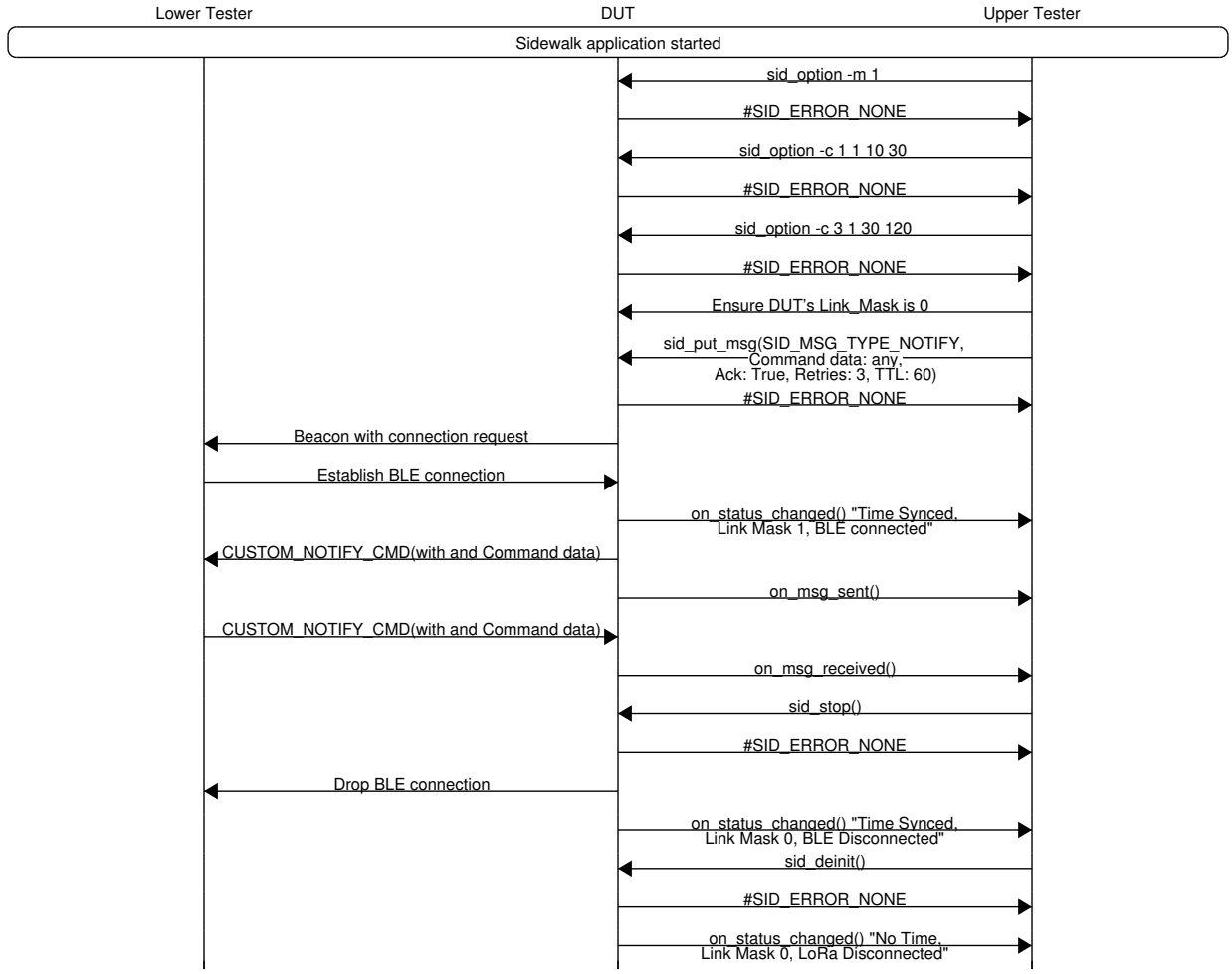
- The Sidewalk stack (BLE+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

7.7.3 Test Procedure



7.7.4 Expected Results

7.7.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.8 MULTI-LINK/EP/BLE-LoRa-AUTO-CONNECT/UL/BV/02: Send UL with auto-conenct when BLE link priority is higher than LoRa, EN Link_Mask is 0, Specify BLE+LoRa link, disable BLE on GW.

7.8.1 Test Purpose

A registered DUT that enables BLE and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. Given the BLE>LoRa link priority and enabling LoRa on the Lower Tester, the DUT should first attempt

to establish a BLE connection, which will fail. Afterward, it should attempt to establish a LoRa connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status.

7.8.2 Initial Conditions

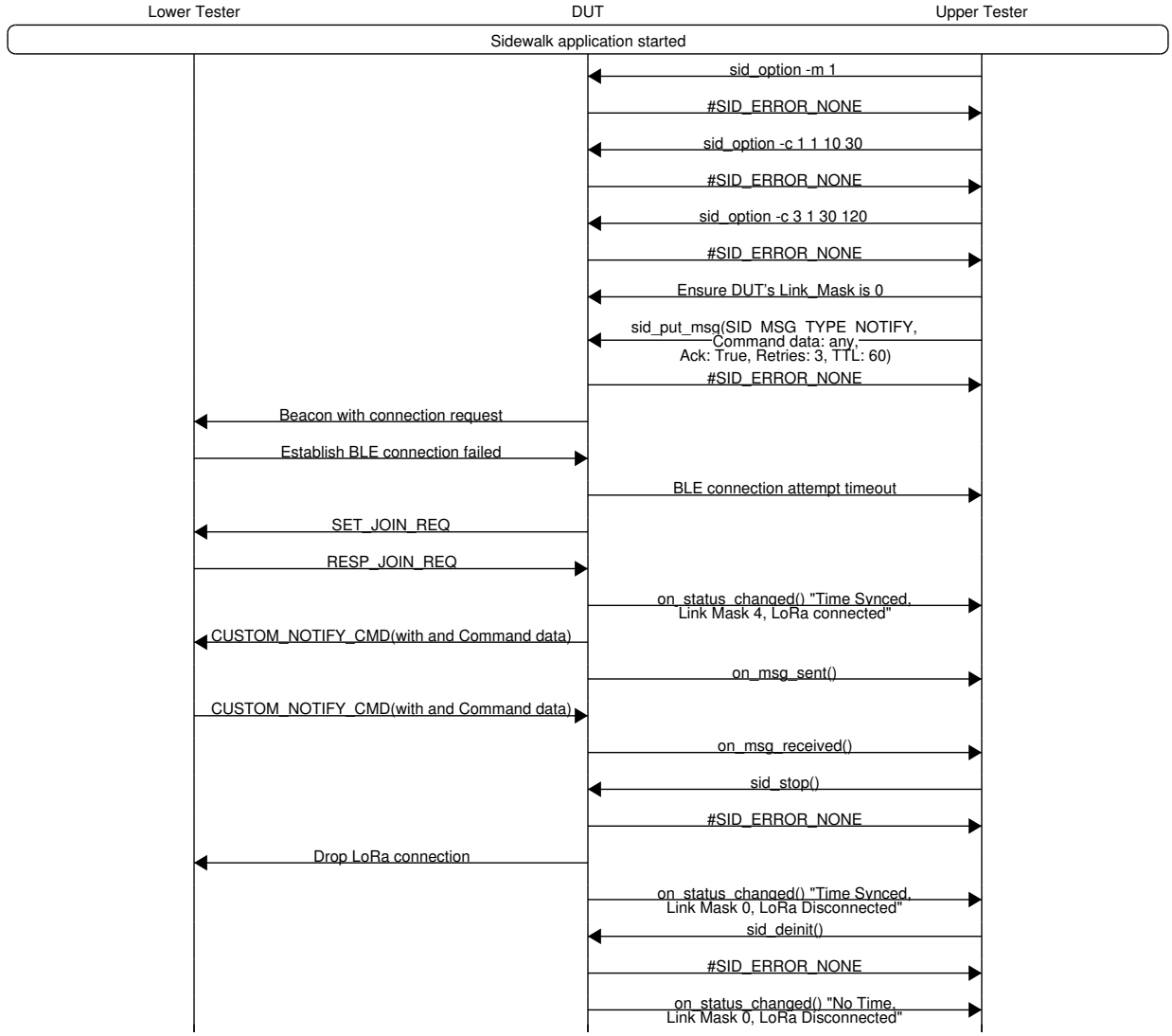
- The Sidewalk stack (BLE+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode.

7.8.3 Test Procedure



7.8.4 Expected Results

7.8.4.1 Pass Verdict

A registered DUT should attempt to establish a BLE connection and fail. Afterward, it should attempt to establish a LoRa connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status

7.9 MULTI-LINK/EP/BLE-LoRa-AUTO-CONNECT/UL/BV/03: Send UL with auto-conenct when BLE link priority is higher than LoRa, EN Link_Mask is 0, disables BLE & LoRa on GW.

7.9.1 Test Purpose

A registered DUT that enables BLE, and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. The DUT will stop the connection search process if it can't connect with the proper link type before the TTL has expired. Given the BLE>LoRa link priority and enabling LoRa on the Lower Tester, the DUT should first attempt to establish a BLE connection, which will fail. Afterward, it should attempt to establish a LoRa connection, which will also fail. The DUT will repeat the same process and stop the process after the TTL has expired.

7.9.2 Initial Conditions

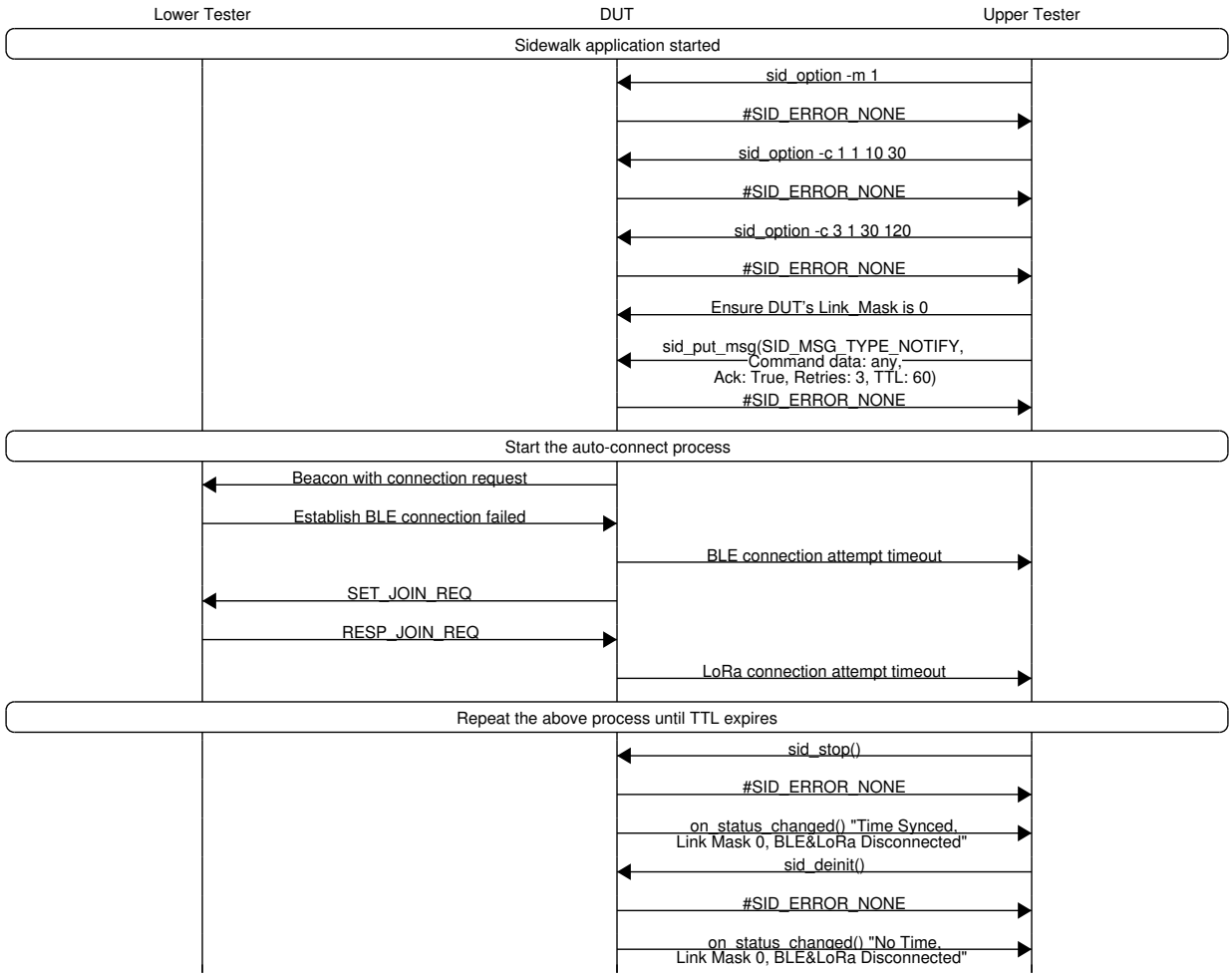
- The Sidewalk stack (BLE+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE&LoRa mode

7.9.3 Test Procedure



7.9.4 Expected Results

7.9.4.1 Pass Verdict

A registered DUT should first attempt to establish a BLE connection, which will fail. Afterward, it should attempt to establish a LoRa connection, which will also fail. The DUT will repeat the same process and stop the process after the TTL has expired.

7.10 MULTI-LINK/EP/BLE-LoRa-AUTO-CONNECT/UL/BV/04: Send UL with auto-conenct when BLE link priority is higher than LoRa, EN Link_Mask is 0, Specify FSK link.

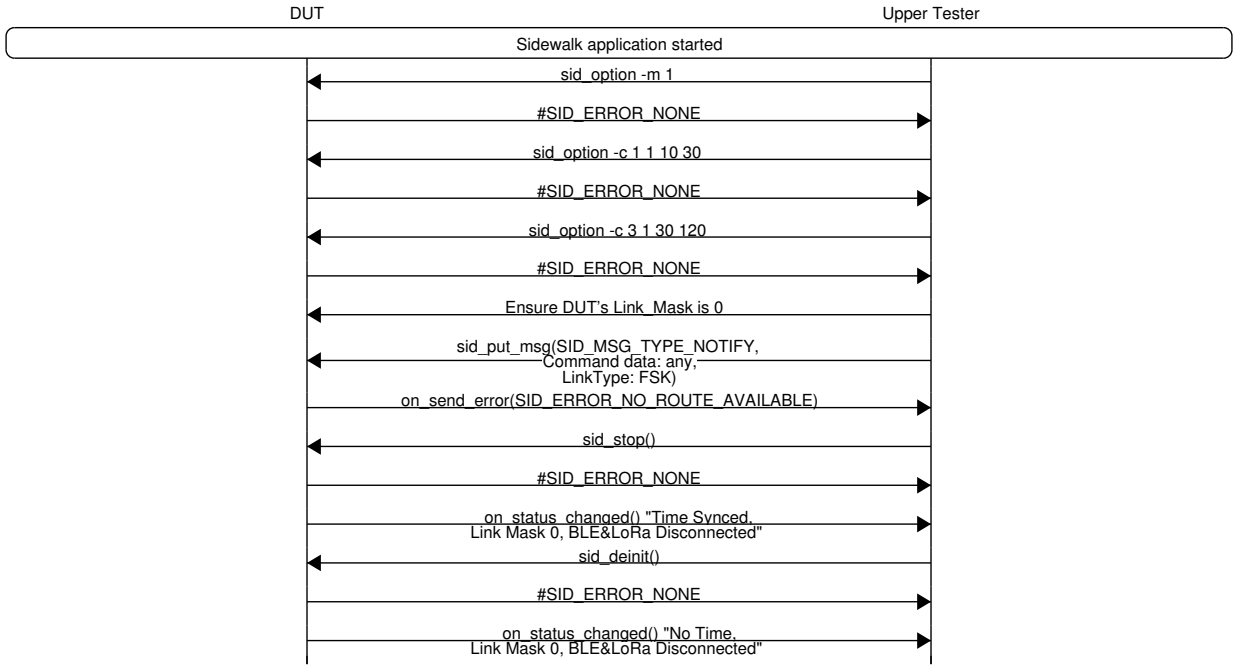
7.10.1 Test Purpose

For an auto-connect registered DUT, when the link mask in the sid_put message does not have the auto-connect enabled, an error is returned, and the link connection is not established.

7.10.2 Initial Conditions

- The Sidewalk stack (BLE+LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode

7.10.3 Test Procedure



7.10.4 Expected Results

7.10.4.1 Pass Verdict

The DUT should report the proper error message, SID_ERROR_NO_ROUTE_AVAILABLE, to the Upper Tester.

7.11 MULTI-LINK/EP/BLE-FSK-LoRa-AUTO-CONNECT/UL/BV/01: UL sent through BLE when no connection.

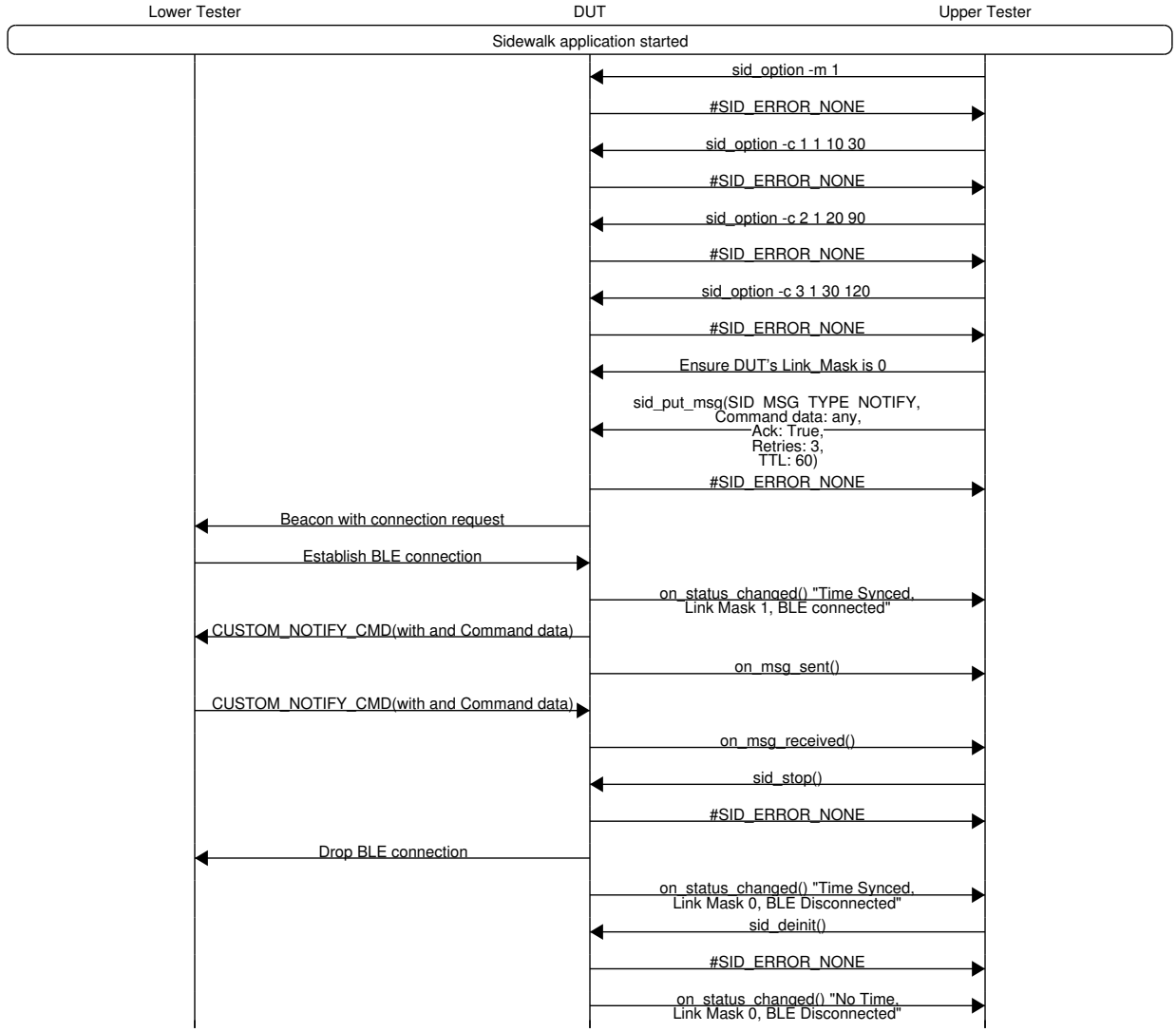
7.11.1 Test Purpose

A registered DUT that enables BLE, FSK, and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. Given the BLE>FSK>LoRa link priority and enabling BLE on the Lower Tester, the DUT should attempt to establish a BLE connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status.

7.11.2 Initial Conditions

- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode

7.11.3 Test Procedure



7.11.4 Expected Results

7.11.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.12 MULTI-LINK/EP/BLE-FSK-LoRa-AUTO-CONNECT/UL/BV/02: UL sent through FSK when no connection.

7.12.1 Test Purpose

A registered DUT that enables BLE, FSK, and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. Given the BLE>FSK>LoRa link priority and enabling FSK on the Lower Tester, the DUT should first attempt to establish a BLE connection, which will fail. Subsequently, it should then attempt to establish an FSK connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status.

7.12.2 Initial Conditions

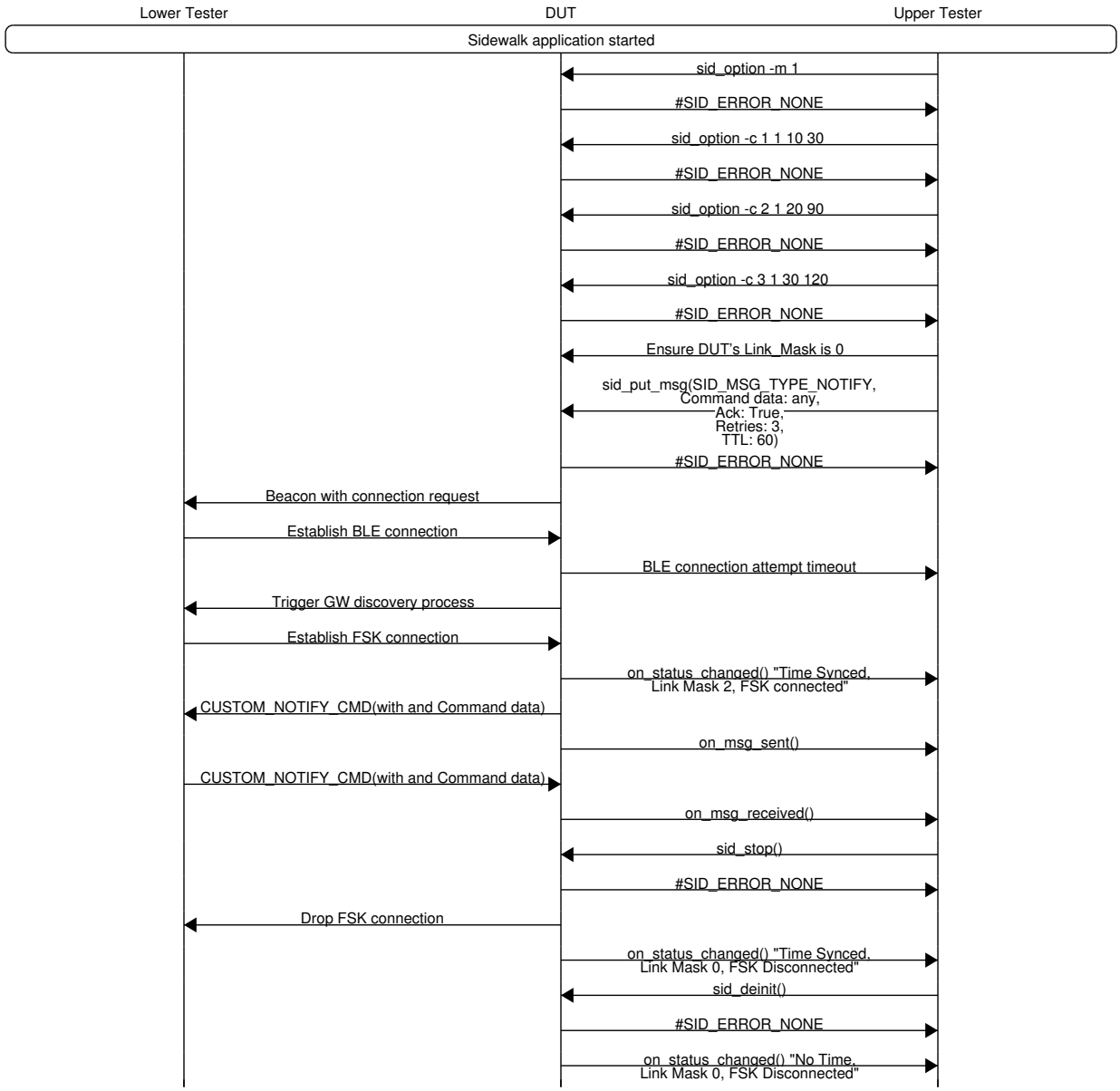
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode

7.12.3 Test Procedure



7.12.4 Expected Results

7.12.4.1 Pass Verdict

A registered DUT should attempt to establish a BLE connection and fail. It should then try to establish an FSK connection with the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.13 MULTI-LINK/EP/BLE-FSK-LoRa-AUTO-CONNECT/UL/BV/03: UL sent through LoRa when no connection.

7.13.1 Test Purpose

A registered DUT that enables BLE, FSK, and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. Given the BLE>FSK>LoRa link priority and enabling LoRa on the Lower Tester, the DUT should first attempt to establish a BLE connection, which will fail. Subsequently, it should then attempt to establish an FSK connection, which will also fail. Afterward, it should attempt to establish a LoRa connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status.

7.13.2 Initial Conditions

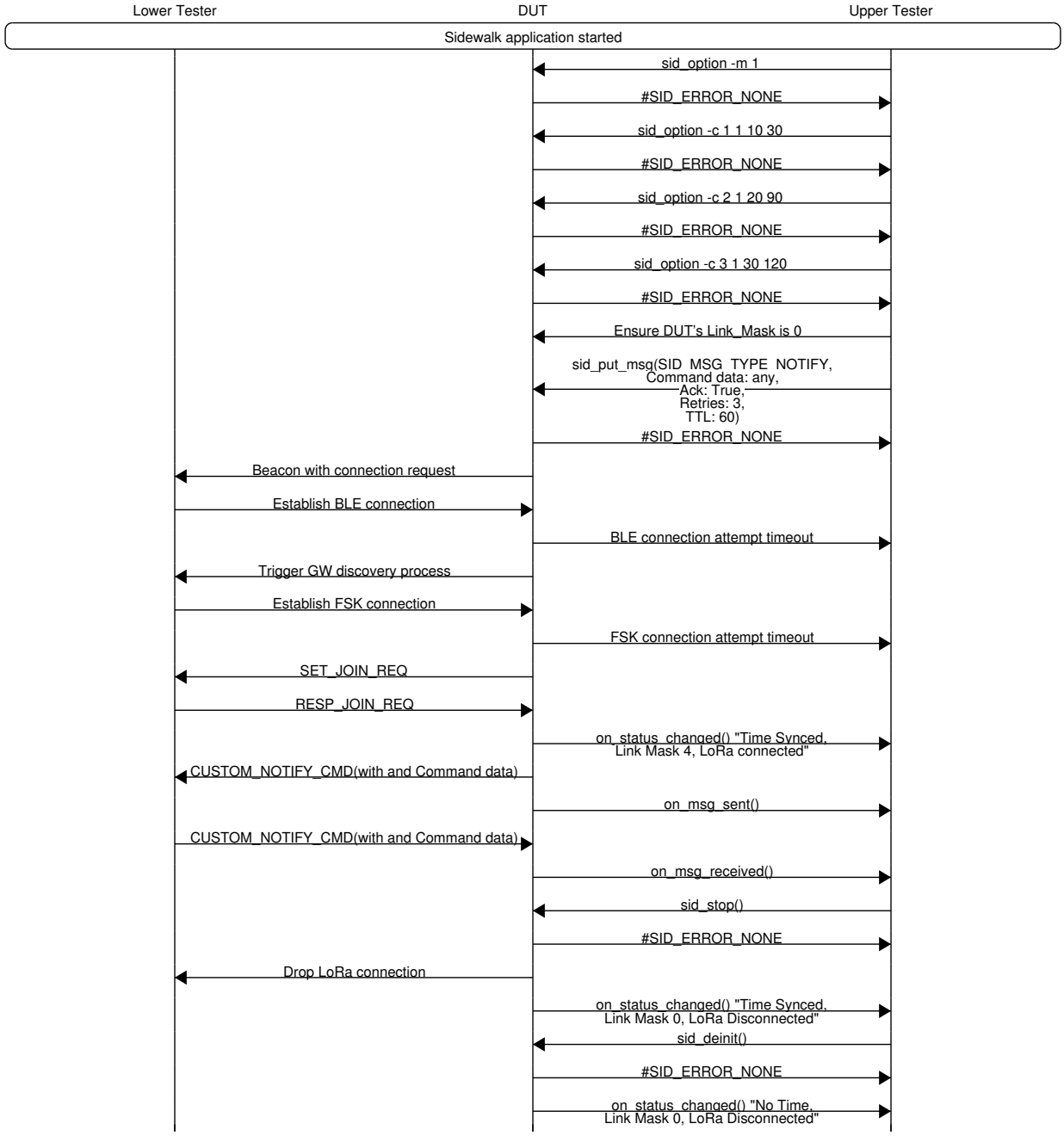
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode

7.13.3 Test Procedure



7.13.4 Expected Results

7.13.4.1 Pass Verdict

A registered DUT should attempt to establish a BLE connection and fail. It should then try to establish an FSK connection and fail. Afterward, it should attempt to establish a LoRa connection with the Lower Tester and automatically send the uplink when sending an uplink with a Link_Mask 0 status

7.14 MULTI-LINK/EP/BLE-FSK-LoRa-AUTO-CONNECT/UL/BV/04: UL not send when no connection and BLE/FSK/LoRa unavailable.

7.14.1 Test Purpose

A registered DUT that enables BLE, FSK, and LoRa auto-connect should attempt to establish a connection with each link type according to the configured link priority and send an uplink via the connected link type. The DUT will stop the connection search process if it can't connect with the proper link type before the TTL has expired. Given the BLE>FSK>LoRa link priority and disabling BLE&FSK&LoRa on the Lower Tester, the DUT should first attempt to establish a BLE connection, which will fail. Subsequently, it should then attempt to establish an FSK connection, which will also fail. Afterward, it should attempt to establish a LoRa connection, which will also fail. The DUT will repeat the same process and stop the process after the TTL has expired.

7.14.2 Initial Conditions

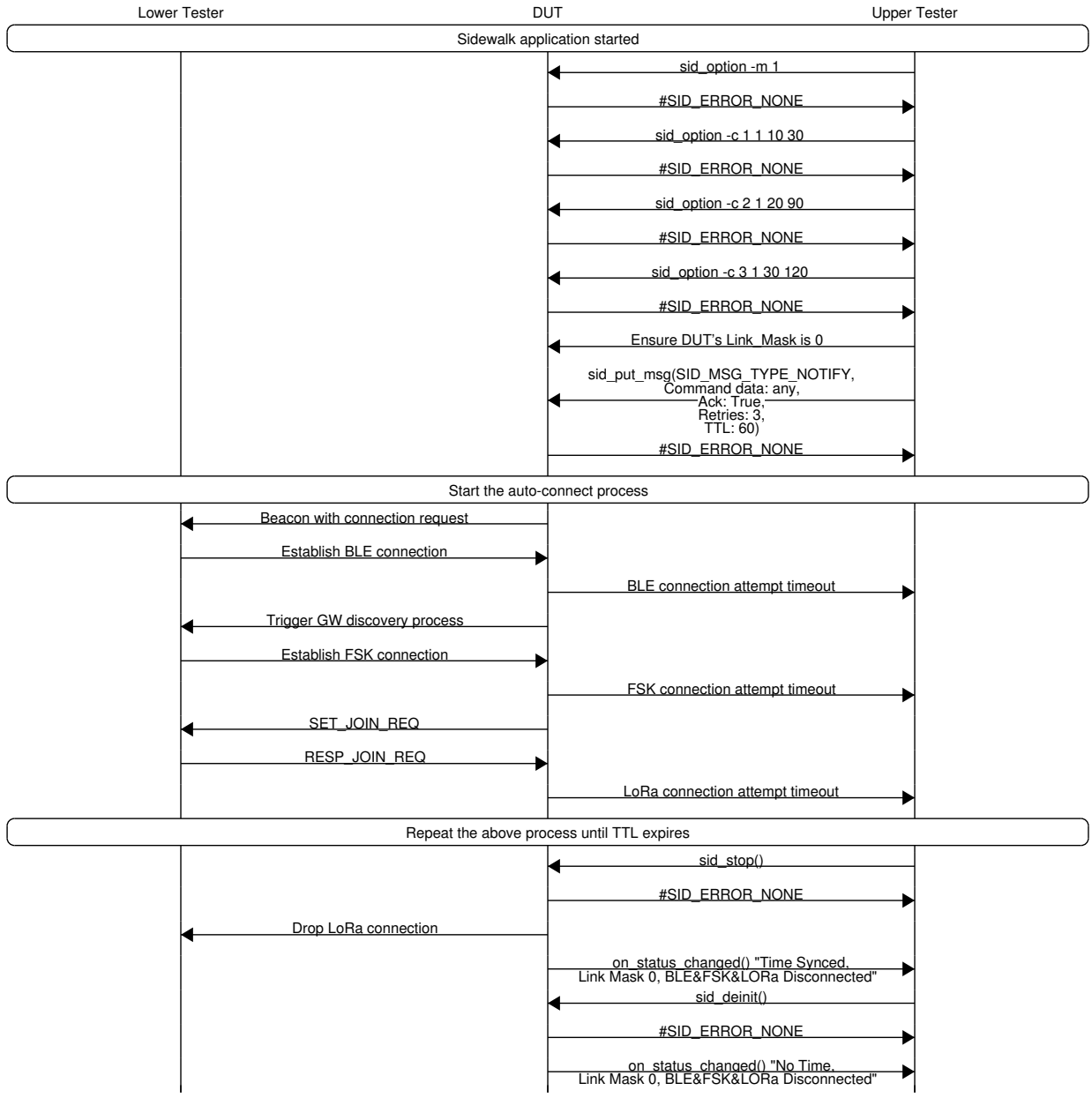
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE & FSK & LoRa mode

7.14.3 Test Procedure



7.14.4 Expected Results

7.14.4.1 Pass Verdict

A registered DUT should first attempt to establish a BLE connection, which will fail. Subsequently, it should then attempt to establish an FSK connection, which will also fail. Afterward, it should attempt to establish a LoRa connection, which will also fail. The DUT will repeat the same process and stop the process after the TTL has expired.

7.15 MULTI-LINK/EP/BLE-FSK-LoRa-AUTO-CONNECT/UL/BV/05: UL sent through BLE when EN's Link_Mask is 1.

7.15.1 Test Purpose

When the link is connected, a registered auto-connect DUT does not initiate a connection but sends out a message on the connected link.

7.15.2 Initial Conditions

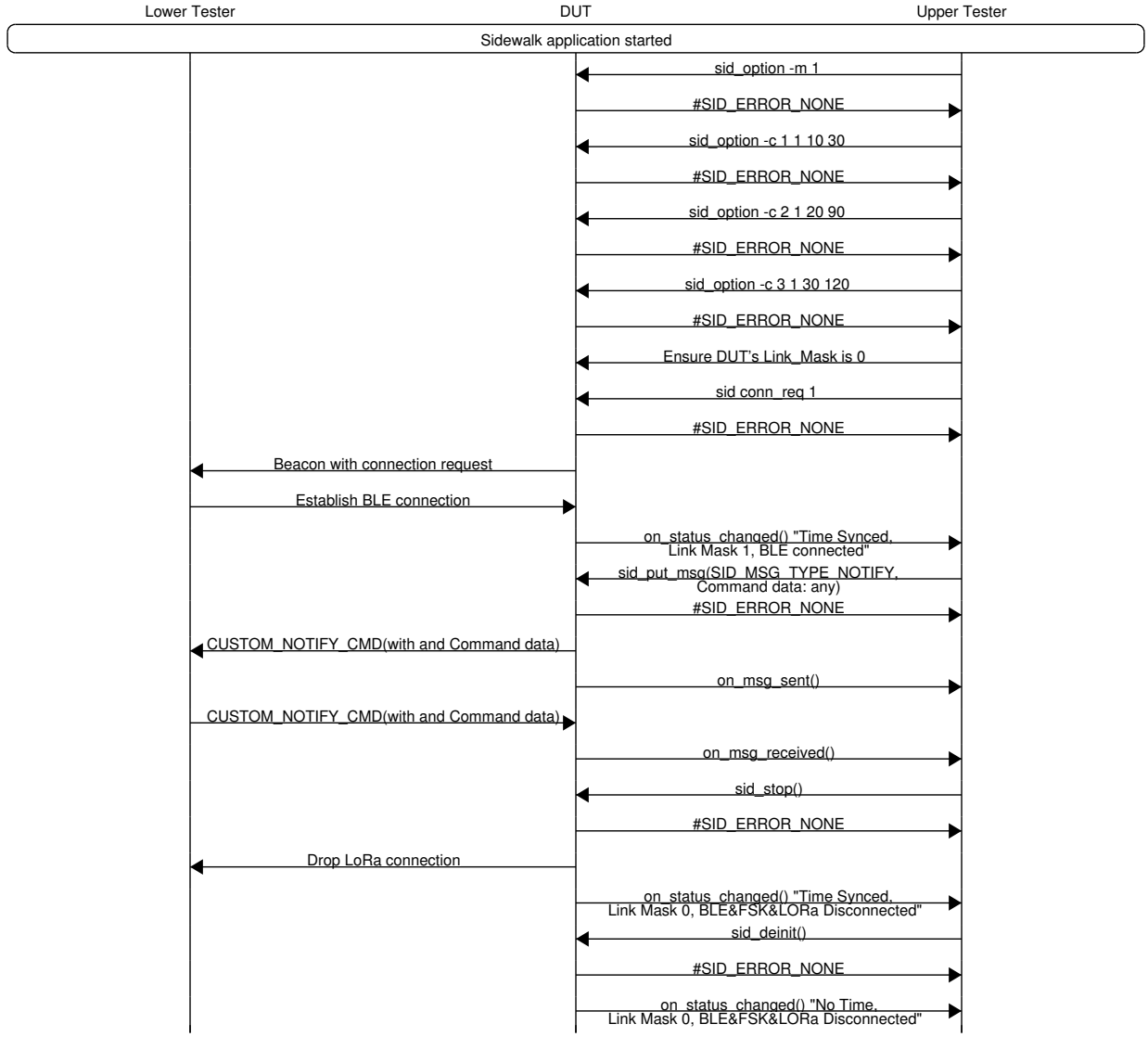
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates BLE mode.

7.15.3 Test Procedure



7.15.4 Expected Results

7.15.4.1 Pass Verdict

A registered DUT should send an uplink via BLE directly.

7.16 MULTI-LINK/EP/MLM-ACTIVE/UL/BV/01: UL sent through BLE when no connection.

7.16.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy,

when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM ACTIVE policy, which is BLE>FSK>LoRa.

7.16.2 Initial Conditions

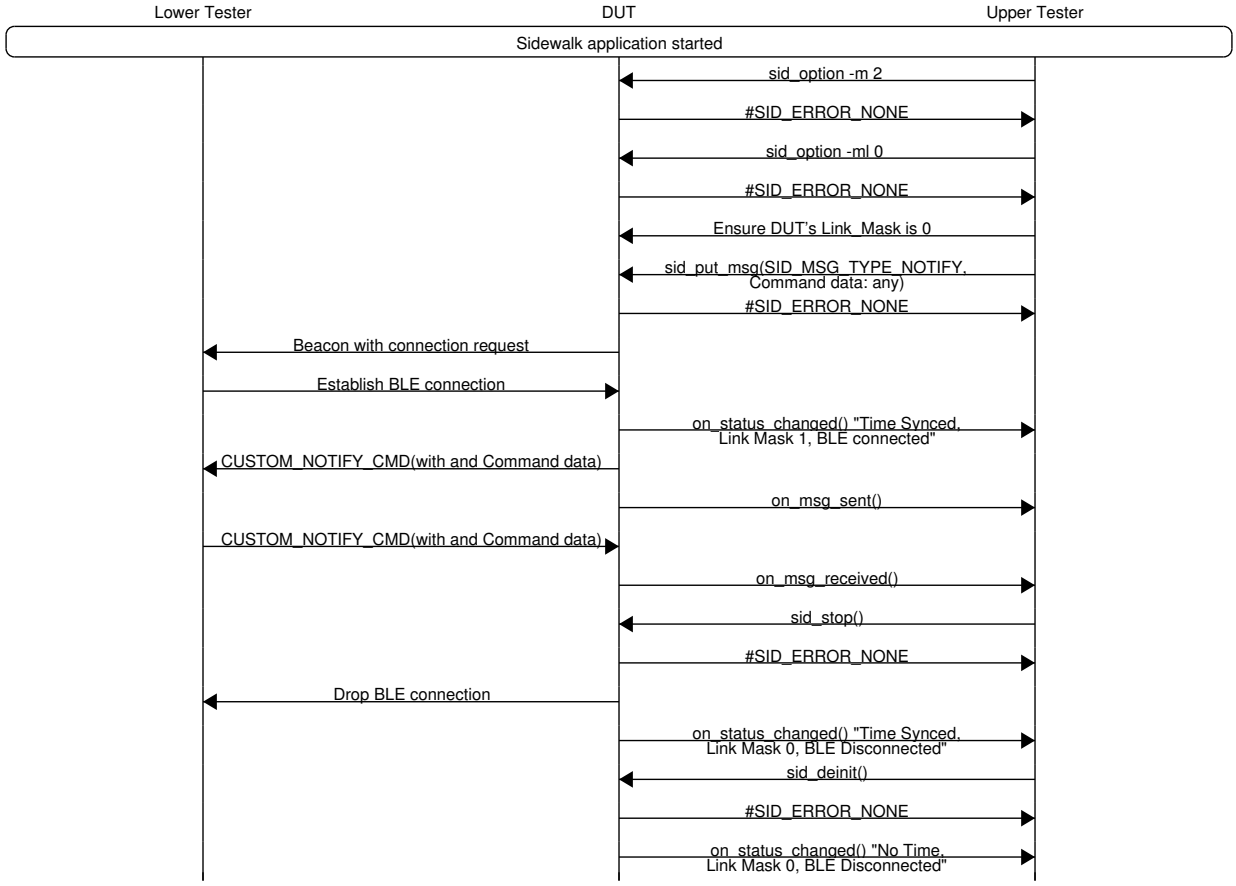
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in BLE mode

7.16.3 Test Procedure



7.16.4 Expected Results

7.16.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.17 MULTI-LINK/EP/MLM-ACTIVE/UL/BV/02: UL sent through FSK when no connection.

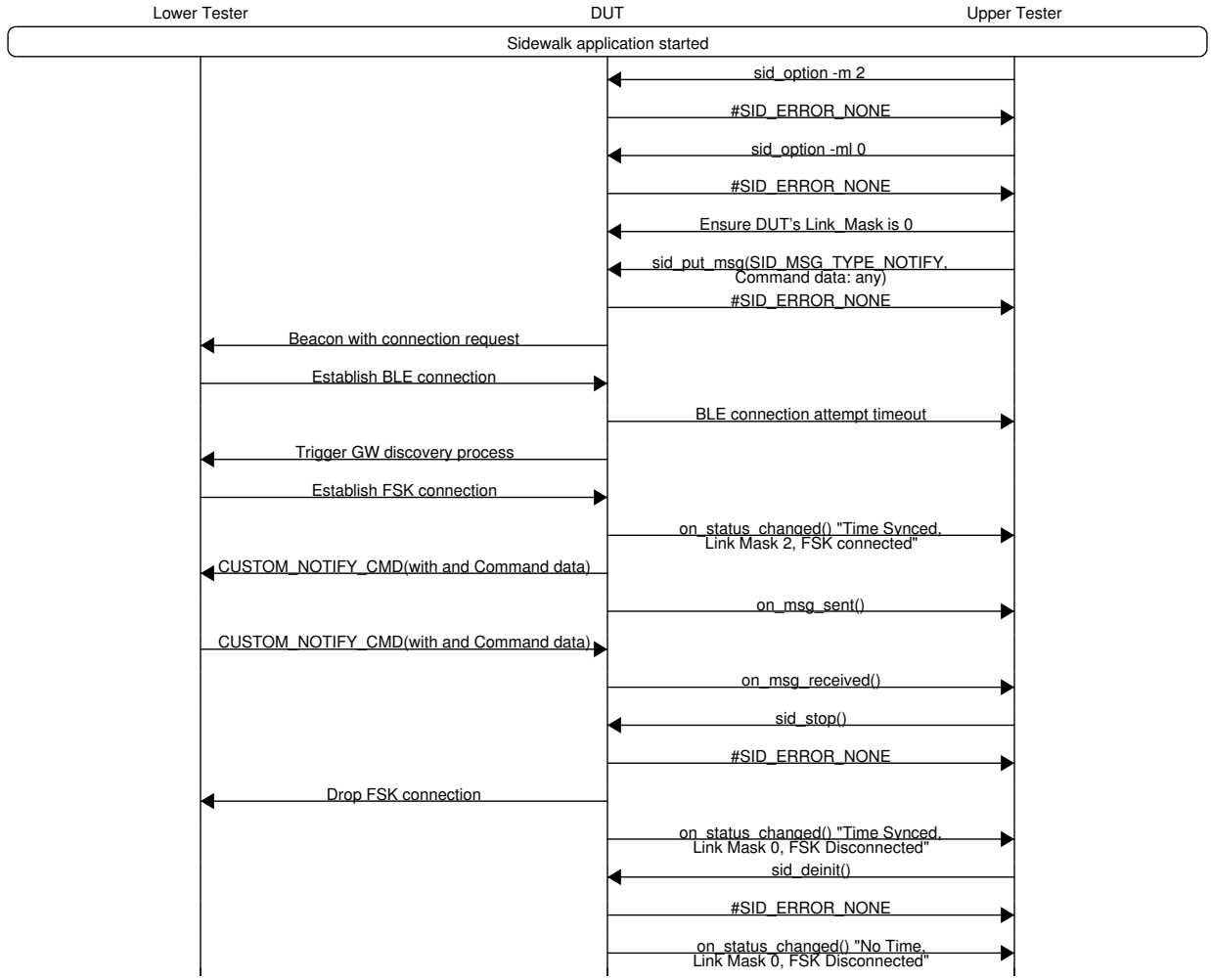
7.17.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM ACTIVE policy, which is BLE>FSK>LoRa.

7.17.2 Initial Conditions

- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in FSK mode

7.17.3 Test Procedure



7.17.4 Expected Results

7.17.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.18 MULTI-LINK/EP/MLM-ACTIVE/UL/BV/03: UL sent through LoRa when no connection.

7.18.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM ACTIVE policy, which is BLE>FSK>LoRa.

7.18.2 Initial Conditions

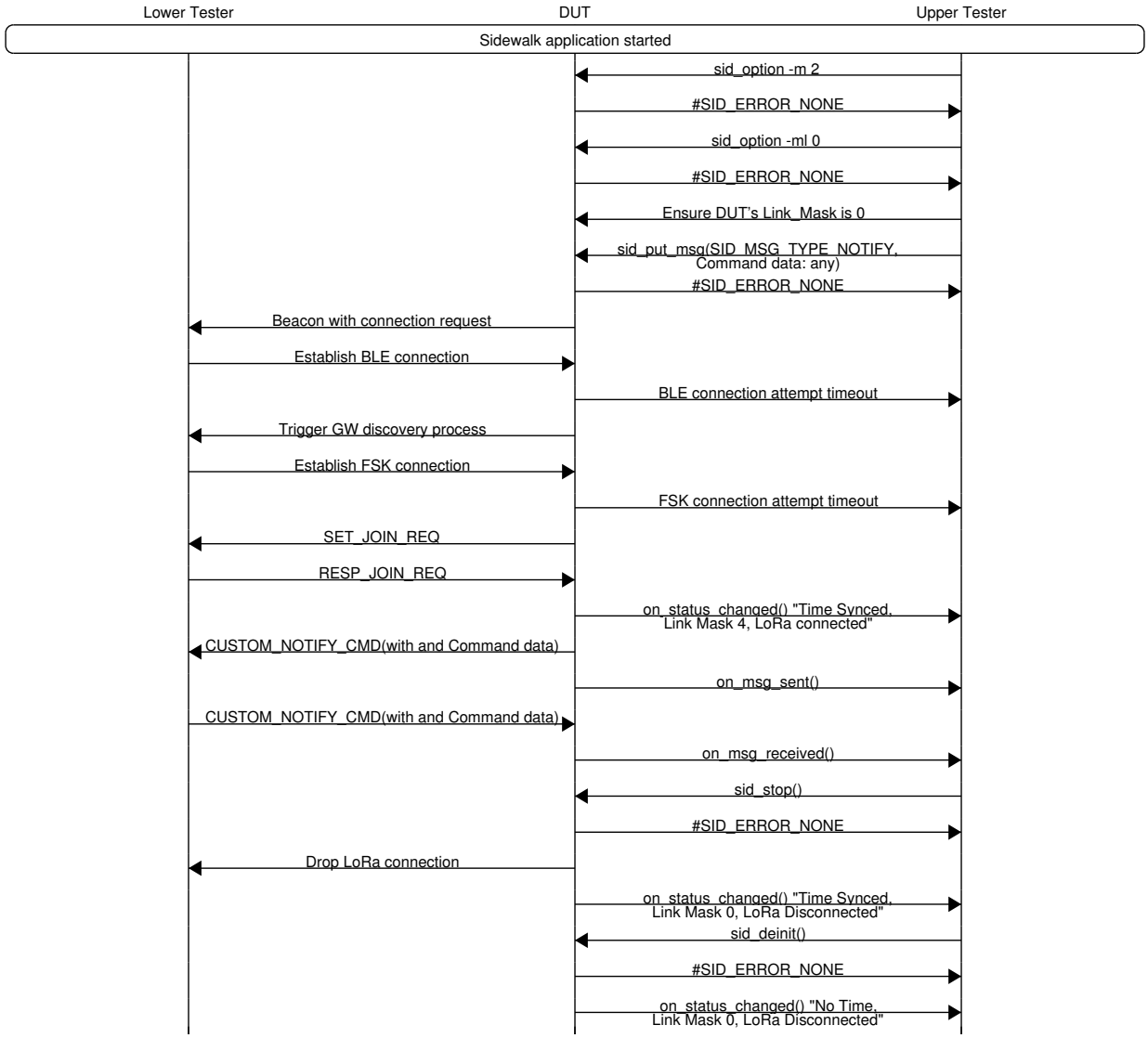
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode

7.18.3 Test Procedure



7.18.4 Expected Results

7.18.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK and fail. Afterward, it should attempt to connect with LoRa on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.19 MULTI-LINK/EP/MLM-ACTIVE/UL/BV/04: UL not send when no connection and BLE/FSK/LoRa unavailable.

7.19.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type. The DUT will halt the connection search process if it cannot connect with the proper link type before the TTL has expired. Once the TTL has expired, a background process may or may not be triggered according to the configured MLM policy. For MLM ACTIVE, the background process should not be triggered. The TTL will be equal to the LoRa link type's TTL.

7.19.2 Initial Conditions

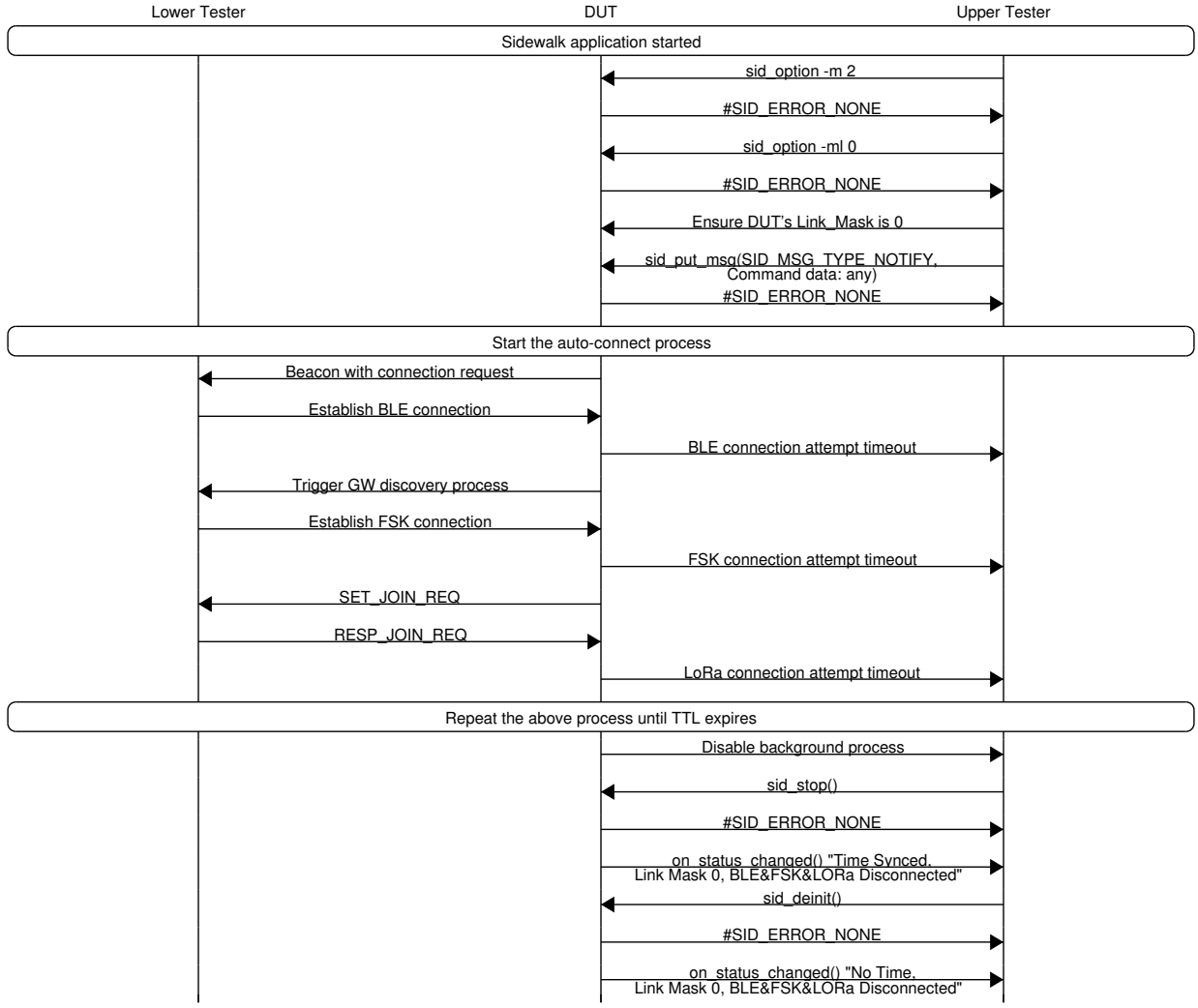
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE & FSK & LoRa mode

7.19.3 Test Procedure



7.19.4 Expected Results

7.19.4.1 Pass Verdict

A registered DUT should attempt to connect with BLE and fail, then try to connect with FSK and fail, and attempt to connect with LoRa and fail. The DUT will repeat the same process and stop it after the TTL has expired. Once the TTL is expired, the background process should not be triggered (indicating that the DUT will not attempt to connect with each link type).

7.20 MULTI-LINK/EP/MLM-ACTIVE/UL/BV/05: UL sent through BLE when EN's Link_Mask is 1.

7.20.1 Test Purpose

When the link is connected, a registered MLM ACTIVE DUT does not initiate a connection but sends out a message on the connected link.

7.20.2 Initial Conditions

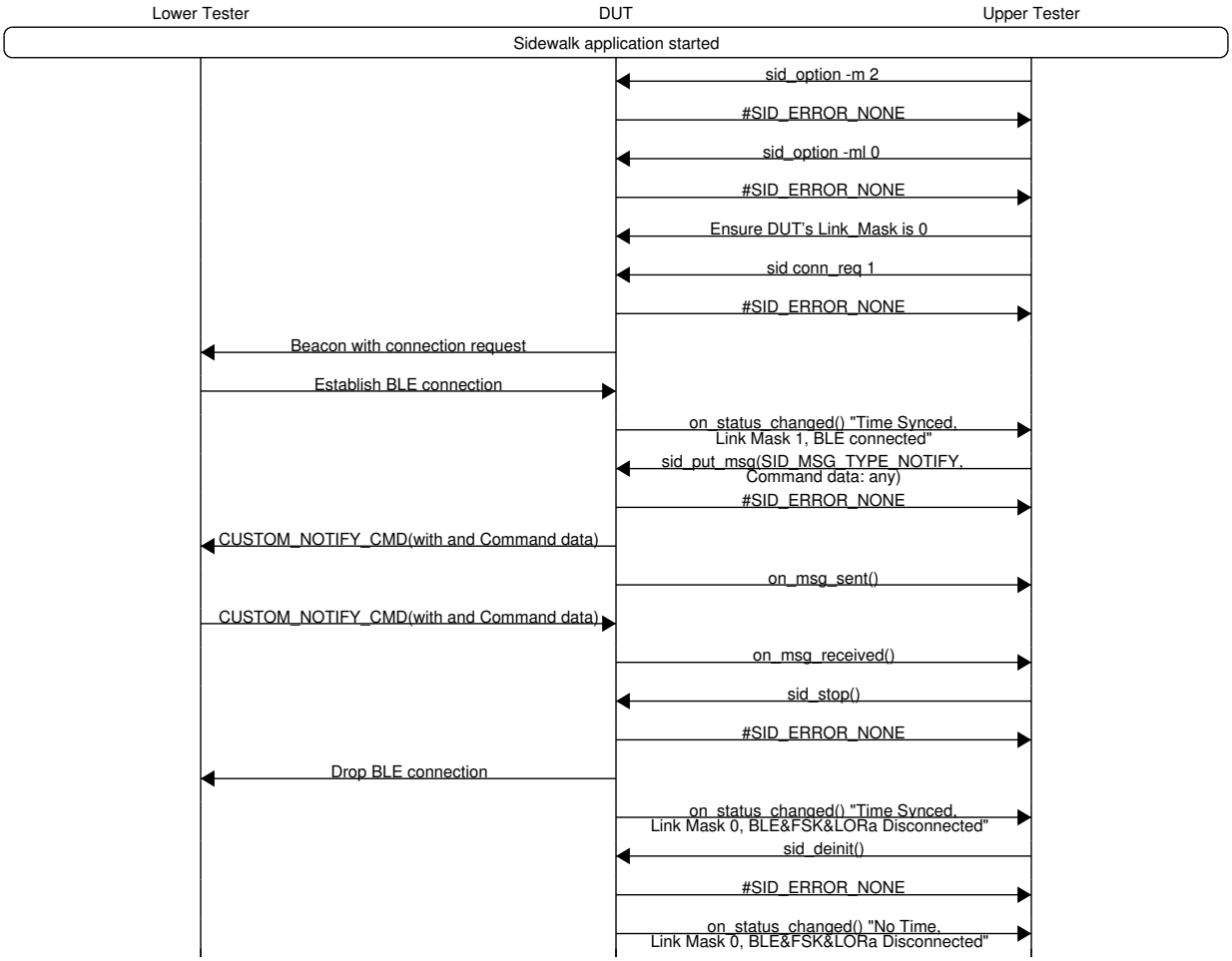
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates BLE mode.

7.20.3 Test Procedure



7.20.4 Expected Results

7.20.4.1 Pass Verdict

A registered DUT should send an uplink via BLE directly.

7.21 MULTI-LINK/EP/MLM-POWER/UL/BV/01: UL sent through BLE when no connection.

7.21.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM POWER policy, which is BLE>FSK>LoRa.

7.21.2 Initial Conditions

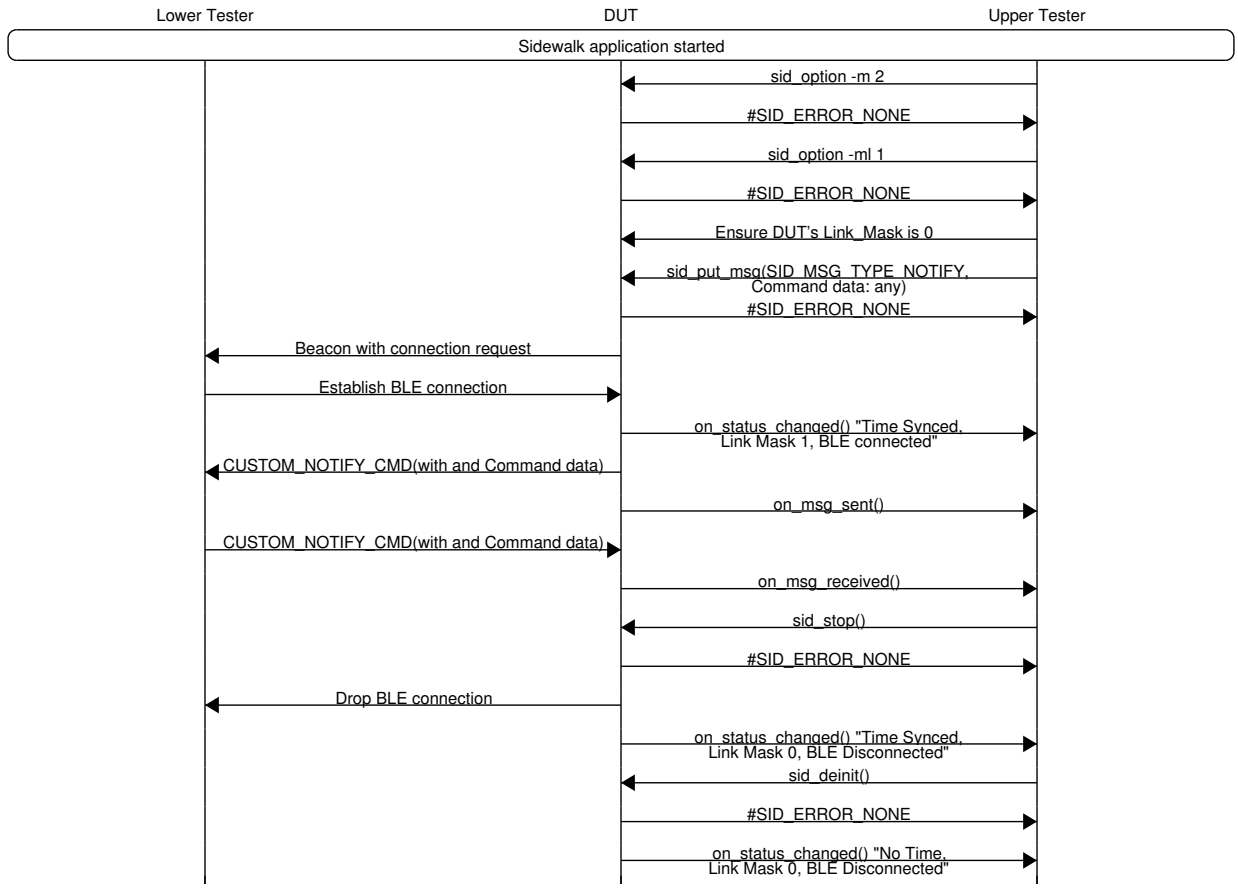
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in BLE mode

7.21.3 Test Procedure



7.21.4 Expected Results

7.21.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.22 MULTI-LINK/EP/MLM-POWER/UL/BV/02: UL sent through FSK when no connection.

7.22.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM POWER policy, which is BLE>FSK>LoRa.

7.22.2 Initial Conditions

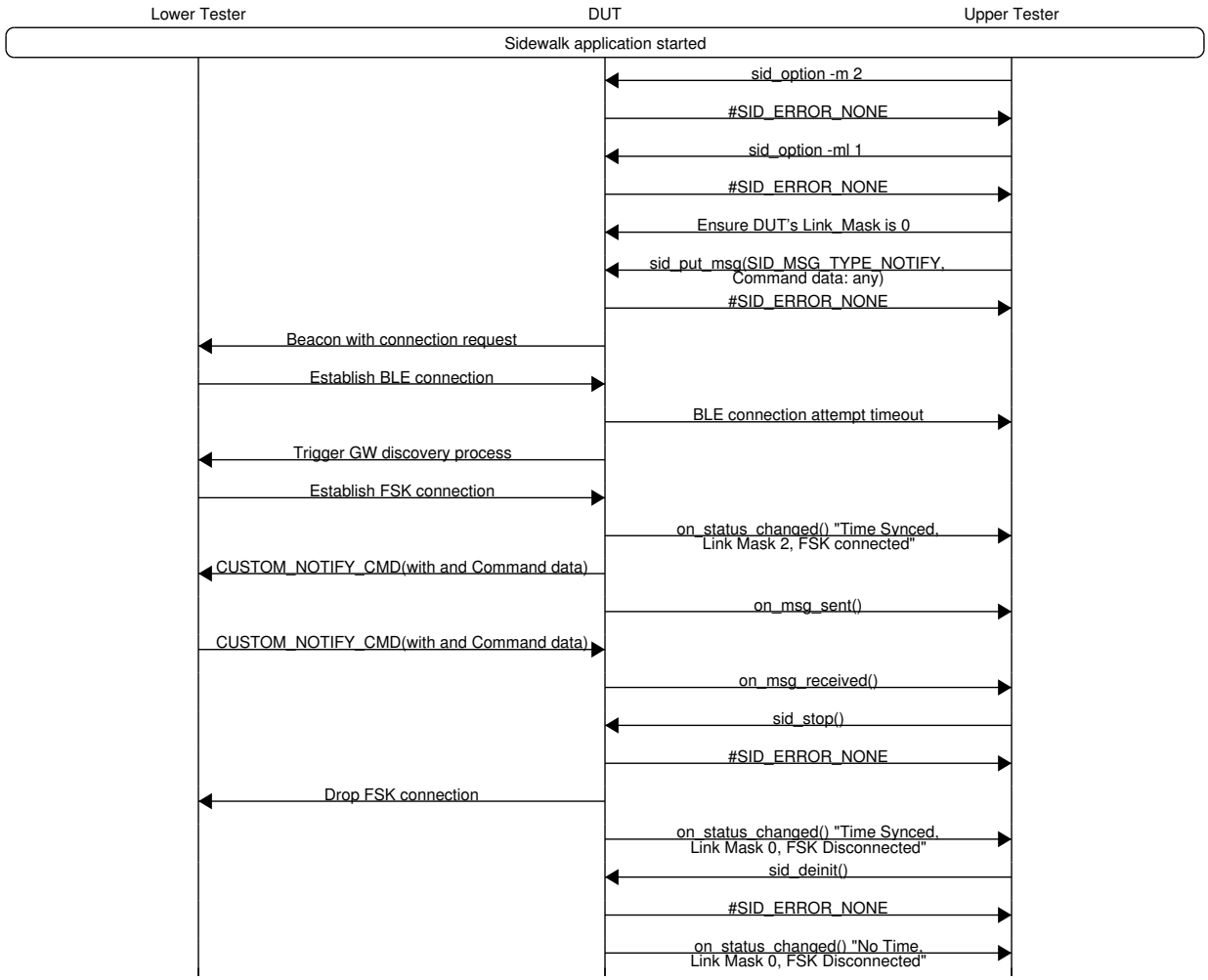
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode

7.22.3 Test Procedure



7.22.4 Expected Results

7.22.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.23 MULTI-LINK/EP/MLM-POWER/UL/BV/03: UL sent through LoRa when no connection.

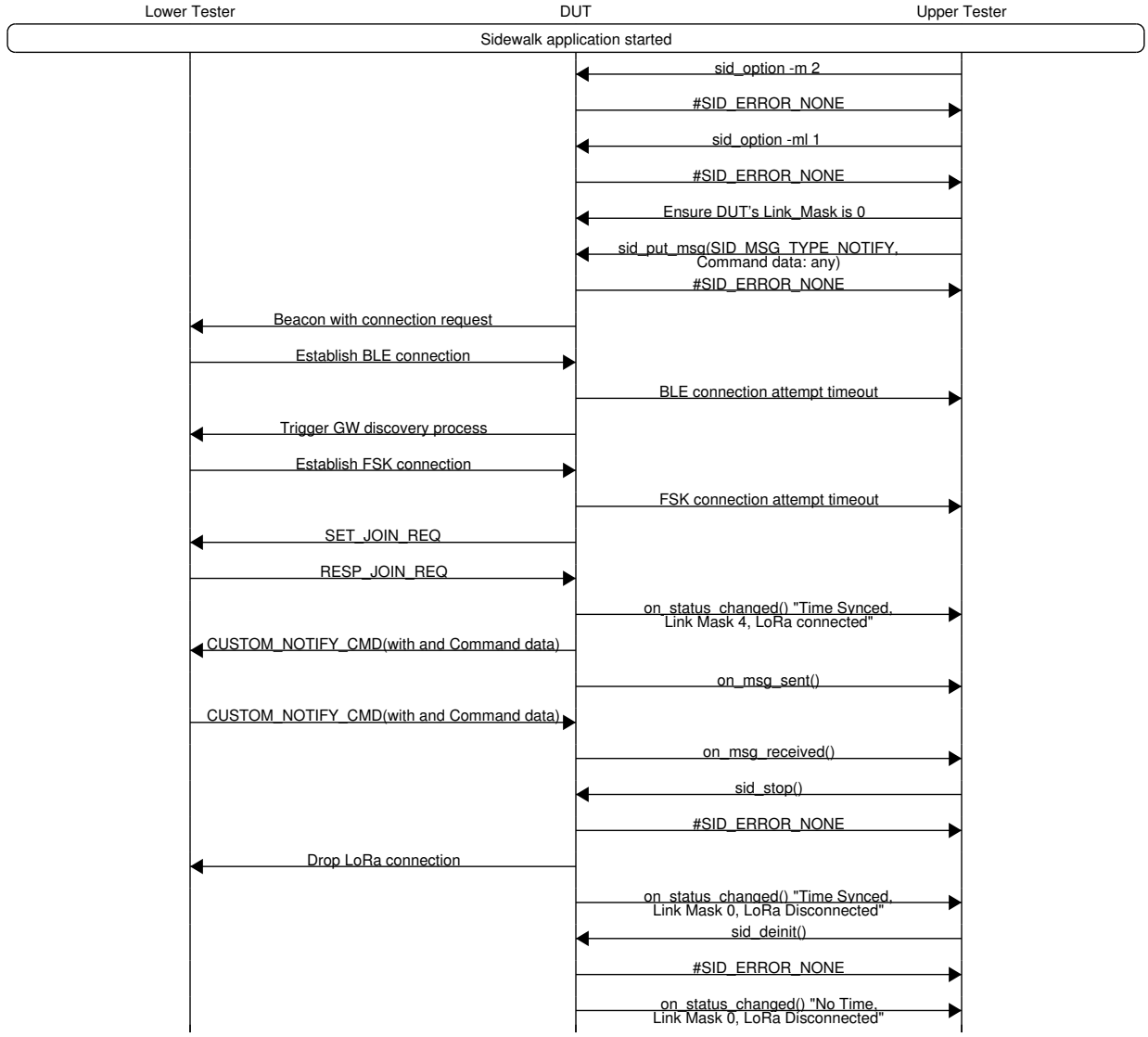
7.23.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM POWER policy, which is BLE>FSK>LoRa.

7.23.2 Initial Conditions

- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in LoRa mode

7.23.3 Test Procedure



7.23.4 Expected Results

7.23.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK and fail. Afterward, it should attempt to connect with LoRa on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.24 MULTI-LINK/EP/MLM-POWER/UL/BV/04: UL not send when no connection and BLE/FSK/LoRa unavailable.

7.24.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type. The DUT will halt the connection search process if it cannot connect with the proper link type before the TTL has expired. Once the TTL has expired, a background process may or may not be triggered according to the configured MLM policy. For MLM POWER, the background process should not be triggered. The TTL will be equal to the LoRa link type's TTL.

7.24.2 Initial Conditions

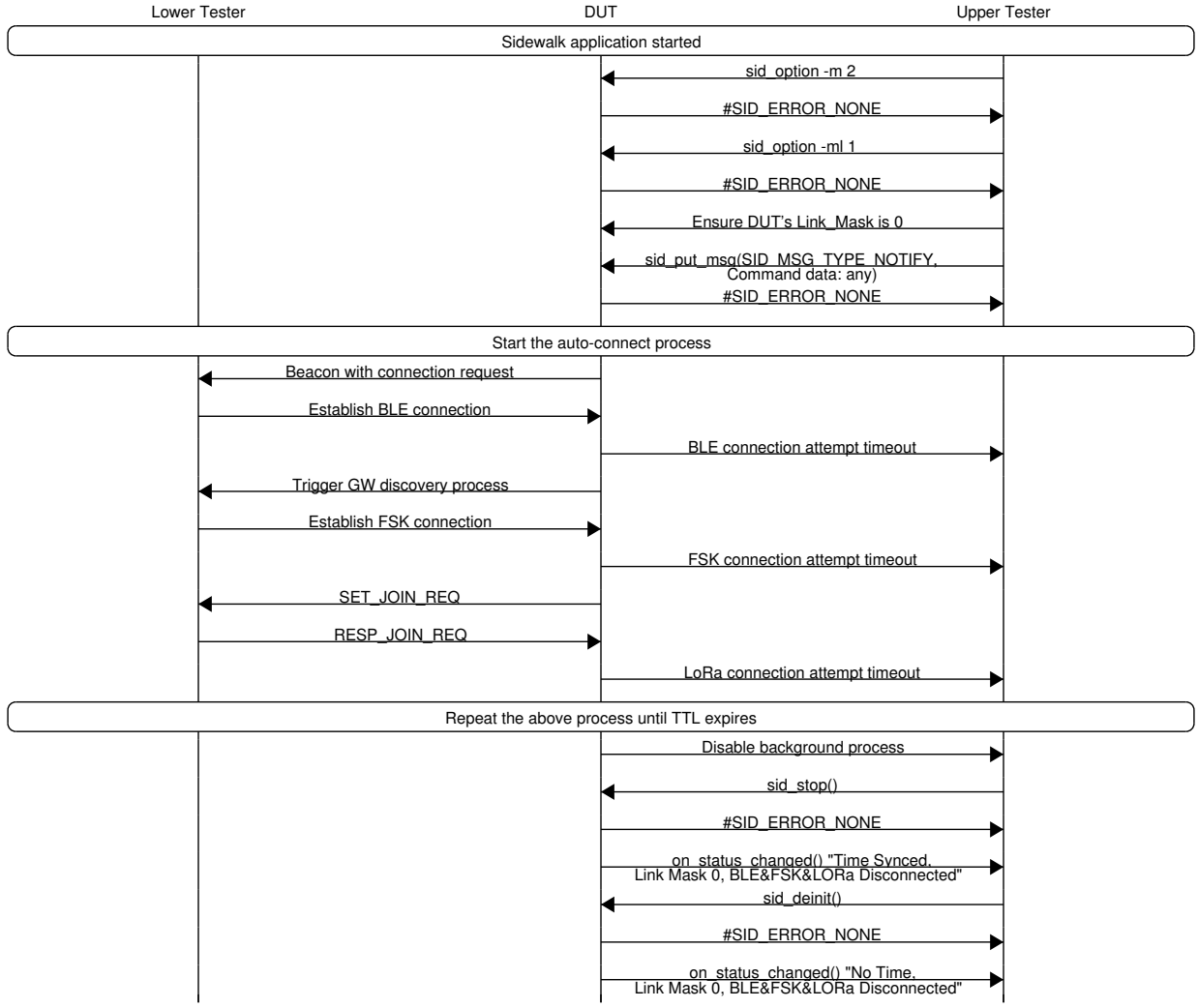
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE & FSK & LoRa mode

7.24.3 Test Procedure



7.24.4 Expected Results

7.24.4.1 Pass Verdict

A registered DUT should attempt to connect with BLE and fail, then try to connect with FSK and fail, and attempt to connect with LoRa and fail. The DUT will repeat the same process and stop it after the TTL has expired. Once the TTL is expired, the background process should not be triggered (indicating that the DUT will not attempt to connect with each link type).

7.25 MULTI-LINK/EP/MLM-POWER/UL/BV/05: UL sent through BLE when EN's Link_Mask is 1.

7.25.1 Test Purpose

When the link is connected, a registered MLM POWER DUT does not initiate a connection but sends out a message on the connected link.

7.25.2 Initial Conditions

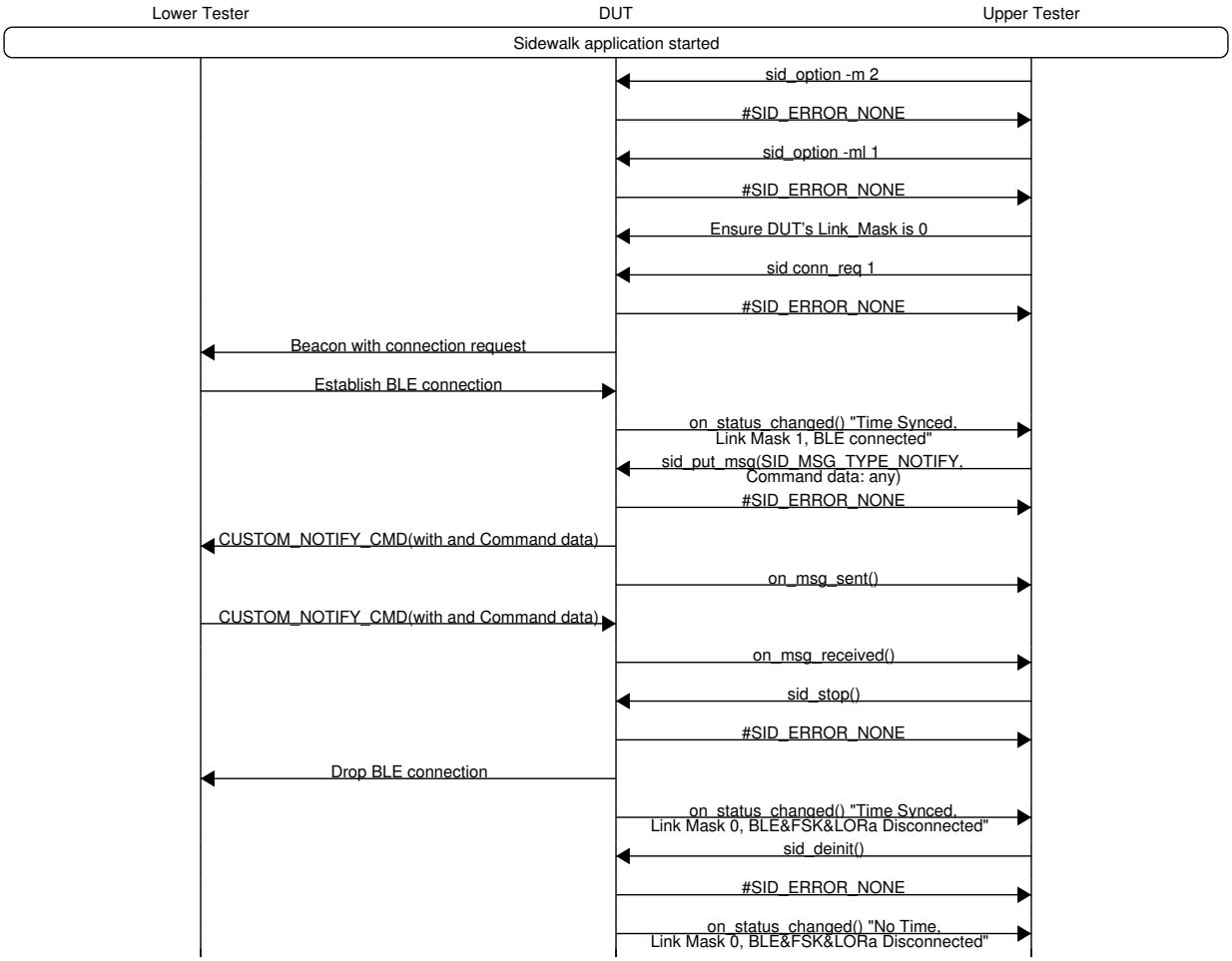
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates BLE mode.

7.25.3 Test Procedure



7.25.4 Expected Results

7.25.4.1 Pass Verdict

A registered DUT should send an uplink via BLE directly.

7.26 MULTI-LINK/EP/MLM-PERFORMANCE/UL/BV/01: UL sent through BLE when no connection.

7.26.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM PERFORMANCE policy, which is BLE>FSK>LoRa.

7.26.2 Initial Conditions

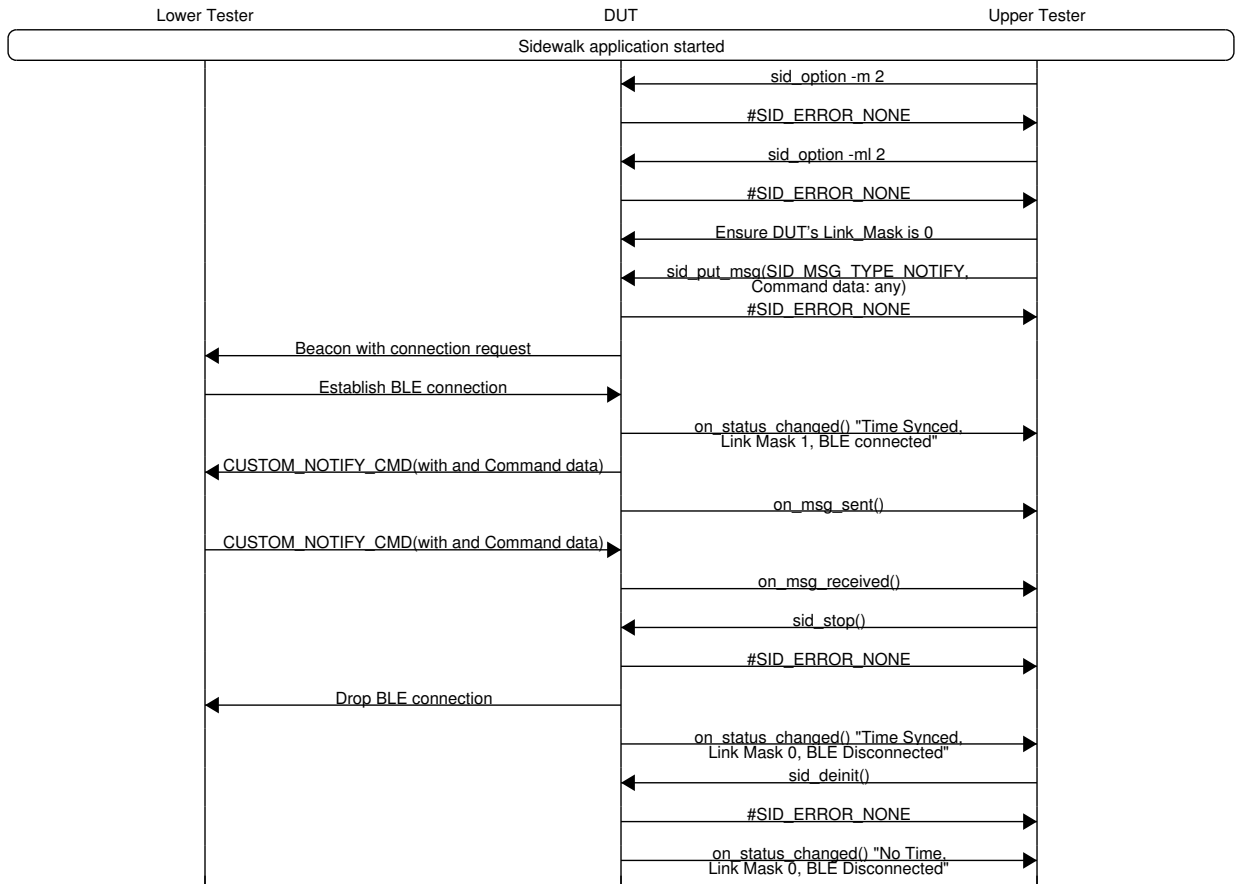
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in BLE mode

7.26.3 Test Procedure



7.26.4 Expected Results

7.26.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.27 MULTI-LINK/EP/MLM-PERFORMANCE/UL/BV/02: UL sent through FSK when no connection.

7.27.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM PERFORMANCE policy, which is BLE>FSK>LoRa.

7.27.2 Initial Conditions

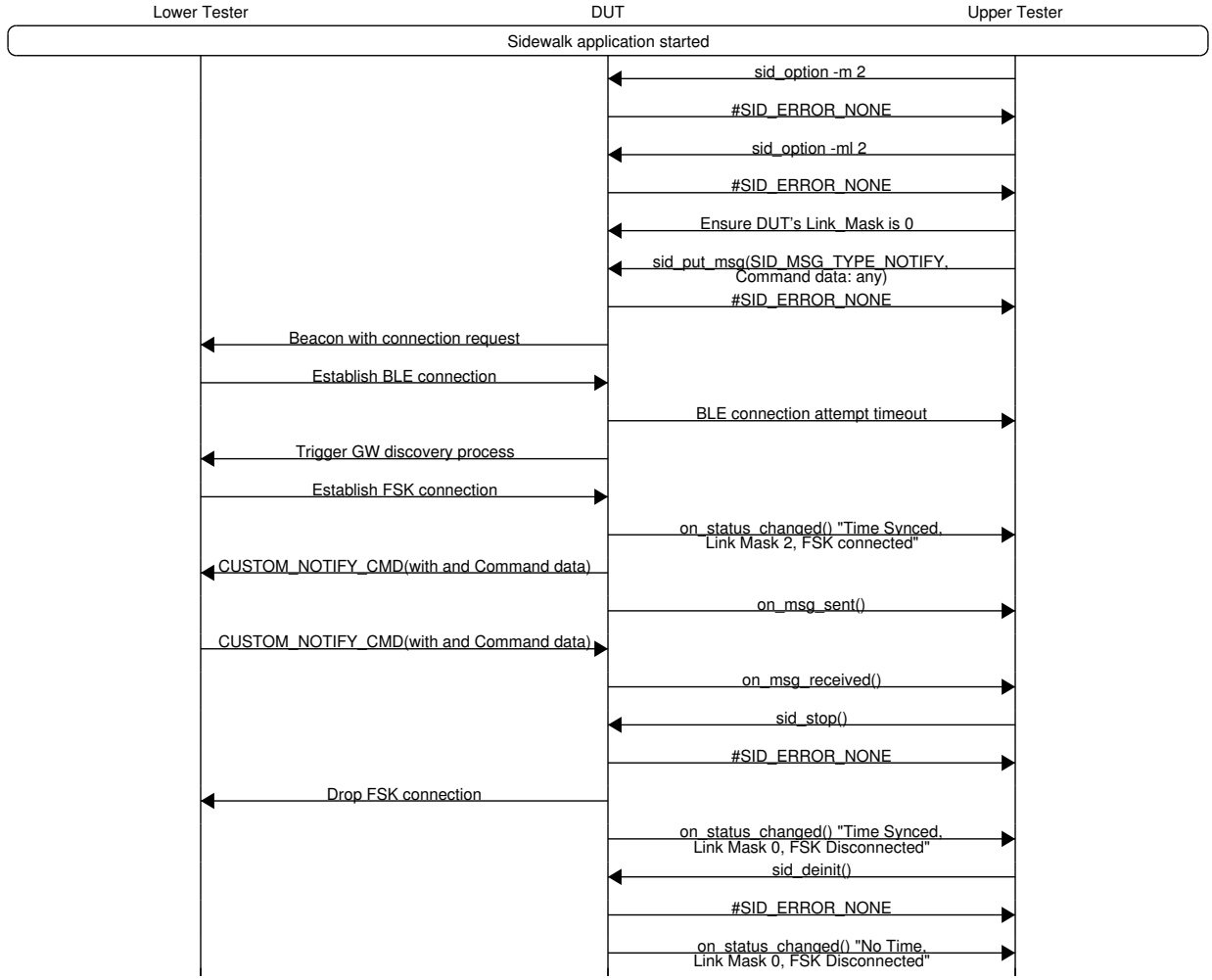
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode

7.27.3 Test Procedure



7.27.4 Expected Results

7.27.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.28 MULTI-LINK/EP/MLM-PERFORMANCE/UL/BV/03: UL sent through LoRa when no connection.

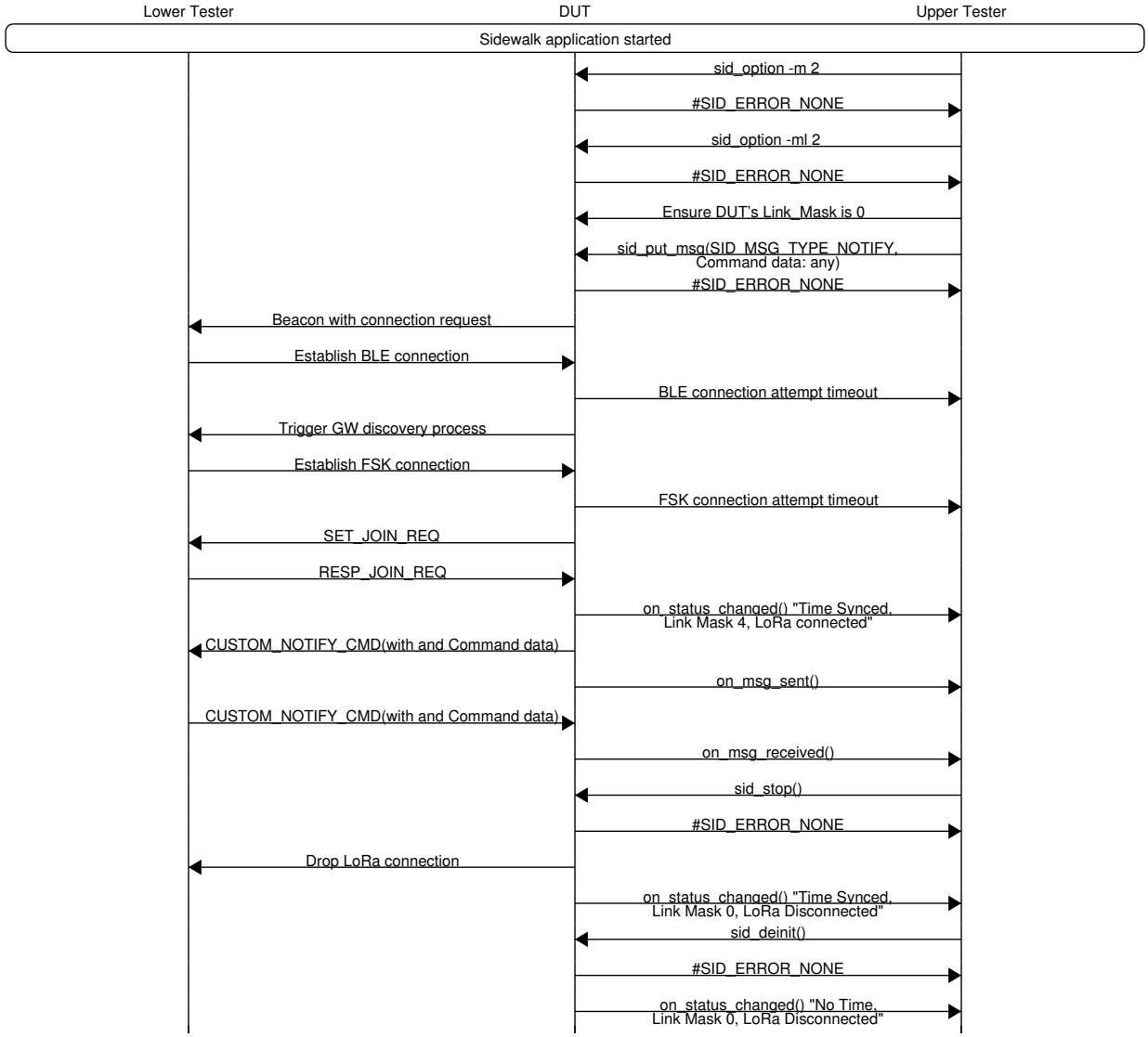
7.28.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM PERFORMANCE policy, which is BLE>FSK>LoRa.

7.28.2 Initial Conditions

- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in LoRa mode

7.28.3 Test Procedure



7.28.4 Expected Results

7.28.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK and fail. Afterward, it should attempt to connect with LoRa on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.29 MULTI-LINK/EP/MLM-PERFORMANCE/UL/BV/04: UL not send when no connection and BLE/FSK/LoRa unavailable.

7.29.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type. The DUT will halt the connection search process if it cannot connect with the proper link type before the TTL has expired. Once the TTL has expired, a background process may or may not be triggered according to the configured MLM policy. For MLM PERFORMANCE, the background process should be triggered. The DUT will perform the background process (BLE>FSK>LoRa) indefinitely. The TTL will be equal to the LoRa link type's TTL.

7.29.2 Initial Conditions

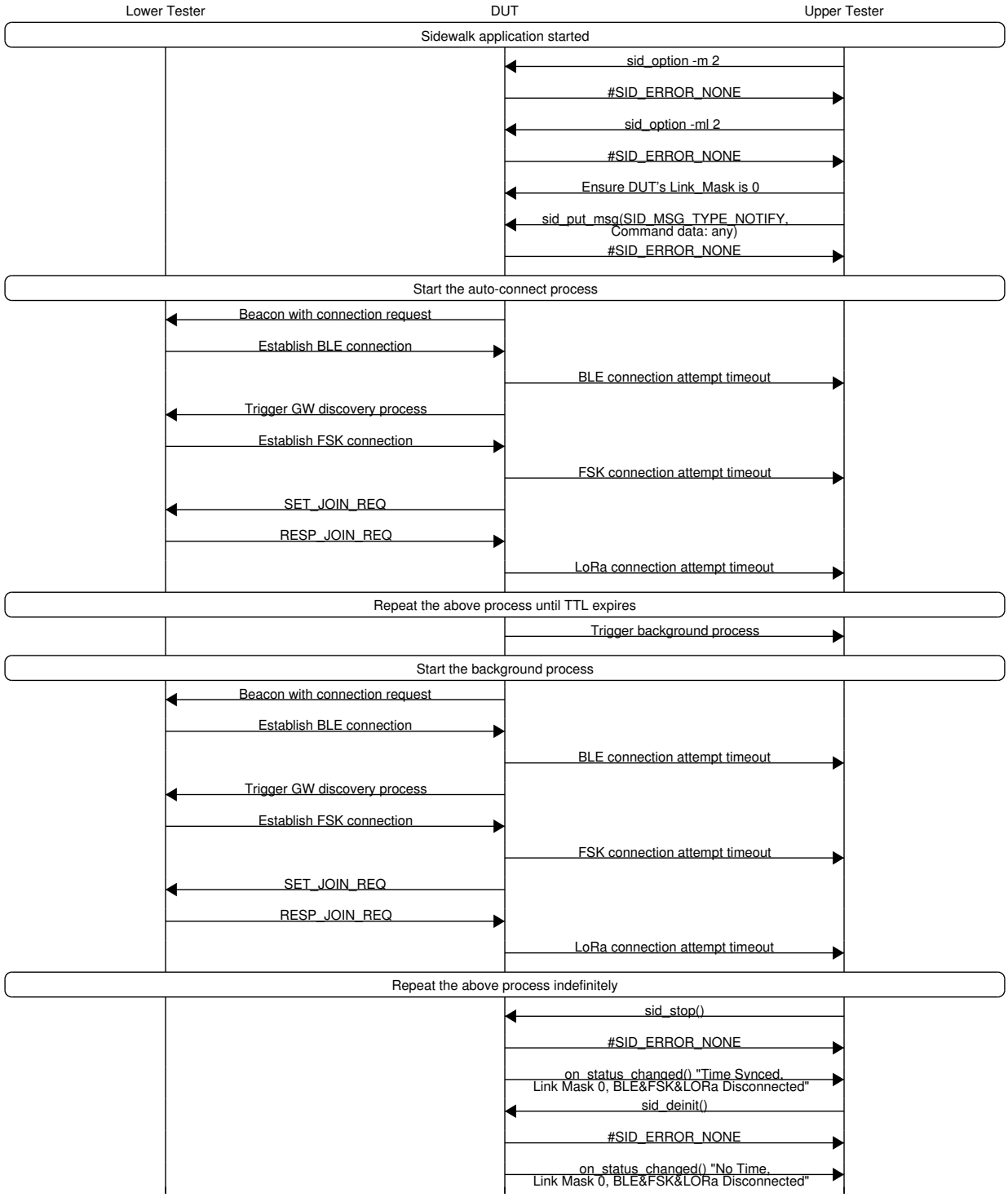
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE & FSK & LoRa mode

7.29.3 Test Procedure



7.29.4 Expected Results

7.29.4.1 Pass Verdict

A registered DUT should attempt to connect with BLE and fail, then try to connect with FSK and fail, and finally attempt to connect with LoRa and fail. This process should be repeated until the TTL expires. Once the TTL has expired, the background process should be triggered. The DUT will then try to connect with BLE, FSK, and LoRa indefinitely.

7.30 MULTI-LINK/EP/MLM-PERFORMANCE/UL/BV/05: UL sent through BLE when EN's Link_Mask is 1.

7.30.1 Test Purpose

When the link is connected, a registered MLM PERFORMANCE DUT does not initiate a connection but sends out a message on the connected link.

7.30.2 Initial Conditions

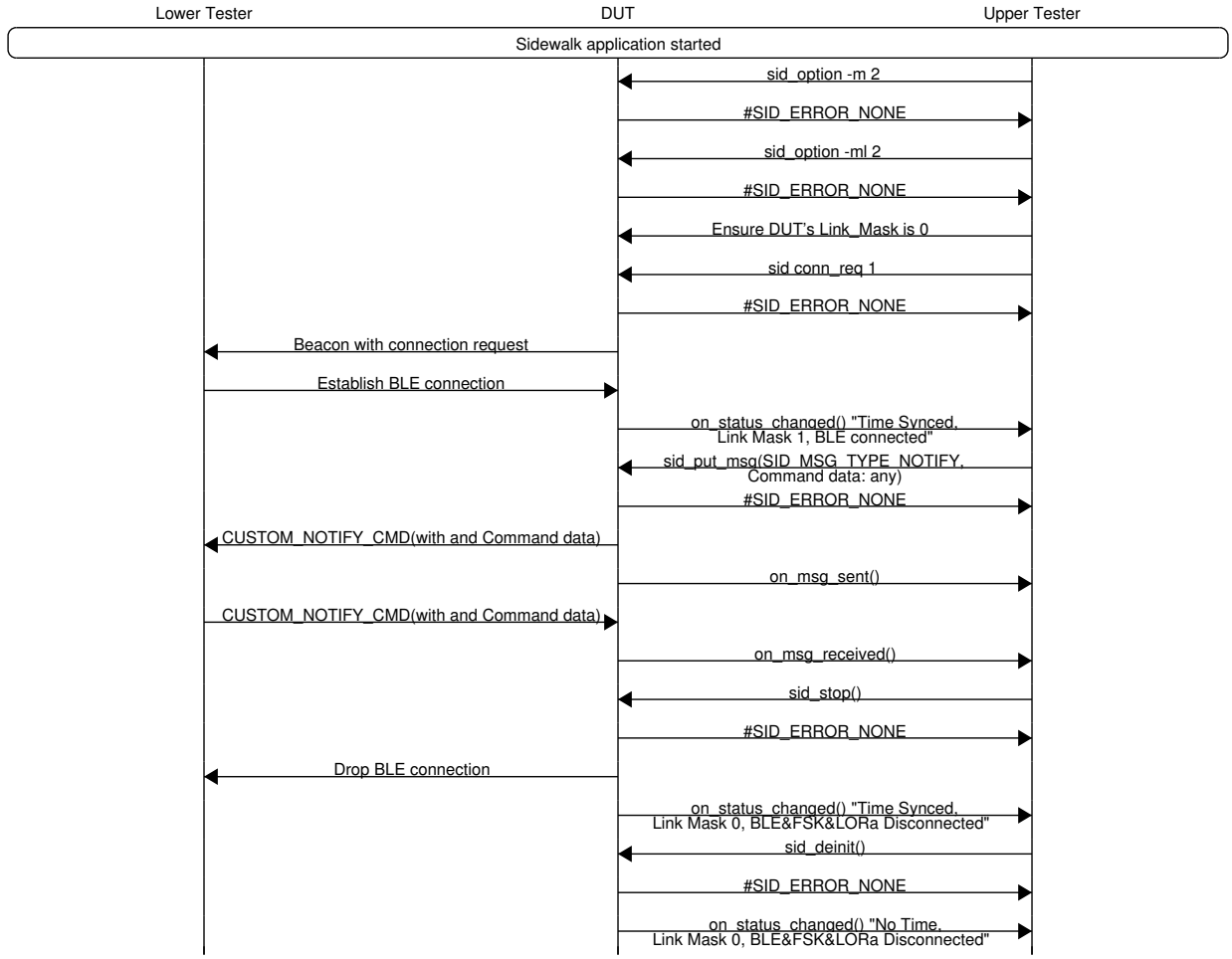
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates BLE mode.

7.30.3 Test Procedure



7.30.4 Expected Results

7.30.4.1 Pass Verdict

A registered DUT should send an uplink via BLE directly.

7.31 MULTI-LINK/EP/MLM-LATENCY/UL/BV/01: UL sent through BLE when no connection.

7.31.1 Test Purpose

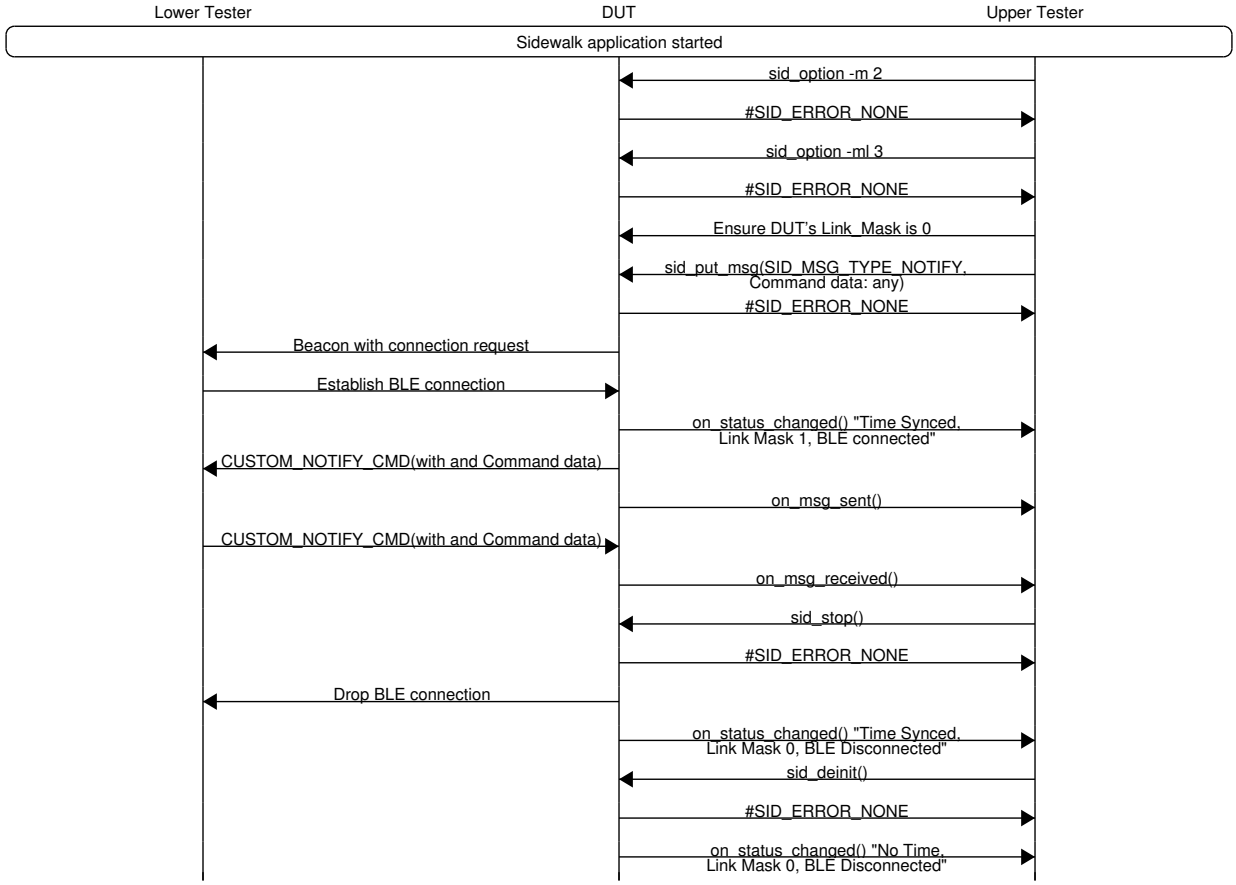
A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM LATENCY policy, which is BLE>FSK>LoRa.

7.31.2 Initial Conditions

- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode

7.31.3 Test Procedure



7.31.4 Expected Results

7.31.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.32 MULTI-LINK/EP/MLM-LATENCY/UL/BV/02: UL sent through FSK when no connection.

7.32.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM LATENCY policy, which is BLE>FSK>LoRa.

7.32.2 Initial Conditions

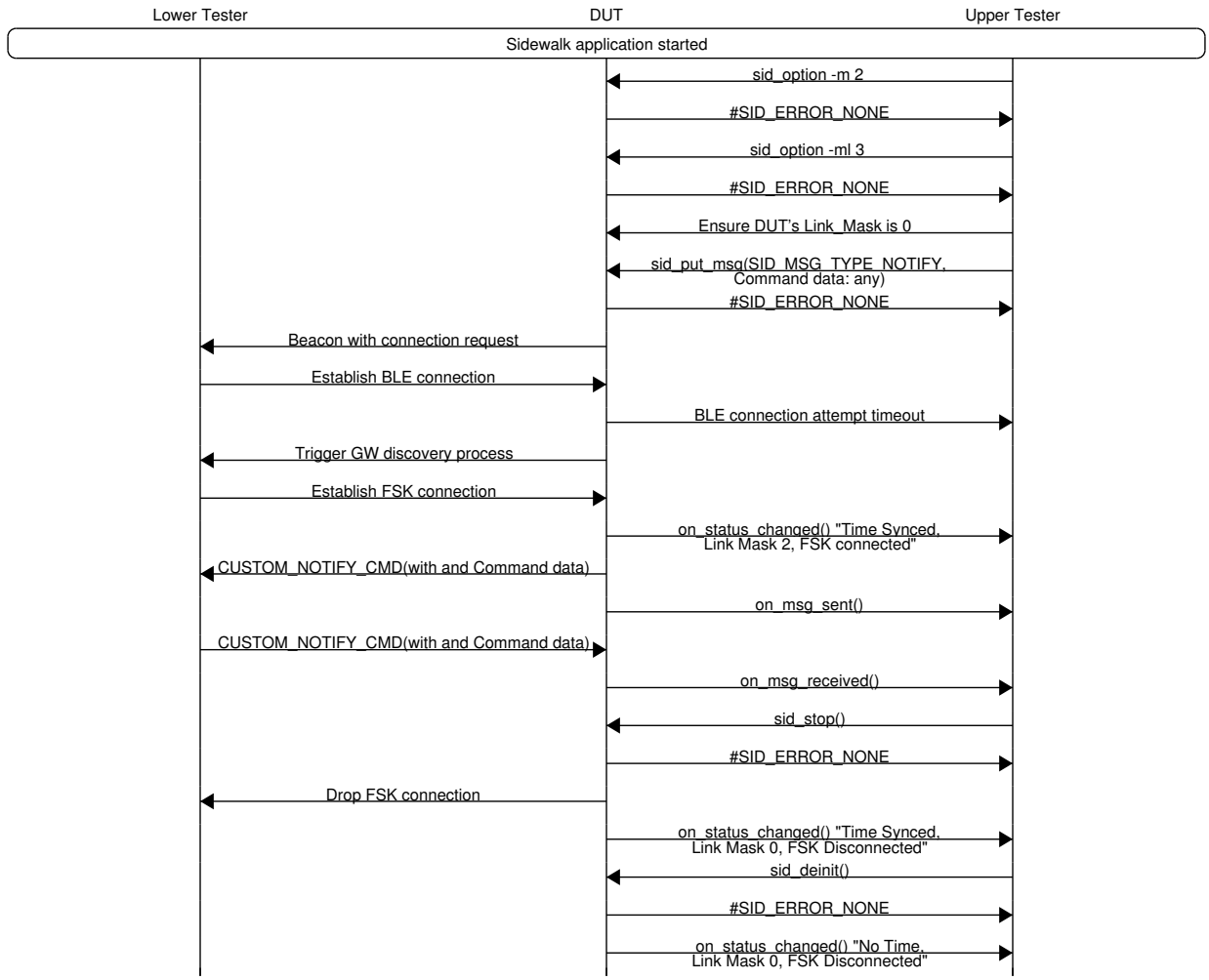
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode

7.32.3 Test Procedure



7.32.4 Expected Results

7.32.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.33 MULTI-LINK/EP/MLM-LATENCY/UL/BV/03: UL sent through LoRa when no connection.

7.33.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM LATENCY policy, which is BLE>FSK>LoRa.

7.33.2 Initial Conditions

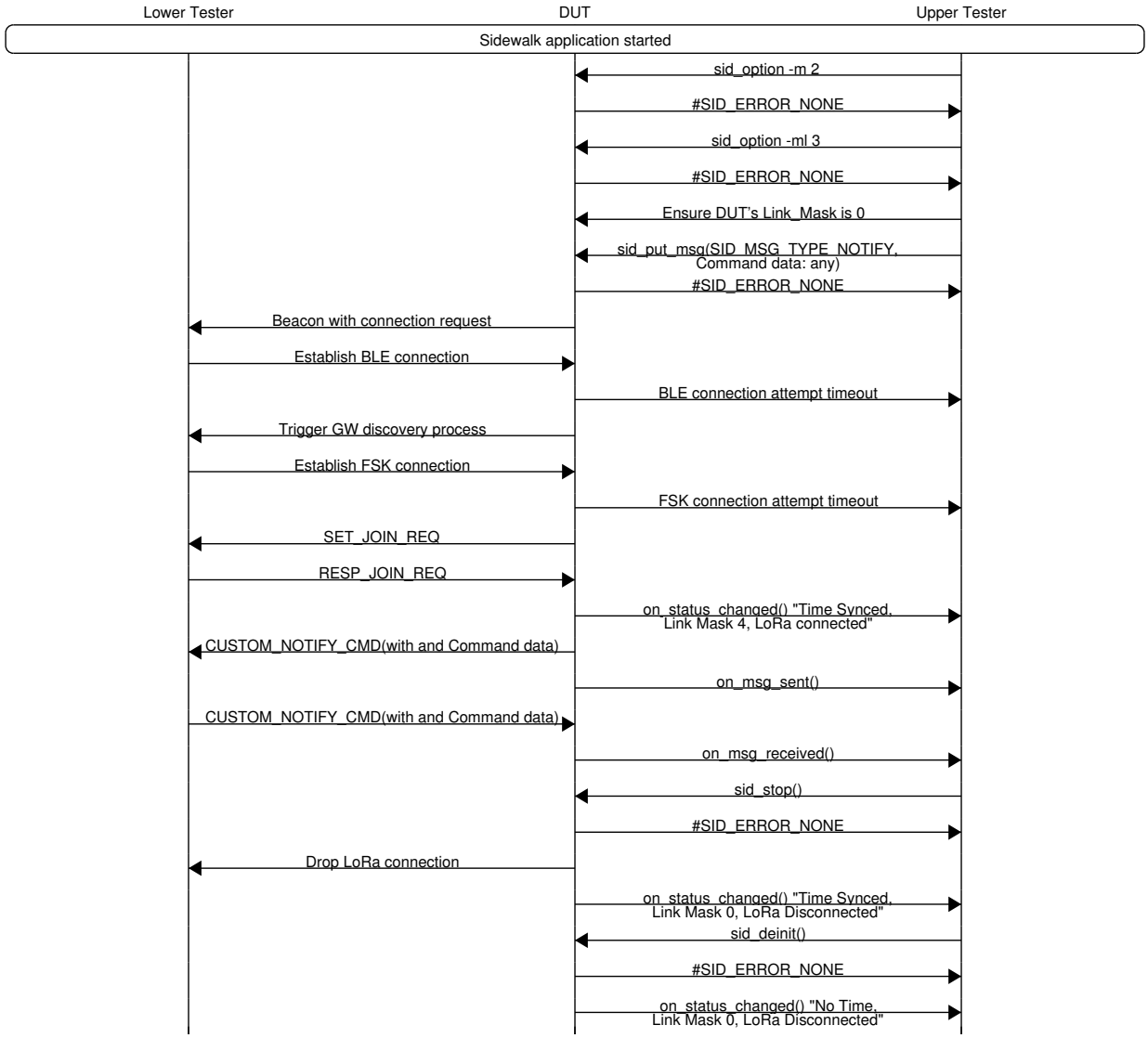
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode

7.33.3 Test Procedure



7.33.4 Expected Results

7.33.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK and fail. Afterward, it should attempt to connect with LoRa on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.34 MULTI-LINK/EP/MLM-LATENCY/UL/BV/04: UL not send when no connection and BLE/FSK/LoRa unavailable.

7.34.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type. The DUT will halt the connection search process if it cannot connect with the proper link type before the TTL has expired. Once the TTL has expired, a background process may or may not be triggered according to the configured MLM policy. For MLM LATENCY, the background process should be triggered. The DUT will perform the background process (BLE>FSK>LoRa) indefinitely. The TTL will be equal to the LoRa link type's TTL.

7.34.2 Initial Conditions

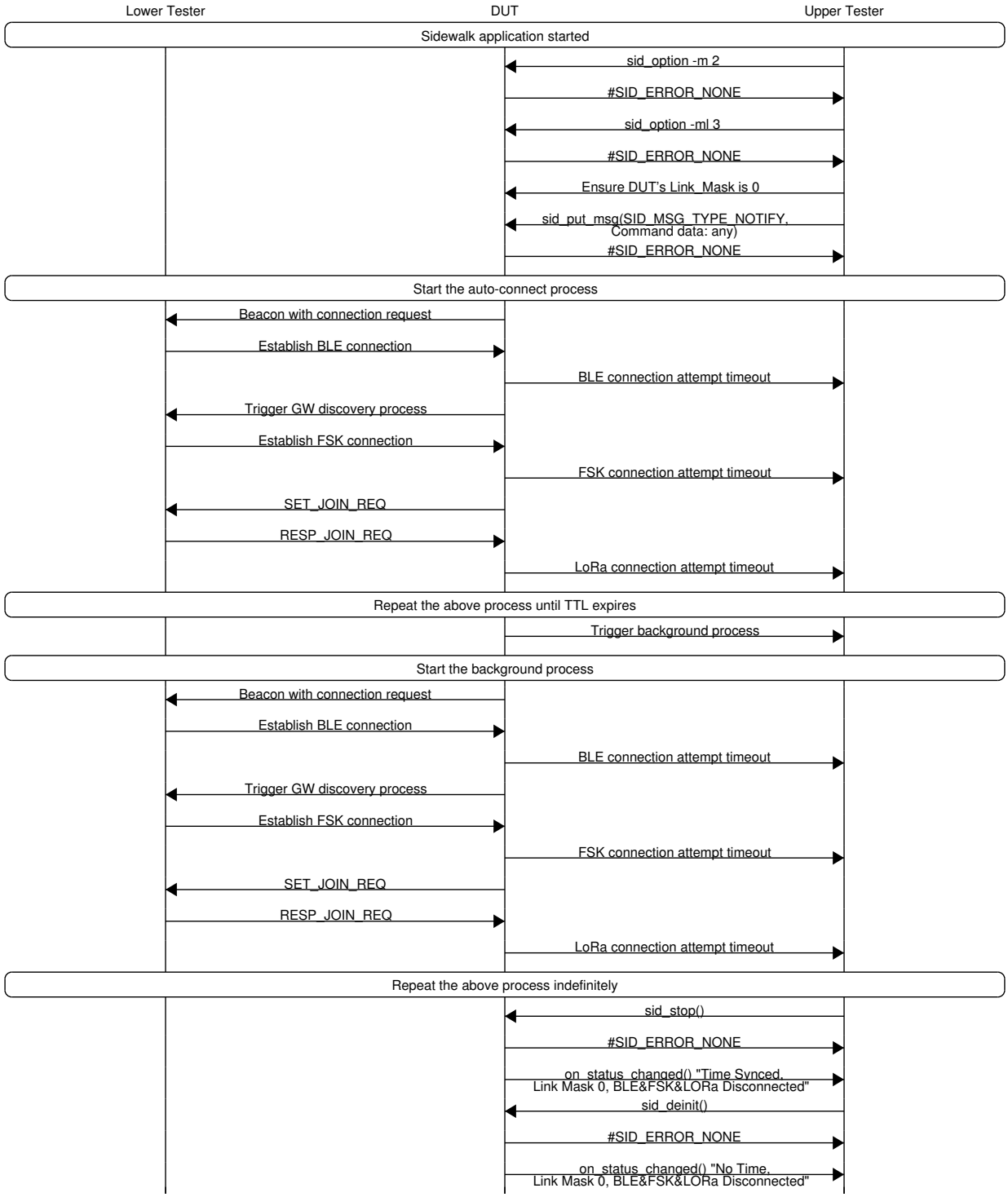
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE & FSK & LoRa mode

7.34.3 Test Procedure



7.34.4 Expected Results

7.34.4.1 Pass Verdict

A registered DUT should attempt to connect with BLE and fail, then try to connect with FSK and fail, and finally attempt to connect with LoRa and fail. This process should be repeated until the TTL expires. Once the TTL has expired, the background process should be triggered. The DUT will then try to connect with BLE, FSK, and LoRa indefinitely.

7.35 MULTI-LINK/EP/MLM-LATENCY/UL/BV/05: UL sent through BLE when EN's Link_Mask is 1.

7.35.1 Test Purpose

When the link is connected, a registered MLM LATENCY DUT does not initiate a connection but sends out a message on the connected link.

7.35.2 Initial Conditions

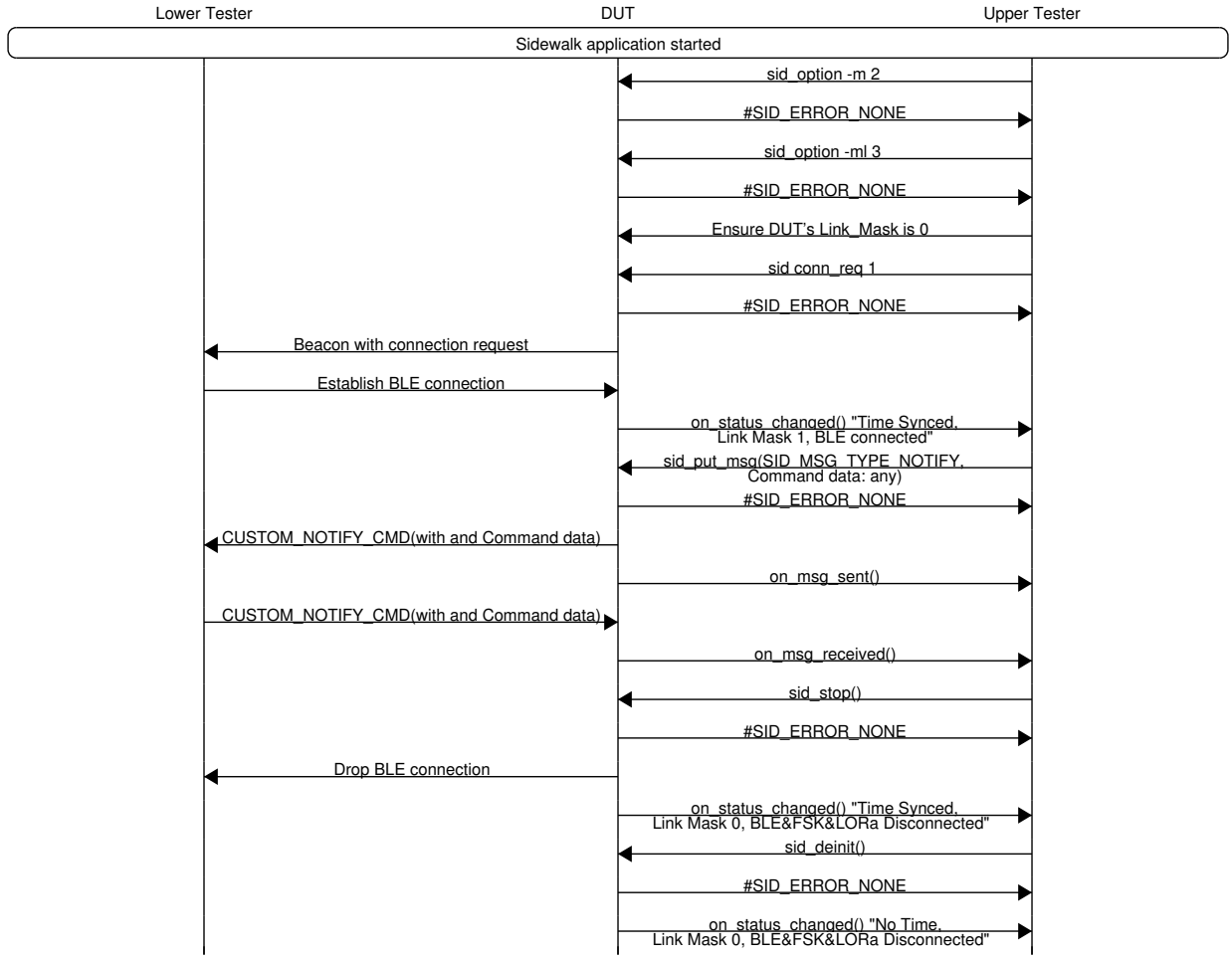
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates BLE mode.

7.35.3 Test Procedure



7.35.4 Expected Results

7.35.4.1 Pass Verdict

A registered DUT should send an uplink via BLE directly.

7.36 MULTI-LINK/EP/MLM-RELIABILITY/UL/BV/01: UL sent through BLE when no connection.

7.36.1 Test Purpose

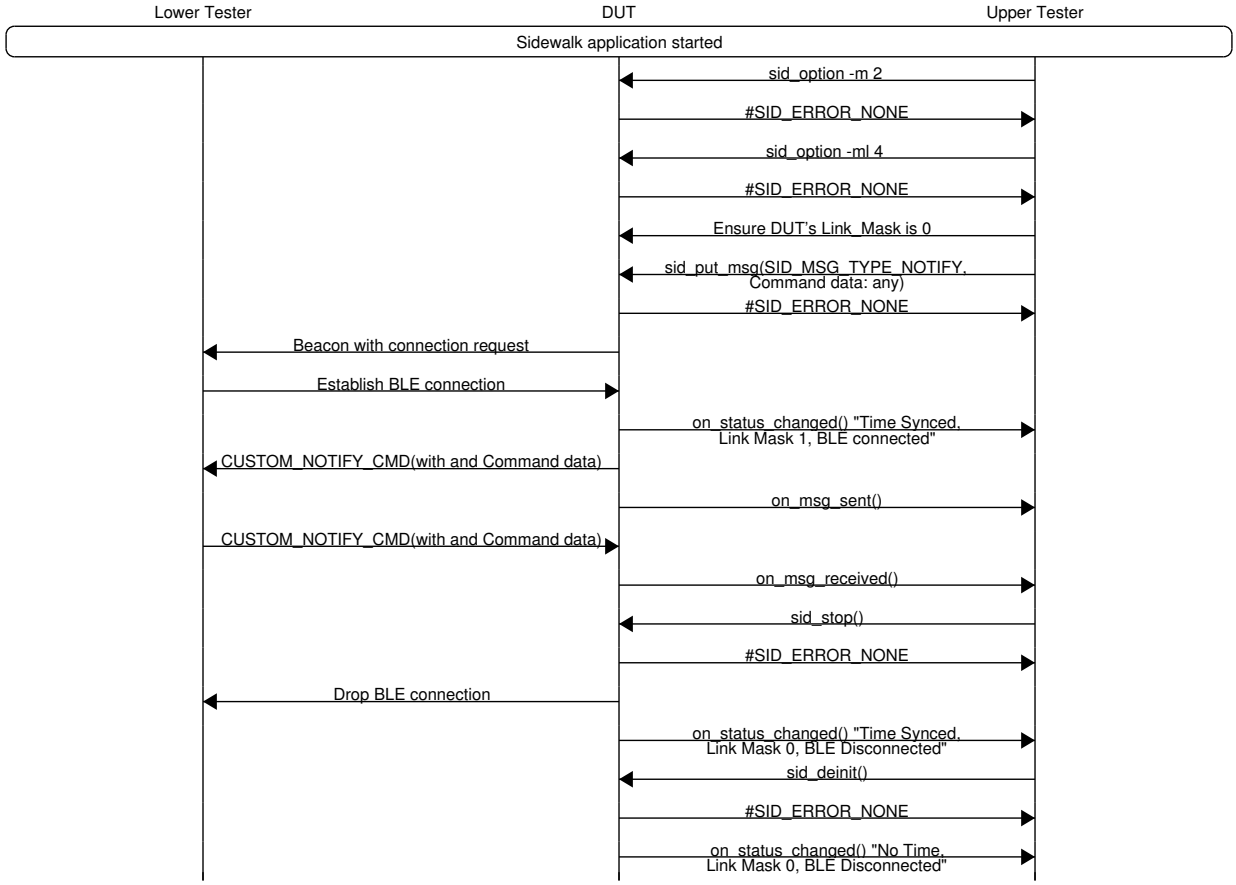
A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM RELIABILITY policy, which is BLE>FSK>LoRa.

7.36.2 Initial Conditions

- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode

7.36.3 Test Procedure



7.36.4 Expected Results

7.36.4.1 Pass Verdict

A registered DUT should successfully establish a BLE connection with the Lower Tester and send an uplink.

7.37 MULTI-LINK/EP/MLM-RELIABILITY/UL/BV/02: UL sent through FSK when no connection.

7.37.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM RELIABILITY policy, which is BLE>FSK>LoRa.

7.37.2 Initial Conditions

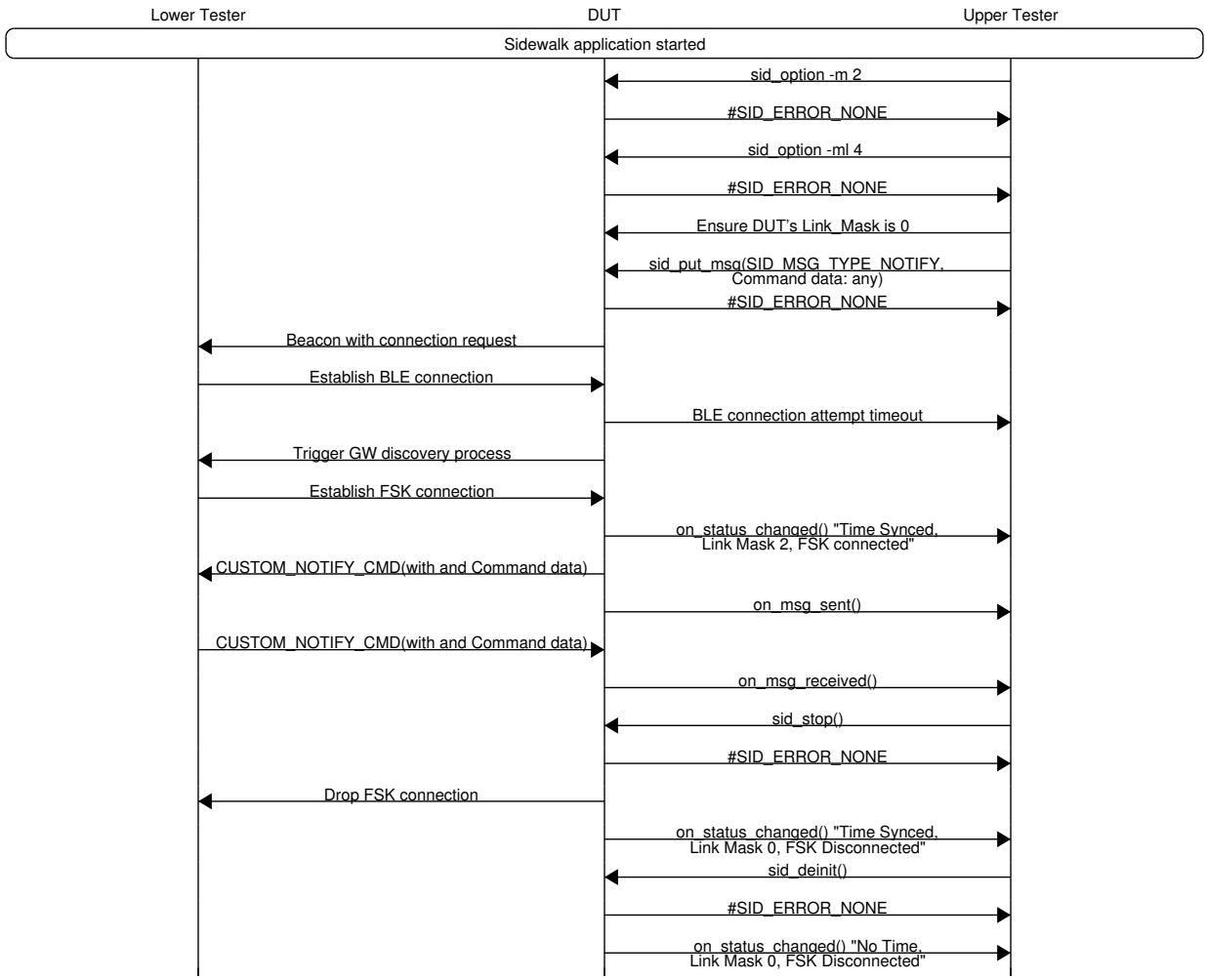
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode

7.37.3 Test Procedure



7.37.4 Expected Results

7.37.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.38 MULTI-LINK/EP/MLM-RELIABILITY/UL/BV/03: UL sent through LoRa when no connection.

7.38.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type, following the priority table defined by the MLM policy, when sending an uplink with a Link_Mask 0 status. Specifically, in this instance, the DUT should adhere to the priority of the MLM RELIABILITY policy, which is BLE>FSK>LoRa.

7.38.2 Initial Conditions

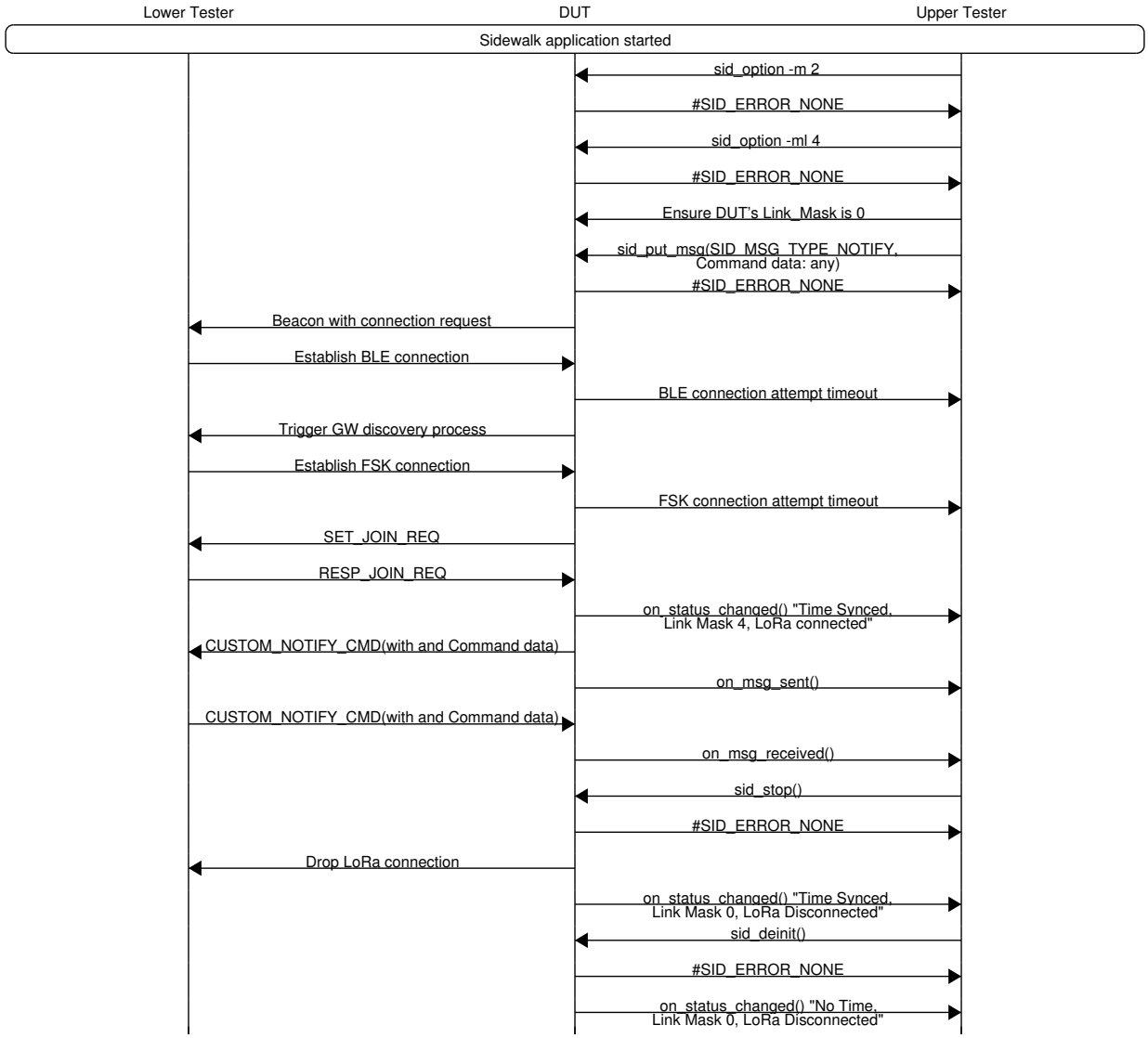
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode

7.38.3 Test Procedure



7.38.4 Expected Results

7.38.4.1 Pass Verdict

A registered DUT should try to connect with BLE and fail, then attempt to connect with FSK and fail. Afterward, it should attempt to connect with LoRa on the Lower Tester and send the uplink automatically when sending an uplink with a Link_Mask 0 status.

7.39 MULTI-LINK/EP/MLM-RELIABILITY/UL/BV/04: UL not send when no connection and BLE/FSK/LoRa unavailable.

7.39.1 Test Purpose

A registered DUT configured with the MLM policy will attempt to establish a connection with each link type and send an uplink via the connected link type. The DUT will halt the connection search process if it cannot connect with the proper link type before the TTL has expired. Once the TTL has expired, a background process may or may not be triggered according to the configured MLM policy. For MLM RELIABILITY, the background process should be triggered. The DUT will perform the background process (FSK>LoRa) indefinitely. The TTL will be equal to the LoRa link type's TTL.

7.39.2 Initial Conditions

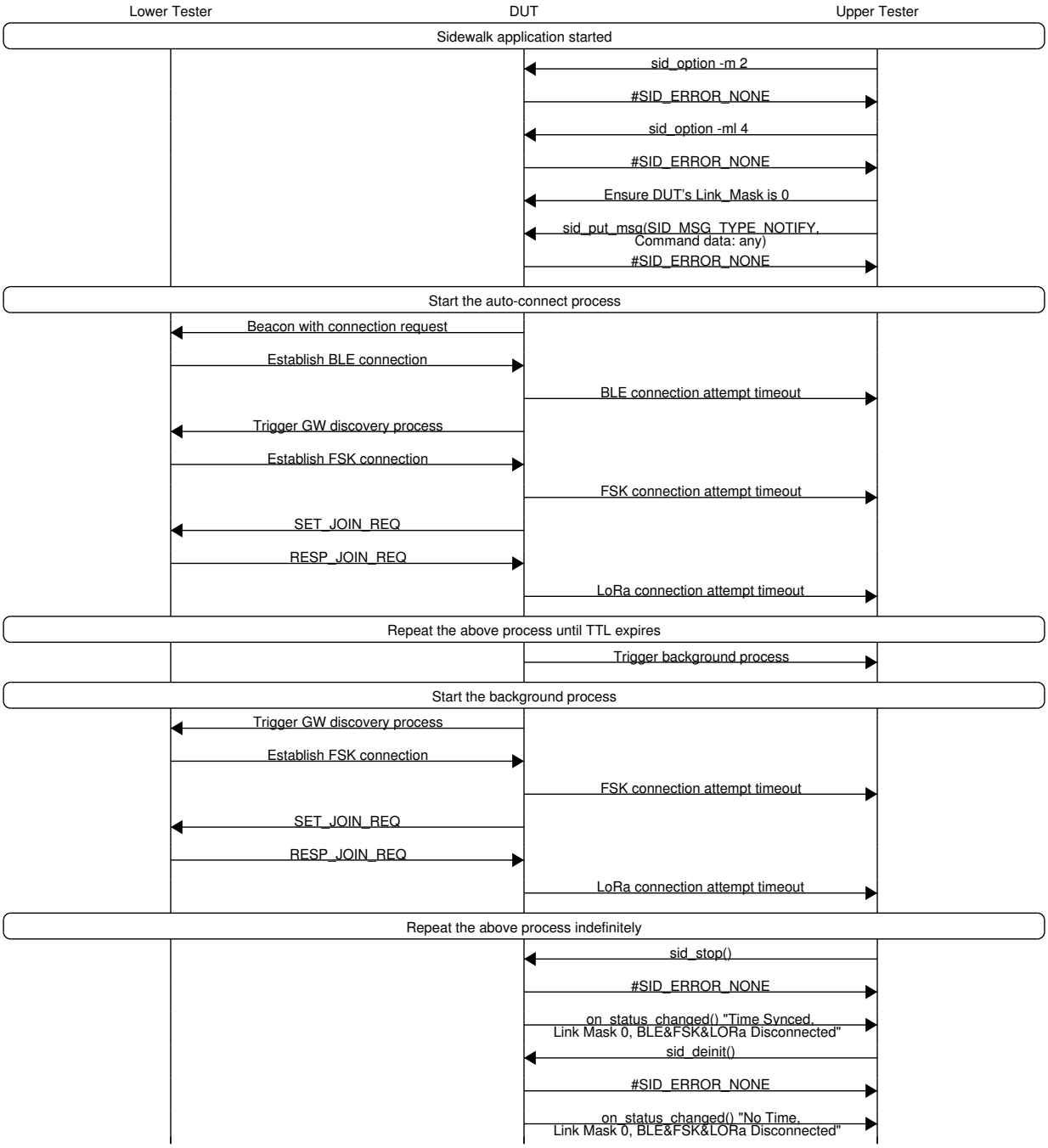
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester disables BLE & FSK & LoRa mode

7.39.3 Test Procedure



7.39.4 Expected Results

7.39.4.1 Pass Verdict

A registered DUT should attempt to connect with BLE and fail, then try to connect with FSK and fail, and finally attempt to connect with LoRa and fail. This process should be repeated until the TTL expires. Once the TTL has expired, the background process should be triggered. The DUT will then try to connect with FSK, and LoRa indefinitely.

7.40 MULTI-LINK/EP/MLM-RELIABILITY/UL/BV/05: UL sent through BLE when EN's Link_Mask is 1.

7.40.1 Test Purpose

When the link is connected, a registered MLM RELIABILITY DUT does not initiate a connection but sends out a message on the connected link.

7.40.2 Initial Conditions

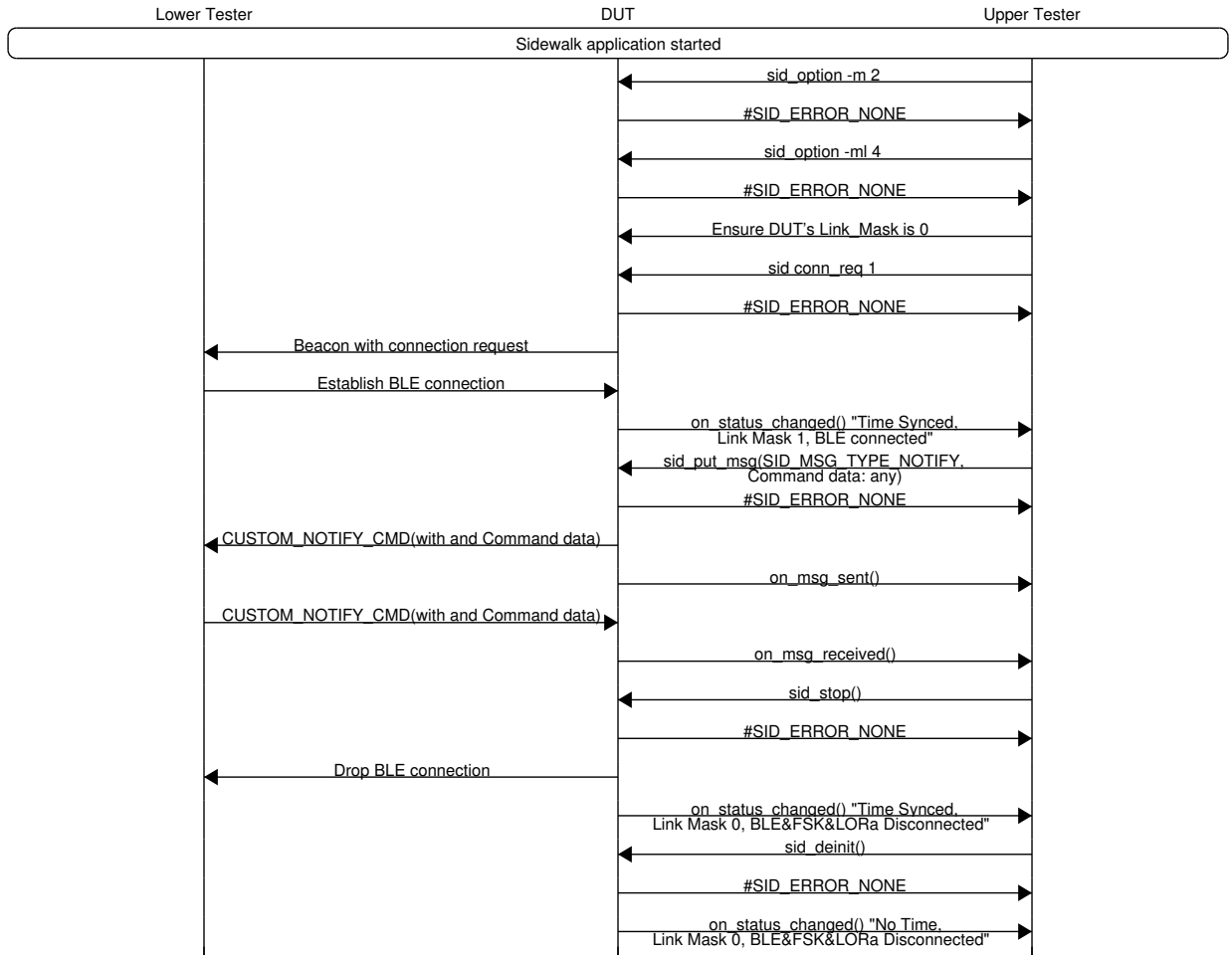
- The Sidewalk stack (BLE+FSK+LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates BLE mode.

7.40.3 Test Procedure



7.40.4 Expected Results

7.40.4.1 Pass Verdict

A registered DUT should send an uplink via BLE directly.

Chapter 8

File-Transfer Test Cases

8.1 BLE/EP/API/FILETRANSFER/BV/01: Initialize the feature and start receiving a file.

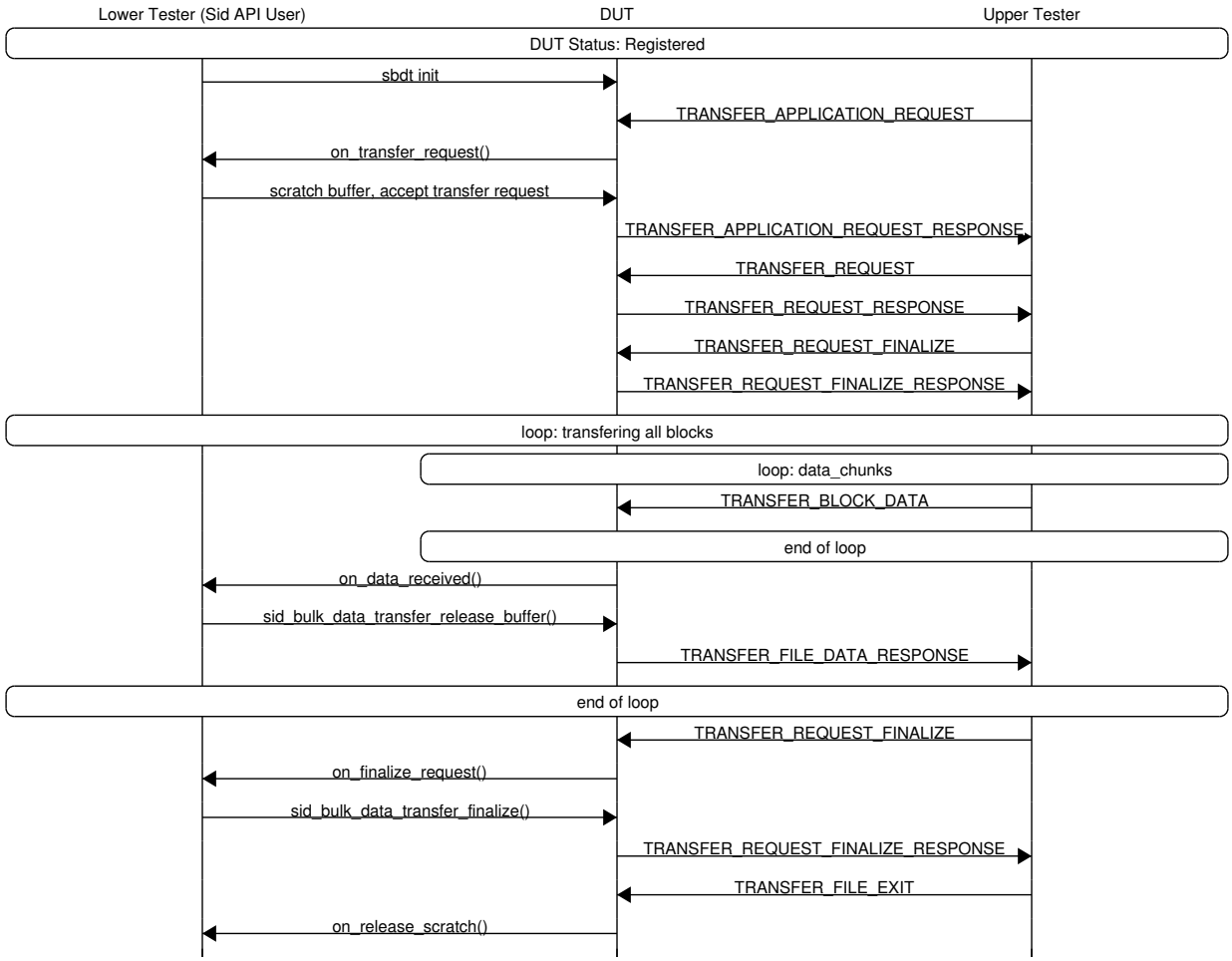
8.1.1 Test Purpose

DUT is able to initialize the feature and be ready for the coming request of data transfer. DUT is able to finish a transfer.

8.1.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates as a Sid API user.
- Upper Tester is ready on AWS IOT side.

8.1.3 Test Procedure



8.1.4 Expected Results

8.1.4.1 Pass Verdict

The DUT should successfully complete the data transfer with the Upper Tester and send a task complete notify to AWS IOT side.

8.2 BLE/EP/API/FILETRANSFER/BV/02: Cancel ongoing transfer.

8.2.1 Test Purpose

DUT is able to cancel the ongoing data transfer with a given file_id.

8.2.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

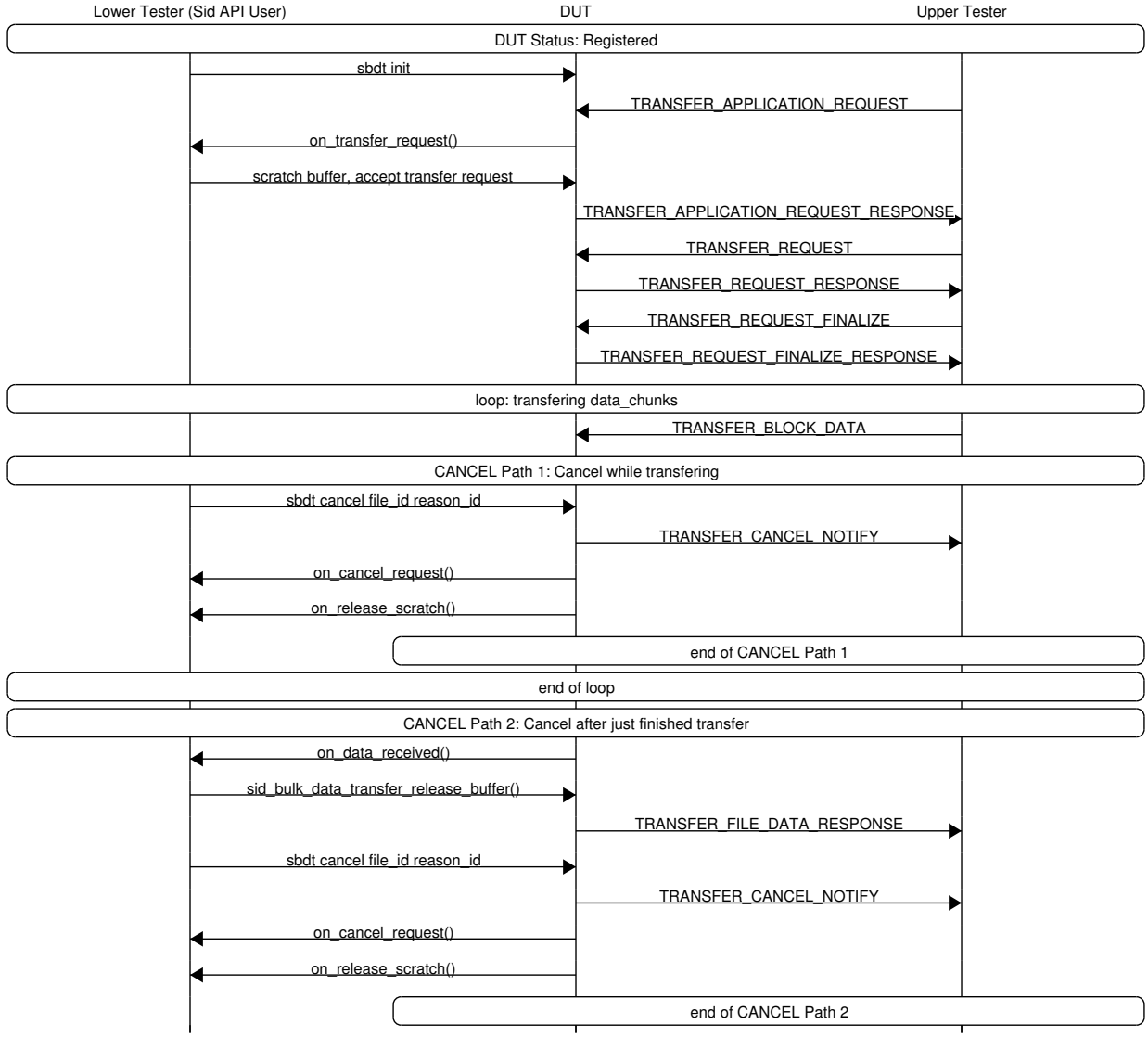
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.2.3 Test Procedure



8.2.4 Expected Results

8.2.4.1 Pass Verdict

The DUT should successfully cancel the ongoing transfer with a specific given reason. The DUT should report the reason to the Upper Tester.

8.3 BLE/EP/API/FILETRANSFER/BV/03: Print the progress of the transfer and current file offset.

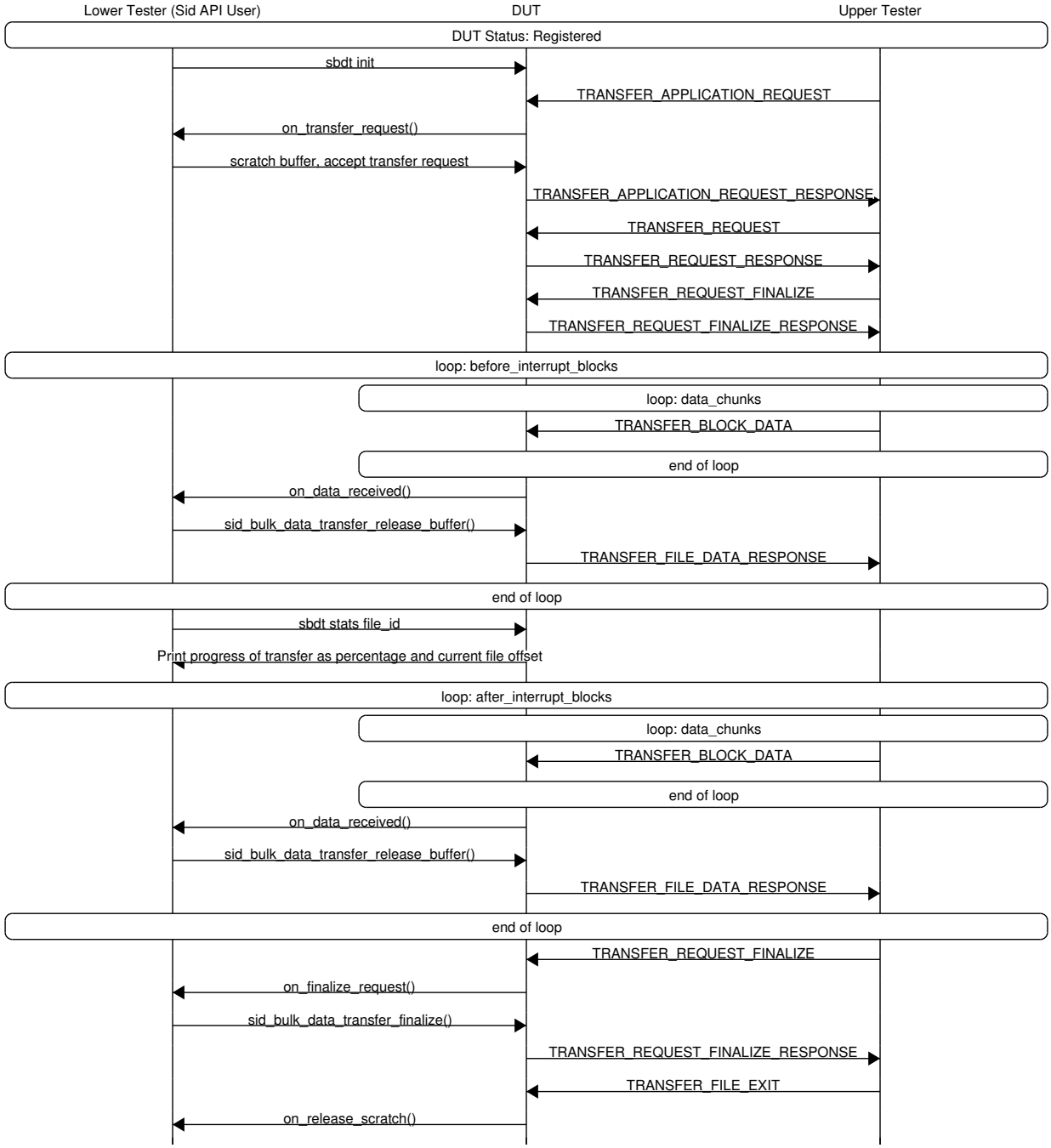
8.3.1 Test Purpose

DUT is able to output the progress of the transfer as a percent and the current file offset.

8.3.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates as a Sid API user.
- Upper Tester is ready on AWS IOT side.

8.3.3 Test Procedure



8.3.4 Expected Results

8.3.4.1 Pass Verdict

The DUT should successfully print out the progress of the transfer and current file offset.

8.4 BLE/EP/API/FILETRANSFER/BV/04: Print various parameters of the transfer.

8.4.1 Test Purpose

DUT is able to output the various parameters of the transfer.

8.4.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

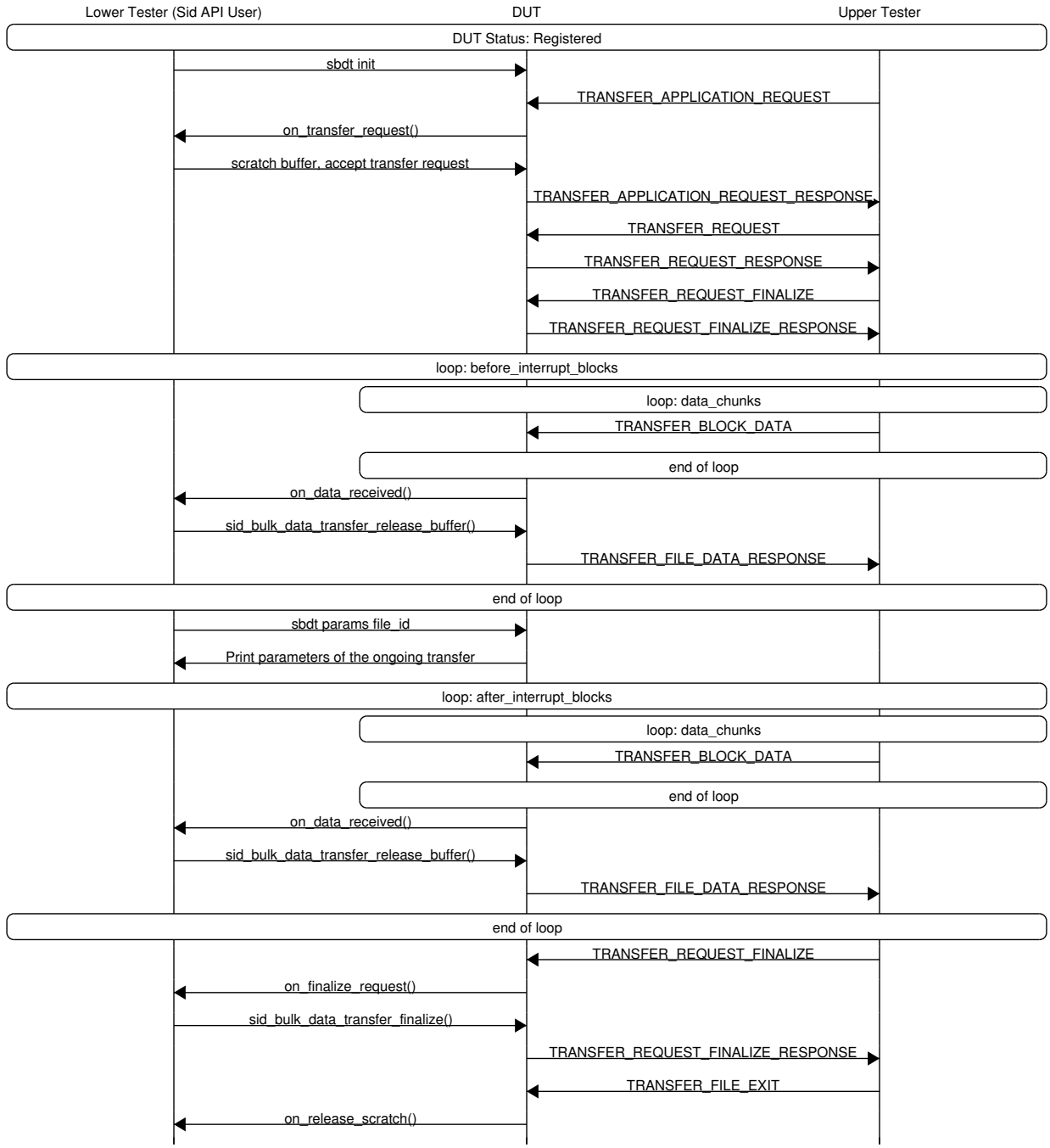
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.4.3 Test Procedure



8.4.4 Expected Results

8.4.4.1 Pass Verdict

The DUT should successfully print out various parameters relavant to file transfer.

8.5 BLE/EP/API/FILETRANSFER/RECOVERY/BI/01: Recover transfer after EP powered off and back on.

8.5.1 Test Purpose

DUT is able to recover the transfer after EP power off for a valid time slot and back on.

8.5.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

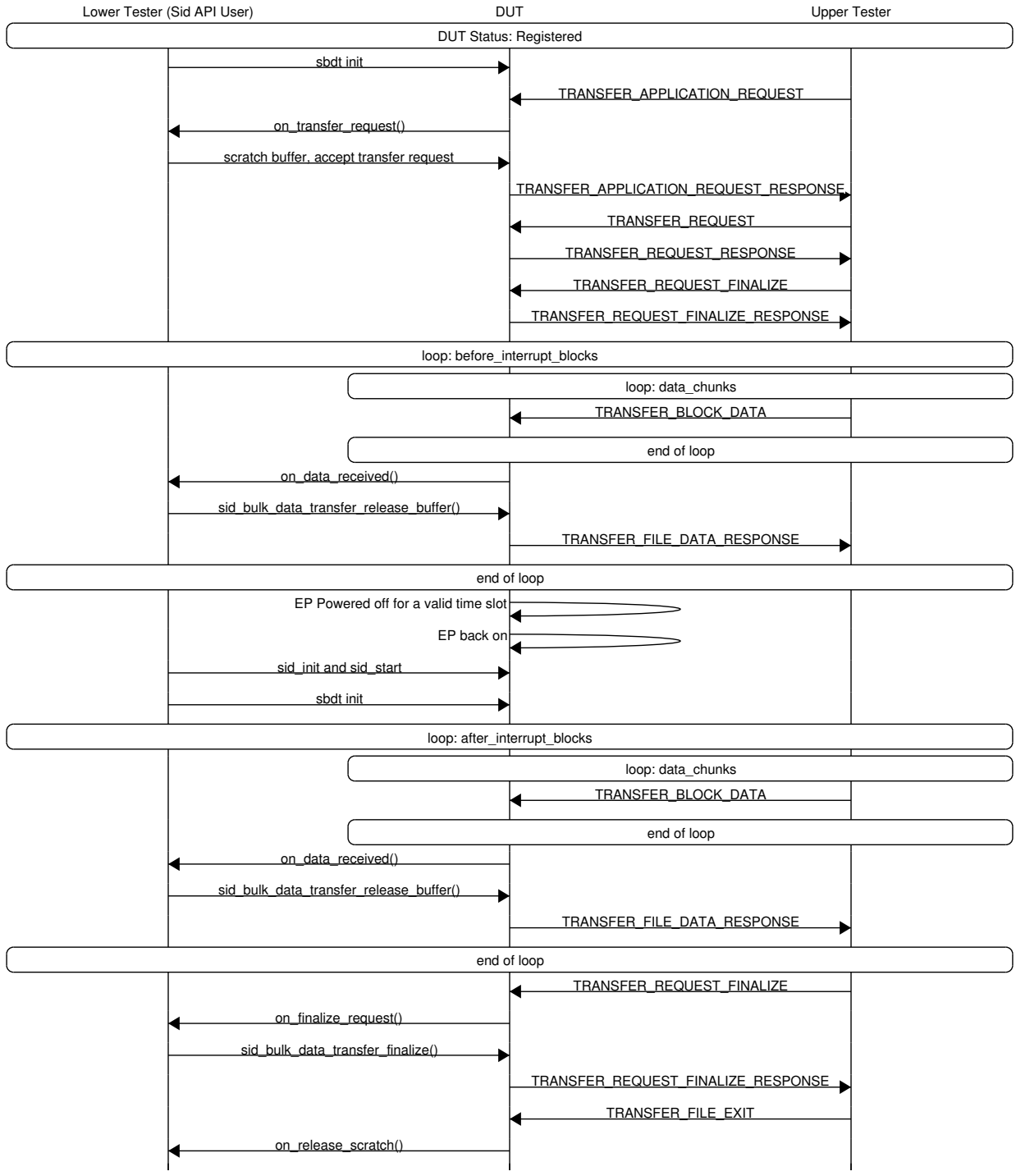
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.5.3 Test Procedure



8.5.4 Expected Results

8.5.4.1 Pass Verdict

The DUT should successfully recover the transfer after EP power off for a valid time slot and back on.

8.6 BLE/EP/API/FILETRANSFER/RECOVERY/BI/02: Recover transfer after EP was out of range from GW.

8.6.1 Test Purpose

DUT is able to recover the transfer after out of range from GW for a valid time slot and back on.

8.6.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

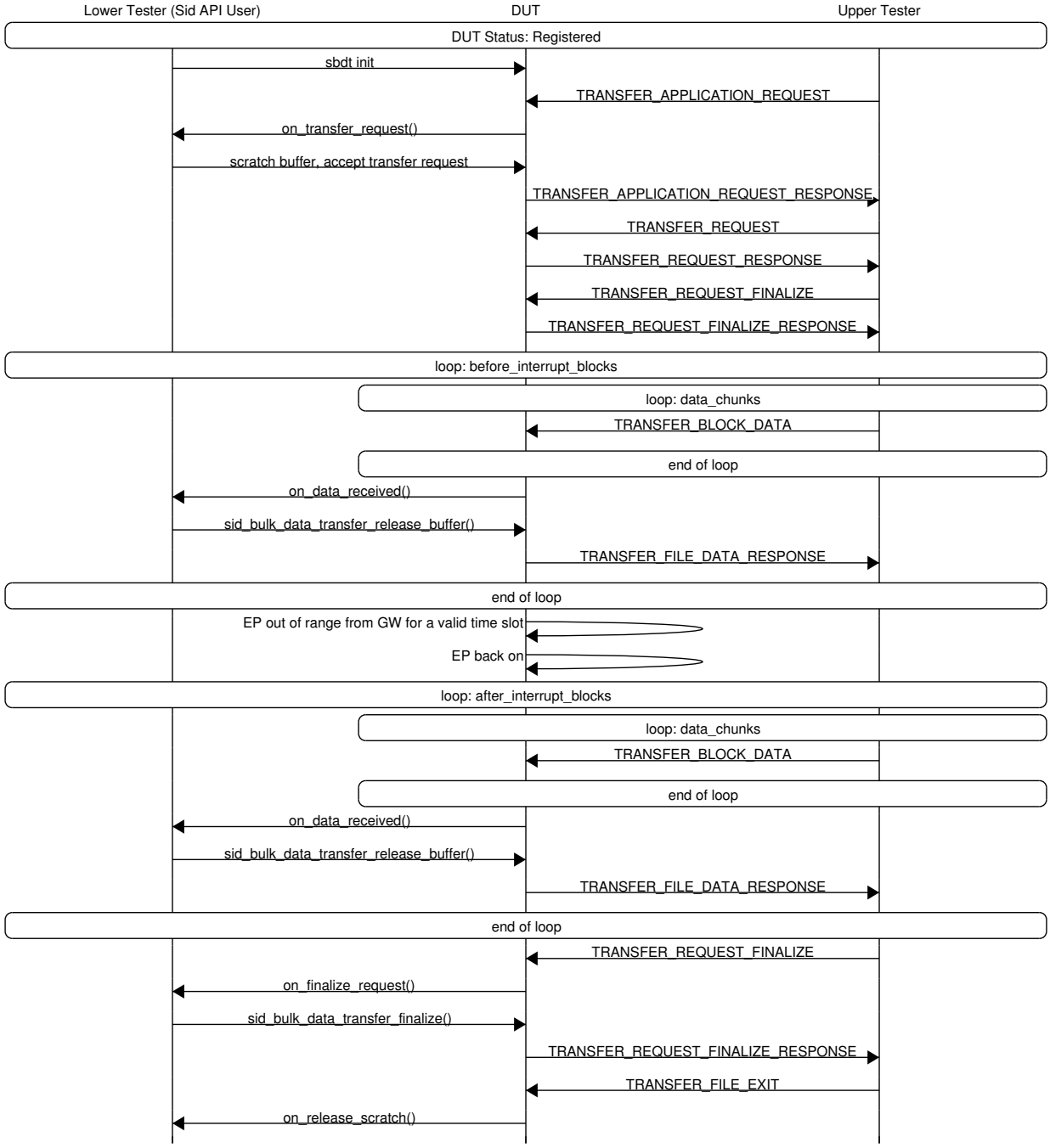
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.6.3 Test Procedure



8.6.4 Expected Results

8.6.4.1 Pass Verdict

The DUT should successfully recover the transfer after out of range from GW for a valid time slot and back on.

8.7 BLE/EP/API/FILETRANSFER/RECOVERY/BI/03: Recover transfer after GW that was using to send packets switched to another GW.

8.7.1 Test Purpose

DUT is able to recover the transfer after GW that is using to send packets switched to another GW.

8.7.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

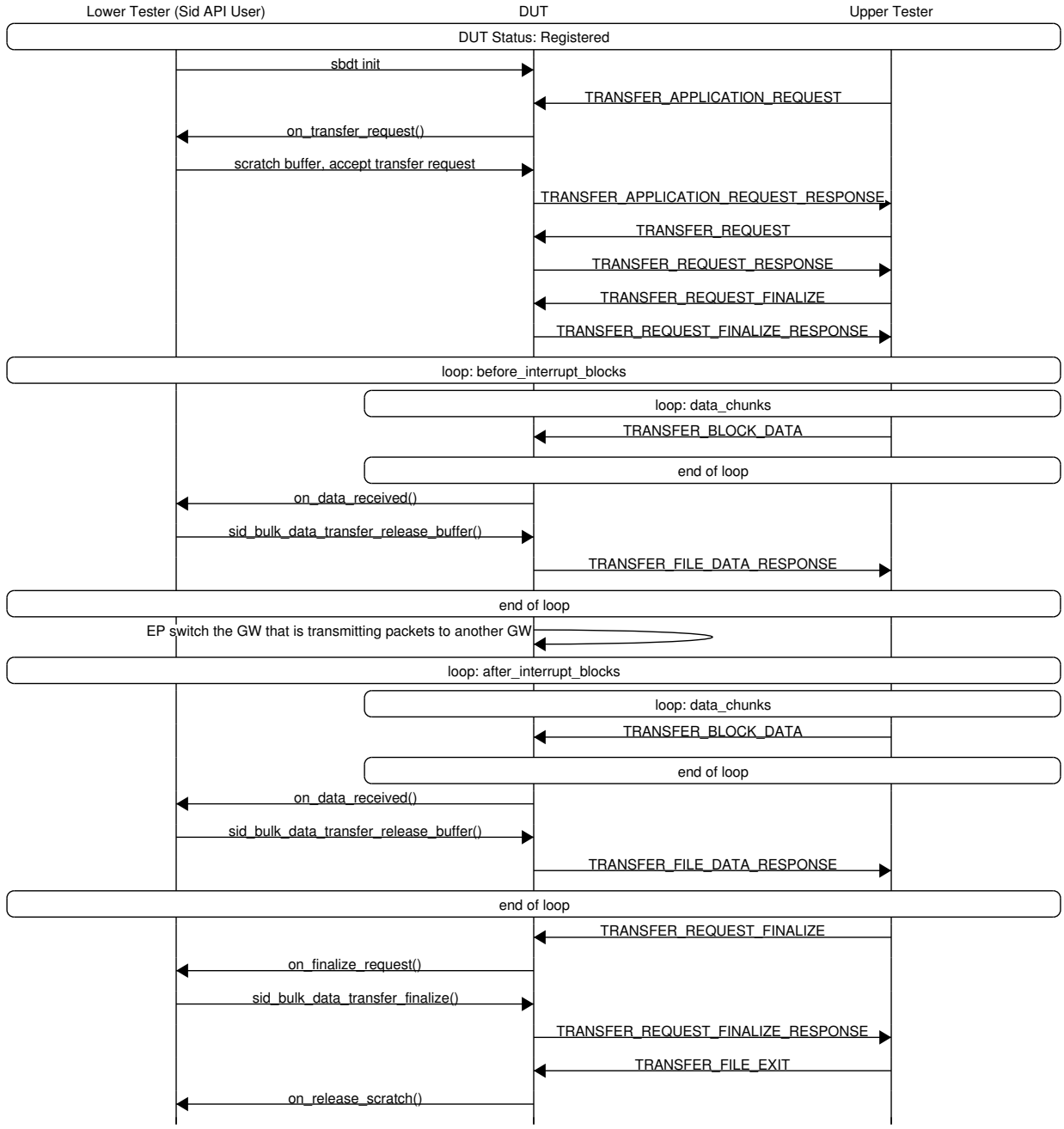
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.7.3 Test Procedure



8.7.4 Expected Results

8.7.4.1 Pass Verdict

The DUT should successfully recover the transfer after GW that is using to send packets switched to another GW.

8.8 BLE/EP/API/FILETRANSFER/RECOVERY/BI/04: Recover transfer after GW that was using to send packets being opt-out.

8.8.1 Test Purpose

DUT is able to recover the transfer after GW that was using to send packets being opt-out.

8.8.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

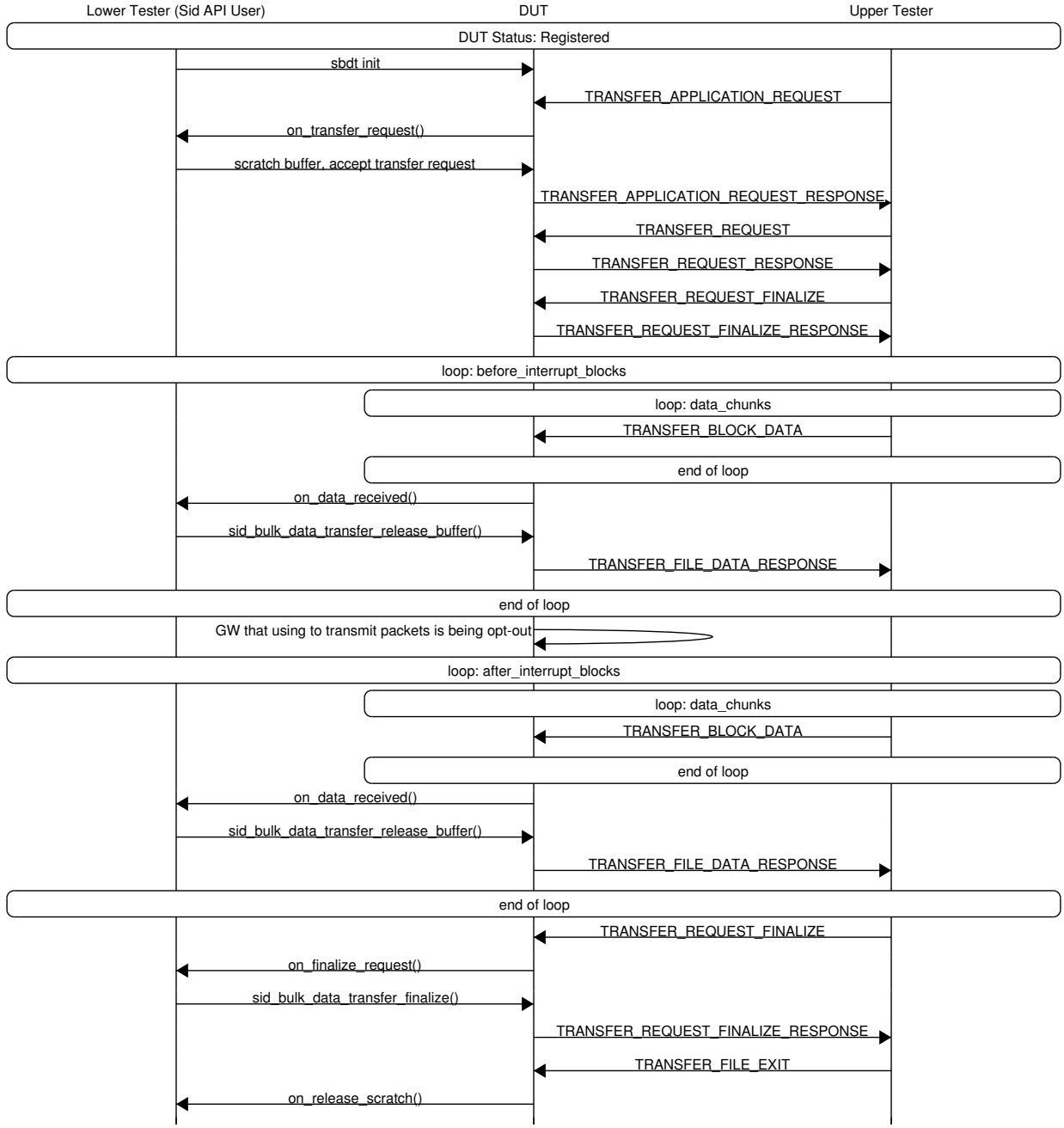
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.8.3 Test Procedure



8.8.4 Expected Results

8.8.4.1 Pass Verdict

The DUT should successfully recover the transfer after GW that was using to send packets being opt-out.

8.9 BLE/EP/API/FILETRANSFER/RECOVERY/BI/05: Recover transfer after GW that was using to send packets powered off for a while and back on.

8.9.1 Test Purpose

DUT is able to recover the transfer after GW powered off for a valid time slot and back on.

8.9.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.

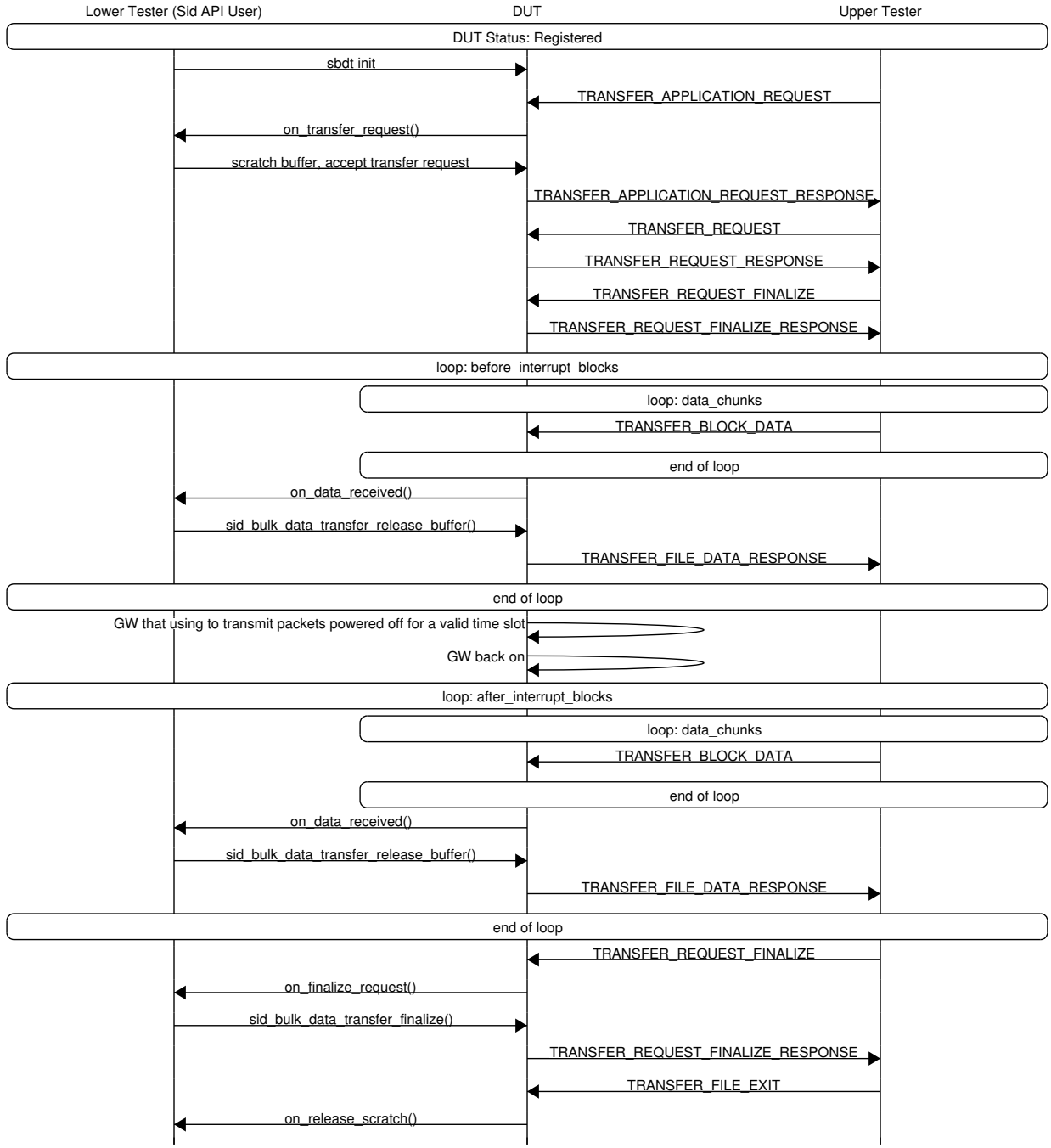
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates as a Sid API user.

- Upper Tester is ready on AWS IOT side.

8.9.3 Test Procedure



8.9.4 Expected Results

8.9.4.1 Pass Verdict

The DUT should successfully recover transfer after GW that was using to send packets powered off for a valid time slot and back on.

Chapter 9

Endpoint Metrics Test Cases

9.1 CMN/EP/EPMETRICS/METRICS/BV/01: Verify Endpoint has corresponding metrics but not invalid metrics enabled.

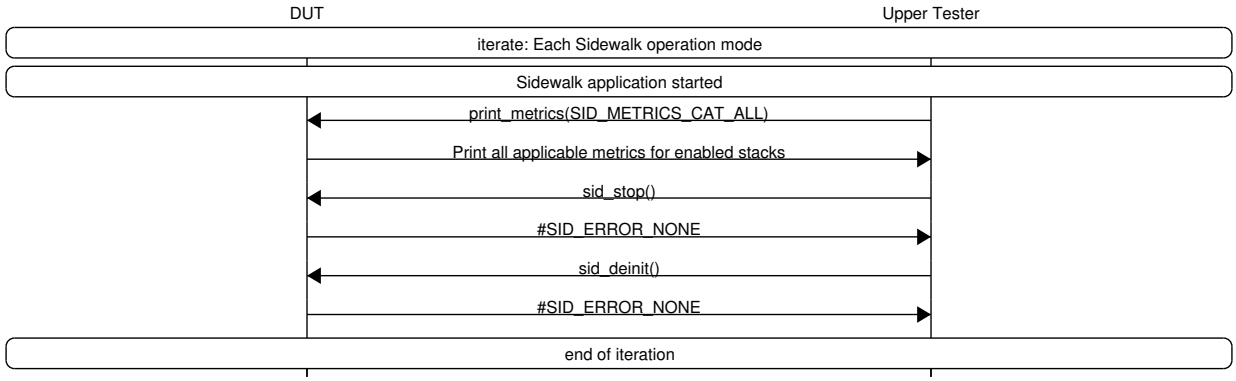
9.1.1 Test Purpose

DUT only has the metrics that correspond to enabled protocol stacks, with no irrelevant metrics present.

9.1.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

9.1.3 Test Procedure



9.1.4 Expected Results

9.1.4.1 Pass Verdict

DUT maintains only metrics associated with currently enabled protocol stacks, with no irrelevant metrics present.

9.2 BLE/EP/EPMETRICS/REPORT/BV/01: Verify Endpoint sends Endpoint Metrics to Cloud over BLE in a specific time interval.

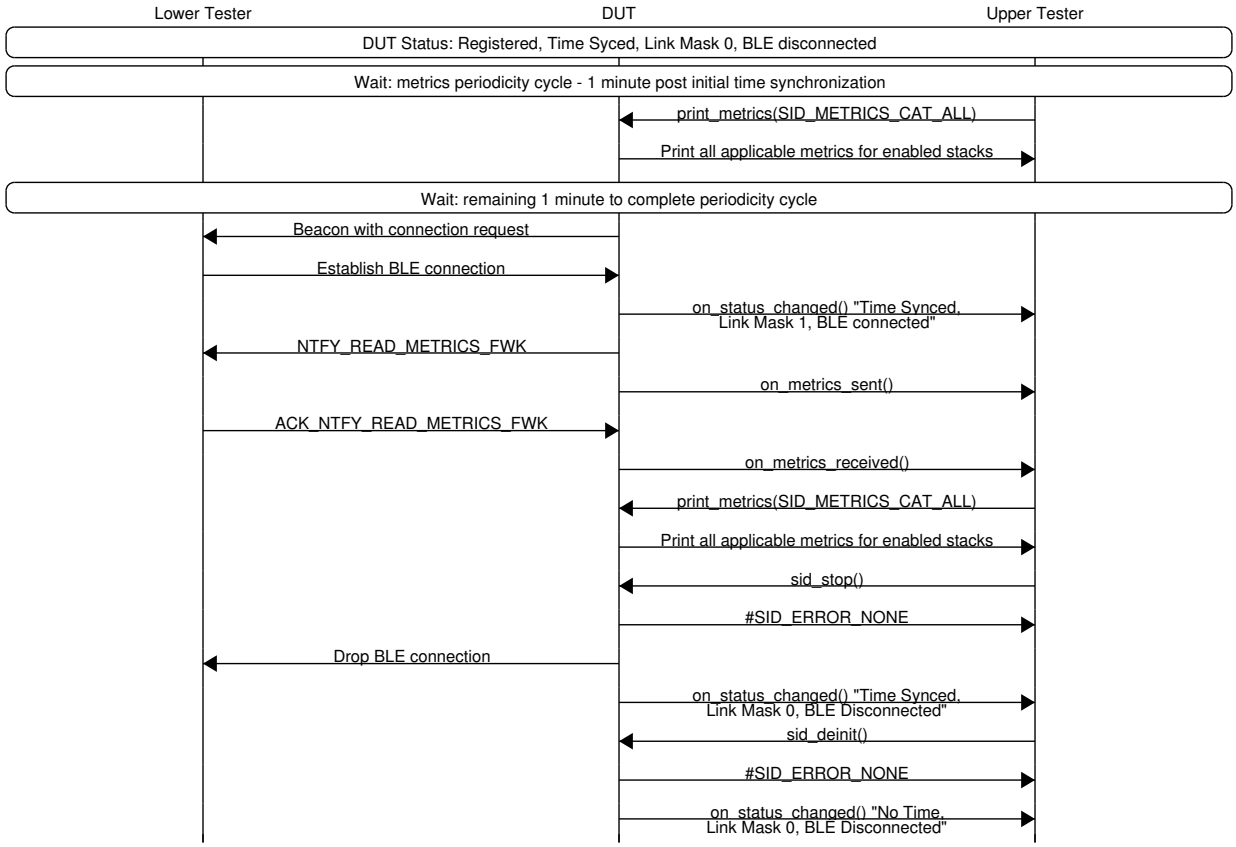
9.2.1 Test Purpose

DUT demonstrates capability to transmit endpoint metrics through BLE connectivity based on the configured metrics periodicity.

9.2.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- DUT is configured with metrics capability enabled.
- Lower Tester operates in BLE mode.

9.2.3 Test Procedure



9.2.4 Expected Results

9.2.4.1 Pass Verdict

Following time synchronization, DUT successfully transmits metrics over BLE according to the configured periodicity.

DUT receives Cloud acknowledgment for the transmitted metrics package.

DUT resets metrics after periodic reporting completion.

9.3 BLE/EP/EPMETRICS/REPORT/BV/02: Verify Endpoint sends remaining Endpoint Metrics to Cloud over BLE via piggybacking on a periodic reporting.

9.3.1 Test Purpose

DUT implements metrics piggybacking over subsequent BLE uplinks to complete metrics transmission when single periodic uplink capacity is insufficient.

9.3.2 Initial Conditions

- The Sidewalk stack (BLE+FSK), (BLE+LORA) or (BLE+FSK+LoRa) is initialized and started on the DUT.

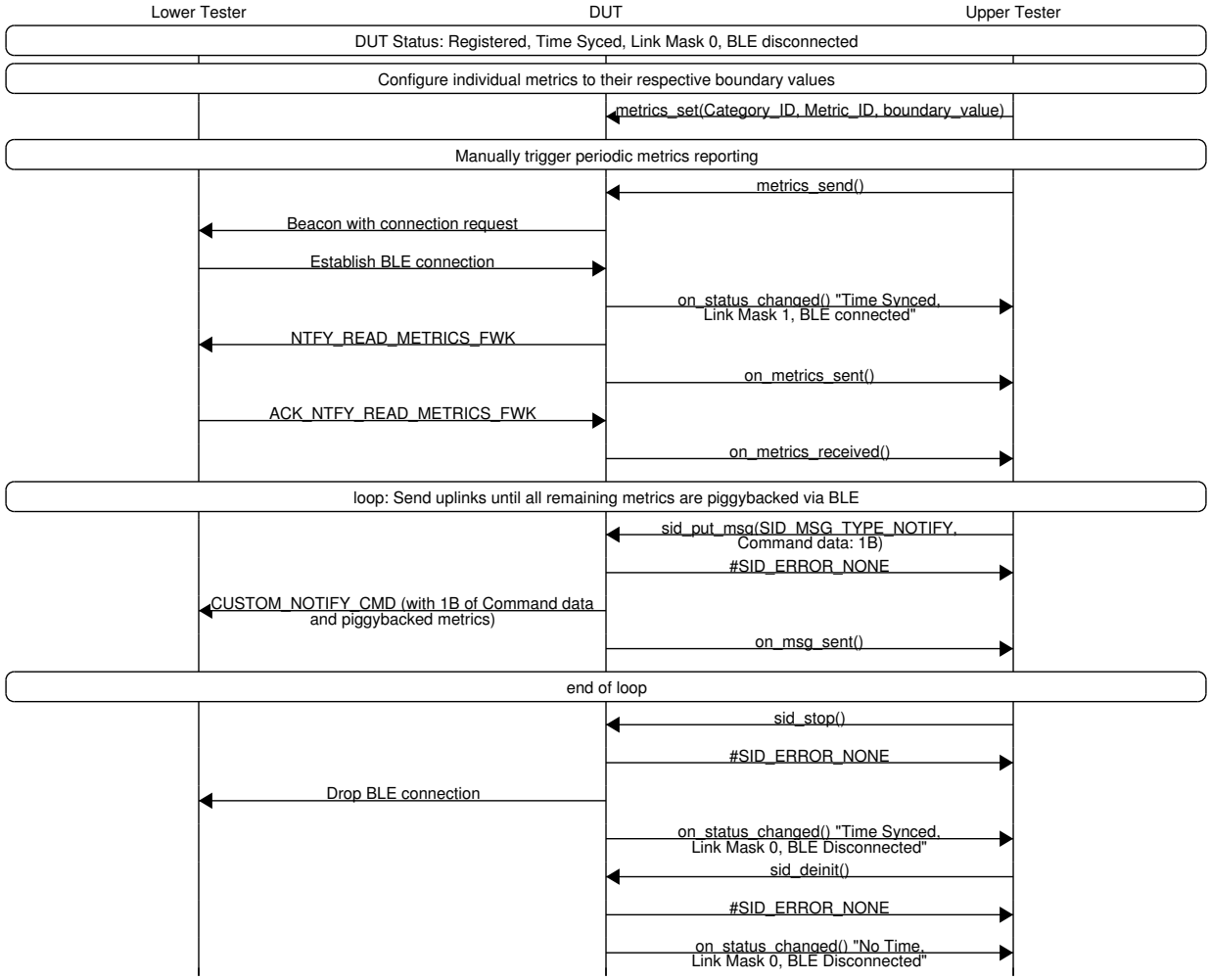
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- DUT is configured with metrics capability enabled.

- Lower Tester operates in BLE mode.

9.3.3 Test Procedure



9.3.4 Expected Results

9.3.4.1 Pass Verdict

DUT transmits remaining metrics from periodic reporting via BLE uplink piggybacking.

9.4 BLE/EP/EPMETRICS/REPORT/BV/03: Verify Endpoint Metrics are uploaded via Piggybacking over BLE if the explicit reporting is disabled.

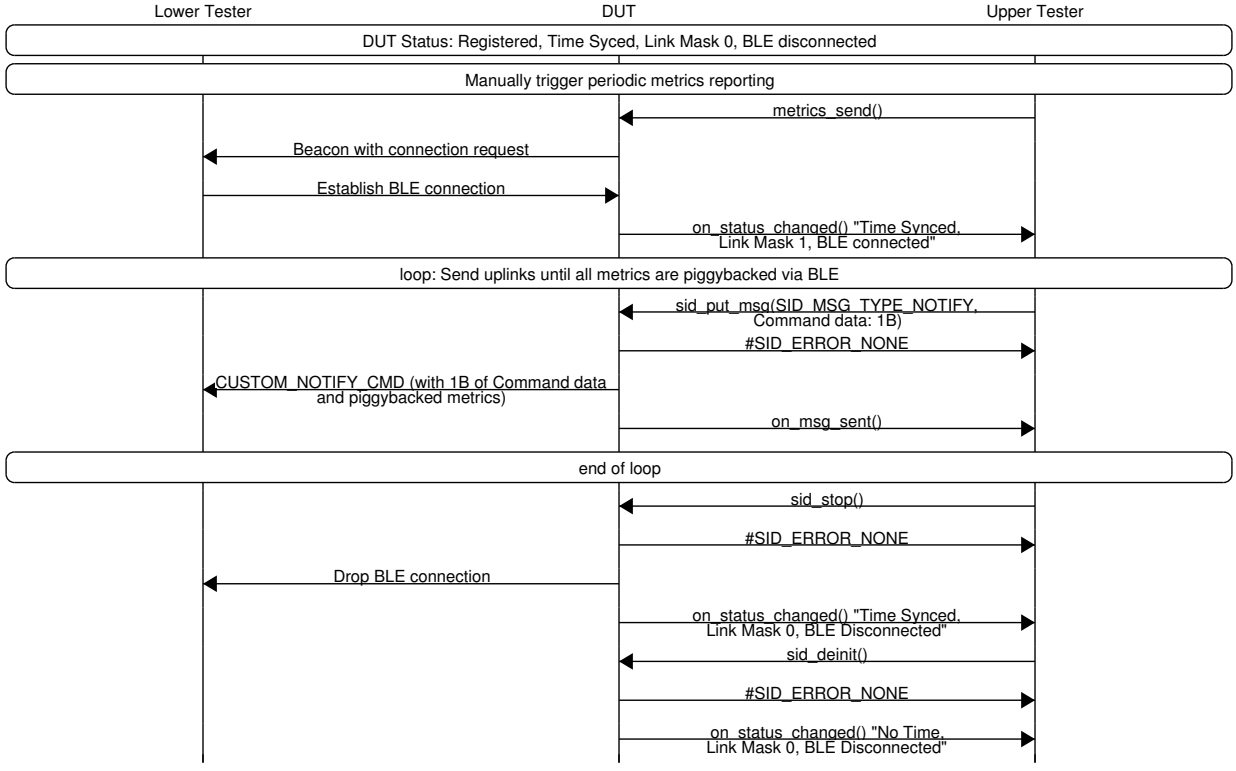
9.4.1 Test Purpose

When metrics capability is disabled, DUT is able to transmit endpoint metrics via BLE piggybacking instead of periodic reporting during regular reporting intervals.

9.4.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- DUT is configured with metrics capability disabled.
- Lower Tester operates in BLE mode.

9.4.3 Test Procedure



9.4.4 Expected Results

9.4.4.1 Pass Verdict

DUT transmits all metrics through BLE piggybacking instead of periodic reporting.

9.5 BLE/EP/EPMETRICS/UL/BV/01: Verify Uplink messages Metrics.

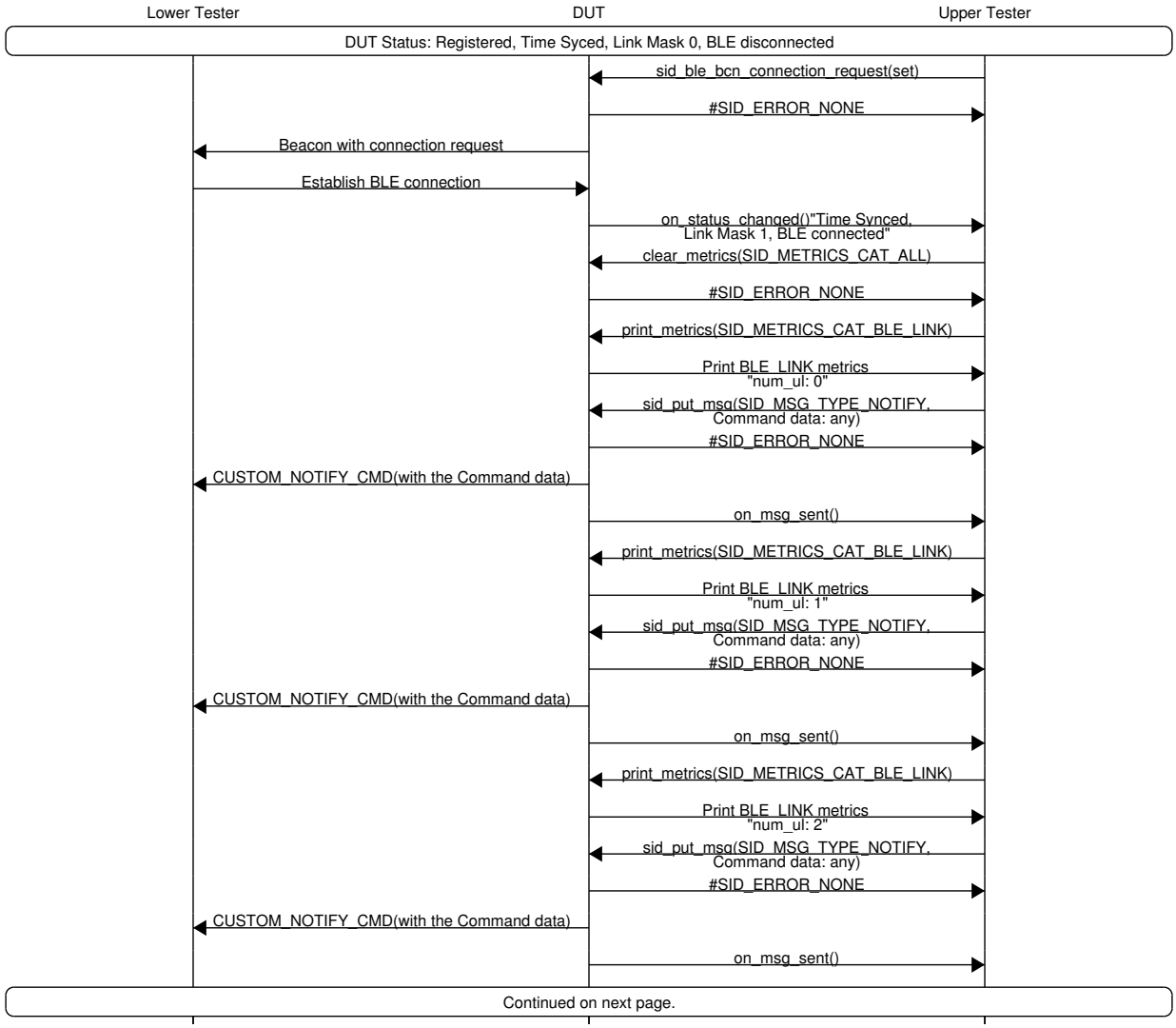
9.5.1 Test Purpose

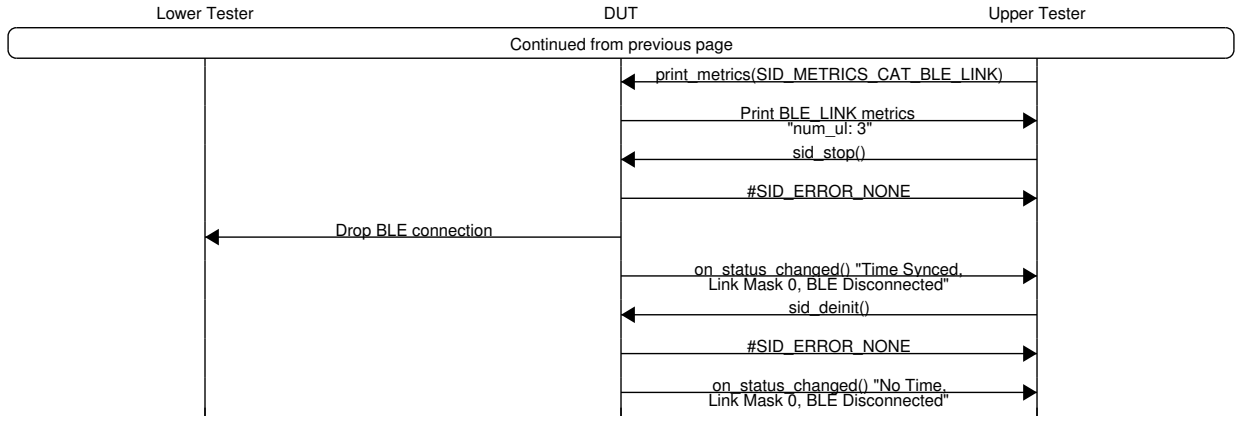
DUT captures BLE uplink metrics.

9.5.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.

9.5.3 Test Procedure





9.5.4 Expected Results

9.5.4.1 Pass Verdict

DUT's BLE uplink metrics increment after each BLE uplink transmission.

9.6 BLE/EP/EPMETRICS/DL/BV/01: Verify Downlink messages Metrics.

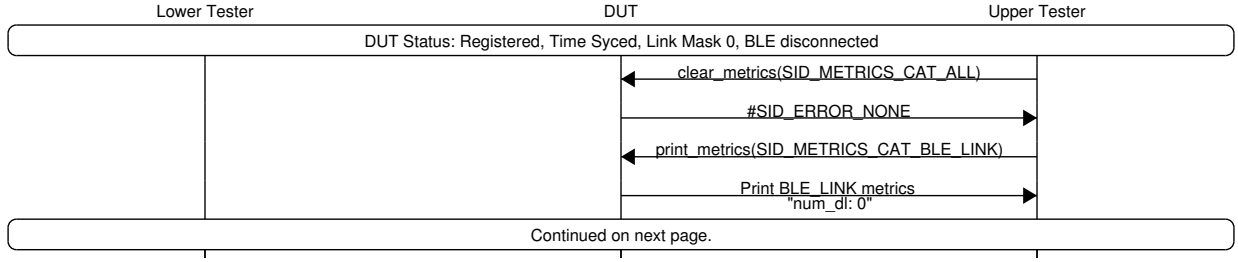
9.6.1 Test Purpose

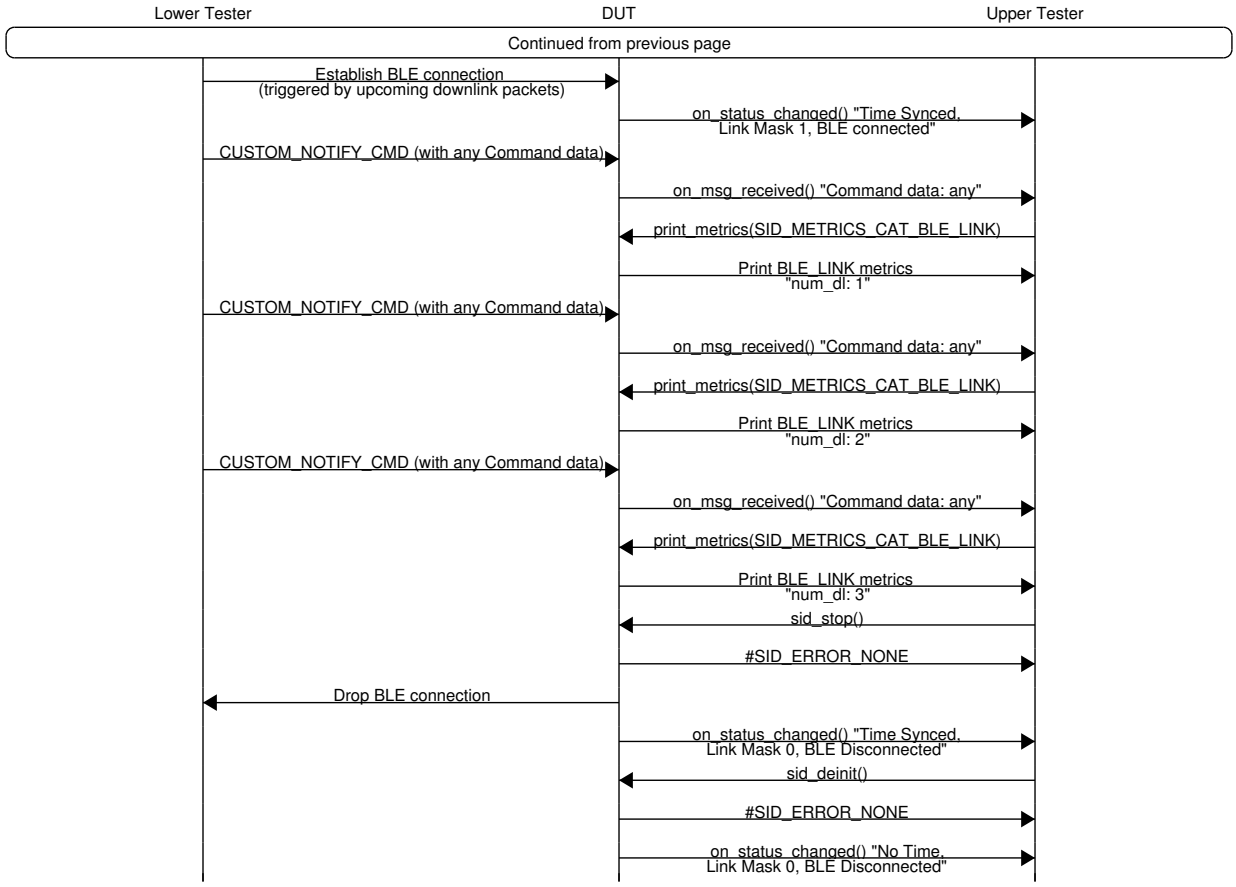
DUT captures BLE downlink metrics.

9.6.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.

9.6.3 Test Procedure





9.6.4 Expected Results

9.6.4.1 Pass Verdict

DUT's BLE downlink metrics increment after each BLE downlink reception.

9.7 BLE/EP/EPMETRICS/CONN-BV-01: Verify Connection attempts Metrics.

9.7.1 Test Purpose

DUT captures BLE connection attempts metrics.

9.7.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized on the DUT.

- DUT is registered with Amazon Sidewalk network.

- Lower Tester operates in BLE mode.

9.7.3 Test Procedure

9.7.4 Expected Results

9.7.4.1 Pass Verdict

DUT's BLE connection attempts metrics increment after BLE start and each DUT-initiated BLE connennection request.

9.8 FSK/EP/EPMETRICS/REPORT/BV/01: Verify Endpoint sends Endpoint Metrics to Cloud over FSK in a specific time interval.

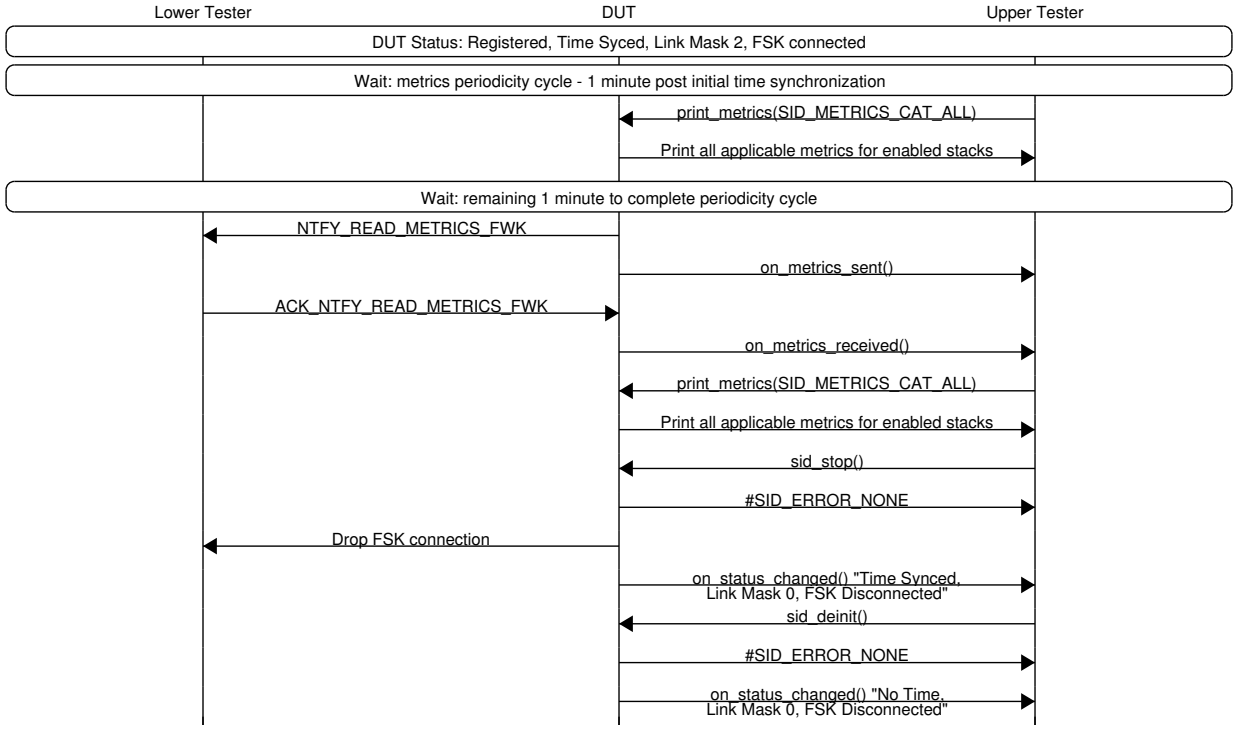
9.8.1 Test Purpose

DUT demonstrates capability to transmit endpoint metrics through FSK connectivity based on the configured metrics periodicity.

9.8.2 Initial Conditions

- The Sidewalk stack (FSK) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- DUT is configured with metrics capability enabled.
- Lower Tester operates in FSK mode.

9.8.3 Test Procedure



9.8.4 Expected Results

9.8.4.1 Pass Verdict

Following time synchronization, DUT successfully transmits metrics over FSK according to the configured periodicity.

DUT receives Cloud acknowledgment for the transmitted metrics package.

DUT resets metrics after periodic reporting completion.

9.9 FSK/EP/EPMETRICS/REPORT/BV/02: Verify Endpoint sends remaining Endpoint Metrics to Cloud over FSK via piggybacking on a periodic reporting.

9.9.1 Test Purpose

DUT implements metrics piggybacking over subsequent FSK uplinks to complete metrics transmission when single periodic uplink capacity is insufficient.

9.9.2 Initial Conditions

- The Sidewalk stack (FSK) is initialized and started on the DUT.

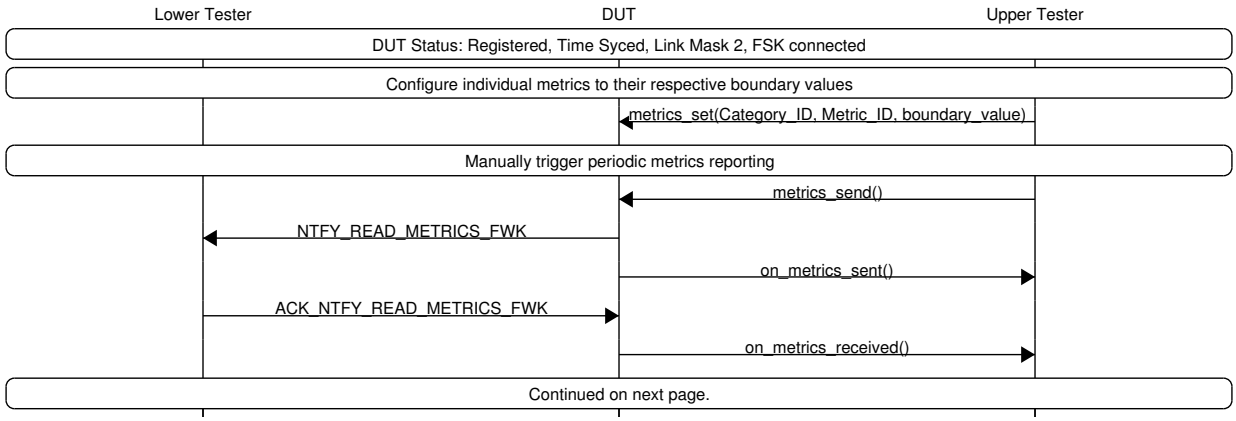
- DUT is registered with Amazon Sidewalk network.

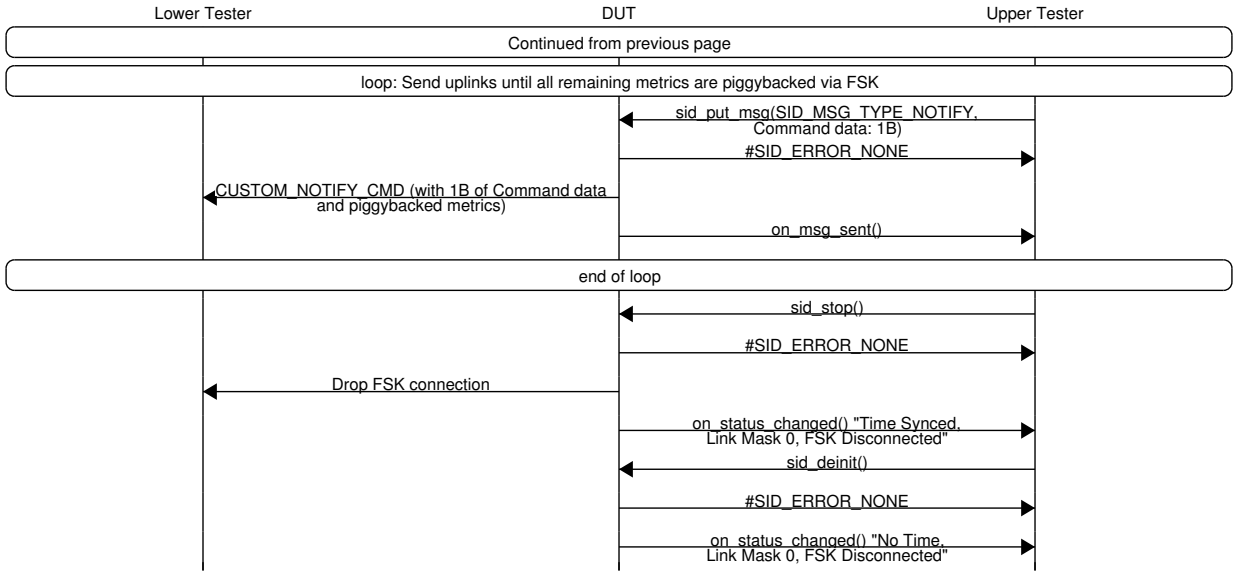
- DUT is time-synced with Amazon Sidewalk network.

- DUT is configured with metrics capability enabled.

- Lower Tester operates in FSK mode.

9.9.3 Test Procedure





9.9.4 Expected Results

9.9.4.1 Pass Verdict

DUT transmits remaining metrics from periodic reporting via FSK uplink piggybacking.

9.10 FSK/EP/EPMETRICS/REPORT/BV/03: Verify Endpoint Metrics are uploaded via Piggybacking over FSK if the explicit reporting is disabled.

9.10.1 Test Purpose

When metrics capability is disabled, DUT is able to transmit endpoint metrics via FSK piggybacking instead of periodic reporting during regular reporting intervals.

9.10.2 Initial Conditions

- The Sidewalk stack (FSK) is initialized and started on the DUT.

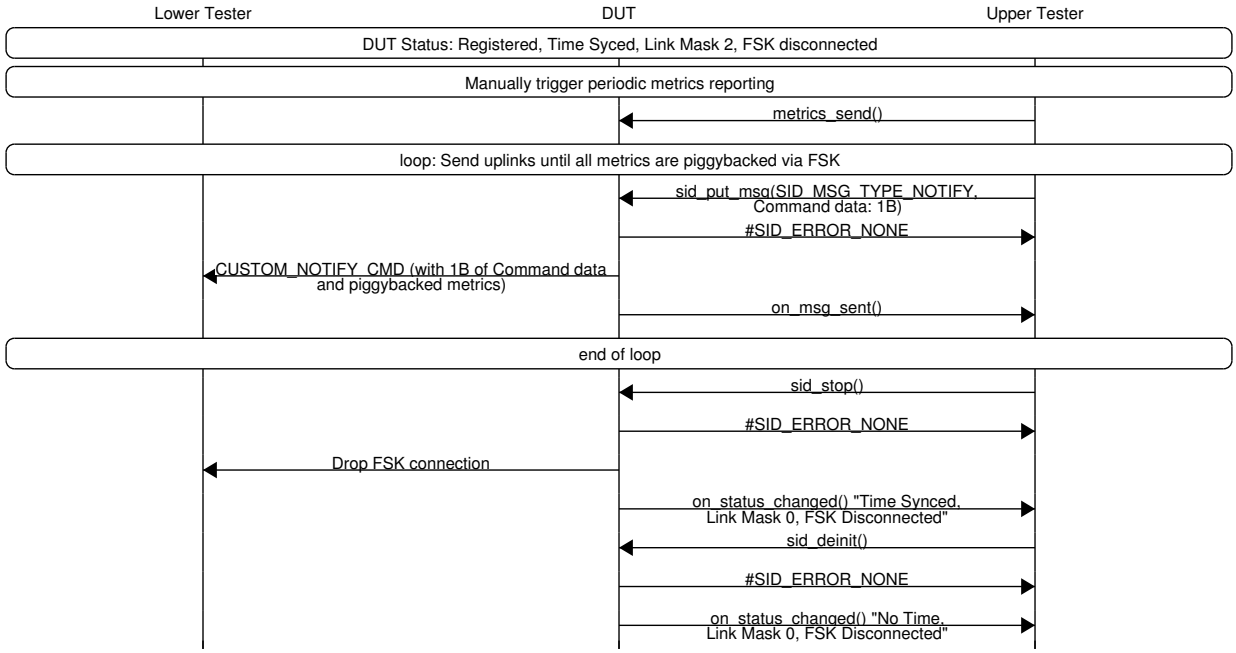
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- DUT is configured with metrics capability disabled.

- Lower Tester operates in FSK mode.

9.10.3 Test Procedure



9.10.4 Expected Results

9.10.4.1 Pass Verdict

DUT transmits all metrics through FSK piggybacking instead of periodic reporting.

9.11 FSK/EP/EPMETRICS/UL/BV/01: Verify Uplink messages Metrics and Total number of TX unique packets Metrics.

9.11.1 Test Purpose

DUT captures FSK uplink metrics and TX packets metrics.

9.11.2 Initial Conditions

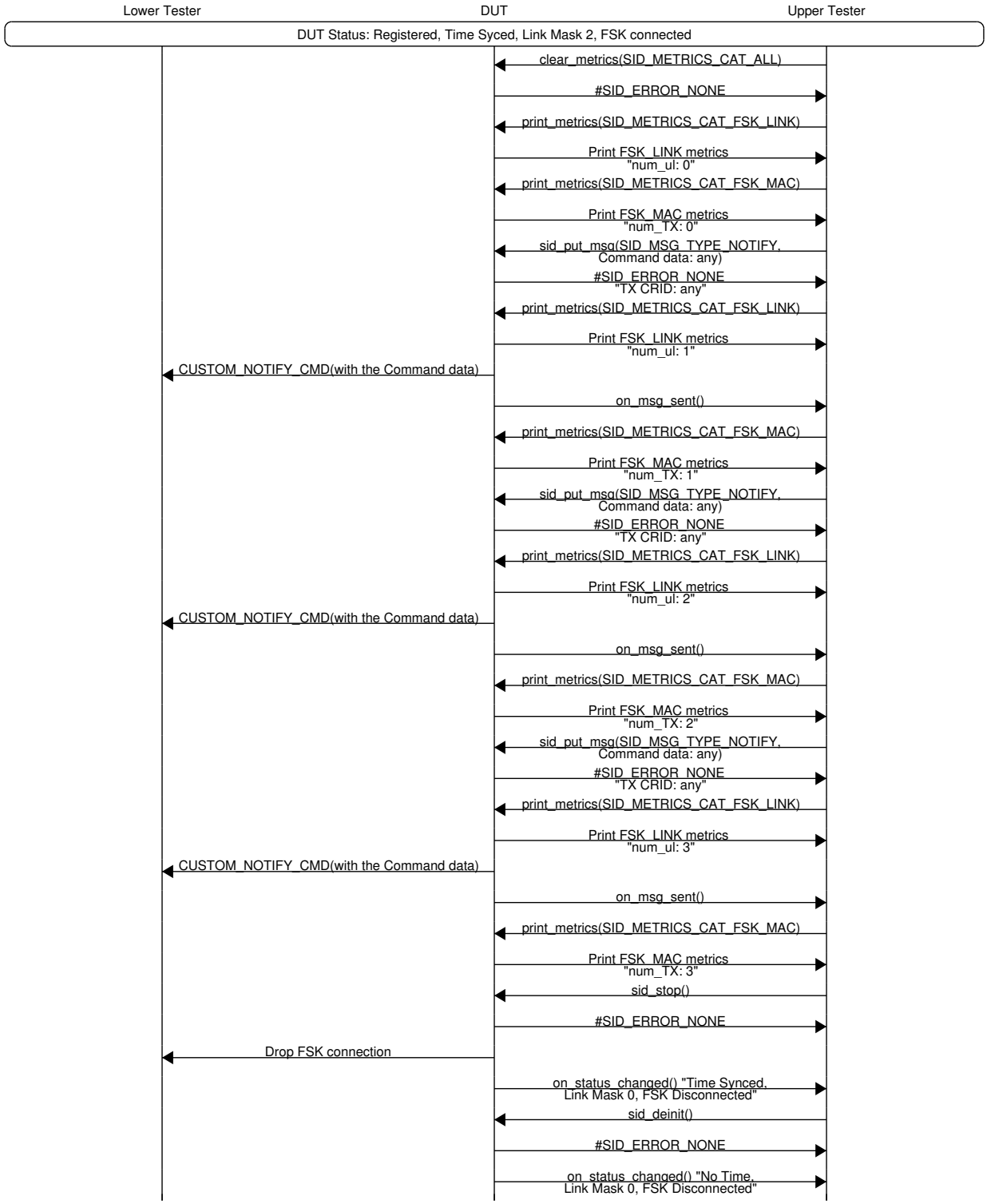
- The Sidewalk stack (FSK) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode.

9.11.3 Test Procedure



9.11.4 Expected Results

9.11.4.1 Pass Verdict

DUT's FSK uplink metrics increment after each FSK uplink transmission.

DUT's FSK TX packets metrics increment after each FSK packet transmission.

9.12 FSK/EP/EPMETRICS/DL/BV/01: Verify Downlink messages Metrics and Total number of RX unique packets Metrics.

9.12.1 Test Purpose

DUT captures FSK downlink metrics and RX packets metrics.

9.12.2 Initial Conditions

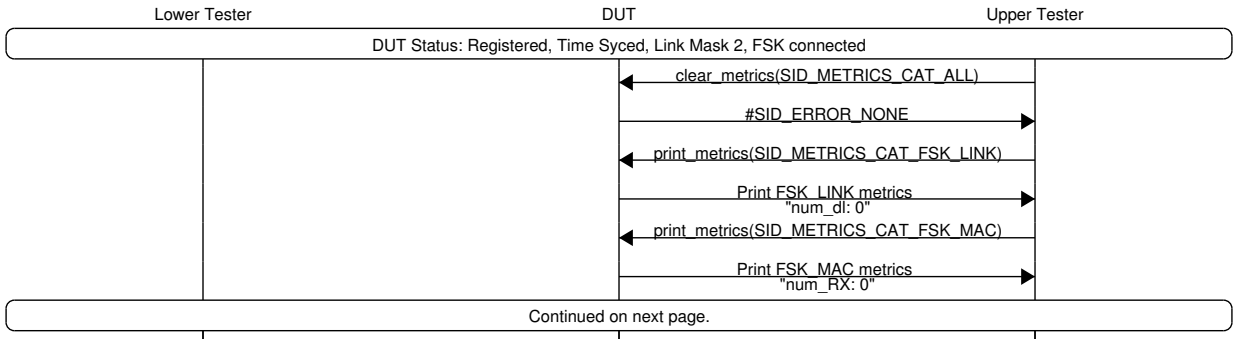
- The Sidewalk stack (FSK) is initialized and started on the DUT.

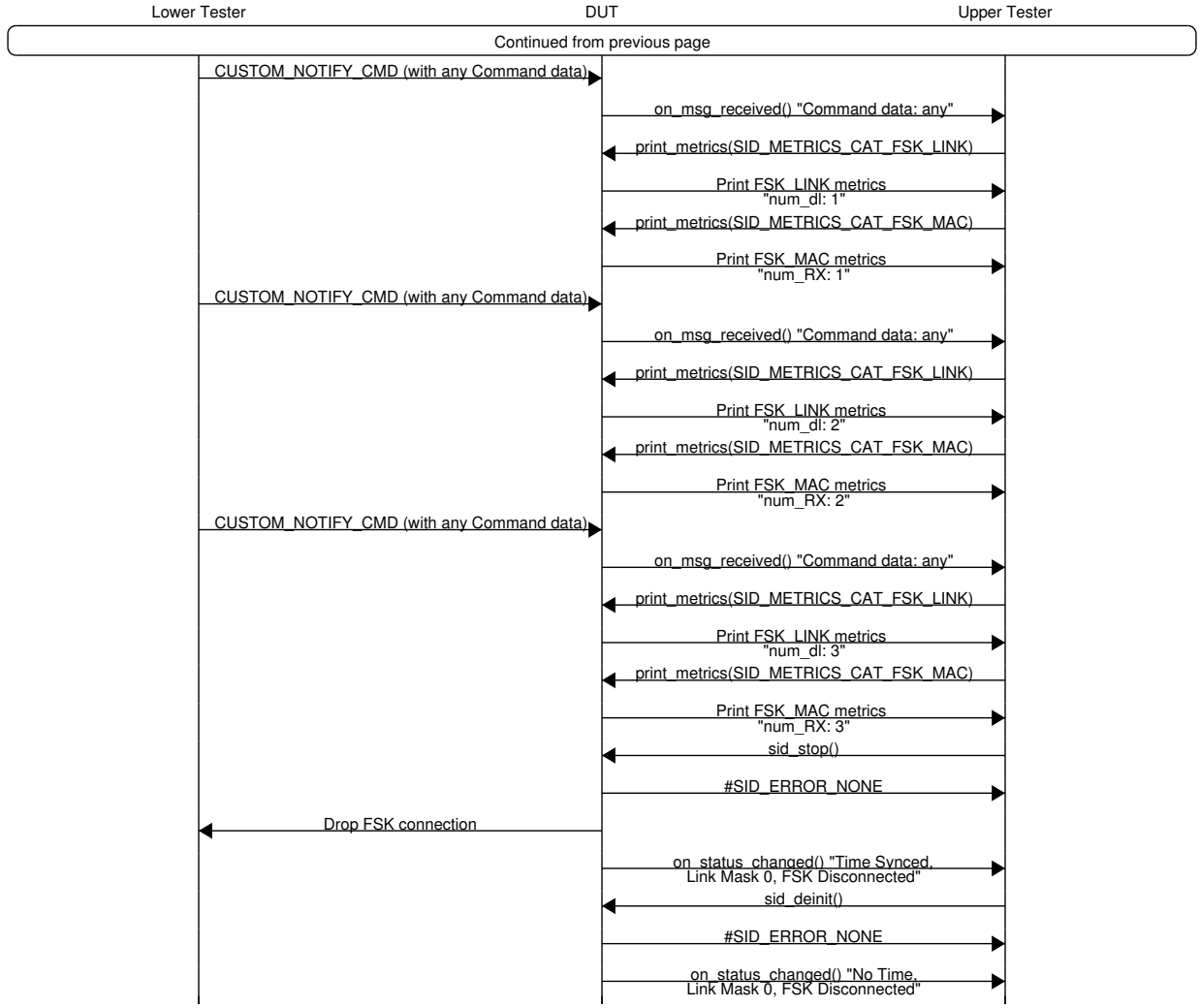
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in FSK mode.

9.12.3 Test Procedure





9.12.4 Expected Results

9.12.4.1 Pass Verdict

DUT's FSK downlink metrics increment after each FSK downlink reception.

DUT's FSK RX packets metrics increment after each FSK packet reception.

9.13 LORA/EP/EPMETRICS/REPORT/BV/01: Verify Endpoint sends Endpoint Metrics to Cloud over LoRa in a specific time interval.

9.13.1 Test Purpose

DUT demonstrates capability to transmit endpoint metrics through LoRa connectivity based on the configured metrics periodicity.

9.13.2 Initial Conditions

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

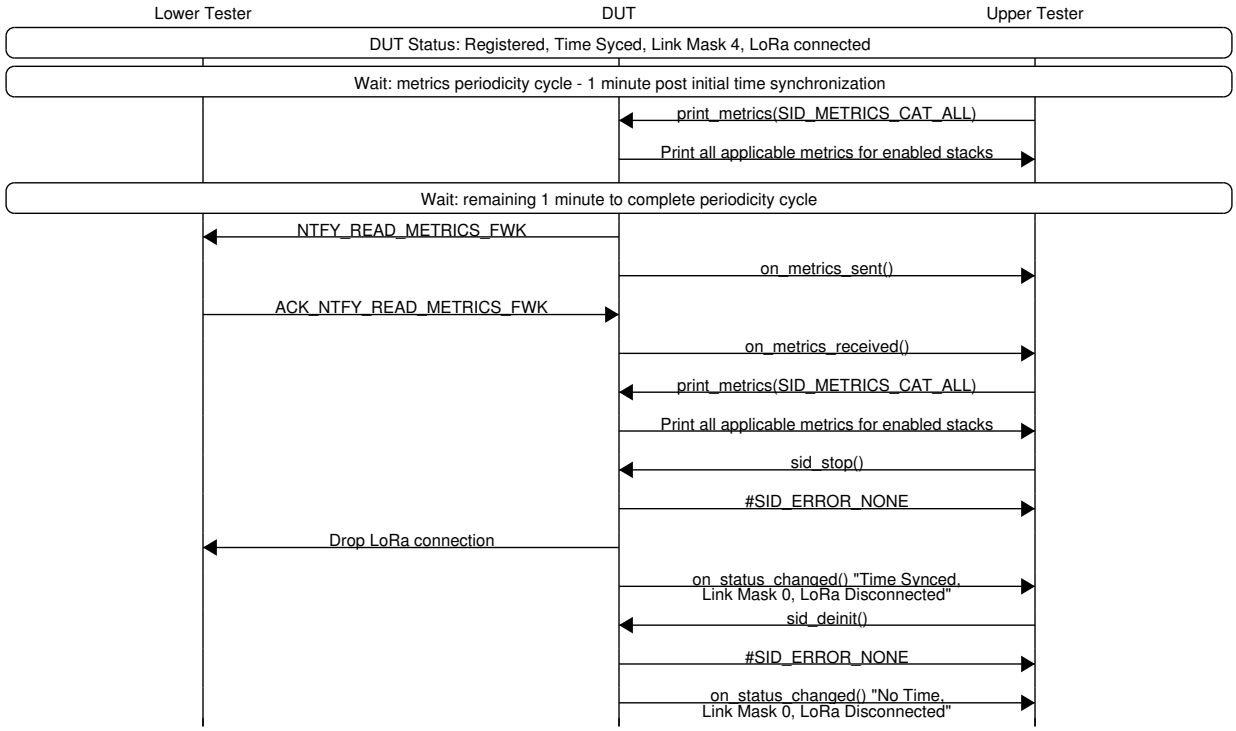
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- DUT is configured with metrics capability enabled.

- Lower Tester operates in LoRa mode.

9.13.3 Test Procedure



9.13.4 Expected Results

9.13.4.1 Pass Verdict

Following time synchronization, DUT successfully transmits metrics over LoRa according to the configured periodicity.

DUT receives Cloud acknowledgment for the transmitted metrics package.

DUT resets metrics after periodic reporting completion.

9.14 LORA/EP/EPMETRICS/REPORT/BV/02: Verify Endpoint sends remaining Endpoint Metrics to Cloud over LoRa via piggybacking on a periodic reporting.

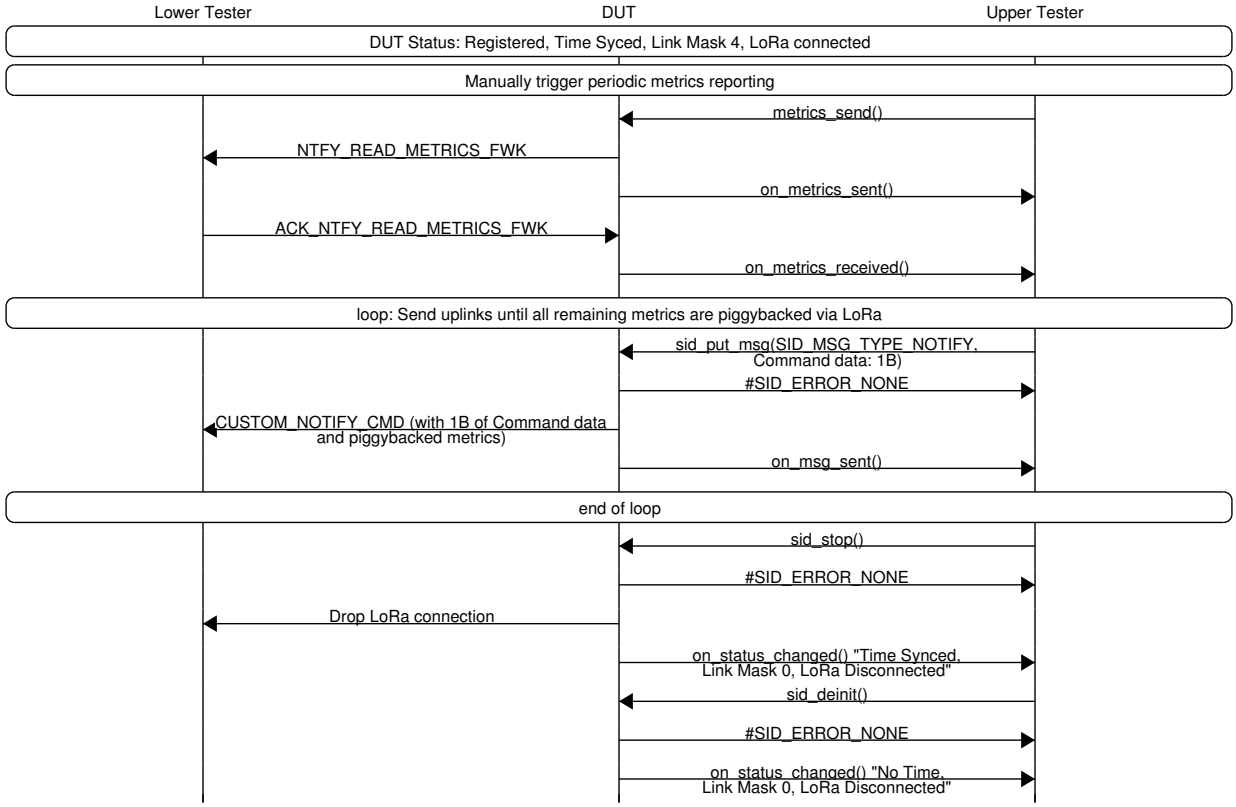
9.14.1 Test Purpose

DUT implements metrics piggybacking over subsequent LoRa uplinks to complete metrics transmission when single periodic uplink capacity is insufficient.

9.14.2 Initial Conditions

- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- DUT is configured with metrics capability enabled.
- Lower Tester operates in LoRa mode.

9.14.3 Test Procedure



9.14.4 Expected Results

9.14.4.1 Pass Verdict

DUT transmits remaining metrics from periodic reporting via LoRa uplink piggybacking.

9.15 LORA/EP/EPMETRICS/REPORT/BV/03: Verify Endpoint Metrics are uploaded via Piggybacking over LoRa if the explicit reporting is disabled.

9.15.1 Test Purpose

When metrics capability is disabled, DUT is able to transmit endpoint metrics via LoRa piggybacking instead of periodic reporting during regular reporting intervals.

9.15.2 Initial Conditions

- The Sidewalk stack (LoRa) is initialized and started on the DUT.

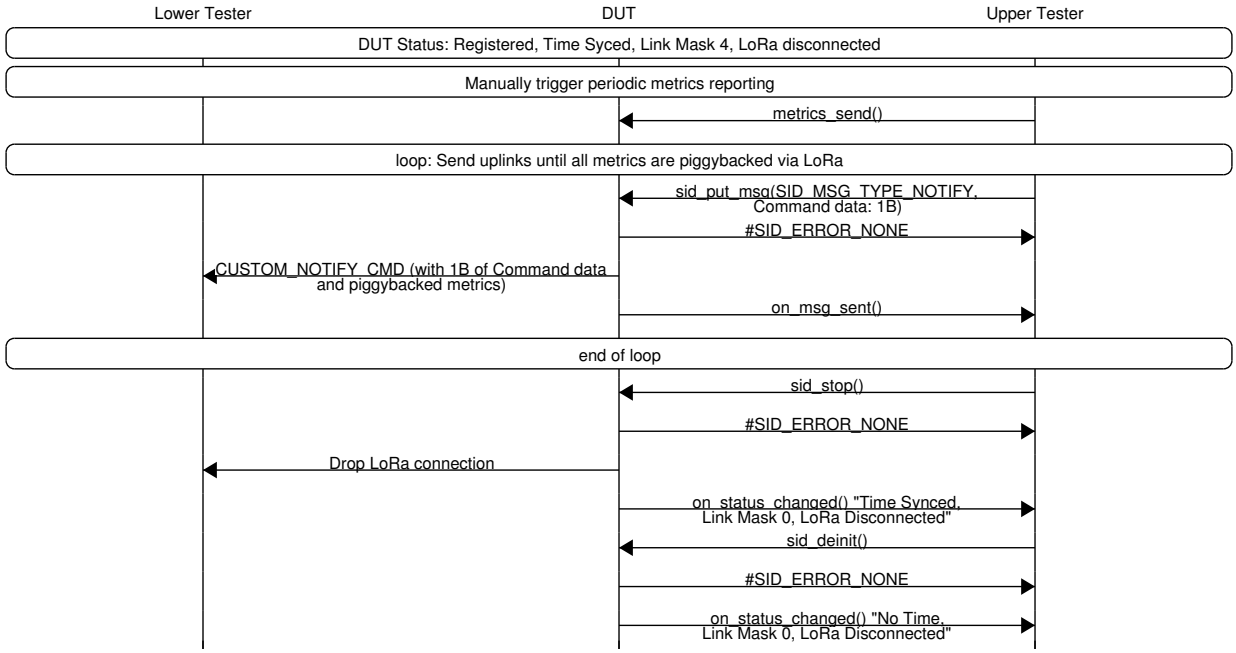
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- DUT is configured with metrics capability disabled.

- Lower Tester operates in LoRa mode.

9.15.3 Test Procedure



9.15.4 Expected Results

9.15.4.1 Pass Verdict

DUT transmits all metrics through LoRa piggybacking instead of periodic reporting.

9.16 LORA/EP/EPMETRICS/UL/BV/01: Verify Uplink messages Metrics and Total number of TX normal packets Metrics.

9.16.1 Test Purpose

DUT captures LoRa uplink metrics and TX normal packets metrics.

9.16.2 Initial Conditions

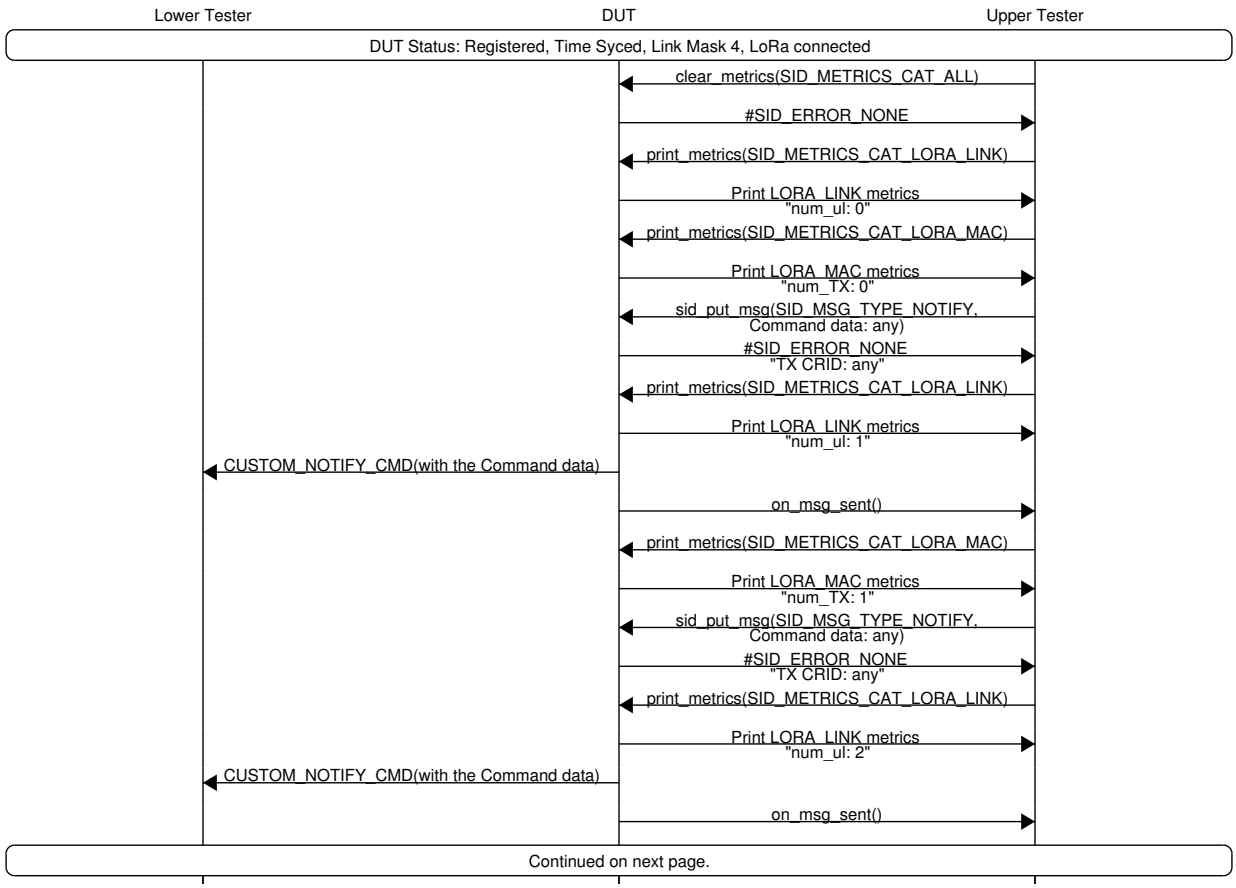
- The Sidewalk stack (LoRa) is initialized and started on the DUT.

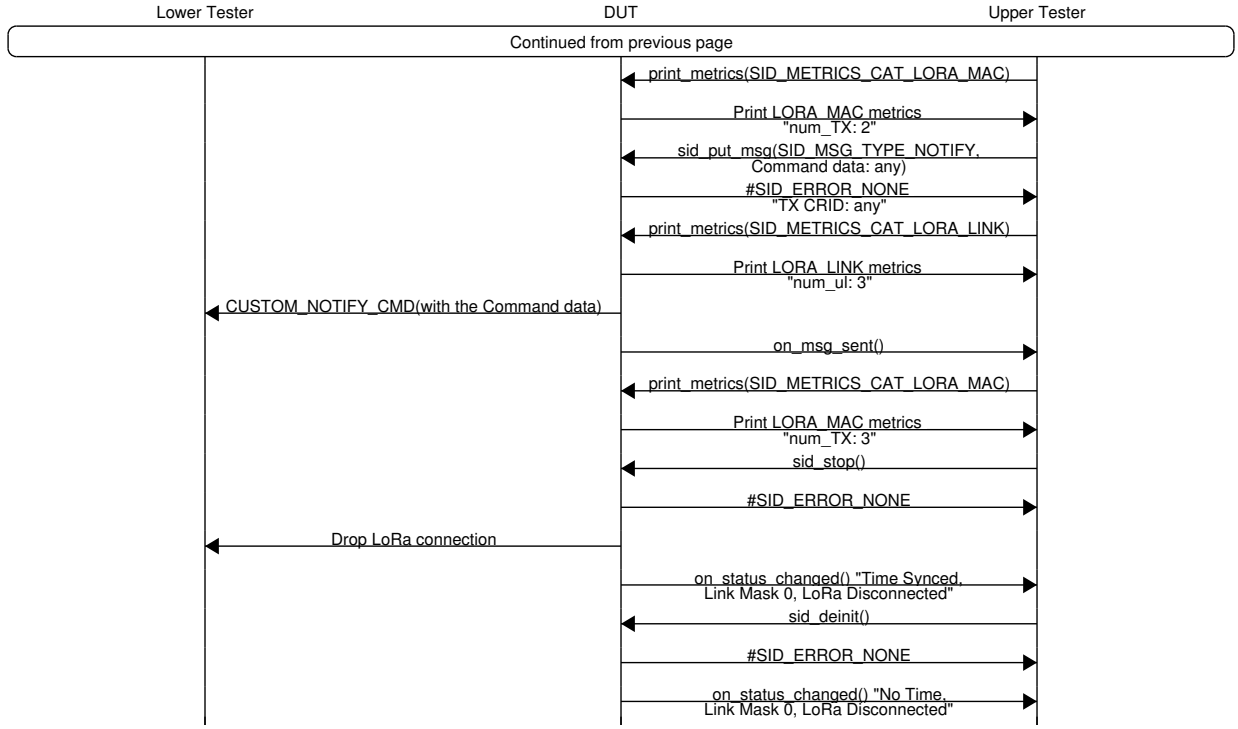
- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode.

9.16.3 Test Procedure





9.16.4 Expected Results

9.16.4.1 Pass Verdict

DUT's LoRa uplink metrics increment after each LoRa uplink transmission.

DUT's LoRa TX packets metrics increment after each LoRa packet transmission.

9.17 LORA/EP/EPMETRICS/DL/BV/01: Verify Downlink messages Metrics and Total number of RX packets Metrics.

9.17.1 Test Purpose

DUT captures LoRa downlink metrics and RX packets metrics.

9.17.2 Initial Conditions

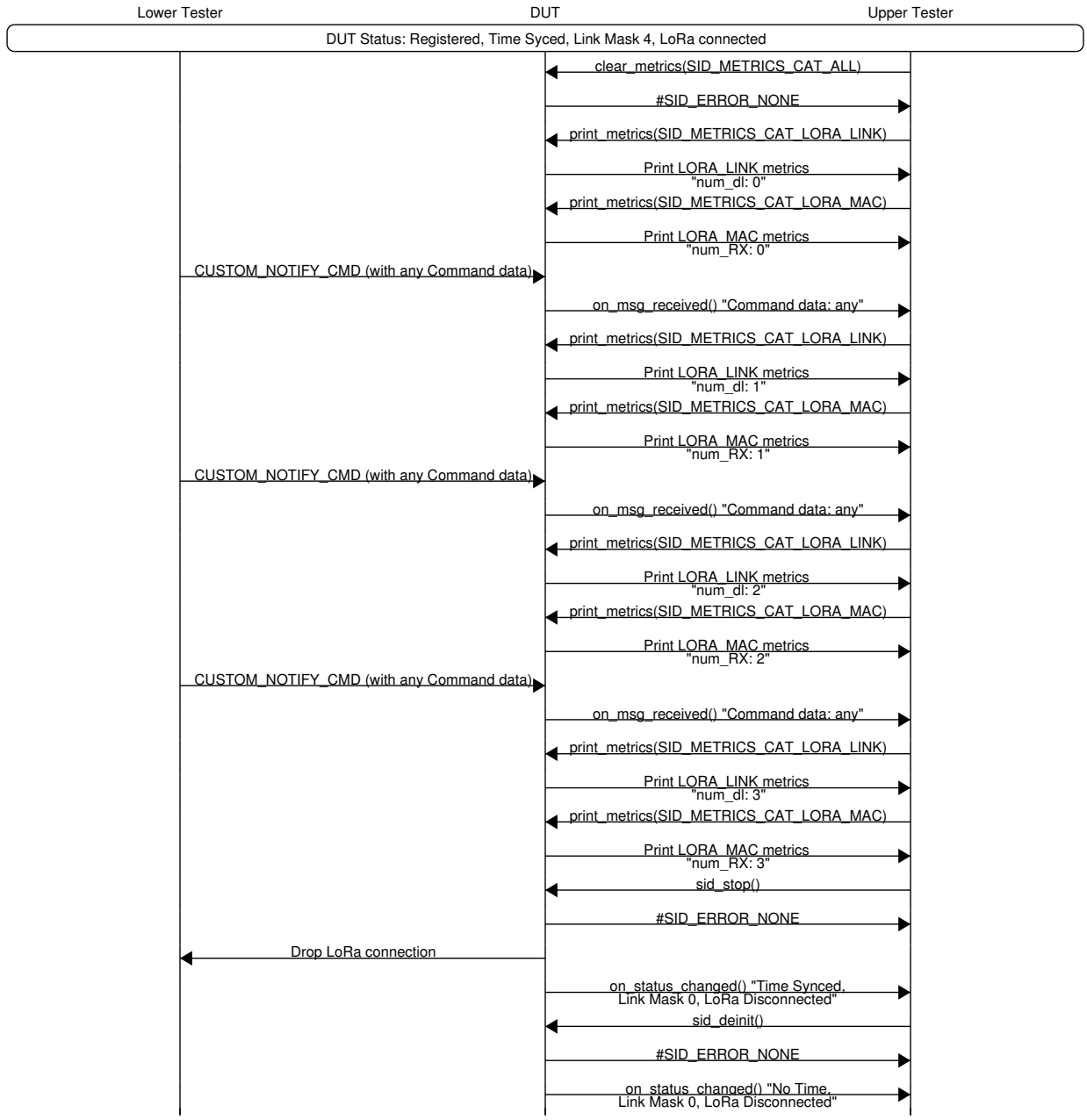
- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode.

9.17.3 Test Procedure



9.17.4 Expected Results

9.17.4.1 Pass Verdict

DUT's LoRa downlink metrics increment after each LoRa downlink reception.

DUT's LoRa RX packets metrics increment after each LoRa normal packet reception.

Chapter 10

Endpoint Capability Test Cases

10.1 CMN-EP-CAPABILITY-REPORT-BV-01: When KV store does not have the capability report saved, the event to send capability is scheduled.

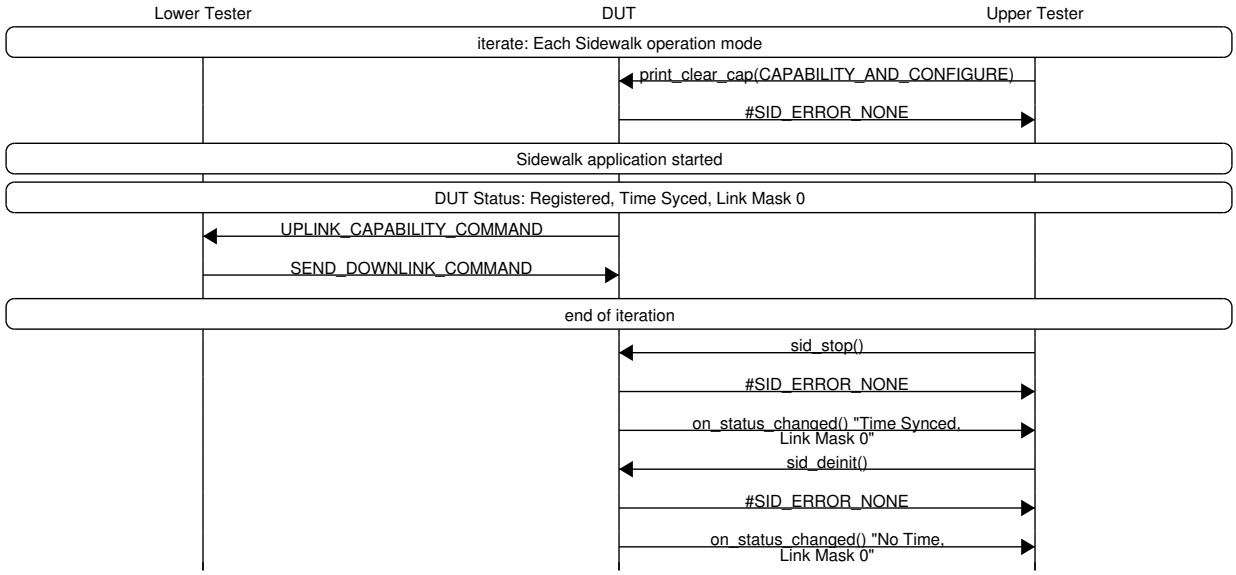
10.1.1 Test Purpose

Verify capability report flow when endpoint attempt to schedule report.

10.1.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.1.3 Test Procedure



10.1.4 Expected Results

10.1.4.1 Pass Verdict

When the capability information of Endpoint is not equal to the capability information stored in the KV store, the event to send capability is performed.

10.2 CMN-EP-CAPABILITY-REPORT-BV-02: When Capability stored in the KV store is equal to the capability of the Endpoint, the Capability event report is not generated.

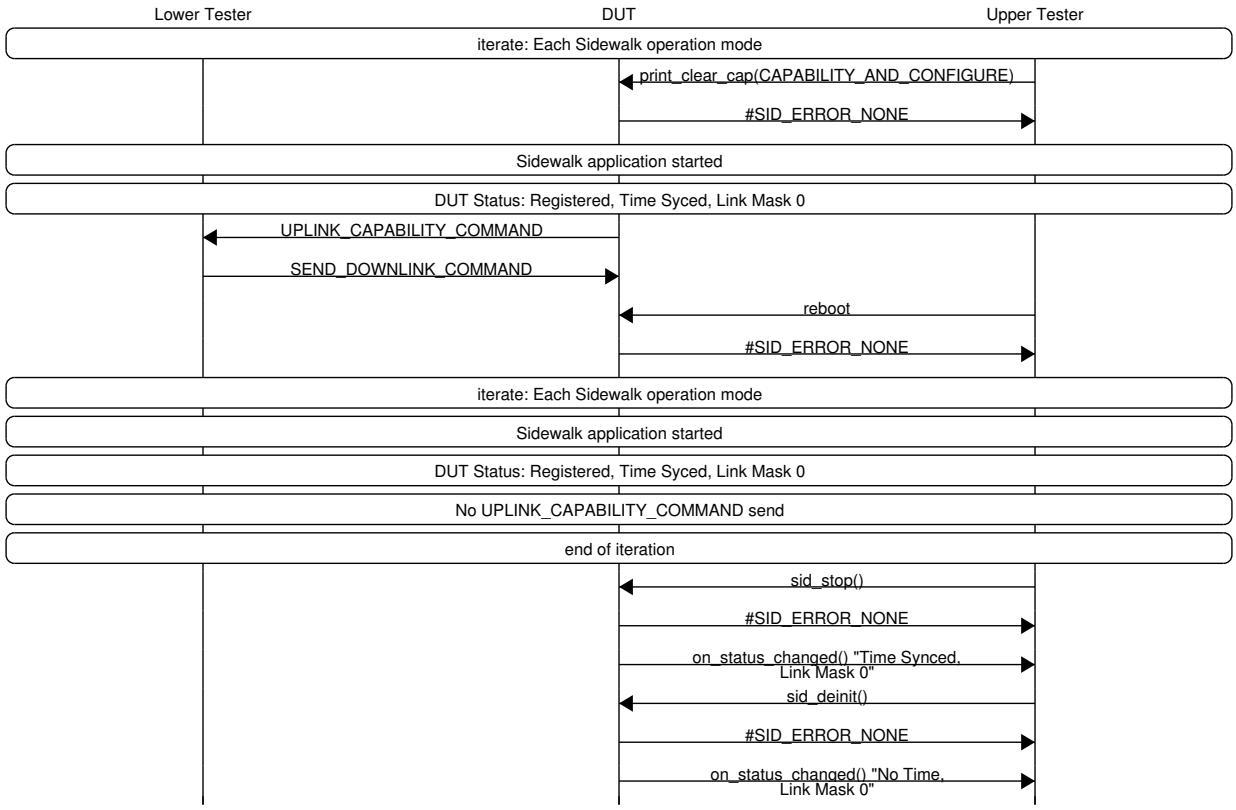
10.2.1 Test Purpose

Verify capability report flow when the Capability information stored in KV store capability is equal to the capability of the endpoint.

10.2.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.2.3 Test Procedure



10.2.4 Expected Results

10.2.4.1 Pass Verdict

Capability information stored in the KV store is equal to capability information of the device. The event to report capability information is not scheduled.

10.3 CMN-EP-CAPABILITY-REPORT-BV-03: Endpoint default capability report.

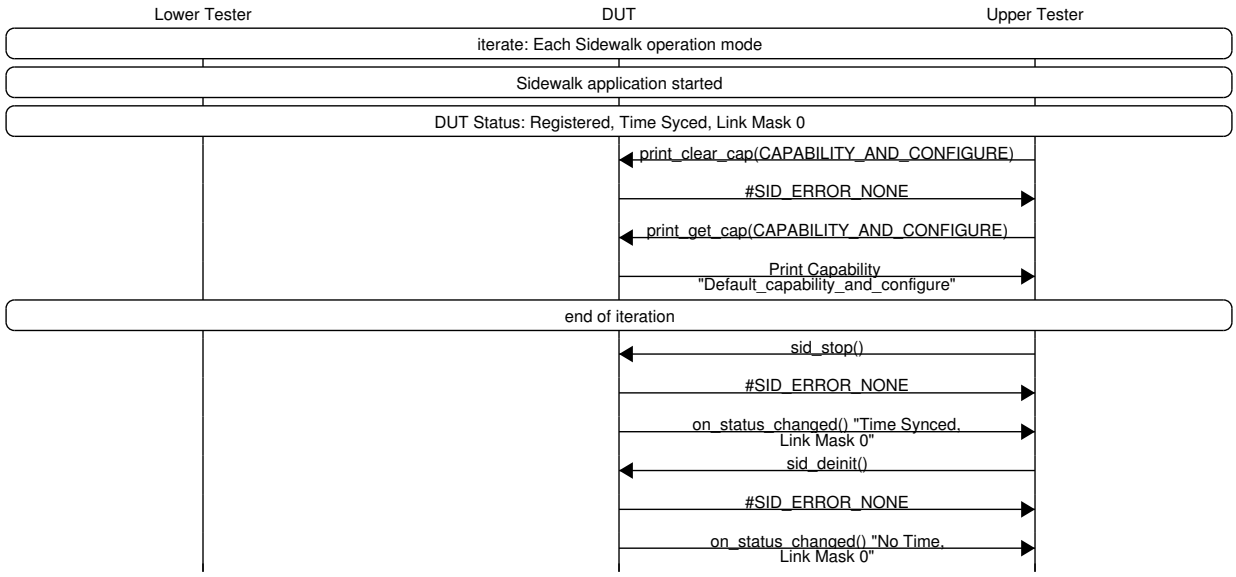
10.3.1 Test Purpose

Verify on clearing the configuration, the capability and configuration shall be set to defaults.

10.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.3.3 Test Procedure



10.3.4 Expected Results

10.3.4.1 Pass Verdict

The capability are configuration information are equal to the default values.

10.4 CMN-EP-CAPABILITY-REQUEST-BV-01: Endpoint is online, send request to get endpoint capability.

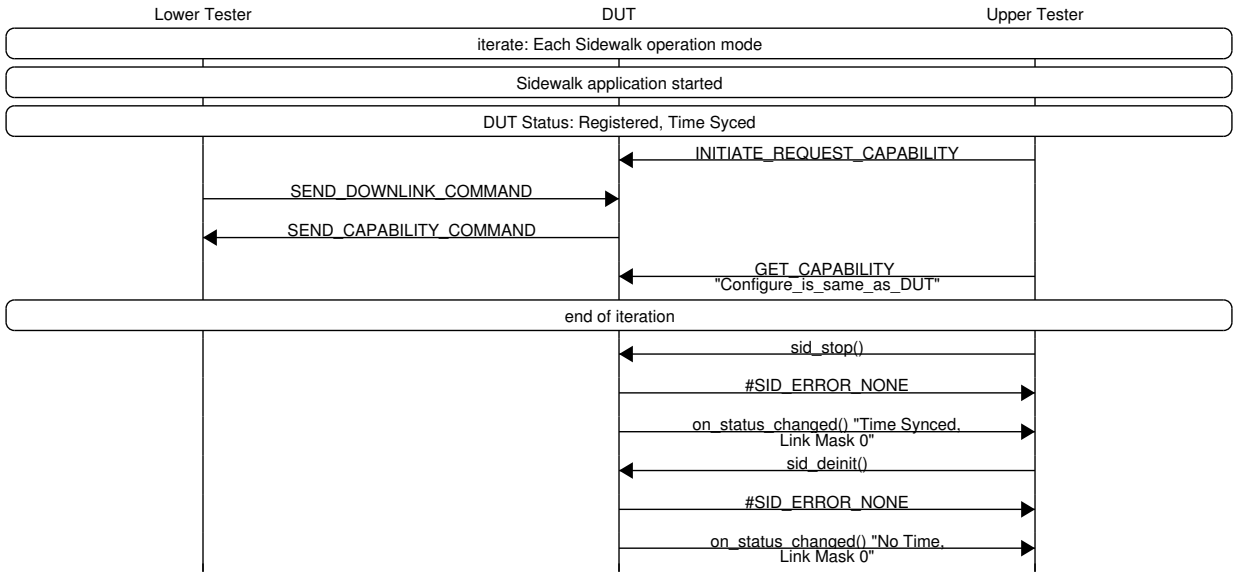
10.4.1 Test Purpose

Verify endpoint sends updated capability when user initiates request capability.

10.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.4.3 Test Procedure



10.4.4 Expected Results

10.4.4.1 Pass Verdict

Endpoint reports updated capability report when requested by the user.

10.5 CMN-EP-CAPABILITY-CONFIGURE-BV-01: Endpoint configuraton shall be updated on user setting.

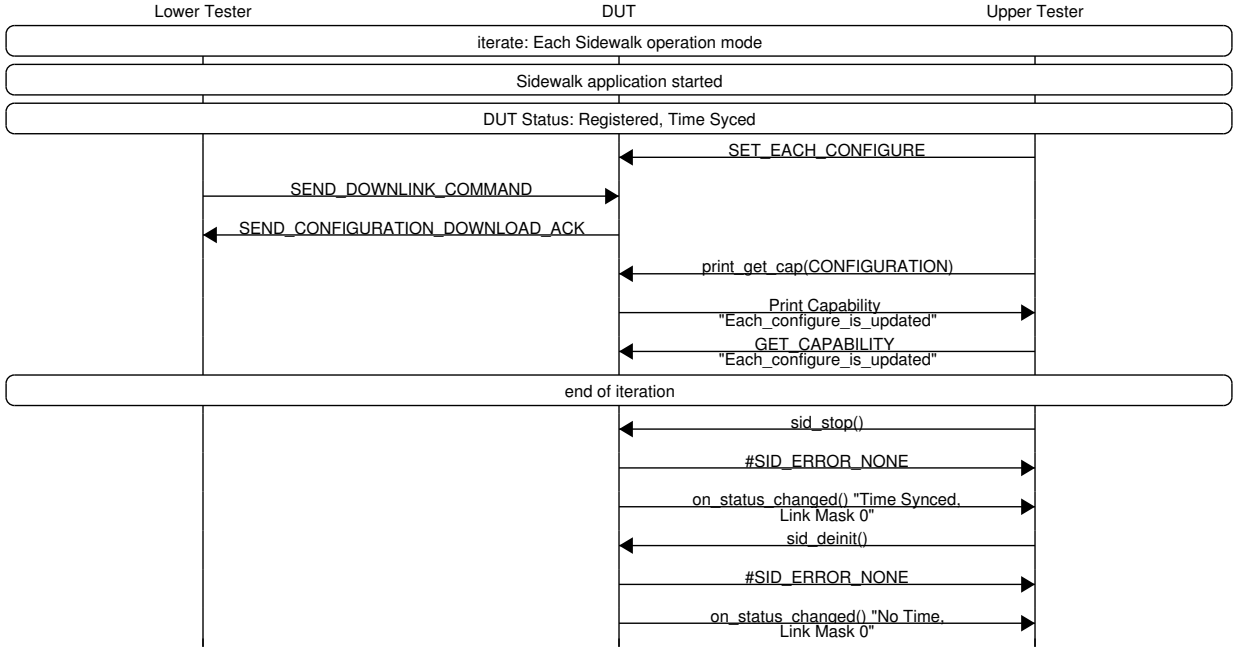
10.5.1 Test Purpose

Verify configuration of the endpoint is updated after it is set by the user.

10.5.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.5.3 Test Procedure



10.5.4 Expected Results

10.5.4.1 Pass Verdict

The configuration on DUT is updated.

10.6 CMN-EP-CAPABILITY-REGISTER-BV-01: Endpoint capability is set to default after re-registration.

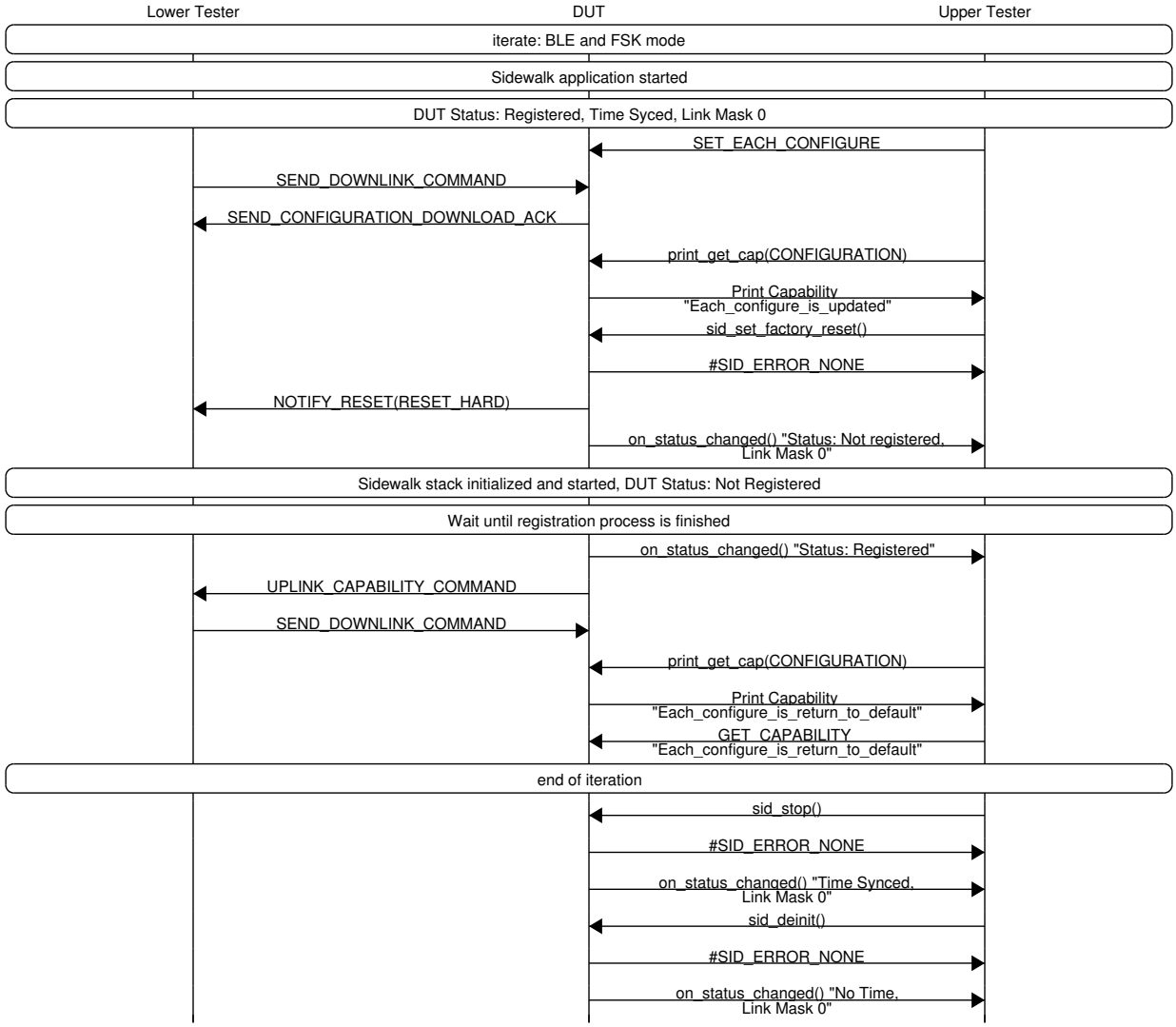
10.6.1 Test Purpose

Verify capability of Endpoint shall have default configuration on re-registration.

10.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links(BLE or FSK) mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.6.3 Test Procedure



10.6.4 Expected Results

10.6.4.1 Pass Verdict

Configuration is set to defaults on re-registration.

10.7 CMN-EP-CAPABILITY-THRESHOLD-BV-01: Traffic threshold reset mechanism.

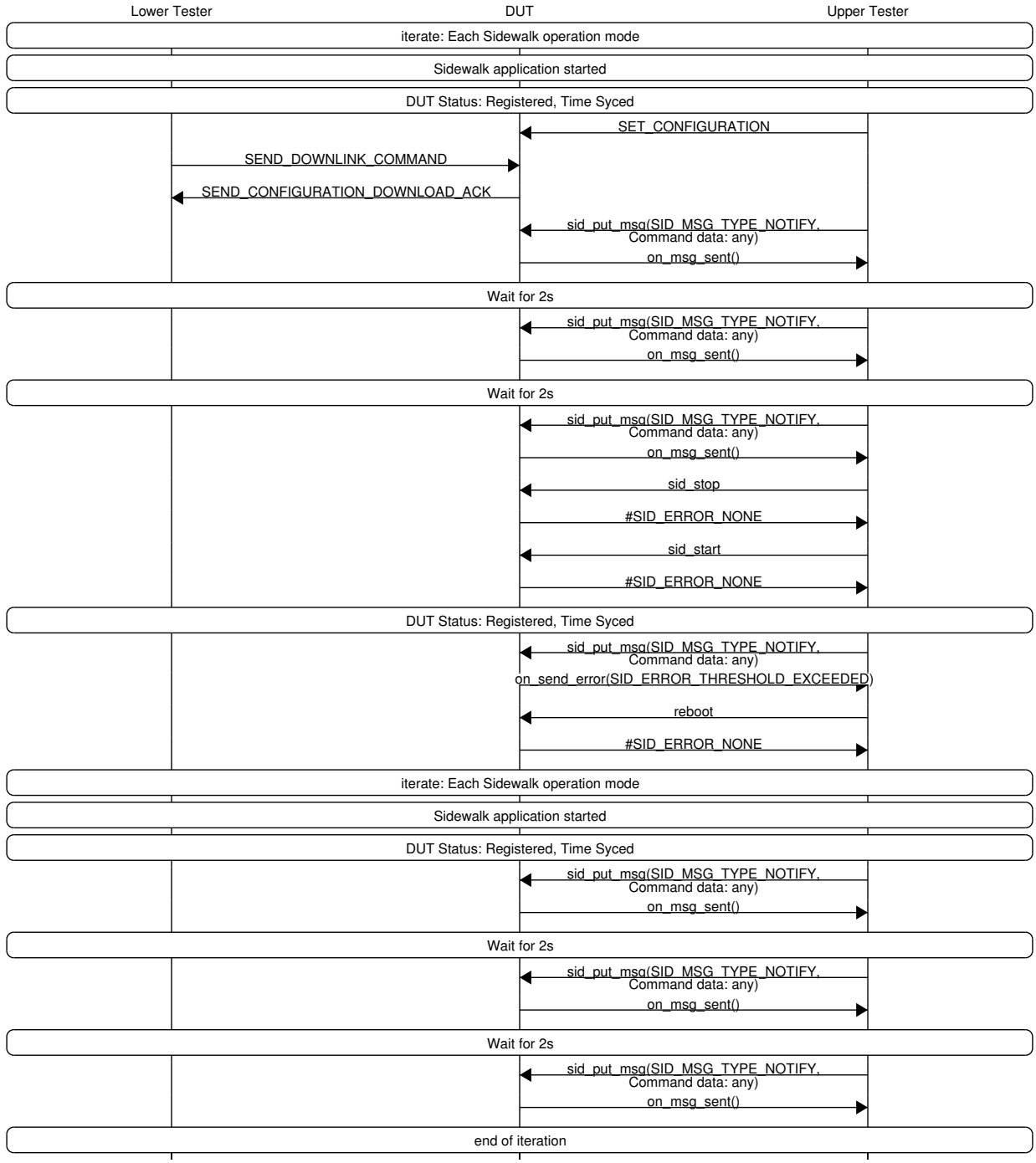
10.7.1 Test Purpose

Verify traffic thresholds are reset when the device is reset but not when sidewalk stack is stopped and started.

10.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.7.3 Test Procedure



10.7.4 Expected Results

10.7.4.1 Pass Verdict

After messages on a particular link exceed traffic threshold, stopping and starting the stack shall not allow new uplink messages to be sent. After messages on a particular link exceed traffic threshold, a reboot of device can allow new uplink messages to be sent.

10.8 CMN-EP-CAPABILITY-PERIODICITY-BV-01: Set metrics periodicity.

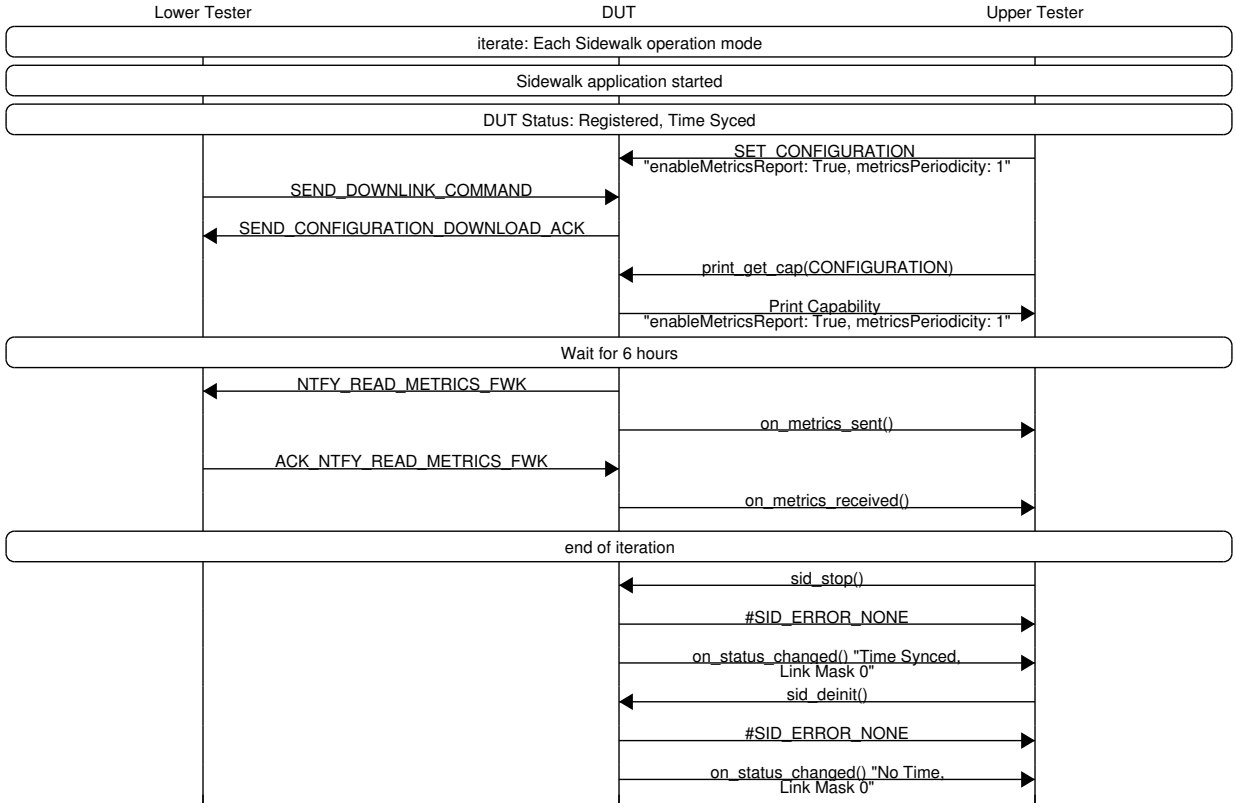
10.8.1 Test Purpose

Verify metrics are sent at a periodicity set in the endpoint metrics periodicity configuration.

10.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.8.3 Test Procedure



10.8.4 Expected Results

10.8.4.1 Pass Verdict

configuration is updated after setting. DUT successfully transmits metrics according to the configured periodicity. DUT receives Cloud acknowledgment for the transmitted metrics messages.

10.9 CMN-EP-CAPABILITY-PERIODICITY-BV-02: Set metrics periodicity when link metrics is disabled.

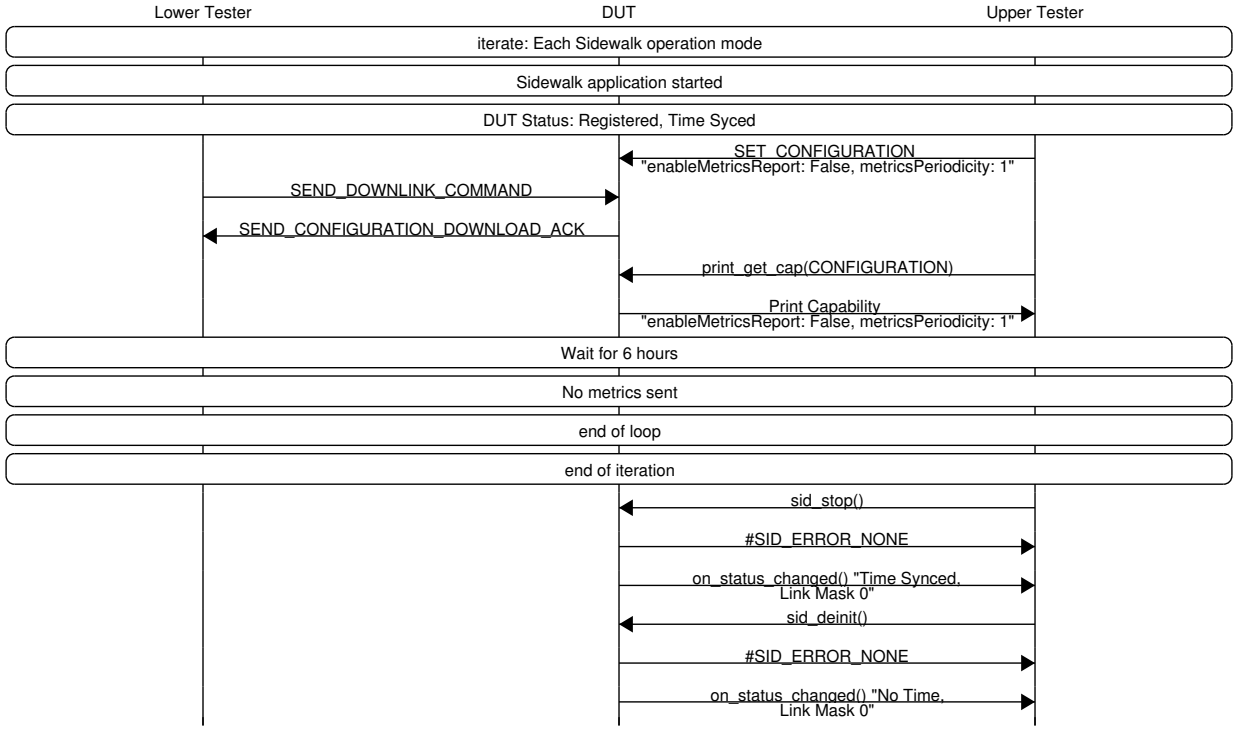
10.9.1 Test Purpose

Verify the metrics periodicity configuration shall be set successfully even when link is disabled.

10.9.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in supported links mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

10.9.3 Test Procedure



10.9.4 Expected Results

10.9.4.1 Pass Verdict

Configuration is updated after setting. Metrics are sent only at the periodicity configuration.

10.10 BLE-EP-CAPABILITY-THRESHOLD-BV-01: Verify traffic thresholds for BLE stack.

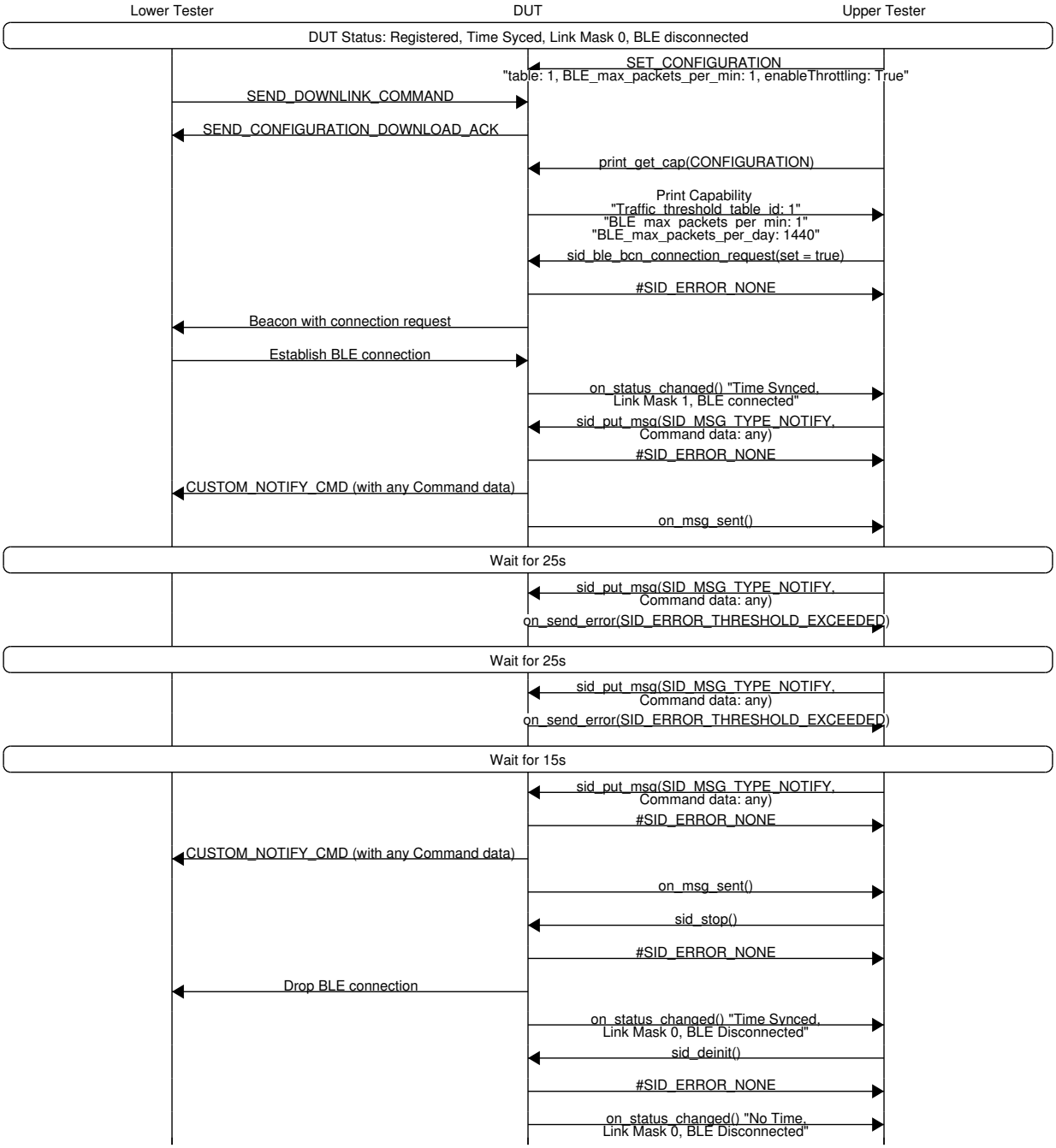
10.10.1 Test Purpose

After traffic on BLE link exceeds the BLE traffic thresholds, the user messages shall be dropped.

10.10.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode.

10.10.3 Test Procedure



10.10.4 Expected Results

10.10.4.1 Pass Verdict

Traffic threshold configuration shall reflect the correct setting. User messages shall be allowed after the traffic threshold timeouts.

10.11 FSK-EP-CAPABILITY-THRESHOLD-BV-01: Verify traffic threshold for FSK stack.

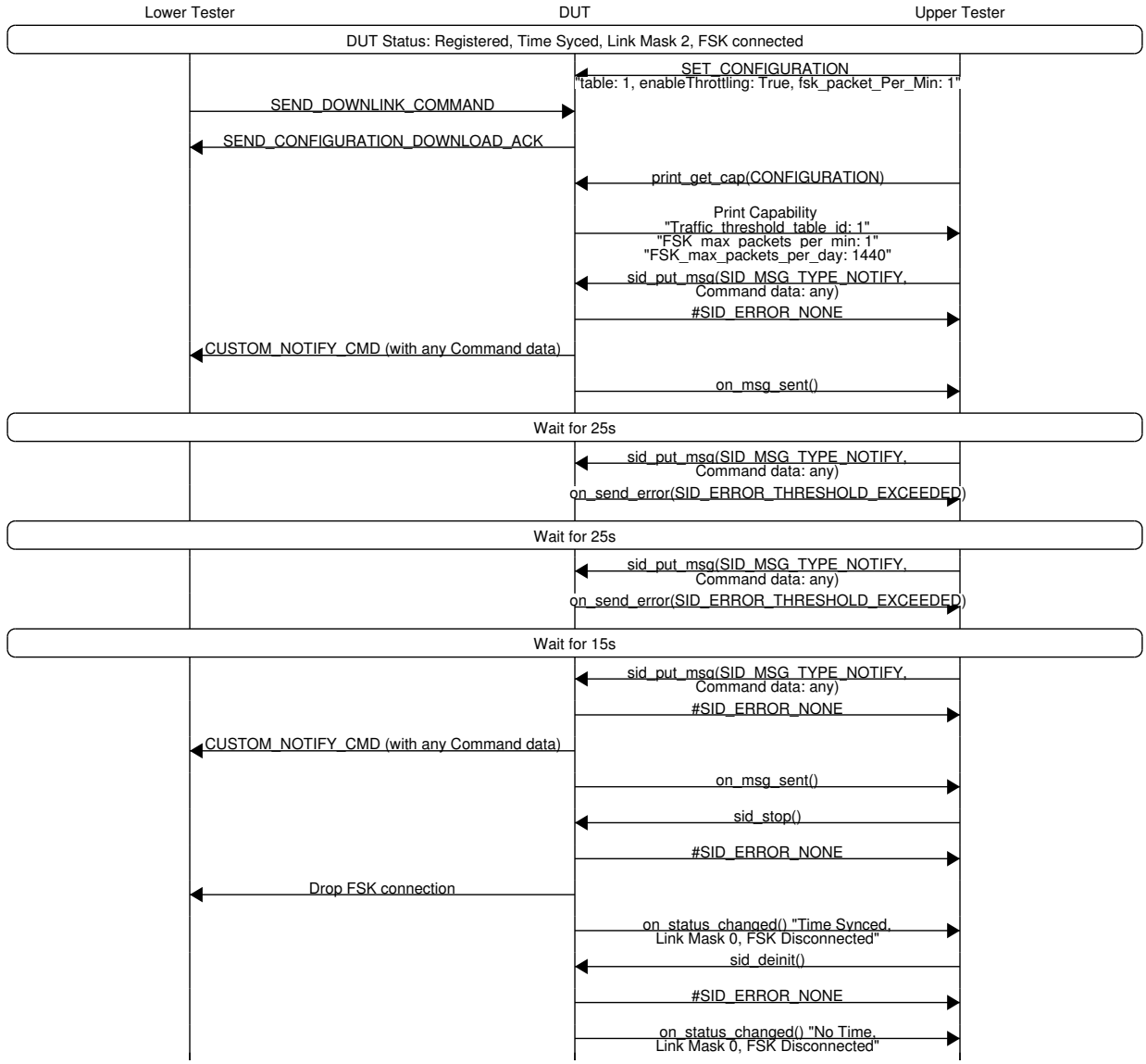
10.11.1 Test Purpose

When messages on FSK exceed thresholds, messages shall be dropped.

10.11.2 Initial Conditions

- The Sidewalk stack (FSK) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in FSK mode.

10.11.3 Test Procedure



10.11.4 Expected Results

10.11.4.1 Pass Verdict

Traffic threshold configuration shall reflect the correct setting. After traffic on FSK link exceeds the FSK traffic thresholds, the user messages shall be dropped. User messages shall be allowed after the traffic threshold timeouts.

10.12 LORA-EP-CAPABILITY-THRESHOLD-BV-01: Verify traffic threshold on static endpoint of LoRa.

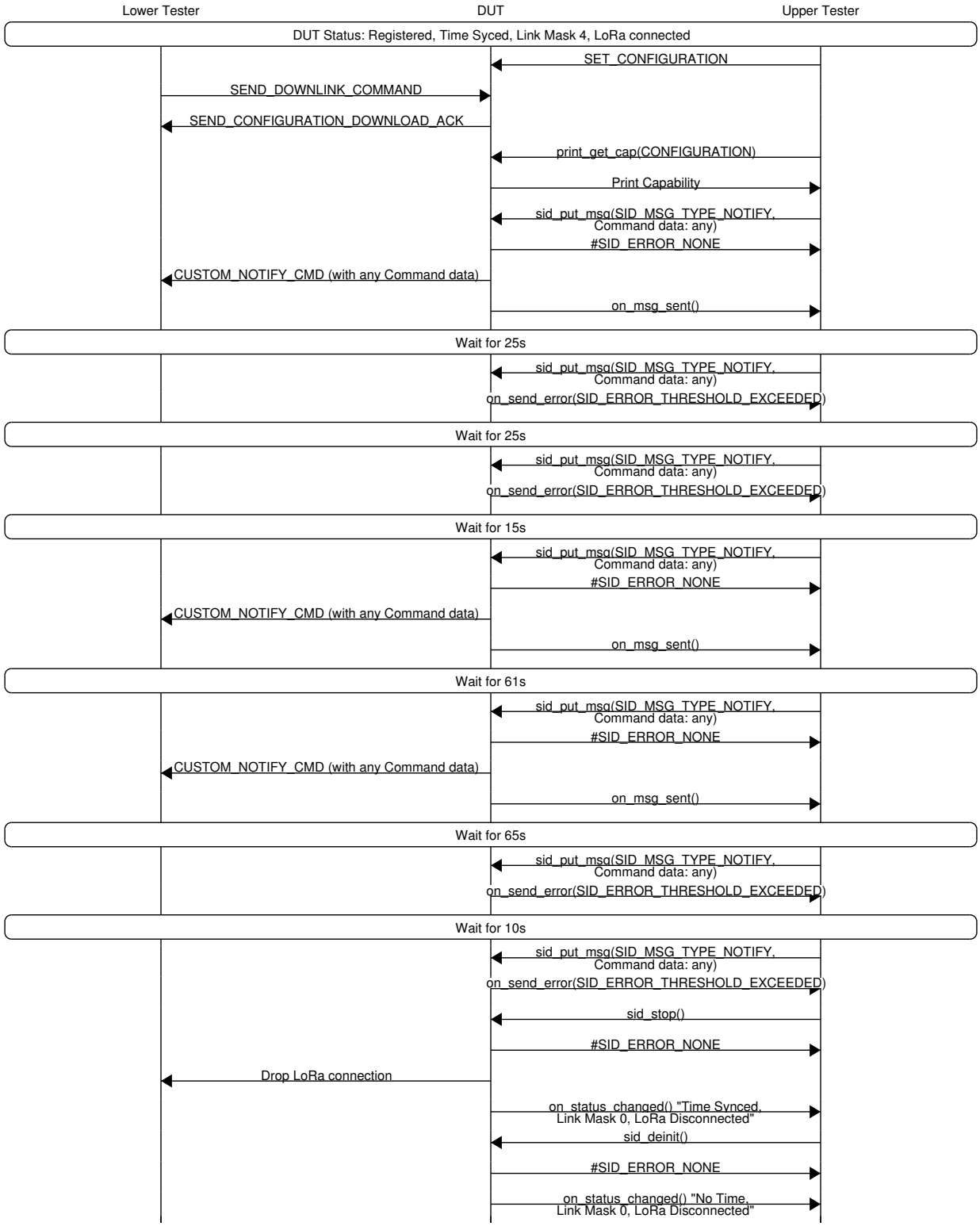
10.12.1 Test Purpose

When messages on LoRa exceed thresholds, messages shall be dropped.

10.12.2 Initial Conditions

- The Sidewalk stack (LoRa) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in LoRa mode.

10.12.3 Test Procedure



10.12.4 Expected Results

10.12.4.1 Pass Verdict

Traffic threshold configuration shall reflect the correct setting. After traffic on LoRa link exceeds the LoRa traffic thresholds, the user messages shall be dropped. User messages shall be allowed after the traffic threshold timeouts.

Chapter 11

MAC Address Test Cases

11.1 BLE/EP/BCN/MAC/BV/01: Verify MAC address rotation after registration.

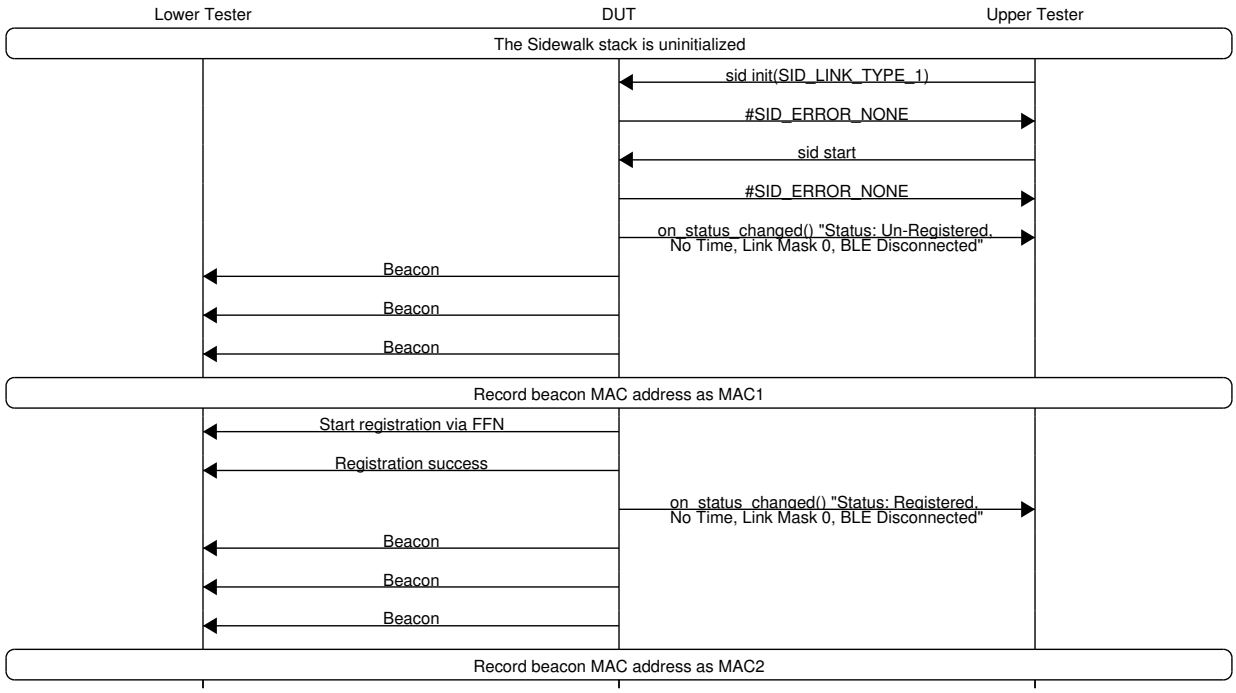
11.1.1 Test Purpose

DUT BLE MAC address should rotate after registration.

11.1.2 Initial Conditions

- DUT is not registered on Amazon Sidewalk Network.
- Lower Tester is a Sidewalk gateway and a BLE sniffer.
- Upper Tester operates as a Sid API user.

11.1.3 Test Procedure



11.1.4 Expected Results

11.1.4.1 Pass Verdict

MAC1 is different with MAC2.

11.2 BLE/EP/BCN/MAC/BV/02: Verify MAC address rotation after time sync.

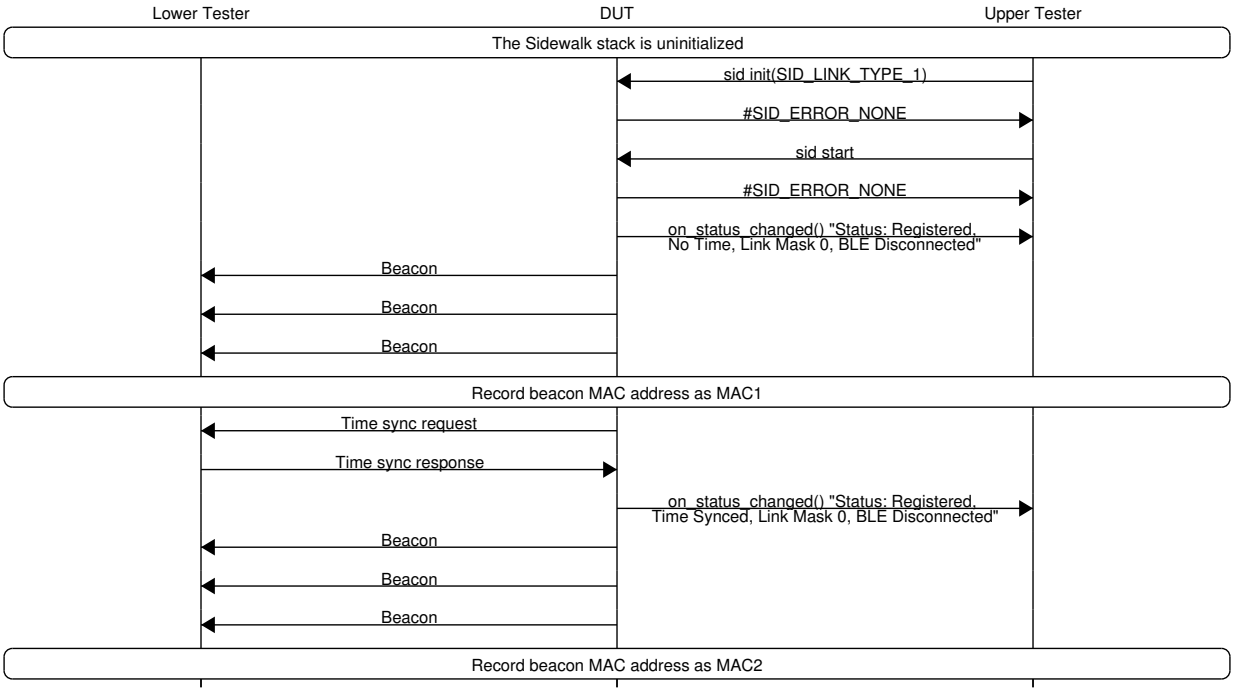
11.2.1 Test Purpose

DUT BLE MAC address should rotate after time sync.

11.2.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester is a Sidewalk gateway and a BLE sniffer.
- Upper Tester operates as a Sid API user.

11.2.3 Test Procedure



11.2.4 Expected Results

11.2.4.1 Pass Verdict

MAC1 is different with MAC2.

11.3 BLE/EP/BCN/MAC/BV/03: Verify MAC address rotates every 15 minutes.

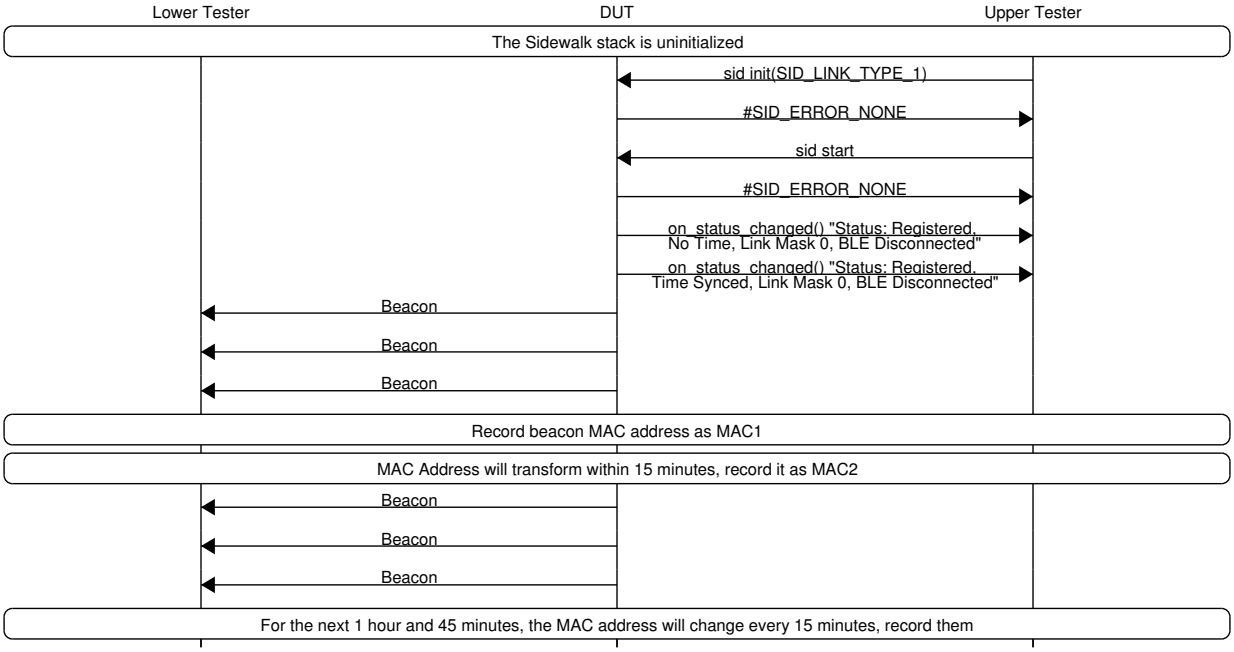
11.3.1 Test Purpose

DUT BLE MAC address should rotate after time sync every 15 minutes along with TX-UUID.

11.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.
- Lower Tester is a Sidewalk gateway and a BLE sniffer.
- Upper Tester operates as a Sid API user.

11.3.3 Test Procedure



11.3.4 Expected Results

11.3.4.1 Pass Verdict

MAC address and TX-UUID change every 15 minutes.

11.4 BLE/EP/BCN/MAC/BV/04: Verify MAC address rotation after connection request sent to cloud.

11.4.1 Test Purpose

DUT BLE MAC address should rotate after connection request sent from EN to cloud.

11.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

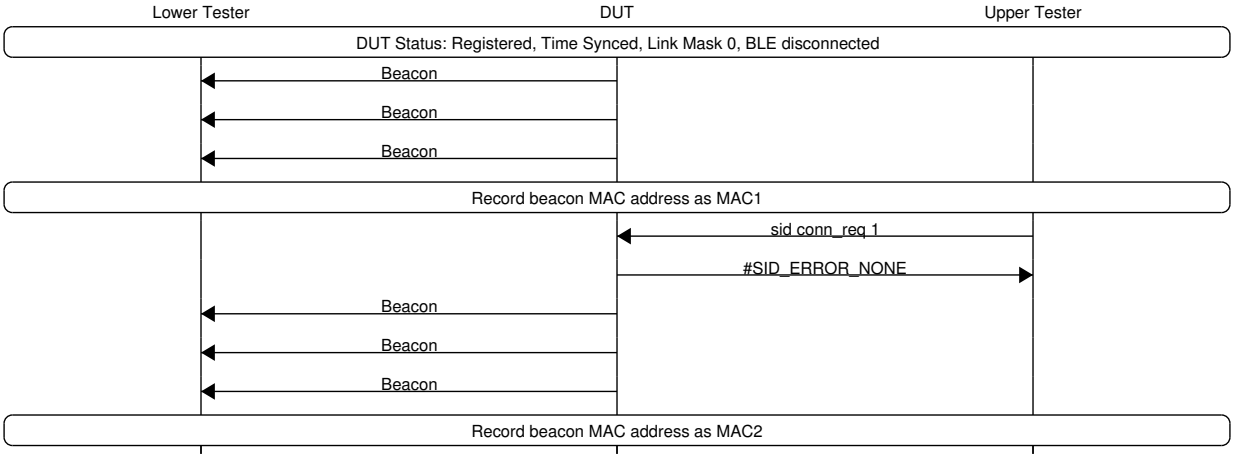
- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester is a Sidewalk gateway and a BLE sniffer.

- Upper Tester operates as a Sid API user.

11.4.3 Test Procedure



11.4.4 Expected Results

11.4.4.1 Pass Verdict

MAC1 is different with MAC2.

11.5 BLE/EP/BCN/MAC/BV/05: Verify MAC address rotation on disconnection from Sidewalk cloud.

11.5.1 Test Purpose

DUT BLE MAC address rotated after disconnection.

11.5.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

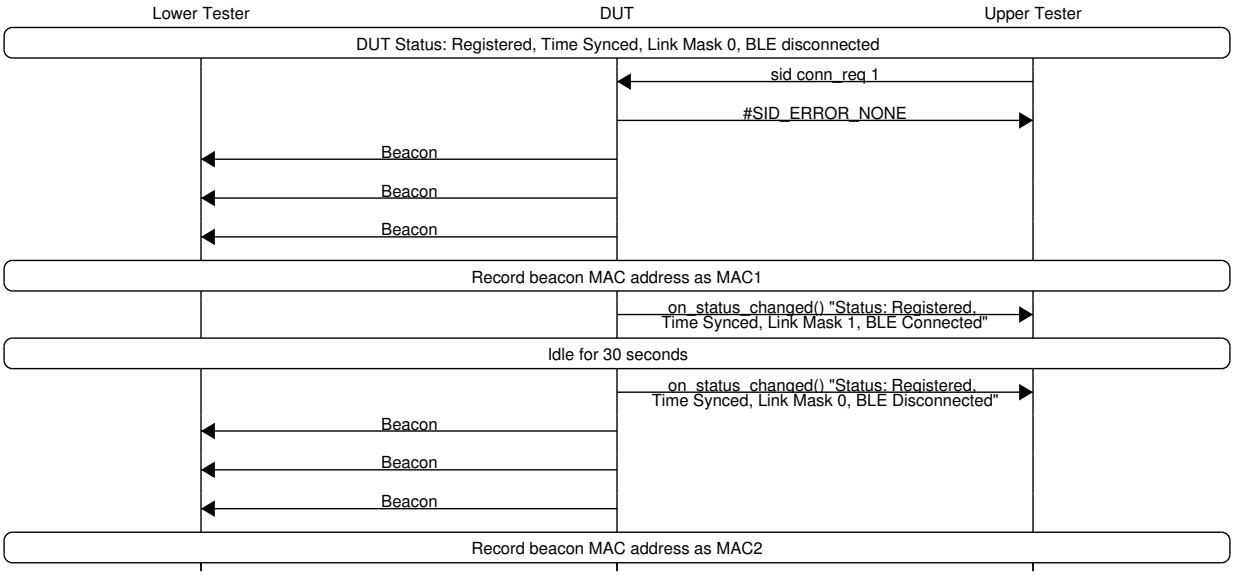
- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester is a Sidewalk gateway and a BLE sniffer.

- Upper Tester operates as a Sid API user.

11.5.3 Test Procedure



11.5.4 Expected Results

11.5.4.1 Pass Verdict

MAC1 is different with MAC2.

11.6 BLE/EP/BCN/MAC/BV/06: Verify MAC address rotation on downlink reception.

11.6.1 Test Purpose

DUT BLE MAC address should rotate after receiving a downlink.

11.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

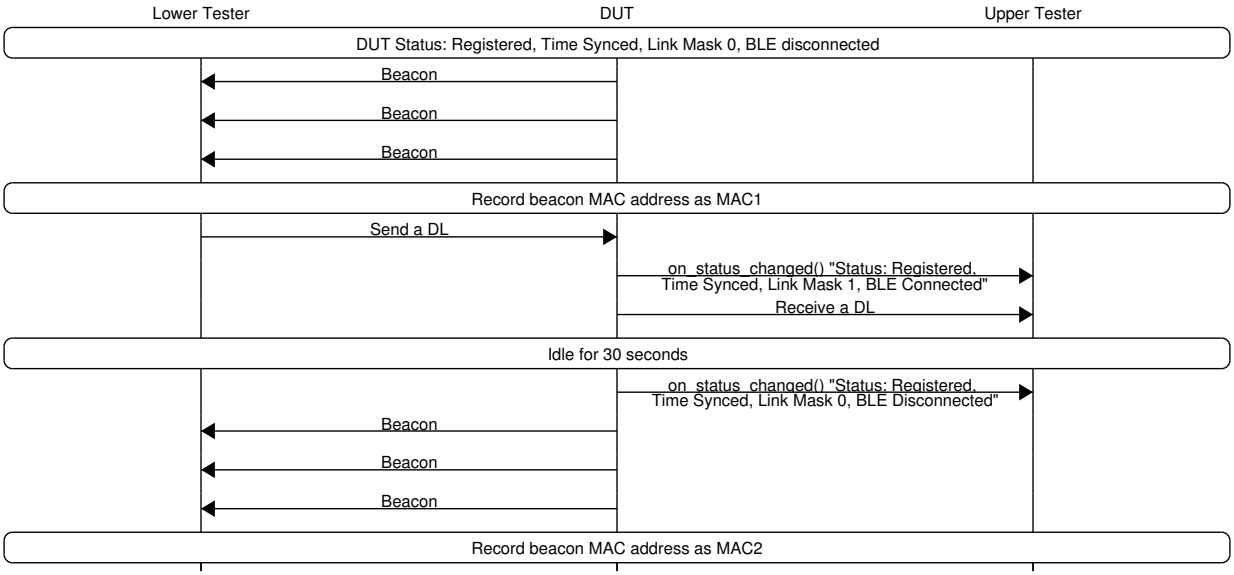
- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester is a Sidewalk gateway, a BLE sniffer, and ready on AWS IOT side.

- Upper Tester operates as a Sid API user.

11.6.3 Test Procedure



11.6.4 Expected Results

11.6.4.1 Pass Verdict

MAC1 is different with MAC2.

11.7 BLE/EP/BCN/MAC/BV/07: Verify MAC address rotation on key refresh.

11.7.1 Test Purpose

DUT BLE MAC address should rotate after key refresh.

11.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

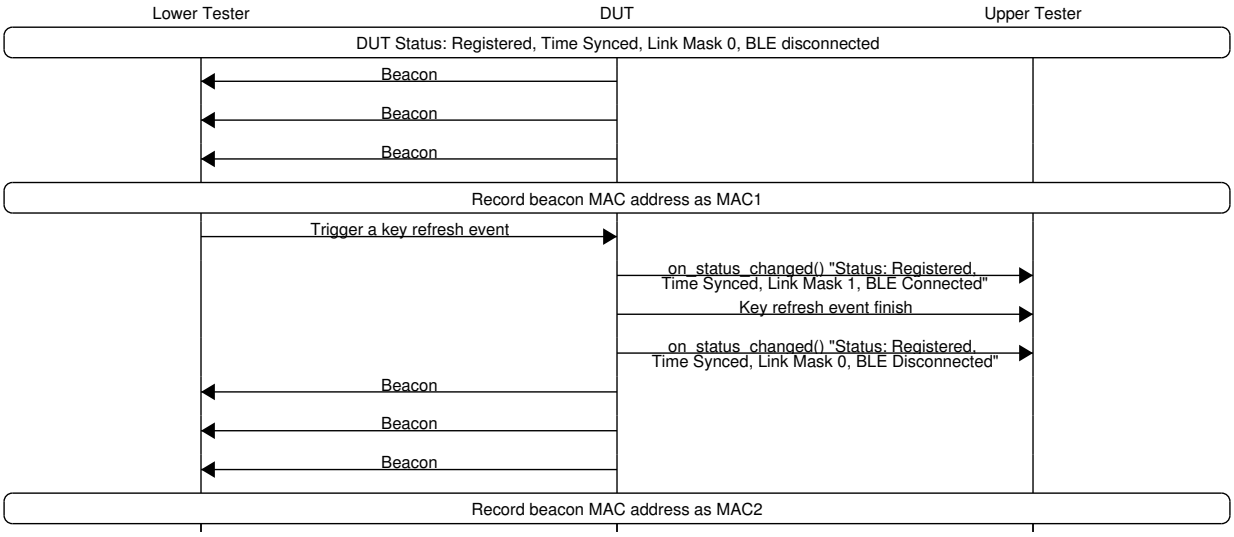
- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester is a Sidewalk gateway, a BLE sniffer, and ready on AWS IOT side.

- Upper Tester operates as a Sid API user.

11.7.3 Test Procedure



11.7.4 Expected Results

11.7.4.1 Pass Verdict

MAC1 is different with MAC2.

11.8 BLE/EP/BCN/MAC/BV/08: Verify MAC address rotation on long lived connection.

11.8.1 Test Purpose

DUT BLE MAC address should rotate every 15 minutes if the connection to Sidewalk cloud is maintained beyond 15 minutes.

11.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network.

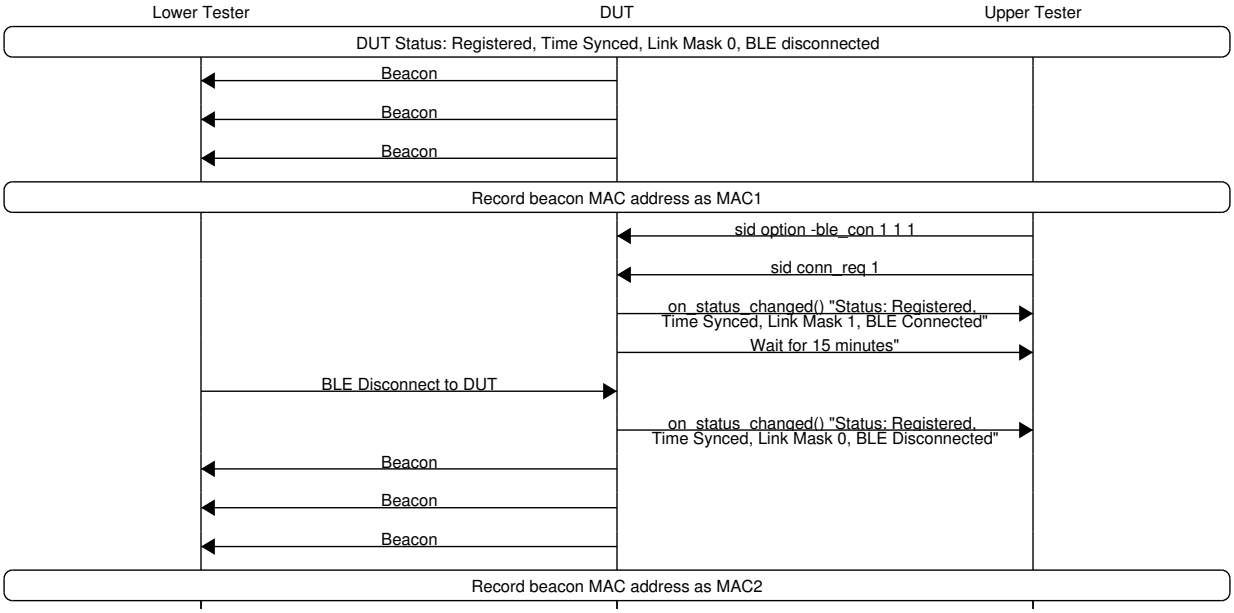
- The Sidewalk stack (BLE) is initialized and started on the DUT.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester is a Sidewalk gateway, a BLE sniffer, and ready on AWS IOT side.

- Upper Tester operates as a Sid API user.

11.8.3 Test Procedure



11.8.4 Expected Results

11.8.4.1 Pass Verdict

MAC1 is different with MAC2.

Chapter 12

Sidewalk Location Service Test Cases

12.1 LOCSVC-E2E/EP/BLE-GNSS-SCAN/UL/BV/01: Resolve EN location on BLE uplink message containing GNSS scan information

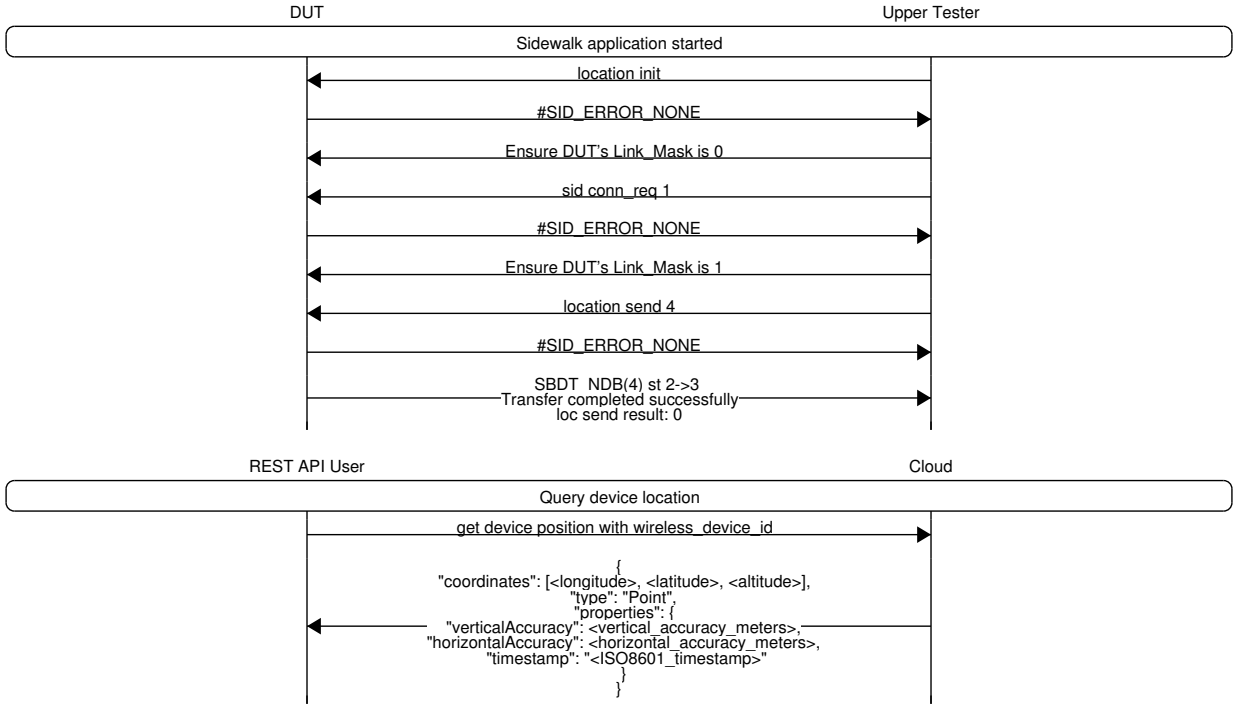
12.1.1 Test Purpose

Send GNSS scan data on a BLE uplink message.

12.1.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.

12.1.3 Test Procedure



12.1.4 Expected Results

12.1.4.1 Pass Verdict

The DUT should successfully send the uplink message with GNSS scan information, and the Cloud should be able to resolve the device location based on the GNSS data.

12.2 LOCSVC-E2E/EP/BLE-WIFI-SCAN/UL/BV/02: Resolve EN location on BLE uplink message containing WiFi scan information

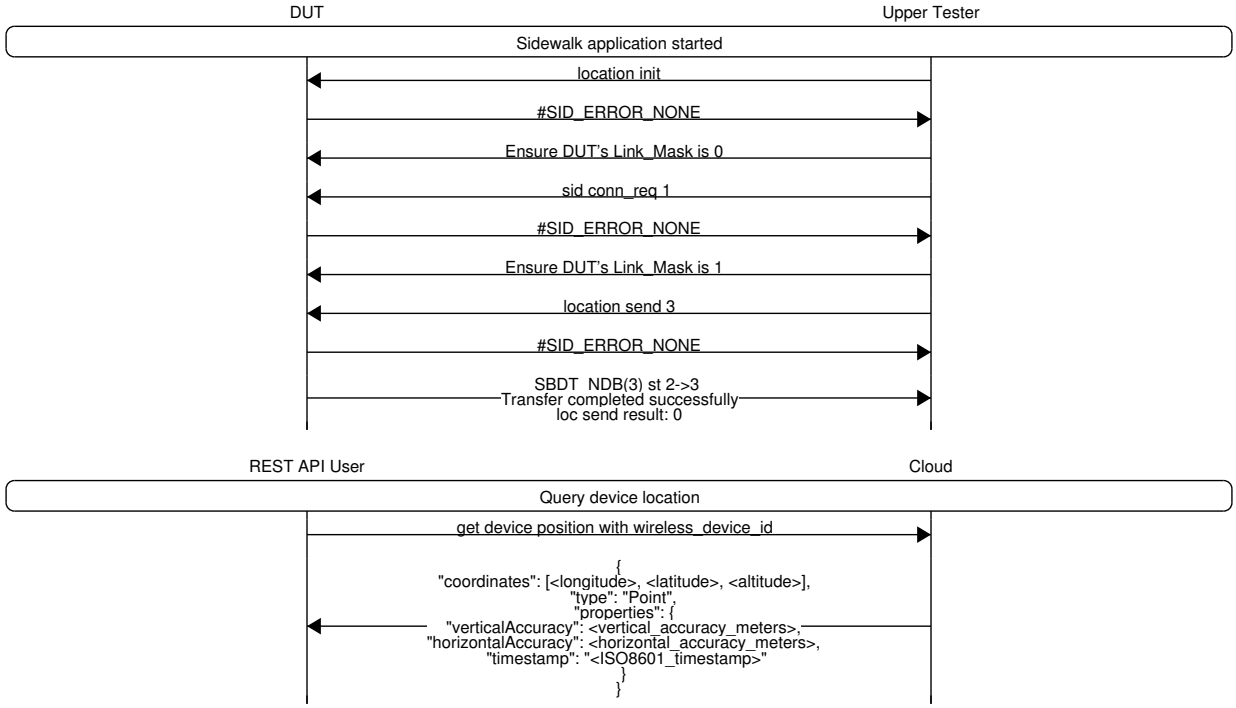
12.2.1 Test Purpose

Send WiFi Scan results on a BLE uplink message.

12.2.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.

12.2.3 Test Procedure



12.2.4 Expected Results

12.2.4.1 Pass Verdict

The DUT should successfully send the uplink message with WiFi scan information, and the Cloud should resolve the device location.

12.3 LOCSVC-E2E/EP/BLE-GW-LOC/UL/BV/03: Resolve EN location on BLE uplink message with connected GW location

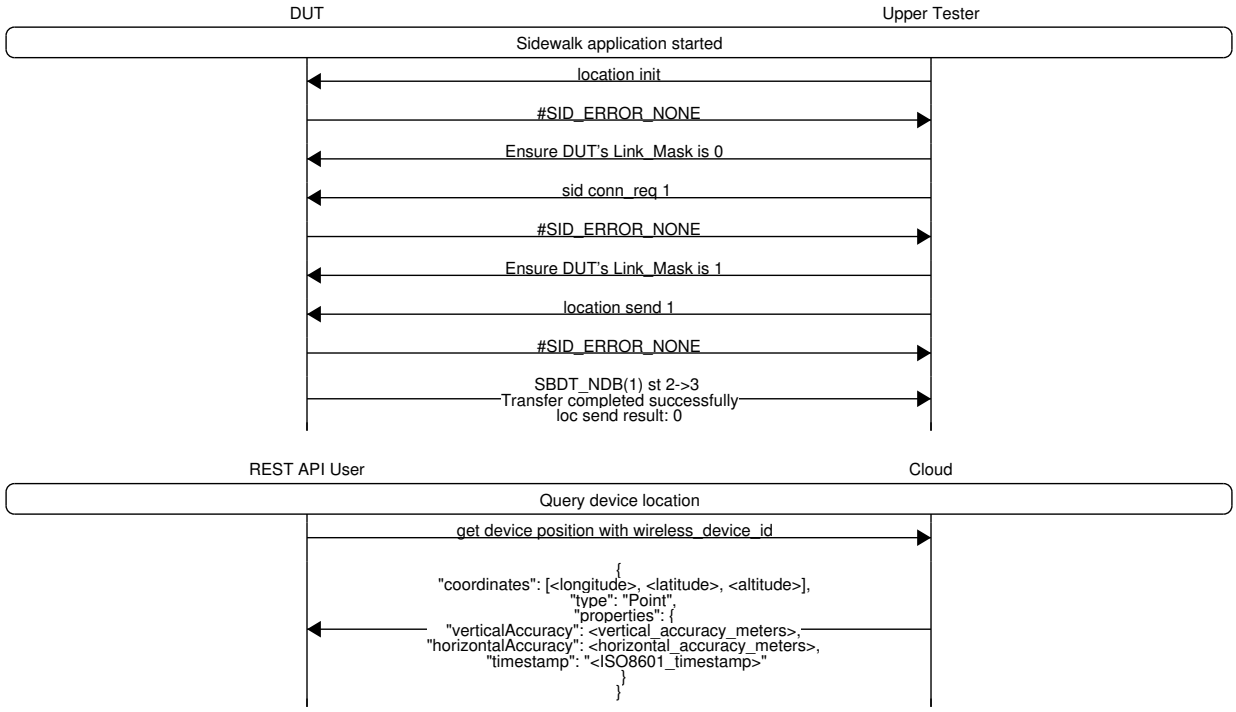
12.3.1 Test Purpose

Send DUT location as a proximity to a GW connected over BLE.

12.3.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in BLE mode.

12.3.3 Test Procedure



12.3.4 Expected Results

12.3.4.1 Pass Verdict

The DUT should successfully send the uplink message with gateway location information, and the Cloud should resolve the device location.

12.4 LOCSVC-E2E/EP/LORA-GNSS-SCAN/UL/BV/01: Resolve EN location on LoRa uplink message containing GNSS scan information

12.4.1 Test Purpose

Send GNSS location scan data on LoRa.

12.4.2 Initial Conditions

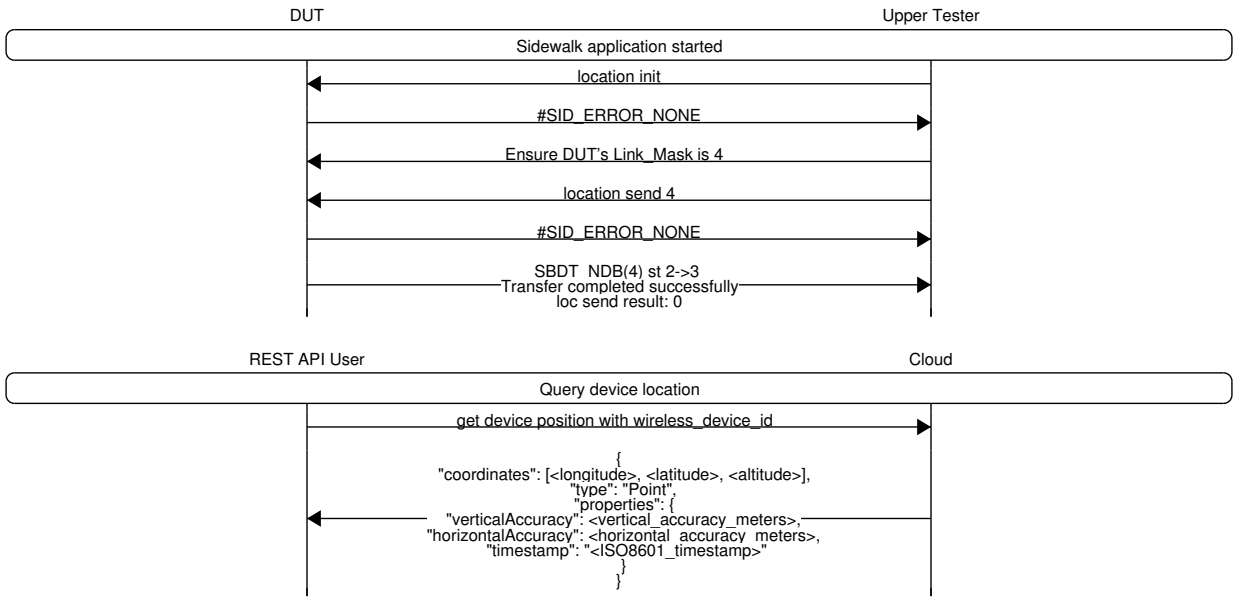
- The Sidewalk stack (LoRa) is initialized and started on the DUT.

- DUT is registered with Amazon Sidewalk network.

- DUT is time-synced with Amazon Sidewalk network.

- Lower Tester operates in LoRa mode.

12.4.3 Test Procedure



12.4.4 Expected Results

12.4.4.1 Pass Verdict

The DUT should successfully send the uplink messages with GNSS scan information via LoRa, and the Cloud should resolve the device location.

12.5 LOCSVC-E2E/EP/LORA-WIFI-SCAN/UL/BV/02: Resolve EN location on LoRa uplink message containing WiFi scan information

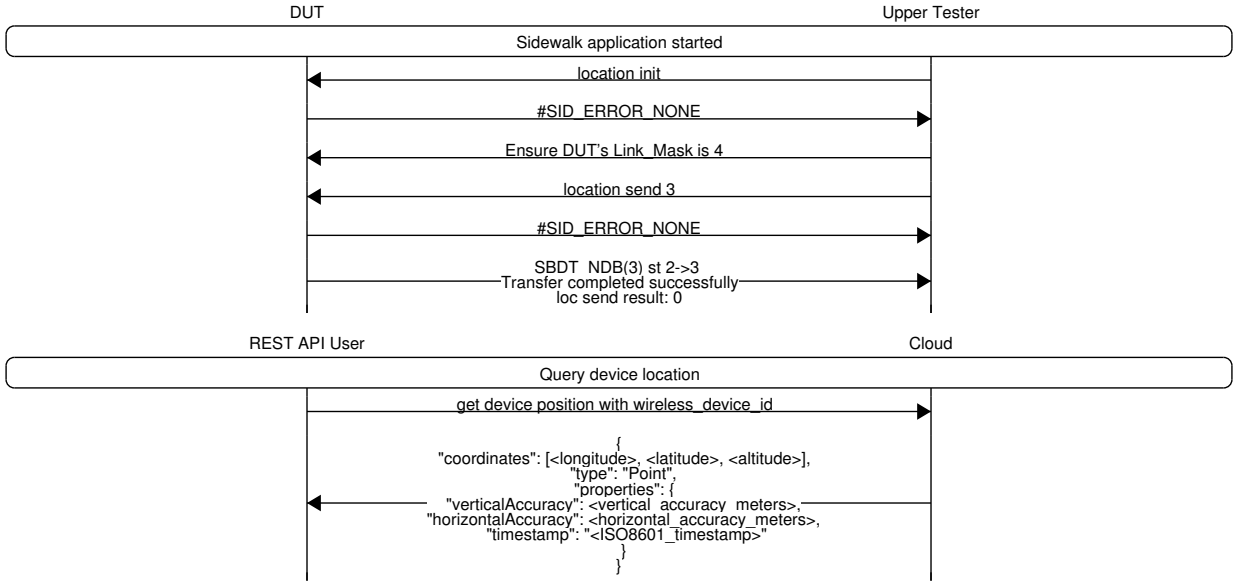
12.5.1 Test Purpose

Send WiFi scan data on LoRa.

12.5.2 Initial Conditions

- The Sidewalk stack (LoRa) is initialized and started on the DUT.
- DUT is registered with Amazon Sidewalk network.
- DUT is time-synced with Amazon Sidewalk network.
- Lower Tester operates in LoRa mode.

12.5.3 Test Procedure



12.5.4 Expected Results

12.5.4.1 Pass Verdict

The DUT should successfully send the uplink message with WiFi scan information via LoRa, and the Cloud should resolve the device location.

Chapter 13

Location Service MCU Test Cases

13.1 CMN-EP-LOCATIONSERVICE-BLELOCATION-BV-01: Send location when there is BLE gateway.

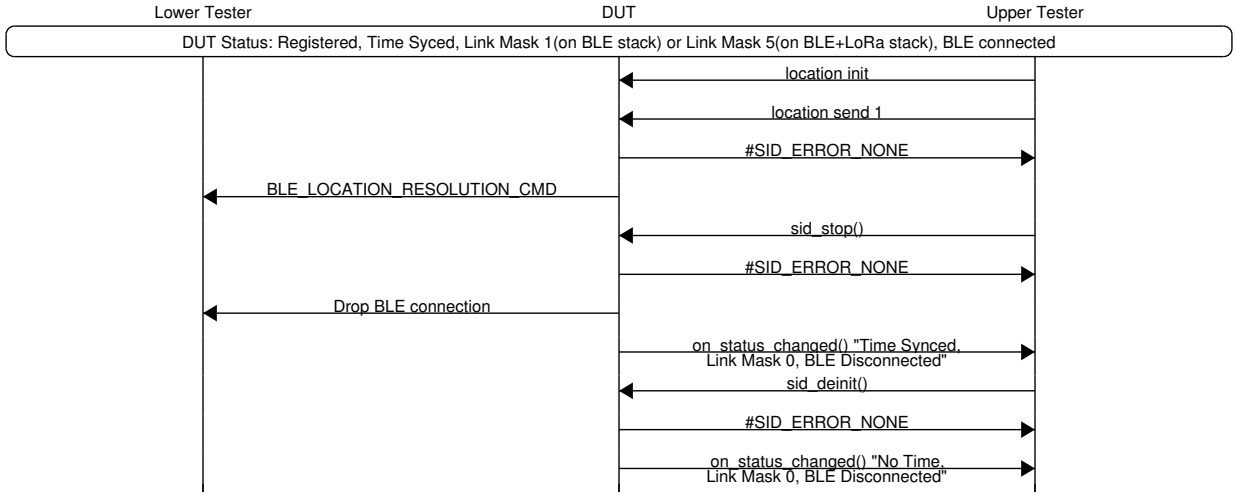
13.1.1 Test Purpose

Verify EN send a location uplink at level 1.

13.1.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE or BLE+LoRa mode. - The Sidewalk stack (BLE or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester.

13.1.3 Test Procedure



13.1.4 Expected Results

13.1.4.1 Pass Verdict

Device can send location via BLE uplink using Sidewalk Network location.

13.2 CMN-EP-LOCATIONSERVICE-BLELOCATION-BV-02: Send location with piggybacking.

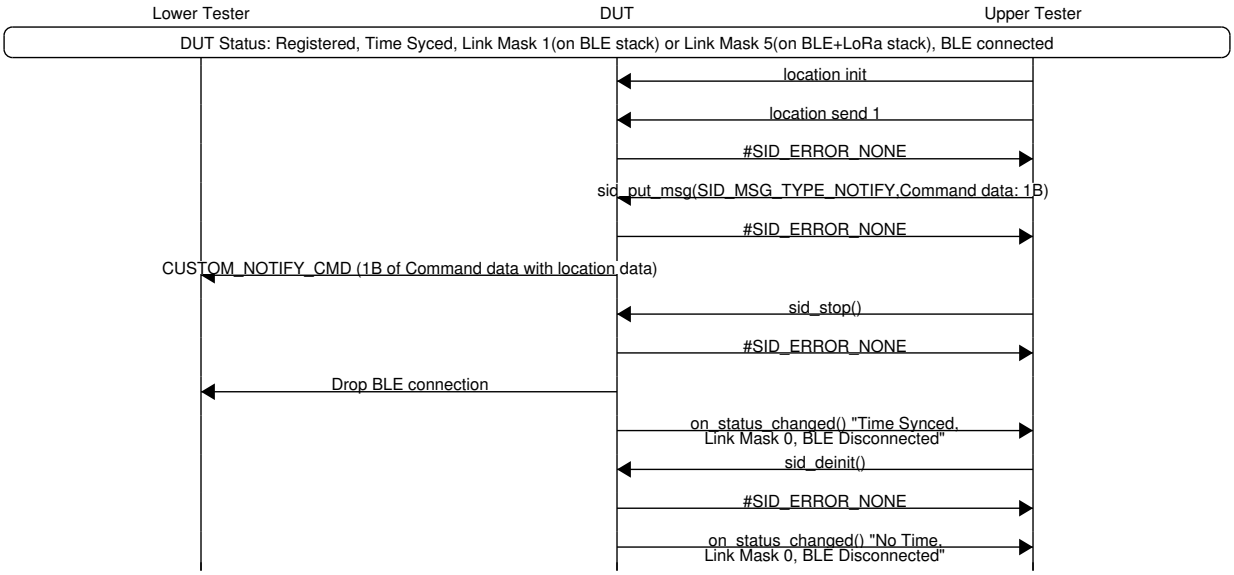
13.2.1 Test Purpose

Verify EN send a location uplink at level 1 via piggybacking.

13.2.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE or BLE+LoRa mode. - The Sidewalk stack (BLE or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester.

13.2.3 Test Procedure



13.2.4 Expected Results

13.2.4.1 Pass Verdict

Device can send location via BLE uplink using Sidewalk Network location via piggybacking.

13.3 CMN-EP-LOCATIONSERVICE-WIFILOCATION-BV-01: Send location when there are enough WiFi Access points.

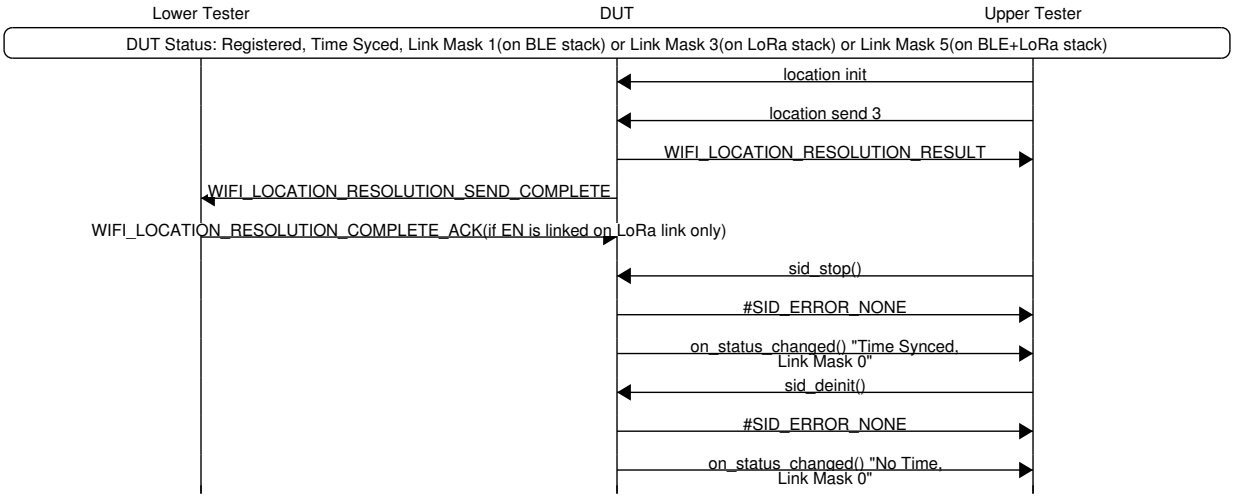
13.3.1 Test Purpose

Verify EN send a location uplink at level 3.

13.3.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE, LoRa or BLE+LoRa mode. - The Sidewalk stack (BLE, LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester. - There is one WiFi Access point nearby at least.

13.3.3 Test Procedure



13.3.4 Expected Results

13.3.4.1 Pass Verdict

Device can resolve and send location using WiFi Access points location.

13.4 CMN-EP-LOCATIONSERVICE-WIFILOCATION-BV-02: Scan location when there are enough WiFi Access points.

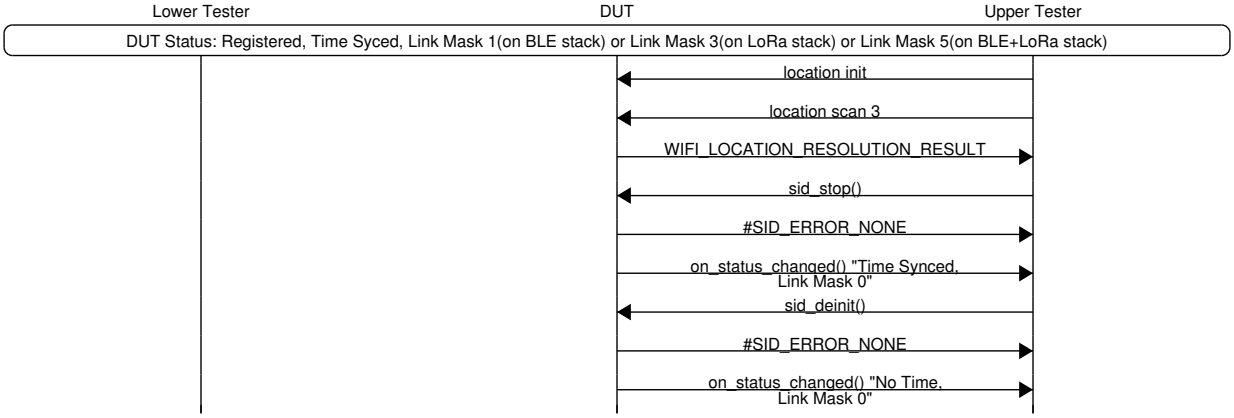
13.4.1 Test Purpose

Verify EN scan location at level 3.

13.4.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE, LoRa or BLE+LoRa mode. - The Sidewalk stack (BLE, LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester. - There is one WiFi Access point nearby at least.

13.4.3 Test Procedure



13.4.4 Expected Results

13.4.4.1 Pass Verdict

Device can resolve without sending UL using WiFi Access points location.

13.5 CMN-EP-LOCATIONSERVICE-GNSSLOCATION-BV-01: Send location when there are enough satellites.

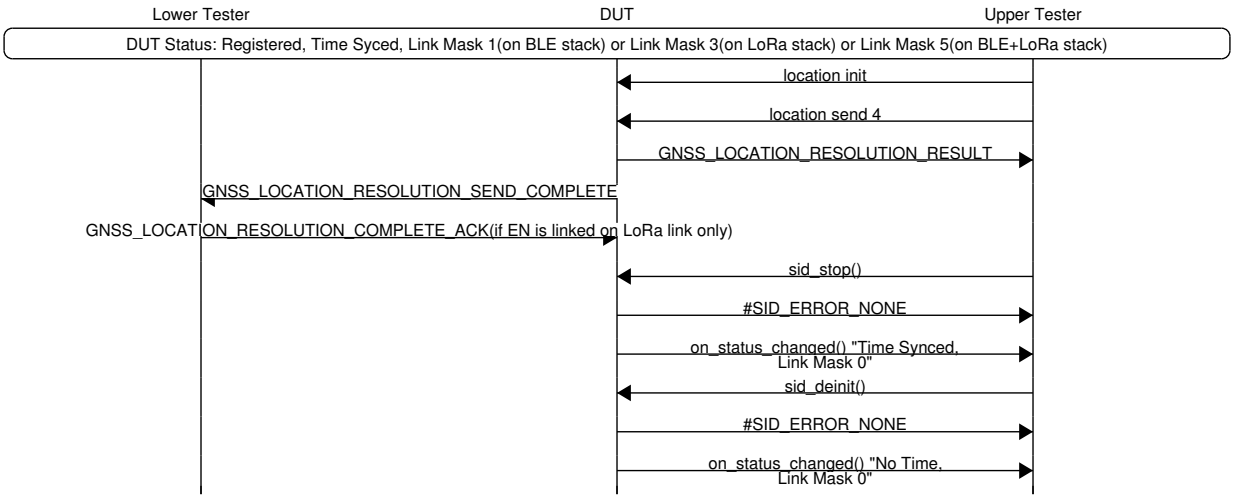
13.5.1 Test Purpose

Verify EN send a location uplink at level 4.

13.5.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE, LoRa or BLE+LoRa mode. - The Sidewalk stack (BLE, LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester.

13.5.3 Test Procedure



13.5.4 Expected Results

13.5.4.1 Pass Verdict

Device can resolve and send location using GNSS location.

13.6 CMN-EP-LOCATIONSERVICE-GNSSLOCATION-BV-02: Scan location when there are enough satellites.

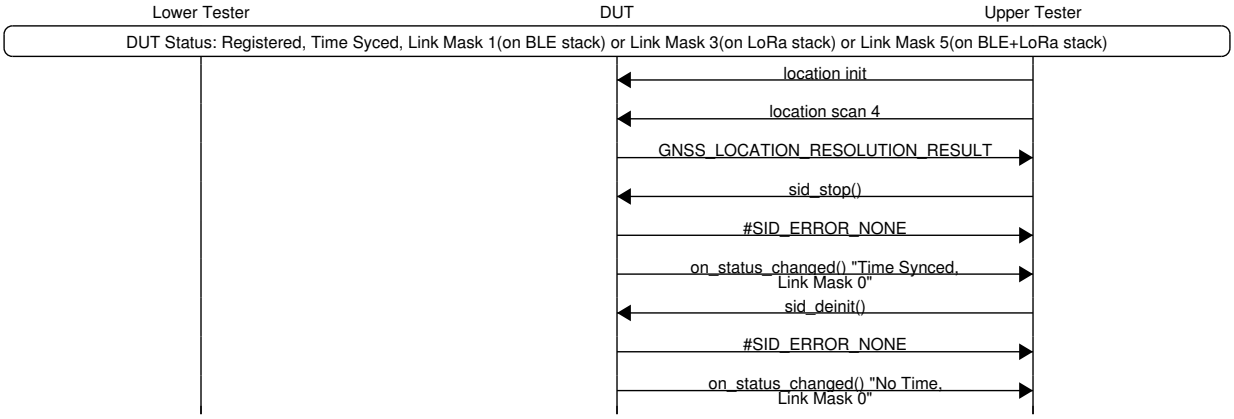
13.6.1 Test Purpose

Verify EN scan location at level 4.

13.6.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE, LoRa or BLE+LoRa mode. - The Sidewalk stack (BLE, LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester.

13.6.3 Test Procedure



13.6.4 Expected Results

13.6.4.1 Pass Verdict

Device can resolve without sending UL using GNSS location.

13.7 CMN-EP-LOCATIONSERVICE-FRAGMENT-BV-01: Retransmit all missed fragments for WiFi on LoRa.

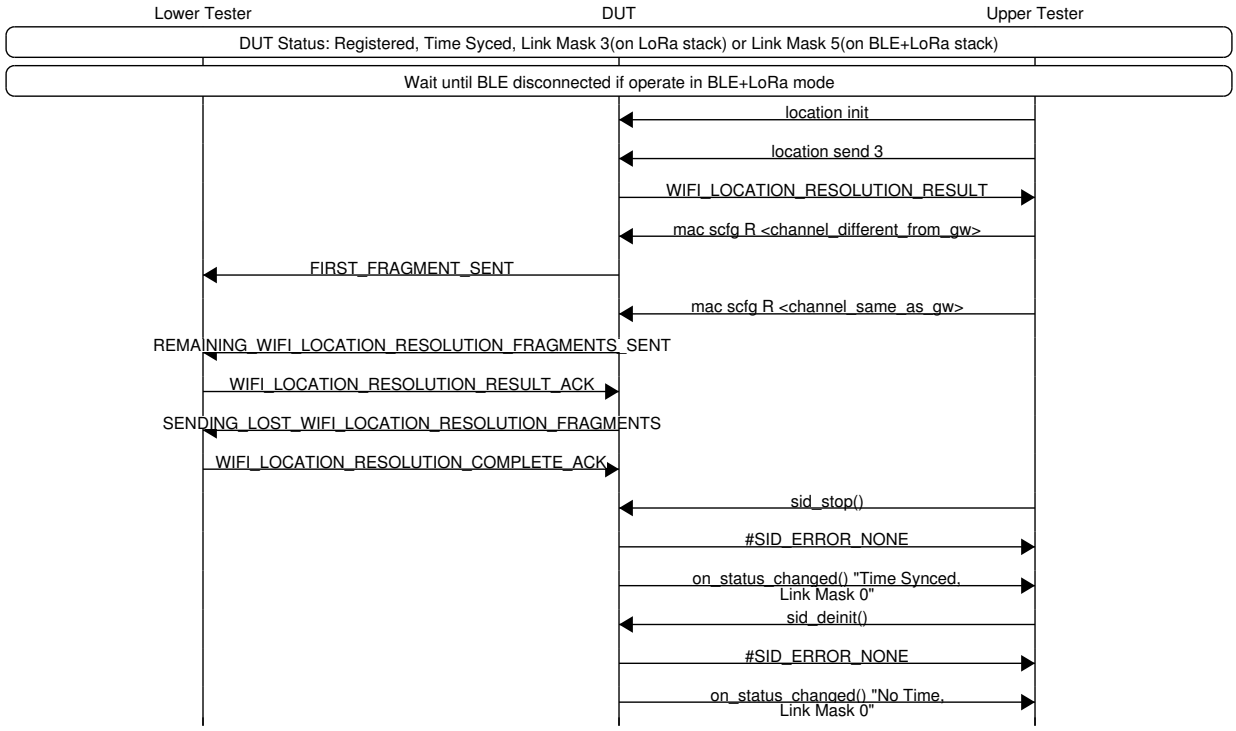
13.7.1 Test Purpose

Verify some of location fragments are missed when specify location resolution via WiFi and send via LoRa link.

13.7.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in LoRa or BLE+LoRa mode. - The Sidewalk stack (LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester. - There is one AP nearby at least.

13.7.3 Test Procedure



13.7.4 Expected Results

13.7.4.1 Pass Verdict

when some fragments fail to be received by the cloud, device will re-transmit lost fragments.

13.8 CMN-EP-LOCATIONSERVICE-FRAGMENT-BV-02: Re-transmit all missed fragments for GNSS on LoRa.

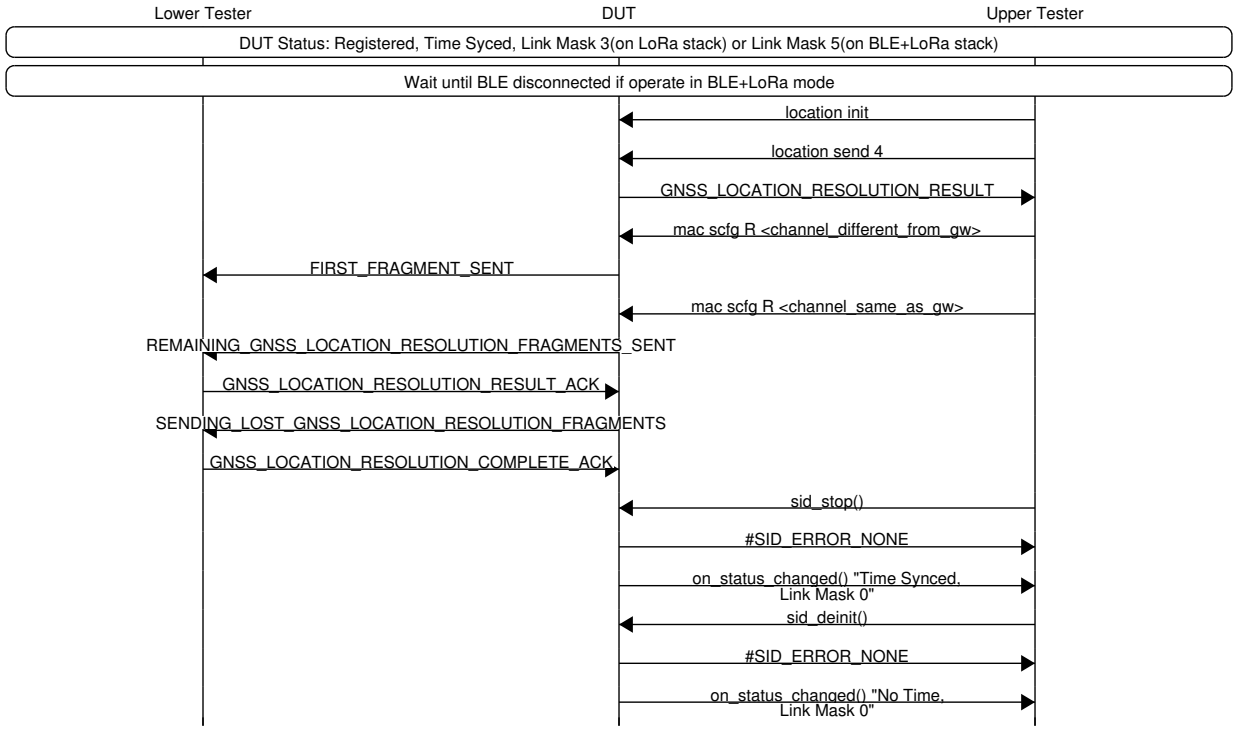
13.8.1 Test Purpose

Verify some of location fragments are missed when specify location resolution via GNSS and send via LoRa link.

13.8.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in LoRa or BLE+LoRa mode. - The Sidewalk stack (LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester.

13.8.3 Test Procedure



13.8.4 Expected Results

13.8.4.1 Pass Verdict

when some fragments fail to be received by the cloud, device will re-transmit lost fragments.

13.9 CMN-EP-LOCATIONSERVICE-LOCATIONSWITCH-BV-01: Location resolution level move from 1 to 3.

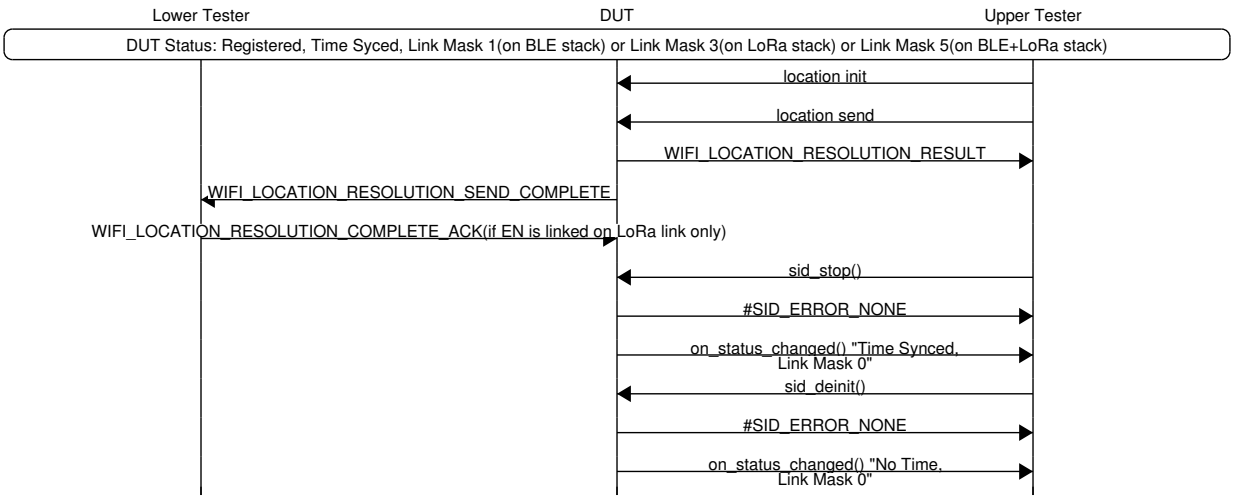
13.9.1 Test Purpose

Verify switch location resolution from level 1 to level 3 automatically.

13.9.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE, LoRa or BLE+LoRa mode. - The Sidewalk stack (BLE, LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester. - There is no BLE but LoRa GW nearby. - There is 1 AP nearby at least.

13.9.3 Test Procedure



13.9.4 Expected Results

13.9.4.1 Pass Verdict

When there is no BLE GW nearby but WiFi Access points, device can switch to resolve and send location using AP location automatically.

13.10 CMN-EP-LOCATIONSERVICE-LOCATIONSWITCH-BV-02: Location resolution level move from 1 to 4.

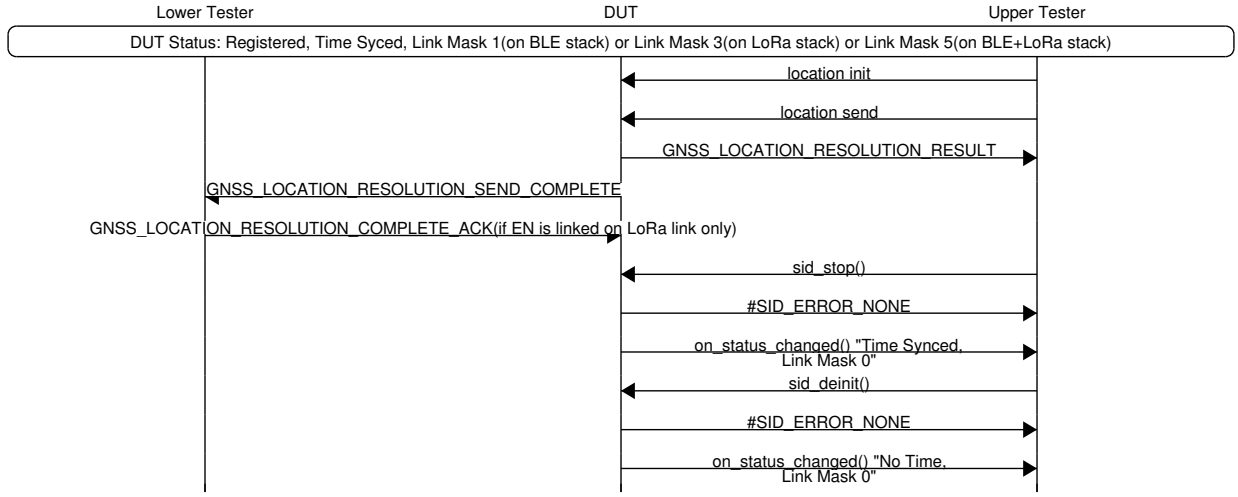
13.10.1 Test Purpose

Verify switch location resolution from level 1 to level 4 automatically.

13.10.2 Initial Conditions

- DUT is registered with Amazon Sidewalk network. - Lower Tester operates in BLE, LoRa or BLE+LoRa mode. - The Sidewalk stack (BLE, LoRa or BLE+LoRa) is initialized and started on the DUT. - DUT is time-synced with Amazon Sidewalk network. - SidewalkNetworkFlag is enabled on the Lower Tester. - There is no BLE but LoRa GW nearby. - There is no any APs nearby.

13.10.3 Test Procedure



13.10.4 Expected Results

13.10.4.1 Pass Verdict

When there is no BLE GW and WiFi Access points nearby, device can switch to resolve and send location using GNSS location automatically.

Chapter 14

Power Optimization Test Cases

14.1 FSK/EP/PWR/OPT/BV/01: Verify RX duration can be adjusted.

14.1.1 Test Purpose

DUT FSK RX duration can be adjusted.

14.1.2 Initial Conditions

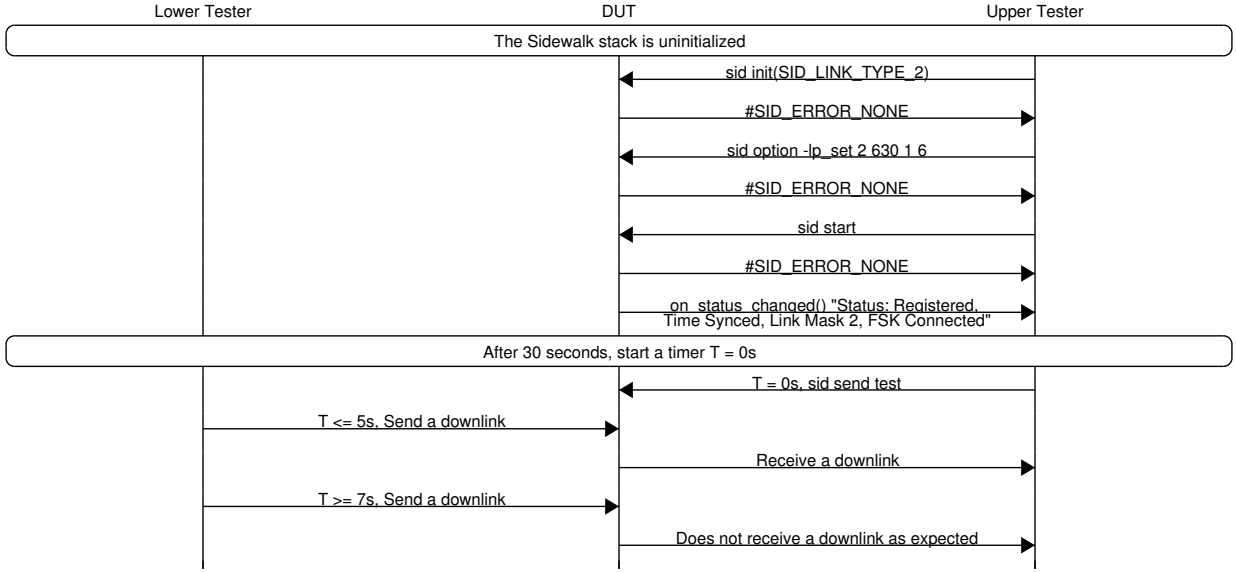
- DUT is registered on Amazon Sidewalk Network.

- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set FSK Profile 2 command: sid option -lp_set SID_LINK2_PROFILE_2 RX_INTERVAL_IN_MS BEACON_INTERVAL RX_DURATION_IN_S

14.1.3 Test Procedure



14.1.4 Expected Results

14.1.4.1 Pass Verdict

The RX window remains open for 6.63 (RX duration + RX window interval) seconds.

14.2 FSK/EP/PWR/OPT/BV/02: Verify RX windows after control message sent should not be closed.

14.2.1 Test Purpose

The RX windows after sending control messages (time-sync and join) should not be overridden by user settings. The RX windows should remain open until the response to the control message is received.

14.2.2 Initial Conditions

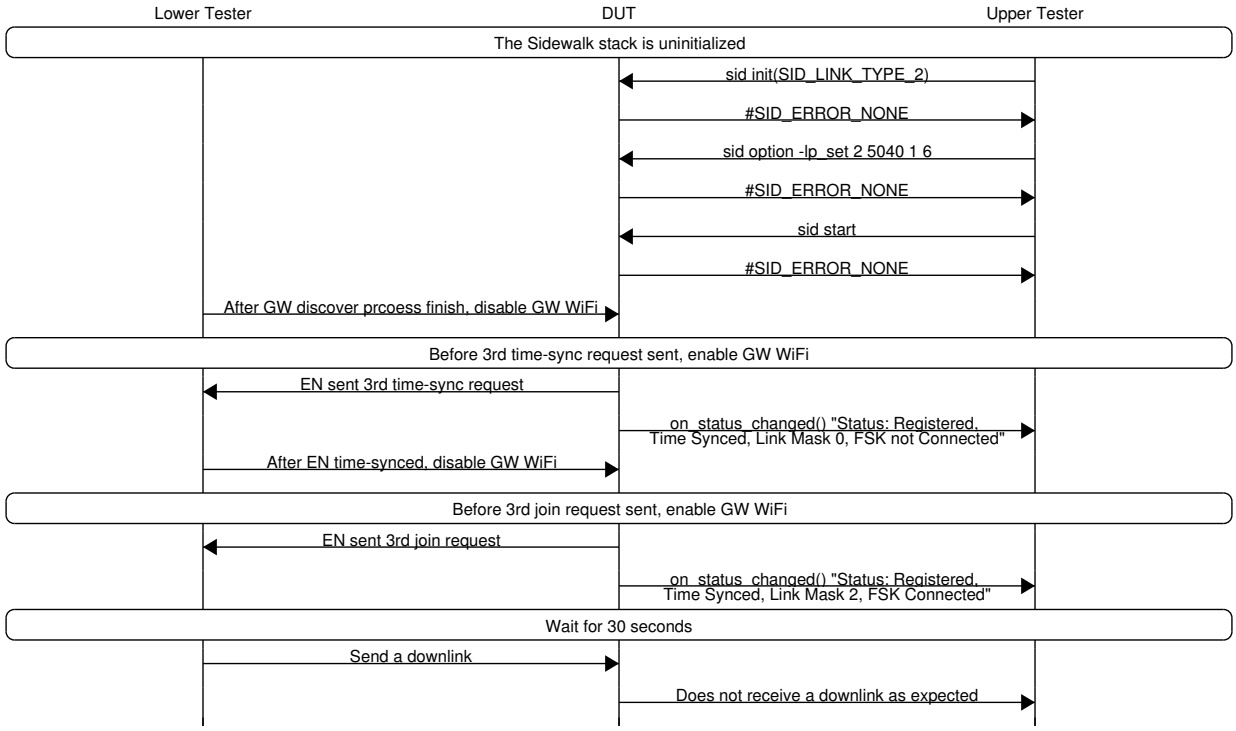
- DUT is registered on Amazon Sidewalk Network.

- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set FSK Profile 2 command: sid option -lp_set SID_LINK2_PROFILE_2 RX_INTERVAL_IN_MS BEACON_INTERVAL RX_DURATION_IN_S

14.2.3 Test Procedure



14.2.4 Expected Results

14.2.4.1 Pass Verdict

Control messages (time-sync and join) are not affected by user config and can be sent and received normally.

14.3 FSK/EP/PWR/OPT/BV/03: Verify RX window termination request stop RX window opended at profile 2.

14.3.1 Test Purpose

Users can close the DUT RX windows at any time using the RX window termination command

14.3.2 Initial Conditions

- DUT is registered on Amazon Sidewalk Network.

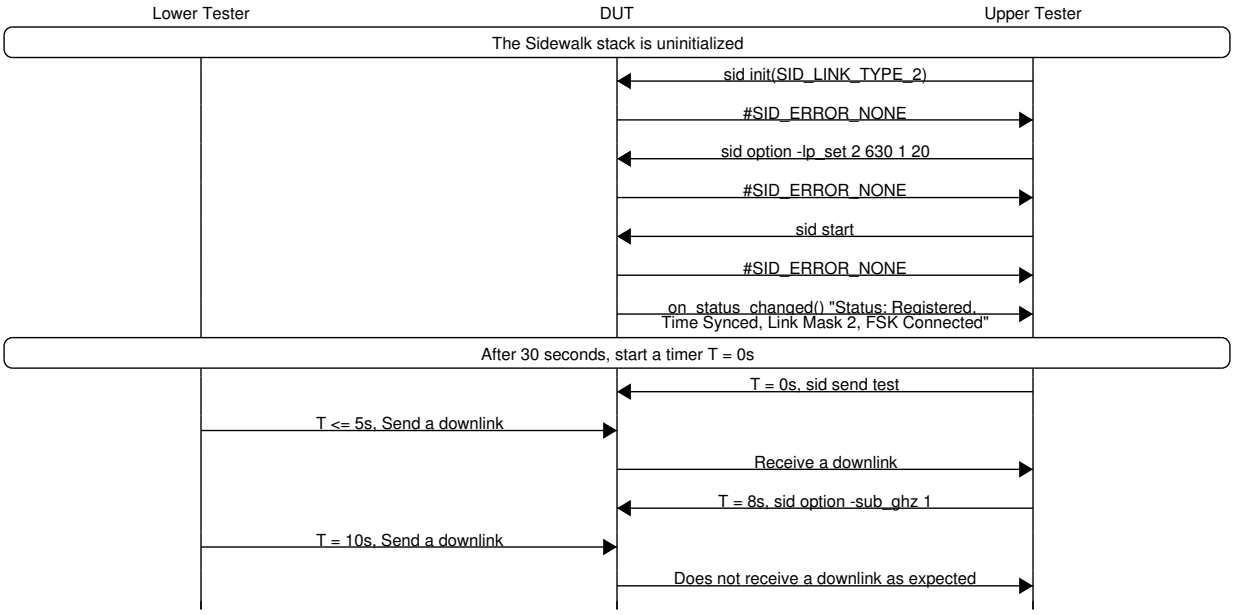
- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set FSK Profile 2 command: sid option -lp_set SID_LINK2_PROFILE_2 RX_INTERVAL_IN_MS BEACON_INTERVAL RX_DURATION_IN_S

- DUT User control commands with sub-ghz: sid option -sub_ghz_ctl CTL_CMD

14.3.3 Test Procedure



14.3.4 Expected Results

14.3.4.1 Pass Verdict

There is no RX window opening after RX window termination command executed.

14.4 FSK/EP/PWR/OPT/BV/04: Verify RX window termination request should not stop RX window opened at profile 1.

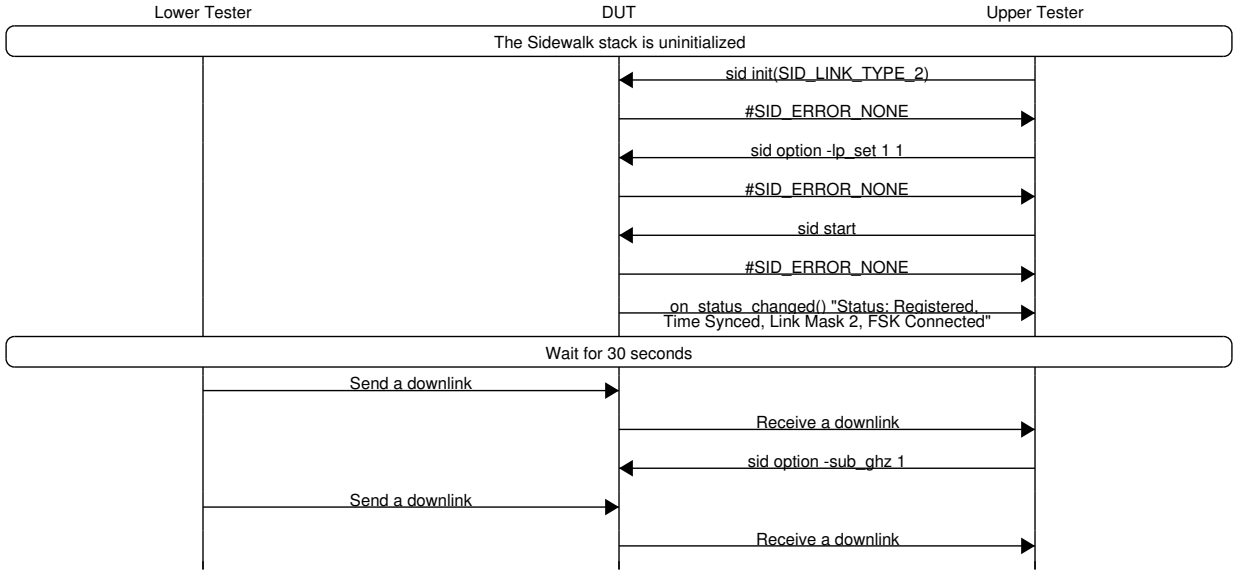
14.4.1 Test Purpose

As profile 1 default setting is unlimited RX duration, the RX window termination command should not interrupt or close RX windows.

14.4.2 Initial Conditions

- DUT is registered on Amazon Sidewalk Network.
- Lower Tester acts a Sidewalk gateway and cloud.
- Upper Tester operates as a Sid API user.
- DUT Set FSK Profile 1 command: sid option -lp_set SID_LINK2_PROFILE_1 BEACON_INTERVAL
- DUT User control commands with sub-ghz: sid option -sub_ghz_ctl CTL_CMD

14.4.3 Test Procedure



14.4.4 Expected Results

14.4.4.1 Pass Verdict

RX window termination command should not interrupt or close RX windows.

14.5 FSK/EP/PWR/OPT/BV/05: Verify Beacon interval can be adjusted.

14.5.1 Test Purpose

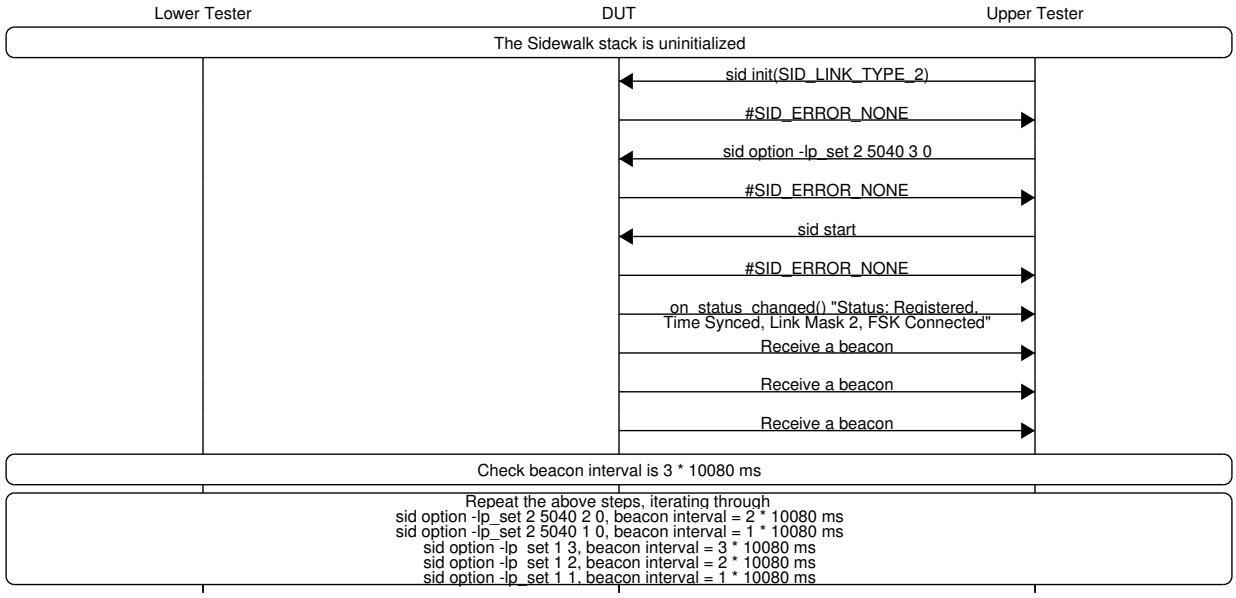
Users can modify the number of beacons to skip.

14.5.2 Initial Conditions

- DUT is registered on Amazon Sidewalk Network.
- Lower Tester acts a Sidewalk gateway and cloud.
- Upper Tester operates as a Sid API user.
- DUT Set FSK Profile 1 command: sid option -lp_set SID_LINK2_PROFILE_1 BEACON_INTERVAL

- DUT Set FSK Profile 2 command: sid option -lp_set SID_LINK2_PROFILE_2 RX_INTERVAL_IN_MS BEACON_INTERVAL RX_DURATION_IN_S

14.5.3 Test Procedure



14.5.4 Expected Results

14.5.4.1 Pass Verdict

Beacon interval can be modify by user setting.

14.6 FSK/EP/PWR/OPT/BV/06: Verify beacon interval revert to default after 2nd beacon misses.

14.6.1 Test Purpose

To prevent gateway beacon loss, DUT beacon interval will revert to default (10080 ms) after two consecutive beacon misses

14.6.2 Initial Conditions

- DUT is registered on Amazon Sidewalk Network.

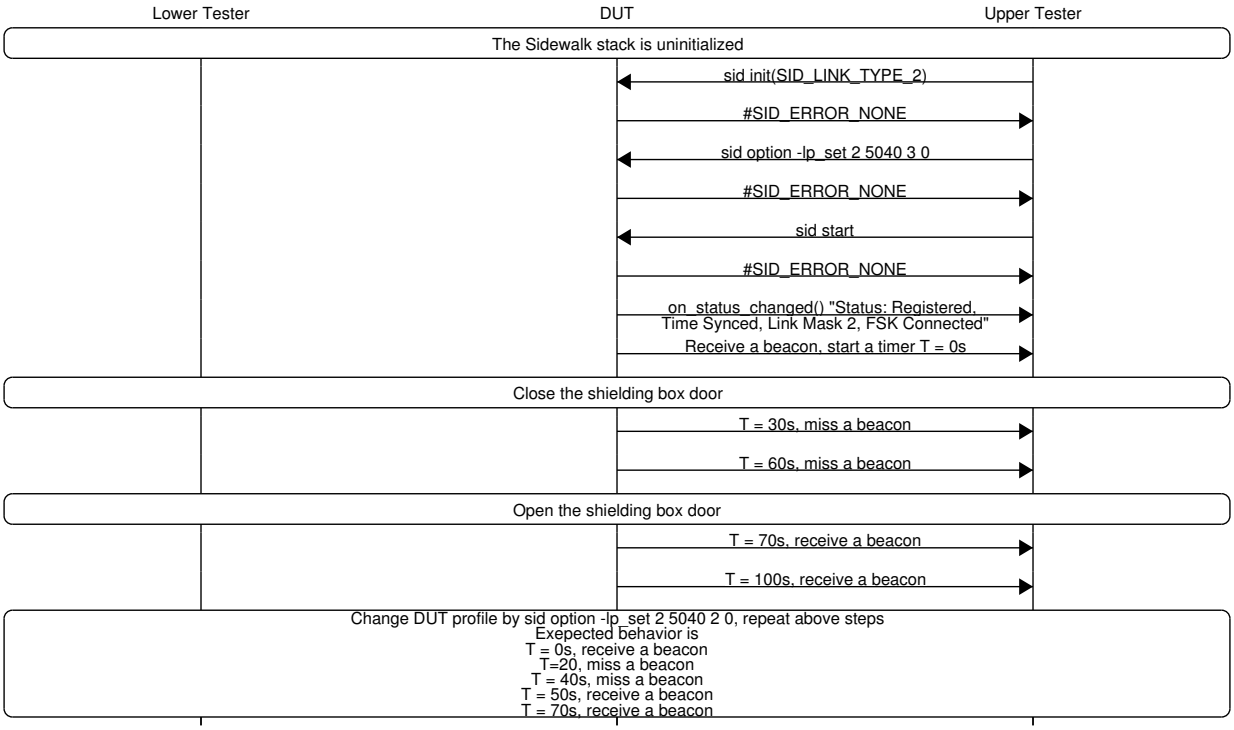
- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set FSK Profile 2 command: sid option -lp_set SID_LINK2_PROFILE_2 RX_INTERVAL_IN_MS BEACON_INTERVAL RX_DURATION_IN_S

- Sidewalk gateway put in a shielding box.

14.6.3 Test Procedure



14.6.4 Expected Results

14.6.4.1 Pass Verdict

When the DUT misses two beacons, it triggers a default interval beacon. Upon receiving this beacon, the Beacon interval should be restored to the user-configured setting.

14.7 FSK/EP/PWR/OPT/BV/07: Verify DUT can still perform uplinks and downlinks normally after a beacon skipped.

14.7.1 Test Purpose

After DUT skip a beacon, there will be some time drift, but a compensation mechanism allows TX/RX to maintain normal transmission and reception

14.7.2 Initial Conditions

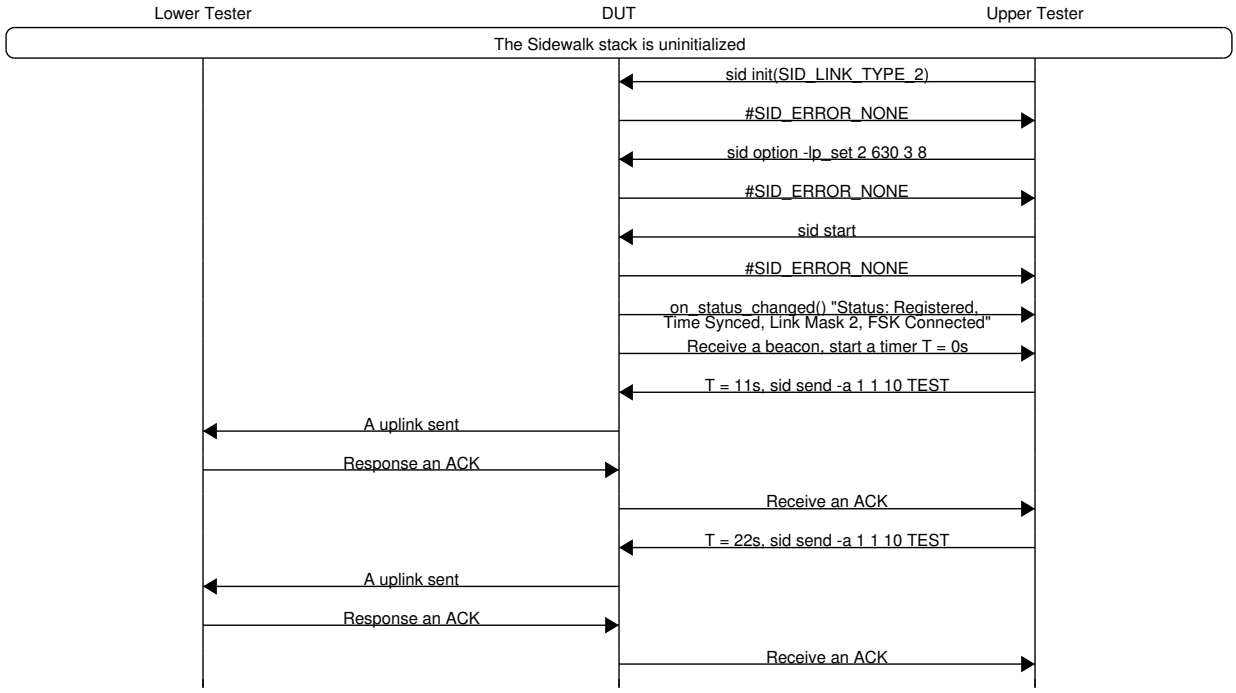
- DUT is registered on Amazon Sidewalk Network.

- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set FSK Profile 2 command: sid option -lp_set SID_LINK2_PROFILE_2 RX_INTERVAL_IN_MS BEACON_INTERVAL RX_DURATION_IN_S

14.7.3 Test Procedure



14.7.4 Expected Results

14.7.4.1 Pass Verdict

Even during the beacon skip phase, uplinks and downlinks can operate normally.

14.8 LORA/EP/PWR/OPT/BV/01: Verify number of RX windows is limited and can be changed.

14.8.1 Test Purpose

At profile A, after single transmission in a uplink, DUT should open specified number of RX windows and go to sleep.

14.8.2 Initial Conditions

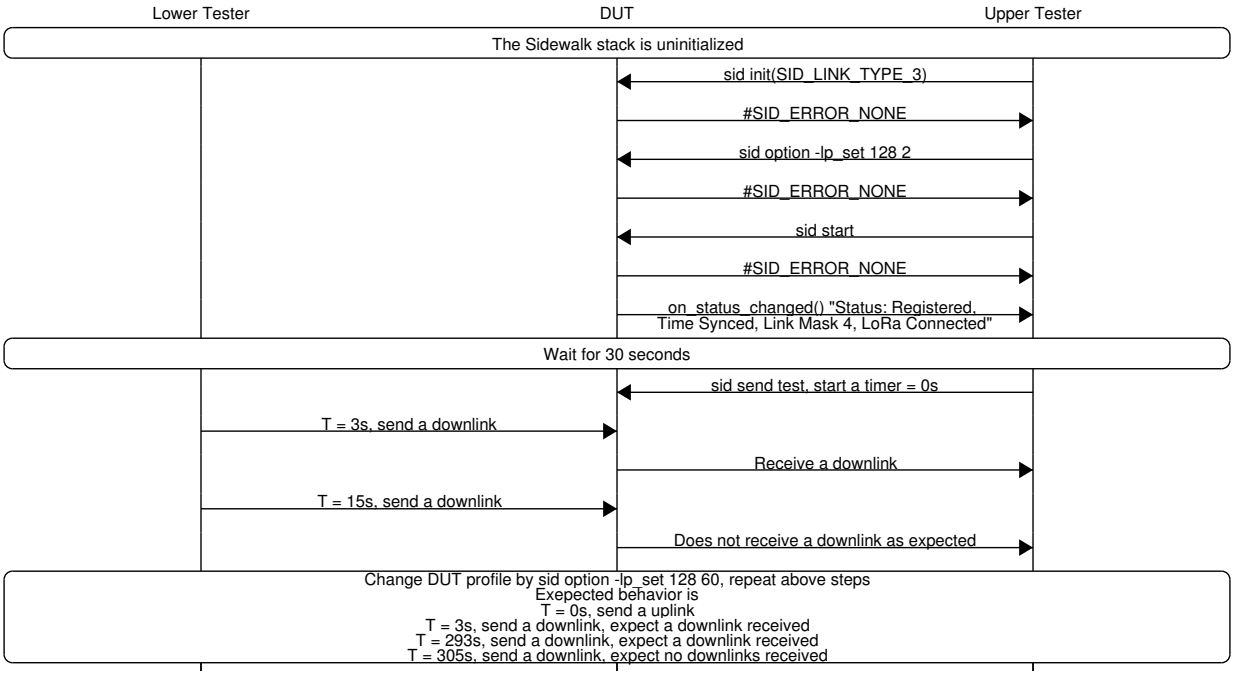
- DUT is registered on Amazon Sidewalk Network.

- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set LoRa Profile A command: sid option -lp_set SID_LINK3_PROFILE_A RX_WINDOWS

14.8.3 Test Procedure



14.8.4 Expected Results

14.8.4.1 Pass Verdict

The RX windows can be adjusted by user setting.

14.9 LORA/EP/PWR/OPT/BV/02: Verify number of RX windows is reset after sending an additional uplink.

14.9.1 Test Purpose

At profile A, when TX occurs before all RX windows have been opened, then windows counter should be reset again.

14.9.2 Initial Conditions

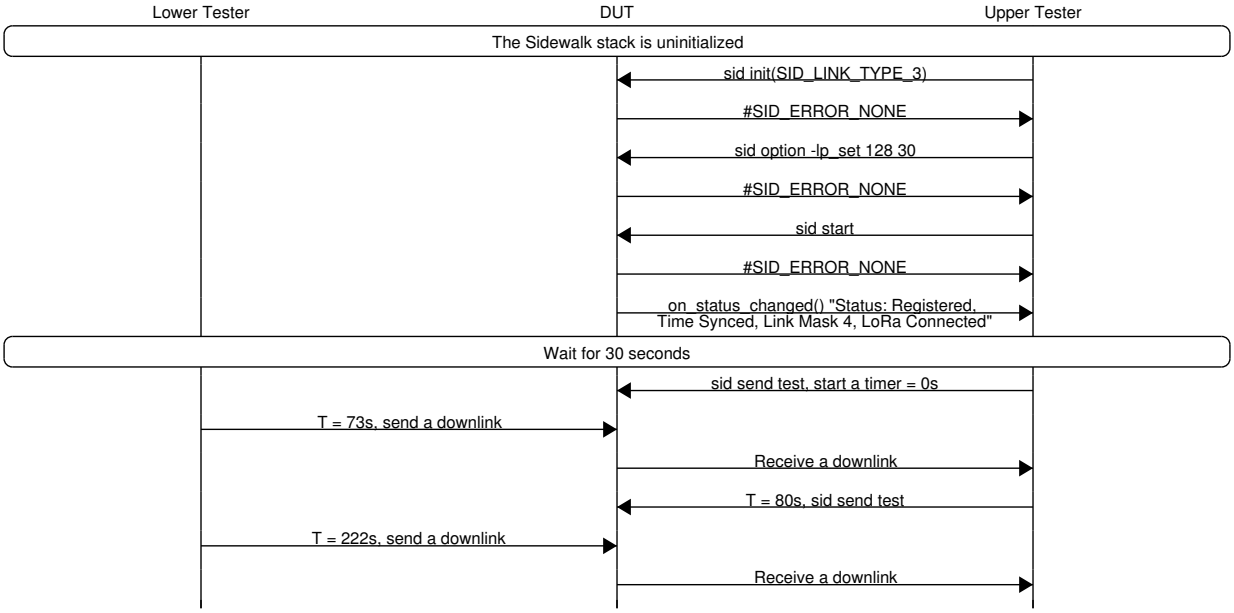
- DUT is registered on Amazon Sidewalk Network.

- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set LoRa Profile A command: sid option -lp_set SID_LINK3_PROFILE_A RX_WINDOWS

14.9.3 Test Procedure



14.9.4 Expected Results

14.9.4.1 Pass Verdict

The RX windows counter is reset by a uplink sent

14.10 LORA/EP/PWR/OPT/BV/03: Verify RX window termination request stop RX window opened at profile A.

14.10.1 Test Purpose

Users can close the DUT RX windows at any time using the RX window termination command

14.10.2 Initial Conditions

- DUT is registered on Amazon Sidewalk Network.

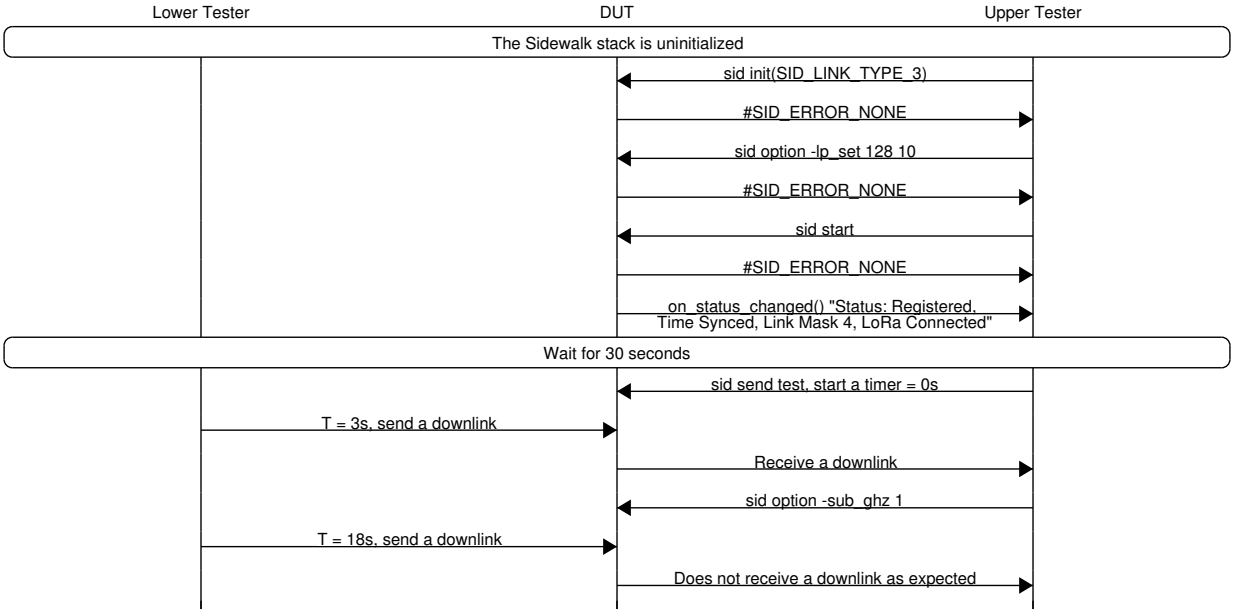
- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set LoRa Profile A command: sid option -lp_set SID_LINK3_PROFILE_A RX_WINDOWS

- DUT User control commands with sub-ghz: sid option -sub_ghz_ctl CTL_CMD

14.10.3 Test Procedure



14.10.4 Expected Results

14.10.4.1 Pass Verdict

There is no RX window opening after RX window termination command executed.

14.11 LORA/EP/PWR/OPT/BV/04: Verify RX window termination request should not stop RX window opened at profile B.

14.11.1 Test Purpose

As profile B default setting is unlimited RX window count, the RX window termination command should not interrupt or close RX windows.

14.11.2 Initial Conditions

- DUT is registered on Amazon Sidewalk Network.

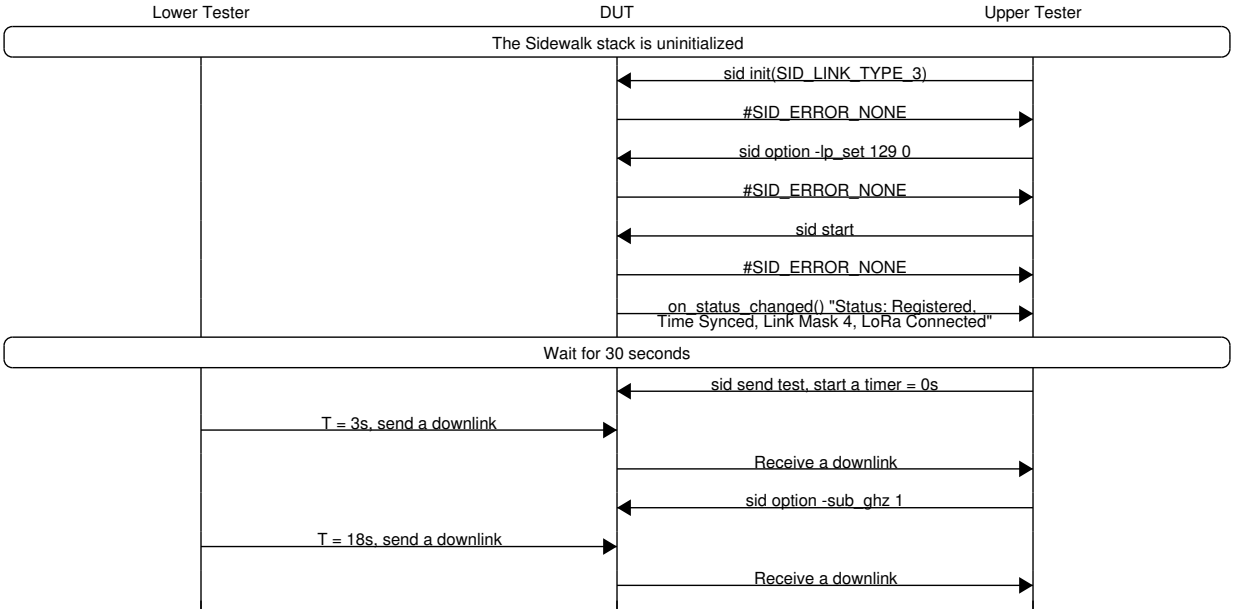
- Lower Tester acts a Sidewalk gateway and cloud.

- Upper Tester operates as a Sid API user.

- DUT Set LoRa Profile B command: sid option -lp_set SID_LINK3_PROFILE_B RX_WINDOWS

- DUT User control commands with sub-ghz: sid option -sub_ghz_ctl CTL_CMD

14.11.3 Test Procedure



14.11.4 Expected Results

14.11.4.1 Pass Verdict

RX window termination command should not interrupt or close RX windows.

Chapter 15

BLE Connection Policy Test Cases

15.1 BLE-EP-CONNECTIONPOLICY-DEFAULT-BV-01: Default connection policy with advertisement interval configured.

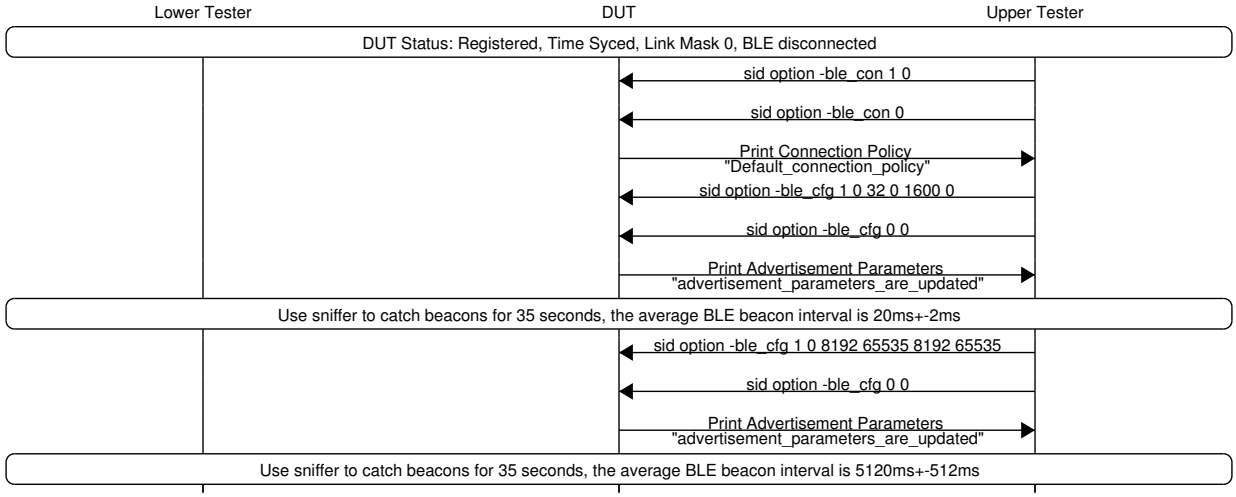
15.1.1 Test Purpose

Verify advertisement parameters and advertising interval of BLE beacons on default connection policy.

15.1.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.1.3 Test Procedure



15.1.4 Expected Results

15.1.4.1 Pass Verdict

Both the advertisement parameters and advertising interval on DUT are updated according to the configuration.

15.2 BLE-EP-CONNECTIONPOLICY-DEFAULT-BV-02: Default connection policy with connection parameters configured.

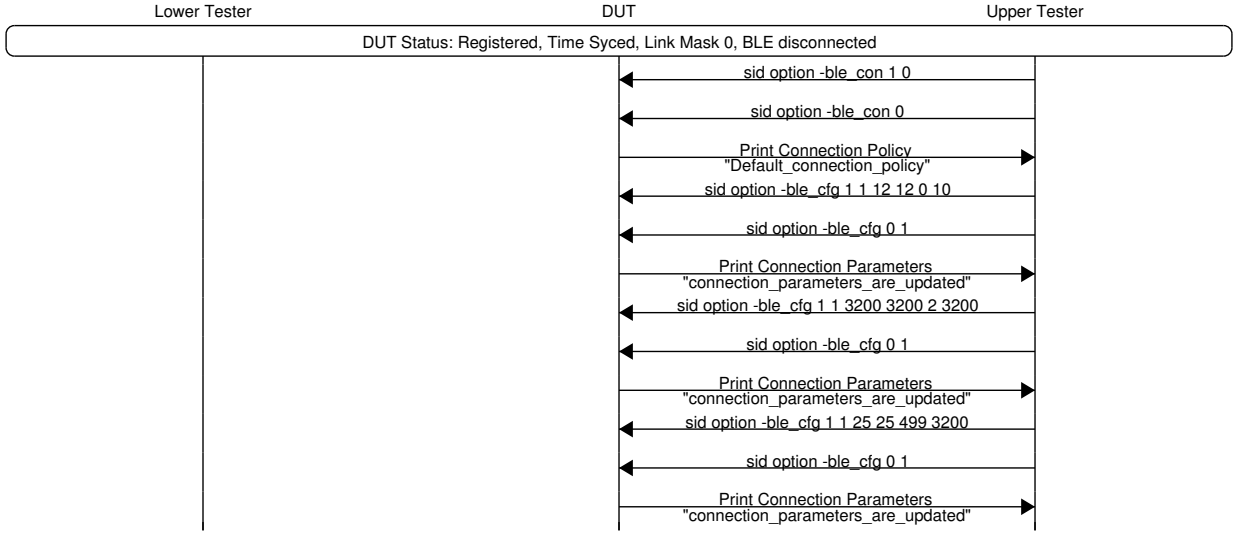
15.2.1 Test Purpose

Verify DUT connection parameters on default connection policy.

15.2.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.2.3 Test Procedure



15.2.4 Expected Results

15.2.4.1 Pass Verdict

The connection parameters on DUT are updated according to the configuration.

15.3 BLE-EP-CONNECTIONPOLICY-DEFAULT-BV-03: Default connection policy with both advertisement interval and connection parameters configured.

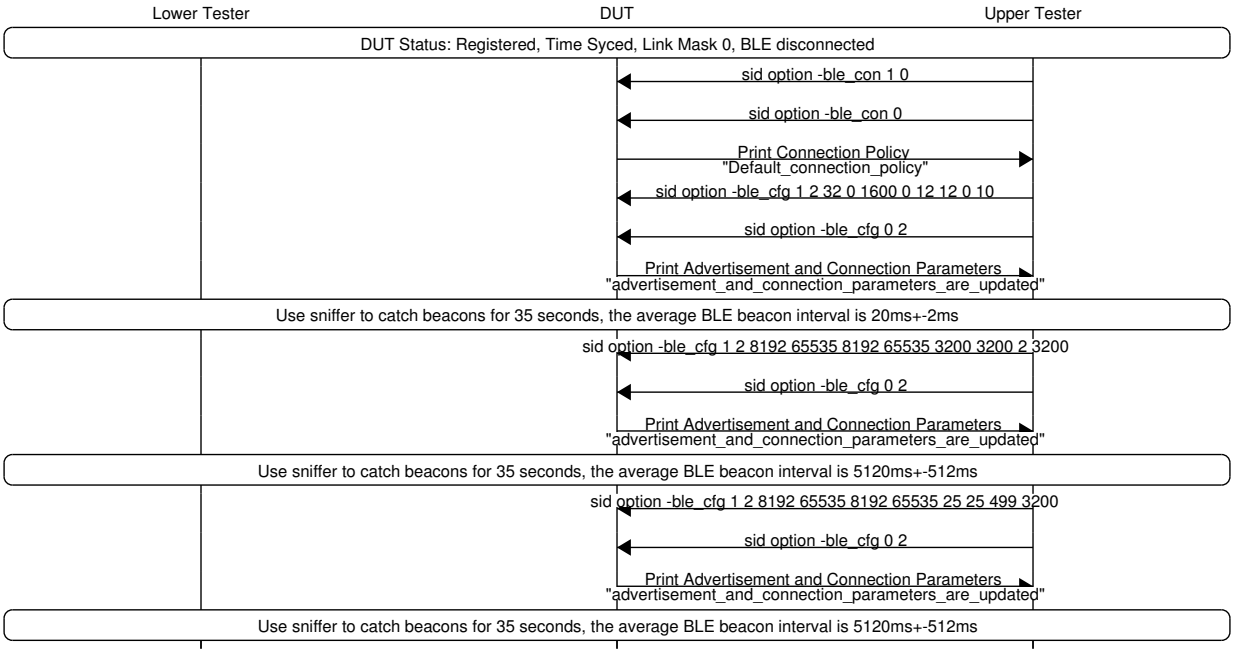
15.3.1 Test Purpose

Verify advertisement parameters, connection parameters, and advertising interval of BLE beacons on default connection policy.

15.3.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.3.3 Test Procedure



15.3.4 Expected Results

15.3.4.1 Pass Verdict

The advertisement parameters, connection parameters, and advertising interval on DUT are updated according to the configuration.

15.4 BLE-EP-CONNECTIONPOLICY-DEFAULT-BV-04: Default connection policy.

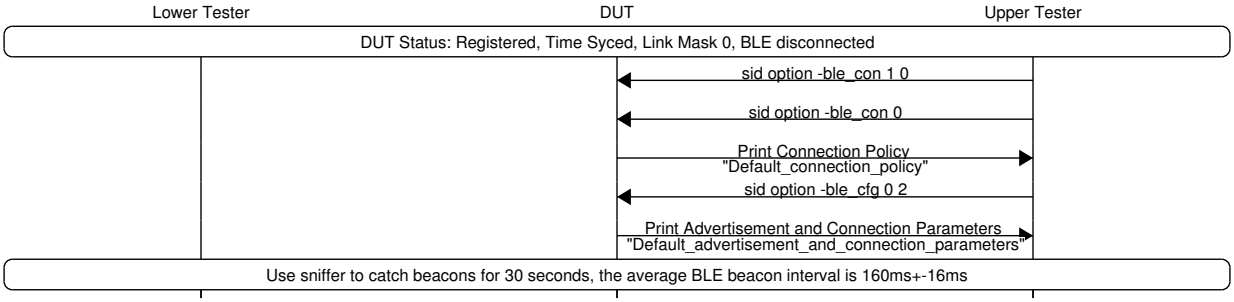
15.4.1 Test Purpose

Verify both default advertisement and connection parameters and advertising interval of BLE beacons.

15.4.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.4.3 Test Procedure



15.4.4 Expected Results

15.4.4.1 Pass Verdict

Both the advertisement parameters and advertising interval on DUT are updated according to the configuration.

15.5 BLE-EP-CONNECTIONPOLICY-DEFAULT-BV-05: Default connection policy with inactivity timeout.

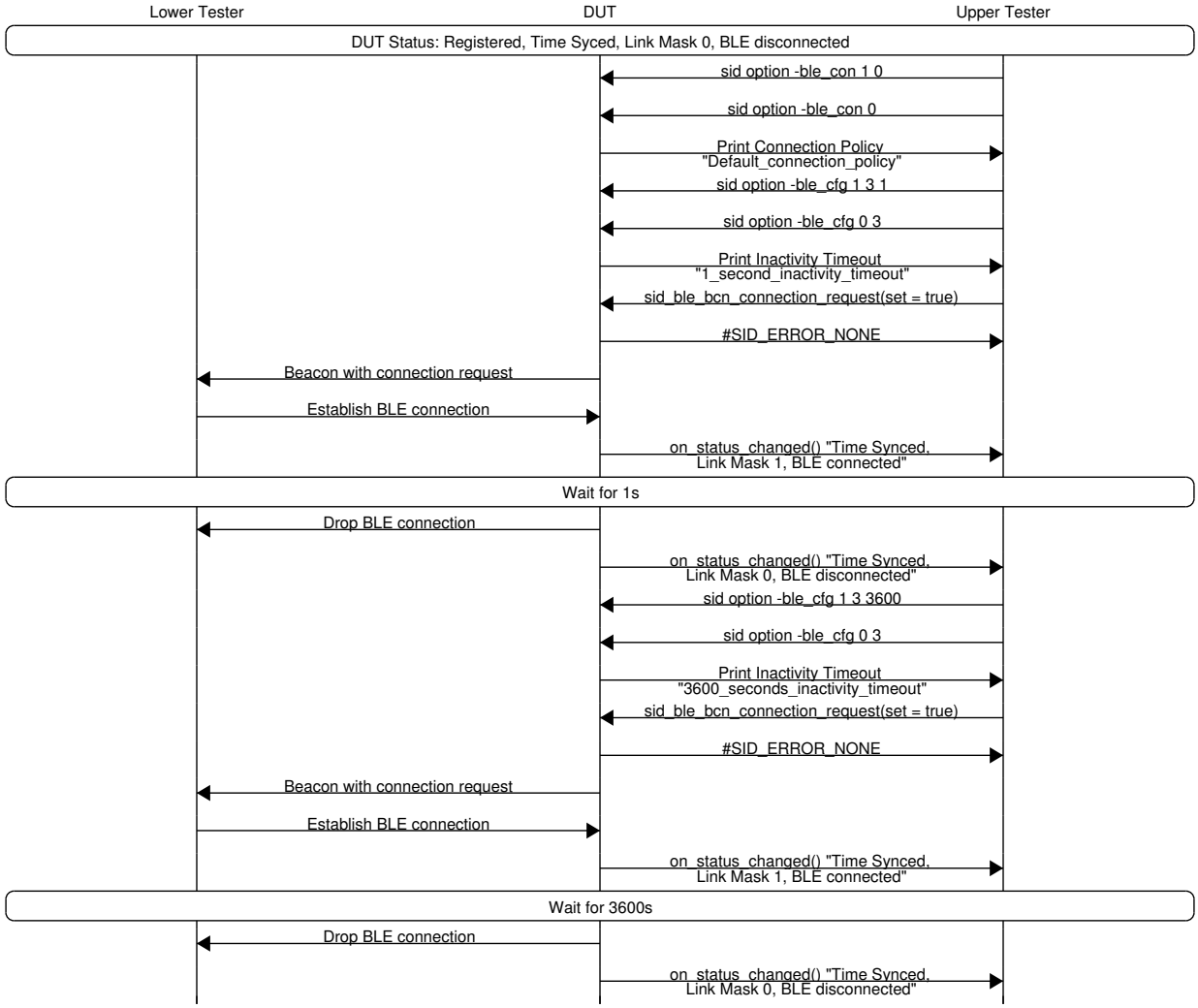
15.5.1 Test Purpose

Verify that BLE would be disconnected after inactivity timeout on default connection policy.

15.5.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.5.3 Test Procedure



15.5.4 Expected Results

15.5.4.1 Pass Verdict

BLE connection can be established and will be dropped after inactivity timeout.

15.6 BLE-EP-CONNECTIONPOLICY-LONGLIVED-BV-01: Long lived connection policy with advertisement interval configured.

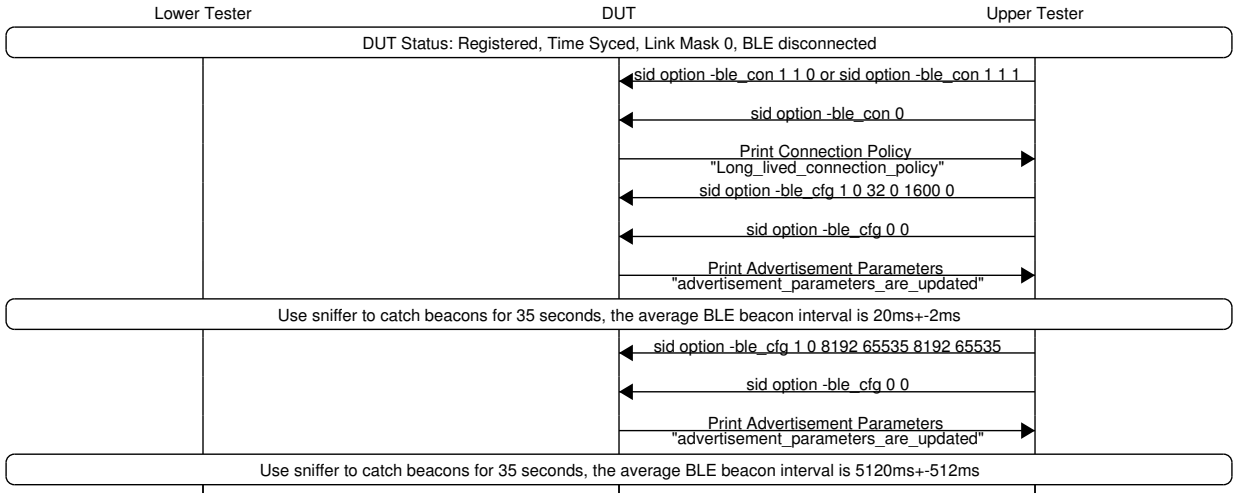
15.6.1 Test Purpose

Verify advertisement parameters and advertising interval of BLE beacons on long lived connection policy.

15.6.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.6.3 Test Procedure



15.6.4 Expected Results

15.6.4.1 Pass Verdict

Both the advertisement parameters and advertising interval on DUT are updated according to the configuration.

15.7 BLE-EP-CONNECTIONPOLICY-LONGLIVED-BV-02: Long lived connection policy with connection parameters configured.

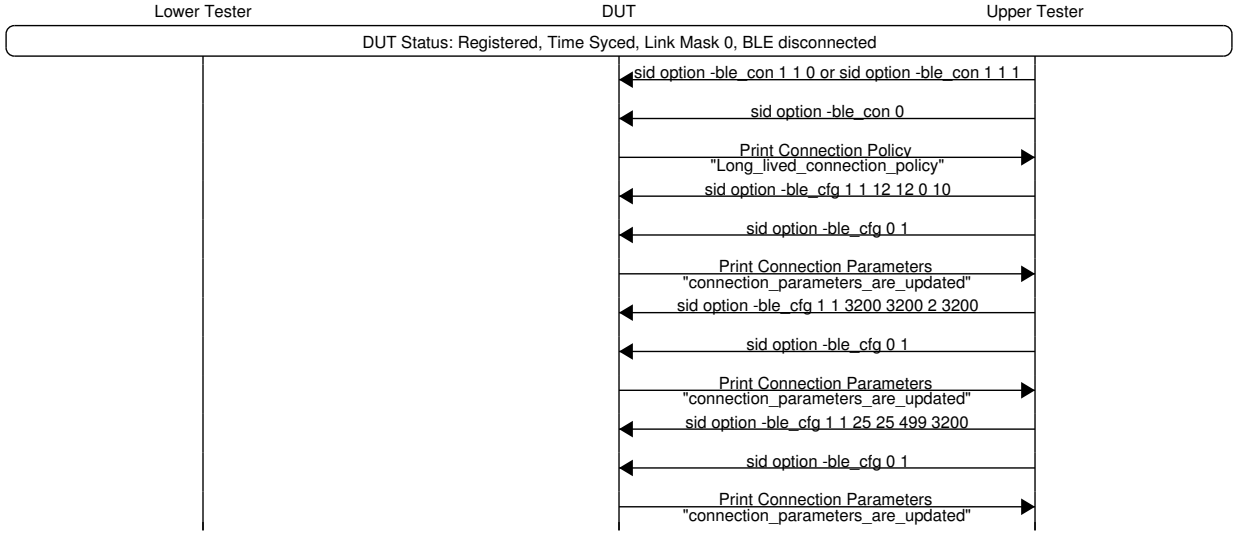
15.7.1 Test Purpose

Verify DUT connection parameters on long lived connection policy.

15.7.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.7.3 Test Procedure



15.7.4 Expected Results

15.7.4.1 Pass Verdict

The connection parameters on DUT are updated according to the configuration.

15.8 BLE-EP-CONNECTIONPOLICY-LONGLIVED-BV-03: Long lived connection policy with both advertisement interval and connection parameters configured.

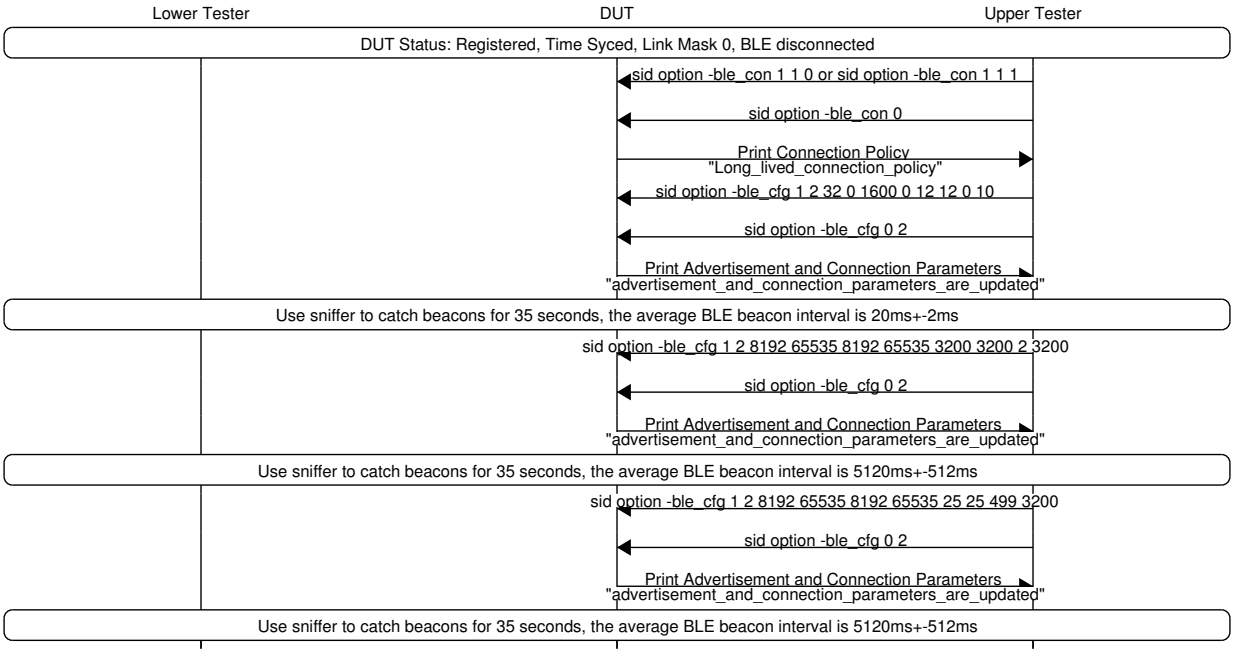
15.8.1 Test Purpose

Verify both advertisement parameters, connection parameters and advertising interval of BLE beacons on long lived connection policy.

15.8.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.8.3 Test Procedure



15.8.4 Expected Results

15.8.4.1 Pass Verdict

The advertisement parameters, connection parameters and advertising interval on DUT are updated according to the configuration.

15.9 BLE-EP-CONNECTIONPOLICY-LONGLIVED-BV-04: Long lived connection policy with inactivity timeout.

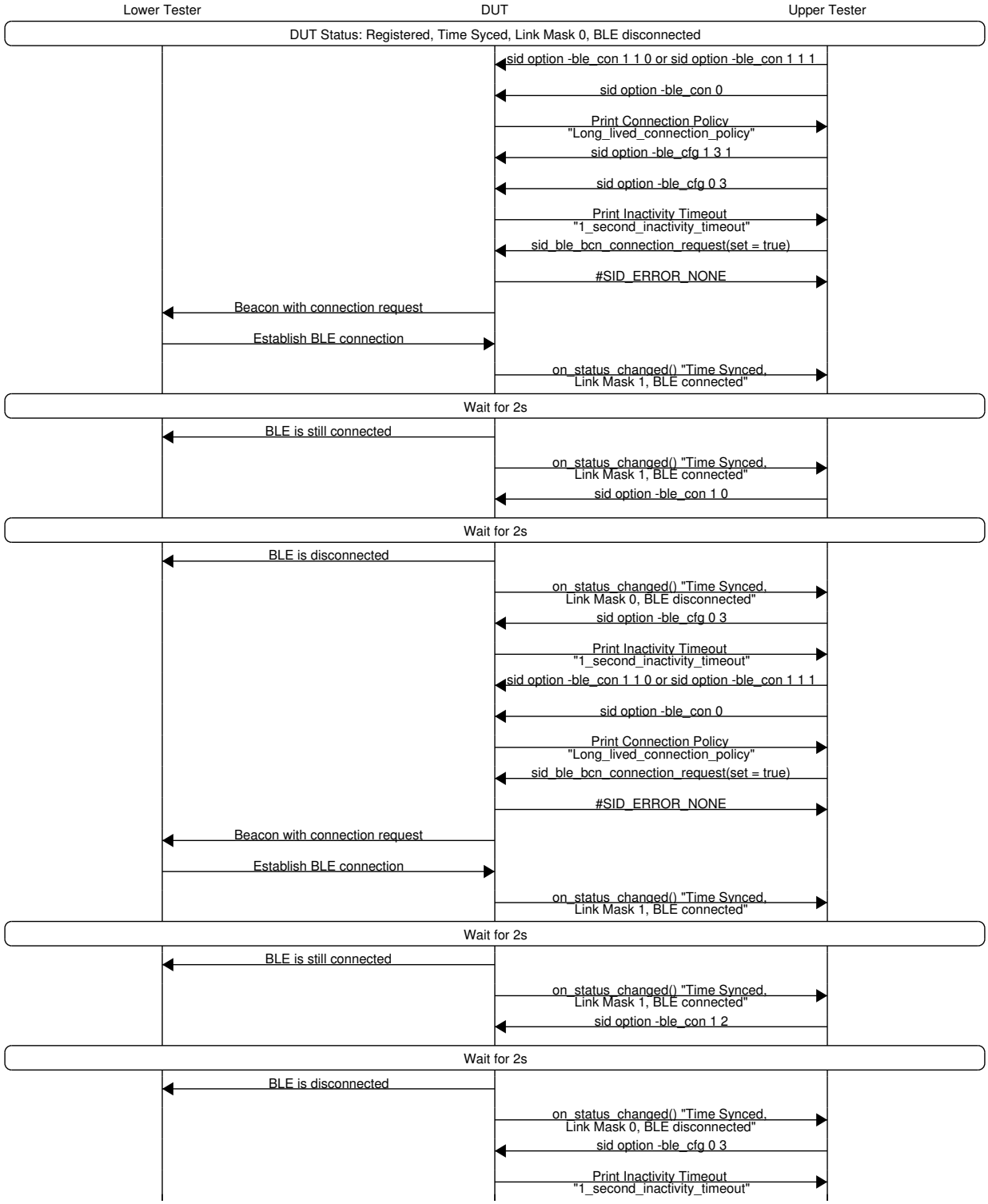
15.9.1 Test Purpose

Verify that BLE would be disconnected after inactivity timeout on long lived connection policy.

15.9.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.9.3 Test Procedure



15.9.4 Expected Results

15.9.4.1 Pass Verdict

When switching to a long-lived connection policy, the automatic disconnect due to inactivity is disabled. When switching away from a long-lived policy, the inactivity timeout is re-enabled with a specified delay period.

15.10 BLE-EP-CONNECTIONPOLICY-OPTIMALADVERTISING-BV-01: Optimal advertising connection policy with advertisement interval configured.

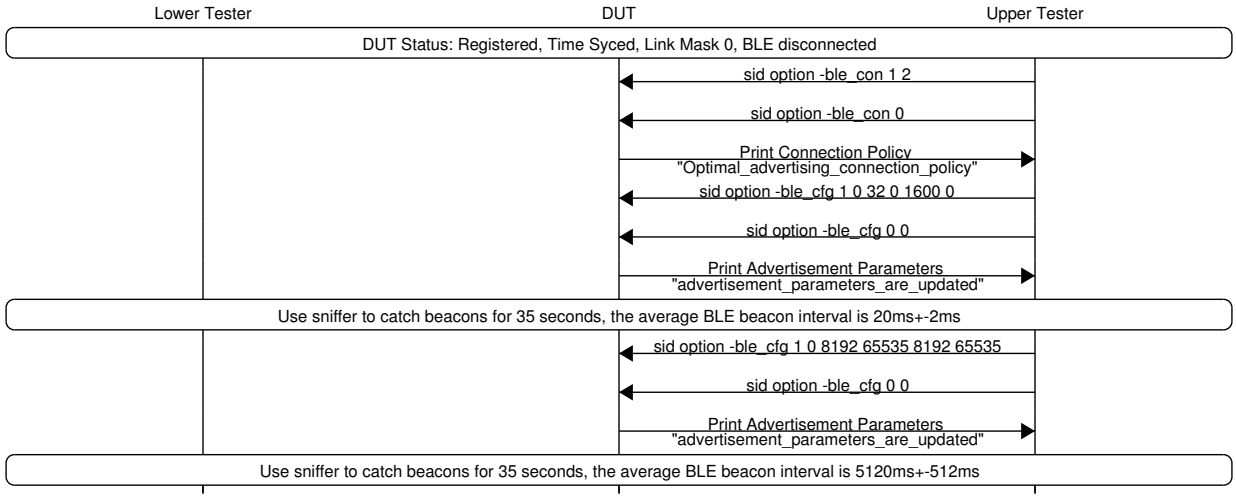
15.10.1 Test Purpose

Verify advertisement parameters and advertising interval of BLE beacons on optimal advertising connection policy.

15.10.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.10.3 Test Procedure



15.10.4 Expected Results

15.10.4.1 Pass Verdict

Both the advertisement parameters and advertising interval on DUT are updated according to the configuration.

15.11 BLE-EP-CONNECTIONPOLICY-OPTIMALADVERTISING-BV-02: Optimal advertising connection policy with connection parameters configured.

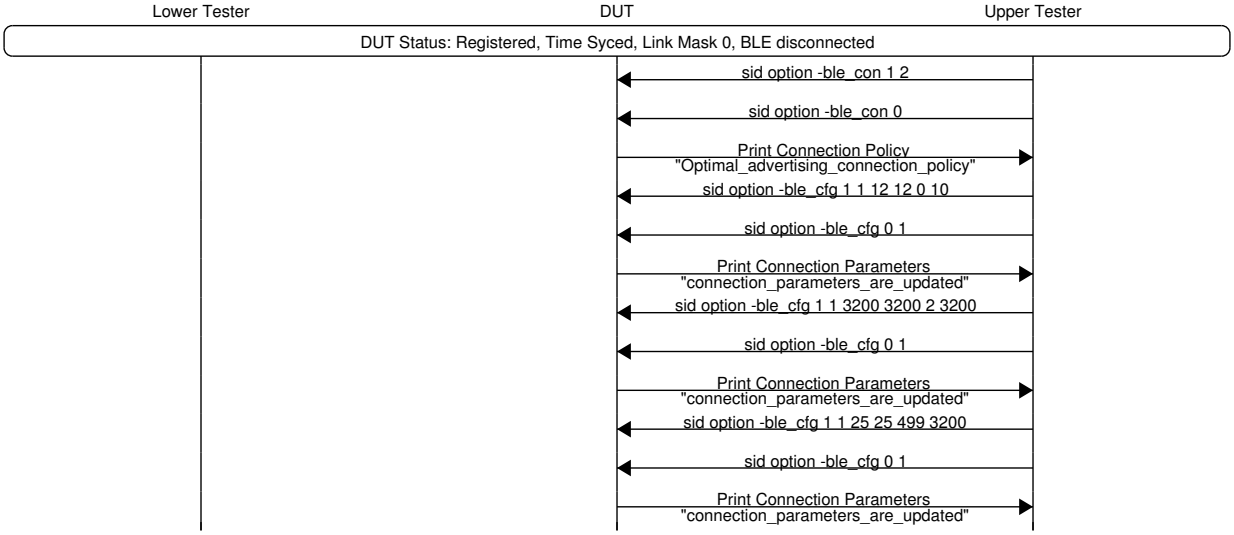
15.11.1 Test Purpose

Verify DUT connection parameters on optimal advertising connection policy.

15.11.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.11.3 Test Procedure



15.11.4 Expected Results

15.11.4.1 Pass Verdict

The connection parameters on DUT are updated according to the configuration.

15.12 BLE-EP-CONNECTIONPOLICY-OPTIMALADVERTISING-BV-03: Optimal advertising connection policy with both advertisement interval and connection parameters configured.

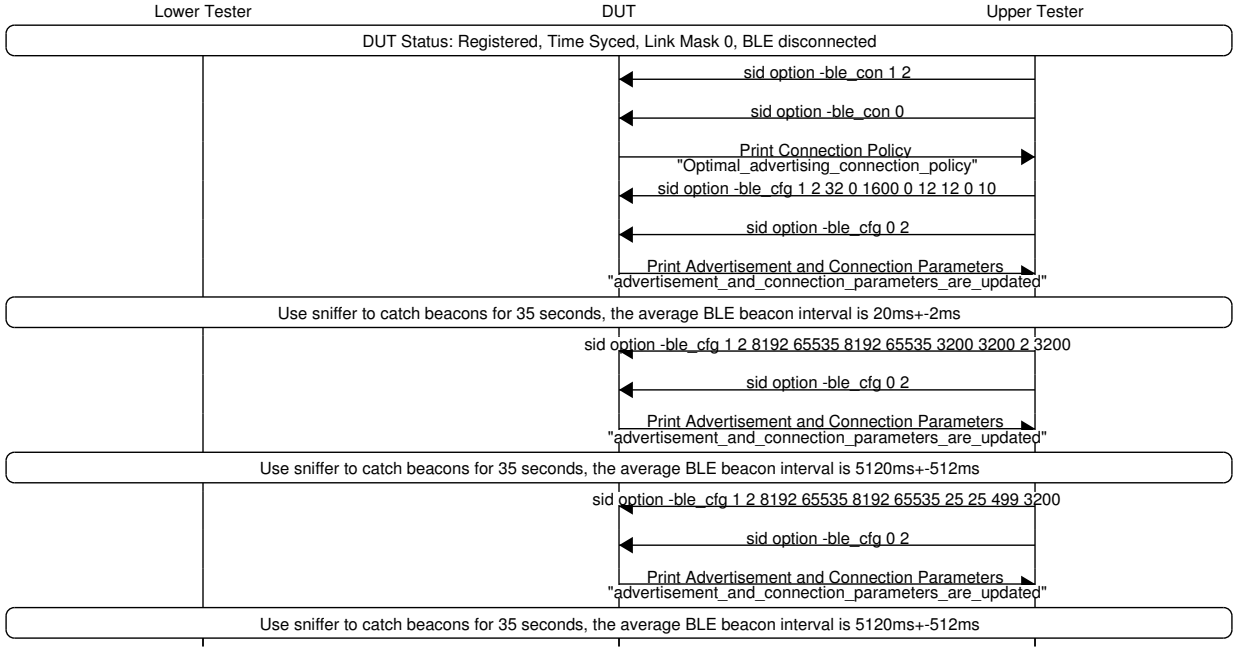
15.12.1 Test Purpose

Verify both advertisement parameters, connection parameters and advertising interval of BLE beacons on optimal advertising connection policy.

15.12.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.12.3 Test Procedure



15.12.4 Expected Results

15.12.4.1 Pass Verdict

The advertisement parameters, connection parameters and advertising interval on DUT are updated according to the configuration.

15.13 BLE-EP-CONNECTIONPOLICY-OPTIMALADVERTISING-BV-04: Optimal advertising connection policy with inactivity timeout.

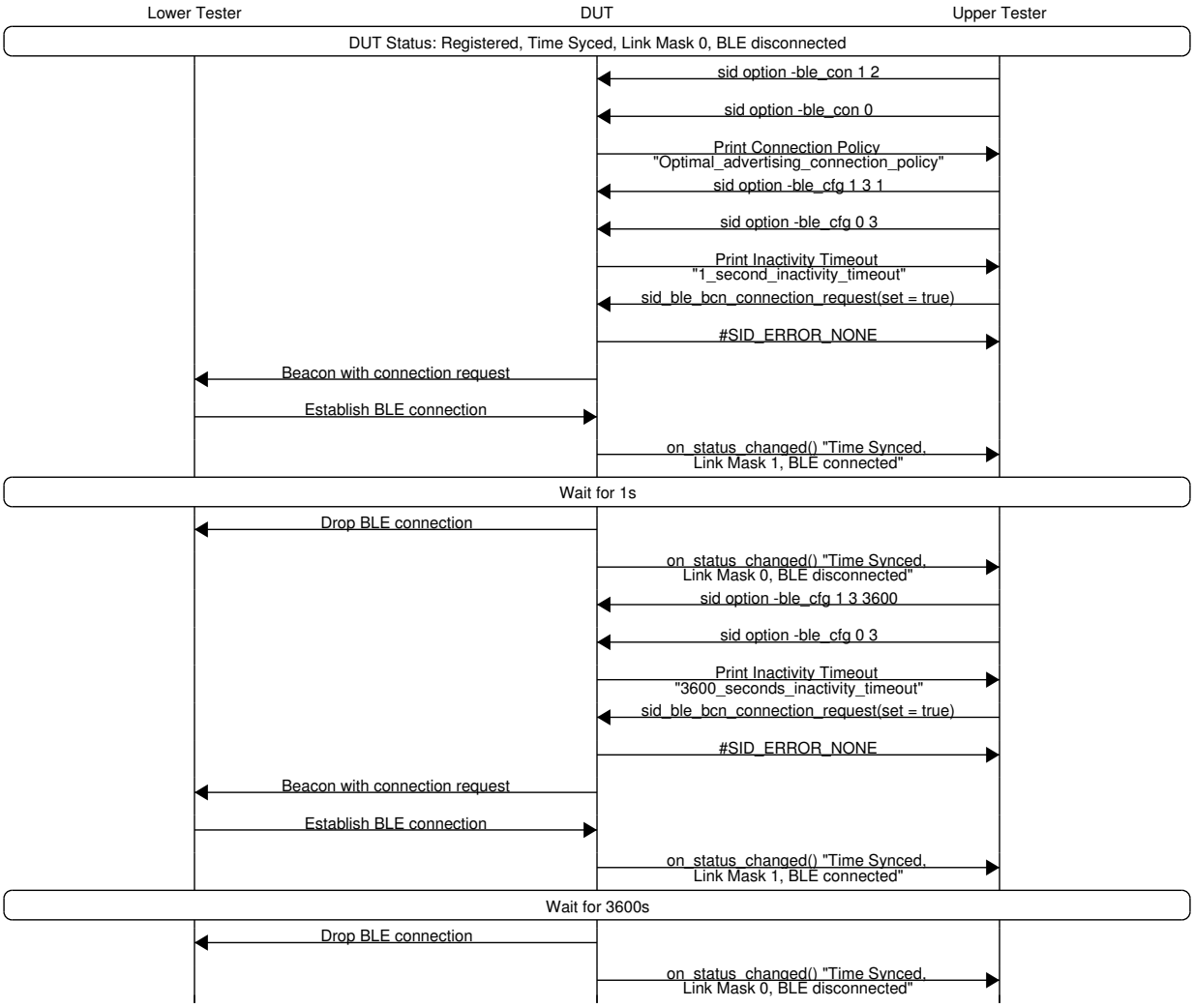
15.13.1 Test Purpose

Verify that BLE would be disconnected after inactivity timeout on optimal advertising connection policy.

15.13.2 Initial Conditions

- The Sidewalk stack (BLE) is initialized and started on the DUT. - DUT is registered with Amazon Sidewalk network. - DUT is time-synced with Amazon Sidewalk network. - Lower Tester operates in BLE mode. - SidewalkNetworkFlag is enabled on the Lower Tester.

15.13.3 Test Procedure



15.13.4 Expected Results

15.13.4.1 Pass Verdict

BLE connection can be established and will be dropped after inactivity timeout.

Chapter 16

Change History

Version	Summary of Changes
Protocol Stack 1.0, Document Revision A	First release of specification.
Protocol Stack 1.0, Document Revision A.1	Expanded Introduction section to provide background on tester roles. Corrected test case IDs to use slash separators. Layout changes to message sequence charts.
Protocol Stack 1.0, Document Revision A.2	Add multi-link test cases.
Protocol Stack 1.0, Document Revision A.3	Add file-transfer test cases.
Protocol Stack 1.0, Document Revision A.4	Add PICS appendix.
Protocol Stack 1.0, Document Revision A.5	Add endpoint metrics test cases.
Protocol Stack 1.0, Document Revision A.6	Add endpoint capability test cases.
Protocol Stack 1.0, Document Revision A.7	Add MAC address test cases.
Protocol Stack 1.0, Document Revision A.8	Add location service E2E test cases.
Protocol Stack 1.0, Document Revision A.9	Add location service MCU test cases.
Protocol Stack 1.0, Document Revision A.10	Add power optimization test cases.
Protocol Stack 1.0, Document Revision A.11	Add BLE connection policy test cases.

Chapter 17

Appendix

17.1 PICS

A Protocol Conformance Implementation (PIC) statement is required for every Sidewalk-enabled device, where the developer must confirm that their device implementation meets all requirements outlined in the Amazon Sidewalk protocol specification. The PIC statement serves as the developer's attestation that is submitted along with a request for their Sidewalk product qualification review and approval.

17.2 Reference Table

Table 17.1:

ID	Group	Implementation Name	Implementation Case	Test Required (Y)=YES / (C)=Conditional
Basic Conformance		**Basic conformance is mandatory. The items shall be implemented for the selected operation band (s).**		**Mandatory**
1	SID_VERSION	Amazon Sidewalk Compatible MCU	DUT is flashed with a valid MCU build for Amazon Sidewalk.	(Y)
2	BAND	Operation Band	DUT with BLE compatibility operates in the 2.4GHz ISM band in US, compliant with FCC ITU Region 2.	(Y)
2.1	BAND	Operation Band	DUT with Sub-1GHz compatibility operates in the sub-1GHz ISM band in US, compliant with FCC ITU Region 2.	(Y)
Protocol Implementation Conformance		**Protocol conformance is mandatory. DUT can have selectable implementations for BLE, SubG-FSK, and SubG-CSS. The items shall be implemented for each chosen protocol.**		**Mandatory**
3	**BLE Protocol**	**BLE Link Type**	**DUT with BLE compatibility connects to the Amazon Sidewalk network using BLE version 4.2 (minimum), 1Mbps data rate.**	**(Y)**
3.1	BLE Protocol	Device Connection - REG	DUT successfully completes Sidewalk device registration over BLE.	(Y)
3.2	BLE Protocol	Device Connection - REG	DUT successfully completes Sidewalk device registration with use of FFN.	(Y)

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Table 17.1: (Continued)

3.3	BLE Protocol	Device Connection - REG	DUT can be deregistered from Sidewalk network.	(Y)
3.4	BLE Protocol	Device Data - DL	DUT receives downlink packets with various sizes of Command data.	(Y)
3.5	BLE Protocol	Device Data - UL	Gateway receives uplink packets with various sizes of Command data from DUT.	(Y)
3.6	BLE Protocol	Device Connection - EST	Gateway establishes BLE connection on DUT's request.	(Y)
3.7	BLE Protocol	Device Connection - EST	DUT can connect with Gateway via BLE, after reinitializing Sidewalk library.	(Y)
3.8	BLE Protocol	Device Connection - EST	DUT can connect with Gateway via BLE, after restarting Sidewalk library.	(Y)
3.9	BLE Protocol	Device Connection - DSC	BLE connection between Gateway and DUT is dropped after 30 seconds of being idle.	(Y)
3.10	BLE Protocol	Device Connection - DSC	BLE connection between Gateway and DUT is extended by uplink packet and dropped after additional 30 seconds.	(Y)
3.11	BLE Protocol	Device Connection - DSC	BLE connection between Gateway and DUT is extended by downlink packet and dropped after additional 30 seconds.	(Y)
3.12	BLE Protocol	Device Connection - DSC	DUT drops BLE connection in case of received downlink packet with duplicated SEQ.	(Y)
3.13	BLE Protocol	Device Connection - DSC	DUT drops BLE connection in case of received downlink packets with duplicated SEQ range.	(Y)
3.14	BLE Protocol	Device Connection - DSC	DUT drops BLE connection after stopping Sidewalk library.	(Y)
3.15	BLE Protocol	Device Connection - DSC	DUT drops BLE connection after de-initializing Sidewalk library.	(Y)
3.16	BLE Protocol	Device Connection - BCN	DUT transmits beacons only when BLE connection is not established.	(Y)
3.17	BLE Protocol	Device Connection - BCN	DUT transmits beacons that contain Identifier (TX-ID), which changes every 15 minutes.	(Y)
3.18	BLE Protocol	Device Connection - BCN	DUT transmits beacons with 160ms interval for the first 30 seconds after starting BLE protocol.	(Y)
3.19	BLE Protocol	Device Connection - BCN	DUT transmits beacons with 1s interval, 30 seconds after starting BLE protocol.	(Y)
3.20	BLE Protocol	Device Connection - BCN	DUT transmits beacons with valid header.	(Y)
3.21	BLE Protocol	Device Connection - DUP	BLE connection is closed after DUT receives 10 packets with duplicate SEQ number within one minute (filter duplicates enabled).	(Y)
3.22	BLE Protocol	Device Connection - DUP	BLE connection is closed after DUT receives 10 packets with various duplicate SEQ numbers within one minute (filter duplicates enabled).	(Y)
3.23	BLE Protocol	Device Connection - DUP	BLE connection is not closed after DUT receives 10 packets with duplicate SEQ number within one minute (filter duplicates disabled).	(Y)
3.24	BLE Protocol	Device Connection - DUP	BLE connection is not closed after DUT receives 10 packets with various duplicate SEQ numbers within one minute (filter duplicates disabled).	(Y)

Continued on next page

Table 17.1: (Continued)

3.25	BLE Protocol	Device Connection - DUP	BLE connection is not closed after 10 packets with duplicate SEQ number reach DUT, if not all of those packets are sent within one minute.	(Y)
3.26	BLE Protocol	Network Sync - Time	DUT completes the initial time sync procedure.	(Y)
4	**SubG-FSK Protocol**	**SubG-FSK Link Type**	**DUT with SubG-FSK compatibility connects to the Amazon Sidewalk network using Sidewalk GFSK 50 kbps raw data rate.**	**(Y)**
4.1	SubG-FSK Protocol	Beacon Discovery	FSK-WAN DUT discovers neighbor Gateway and synchronizes with it if roaming is allowed.	(Y)
4.2	SubG-FSK Protocol	Beacon Discovery	FSK-WAN DUT discovers home Gateway and synchronizes with it even if roaming is forbidden.	(Y)
4.3	SubG-FSK Protocol	Beacon Discovery	FSK-WAN DUT detects a neighbor Gateway Beacon but continues with the Gateway discovery process if roaming is forbidden.	(Y)
4.4	SubG-FSK Protocol	Device Connection - REG	DUT successfully completes Sidewalk device registration over BLE.	(Y)
4.5	SubG-FSK Protocol	Device Connection - REG	DUT can be deregistered from Sidewalk network.	(Y)
4.6	SubG-FSK Protocol	Device Connection - REG	DUT successfully completes Sidewalk device registration with the use of FFN.	(Y)
4.7	SubG-FSK Protocol	Device Connection - SEQ	Uplink packets contain SEQ number.	(Y)
4.8	SubG-FSK Protocol	Device Connection - SEQ	DUT increments uplink SEQ number until UUID changes.	(Y)
4.9	SubG-FSK Protocol	Device Connection - SEQ	DUT accepts and decodes downlink packets with increased and decreased SEQ.	(Y)
4.10	SubG-FSK Protocol	Device Connection - SEQ	DUT rejects downlink packet with duplicated SEQ.	(Y)
4.11	SubG-FSK Protocol	Device Connection - SEQ	DUT rejects downlink packet with duplicated SEQ range.	(Y)
4.12	SubG-FSK Protocol	Device Connection - SEQ	SEQ number can be accepted again after getting 10 other messages.	(Y)
4.13	SubG-FSK Protocol	Device Connection - SEQ	SEQ number can be accepted again after Sidewalk stack reinitialization.	(Y)
4.14	SubG-FSK Protocol	Device Connection - SEQ	DUT drops the packet with SEQ which is out of range.	(Y)
4.15	SubG-FSK Protocol	Device Data - DL	DUT receives downlink packets with various sizes of Command data.	(Y)
4.16	SubG-FSK Protocol	Device Data - UL	Gateway receives uplink packets with various sizes of Command data from DUT.	(Y)
4.17	SubG-FSK Protocol	Network Sync - Time	DUT completes the initial time sync procedure.	(Y)
4.18	SubG-FSK Protocol	Network Sync - JOIN	DUT completes the initial Join procedure.	(Y)
4.19	SubG-FSK Protocol	Network Sync - JOIN	DUT keeps synchronization with the network by periodic transmission of Join request.	(Y)
4.20	SubG-FSK Protocol	Network Sync - JOIN	DUT keeps synchronization with the network by embedded sync request.	(Y)
4.21	SubG-FSK Protocol	Device Security - UUID	DUT rotates UUID immediately after time sync.	(Y)
4.22	SubG-FSK Protocol	Device Security - UUID	UUID rotates every 15 minutes after time sync.	(Y)

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Table 17.1: (Continued)

4.23	SubG-FSK Protocol	Device Security - UUID	DUT can exchange UL/DL during UUID rotation.	(Y)
5	**SubG-CSS Protocol**	**SubG-CSS Link Type**	**DUT with SubG-CSS compatibility connects to the Amazon Sidewalk network using LoRa CSS raw bit rate 2 kbps @ BW 500 kHz, SF11. SubG-CSS must exist with either BLE or SubG-FSK implementation.**	**Y**
5.1	SubG-CSS Protocol	Device Data - DL	DUT receives downlink packets with various sizes of Command data.	(Y)
5.2	SubG-CSS Protocol	Device Data - UL	Gateway receives uplink packets with various Command data sizes from DUT.	(Y)
5.3	SubG-CSS Protocol	Device Security - UUID	DUT rotates UUID immediately after time sync.	(Y)
5.4	SubG-CSS Protocol	Device Security - UUID	UUID rotates every 15 minutes after time sync.	(Y)
5.5	SubG-CSS Protocol	Device Security - UUID	DUT can exchange UL/DL during UUID rotation.	(Y)
5.6	SubG-CSS Protocol	Device Connection - REG	DUT successfully completes Sidewalk device registration over BLE.	(Y)
5.7	SubG-CSS Protocol	Device Connection - REG	DUT can be deregistered from Sidewalk network.	(Y)
5.8	SubG-CSS Protocol	Device Connection - LP	DUT can select Profile A and complete the Join procedure.	(Y)
5.9	SubG-CSS Protocol	Device Connection - LP	DUT can select Profile B and complete the Join procedure.	(Y)
5.10	SubG-CSS Protocol	Device Connection - SEQ	Uplink packets contain SEQ number.	(Y)
5.11	SubG-CSS Protocol	Device Connection - SEQ	DUT increments uplink SEQ number until UUID changes.	(Y)
5.12	SubG-CSS Protocol	Device Connection - SEQ	DUT accepts and decodes downlink packets with increased and decreased SEQ.	(Y)
5.13	SubG-CSS Protocol	Device Connection - SEQ	DUT rejects downlink packet with duplicated SEQ.	(Y)
5.14	SubG-CSS Protocol	Device Connection - SEQ	DUT rejects downlink packet with duplicated SEQ range.	(Y)
5.15	SubG-CSS Protocol	Device Connection - SEQ	SEQ number can be accepted again after getting 10 other messages.	(Y)
5.16	SubG-CSS Protocol	Device Connection - SEQ	SEQ number can be accepted again after Sidewalk stack reinitialization.	(Y)
5.17	SubG-CSS Protocol	Device Connection - SEQ	DUT drops the packet with SEQ which is out of range.	(Y)
5.18	SubG-CSS Protocol	Network Sync - JOIN	DUT keeps synchronization with the network by periodic transmission of Join request.	(Y)
5.19	SubG-CSS Protocol	Network Sync - JOIN	DUT keeps synchronization with the network by embedded sync request.	(Y)
5.20	SubG-CSS Protocol	Network Sync - TIME	DUT completes the initial time sync procedure.	(Y)
6	**SubG-CSS Protocol**	**Multi-Radio**	**DUT's SubG-CSS exists with BLE implementation.**	**Y (conditional to SubG-CSS existence with BLE)**

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Table 17.1: (Continued)

6.1	SubG-CSS Protocol	Mutli-Radio - API INIT	DUT switches between 900MHz and BLE stack multiple times.	Y
6.2	SubG-CSS Protocol	Mutli-Radio Connection - DL	DUT is able to receive a downlink packet using BLE.	Y
6.3	SubG-CSS Protocol	Mutli-Radio Connection - DL	DUT is able to receive a downlink packet using LoRa.	Y
6.4	SubG-CSS Protocol	Mutli-Radio Connection - DL	DUT is able to receive a downlink packet using LoRa, while BLE connection with Gateway is established.	Y
6.5	SubG-CSS Protocol	Mutli-Radio Connection - Send LINK	Uplink performed through BLE, when send link 0 and active BT connection.	Y
6.6	SubG-CSS Protocol	Mutli-Radio Connection - Send LINK	Uplink performed through BLE, when send link 1 and active BT connection.	Y
6.7	SubG-CSS Protocol	Mutli-Radio Connection - Send LINK	Uplink performed through LoRa, when send link 3 and active BT connection.	Y
6.8	SubG-CSS Protocol	Mutli-Radio Connection - Send LINK	Uplink performed through LoRa, when send link 0 and terminated BT connection.	Y
6.9	SubG-CSS Protocol	Mutli-Radio Connection - Send LINK	Uplink not performed, when send link 1 and terminated BT connection.	Y
Functionality Implementation Conformance		**Functionality conformance is optional. The implementation may choose to implement the items.**		**Optional**
7	**MLM**	**Multi-Link Connection**	**DUT enables any combination of BLE, and/or SubG-FSK, and/or SubG-CSS link type for Amazon Sidewalk network connection..**	**Y (conditional to the selected Protocol)**
7.1	MLM	Mullti-Link Auto Connection - BLE	DUT sends UL without auto-connect, DUT is BLE disconnected (Link_Mask 0)	C
7.2	MLM	Mullti-Link Auto Connection - BLE	DUT sends UL with auto-connect, ack is true, retry is 3, TTL is 60	C
7.3	MLM	Mullti-Link Auto Connection - SubG-FSK	DUT sends UL without auto-connect, DUT is FSK disconnected (Link_Mask 0)	C
7.4	MLM	Mullti-Link Auto Connection - SubG-FSK	DUT sends UL with auto-connect, ack is true, retry is 3, TTL is 60	C
7.5	MLM	Mullti-Link Auto Connection - SubG-CSS	DUT sends UL without auto-connect, DUT is LoRa disconnected (Link_Mask 0)	C
7.6	MLM	Mullti-Link Auto Connection - SubG-CSS	DUT sends UL with auto-connect, ack is true, retry is 3, TTL is 60	C
7.7	MLM	Mullti-Link Auto Connection - BLE_SubG-CSS	DUT sends UL with auto-connect when BLE link priority is higher than LoRa, EN Link_Mask is 0, Specify BLE+LoRa link	C
7.8	MLM	Mullti-Link Auto Connection - BLE_SubG-CSS	DUT sends UL with auto-connect when BLE link priority is higher than LoRa, EN Link_Mask is 0, Specify BLE+LoRa link, disable BLE on GW	C
7.9	MLM	Mullti-Link Auto Connection - BLE_SubG-CSS	DUT sends UL with auto-connect when BLE link priority is higher than LoRa, EN Link_Mask is 0, disables BLE & LoRa on GW	C
7.10	MLM	Mullti-Link Auto Connection - BLE_SubG-CSS	DUT sends UL with auto-connect when BLE link priority is higher than LoRa, EN Link_Mask is 0, Specify FSK link	C

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Table 17.1: (Continued)

7.11	MLM	Mullti-Link Auto Connection - BLE_SubG-FSK_CSS	DUT sends UL through BLE when no connection	C
7.12	MLM	Mullti-Link Auto Connection - BLE_SubG-FSK_CSS	DUT sends UL through FSK when no connection	C
7.13	MLM	Mullti-Link Auto Connection - BLE_SubG-FSK_CSS	DUT sends UL through LoRa when no connection	C
7.14	MLM	Mullti-Link Auto Connection - BLE_SubG-FSK_CSS	DUT doesn't send UL when no connection and BLE/FSK/LoRa unavailable	C
7.15	MLM	Mullti-Link Auto Connection - BLE_SubG-FSK_CSS	DUT sends UL through BLE when Link_Mask is 1	C
7.16	MLM	Mullti-Link Active	DUT sends UL through BLE when no connection	C
7.17	MLM	Mullti-Link Active	DUT sends UL through FSK when no connection	C
7.18	MLM	Mullti-Link Active	DUT sends UL through LoRa when no connection	C
7.19	MLM	Mullti-Link Active	DUT doesn't send UL when no connection and BLE/FSK/LoRa unavailable	C
7.20	MLM	Mullti-Link Active	DUT doesn't send UL BLE when Link_Mask is 1	C
7.21	MLM	Mullti-Link Power	DUT sends UL through BLE when no connection	C
7.22	MLM	Mullti-Link Power	DUT sends UL through FSK when no connection	C
7.23	MLM	Mullti-Link Power	DUT sends UL through LoRa when no connection	C
7.24	MLM	Mullti-Link Power	DUT doesn't send UL when no connection and BLE/FSK/LoRa unavailable	C
7.25	MLM	Mullti-Link Power	DUT sends UL through BLE when Link_Mask is 1	C
7.26	MLM	Mullti-Link Performance	DUT sends UL through BLE when no connection.	C
7.27	MLM	Mullti-Link Performance	DUT sends UL through FSK when no connection	C
7.28	MLM	Mullti-Link Performance	DUT sends UL through LoRa when no connection	C
7.29	MLM	Mullti-Link Performance	DUT doesn't send UL when no connection and BLE/FSK/LoRa unavailable	C
7.30	MLM	Mullti-Link Performance	DUT sends UL through BLE when Link_Mask is 1	C
7.31	MLM	Mullti-Link Latency	DUT sends UL through BLE when no connection	C
7.32	MLM	Mullti-Link Latency	DUT sends UL through FSK when no connection	C
7.33	MLM	Mullti-Link Latency	DUT sends UL through LoRa when no connection	C
7.34	MLM	Mullti-Link Latency	DUT doesn't send UL when no connection and BLE/FSK/LoRa unavailable	C
7.35	MLM	Mullti-Link Latency	DUT sends UL through BLE when Link_Mask is 1	C
7.36	MLM	Mullti-Link Reliability	DUT sends UL through BLE when no connection	C
7.37	MLM	Mullti-Link Reliability	DUT sends UL through FSK when no connection	C
7.38	MLM	Mullti-Link Reliability	DUT sends UL through LoRa when no connection	C

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Table 17.1: (Continued)

7.39	MLM	Mullti-Link Reliability	DUT doesn't send UL when no connection and BLE/FSK/LoRa unavailable	C
7.40	MLM	Mullti-Link Reliability	DUT sends UL through BLE when Link_Mask is 1	C
8	**SBDT**	**File transfer**	**DUT receives a file transfer via Sidewalk BLE.**	**Y (conditional to the selected Protocol)**
8.1	SBDT	File Transfer	DUT initializes the feature and starts receiving a file	Y
8.2	SBDT	File Transfer	DUT cancels ongoing transfer	Y
8.3	SBDT	File Transfer	DUT prints the progress of the transfer and current file offset	Y
8.4	SBDT	File Transfer	DUT prints various parameters of the transfer	Y
8.5	SBDT	File Transfer Recovery	DUT recovers transfer after powered off and back on	Y
8.6	SBDT	File Transfer Recovery	DUT recovers transfer after being out of range from GW	Y
8.7	SBDT	File Transfer Recovery	DUT recovers transfer after GW that was using to send packets switched to another GW	Y
8.8	SBDT	File Transfer Recovery	DUT recovers transfer after GW that was using to send packets being opt-out	Y
8.9	SBDT	File Transfer Recovery	DUT recovers transfer after GW that was using to send packets powered off for a while and back on	Y
9	**EPMETRICS**	**Endpoint metrics**	**DUT has the capability to collect and upload endpoint metrics.**	**Y (conditional to the selected Protocol)**
9.1	EPMETRICS	Endpoint metrics - Common	DUT has corresponding metrics but not invalid metrics enabled	Y
9.2	EPMETRICS	Endpoint metrics - BLE Report	DUT sends endpoint metrics to Cloud over BLE in a specific time interval	Y
9.3	EPMETRICS	Endpoint metrics - BLE Report	DUT sends remaining endpoint metrics to Cloud over BLE via piggybacking on a periodic reporting	Y
9.4	EPMETRICS	Endpoint metrics - BLE Report	DUT sends endpoint metrics via piggybacking over BLE if the explicit reporting is disabled	Y
9.5	EPMETRICS	Endpoint metrics - BLE Uplink	DUT collects BLE uplink messages metrics	Y
9.6	EPMETRICS	Endpoint metrics - BLE Downlink	DUT collects BLE downlink messages metrics	Y
9.7	EPMETRICS	Endpoint metrics - BLE Connection	DUT collects BLE connection attempts metrics	Y
9.8	EPMETRICS	Endpoint metrics - FSK Report	DUT sends endpoint metrics to Cloud over FSK in a specific time interval	Y
9.9	EPMETRICS	Endpoint metrics - FSK Report	DUT sends remaining endpoint metrics to Cloud over FSK via piggybacking on a periodic reporting	Y
9.10	EPMETRICS	Endpoint metrics - FSK Report	DUT sends endpoint metrics via piggybacking over FSK if the explicit reporting is disabled	Y

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Table 17.1: (Continued)

9.11	EPMETRICS	Endpoint metrics - FSK Uplink	DUT collects FSK uplink messages metrics and total number of tx unique packets Metrics	Y
9.12	EPMETRICS	Endpoint metrics - FSK Downlink	DUT collects FSK downlink messages metrics and total number of rx packets metrics	Y
9.13	EPMETRICS	Endpoint metrics - LoRa Report	DUT sends endpoint metrics to Cloud over LoRa in a specific time interval	Y
9.14	EPMETRICS	Endpoint metrics - LoRa Report	DUT sends remaining endpoint metrics to Cloud over LoRa via piggybacking on a periodic reporting	Y
9.15	EPMETRICS	Endpoint metrics - LoRa Report	DUT sends endpoint metrics via piggybacking over LoRa if the explicit reporting is disabled	Y
9.16	EPMETRICS	Endpoint metrics - LoRa Uplink	DUT collects LoRa uplink messages metrics and total number of tx normal packets metrics	Y
9.17	EPMETRICS	Endpoint metrics - LoRa Downlink	DUT collects LoRa downlink messages metrics and total number of rx packets metrics	Y
10	**CAPABILITY**	**Endpoint capability**	**Capability of DUT can be uploaded and configured.**	**Y (conditional to the selected Protocol)**
10.1	CAPABILITY	Endpoint capability - Common Report	DUT does not have the capability report saved, schedule an event to report the capability	Y
10.2	CAPABILITY	Endpoint capability - Common Report	DUT have the capability report saved and match between the capability parameters present in the image and the KV store, should not schedule an event to report the capability	Y
10.3	CAPABILITY	Endpoint capability - Common Report	DUT default capability report	Y
10.4	CAPABILITY	Endpoint capability - Common Uplink	DUT schedule an event, before EP capability report ACK receive, can send messages	Y
10.5	CAPABILITY	Endpoint capability - Common Request	Send request to get DUT capabilities	Y
10.6	CAPABILITY	Endpoint capability - Common Configure	DUT configure should be updated after setting	Y
10.7	CAPABILITY	Endpoint capability - Common Register	DUT capability return to default after re-register	Y
10.8	CAPABILITY	Endpoint capability - Common Threshold	DUT traffic threshold renew mechanism	Y
10.9	CAPABILITY	Endpoint capability - Common Periodicity	DUT set metrics periodiicty	Y
10.10	CAPABILITY	Endpoint capability - Common Periodicity	DUT set metrics periodiicty when link metrics is disabled	Y
10.11	CAPABILITY	Endpoint capability - BLE Threshold	Traffic threshold for BLE stack	Y
10.12	CAPABILITY	Endpoint capability - FSK Threshold	Traffic threshold for FSK stack	Y
10.13	CAPABILITY	Endpoint capability - LoRa Threshold	Traffic threshold for LoRa stack	Y

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Table 17.1: (Continued)

11	**BLE BEACON**	**MAC Address**	**DUT MAC address rotation under specific conditions**	**Y (conditional to the selected Protocol)**
11.1	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after registration	Y
11.2	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after time sync	Y
11.3	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after time sync every 15 minutes together with UUID	Y
11.4	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after connection request sent from EN to cloud	Y
11.5	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after connection released	Y
11.6	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after receiving a DL	Y
11.7	BLE BEACON	MAC Address	DUT BLE MAC address should rotate after key refresh	Y
11.8	BLE BEACON	MAC Address	DUT BLE MAC address should rotate every 15 minutes even during long live connection	Y
12	**Location Service**	**Location Service Uplink**	**DUT sends location data (GNSS, WiFi, Gateway) to Cloud for device positioning.**	**Y (conditional to the selected Protocol)**
12.1	Location Service	Location Service Uplink - BLE	Resolve EN location for BLE uplink message containing GNSS scan information	Y
12.2	Location Service	Location Service Uplink - BLE	Resolve EN location for BLE uplink message containing WiFi scan information	Y
12.3	Location Service	Location Service Uplink - BLE	Resolve EN location for BLE uplink message with connected GW location	Y
12.4	Location Service	Location Service Uplink - LoRa	Resolve EN location for LoRa uplink message containing GNSS scan information	Y
12.5	Location Service	Location Service Uplink - LoRa	Resolve EN location for LoRa uplink message containing WiFi scan information	Y
13	**Location Service**	**Location service MCU**	**DUT location can be resolved and sent**	**Y (conditional to the selected Protocol)**
13.1	Location Service	Location service MCU	DUT send a location uplink at level 1	Y
13.2	Location Service	Location service MCU	DUT send a location uplink at level 1 via piggybacking	Y
13.3	Location Service	Location service MCU	DUT send a location uplink at level 3	Y
13.4	Location Service	Location service MCU	DUT scan location at level 3	Y
13.5	Location Service	Location service MCU	DUT send a location uplink at level 4	Y
13.6	Location Service	Location service MCU	DUT scan location at level 4	Y
13.7	Location Service	Location service MCU	DUT re-transmit all missed fragments for WiFi on LoRa	Y

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Table 17.1: (Continued)

13.8	Location Service	Location service MCU	DUT re-transmit all missed fragments for GNSS on LoRa	Y
13.9	Location Service	Location service MCU	DUT switch location resolution from level 1 to level 3 automatically	Y
13.10	Location Service	Location service MCU	DUT switch location resolution from level 1 to level 4 automatically	Y
14	**POWER**	**Power Optimization**	**DUT can adjust RX window opening time**	**Y (conditional to the selected Protocol)**
14.1	POWER	Power Optimization	DUT FSK RX duration can be adjusted	Y
14.2	POWER	Power Optimization	DUT FSK RX windows after control message sent should not be closed	Y
14.3	POWER	Power Optimization	DUT FSK RX window termination request stop RX window opened at profile 2	Y
14.4	POWER	Power Optimization	DUT FSK RX window termination request should not stop RX window opened at profile 1	Y
14.5	POWER	Power Optimization	DUT FSK beacon interval can be adjusted	Y
14.6	POWER	Power Optimization	DUT FSK beacon interval revert to default after 2nd beacon misses	Y
14.7	POWER	Power Optimization	DUT FSK can still perform uplinks and downlinks normally after a beacon skipped	Y
14.8	POWER	Power Optimization	DUT LORA number of RX windows is limited and can be changed	Y
14.9	POWER	Power Optimization	DUT LORA number of RX windows is reset after sending an additional uplink	Y
14.10	POWER	Power Optimization	DUT LORA RX window termination request stop RX window opened at profile A	Y
14.11	POWER	Power Optimization	DUT LORA RX window termination request should not stop RX window opened at profile B	Y
14	**CONNECTION POLICY**	**BLE connection policy**	**BLE connection policy and parameters can be configured on DUT**	**Y (conditional to the selected Protocol)**
14.1	Connection Policy	BLE connection policy	Advertisement parameters and advertising intervals on default connection policy	Y
14.2	Connection Policy	BLE connection policy	Connection parameters on default connection policy	Y
14.3	Connection Policy	BLE connection policy	Both advertisement and connection parameters, advertising interval of BLE beacons on default connection policy	Y
14.4	Connection Policy	BLE connection policy	Both default advertisement and connection parameters, advertising interval of BLE beacons	Y
14.5	Connection Policy	BLE connection policy	DUT disconnects after inactivity timeout on default connection policy	Y
14.6	Connection Policy	BLE connection policy	Advertisement parameters and advertising intervals on long lived connection policy	Y
14.7	Connection Policy	BLE connection policy	DUT connection parameters on long lived connection policy	Y

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Table 17.1: (Continued)

14.8	Connection Policy	BLE connection policy	Both advertisement and connection parameters, advertising interval of BLE beacons on long lived connection policy	Y
14.9	Connection Policy	BLE connection policy	DUT disconnects after inactivity timeout on long lived connection policy	Y
14.10	Connection Policy	BLE connection policy	Advertisement parameters and advertising intervals on optimal advertising connection policy	Y
14.11	Connection Policy	BLE connection policy	Connection parameters on optimal advertising connection policy	Y
14.12	Connection Policy	BLE connection policy	Both advertisement and connection parameters, advertising interval of BLE beacons on optimal advertising connection policy	Y
14.13	Connection Policy	BLE connection policy	DUT disconnects after inactivity timeout on optimal advertising connection policy	Y

