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| | | Management | communication shall support the UDP |
| | | | protocol stack |

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1 Acronyms and Abbreviations

| Abbreviation / Acronym: | Description: |
|---------------------------------|--|
| AT | Acceptance Test |
| ECU | Electronic Control Unit |
| IUT | Implementation Under Test |
| LT | Lower Tester |
| PDU | Protocol Data Unit |
| SP | Service Primitive |
| TS | Test System |
| UDP | User Datagram Protocol (according to IETF RFC 768) |
| UT | Upper Tester |
| IP | Internet Protocol |
| ICMP | Internet Control Message Protocol |
| TTL | Time To Live |
| TOS | Type Of Service |
| MTU | Maximum Transmission Unit |
| <ltiface-m></ltiface-m> | m-th Interface of LT |
| <iutiface-n></iutiface-n> | n-th Interface of IUT |
| <iutiface-n-ip></iutiface-n-ip> | IP address of n-th Interface of IUT |
| <ltiface-m-ip></ltiface-m-ip> | IP address of m-th Interface of LT |
| SCG | Static Configuration Groups |
| allSystemMCastA ddr | Refers to the multicast address of All Systems on a Subnet |
| BroadCastAddr | Refers to the broadcast address of a EthIfCtrl |

2 Related Documentation

2.1 Input documents

[1] AUTOSAR Specification of TCP/IP Stack AUTOSAR_SWS_Tcplp.pdf

[2] AUTOSAR System Template AUTOSAR_TPS_SystemTemplate.pdf

[3] AUTOSAR SRS Ethernet AUTOSAR_SRS_Ethernet.pdf

[4] AUTOSAR General Specification for Basic Software Modules AUTOSAR_SWS_BSWGeneral.pdf

[5] Specification of ECU Configuration AUTOSAR_TPS_ECUConfiguration.pdf

[6] Requirements on AUTOSAR Features AUTOSAR_RS_Features.pdf

2.2 Related standards and norms

[7] IETF RFC 768 http://tools.ietf.org/html/rfc768

[8] IETF RFC 1122 http://tools.ietf.org/html/rfc1122

2.3 Testability Protocol and Service Primitives

[9] Testability Protocol and Service Primitives
AUTOSAR_PRS_TestabilityProtocolAndServicePrimitives.pdf



3 RS_BRF_01784 - AUTOSAR communication shall support the IP protocol stack

3.1 General Test Objective and Approach

This document intends to provide a test-specification for various features of User Datagram Protocol (UDP) as mentioned in RS_BRF_01784.

It uses the UDP message headers and operations as described in Trace to SWS Item. It also uses various parts of RFC 768 and RFC 1122 as reference.

This test-chapter aims to test following requirements which are mentioned in the "AUTOSAR SWS Specification of TCP/IP Stack" for a UDP stack:

- I. [SWS_TCPIP_00060]: implement the User Datagram Protocol (UDP) as defined in IETF RFC 768.
- II. [SWS_TCPIP_00103]: fulfill the UDP related requirements specified by IETF RFC 1122, section 4.1.3.1 (Ports), 4.1.3.4 (UDP Checksums), and 4.1.3.6 (Invalid Addresses).
- III. [SWS_TCPIP_00170]: UDP-layer shall map received UDP datagrams to sockets based on the destination port as contained in the UDP protocol header and the local address (TcplpAddrld).
- IV. [SWS_TCPIP_00204]: For transmissions the Tcplp Module shall skip the calculation of the protocol checksums and fill the field with the value 0 for frames with respect to the configuration of the Ethernet Controller.

Following test sub-sections have been derived to test the above mentioned requirements:

- UDP message field value verifications.
- UDP message operation verifications.
- UDP user interface operation for unicast messages.
- UDP message reception functionality verification for unicast configurations.
- UDP message transmission: Source address selection mechanism.

This specification gives the description of required test environments and detailed test cases for executing tests.

Please refer to the "Traceability Matrix" (Appendix-A) mentioned at the end of this document, which gives a consolidated correlation between the AUTOSAR requirement, IETF RFC sections and the test cases mentioned in this document.

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3.1.1 Test System

3.1.1.1 Overview on Architecture

The basic test system architecture is depicted in the following figure:

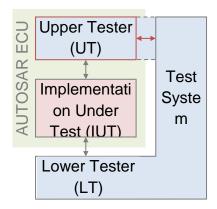


Figure 1: Basic test system architecture

Test System

- controls the Upper Tester and the Lower Tester
- evaluates the test results

The Upper Tester (UT)

- is part of the Test System
- sends / receives Testability SPs and propagates the needed actions to the IUT
- receives return values from the IUT
- communicates return values with the Lower tester to achieve test execution coordination with the Lower tester interface

The Lower Tester (LT)

- is part of the Test System
- records any Ethernet encapsulated packets during the test execution
- sends Ethernet PDUs to the IUT
- coordinates and synchronizes with the Upper Tester

3.1.1.2 Specific Requirements

The Testability Protocol and Service Primitives [9] shall be implemented as a part of the UT

in order to propagate the needed Service Primitives and actions to the IUT.

3.1.1.3 **Test Coordination Requirements**

As observation of the IUT is done by the test cases at both the Lower Tester and the Upper Tester, a test coordination procedure for collecting the local test verdicts (at LT and UT) at one central place is required. It is up to the test system designer /

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implementer to define that "central place" and to design and implement the test coordination functionality.

3.1.2 Configuration

This section describes sets of requirements on configuration. These sets are later referenced by test cases. No configuration files are provided. They need to be developed when the test suite is implemented. The configuration can be divided into two separate parts. The 'UDP Tester Configuration' describes variables used to parameterize the Tester. The 'UDP IUT Configuration' describes the necessary settings of the IUT in order to allow a test case to perform. Now onwards this configuration will be referenced as "UDP Test Configuration-1".

3.1.2.1 UDP Tester Configuration

The Test Configuration is changeable during runtime and contains parameters that are referenced by test cases and can be adjusted by a test case itself. In case the test configuration parameter is only referenced the following default parameters will apply.

| Test configuration parameters | | | |
|--|---|----------------|---|
| Parameter Descriptions | | Default values | Parameter names used during test |
| Ethernet Interface to be used by Tester | Name of the Ethernet interface on the host machine that tester will use. | Eth-0 | <testerlface-n> [e.g. <testerlface-0>, <testerlface-1> etc]</testerlface-1></testerlface-0></testerlface-n> |
| Ethernet Interface to be used by IUT | Name of the Ethernet interface on the host machine that IUT will use. | As configured | <iutiface-n> [e.g. <iutiface-0>,</iutiface-0></iutiface-n> |
| Lower Tester IP Address pool | This is the IP address pool to be used by LT. (Note – Lower Tester may need to simulate a series of IP addressed during a test, this pool will be used for that purpose). | As configured | <host-n-ip> [e.g. <host-1-ip>, <host-2-ip> etc]</host-2-ip></host-1-ip></host-n-ip> |
| Lower Tester port pool | This is the port pool to be used by LT. (Note – Lower Tester may need to use multiple ports during a test, this pool will be used for | 20000 | <unusedudp- LT-Port-n></unusedudp- |



| | | | TO Release 1.2.0 |
|---------------------------------|---|---|--|
| | that purpose). | | |
| IUT IP Address | This is the IP address of the Implementation Under Test's connection to that network. | As configured | <iutiface-n-ipaddr> [e.g. <iutiface-0-ipaddr> denotes the IP address of 0th interface of IUT]</iutiface-0-ipaddr></iutiface-n-ipaddr> |
| IUT port number | This is the IUT port number to be used during the test. | 20001 | <unusedudp- IUT-Port1></unusedudp- |
| Listen Time | This is the maximum time interval (in seconds) for which LT waits for a packet for cases when a certain event has been triggered on the IUT either by some protocol timer or using some external mechanism. | 10 seconds | <listentime></listentime> |
| Tolerance Time | Time tolerance (in ms) to be used during various calculations for time sensitive tests. | 500 ms | <tolerancetime></tolerancetime> |
| Sample UDP data | Sample UDP data used by TESTER. e.g. <udpdata-16> indicates 16 octet of UDP data. e.g. <udpdata-17> indicates 17 octet of UDP data.</udpdata-17></udpdata-16> | <udpdataud PDATAUDPDA TA up to n octets></udpdataud | <udpdata-n></udpdata-n> |
| Default IP TTL | Specifies the time to live value for outgoing frames. | 64 | <defaultipttl></defaultipttl> |
| Minimum Buffer Size | Minimum Memory size in bytes reserved for TCP/IP buffers | 50bytes | MIN_MEM_BUF |
| All System Multicast Addr | Refers to the multicast address of All Systems on a Subnet. It will be specific to a EthIfCtrl | As Configured | <allsystemmcas tAddr></allsystemmcas |
| Broadcast Address | Refers to the broadcast address corresponding to EthIfCtrl of an IUT interface. e.g <broadcastaddr-0> signifies broad cast address corresponding to EthIfCtrl of <iutiface-0></iutiface-0></broadcastaddr-0> | As Configured | <broadcastaddr -n></broadcastaddr |



Table 1 Table of input parameters for Tester

3.1.2.2 UDP IUT Configuration

In order to make a test run possible, it is needed to configure various parameters of the IUT. Those configuration parameters can be derived from the AUTOSAR System Template. ECUC Parameters can also be used if needed especially when no corresponding System Template Parameter is present.

3.1.2.2.1 Required System Description

In order to perform the 'Test Cases' of this ATS, following basic System Description must be available.

- ApplicationEndpoint.TransportProtocolConfiguration.TcpUdpConfig.TcpTp.por tNumber > <unusedUDP-IUT-Port1>
- 2. ApplicationEndpoint.TransportProtocolConfiguration.TcpUdpConfig.TcpTp.dyn amicallyAssigned = FALSE
- 3. For IPv4 scenario:
- 4. SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology::NetworkEndpoint Address::IPv4Configuration.ipv4Address = <IUTlface-0-IPAddr>
- 5. For IPv6 scenario:
- 6. SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology::NetworkEndpoint Address:: IPv6Configuration.ipv6Address = <IUTIface-0-IPAddr>
- 7. SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology::NetworkEndpoint Address. TcplpAddressType = TCPIP_UNICAST

3.1.2.2.2 Required values for TCP/IP Stack configuration parameters

- Tcplp.TcplpGeneral.TcplpUdpEnabled = TRUE
- 2. Tcplp.TcplpGeneral.TcplpBufferMemory > MIN MEM BUF
- 3. Tcplp.TcplpConfig.TcplpCtrl.TcplpEthlfCtrlRef = <IUTlface-0>
- 4. Tcplp.TcplpConfig.TcplpLocalAddr = <IUTlface-0-IPAddr>
- 5. EthGeneral.EthCtrlOffloading.EthCtrlEnableOffloadChecksumUDP = FALSE
- 6. Tcplp.TcplpConfig.TcplpLocalAddr.TcplpAddressType = TCPIP_UNICAST

3.1.2.3 Required Software Component Description Files

No specific configuration requirements for Software Components.

3.1.2.4 Mandatory vs. Customizable Parts

All the parameters mentioned at section 3.1.2.1 and section 3.1.2.2 are mandatory parameters to run any of the below mentioned test cases.

There could be a need for few more configurations items at ECU, however they are individual test case specific and defined at each test-case level.

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3.2 General remarks

Please be aware, that some Test Cases require no reaction from the DUT in order to pass. There should be a generic test to ensure the DUT is still reactive and was not compromised by the previous test case execution. If the DUT is not reactive the previous test case execution must be interpreted as not passed.

One example could be writing a volatile information to the DUT and verify that this information is still available after the test case execution.

3.3 Service Primitives

Depending on the necessity of a test case, the test system may use various service-primitives for the IUT to take certain actions.

For the complete working model of Service Primitives please refer to [9]

| Name | Description |
|---------------------|--|
| CREATE AND BIND | Triggers the IUT to create a socket and optionally binds this socket to a port and a local IP address. |
| SEND DATA | Triggers the IUT to send a specified data to a specified target. |
| CLOSE SOCKET | Triggers the IUT to close all the open sockets which were created during a particular test case. |
| RECEIVE AND FORWARD | Triggers the IUT to receive data from the LT through UDP stack under test and forward back the data to UT. |
| CONFIGURE SOCKET | This SP is used to select and set certain parameters that can be configured on an UDP socket. |

Table 2 Table of Service Primitives

3.4 Assumptions

At the beginning of each test it has to be ensured that the IUT must be in the following conditions:

- All IUT interfaces that are connected to the Test System MUST be enabled.
- All IUT interfaces that are NOT connected to The Test System MUST be disabled
- There's no other unit in the test system that can inadvertently affect a test case.



3.5 **Terminologies**

This section defines the terminologies used in the test statements. The following is a brief description of the special terminologies and reusable test steps used in the test sections.

| SI. No. | Phrases | Illustrations |
|------------|--|--|
| 1 | Instruct IUT to send a UDP message with source port set to <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1> | UT issues service primitive <send data=""> to instruct IUT to send a UDP message through <iutiface-0>, containing: - Source-port field set to <unusedudp-iut-port1> - Source IP Address as defined in 'TcpIpLocalAddr' container Destination-port field set to <unusedudp-lt-port> - Destination IP Address set to <host-1-ip> - Length field set to UDP header and data length - UDP data field set to 1000 bytes of data - Checksum field set to 16-bit one's complement of the one's complement sum of the UDP header, UDP data and pseudo header.</host-1-ip></unusedudp-lt-port></unusedudp-iut-port1></iutiface-0></send> |
| 2 | Instruct IUT to send a UDP message with <udpdefaultdata> as data through <iutiface-0></iutiface-0></udpdefaultdata> | UT issues service primitive <send data=""> to instruct IUT to send a UDP message through <iutiface-0>, containing: - Source-port field set to <unusedudp-iut-port1> - Source IP Address as defined in 'TcpIpLocalAddr' container Destination-port field set to <unusedudp-lt-port> - Destination IP Address set to <host-1-ip> - Length field set to UDP header and data length - UDP data field set to "Hello world" - Checksum field set to 16-bit one's complement of the one's complement sum of the UDP header, UDP data and pseudo header.</host-1-ip></unusedudp-lt-port></unusedudp-iut-port1></iutiface-0></send> |
| 3 | Instruct IUT to send a UDP message with <defaultipttl+n> as TTL/HopLimit through <iutiface-0></iutiface-0></defaultipttl+n> | UT issues service primitive <send data=""> to instruct IUT to send a UDP message through <iutlface-0>, containing: - Source-port field set to <unusedudp-iut-port1> - Source IP Address as defined in 'TcpIpLocalAddr' container Destination-port field set to <unusedudp-lt-port> - Destination IP Address set to <host-1-ip> - Length field set to UDP header and data length - UDP data field set to 1000 bytes of data - Checksum field set to 16-bit one's complement of the one's complement sum of the UDP header, UDP data and pseudo header IP-TTL/HopLimit set to <defaultipttl+n></defaultipttl+n></host-1-ip></unusedudp-lt-port></unusedudp-iut-port1></iutlface-0></send> |



| | _ | |
|---|---|--|
| 4 | Verify that IUT has received the UDP message at <unusedudp-iut-port1> containing: - One or many fields mentioned by tester.</unusedudp-iut-port1> | A. UT issues service primitive <receive and="" forward=""> to check whether IUT has received the UDP message sent from Lower Tester. B. UT will initiate an event message which will forward data portion of the received UDP messages toward the lower tester (LT). Then LT will analyze that forwarded message and perform the necessary verifications. C. The forwarding-process will continue (active phase) until the maximum amount of data requested by UT in the request-message is received. For the complete working model of this Service Primitives please refer to [9].</receive> |
| 5 | Verify that IUT discards that UDP message. | A. UT issues service primitive <receive and="" forward=""> to reset the dropCount at IUT B. LT sends an UDP message to IUT by tweaking one or many fields as per the requirement of the test case. C. LT starts sensing the medium up to (<listentime> + <tolerancetime>). D. After the above timeout and LT not receiving any relevant response from IUT, test-system instructs UT to issue service primitive <receive and="" forward=""> to check whether IUT has received the UDP message sent from LT. E. UT receives the verification-response message containing:</receive></tolerancetime></listentime></receive> |
| 6 | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut-port1> to unicast address <iutiface-0- IPAddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0- </unusedudp-iut-port1></create> | A. UT issues service primitive <create and="" bind=""> to create a UDP socket and optionally binds this socket to a port and a local IP address mentioned in the parameter.</create> |



| 7 | Assign broadcast address <broadcastaddr-0> to EthIf controller <iutiface-0></iutiface-0></broadcastaddr-0> | For the test sub network, configure the network address and subnet mask in such a way that broadcast address <broadcastaddr-0> gets set for this subnet.</broadcastaddr-0> |
|---|---|--|
|---|---|--|

Table 3 Terminologies



3.6 UDP Topology

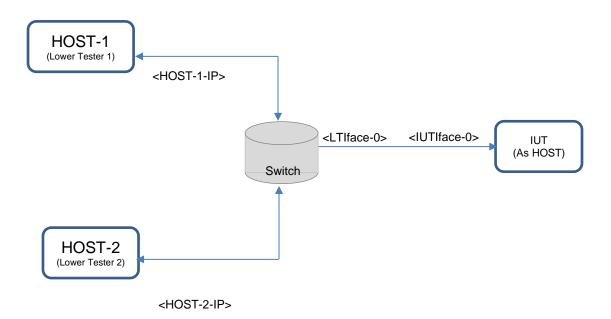
3.6.1 UDP Topology-1



DESCRIPTION:

This topology simulates HOST to HOST communication scenario between the IUT and LT. In this topology both LT and IUT should be on the same network.

3.6.2 UDP Topology-2





DESCRIPTION:

This topology simulates a hosts-to-host communication scenario between the IUT and TESTER. In this topology, the IUT is a host and TESTER simulates two HOSTs which are connected to IUT via a switch.

3.7 Test Cases

3.7.1 [ATS_UDP_00360] UDP datagram total length less than 8 octets MUST be discarded

| Test Objective | ective UDP datagram total length less than 8 octets MUST be discarded | | | |
|---|---|----------------------------|---------------|--|
| - | ATS_UDP_00360 | AUTOSAR Releases | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed | |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10001 | | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | | |
| Configuration Parameters | "UDP Test Configuration-1" | "UDP Test Configuration-1" | | |
| | LT sends a truncated UDP message to IUT through <iutiface-0> with a length less than 8 bytes. Verify that UDP stack under test discards this UDP message.</iutiface-0> | | | |
| Needed Adaptation to other Releases | None | | | |
| | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | | |
| Main Test Execu | ution | | | |
| Test Steps | | | Pass Criteria | |
| | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | | |
| | [LT] LT sends UDP message to IUT co - truncated message: length less | _ | | |



| | bytes | |
|---------------------|--|--|
| | - No UDP Data set. | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 3 | [UT] | The IUT discards the UDP message silently. |
| | Verify that IUT discards that UDP message. | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | |

3.7.2 [ATS_UDP_00435] UDP datagram with length value zero MUST be discarded

| Test Objective | UDP datagram with length value zero MUST be discarded | | | |
|---------------------|--|-----------|--|--|
| ID | ATS_UDP_00435 | AUTOSAR | 4.2.1 4.2.2 | |
| | | Releases | | |
| Affected Modules | TcpIP, Ethlf, Eth | State | reviewed | |
| Trace to | ATR: ATR_ATR_00124 | | | |
| Requirement | | | | |
| on Acceptance | | | | |
| Test Document | | | | |
| Trace to SWS | Tcplp: SWS_TCPIP_00060 | | | |
| Item | ATS_SID: SWS_SID_10002 | | | |
| Requirements / | 3.2 Service Primitives (Table-1) | | | |
| Reference | UDP Topology-1 | | | |
| to Test | | | | |
| Environment | | | | |
| Configuration | "UDP Test Configuration-1" | | | |
| Parameters |] | | | |
| Summary | LT sends UDP message to IUT through <iutiface-0> containing Length field set to</iutiface-0> | | | |
| | zero. | | | |
| | | | | |
| | Verify that UDP stack under test discards this UDP message. | | | |
| Needed | None | | | |
| Adaptation to | | | | |
| other Releases | | | | |
| Pre-conditions | UT causes the IUT to <create< th=""><th>AND BIND></th><th>a UDP socket on port <unusedudp-< th=""></unusedudp-<></th></create<> | AND BIND> | a UDP socket on port <unusedudp-< th=""></unusedudp-<> | |
| | IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr> | | | |
| Main Test Execu | ution | | | |
| Test Steps | Pass Criteria | | | |
| Step 1 | [UT] | | | |
| • | | | | |
| | | | | |
| | | | | |
| | UT causes the IUT to <receive< th=""><th>AND</th><th></th></receive<> | AND | | |
| | FORWARD> from LT at <unused< th=""><th></th><th></th></unused<> | | | |
| | Port1> through <iutiface-0></iutiface-0> | | | |
| | 0 = | | I . | |



| Step 2 | [LT] | |
|---------------------|--|--|
| | LT sends UDP message to IUT containing: | |
| | - Length field set to zero | |
| | | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 3 | [UТ] | The IUT discards the UDP message silently. |
| | Verify that IUT discards that UDP message. | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this |

3.7.3 [ATS_UDP_00436] UDP datagram length value greater than actual datagram length

| Test Objective | UDP datagram length value greater than actual datagram length | | |
|---|---|---------------------|---------------|
| ID | ATS_UDP_00436 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | - | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10003 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | LT sends UDP message to IUT through <iutiface-0> containing Length field set to (Length of <udpdata-16> + 8) + 1. Verify that UDP stack under test discards this UDP message.</udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |
| Main Test Execution | | | |
| Test Steps | | | Pass Criteria |
| Step 1 | [UT] | | |



| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | |
|---------------------|---|--|
| Step 2 | [LT] | |
| | LT sends UDP message to IUT containing: | |
| | - Length field set to (Length of <udpdata- 16> + 8) + 1</udpdata- | |
| | - Data field set to <udpdata-16></udpdata-16> | |
| | | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 3 | [UT] | The IUT discards the UDP message silently. |
| | Verify that IUT discards that UDP message | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | |

3.7.4 [ATS_UDP_00437] UDP datagram length value less than actual datagram length

| Test Objective | UDP datagram length value less | than actual c | datagram length |
|---|---|---------------------|-----------------|
| ID | ATS_UDP_00437 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10004 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | LT sends UDP message to IUT through <iutiface-0> containing Length field set to (Length of <udpdata-16> + 8) - 1. Verify that UDP stack under test discards this UDP message</udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |



| Main Test Exec | Main Test Execution | | | |
|---------------------|---|--|--|--|
| Test Steps | | Pass Criteria | | |
| Step 1 | [UT] | | | |
| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | | | |
| Step 2 | [LТ] | | | |
| | LT sends UDP message to IUT containing: | | | |
| | - Length field set to (Length of <udpdata- 16> + 8) - 1</udpdata- | | | |
| | - Data field set to <udpdata-16></udpdata-16> | | | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | | |
| Step 3 | [UT] | The IUT discards the UDP message silently. | | |
| | Verify that IUT discards that UDP message. | | | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | | | |

3.7.5 [ATS_UDP_00438] UDP datagram with max length value is accepted [classifier:SHOULD]

| Test Objective | UDP datagram with max length value is accepted [classifier:SHOULD] | | |
|--|--|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10005 | | |
| - | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Parameters | A. "UDP Test Configuration-1" B. Test Specific Configurations: | | |



| | • [ECU Configuration Dependencies]: Tcplp.TcplpGeneral. TcplpBufferMemory = 65,527 | | |
|---|--|---|--|
| | TcplplpVXCtrl.TcplplpFragmentationConfig.TcplplpFragmentationRxEnabled = TRUE | | |
| Summary | LT sends UDP message to IUT through <iut and="" data="" ma<="" maximum="" set="" supported="" th="" to="" value=""><th></th></iut> | | |
| | Verify using UT Service Primitives that IUT's UDP message containing Length field set to r set to maximum supported octet size. | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> IUT-Port1> to unicast address <iutiface-0-ip< th=""><th></th></iutiface-0-ip<></create> | | |
| Main Test Exec | ution | bara orienta | |
| Test Steps Step 1 | la cen | Pass Criteria | |
| отер і | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| Step 2 | LT sends UDP message to IUT containing: - Length field set to maximum supported value - data set to maximum supported octet size All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | |
| Step 3 | [UT] Verify that IUT has received the UDP message with full data. | - Verify that IUT has received the UDP message with full data. | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this | |

3.7.6 [ATS_UDP_00439] UDP header with Source Port value set to zero is accepted [classifier:SHOULD]

| Test Objective | UDP header with Source Port value set to zero is accepted [classifier:SHOULD] | | | |
|----------------|---|-------|----------|--|
| ID | ATS_UDP_00439 | | | |
| Affected | TcpIP, EthIf, Eth | State | reviewed | |



| | | 1 | |
|---|---|---|---|
| Modules | | | |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10006 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| | and DESTINATION-UDP-PORT s | et to <unuse that IUT's U</unuse | JDP stack successfully received the |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | | | a UDP socket on port <unusedudp- Addr> for EthIf controller <iutiface-0></iutiface-0></unusedudp- |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| | [UT] UT causes the IUT to <receive forward=""> from LT at <unusedi port1=""> through <iutiface-0></iutiface-0></unusedi></receive> | | |
| | LT sends UDP message to IUT construction Source UDP Port field set to Destination UDP Port field to <unusedudp-iut-potential< li=""> All other fields are set to their defaults as mentioned in section 3.1.2.1 of document. </unusedudp-iut-potential<> | to 0 d set ort1> ault values | |
| | [UT] Verify that IUT has received the Umessage | | Source UDP Port field set to 0 |
| Post- conditions | UT issues <close socket=""> to test.</close> | IUT to close | all UDP sockets created during this |

3.7.7 [ATS_UDP_00440] UDP header with Source IP address value set to multicast-address must be rejected

|--|



| | unio ata d | | AUTOGAR TO Release 1.2.0 | |
|---|---|------------------------------------|---|--|
| in. | rejected | ALITOOAD | 404400 | |
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 | |
| Affected Modules | | State | reviewed | |
| Trace to Requirement on Acceptance Test Document | | | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00103 ATS_SID: SWS_SID_10007 | | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | | |
| Configuration Parameters | "UDP Test Configuration-1" | | | |
| Summary | | | | |
| Needed Adaptation to other Releases | None | | | |
| Pre-conditions | IUT-Port1> to unicast address <iu< th=""><th></th><th>a UDP socket on port <unusedudp- Addr> for EthIf controller <iutiface-0></iutiface-0></unusedudp- </th></iu<> | | a UDP socket on port <unusedudp- Addr> for EthIf controller <iutiface-0></iutiface-0></unusedudp- | |
| Main Test Execu | ution | | | |
| Test Steps | | | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | | |
| Step 2 | LT sends UDP message to IUT construction - Source IP Address field set to callSystemMCastAddr> - Destination UDP Port set to cun IUT-Port1> - UDP send data set to cuppData construction. | usedUDP- a-16> efault values | | |
| | as mentioned in section 3.1.2.1 of document. | 1 11115 | | |
| Step 3 | [UT] | | The IUT discards the UDP message silently. | |



| Post- | UT issues <close socket=""> to IUT to close all UDP sockets created during this</close> |
|------------|---|
| conditions | test. |

3.7.8 [ATS_UDP_00441] UDP header with Source IP address value set to broadcast-address must be rejected

| Test Objective | UDP header with Source IP addre | ess value se | t to broadcast-address must be |
|---|---|---------------------|---|
| ID | • | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00103 ATS_SID: SWS_SID_10008 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | LT sends UDP message to IUT through <iutiface-0> containing source IP Address field set to <broadcastaddr-0> and destination UDP Port field set to <unusedudp-iut-port1> along with default data-set. Verify that UDP stack under test has discarded UDP message.</unusedudp-iut-port1></broadcastaddr-0></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | | | a UDP socket on port <unusedudp- Addr> for EthIf controller <iutiface-0></iutiface-0></unusedudp- |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | |
| Step 2 | [LT] | | |
| | LT sends UDP message to IUT or - Source IP Address field set to <broadcastaddr-0> - Destination UDP Port set to <un< th=""><th>-</th><th></th></un<></broadcastaddr-0> | - | |



| | IUT-Port1> | |
|------------|--|--|
| | - UDP send data set to <udpdata-16></udpdata-16> | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 3 | | The IUT discards the UDP message silently. |
| | Verify that IUT does not send any response | |
| Post- | UT issues <close socket=""> to IUT to close all UDP sockets created during this</close> | |
| conditions | test. | |

3.8 Test Cases - UDP message operation verifications

3.8.1 [ATS_UDP_00442] IUTsends back ICMP Destination Port Unreachable message if it receives a datagram addressed to UDP port with no pending listen call[classifier:SHOULD]

| • | IUTsends back ICMP Destination Port Unreachable message if it receives a datagram addressed to UDP port with no pending listen call[classifier:SHOULD] | | |
|---|---|---------------------|--------------------------------------|
| ID | ATS_UDP_00442 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00103 ATS_SID: SWS_SID_10009 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| | LT sends UDP message to IUT through <iutiface-0> containing Destination IP Address field set to <iutiface-0-ipaddr> and Destination UDP Port field set to <unusedudp-iut-port1>. Ensure that there is no pending BIND call on <unusedudp-iut-port1> at IUT. IUT to send <icmp-destination-unreachable> message to LT</icmp-destination-unreachable></unusedudp-iut-port1></unusedudp-iut-port1></iutiface-0-ipaddr></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | UT causes the IUT to <create false.<="" th=""><th>AND BIND></th><th>a UDP socket with doBind flag set to</th></create> | AND BIND> | a UDP socket with doBind flag set to |



| | Also there is no pending BIND call on <unused< th=""><th colspan="2">Also there is no pending BIND call on <unusedudp-iut-port1> at IUT.</unusedudp-iut-port1></th></unused<> | Also there is no pending BIND call on <unusedudp-iut-port1> at IUT.</unusedudp-iut-port1> | | |
|---------------------|---|--|--|--|
| Main Test Ex | Main Test Execution | | | |
| Test Steps | F | Pass Criteria | | |
| Step 1 | Sends message to IUT through <iutiface- 0=""> containing: - Destination IP Address field set to <iutiface-0> - Destination UDP Port field set to <unusedudp-iut-port1> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</unusedudp-iut-port1></iutiface-0></iutiface-> | | | |
| Step 2 | Verify that the received ICMP Destination | UT sends the ICMP Destination Unreachable message with 'code' ield of ICMP header set to 3 (i.e. Port unreachable). | | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | all UDP sockets created during this | | |

3.8.2 [ATS_UDP_00443] An application can send UDP message at same destination port but more than one different IP addresses

| | An application can send UDP message at same destination port but more than one different IP addresses | | |
|---|---|---------------------|-------------|
| ID | ATS_UDP_00443 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, Ethlf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10010 | | |
| • | 3.2 Service Primitives (Table-1) UDP Topology-2 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | Externally cause IUT to send a UDP message to LT where destination-port is set to <unusedudp-lt-port> and Destination IP address is set to <host-1-ip>.</host-1-ip></unusedudp-lt-port> | | |
| | LT to receive that message and verify the destination-port and destination-ip | | |



| | AOTOGAN TO Nelease 1.2.0 | | |
|---|---|---|--|
| | addresses are really set to <unusedudp-lt-port> and <host-1-ip> respectively.</host-1-ip></unusedudp-lt-port> | | |
| | Again externally cause IUT to send a UDP message to LT where destination-port is set to <unusedudp-lt-port> and Destination IP address is set to <host-2-ip>.</host-2-ip></unusedudp-lt-port> | | |
| | LT to receive that message and verify the des addresses are really set to <unusedudp-lt-< th=""><th></th></unusedudp-lt-<> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |
| Main Test Exec | ution | | |
| Test Steps | | Pass Criteria | |
| Step 1 | [UT] | • | |
| | UT instructs the IUT to <send data=""> containing:</send> | | |
| | Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is set to <host-1-ip></host-1-ip> | | |
| Step 2 | [LT <host1>]</host1> | [LT] | |
| | Verify that the received UDP message from IUT contains | The UDP message from the IUT shall contain: | |
| | destination-port set to <unusedudp- LT-Port></unusedudp- destination IP address is set to <host-1-ip></host-1-ip> | Destination Port := <unusedudp-lt- Port> Destination IP := <host-1-ip></host-1-ip></unusedudp-lt- | |
| Step 3 | [UТ] | • | |
| | UT instructs the IUT to <send data=""> containing:</send> | | |
| | Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is set to <host-2-ip></host-2-ip> | | |
| Step 4 | [LT <host2>]</host2> | [LT] | |
| | Verify that the received UDP message from IUT contains | The UDP message from the IUT shall contain: | |
| | destination-port set to <unusedudp- LT-Port></unusedudp- destination IP address is set to <host-2-ip></host-2-ip> | Destination Port := <unusedudp-lt-port> Destination IP := <host-2-ip></host-2-ip></unusedudp-lt-port> | |
| | | - \1001-2-11 / | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this | |
| | • | | |



3.8.3 [ATS_UDP_00444] An application can specify source port while sending UDP message

| Test Objective | An application can specify source port while sending UDP message | | |
|---|---|---------------------|---|
| ID | ATS_UDP_00444 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10011 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | UT instructs the IUT to originate a UDP message with a specific source-port value and send it to LT. Once LT receives that UDP message it'll verify the source port of the UDP header is indeed set to that specific value. | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| • | [UT] | | • |
| | UT instructs the IUT to <send destination-port="" docontaining:="" is="" set="" th="" to<=""><th>ATA></th><th></th></send> | ATA> | |
| | <unusedudp-lt-port></unusedudp-lt-port>Destination IP address is<host-1-ip></host-1-ip> | set to | |
| | [LT]Verify that the received UDP mes IUT containssource-port set to <unuse port1=""></unuse> | ssage from | The UDP message from the IUT shall contain: Source Port := <unusedudp-iut-port1></unusedudp-iut-port1> |
| Step 3 | UT causes the IUT to <create <unusedud="" on="" port="" port1="" sockets="" udp="">+1</create> | | |

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| · | [UT] UT instructs the IUT to <send data=""> containing:</send> Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is set to <host-1-ip></host-1-ip> | • |
|---------------------|---|---|
| Step 5 | Verify that the received UDP message from IUT contains | The UDP message from the IUT shall contain: Source Port := <unusedudp-iut-port1>+1</unusedudp-iut-port1> |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this |

3.8.4 [ATS_UDP_00445] Source port of the received UDP message can be used as the destination port while replying back

| Test Objective | Source port of the received UDP message can be used as the destination port while replying back | | |
|---|---|---------------------|-------------|
| ID | ATS_UDP_00445 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10011 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | IUT receives a UDP message from LT with a specified source port UT instructs IUT to reply to the received UDP message. verify that the IUT uses the source port mentioned in that received UDP datagram as the destination port of the UDP datagram sent to LT. | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |



| Main Test Exec | Main Test Execution | | | |
|---------------------|---|--|--|--|
| Test Steps | | Pass Criteria | | |
| Step 1 | [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0> - Destination UDP Port field set to <unusedudp-iut-port1> - Source UDP port is set to <unusedudp-lt-port></unusedudp-lt-port></unusedudp-iut-port1></iutiface-0></iutiface-0> | | | |
| Star 0 | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | | |
| Step 2 | [UT]UT instructs the IUT to <send data=""> containing:</send>Destination UDP port is set to | • | | |
| | <unusedudp-lt-port></unusedudp-lt-port>Destination IP address is set to <host-1-ip></host-1-ip> | | | |
| Step 3 | [LT] Verify that the received UDP message from IUT contains: | The UDP message from the IUT shall contain: Destination Port := <unusedudp-lt-port></unusedudp-lt-port> | | |
| | destination-port set to <unusedudp-lt-port></unusedudp-lt-port> destination IP address is set to <host-1-ip></host-1-ip> | | | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this | | |

3.8.5 [ATS_UDP_00446] An application can receive UDP message at same destination port coming from more than one different IP addresses

| | An application can receive UDP message at same destination port coming from more than one different IP addresses | | | |
|---------------------|--|-------|----------|--|
| ID | ATS_UDP_00446 | | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed | |



| | ATR: ATR_ATR_00124 | | |
|-------------------------------|--|---|--|
| Requirement on Acceptance | | | |
| Test Document | | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10010 | | |
| | 3.2 Service Primitives (Table-1) | | |
| Reference to Test | UDP Topology-2 | | |
| Environment | | | |
| Configuration | "UDP Test Configuration-1" | | |
| Parameters | <u></u> | 0011005 10 4 11 | |
| Summary | The LT sends UDP message to IUT containing SOURCE-IP-Address is set to <host-1-ip>, DESTINATION-UDP-PORT set to <unusedudp-iut-port1> and data set to <udpdata-16>.</udpdata-16></unusedudp-iut-port1></host-1-ip> | | |
| | Then again LT sends UDP message to IUT co to <host-2-ip>, DESTINATION-UDP-PORT s data set to <udpdata-32>.</udpdata-32></host-2-ip> | | |
| | IUT MUST receive both the UDP messages p | roperly | |
| Needed | None | | |
| Adaptation to | | | |
| other Releases Pre-conditions | UT causes the IUT to <create and="" bind=""></create> | a LIDD applies an part supplied LIDD | |
| Pre-conditions | IUT-Port1> to unicast address <iutiface-0-ip< th=""><th></th></iutiface-0-ip<> | | |
| Main Test Execu | | | |
| | | | |
| Test Steps | | Pass Criteria | |
| • | [UT] | Pass Criteria | |
| • | [UT] | Pass Criteria | |
| • | | Pass Criteria | |
| • | [UT] UT causes the IUT to <receive and<="" th=""><th>Pass Criteria</th></receive> | Pass Criteria | |
| • | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-< th=""><th>Pass Criteria</th></unusedudp-iut-<></receive> | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0> [LT] Send UDP message to IUT through</iutiface-0></unusedudp-iut-></receive> | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0> [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to</iutiface-0></iutiface-0></unusedudp-iut-></receive> | Pass Criteria | |
| Step 1 | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0> [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0-ipaddr> - Destination UDP Port field set to</iutiface-0-ipaddr></iutiface-0></iutiface-0></unusedudp-iut-></receive> | Pass Criteria | |
| Step 1 | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0> [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0-ipaddr> - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1></iutiface-0-ipaddr></iutiface-0></iutiface-0></unusedudp-iut-></receive> | Pass Criteria | |
| Step 1 | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0> [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0-ipaddr> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16></udpdata-16></unusedudp-iut-port1></iutiface-0-ipaddr></iutiface-0></iutiface-0></unusedudp-iut-></receive> | Pass Criteria | |
| Step 1 | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0> [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0-ipaddr> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - Source IP Address field set to <host-1-ip> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this</host-1-ip></udpdata-16></unusedudp-iut-port1></iutiface-0-ipaddr></iutiface-0></iutiface-0></unusedudp-iut-></receive> | - UDP data field set to <udpdata-16></udpdata-16> | |



| | UDP message containing: | |
|---------------------|---|---|
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Step 4 | [UT] | |
| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | |
| Step 5 | [LT] | |
| | Send UDP message to IUT through IUTIface-0> containing : | |
| | - Destination IP Address field set to <iutiface-0-ipaddr></iutiface-0-ipaddr> | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-32></udpdata-32> | |
| | - Source IP Address field set to <host-2-ip></host-2-ip> | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document | |
| Step 6 | [UT] | UDP data field set to <udpdata-32></udpdata-32> |
| | Verify that IUT has successfully received the UDP message containing: | |
| | - UDP data field set to <udpdata-32></udpdata-32> | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this |

3.8.6 [ATS_UDP_00447] Length is the length in octets of the message including the header and the data

| Test Objective | Length is the length in octets of the message including the header and the data | | |
|---|---|---------------------|-------------|
| ID | ATS_UDP_00447 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10014 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) 3.3 Input Parameters UDP Topology-1 | | |



| Configuration Parameters | "UDP Test Configuration-1" | | |
|---|--|---|--|
| Summary | Instruct IUT to send a UDP message with data set to <udpdata-16>.</udpdata-16> | | |
| | LT receives the message and verifies that the 'length' field of the UDP header is set to (<udpdata-16> + 8)</udpdata-16> | | |
| Needed Adaptation to other Releases | None | | |
| | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |
| Main Test Execu | ution | | |
| Test Steps | | Pass Criteria | |
| | UT instructs the IUT to <send data=""> containing:</send> Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is set to <host-1-ip></host-1-ip> UDP data set to <udpdata-16></udpdata-16> | • | |
| Step 2 | Verify that the received UDP message from IUT contains: UDP data set to <udpdata-16></udpdata-16> UDP Length field is set to length of (<udpdata-16> + 8)</udpdata-16> | The UDP message from the IUT shall contain: UDP data set to <udpdata- 16=""> UDP Length field is set to length of (<udpdata-16> + 8)</udpdata-16></udpdata-> | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this | |

3.8.7 [ATS_UDP_00448] An application can send a UDP message with no data and the length field will be set to 8 octets in such cases

| | An application can send a UDP message with no data and the length field will be set to 8 octets in such cases | | |
|---|---|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10015 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |



| to Test | | |
|------------------------------|--|---|
| Environment | | |
| Configuration Parameters | "UDP Test Configuration-1" | |
| Summary | Instruct IUT to send a UDP data of zero size. | |
| | LT receives the message and verifies that the to 8 octets. | 'length' field of the UDP header is set |
| Needed | None | |
| Adaptation to other Releases | | |
| | UT causes the IUT to <create and="" bind=""> IUT-Port1> to unicast address <iutiface-0-ip< th=""><th></th></iutiface-0-ip<></create> | |
| Main Test Execu | ıtion | |
| Test Steps | | Pass Criteria |
| | [UT] UT instructs the IUT to <send data=""> containing:</send> | • |
| | Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is set to <host-1-ip></host-1-ip> No UDP Data set. | |
| Step 2 | [LT] | The UDP message from the IUT shall contain: |
| | Verify that the received UDP message from IUT contains: | No UDP data. |
| | No UDP data. | UDP Length field is set to 8 |
| | UDP Length field is set to 8 | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this |

3.8.8 [ATS_UDP_00449] IUT calculates UDP checksum correctly

| Test Objective | IUT calculates UDP checksum correctly | | |
|--|--|---------------------|-------------|
| ID | ATS_UDP_00449 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10016 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |



| Environment | | | |
|---|--|---|--|
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | Instruct IUT to send a UDP message with UDP Data field set to a 16 octet long data. LT receives the message and verifies that the 'checksum' field of the UDP header is correctly calculated and populated with respect to the above mentioned <udpdata-16>.</udpdata-16> | | |
| Needed Adaptation to other Releases | None | | |
| | UT causes the IUT to <create and="" bind=""> IUT-Port1> to unicast address <iutiface-0-ip< th=""><th></th></iutiface-0-ip<></create> | | |
| Main Test Execu Test Steps | ution Pass Criteria | | |
| • | [UT] | r ass Criteria | |
| | UT instructs the IUT to <send data=""> containing: Destination-port is set to <unusedudp-lt-port> Destination IP address is set to <host-1-ip> UDP data set to <udpdata-16></udpdata-16></host-1-ip></unusedudp-lt-port></send> | | |
| Step 2 | [LT] Verify that the received UDP message from IUT contains: UDP data set to <udpdata-16></udpdata-16> UDP Checksum correctly calculated and populated at checksum field. | The UDP message from the IUT shall contain: UDP data set to <udpdata-16> UDP Checksum correctly calculated and populated at checksum field.</udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this | |

3.8.9 [ATS_UDP_00450] IUT calculates UDP checksum correctly by using padding bytes

| Test Objective | IUT calculates UDP checksum correctly by using padding bytes | | |
|---|--|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10016 | | |



| D : | la a a a a a a a a a a a a a a a a a a | | |
|-----------------------------|--|---|--|
| | 3.2 Service Primitives (Table-1) | | |
| Reference to Test | UDP Topology-1 | | |
| Environment | | | |
| | "IDD Took Configuration 4" | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | Instruct IUT to send a UDP message with UD data. LT receives the message and verifies that the | _ | |
| | correctly calculated with respect to the above considering required amount of pad-bytes | | |
| Needed | None | | |
| Adaptation to | | | |
| other Releases | | | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp- IUT-Port1> to unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr></unusedudp- </create> | | |
| Main Test Execu | ution | | |
| Test Steps | | Pass Criteria | |
| Step 1 | [UT] | • | |
| | UT instructs the IUT to <send data=""> containing: Destination-port is set to <unusedudp-lt-port> Destination IP address is set to <host-1-ip> UDP data set to <udpdata-17> which is just 17 octets long.</udpdata-17></host-1-ip></unusedudp-lt-port></send> | | |
| Step 2 | Verify that the received UDP message from IUT contains: UDP data set to <udpdata-17></udpdata-17> UDP Checksum correctly calculated and populated at checksum field considering required amount of pad-bytes | The UDP message from the IUT shall contain: UDP data set to <udpdata- 17=""> UDP Checksum correctly calculated and populated at checksum field.</udpdata-> | |
| Post- | UT issues <close socket=""> to IUT to close</close> | e all UDP sockets created during this | |
| conditions | test. | | |

3.8.10 [ATS_UDP_00451] IUT MUST discard messages with invalid checksums

| Test Objective | IUT MUST discard messages with invalid checksums | | | |
|--|--|--|--|--|
| ID | ATS_UDP_00451 | | | |
| Affected Modules | TcpIP, EthIf, Eth State reviewed | | | |
| Trace to Requirement on Acceptance | ATR: ATR_ATR_00124 | | | |



| Test Document | | | |
|------------------------------|---|--|--|
| Trace to SWS | Tcplp: SWS_TCPIP_00103 | | |
| Item | ATS_SID: SWS_SID_10018 | | |
| | 3.2 Service Primitives (Table-1) | | |
| Reference | UDP Topology-1 | | |
| to Test | ODI Topology-1 | | |
| Environment | | | |
| Configuration | "UDP Test Configuration-1" | | |
| Parameters | Test Comiguration 1 | | |
| Summary | LT sends a UDP message with a non-zero bu | ut invalid chackeum | |
| Julillary | | it iiivaliu checksum | |
| | Ciricon ectobi enconsum>. | | |
| | IUT must discard the message. | | |
| Nasalaal | | | |
| | None | | |
| Adaptation to other Releases | | | |
| | LIT ODEATE AND DIND | - LIDD I - I I - I I I DD | |
| Pre-conditions | UT causes the IUT to <create and="" bind=""> IUT-Port1> to unicast address <iutiface-0-ip< th=""><th></th></iutiface-0-ip<></create> | | |
| | | Addi> for Ethii controller <10 fliace-0> | |
| Main Test Execu | | | |
| Test Steps | | Pass Criteria | |
| Step 1 | [UT] | | |
| | | | |
| | | | |
| | | | |
| | UT causes the IUT to <receive and<="" th=""><th></th></receive> | | |
| | FORWARD> from LT at <unusedudp-iut-< th=""><th></th></unusedudp-iut-<> | | |
| | Port1> through <iutiface-0></iutiface-0> | | |
| Step 2 | [LT] | | |
| _ | | | |
| | LT sends UDP message to IUT containing: | | |
| | | | |
| | - Destination UDP Port set to <unusedudp-< th=""><th></th></unusedudp-<> | | |
| | IUT-Port1> | | |
| | | | |
| | - UDP send data set to <udpdata-16></udpdata-16> | | |
| | | | |
| | - UDP checksum set to | | |
| | <pre><incorrectudpchecksum></incorrectudpchecksum></pre> | | |
| | | | |
| | All other fields are set to their default values | | |
| | as mentioned in section 3.1.2.1 of this | | |
| | document. | | |
| Step 3 | [UT] | The IUT discards the UDP message | |
| | - | silently. | |
| | Verify that IUT discards the message. | | |
| Post- | UT issues <close socket=""> to IUT to close</close> | all LIDP sockets created during this | |
| conditions | test. | can obli sockets created during tills | |
| Conditions | 1001. | | |

3.8.11 [ATS_UDP_00452] IUT accepts messages with all zero filled checksums [classifier:MAY]

|--|



| | | | 1 |
|---|---|-----------------------------------|--|
| ID | ATS_UDP_00452 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00060 ATS_SID: SWS_SID_10019 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| | all zeros. IUT must accept the me | | 6> where checksum field is filled with |
| Needed Adaptation to other Releases | None | | |
| | IUT-Port1> to unicast address <ii< th=""><th></th><th>a UDP socket on port <unusedudp- 'Addr> for Ethlf controller <iutiface-0></iutiface-0></unusedudp- </th></ii<> | | a UDP socket on port <unusedudp- 'Addr> for Ethlf controller <iutiface-0></iutiface-0></unusedudp- |
| Main Test Execu | ıtion | | |
| Test Steps | | | Pass Criteria |
| | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | |
| | LT sends UDP message to IUT c Destination UDP Port set to <ur iut-port1=""></ur> UDP send data set to <udpdat< li=""> UDP checksum set to zero. All other fields are set to their def as mentioned in section 3.1.2.1 o document. </udpdat<> | nusedUDP- a-16> ault values | |
| Step 3 | [UT] Verify that IUT has received the l message | UDP | - UDP data set to <udpdata-16></udpdata-16> |
| Post- conditions | UT issues <close socket=""> to test.</close> | IUT to close | e all UDP sockets created during this |



3.9 Test Cases - UDP message reception - functionality verification for unicast configurations.

3.9.1 [ATS_UDP_00458] Destination IP Address – Unicast; IP Address Selected at Bind () – Unicast

| Test Objective | Destination IP Address – Unicast | ; IP Address | Selected at Bind () – Unicast |
|---|--|--|---|
| ID | ATS_UDP_00458 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | destination IP address set to <iu< th=""><th>ntroller <iut nrough <iut Ilface-0-IPA</iut </iut </th><th>Iface-0> Iface-0> with <udpdata-16> and .ddr>.</udpdata-16></th></iu<> | ntroller <iut nrough <iut Ilface-0-IPA</iut </iut | Iface-0> Iface-0> with <udpdata-16> and .ddr>.</udpdata-16> |
| Needed Adaptation to other Releases | UT verifies that IUT accepts the n | nessage as | n passed the acceptance inter |
| Pre-conditions | | | |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | [UT] UT causes the IUT to <create <unusedui="" a="" on="" port="" port1="" socket="" udp=""> to unicast address <iutifa ipaddr=""> for EthIf controller <iutif< th=""><th>OP-IUT- ace-0-</th><th></th></iutif<></iutifa></create> | OP-IUT- ace-0- | |
| Step 2 | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | |
| Step 3 | [LT] Send UDP message to IUT throu | gh | |



| | <iutiface-0> containing : Destination IP Address field set to IUTIface-0-IPAddr> Destination UDP Port field set to unusedUDP-IUT-Port1> UDP data field set to <udpdata-16></udpdata-16> All other fields are set to their default values as mentioned in section 3.1.2.1 of this document </iutiface-0> | |
|---------------------|---|--|
| · | [UT] Verify that IUT receives the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | e all UDP sockets created during this |

3.9.2 [ATS_UDP_00459] Destination IP Address – Multicast; IP Address Selected at Bind () – Unicast

| Test Objective | Destination IP Address – Multicas | st; IP Addres | s Selected at Bind () – Unicast |
|---|---|---------------------|---------------------------------|
| - | ATS_UDP_00459 | AUTOSAR Releases | Ÿ |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| | UT instructs the IUT to create and bind an UDP socket to Unicast address (<iutiface-0-ipaddr>. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to an IP Multicast address. UT verifies that IUT discards the message</udpdata-16></iutiface-0></iutiface-0-ipaddr> | | |
| Needed Adaptation to other Releases | None | | |



| Pre-condition | Pre-conditions Assign unicast address <iutiface-0-ipaddr> to EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr> | | | |
|---------------------|---|------------------------------|--|--|
| Main Test Exe | ecution | | | |
| Test Steps | | Pass Criteria | | |
| Step 1 | [UT] UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to unicast address <iutiface-0- ipaddr=""> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-></unusedudp-iut-></create> | | | |
| Step 2 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | | |
| Step 3 | [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to multicast address <allsystemmcastaddr> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document</udpdata-16></unusedudp-iut-port1></allsystemmcastaddr></iutiface-0> | | | |
| Step 4 | [UT] Verify that IUT discards the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT discards the UDP message | | |
| Post- conditions | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during this test. 2) Restore the default address assignment to <iutiface-0></iutiface-0></close> | | | |

3.9.3 [ATS_UDP_00460] Destination IP Address – Broadcast; IP Address Selected at Bind () – Unicast (IF-match)

| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – Unicast (IF-match) | | |
|--|---|-------|----------|
| ID | ATS_UDP_00460 | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance | ATR: ATR_ATR_00124 | | |



| | T | | |
|--------------------------|--|---|--|
| Test Document | | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to Unicast address (<iutiface-0-ipaddr> of <iutiface-0> LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to broadcast address. UT verifies that IUT accepts the message as it passed the acceptance filter.</udpdata-16></iutiface-0></iutiface-0></iutiface-0-ipaddr> | | |
| | None | ., | |
| | Assign unicast address <iutiface-0-ipaddr> Assign broadcast address <broadcastaddr-0< th=""><th></th></broadcastaddr-0<></iutiface-0-ipaddr> | | |
| Main Test Execu | ution | | |
| Test Steps | | Pass Criteria | |
| | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to unicast address <iutiface-0- ipaddr=""> for EthIf controller <iutiface-0></iutiface-0></iutiface-0-></unusedudp-iut-></create> | | |
| | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| | Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <broadcastaddr-0> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</udpdata-16></unusedudp-iut-port1></broadcastaddr-0></iutiface-0> | | |
| Step 4 | [UT] Verify that IUT receives the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT receives the UDP message with UDP data set to <udpdata-16></udpdata-16> | |



| Post- | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during</close> |
|------------|---|
| conditions | this test. |
| | Restore the default address assignment to <iutiface-0></iutiface-0> |

3.9.4 [ATS_UDP_00461] Destination IP Address – Broadcast; IP Address Selected at Bind () – Unicast (IF not match)

| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – Unicast (IF | | |
|---|--|---------------------|---------------|
| _ | not match) | | I |
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-1" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to Unicast address (<iutiface-0-ipaddr> of <iutiface-0> LT sends UDP message to IUT with <udpdata-16> and destination IP address set to broadcast address which is not related to <iutiface-0> UT verifies that IUT discards the message</iutiface-0></udpdata-16></iutiface-0></iutiface-0-ipaddr> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign unicast address <iutiface-0-ipaddr> to EthIf controller <iutiface-0></iutiface-0></iutiface-0-ipaddr> | | |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | UT causes the IUT to <create a<br="">a UDP socket on port <unusedud Port1> to unicast address <iutifac IPAddr> for EthIf controller <iutifac< th=""><th>P-IUT- ce-0-</th><th></th></iutifac<></iutifac </unusedud </create> | P-IUT- ce-0- | |
| Step 2 | [UT] UT causes the IUT to <receive forward=""> from LT at <unusedl port1=""> through <iutiface-0></iutiface-0></unusedl></receive> | | |
| Step 3 | [LT] Send UDP message to IUT contain - Destination IP Address field set to | J | |

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| | <broadcastaddr-1></broadcastaddr-1> | |
|---------------------|---|------------------------------|
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 4 | [UT] | IUT discards the UDP message |
| | Verify that IUT discards the UDP message containing: | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- conditions | This sues < CLOSE SOCKET> to IUT to close all UDP sockets created during this test. Restore the default address assignment to < IUTIface-0> | |



4 RS_BRF_01784 - AUTOSAR communication shall support the IP protocol stack

4.1 General Test Objective and Approach

This document intends to provide a test-specification for multicast message handling features of User Datagram Protocol (UDP) as mentioned in RS_BRF_01784.

It uses the UDP message headers and operations as described in Trace to SWS Item. It also uses various parts of RFC 768 and RFC 1122 as reference.

This test-chapter aims to test following requirements which are mentioned in the "AUTOSAR SWS Specification of TCP/IP Stack" for a UDP stack:

- I. [SWS_TCPIP_00171]: For received UDP datagrams where the local address (TcplpAddrld) is a broadcast or multicast address, all matching sockets shall receive the incoming message.
- II. [SWS_TCPIP_00178]: If data is transmitted using an UDP socket which is bound to a local address (TcplpAddrld) of type Multicast, then the Tcplp shall use the IP address of the configured local address (TcplpAddrld), which is of type IP Unicast and assigned to the same EthlfCtrl, as the bound local address (TcplpAddrld) as source IP address in the IP datagram header.
- III. [SWS_TCPIP_00179]: If data is transmitted using an UDP socket which is bound to a local address (TcplpAddrld) of type Broadcast, then the Tcplp shall use the IP address of the configured local address (TcplpAddrld), which is of type IP Unicast and assigned to the same EthIfCtrl, as the bound local address (TcplpAddrld) as source IP address in the IP datagram header.

Following test sub-sections have been derived to test the above mentioned requirements:

UDP message reception - functionality verification for multicast messages.

UDP message transmission - functionality verification for multicast messages.

This specification gives the description of required test environments and detailed test cases for executing tests.

Please refer to the "Traceability Matrix" (Appendix-A) mentioned at the end of this document, which gives a consolidated correlation between the AUTOSAR requirement, IETF RFC sections and the test cases mentioned in this document.

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4.1.1 Test System

4.1.1.1 Overview on Architecture

This is same as mentioned at Section 3.1.1

4.1.1.2 Specific Requirements

Same as Section 3.1.1.2

4.1.1.3 Test Coordination Requirements

Same as Section 3.1.1.3

4.1.2 UDP Test Configuration

This section describes sets of requirements on configuration. These sets are later referenced by test cases. No configuration files are provided. They need to be developed when the test suite is implemented. Now onwards this section will be referred as "UDP Test Configuration-2".

4.1.2.1 Required ECU Extract of System Description Files

The purpose of the tests is to check the implementation of the SOP SW version as black box test. So only the final SOP System Description is required.

- ApplicationEndpoint.TransportProtocolConfiguration.TcpUdpConfig.TcpTp.por tNumber > <unusedUDP-IUT-Port1>
- 2. ApplicationEndpoint.TransportProtocolConfiguration.TcpUdpConfig.TcpTp.dyn amicallyAssigned = FALSE
- 3. SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology::NetworkEndpoint Address. TcplpLocalAddr =<IUTlface-0-IPAddr>
- 4. SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology::NetworkEndpoint Address. TcplpAddressType = TCPIP_MULTICAST

4.1.2.2 Required ECU Configuration Description Files

- 1. Tcplp.TcplpGeneral. TcplpUdpEnabled = TRUE
- 2. Tcplp.TcplpGeneral. TcplpBufferMemory > MIN_MEM_BUF
- 3. Tcplp.TcplpConfig.TcplpCtrl.TcplpEthlfCtrlRef = <IUTlface-0>
- 4. Tcplp.TcplpConfig.TcplpCtrl.TcplpLocalAddr = <IUTlface-0-IPAddr>
- 5. EthGeneral.EthCtrlOffloading.EthCtrlEnableOffloadChecksumTCP = FALSE
- Tcplp.TcplpConfig.TcplpCtrl.TcplpLocalAddr.TcplpAddressType TCPIP_MULTICAST

4.1.2.3 Required Software Component Description Files

No specific configuration requirements for Software Components.



4.1.2.4 User defined Input Parameters

Following input parameters are needed for Tester to run the test cases.

| Test configuration parameters | | | |
|--|---|----------------|---|
| Parameter | Descriptions | Default values | Parameter names used during test |
| Ethernet Interface to be used by Tester | Name of the Ethernet interface on the host machine that tester will use. | Eth-0 | <testerlface-n> [e.g. <testerlface-0>, <testerlface-1> etc]</testerlface-1></testerlface-0></testerlface-n> |
| Ethernet Interface to be used by IUT | Name of the Ethernet interface on the host machine that IUT will use. | As configured | <iutiface-n> [e.g. <iutiface-0>,</iutiface-0></iutiface-n> |
| Lower Tester IP Address pool | This is the IP address pool to be used by LT. (Note – Lower Tester may need to simulate a series of IP addressed during a test, this pool will be used for that purpose). | As configured | <host-n-ip> [e.g. <host-1-ip>, <host-2-ip> etc]</host-2-ip></host-1-ip></host-n-ip> |
| Lower Tester port pool | This is the port pool to be used by LT. (Note – Lower Tester may need to use multiple ports during a test, this pool will be used for that purpose). | 20000 | <unusedudp- LT-Port-n></unusedudp- |
| IUT IP Address | This is the IP address of the Implementation Under Test's connection to that network. | As configured | <iutiface-n-ipaddr> [e.g. <iutiface-0-ipaddr> denotes the IP address of 0th interface of IUT]</iutiface-0-ipaddr></iutiface-n-ipaddr> |



| IUT port number | This is the IUT port number to be used during the test. | 20001 | <unusedudp- IUT-Port1></unusedudp- |
|---------------------------------|---|---|--|
| Listen Time | This is the maximum time interval (in seconds) for which LT waits for a packet for cases when a certain event has been triggered on the IUT either by some protocol timer or using some external mechanism. | 10 seconds | <listentime></listentime> |
| Tolerance Time | Time tolerance (in ms) to be used during various calculations for time sensitive tests. | 500 ms | <tolerancetime></tolerancetime> |
| Sample UDP data | Sample UDP data used by TESTER. e.g. <udpdata-16> indicates 16 octet of UDP data. e.g. <udpdata-17> indicates 17 octet of UDP data.</udpdata-17></udpdata-16> | <udpdataud PDATAUDPDA TA up to n octets></udpdataud | <udpdata-n></udpdata-n> |
| Default IP TTL | Specifies the time to live value for outgoing frames. | 64 | <defaultipttl></defaultipttl> |
| Minimum Buffer Size | Minimum Memory size in bytes reserved for TCP/IP buffers | 50bytes | MIN_MEM_BUF |
| All System Multicast Addr | Refers to the multicast address of All Systems on a Subnet. It will be specific to a EthlfCtrl | As Configured | <allsystemmcas tAddr></allsystemmcas |
| Broadcast Address | Refers to the broadcast address corresponding to EthIfCtrl of an IUT interface. e.g <broadcastaddr-0> signifies broad cast address corresponding to EthIfCtrl of <iutiface-0></iutiface-0></broadcastaddr-0> | As Configured | <broadcastaddr -n></broadcastaddr |

Table 3: Table of input parameters for Tester

4.1.2.5 Mandatory vs. Customizable Parts

All the parameters mentioned at section 3.1.2.1, section 3.1.2.2 and section 3.1.2.4 are mandatory parameters to run any of the below mentioned test cases. There could be a need for few more configurations items at ECU, however they are individual test case specific and defined at each test-case level.



| 4.1.3 Test Case D | esign) |
|-------------------|--------|
|-------------------|--------|

Not Applicable

4.2 Service Primitives

Same as section 3.2

4.3 Assumptions

Same as section 3.3

4.4 Terminologies

Same as section 3.4

4.5 **UDP Topology**

Same as section 3.5



4.6 Test Cases - UDP message reception: Acceptance Filter test

4.6.1 [ATS_UDP_00462] Destination IP Address – Unicast; IP Address Selected at Bind () – Multicast

| Test Chiective | Destination IP Address Unicost | · ID Addross | Selected at Rind () Multicast |
|--------------------------------|--|--------------|--|
| | Destination IP Address – Unicast; IP Address Selected at Bind () – Multicast ATS_UDP_00462 AUTOSAR 4.2.1 4.2.2 | | |
| ID | ATS_UDP_00462 | Releases | H.Z.1 4.Z.Z |
| Affected | TcpIP, Ethlf, Eth | State | reviewed |
| Modules | | | |
| | ATR: ATR_ATR_00124 | - | |
| Requirement | | | |
| on Acceptance Test Document | | | |
| Trace to SWS | Tcplp: SWS TCPIP 00170 | | |
| Item | | | |
| - | 3.2 Service Primitives (Table-1) | | |
| Reference to Test | UDP Topology-1 | | |
| Environment | | | |
| Configuration | "UDP Test Configuration-2" | | |
| Parameters | | | |
| Summary | | d bind an UD | P socket to multicast IP address that |
| | is mapped to <iutiface-0>.</iutiface-0> | | |
| | | | |
| | LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and</udpdata-16></iutiface-0> | | |
| | destination IP address set to <iutiface-0-ipaddr>.</iutiface-0-ipaddr> | | |
| | UT verifies that IUT discards the | message | |
| | None | | |
| Adaptation to | | | |
| other Releases | A | 140 14 | Lie to Edifferentially HITKers O |
| | | temiviCastAc | ddr> to EthIf controller <iutiface-0></iutiface-0> |
| Main Test Execu | ution | | b 0 " ' |
| Test Steps | r. 1 | | Pass Criteria |
| Step 1 | [UT] | | |
| | UT causes the IUT to <create< th=""><th>AND BIND.</th><th></th></create<> | AND BIND. | |
| | a UDP socket on port <unusedu< th=""><th></th><th></th></unusedu<> | | |
| | Port1> to multicast address | | |
| | <allsystemmcastaddr> for EthIf</allsystemmcastaddr> | controller | |
| | <iutiface-0></iutiface-0> | | |
| Step 2 | [UT] | | |
| | HT courses the HT to DECENT | AND | |
| | UT causes the IUT to <receive forward=""> from LT at <unused< th=""><th></th><th></th></unused<></receive> | | |
| | Port1> through <iutiface-0></iutiface-0> | 001 101- | |
| Step 3 | [LT] | | |
| | _ | | |
| | Send UDP message to IUT throu | gh | |



| | <iutiface-0> containing :</iutiface-0> | | |
|---------------------|--|------------------------------|--|
| | - Destination IP Address field set to <iutiface-0-ipaddr></iutiface-0-ipaddr> | | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | |
| Step 4 | [UT] | IUT discards the UDP message | |
| | Verify that IUT discards the UDP message containing: | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| Post- conditions | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | | |
| | 2) Restore the default address assignments to <iutiface-0></iutiface-0> | | |

4.6.2 [ATS_UDP_00463] Destination IP Address – Unicast; IP Address Selected at Bind () – Broadcast

| Test Objective | Destination IP Address – Unicast; IP Address Selected at Bind () – Broadcast | | |
|---|---|---------------------|-------------|
| ID | ATS_UDP_00463 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| , | UT instructs the IUT to create and bind an UDP socket to a Broadcast IP address. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to <iutiface-0-ipaddr>. UT verifies that IUT discards the message.</iutiface-0-ipaddr></udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |



| Pre-conditions Assign broadcast address < BroadCastAddr-0> to EthIf controller <iutiface-0></iutiface-0> | | | |
|--|--|------------------------------|--|
| Main Test Execution | | | |
| Test Steps | | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to broadcast address <broadcastaddr-0> for EthIf controller <iutiface-0< th=""><th></th></iutiface-0<></broadcastaddr-0></unusedudp-iut-></create> | | |
| Step 2 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| Step 3 | [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0-ipaddr> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</udpdata-16></unusedudp-iut-port1></iutiface-0-ipaddr></iutiface-0> | | |
| Step 4 | [UT] Verify that IUT discards the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT discards the UDP message | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignments to <iutiface-0></iutiface-0></close> | | |

4.6.3 [ATS_UDP_00464] Destination IP Address – Unicast; IP Address Selected at Bind () – ANY

| Test Objective | Destination IP Address – Unicast; IP Address Selected at Bind () – ANY | | | |
|--|--|-------|----------|--|
| ID | ATS_UDP_00464 | | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed | |
| Trace to Requirement on Acceptance | ATR: ATR_ATR_00124 | | | |



| Test Document | | | |
|---|--|--|--|
| Trace to SWS | Tcplp: SWS_TCPIP_00170 | | |
| Item | Γερίβ. 3W3_ΓΕΡΊΡ_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration | "UDP Test Configuration-2" | | |
| Parameters | | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to ANY address of <iutiface-0>. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to <iutiface-0-ipaddr>.</iutiface-0-ipaddr></udpdata-16></iutiface-0></iutiface-0> | | |
| | UT verifies that IUT accepts the message as i | t passed the acceptance filter | |
| Needed Adaptation to other Releases | None | | |
| | Assign unicast address <iutiface-0-ipaddr></iutiface-0-ipaddr> | to Ethlf controller <iutlface-0></iutlface-0> | |
| Main Test Execu | | | |
| Test Steps | | Pass Criteria | |
| · | [UT] UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to ANY for EthIf controller <iutiface- 0=""></iutiface-></unusedudp-iut-></create> | | |
| · | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| Step 3 | [LT] Send UDP message to IUT through IUTIface-0> containing: Destination IP Address field set to IUTIface-0-IPAddr> Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> UDP data field set to <udpdata-16></udpdata-16> All other fields are set to their default values as mentioned in section 3.1.2.1 of this document | | |
| | [UT] Verify that IUT receives the UDP message containing: | IUT receives the UDP message with UDP data set to <udpdata-16></udpdata-16> | |



| | - UDP data field set to <udpdata-16></udpdata-16> |
|---------------------|---|
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignment to <iutiface-0></iutiface-0></close> |

4.6.4 [ATS_UDP_00465] Destination IP Address – Unicast (not exact match with interface); IP Address Selected at Bind () – ANY

| | 1 | | |
|---|--|---------------------|---|
| Test Objective | Destination IP Address – Unicast (not exact match with interface); IP Address | | |
| | Selected at Bind () – ANY | | |
| ID | ATS_UDP_00465 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | • | • |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to ANY address of <iutiface-0>. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to (<iutiface-0-ipaddr> + 1). UT verifies that IUT discards the message as it doesn't pass the acceptance filter.</iutiface-0-ipaddr></udpdata-16></iutiface-0></iutiface-0> | | |
| Needed Adaptation to other Releases | None | <u> </u> | · · |
| Pre-conditions | Assign unicast address <iutiface< th=""><th>e-0-IPAddr></th><th>to EthIf controller <iutiface-0></iutiface-0></th></iutiface<> | e-0-IPAddr> | to EthIf controller <iutiface-0></iutiface-0> |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | UT causes the IUT to <create <unusedul="" a="" on="" port="" port1="" socket="" udp=""> to ANY for EthIf controller 0></create> | OP-IUT- | |
| Step 2 | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | |
| Step 3 | [LT] Send UDP message to IUT throu | gh | |



| | <iutiface-0> containing :</iutiface-0> | | |
|---------------------|--|------------------------------|--|
| | - Destination IP Address field set to (<iutiface-0-ipaddr>+1)</iutiface-0-ipaddr> | | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | |
| Step 4 | [UT] | IUT discards the UDP message | |
| | Verify that IUT discards the UDP message containing: | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| Post- conditions | 1) UT issues <close socket=""> to IUT to clothis test.</close> | · · | |
| | 2) Restore the default address assignment to <iutiface-0></iutiface-0> | | |

4.6.5 [ATS_UDP_00466] Destination IP Address – Unicast; IP Address Selected at Bind () – TCPIP_LOCALADDRID_ANY

| Test Objective | Destination IP Address – Unicast; IP Address Selected at Bind () – TCPIP_LOCALADDRID_ANY | | |
|---|---|---------------------|-------------|
| ID | ATS_UDP_00466 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology- | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| | UT instructs the IUT to create and bind an UDP socket to TCPIP_LOCALADDRID_ANY (i.e. wildcard for any IP address on any interface). 1) LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to <iutiface-0-ipaddr>. 2) UT verifies that IUT accepts the message as it passed the acceptance filter</iutiface-0-ipaddr></udpdata-16></iutiface-0> | | |
| Needed Adaptation to | None | | |



| other Release | s | |
|---------------------|--|---|
| Pre-conditions | Assign unicast address <iutlface-0-ipaddr></iutlface-0-ipaddr> | to EthIf controller <iutiface-0></iutiface-0> |
| Main Test Exe | cution | |
| Test Steps | | Pass Criteria |
| Step 1 | [UT] UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to TCPIP_LOCALADDRID_ANY for any EthIf controllers of IUT.</unusedudp-iut-></create> | |
| Step 2 | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | |
| Step 3 | Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <iutiface-0-ipaddr> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</udpdata-16></unusedudp-iut-port1></iutiface-0-ipaddr></iutiface-0> | |
| Step 4 | [UT] Verify that IUT accepts the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> |
| Post- conditions | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during this test. 2) Restore the default address assignment to <iutiface-0></iutiface-0></close> | |

4.6.6 [ATS_UDP_00467] Destination IP Address – Unicast; IP Address Selected at Bind () – w/o bind

| Test Objective | Destination IP Address – Unicast; IP Address Selected at Bind () – w/o bind | | |
|--|---|-------|----------|
| ID | ATS_UDP_00467 | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance | ATR: ATR_ATR_00124 | | |



| | | AUTOSAK TC Release 1.2.0 |
|------------------------------|---|---|
| Test Document | | |
| Trace to SWS | Tcplp: SWS_TCPIP_00170 | |
| Item | | |
| Requirements / | 3.2 Service Primitives (Table-1) | |
| Reference | UDP Topology-1 | |
| to Test | | |
| Environment | | |
| Configuration | "UDP Test Configuration-2" | |
| Parameters | | |
| Summary | UT instructs the IUT to create an UDP socket | and do not bind it to ANY IP address. |
| | LT sends UDP message to IUT through <iuti <iutiface-0-ipa="" address="" destination="" discards="" ip="" iut="" message.<="" set="" th="" that="" the="" to="" ut="" verifies=""><th></th></iuti> | |
| Needed | None | |
| Adaptation to other Releases | rvone | |
| Pre-conditions | Assign unicast address <iutiface-0-ipaddr></iutiface-0-ipaddr> | to Ethlf controller <iutlface-0></iutlface-0> |
| Main Test Execu | | |
| Test Steps | | Pass Criteria |
| Step 1 | UT causes the IUT to <create and="" bind=""></create> | |
| | a UDP socket with <i>doBind</i> flag set to FALSE | |
| Step 2 | [UT] | |
| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | |
| Step 3 | [LT] | |
| | Send UDP message to IUT through <iutiface-0> containing :</iutiface-0> | |
| | - Destination IP Address field set to <iutiface-0-ipaddr></iutiface-0-ipaddr> | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 4 | [UT] | IUT discards the UDP message |
| | Verify that IUT discards the UDP message containing: | _ |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- | UT issues <close socket=""> to IUT to close</close> | all UDP sockets created during this |
| conditions | test. | 3 |
| | <u> </u> | |



4.6.7 [ATS_UDP_00468] Destination IP Address - Multicast; IP Address Selected at Bind () - Multicast (exact match)

| | 7 | | |
|---|--|---------------------|------------------------------------|
| Test Objective | Destination IP Address – Multica (exact match) | st; IP Addres | ss Selected at Bind () – Multicast |
| ID | ATS_UDP_00468 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00171 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to multicast IP address that is mapped to <iutiface-0>. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to a matching multicast IP address. UT verifies that IUT accepts the message as it passed the acceptance filter</udpdata-16></iutiface-0></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign multicast address <allsystemmcastaddr> to EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr> | | |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | [UT] UT causes the IUT to <create <unusedu="" a="" on="" port="" port1="" socket="" udp=""> to multicast address <allsystemmcastaddr> for EthIf <iutiface-0></iutiface-0></allsystemmcastaddr></create> | DP-IUT- | |
| Step 2 | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | |
| Step 3 | [LT] Send UDP message to IUT throus <iutiface-0> containing: - Destination IP Address field set</iutiface-0> | | |



| | <allsystemmcastaddr></allsystemmcastaddr> | |
|---------------------|--|--|
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document | |
| Step 4 | [UT] | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> |
| | Verify that IUT accepts the UDP message containing: | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignments to <iutiface-0></iutiface-0></close> | |
| | | |

4.6.8 [ATS_UDP_00469] Destination IP Address – Multicast; IP Address Selected at Bind () – Multicast (not exact match)

| • | Destination IP Address – Multicast; IP Address Selected at Bind () – Multicast (not exact match) | | |
|--|--|---------------------|--|
| ID | ATS_UDP_00469 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00171 | | |
| • | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| | UT instructs the IUT to create and bind an UDP socket to multicast IP address that is mapped to <iutiface-0>. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to a multicast IP address that doesn't match with the multicast IP address bound to the socket. UT verifies that IUT discards the message as it doesn't pass the acceptance filter.</udpdata-16></iutiface-0></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign multicast address <allsys< th=""><th>temMCastAc</th><th>ddr> to EthIf controller <iutiface-0></iutiface-0></th></allsys<> | temMCastAc | ddr> to EthIf controller <iutiface-0></iutiface-0> |



| Main Test Execution | | | |
|---------------------|---|------------------------------|--|
| Test Steps | | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to multicast address <allsystemmcastaddr> for EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr></unusedudp-iut-></create> | | |
| Step 2 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| Step 3 | [LT] Send UDP message to IUT through < IUTIface-0> containing: - Destination IP Address field set to (<allsystemmcastaddr>+1) - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</udpdata-16></unusedudp-iut-port1></allsystemmcastaddr> | | |
| Step 4 | [UT] Verify that IUT discards the UDP message containing: - UDP data field set to <udpdata-16< td=""><td>IUT discards the UDP message</td></udpdata-16<> | IUT discards the UDP message | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignments to <iutiface-0></iutiface-0></close> | | |

4.6.9 [ATS_UDP_00470] Destination IP Address – Multicast; IP Address Selected at Bind () – Broadcast

| Test Objective | Destination IP Address – Multicast; IP Address Selected at Bind () – Broadcast | | |
|---|--|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |



| | | AUTOGAN TO Nelease 1.2.0 |
|---|--|---|
| Trace to SWS Item | Tcplp: SWS_TCPIP_00171 | |
| | 3.2 Service Primitives (Table-1) | |
| Reference | UDP Topology-1 | |
| to Test | | |
| Environment | WIDD T 10 6 W 01 | |
| Configuration Parameters | "UDP Test Configuration-2" | |
| Summary | UT instructs the IUT to create and bind an UD | P socket to a Broadcast IP address. |
| | LT sends UDP message to IUT through <iuti a="" ad<="" address="" destination="" ip="" multicast="" set="" th="" to=""><th></th></iuti> | |
| | UT verifies that IUT discards the message | |
| Needed Adaptation to other Releases | None | |
| | Assign broadcast address <broadcastaddr-0< th=""><th>> to EthIf controller <iutiface-0></iutiface-0></th></broadcastaddr-0<> | > to EthIf controller <iutiface-0></iutiface-0> |
| Main Test Execu | | |
| Test Steps | | Pass Criteria |
| Step 1 | [UT] | |
| | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to broadcast address < BroadCastAddr-0> for EthIf controller <iutiface-0></iutiface-0></unusedudp-iut-></create> | |
| Step 2 | [UT] | |
| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | |
| Step 3 | [LT] | |
| | Send UDP message to IUT through <iutiface-0> containing :</iutiface-0> | |
| | Destination IP Address field set to <allsystemmcastaddr></allsystemmcastaddr> | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 4 | [UT] | IUT discards the UDP message |
| | Verify that IUT discards the UDP message containing: | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |



| Post- | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during</close> |
|------------|---|
| conditions | this test. |
| | Restore the default address assignments to <iutiface-0></iutiface-0> |

4.6.10 [ATS_UDP_00471] Destination IP Address – Multicast; IP Address Selected at Bind () – ANY (if-match scenario)

| Test Objective | Destination IP Address – Multicas scenario) | t; IP Addres | s Selected at Bind () - ANY (if-match | |
|---|--|---------------------|---------------------------------------|--|
| ID | ATS_UDP_00471 | AUTOSAR Releases | 4.2.1 4.2.2 | |
| Affected Modules | TcpIP, Ethlf, Eth | State | reviewed | |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00171 | | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | | |
| Configuration Parameters | "UDP Test Configuration-2" | | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to ANY address of <iutiface-0> LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to an IP multicast address. UT verifies that IUT accepts the message as it passed the acceptance filter.</udpdata-16></iutiface-0></iutiface-0> | | | |
| Needed Adaptation to other Releases | None | | | |
| Pre-conditions | Assign multicast address <allsystemmcastaddr> to EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr> | | | |
| Main Test Execu | ution | | | |
| Test Steps | | | Pass Criteria | |
| Step 1 | [UT] UT causes the IUT to <create <unusedud="" a="" on="" port="" port1="" socket="" udp=""> > to ANY for EthIf controlle <iutiface-0></iutiface-0></create> | P-IUT- | | |
| Step 2 | [UT] UT causes the IUT to <receive forward=""> from LT at <unusedl port1=""> through <iutiface-0></iutiface-0></unusedl></receive> | | | |
| Step 3 | [LT] Send UDP message to IUT throug | jh | | |



| | <iutiface-0> containing :</iutiface-0> | |
|---------------------|--|--|
| | - Destination IP Address field set to <allsystemmcastaddr></allsystemmcastaddr> | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document | |
| Step 4 | [UT] | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> |
| | Verify that IUT accepts the UDP message containing: | ODI data set to CODI Data-102 |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignments to <iutiface-0></iutiface-0></close> | |

4.6.11 [ATS_UDP_00472] Destination IP Address – Multicast; IP Address Selected at Bind () – ANY (if-not-match scenario)

| | Destination IP Address – Multicast; IP Address Selected at Bind () – ANY (if-not-match scenario) | | |
|--|--|---------------------|-------------|
| ID | ATS_UDP_00472 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| • | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| , | UT instructs the IUT to create and bind an UDP socket to ANY address of <iutiface-0>. LT sends UDP message to IUT with <udpdata-16> and destination IP address set to an IP multicast address which is not related to <iutiface-0> UT verifies that IUT discards the message as it doesn't pass the acceptance filter</iutiface-0></udpdata-16></iutiface-0> | | |
| Needed Adaptation to | None | | |



| other Releases | | |
|---------------------|--|---|
| Pre-conditions | Assign unicast address <iutiface-0-ipaddr></iutiface-0-ipaddr> | to EthIf controller <iutiface-0></iutiface-0> |
| Main Test Exec | ution | |
| Test Steps | | Pass Criteria |
| Step 1 | [UT] UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> > to ANY for EthIf controller <iutiface-0></iutiface-0></unusedudp-iut-></create> | |
| Step 2 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | |
| Step 3 | [LT] Send UDP message to IUT containing: - Destination IP Address field set to <allsystemmcastaddr+1> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document</udpdata-16></unusedudp-iut-port1></allsystemmcastaddr+1> | |
| Step 4 | [UT] Verify that IUT discards the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT discards the UDP message |
| Post- conditions | UT issues <close socket=""> to IUT to clothis test. Restore the default address assignments to</close> | _ |

4.6.12 [ATS_UDP_00473] Destination IP Address – multicast; IP Address Selected at Bind () – TCPIP_LOCALADDRID_ANY

| Test Objective | Destination IP Address – multicast; IP Address Selected at Bind () – TCPIP_LOCALADDRID_ANY | | |
|--|--|-------|----------|
| ID | ATS_UDP_00473 | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance | ATR: ATR_ATR_00124 | | |



| Test Document | | | |
|--------------------------|---|---|--|
| Trace to SWS | Tcplp: SWS TCPIP 00170 | | |
| Item | терір. 3003_101 ії _00170 | | |
| | 3.2 Service Primitives (Table-1) | | |
| Reference | UDP Topology-1 | | |
| to Test Environment | | | |
| | | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UD | P socket to | |
| | TCPIP_LOCALADDRID_ANY (i.e. wildcard fo | | |
| | 1) LT sends UDP message to IUT through | gh <iutiface-0> with <udpdata-16></udpdata-16></iutiface-0> | |
| | and destination IP address set to <allsystemn< th=""><th></th></allsystemn<> | | |
| | | | |
| | UT verifies that IUT accepts the mess. | age as it passed the acceptance filter. | |
| Needed | None | | |
| Adaptation to | | | |
| other Releases | _ | | |
| Pre-conditions | Enable Ethlf controllers at <iutiface-0> of IUTAssign multicast address <allsystemmcastac< th=""><th></th></allsystemmcastac<></iutiface-0> | | |
| Main Test Execu | | adis to Eurii denti didi (10 mado ds | |
| Test Steps | | Pass Criteria | |
| Step 1 | [UT] | 7 000 011101111 | |
| Clop I | [0.] | | |
| | UT causes the IUT to <create and="" bind=""></create> | | |
| | a UDP socket on port <unusedudp-iut-< th=""></unusedudp-iut-<> | | |
| | Port1> to TCPIP_LOCALADDRID_ANY for | | |
| | any Ethlf controllers of IUT. | | |
| Step 2 | [UT] | | |
| | UT causes the IUT to <receive and<="" th=""><th></th></receive> | | |
| | FORWARD> from LT at <unusedudp-iut-< th=""><th></th></unusedudp-iut-<> | | |
| | Port1> through <iutiface-0></iutiface-0> | | |
| Step 3 | [LT] | | |
| | [| | |
| | Send UDP message to IUT through | | |
| | <iutiface-0> containing :</iutiface-0> | | |
| | | | |
| | Destination IP Address field set to < | | |
| | allSystemMCastAddr> | | |
| | Doctination LIDD Dort field act to | | |
| | Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | |
| | Canascassi io i i oiti> | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| | | | |
| | - All other fields are set to their default values | | |
| | as mentioned in section 3.1.2.1 of this | | |
| o | document. | hu = - | |
| Step 4 | [UT] | IUT accepts the UDP message with | |
| | Verify that IUT accepts the UDP message | UDP data set to <udpdata-16></udpdata-16> | |
| | | | |



| | containing: | |
|------------|--|------------------------------------|
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- | 1) UT issues <close socket=""> to IUT to clo</close> | ose all UDP sockets created during |
| conditions | this test. | |
| | 2) Restore the default address assignment to | <iutiface-0></iutiface-0> |

4.6.13 [ATS_UDP_00474] Destination IP Address - Multicast; IP Address Selected at Bind () - w/o bind

| Test Objective | Destination IP Address – Multicast; IP Address Selected at Bind () – w/o bind | | |
|---|--|---------------------|---------------|
| - | ATS_UDP_00474 | AUTOSAR Releases | · · |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create an UDP socket and do not bind it to any IP address. LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to a multicast address. UT verifies that IUT discards the message</udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Enable EthIf controllers at <iutiface-0> of IUT. Assign multicast address <allsystemmcastaddr> to EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr></iutiface-0> | | |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | UT causes the IUT to <create a="" dobind="" flag="" se<="" socket="" th="" udp="" with=""><th></th><th></th></create> | | |
| | [UT] UT causes the IUT to <receive forward=""> from LT at <unused port1=""> through <iutiface-0></iutiface-0></unused></receive> | | |
| Step 3 | [LT] Send UDP message to IUT throu | gh | |



| | <iutiface-0> containing :</iutiface-0> | |
|---------------------|--|-------------------------------------|
| | - Destination IP Address field set to <allsystemmcastaddr></allsystemmcastaddr> | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 4 | [UT] | IUT discards the UDP message |
| | Verify that IUT discards the UDP message containing: | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close test.</close> | all UDP sockets created during this |

4.6.14 [ATS_UDP_00475] Destination IP Address – Broadcast; IP Address Selected at Bind () – Multicast (IF-match)

| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – Multicast (IF-match) | | |
|---|--|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, Ethlf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to a multicast IP address that is mapped to <iutiface-0> LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to broadcast address. UT verifies that IUT accepts the message as it passed the acceptance filter.</udpdata-16></iutiface-0></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |



| | Assign multicast address <allsystemmcastaddr> for EthIf controller <iutiface-0> Assign broadcast address <broadcastaddr-0> for EthIf controller <iutiface-0></iutiface-0></broadcastaddr-0></iutiface-0></allsystemmcastaddr> | | |
|---------------------|--|--|--|
| Main Test Execu | | Total Zum controller the three of | |
| Test Steps | | Pass Criteria | |
| Step 1 | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- Port1> to multicast address <allsystemmcastaddr> for EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr></unusedudp-iut- </create> | | |
| Step 2 | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| Step 3 | [LT] Send UDP message to IUT through <iutiface-0> containing: - Destination IP Address field set to <broadcastaddr-0> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</udpdata-16></unusedudp-iut-port1></broadcastaddr-0></iutiface-0> | | |
| Step 4 | [UT] Verify that IUT receives the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignment to <iutiface-0></iutiface-0></close> | | |

4.6.15 [ATS_UDP_00476] Destination IP Address – Broadcast; IP Address Selected at Bind () – Multicast (IF not match)

| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – Multicast (IF not match) | | |
|---|---|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |



| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
|---|--|--|--|
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| | UT instructs the IUT to create and bind an UDP socket to multicast address that is mapped to <iutiface-0> LT sends UDP message to IUT with <udpdata-16> and destination IP address set to broadcast address which is not related to <iutiface-0> UT verifies that IUT discards the message.</iutiface-0></udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign multicast address <allsystemmcastac< th=""><th>ddr> for Ethlf controller <iutlface-0></iutlface-0></th></allsystemmcastac<> | ddr> for Ethlf controller <iutlface-0></iutlface-0> | |
| Main Test Execu | | | |
| Test Steps | | Pass Criteria | |
| • | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to multicast address <allsystemmcastaddr> for EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr></unusedudp-iut-></create> | | |
| · | [UT] UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut- port1=""> through <iutiface-0></iutiface-0></unusedudp-iut-></receive> | | |
| | [LT] Send UDP message to IUT containing: - Destination IP Address field set to <broadcastaddr-1> - Destination UDP Port field set to <unusedudp-iut-port1> - UDP data field set to <udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document.</udpdata-16></unusedudp-iut-port1></broadcastaddr-1> | | |
| Step 4 | Verify that IUT discards the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | IUT discards the UDP message containing: - UDP data field set to <udpdata-16></udpdata-16> | |
| | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during this test. 2) Restore the default address assignment to <iutiface-0></iutiface-0></close> | | |



4.6.16 [ATS_UDP_00477] Destination IP Address – Broadcast; IP Address Selected at Bind () – Broadcast (IF-match)

| | . | | 0 1 1 1 10 10 10 11 14=1 |
|---|--|--|---|
| Test Objective | Destination IP Address match) | - Broadcast; IP Addr | ress Selected at Bind () – Broadcast (IF- |
| ID | ATS_UDP_00477 | AUTOSAR Releases | R 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | 1 | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to a broadcast IP address that is mapped to <iutiface-0> LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to broadcast address.</udpdata-16></iutiface-0></iutiface-0> | | |
| | | cepts the message as | it passed the acceptance filter |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign broadcast addre | ess <broadcastaddr-< th=""><th>0> for EthIf controller <iutiface-0></iutiface-0></th></broadcastaddr-<> | 0> for EthIf controller <iutiface-0></iutiface-0> |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | UT causes the IUT to < a UDP socket on port < Port1> to broadcast ad <broadcastaddr-0> for <iutiface-0></iutiface-0></broadcastaddr-0> | unusedUDP-IUT- dress | > |
| Step 2 | [UT] UT causes the IUT to < FORWARD> from LT a Port1> through <iutifa< th=""><th>t <unusedudp-iut-< th=""><th></th></unusedudp-iut-<></th></iutifa<> | t <unusedudp-iut-< th=""><th></th></unusedudp-iut-<> | |
| Step 3 | [LT] Send UDP message to <iutiface-0> containing - Destination IP Addres <broadcastaddr-0> - Destination UDP Port</broadcastaddr-0></iutiface-0> | g : s field set to | |



| | <unusedudp-iut-port1></unusedudp-iut-port1> | | |
|--------|--|--|--|
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | |
| Step 4 | [UT] | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> | |
| | Verify that IUT receives the UDP message containing: | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| Post- | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during</close> | | |
| | this test. 2) Restore the default address assignment to <iutiface-0></iutiface-0> | | |

4.6.17 [ATS_UDP_00478] Destination IP Address – Broadcast; IP Address Selected at Bind () – Broadcast (IF not match)

| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – Broadcast (IF not match) | | |
|---|--|---------------------|--|
| ID | ATS_UDP_00478 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| | UT instructs the IUT to create and bind an UDP socket to broadcast address that is mapped to <iutiface-0> LT sends UDP message to IUT with <udpdata-16> and destination IP address set to broadcast address not related to <iutiface-0> UT verifies that IUT discards the message</iutiface-0></udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign broadcast address <broad< th=""><th>dCastAddr-0</th><th>> for EthIf controller <iutiface-0></iutiface-0></th></broad<> | dCastAddr-0 | > for EthIf controller <iutiface-0></iutiface-0> |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | UT causes the IUT to <create< th=""><th>AND BIND></th><th></th></create<> | AND BIND> | |



| | a UDP socket on port <unusedudp-iut- Port1> to broadcast address <broadcastaddr-0> for EthIf controller <iutiface-0></iutiface-0></broadcastaddr-0></unusedudp-iut- | | |
|---------------------|---|------------------------------|--|
| Step 2 | [UT] | | |
| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | | |
| Step 3 | [LT] | | |
| | Send UDP message to IUT containing : | | |
| | - Destination IP Address field set to <broadcastaddr-1></broadcastaddr-1> | | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | |
| Step 4 | [UT] | IUT discards the UDP message | |
| | Verify that IUT discards the UDP message containing: | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| Post- conditions | 1) UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | | |
| | 2) Restore the default address assignment to <iutiface-0></iutiface-0> | | |

4.6.18 [ATS_UDP_00479] Destination IP Address – Broadcast; IP Address Selected at Bind () – ANY (IF-match scenario)

| _ | Destination IP Address – Broadcast; IP Address Selected at Bind () – ANY (IF-match scenario) | | |
|--|--|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |



| 0 (! | WIDD Took One Samuel Com. O. | | |
|---|--|--|--|
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to a ANY address that is mapped to <iutiface-0></iutiface-0> | | |
| | LT sends UDP message to IUT through <iuti addre<="" address="" broadcast="" destination="" ip="" set="" th="" to=""><th></th></iuti> | | |
| | UT verifies that IUT has successfully received the message as it passed the acceptance filter. | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign unicast address <iutiface-0-ipaddr> Assign broadcast address <broadcastaddr-0< th=""><th></th></broadcastaddr-0<></iutiface-0-ipaddr> | | |
| Main Test Execu | ution | | |
| Test Steps | | Pass Criteria | |
| Step 1 | UT causes the IUT to <create and="" bind=""> a UDP socket on port <unusedudp-iut- port1=""> to ANY for EthIf controller <iutiface- 0=""></iutiface-></unusedudp-iut-></create> | | |
| Step 2 | [UT] | | |
| | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | | |
| Step 3 | [LT] | | |
| | Send UDP message to IUT through <iutiface-0> containing :</iutiface-0> | | |
| | - Destination IP Address field set to <broadcastaddr-0></broadcastaddr-0> | | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| | - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | | |
| Step 4 | [UT] | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> | |
| | Verify that IUT accepts the UDP message containing: | | |
| | - UDP data field set to <udpdata-16></udpdata-16> | | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | | |
| | 2) Restore the default address assignment to <iutiface-0></iutiface-0> | | |



4.6.19 [ATS_UDP_00480] Destination IP Address – Broadcast; IP Address Selected at Bind () – ANY (IF not match scenario)

| Test Objective | Destination IP Address – Broadca | st: IP Addre | ess Selected at Bind () – ANY (IF not |
|---|---|---|---|
| | match scenario) | ot, ii 7taare | 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and mapped to <iutiface-0> LT sends UDP message to IUT w to broadcast address not related t UT verifies that IUT discards the n</iutiface-0> | vith <udpda o <iutiface< th=""><th>ata-16> and destination IP address set</th></iutiface<></udpda | ata-16> and destination IP address set |
| Needed | None | nessage. | |
| Adaptation to other Releases | Notie | | |
| Pre-conditions | Assign unicast address <iutiface< th=""><th>-0-IPAddr></th><th>to EthIf controller <iutiface-0></iutiface-0></th></iutiface<> | -0-IPAddr> | to EthIf controller <iutiface-0></iutiface-0> |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| | UT causes the IUT to <create <unusedud="" a="" on="" port="" port1="" socket="" udp=""> to ANY for EthIf controller 0></create> | P-IUT- | |
| Step 2 | [UT] UT causes the IUT to <receive forward=""> from LT at <unusedi port1=""> through <iutiface-0></iutiface-0></unusedi></receive> | | |
| Step 3 | [LT] | | |
| | Send UDP message to IUT contai | ining : | |
| | Destination IP Address field set the set | to | |
| | Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | |
| | - UDP data field set to <udpdata< th=""><th>-16></th><th></th></udpdata<> | -16> | |



| | All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
|---------------------|---|------------------------------|
| Step 4 | [UT] Verify that IUT discards the UDP message containing: | IUT discards the UDP message |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignment to <iutiface-0></iutiface-0></close> | |

4.6.20 [ATS_UDP_00481] Destination IP Address – Broadcast; IP Address Selected at Bind () – TCPIP_LOCALADDRID_ANY

| - | - | | |
|---|--|---------------------|---------------|
| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – TCPIP_LOCALADDRID_ANY | | |
| ID | ATS_UDP_00481 | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to TCPIP_LOCALADDRID_ANY (i.e. wildcard for any IP address on any interface). 1) LT sends UDP message to IUT through <iutiface-0> with <udpdata-16> and destination IP address set to <broadcastaddr-0>. 2) UT verifies that IUT accepts the message as it passed the acceptance filter.</broadcastaddr-0></udpdata-16></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| | Enable EthIf controllers at <iutiface-0> of IUT. Assign broadcast address <broadcastaddr-0> for EthIf controller <iutiface-0></iutiface-0></broadcastaddr-0></iutiface-0> | | |
| Main Test Execu | Main Test Execution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | [UT] UT causes the IUT to <create are="" th="" unusedui<=""><th></th><th></th></create> | | |



| | Port1> to TCPIP_LOCALADDRID_ANY for any EthIf controllers of IUT. | |
|---------------------|---|--|
| Step 2 | UT causes the IUT to <receive and="" forward=""> from LT at <unusedudp-iut-port1> through <iutiface-0></iutiface-0></unusedudp-iut-port1></receive> | |
| Step 3 | [LT] Send UDP message to IUT through | |
| | <iutiface-0> containing : Destination IP Address field set to BroadCastAddr-0> </iutiface-0> | |
| | - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | |
| | - UDP data field set to <udpdata-16></udpdata-16> - All other fields are set to their default values as mentioned in section 3.1.2.1 of this document. | |
| Step 4 | [UT] | IUT accepts the UDP message with UDP data set to <udpdata-16></udpdata-16> |
| | Verify that IUT accepts the UDP message containing: | |
| | - UDP data field set to <udpdata-16></udpdata-16> | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignment to <iutiface-0></iutiface-0></close> | |

4.6.21 [ATS_UDP_00482] Destination IP Address – Broadcast; IP Address Selected at Bind () – w/o bind

| Test Objective | Destination IP Address – Broadcast; IP Address Selected at Bind () – w/o bind | | |
|--|---|---------------------|-------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00170 | | |
| | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |



| LT sends UDP message to IUT through destination IP address set to a broadca UT verifies that IUT discards the messa Needed None | | | |
|---|---|--|--|
| destination IP address set to a broadca UT verifies that IUT discards the messa Needed None | ast address. | | |
| destination IP address set to a broadca UT verifies that IUT discards the messa Needed None | ast address. | | |
| Needed None | age | | |
| Needed None | age | | |
| | | | |
| | | | |
| Adaptation to other Releases | | | |
| Pre-conditions Enable EthIf controllers at <iutiface-0:< th=""><th>of IUT</th></iutiface-0:<> | of IUT | | |
| | Assign multicast address <all systemmcastaddr=""> to EthIf controller <iutiface-0></iutiface-0></all> | | |
| Main Test Execution | | | |
| Test Steps | Pass Criteria | | |
| Step 1 UT causes the IUT to <create and="" i<="" th=""><th></th></create> | | | |
| a UDP socket with doBind flag set to F. | ALSE | | |
| Step 2 [UT] | | | |
| Step 2 [O1] | | | |
| UT causes the IUT to <receive and<="" th=""><th></th></receive> | | | |
| FORWARD> from LT at <unusedudp-< th=""><th></th></unusedudp-<> | | | |
| Port1> through <iutiface-0></iutiface-0> | | | |
| Step 3 [LT] | | | |
| Sand LIDD massage to U.T. through | | | |
| Send UDP message to IUT through <iutiface-0> containing :</iutiface-0> | | | |
| The final of containing . | | | |
| - Destination IP Address field set to | | | |
| <broadcastaddr-0></broadcastaddr-0> | | | |
| Destination LIDD Part field set to | | | |
| - Destination UDP Port field set to <unusedudp-iut-port1></unusedudp-iut-port1> | | | |
| | | | |
| - UDP data field set to <udpdata-16></udpdata-16> | | | |
| | . | | |
| - All other fields are set to their default | values | | |
| document. | as mentioned in section 3.1.2.1 of this document. | | |
| Step 4 [UT] | IUT discards the UDP message | | |
| | | | |
| Verify that IUT discards the UDP mess | sage | | |
| containing: | | | |
| - UDP data field set to <udpdata-16></udpdata-16> | | | |
| | to close all UDP sockets created during this | | |
| conditions test. | 3 | | |

4.7 Test Cases - UDP message transmission: Source address selection mechanism.

4.7.1 [ATS_UDP_00483] Source address selection when "Multicast IP address is selected during Bind"

| Test Objective | Source address selection when "Multicast IP address is selected during Bind" | | |
|---|---|---------------------|-----------------------------------|
| ID | | AUTOSAR Releases | 4.2.1 4.2.2 |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00178 | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | |
| Configuration Parameters | "UDP Test Configuration-2" | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to a multicast IP address that is mapped to <iutiface-0>. UT instructs IUT to send an UDP message. UT verifies that IUT has selected a unicast IP address that corresponds to the interface <iutiface-0> and also belongs to the TcplpLocalAddr container as the source IP address of the UDP message</iutiface-0></iutiface-0> | | |
| Needed Adaptation to other Releases | None | | |
| Pre-conditions | Assign unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0>. And EthIf controller <iutiface-0> must not have any other unicast IP address mapped to it. Assign multicast address <allsystemmcastaddr> to EthIf controller <iutiface-0></iutiface-0></allsystemmcastaddr></iutiface-0></iutiface-0></iutiface-0-ipaddr> | | |
| Main Test Execu | ution | | |
| Test Steps | | | Pass Criteria |
| Step 1 | UT causes the IUT to <create <unusedue="" a="" on="" port="" port1="" socket="" udp=""> to multicast address <allsystemmcastaddr> for EthIf o <iutiface-0></iutiface-0></allsystemmcastaddr></create> | P-IUT- | |
| Step 2 | [UT] UT instructs the IUT to <send containing:<="" document="" li="" of="" the=""> Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is <host-1-ip></host-1-ip> </send> | | Pocument ID 683 : AUTOSAR ATS LID |

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| Step 3 | [LT] | The UDP message from the IUT shall contain: | | |
|---------------------|---|--|--|--|
| | Verify that the received UDP message from IUT contains | Source IP address := < IUTIface-0- IPAddr > | | |
| | Source IP address is set to < IUTIface-0-IPAddr > | | | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test. Restore the default address assignment to <iutiface-0></iutiface-0></close> | | | |

4.7.2 [ATS_UDP_00484] Source address selection when "Broadcast IP address during Bind"

| Test Objective | Source address selection when "Broadcast IP address during Bind" | | | | |
|---|--|---------------------|---------------------------------|--|--|
| ID | ATS_UDP_00484 | AUTOSAR Releases | 4.2.1 4.2.2 | | |
| Affected Modules | TcpIP, EthIf, Eth | State | reviewed | | |
| Trace to Requirement on Acceptance Test Document | ATR: ATR_ATR_00124 | | | | |
| Trace to SWS Item | Tcplp: SWS_TCPIP_00179 | | | | |
| Requirements / Reference to Test Environment | 3.2 Service Primitives (Table-1) UDP Topology-1 | | | | |
| Configuration Parameters | "UDP Test Configuration-2" | | | | |
| Summary | UT instructs the IUT to create and bind an UDP socket to a broadcast IP address that is mapped to <iutiface-0>. UT instructs IUT to send an UDP message. UT verifies that IUT has selected a unicast IP address that corresponds to the interface <iutiface-0>, and also belongs to the TcpIpLocalAddr container, as the source IP address of the UDP message.</iutiface-0></iutiface-0> | | | | |
| Needed Adaptation to other Releases | None | | | | |
| | Assign unicast address <iutiface-0-ipaddr> for EthIf controller <iutiface-0>. And EthIf controller <iutiface-0> must not have any other unicast IP address mapped to it. Assign broadcast address <broadcastaddr-0> for EthIf controller <iutiface-0></iutiface-0></broadcastaddr-0></iutiface-0></iutiface-0></iutiface-0-ipaddr> | | | | |
| Main Test Execution | | | | | |
| Test Steps | | | Pass Criteria | | |
| Step 1 | UT causes the IUT to <create <unusedui="" a="" and="" on="" port="" port1="" socket="" udp=""> to broadcast address <broadcastaddr-0> for EthIf cont</broadcastaddr-0></create> | P-IUT- | | | |
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| | <iutiface-0></iutiface-0> | | | | |
|---------------------|--|--|--|--|--|
| _ | | | | | |
| Step 2 | [UT] | • | | | |
| | UT instructs the IUT to <send data=""> containing:</send> | | | | |
| | Destination-port is set to <unusedudp-lt-port></unusedudp-lt-port> Destination IP address is set to <host-1-ip></host-1-ip> | | | | |
| Step 3 | [LT] | The UDP message from the IUT shall contain: | | | |
| | Verify that the received UDP message from IUT contains | Source IP address := <iutiface-0- IPAddr></iutiface-0- | | | |
| | Source IP address is set to <iutiface-0-ipaddr></iutiface-0-ipaddr> | | | | |
| Post- conditions | UT issues <close socket=""> to IUT to close all UDP sockets created during this test.</close> | | | | |
| | 2) Restore the default address assignment to <iutiface-0></iutiface-0> | | | | |



5 Appendix – A :: Traceability Matrix

The AUTOSAR SWS for TCP/IP contain some requirements which are not granular enough for testing. There are few requirements which references to some IETF RFC (or sections of IETF RFCs) where multiple test cases need to be derived.

In other ATS documents, the test cases reference to the specific items from AUTOSAR SWS documents, but for the Ethernet related scenario this would blow up into many test cases referencing the same AUTOSAR specification item (i.e. "Trace to SWS Item").

For this purpose, this ATS document proposes an identification of specification statement from the IETF RFCs so that they can be referenced in the test cases.

Below mentioned table gives a consolidated picture about each test cases, their origination point (i.e. reference at relevant RFC's section, page etc), their purpose and it also provides a 'classifier' that depicts the importance of the feature. All the testable statements that falls under mandatory category with respect to the reference RFC sections has been taken in here.

Please refer to Appendix-C which summarizes the coverage on 'Acceptance filter cases' during UDP datagram receive scenarios.

Below table is organized with the following columns

- Statement ID
 - Is a unique identifier.
 - For example: ATS_SID_10000, ATS_SID_10001
- 2. Related AUTOSAR specification item
 - o Single AUTOSAR SWS requirement which requires the statement
- 3. Reference in IETF RFC
 - provides the location of the statement
 - o It is constructed with a comma separated list of:
 - IETF RFC number,
 - Page number,
 - section number (if exists)
 - section name,
 - For example: RFC 1122, Page 77, Section 4.1.3.1, 'Ports'.

4. Content

 The statement copy pasted from corresponding IETF RFC or from AUTOSAR SWS document. The test method is derived to verify this 'statement'.

5. Classifier

- It is used to signify the requirement category in the specification. There are five different types of classifiers:
 - MUST: This classifier means that the relevant statement is an absolute requirement of the specification. Usually corresponding statements consists words like "must", "shall", "required".
 - MUST NOT: This classifier means that the relevant statement is an absolute prohibition of the specification. Usually corresponding statements consists words like "must not", "shall not".
 - SHOULD: This classifier means that for the relevant statement there may
 exist valid reasons in particular circumstances to ignore a particular item, but
 the full implications must be understood and carefully weighed before

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choosing a different course. Usually corresponding statements consists words like "should", "would", "recommended", "suggested".

- SHOULD NOT: This classifier means that for the relevant statement there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications must be understood and carefully weighed before choosing a different course. Usually corresponding statements consists words like "should not", "not recommended".
- MAY: This classifier signifies that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation which does not include a particular option MUST be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option MUST be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides.). Usually corresponding statements consists words like "may", "optional".

| SI. No. | Statement ID | AUTOSAR SWS # | Reference in IETF RFC | Contont | |
|------------|---------------|-----------------|---|--|--------|
| 1 | ATS_SID_10001 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | | |
| 2 | ATS_SID_10002 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | A UDP datagram having 'length' field set to zero MUST be discarded. | MUST |
| 3 | ATS_SID_10003 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | A UDP datagram having length value greater than the actual datagram length MUST be discarded. | MUST |
| 4 | ATS_SID_10004 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | A UDP datagram having length value less than the actual datagram length MUST be discarded. | MUST |
| 5 | ATS_SID_10005 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | A UDP datagram having length value set to MAX-LENGTH (65535) MUST be accepted. | MUST |
| 6 | ATS_SID_10006 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | UDP header with Source Port value set to zero should be accepted | SHOULD |
| 7 | ATS_SID_10007 | SWS_TCPIP_00103 | RFC 1122, Section 4.1.3.6, 'Invalid Addresses', Page 79 | UDP header with Source IP address value set to multicast-address must be rejected | MUST |
| 8 | ATS_SID_10008 | SWS_TCPIP_00103 | RFC 1122, Section 4.1.3.6, 'Invalid Addresses', Page 79 | UDP header with Source IP address value set to broadcast- address must be rejected | MUST |
| 9 | ATS_SID_10009 | SWS_TCPIP_00103 | RFC 1122, Section 4.1.3.1, 'Ports', Page 77 | If a datagram arrives addressed to a UDP port for which there is no pending LISTEN call, UDP SHOULD send an ICMP Destination Port Unreachable message. | SHOULD |



| 10 | ATS_SID_10010 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 Destination Port has a meaning within the context of a particular internet destination address. | | MUST |
|----|---------------|-----------------|---|--|------|
| 11 | ATS_SID_10011 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 1 | Source Port is an optional field, when meaningful, it indicates the port of the sending process, and may be assumed to be the port to which a reply should be addressed in the absence of any other information. | MUST |
| 13 | ATS_SID_10013 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 1 | Destination Port has a meaning within the context of a particular internet destination address. | MUST |
| 14 | ATS_SID_10014 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | RFC 768, 'Fields', Length is the length in octets of | |
| 15 | ATS_SID_10015 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | Length is the length in octets of this user datagram including this header and the data. (This means the minimum value of the length is eight.) | MUST |
| 16 | ATS_SID_10016 | SWS_TCPIP_00060 | Checksum is the 16-bit one's complement of the one's complement sum of a pseudo header of information from the IP header, the UDP header, and the data, padded with zero octets at the end (if necessary) to make a multiple of two octets. | | MUST |
| 18 | ATS_SID_10018 | SWS_TCPIP_00103 | RFC 1122, Section 4.1.3.4, 'UDP Checksums', Page 78 | If a UDP datagram is received with a checksum that is non-zero and invalid, UDP MUST silently discard the datagram. | MUST |
| 19 | ATS_SID_10019 | SWS_TCPIP_00060 | RFC 768, 'Fields', Page 2 | An all zero transmitted checksum value means that the transmitter generated no checksum (for debugging or for higher level protocols that don't care). | MUST |

Table 4 Traceability matrix



6 Appendix – B :: Test Matrix

| SI. No | Statement ID | Content | Special Configuration dependency |
|-----------|---------------|--|---|
| 1 | ATS_SID_10005 | A UDP datagram having length value set to MAX-LENGTH (65535) MUST be accepted. | Tcplp.TcplpGeneralTcplpBufferMem ory = 65,527 |

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7 Appendix – C :: UDP Acceptance Filter scenarios

The below table provides the list of UDP reception scenarios tested according to SWS_TCPIP_00170.

Accept --> IUT Accepts the Reception
Discard --> IUT Discards the Reception

| | LT Sends with Destination IP address | | | | | |
|---|--------------------------------------|---------------------------|--|--|--|--|
| Upper Tester causes following actions at IUT | Matching Unicast IP | Mismatching Unicast IP | Multicast - Valid (IF match case) | Multicast - InValid (IF not match case) | Broadcast - Valid (IF match case) | Broadcast - InValid (IF not match case) |
| create and bind an UDP socket to ANY address of <iutiface-0></iutiface-0> | Accept | Discard | Accept | Discard | Accept | Discard |
| <create and="" bind=""> a UDP socket with doBind flag set to FALSE i.e. No IP addr bound to the socket</create> | Discard | | Discard | | Discard | |
| Create & Bind a socket with valid Broadcast Addr. | Discard | | Discard | | Accept | Discard |
| Create & Bind a socket with valid Unicast Addr. | Accept | | Discard | | Accept | Discard |
| Create & Bind a socket with valid Multicast Addr. | Discard | | Accept | | Accept | |
| Create & Bind a socket with Invalid Multicast Addr (IF- NotMatch case) | | | Discard | | Discard | |
| Create & Bind a socket to TCPIP_LOCALADDRID_ANY for any Ethlf controllers of IUT. | Accept | | Accept | | Accept | |

 Legends
 Covered in current ATS
 Planned to cover in future
 No plan to cover as of now.