



# **ZigBee Cluster Library Scenes Cluster (0x0005) Test Specification Version 1.0**

ZigBee Document 15-0308-05

April 18th, 2016

Sponsored by: ZigBee Alliance

Accepted by                      This document has been accepted for release by the ZigBee Alliance Board of Directors

Abstract                         This document describes the certification tests for devices which implement the ZCL Scenes cluster.

Keywords                        ZCL, Scenes, cluster

---

Copyright © ZigBee Alliance, Inc. (1996-2016). All rights reserved.

508 Second Street, Suite 206 Davis, CA 95616 - USA

<http://www.zigbee.org>

Permission is granted to members of the ZigBee Alliance to reproduce this document for their own use or the use of other ZigBee Alliance members only, provided this notice is included. All other rights reserved. Duplication for sale, or for commercial or for-profit use is strictly prohibited without the prior written consent of the ZigBee Alliance.

1

2

This page is intentionally blank

## 3 Notice of use and disclosure

4 Copyright © ZigBee Alliance, Inc. (1996-2016). All rights Reserved. This  
5 information within this document is the property of the ZigBee Alliance and its use  
6 and disclosure are restricted.

7 Elements of ZigBee Alliance specifications may be subject to third party intellectual  
8 property rights, including without limitation, patent, copyright or trademark rights  
9 (such a third party may or may not be a member of ZigBee). ZigBee is not responsible  
10 and shall not be held responsible in any manner for identifying or failing to identify  
11 any or all such third party intellectual property rights.

12 No right to use any ZigBee name, logo or trademark is conferred herein. Use of any  
13 ZigBee name, logo or trademark requires membership in the ZigBee Alliance and  
14 compliance with the ZigBee Logo and Trademark Policy and related ZigBee policies.

15 This document and the information contained herein are provided on an “AS IS” basis  
16 and ZigBee DISCLAIMS ALL WARRANTIES EXPRESS OR IMPLIED,  
17 INCLUDING BUT NOT LIMITED TO (A) ANY WARRANTY THAT THE USE  
18 OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OF  
19 THIRD PARTIES (INCLUDING WITHOUT LIMITATION ANY  
20 INTELLECTUAL PROPERTY RIGHTS INCLUDING PATENT, COPYRIGHT OR  
21 TRADEMARK RIGHTS) OR (B) ANY IMPLIED WARRANTIES OF  
22 MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE OR  
23 NONINFRINGEMENT. IN NO EVENT WILL ZIGBEE BE LIABLE FOR ANY  
24 LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OF DATA,  
25 INTERRUPTION OF BUSINESS, OR FOR ANY OTHER DIRECT, INDIRECT,  
26 SPECIAL OR EXEMPLARY, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL  
27 DAMAGES OF ANY KIND, IN CONTRACT OR IN TORT, IN CONNECTION  
28 WITH THIS DOCUMENT OR THE INFORMATION CONTAINED HEREIN,  
29 EVEN IF ADVISED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGE. All  
30 Company, brand and product names may be trademarks that are the sole property of  
31 their respective owners.

32 The above notice and this paragraph must be included on all copies of this document  
33 that are made.

34

35

36

This page is intentionally blank

37

## Revision history

Revision	Date	Details	Editor
00	April, 2015	Created from ZHA and ZLL test specifications.	Phil Jamieson
01	August 12 <sup>th</sup> , 2015	Resolved comments received since the Hull test event in June 2015.	Phil Jamieson
02	September 30 <sup>th</sup> , 2015	Added the new mandatory global attributes.	Phil Jamieson
03	October 30 <sup>th</sup> , 2015	Addressed comments from GTE #3 and the v0.9 ballot.	Phil Jamieson
04	March 1 <sup>st</sup> , 2016	Addressed comments from the ZigBee 3.0 SVEs.	Phil Jamieson
05	April 18 <sup>th</sup> , 2016	Changed status to "approved" and version to 1.0.	Phil Jamieson

38

39

40

41

This page is intentionally blank

42

43	<b>Table of Contents</b>	
44	1	Introduction.....9
45	1.1	Conformance levels.....9
46	2	References.....10
47	2.1	ZigBee Alliance documents .....10
48	2.2	IETF documents .....10
49	3	PIXIT items.....11
50	4	PICS .....12
51	4.1	Usage .....12
52	4.2	Server.....12
53	4.2.1	Attributes.....12
54	4.2.2	Commands received.....12
55	4.2.3	Commands generated.....13
56	4.3	Client .....14
57	4.3.1	Attributes.....14
58	4.3.2	Commands received.....14
59	4.3.3	Commands generated.....15
60	5	Test specification .....16
61	5.1	Introduction .....16
62	5.1.1	Test case overview .....16
63	5.1.2	Testing tolerances .....16
64	5.1.3	Client DUTs .....16
65	5.1.4	Test steps manipulating attributes.....16
66	5.2	Generic test cases .....18
67	5.2.1	S-TC-01G: Global attributes.....18
68	5.3	Server test cases.....22
69	5.3.1	S-TC-01S: Attributes with server as DUT.....22
70	5.3.2	S-TC-02S: Primary functionality with server as DUT .....27
71	5.3.3	S-TC-03S: Secondary functionality with server as DUT .....37
72	5.4	Client test cases .....42
73	5.4.1	S-TC-01C: Functionality with client as DUT.....42
74	6	Annex A: PICS to test case cross reference.....45
75	6.1	Server.....45
76	6.2	Client .....46
77		
78		

79

80

This page is intentionally blank



# 1 Introduction

This document contains the PICS, test specification and PICS/test case cross reference for the ZCL *scenes* cluster.

## 1.1 Conformance levels

The key words "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED" and "MAY" in this document are to be interpreted as described in [R4].

## 2 References

### 2.1 ZigBee Alliance documents

[R1] ZigBee Cluster Library Specification, ZigBee Alliance document 07-5123.

[R2] ZCL General Test Specification, ZigBee Alliance document 15-0xxx.

[R3] ZCL Scenes Cluster XML PICS, ZigBee Alliance document 15-0xxx.

### 2.2 IETF documents

[R4] S. Bradner, Key words for use in RFCs to Indicate Requirement Levels, IETF RFC 2119, March 1997.

### 3 PIXIT items

Item number	Feature	Support
S.PIXIT01	How many scene table entries are automatically created on the device when factory new?	<i>"Number of entries"</i>
S.PIXIT02	Which scene IDs per group ID are automatically configured on the device when factory new?	<i>E.g. 0x0000: 0x00 0x0001: 0x01, 0x02</i>

## 4 PICS

All references are for the ZigBee Cluster Library specification [R1] unless otherwise indicated.  
An XML version of these PICS is also available in [R3].

### 4.1 Usage

Item number	Feature	Reference	Status	Support
S.S	Does the device implement the <i>scenes</i> cluster as a server?	3.7.2	O	Yes/No
S.C	Does the device implement the <i>scenes</i> cluster as a client?	3.7.3	O	Yes/No

### 4.2 Server

#### 4.2.1 Attributes

Item number	Feature	Reference	Status	Support
S.S.A0000	Does the device implement the <i>SceneCount</i> attribute?	Table 3.37, 3.7.2.2.1.1	S.S: M	Yes/No
S.S.A0001	Does the device implement the <i>CurrentScene</i> attribute?	Table 3.37, 3.7.2.2.1.2	S.S: M	Yes/No
S.S.A0002	Does the device implement the <i>CurrentGroup</i> attribute?	Table 3.37, 3.7.2.2.1.3	S.S: M	Yes/No
S.S.A0003	Does the device implement the <i>SceneValid</i> attribute?	Table 3.37, 3.7.2.2.1.4	S.S: M	Yes/No
S.S.A0004	Does the device implement the <i>NameSupport</i> attribute?	Table 3.37, 3.7.2.2.1.5	S.S: M	Yes/No
S.S.A0005	Does the device implement the <i>LastConfiguredBy</i> attribute?	Table 3.37, 3.7.2.2.1.6	S.S: O	Yes/No
S.S.Afffd	Does the device implement the <i>ClusterRevision</i> global attribute?	Table 2-1, 2.3.5.1.1	S.S: M	Yes/No

#### 4.2.2 Commands received

Item number	Feature	Reference	Status	Support
S.S.C00.Rsp	Does the device implement receiving the <i>Add scene</i> command?	Table 3.39, 3.7.2.4.2	S.S: M	Yes/No

Item number	Feature	Reference	Status	Support
S.S.C01.Rsp	Does the device implement receiving the <i>View scene</i> command?	Table 3.39, 3.7.2.4.3	S.S: M	Yes/No
S.S.C02.Rsp	Does the device implement receiving the <i>Remove scene</i> command?	Table 3.29, 3.7.2.4.4	S.S: M	Yes/No
S.S.C03.Rsp	Does the device implement receiving the <i>Remove all scenes</i> command?	Table 3.29, 3.7.2.4.5	S.S: M	Yes/No
S.S.C04.Rsp	Does the device implement receiving the <i>Store scene</i> command?	Table 3.29, 3.7.2.4.6	S.S: M	Yes/No
S.S.C05.Rsp	Does the device implement receiving the <i>Recall scene</i> command?	Table 3.29, 3.7.2.4.7	S.S: M	Yes/No
S.S.C06.Rsp	Does the device implement receiving the <i>Get scene membership</i> command?	Table 3.29, 3.7.2.4.8	S.S: M	Yes/No
S.S.C40.Rsp	Does the device implement receiving the <i>Enhanced add scene</i> command?	Table 3.29, 3.7.2.4.9	S.S: O	Yes/No
S.S.C41.Rsp	Does the device implement receiving the <i>Enhanced view scene</i> command?	Table 3.29, 3.7.2.4.10	S.S: O	Yes/No
S.S.C42.Rsp	Does the device implement receiving the <i>Copy scene</i> command?	Table 3.29, 3.7.2.4.11	S.S: O	Yes/No

110

#### 111 4.2.3 Commands generated

Item number	Feature	Reference	Status	Support
S.S.C00.Tx	Does the device implement sending the <i>Add scene response</i> command?	Table 3.40, 3.7.2.5.1	S.S: M	Yes/No
S.S.C01.Tx	Does the device implement sending the <i>View scene response</i> command?	Table 3.40, 3.7.2.5.2	S.S: M	Yes/No
S.S.C02.Tx	Does the device implement sending the <i>Remove scene response</i> command?	Table 3.40, 3.7.2.5.3	S.S: M	Yes/No
S.S.C03.Tx	Does the device implement sending the <i>Remove all scenes response</i> command?	Table 3.40, 3.7.2.5.4	S.S: M	Yes/No
S.S.C04.Tx	Does the device implement sending the <i>Store scene response</i> command?	Table 3.40, 3.7.2.5.5	S.S: M	Yes/No
S.S.C06.Tx	Does the device implement sending the <i>Get scene membership response</i> command?	Table 3.40, 3.7.2.5.6	S.S: M	Yes/No
S.S.C40.Tx	Does the device implement sending the <i>Enhanced add scene response</i> command?	Table 3.40, 3.7.2.5.7	S.S: O	Yes/No

Item number	Feature	Reference	Status	Support
S.S.C41.Tx	Does the device implement sending the <i>Enhanced view scene response</i> command?	Table 3.40, 3.7.2.5.8	S.S: O	Yes/No
S.S.C42.Tx	Does the device implement sending the <i>Copy scene response</i> command?	Table 3.40, 3.7.2.5.9	S.S: O	Yes/No

112

## 113 4.3 Client

### 114 4.3.1 Attributes

Item number	Feature	Reference	Status	Support
S.C.Afffd	Does the device implement the <i>ClusterRevision</i> global attribute?	Table 2-1, 2.3.5.1.1	S.C: M	Yes/No

115

### 116 4.3.2 Commands received

Item number	Feature	Reference	Status	Support
S.C.C00.Rsp	Does the device implement receiving the <i>Add scene response</i> command?	Table 3.40, 3.7.2.5.1	S.C: O	Yes/No
S.C.C01.Rsp	Does the device implement receiving the <i>View scene response</i> command?	Table 3.40, 3.7.2.5.2	S.C: O	Yes/No
S.C.C02.Rsp	Does the device implement receiving the <i>Remove scene response</i> command?	Table 3.40, 3.7.2.5.3	S.C: O	Yes/No
S.C.C03.Rsp	Does the device implement receiving the <i>Remove all scenes response</i> command?	Table 3.40, 3.7.2.5.4	S.C: O	Yes/No
S.C.C04.Rsp	Does the device implement receiving the <i>Store scene response</i> command?	Table 3.40, 3.7.2.5.5	S.C: O	Yes/No
S.C.C06.Rsp	Does the device implement receiving the <i>Get scene membership response</i> command?	Table 3.40, 3.7.2.5.6	S.C: O	Yes/No
S.C.C40.Rsp	Does the device implement receiving the <i>Enhanced add scene response</i> command?	Table 3.40, 3.7.2.5.7	S.C: O	Yes/No
S.C.C41.Rsp	Does the device implement receiving the <i>Enhanced view scene response</i> command?	Table 3.40, 3.7.2.5.8	S.C: O	Yes/No
S.C.C42.Rsp	Does the device implement receiving the <i>Copy scene response</i> command?	Table 3.40, 3.7.2.5.9	S.C: O	Yes/No

117

118 **4.3.3 Commands generated**

Item number	Feature	Reference	Status	Support
S.C.C00.Tx	Does the device implement sending the <i>Add scene</i> command?	Table 3.39, 3.7.2.4.2	S.C: O	Yes/No
S.C.C01.Tx	Does the device implement sending the <i>View scene</i> command?	Table 3.39, 3.7.2.4.3	S.C: O	Yes/No
S.C.C02.Tx	Does the device implement sending the <i>Remove scene</i> command?	Table 3.39, 3.7.2.4.4	S.C: O	Yes/No
S.C.C03.Tx	Does the device implement sending the <i>Remove all scenes</i> command?	Table 3.39, 3.7.2.4.5	S.C: O	Yes/No
S.C.C04.Tx	Does the device implement sending the <i>Store scene</i> command?	Table 3.39, 3.7.2.4.6	S.C: O	Yes/No
S.C.C05.Tx	Does the device implement sending the <i>Recall scene</i> command?	Table 3.39, 3.7.2.4.7	S.C: O	Yes/No
S.C.C06.Tx	Does the device implement sending the <i>Get scene membership</i> command?	Table 3.39, 3.7.2.4.8	S.C: O	Yes/No
S.C.C40.Tx	Does the device implement sending the <i>Enhanced add scene</i> command?	Table 3.39, 3.7.2.4.9	S.C: O	Yes/No
S.C.C41.Tx	Does the device implement sending the <i>Enhanced view scene</i> command?	Table 3.39, 3.7.2.4.10	S.C: O	Yes/No
S.C.C42.Tx	Does the device implement sending the <i>Copy scene</i> command?	Table 3.39, 3.7.2.4.11	S.C: O	Yes/No

119

## 5 Test specification

### 5.1 Introduction

#### 5.1.1 Test case overview

The following test cases are available for the *scenes* cluster:

Test ID	Description	Reference
<b>Global tests</b>		
S-TC-01G	Global attributes	5.2.1
<b>Server side tests</b>		
S-TC-01S	Attributes with server as DUT	5.3.1
S-TC-02S	Primary functionality with server as DUT	5.3.2
S-TC-03S	Secondary functionality with server as DUT	5.3.3
<b>Client side tests</b>		
S-TC-01C	Functionality with client as DUT	5.4.1

#### 5.1.2 Testing tolerances

In test cases where a change in an attribute value is tested over time, it is permitted for the devices involved in the test to be within a tolerance of  $\pm 15\%$  of the expected value. As such, these test cases indicate that the attribute value must be approximately equal to an expected value, to which the  $\pm 15\%$  tolerance should then be applied. All other attribute values presented are expected to be exact.

#### 5.1.3 Client DUTs

For client test cases only test steps that pertain to commands that are supported on the DUT are required to be executed. All commands in this cluster for which support is indicated in the PICS shall be exercised, using valid, application achievable values.

Note that for the client attribute test case, it is permissible for the client not to be able to execute any of the test steps.

The client SHALL ensure that an application link, e.g. a binding link, exists between itself and the test harness. This should be configured before starting the test.

#### 5.1.4 Test steps manipulating attributes

In test case steps that require more than one attribute to be manipulated (e.g. read), the tester may decide whether it is appropriate or practical to send a single attribute manipulation command, containing multiple attributes, or multiple attribute manipulation commands, each containing a single attribute. The test case is designed to verify the behavior of the device supporting the attribute rather than verifying the attribute manipulation command in question.



146

## 5.2 Generic test cases

### 5.2.1 S-TC-01G: Global attributes

This test case verifies the behavior of the global attributes of the *scenes* cluster client and server.

In this test, the PICS notation *S.S.Agm* and *S.C.Agm* represents the list of global attributes that are specified as being mandatory for either the server or client, respectively. Similarly, the PICS notation *S.S.Ago* and *S.C.Ago* represents the list of global attributes that are specified as being optional for either the server or client, respectively.

#### 5.2.1.1 Scope

General:

- *Read attributes* command (0x00)
- *Read attributes response* command (0x01)
- *Write attributes* command (0x02)
- *Write attributes response* command (0x04)



*Basic* cluster (0x0000):

- All global attributes

PICS:

- S.S, S.C
- S.S.Agm, S.C.Agm, S.S.Ago, S.C.Ago

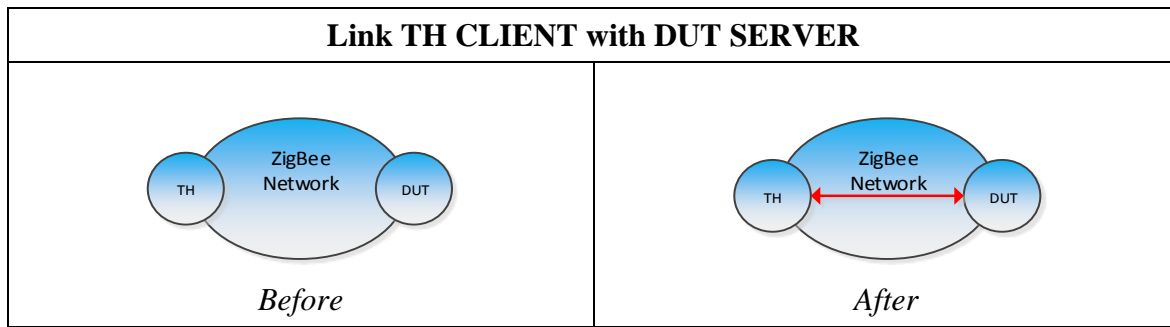
#### 5.2.1.2 Required devices

Designation	Symbol	Description
DUT		Device under test implementing: <ul style="list-style-type: none"> <li>• The <i>scenes</i> cluster server or client.</li> </ul>
TH		Test harness implementing: <ul style="list-style-type: none"> <li>• The <i>scenes</i> cluster client or server, i.e. the opposite cluster instantiation as implemented on the DUT.</li> </ul>

#### 5.2.1.3 Initial conditions

Item	Initial Conditions
1	A packet sniffer shall be observing the communication over the air interface.
2	All devices are factory new and powered off until used.

#### 170 5.2.1.4 Test preparation



<b>S-TC-01G: Global attributes</b>		
Item	Preparation Step	Observation
P1	Form a ZigBee network.	Observe appropriate command frame to form the network.
P2	Power on TH and DUT.	TH and DUT are powered on.
P3	Join TH and DUT to a ZigBee network.	Observe appropriate communication between TH, DUT and any other relevant node on the ZigBee network.

--- End of test case S-TC-01G preparation ---

173 **5.2.1.5 Test procedure**

<b>S-TC-01G: Global attributes</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT pass Verification</b>
1	S.S.Agm, S.C.Agm	TH unicasts a ZCL <i>read attributes</i> command frame to DUT to read each mandatory global attribute of this cluster one at a time.	DUT unicasts a ZCL <i>read attributes response</i> command frame to TH containing each requested attribute.  The data type in each command must match the value listed in the specification(s). The data value in each command for the attribute must fall within the valid range described in the specification(s).
2a	S.S.Agm, S.C.Agm	TH unicasts a ZCL <i>write attributes</i> command frame to DUT to write the respective default value to each mandatory global attribute of this cluster one at a time.	DUT unicasts a ZCL <i>write attributes response</i> command frame to TH for each attribute.  If the access control of DUT is set to READ, the DUT response will indicate that the attribute write command was not a SUCCESS. If the access control of DUT is set to READ/WRITE, the DUT response will indicate that the write command was a SUCCESS.
2b	S.S.Agm, S.C.Agm	TH unicasts a ZCL <i>read attributes</i> command frame to DUT to read back each attribute written in step 2a.	DUT unicasts a ZCL <i>read attributes response</i> command frame to TH containing the requested attribute.  If the <i>Status</i> field of the <i>write attributes response</i> command frame was equal to SUCCESS, the updated value is read back. If the <i>Status</i> field of the <i>write attributes response</i> command frame was not equal to SUCCESS the value is not updated when read back.

Continued...

<b>S-TC-01G: Global attributes</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT pass Verification</b>
3	S.S.Ago, S.C.Ago	TH unicasts a ZCL <i>read attributes</i> command frame to DUT to read each optional global attribute of this cluster one at a time.	DUT unicasts a ZCL <i>read attributes response</i> command frame to TH containing each attribute.  If the DUT implements the attribute, the <i>Status</i> field will be equal to SUCCESS and the command will contain the requested attribute. If the DUT does not implement the attribute, the <i>Status</i> field will not be equal to SUCCESS.  The data type in each command must match the value listed in the specification(s). The data value in each command for the attribute must fall within the valid range described in the specification(s).
4a	S.S.Ago, S.C.Ago	TH unicasts a ZCL <i>write attributes</i> command frame to DUT to write the respective default value to each optional global attribute of this cluster one at a time.	DUT unicasts a ZCL <i>write attributes response</i> command frame to TH for each attribute.  If the attribute is not implemented or the access control of DUT is set to READ, the DUT response will indicate that the attribute write command was not a SUCCESS. If the attribute is implemented and the access control of DUT is set to READ/WRITE, the DUT response will indicate that the write command was a SUCCESS.
4b	S.S.Ago, S.C.Ago	TH unicasts a ZCL <i>read attributes</i> command frame to DUT to read back each attribute written in step 4a.	DUT unicasts a ZCL <i>read attributes response</i> command frame to TH containing the requested attribute.  If the <i>Status</i> field of the <i>write attributes response</i> command frame was equal to SUCCESS, the updated value is read back. If the <i>Status</i> field of the <i>write attributes response</i> command frame was not equal to SUCCESS the value is not updated when read back.

--- End of test case S-TC-01G ---

## 5.3 Server test cases

### 5.3.1 S-TC-01S: Attributes with server as DUT

This test case verifies the behavior of the non-global attributes of the *scenes* cluster server.

In this test, the PICS notation *S.S.Am* represents the list of non-global attributes that are specified as being mandatory. Similarly, the PICS notation *S.S.Ao* represents the list of non-global attributes that are specified as being optional.

#### 5.3.1.1 Scope

General:

- *Read attributes* command (0x00)
- *Read attributes response* command (0x01)
- *Write attributes* command (0x02)
- *Write attributes response* command (0x04)



*Scenes* cluster (0x0005):

- All non-global attributes

PICS:

- S.S,
- S.S.Am, S.S.Ao

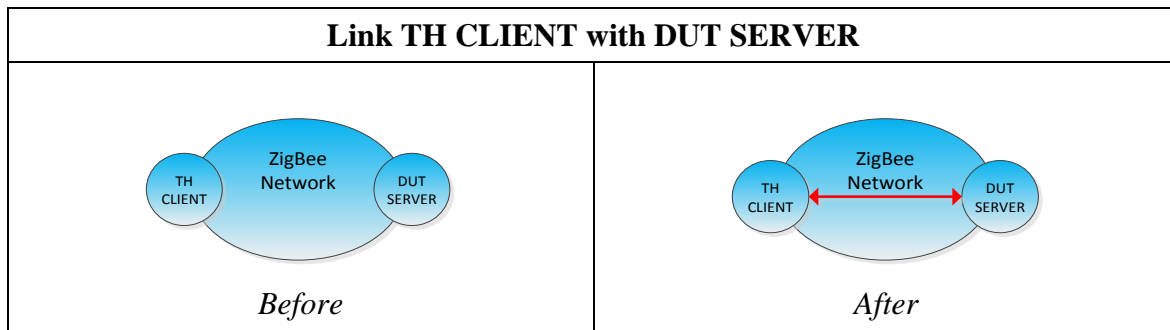
#### 5.3.1.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: <ul style="list-style-type: none"> <li>• The <i>scenes</i> cluster client.</li> </ul>
DUT SERVER		Device under test server: <ul style="list-style-type: none"> <li>• The <i>scenes</i> cluster server.</li> </ul>

#### 5.3.1.3 Initial conditions

Item	Initial Conditions
1	A packet sniffer shall be observing the communication over the air interface.
2	All devices are factory new and powered off until used.

#### 197 5.3.1.4 Test preparation



198

S-TC-01S: Attributes with server as DUT		
Item	Preparation Step	Observation
P1	Form a ZigBee network.	Observe appropriate command frame to form the network.
P2	Power on TH CLIENT and DUT SERVER.	TH CLIENT and DUT SERVER are powered on.
P3	Join TH CLIENT and DUT SERVER to a ZigBee network.	Observe appropriate communication between TH CLIENT, DUT SERVER and any other relevant node on the ZigBee network.

--- End of test case S-TC-01C preparation ---

199

200 **5.3.1.5 Test procedure**

<b>S-TC-01S: Attributes with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT pass Verification</b>
1	S.S.Am	TH CLIENT unicasts a ZCL <i>read attributes</i> command frame to DUT SERVER to read each mandatory attribute of this cluster one at a time.	DUT SERVER unicasts a ZCL <i>read attributes response</i> command frame to TH CLIENT containing each requested attribute.  The data type in each command must match the value listed in the specification(s). The data value in each command for the attribute must fall within the valid range described in the specification(s).
2a	S.S.Am	TH CLIENT unicasts a ZCL <i>write attributes</i> command frame to DUT SERVER to write the respective default value to each mandatory attribute of this cluster one at a time.	DUT SERVER unicasts a ZCL <i>write attributes response</i> command frame to TH CLIENT for each attribute.  If the access control of DUT SERVER is set to READ, the DUT SERVER response will indicate that the attribute write command was not a SUCCESS. If the access control of DUT SERVER is set to READ/WRITE, the DUT SERVER response will indicate that the write command was a SUCCESS.
2b	S.S.Am	TH CLIENT unicasts a ZCL <i>read attributes</i> command frame to DUT SERVER to read back each attribute written in step 2a.	DUT SERVER unicasts a ZCL <i>read attributes response</i> command frame to TH CLIENT containing the requested attribute.  If the <i>Status</i> field of the <i>write attributes response</i> command frame was equal to SUCCESS, the updated value is read back. If the <i>Status</i> field of the <i>write attributes response</i> command frame was not equal to SUCCESS the value is not updated when read back.

Continued...



<b>S-TC-01S: Attributes with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT pass Verification</b>
3	S.S.Ao	TH CLIENT unicasts a ZCL <i>read attributes</i> command frame to DUT SERVER to read each optional attribute of this cluster one at a time.	<p>DUT SERVER unicasts a ZCL <i>read attributes response</i> command frame to TH CLIENT containing each attribute.</p> <p>If the DUT SERVER implements the attribute, the <i>Status</i> field will be equal to SUCCESS and the command will contain the requested attribute. If the DUT SERVER does not implement the attribute, the <i>Status</i> field will not be equal to SUCCESS.</p> <p>The data type in each command must match the value listed in the specification(s). The data value in each command for the attribute must fall within the valid range described in the specification(s).</p>
4a	S.S.Ao	TH CLIENT unicasts a ZCL <i>write attributes</i> command frame to DUT SERVER to write the respective default value to each optional attribute of this cluster one at a time.	<p>DUT SERVER unicasts a ZCL <i>write attributes response</i> command frame to TH CLIENT for each attribute.</p> <p>If the attribute is not implemented or the access control of DUT SERVER is set to READ, the DUT SERVER response will indicate that the attribute write command was not a SUCCESS. If the attribute is implemented and the access control of DUT SERVER is set to READ/WRITE, the DUT response will indicate that the write command was a SUCCESS.</p>

*Continued...*

<b>S-TC-01S: Attributes with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT pass Verification</b>
4b	S.S.Ao	TH CLIENT unicasts a ZCL <i>read attributes</i> command frame to DUT SERVER to read back each attribute written in step 4a.	DUT SERVER unicasts a ZCL <i>read attributes response</i> command frame to TH CLIENT containing the requested attribute.  If the <i>Status</i> field of the <i>write attributes response</i> command frame was equal to SUCCESS, the updated value is read back. If the <i>Status</i> field of the <i>write attributes response</i> command frame was not equal to SUCCESS the value is not updated when read back.

--- End of test case S-TC-01S ---

201

202

### 5.3.2 S-TC-02S: Primary functionality with server as DUT

This test verifies the primary functionality of the *scenes* cluster.

This test case requires an *application configuration*, *AC*, to be set on the device in order to create a scene. An *AC* is essentially a set of cluster attribute settings which affect the scene and is dependent on the application clusters supported on the server device. When the test calls for a specific *AC<sub>i</sub>* it is up to the tester to manipulate the attributes on the DUT according to the supported clusters such that each *AC<sub>i</sub>* is unique.

#### 5.3.2.1 Scope

General:

- *Read attributes* command (0x00)
- *Read attributes response* command (0x01)
- *Default response* command (0x0b)

*Groups* cluster (0x0004):

- *Add group* command (0x00)
- *Add group response* command (0x00)
- *Remove all groups* command (0x04)



*Scenes* cluster (0x0005):

- *Add scene* command (0x00)
- *Add scene response* command (0x00)
- *View scene* command (0x01)
- *View scene response* command (0x01)
- *Remove scene* command (0x02)
- *Remove scene response* command (0x02)
- *Remove all scenes* command (0x03)
- *Remove all scenes response* command (0x03)
- *Store scene* command (0x04)
- *Store scene response* command (0x04)
- *Recall scene* command (0x05)
- *Get scene membership* command (0x06)
- *Get scene membership response* command (0x06)

PICS:

- G.PIXIT02, G.S.C00.Rsp, G.S.C04.Rsp, G.S.C00.Tx
- S.S
- S.S.A0000 – S.S.A0003
- S.S.C00.Rsp – S.S.C06.Rsp
- S.S.C00.Tx – S.S.C04.Tx, S.S.C06.Tx

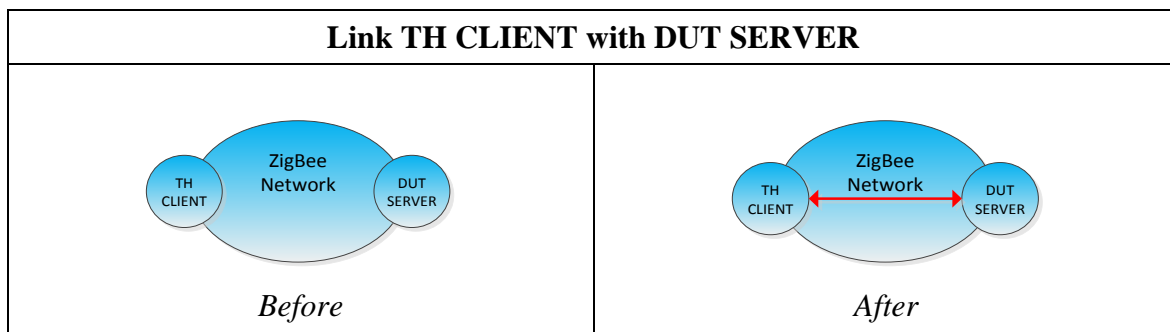
### 5.3.2.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: <ul style="list-style-type: none"><li>• The <i>groups</i> cluster client and</li><li>• The <i>scenes</i> cluster client.</li></ul>
DUT SERVER		Device under test server implementing: <ul style="list-style-type: none"><li>• The <i>groups</i> cluster server and</li><li>• The <i>scenes</i> cluster server.</li></ul>

### 5.3.2.3 Initial conditions

Item	Initial Conditions
1	A packet sniffer shall be observing the communication over the air interface.
2	All devices are factory new and powered off until used.

#### 5.3.2.4 Test preparation



S-TC-02S: Primary functionality with server as DUT		
Item	Preparation Step	Observation
P1	Form a ZigBee network.	Observe appropriate command frame to form the network.
P2	Power on TH CLIENT and DUT SERVER.	TH CLIENT and DUT SERVER are powered on.
P3	Join TH CLIENT and DUT SERVER to a ZigBee network.	Observe appropriate communication between TH CLIENT, DUT SERVER and any other relevant node on the ZigBee network.

--- End of test case S-TC-02S preparation ---

250 **5.3.2.5 Test procedure**

<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
0	G.S.C04.Rsp	TH CLIENT unicasts a ZCL <i>remove all groups</i> command to DUT SERVER.	If requested, DUT SERVER unicasts a ZCL <i>default response</i> command frame to TH CLIENT with the <i>status</i> field equal to 0x00 (SUCCESS).
1a	G.S.C00.Rsp, G.S.C00.Tx	TH CLIENT unicasts a ZCL <i>add group</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>add group response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) and the <i>group ID</i> field set to 0x0001.
1b	S.S.C03.Rsp, S.S.C03.Tx	TH CLIENT unicasts a ZCL <i>remove all scenes</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>remove all scenes response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) and <i>group ID</i> field set to 0x0001.
1c	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to the value <i>SC<sub>0</sub></i> , the <i>group ID</i> field set to 0x0001, the <i>scene count</i> field set to 0x00.
2a	-	TH CLIENT configures <i>AC<sub>1</sub></i> on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with <i>AC<sub>1</sub></i> .
2b	S.S.C04.Rsp, S.S.C04.Tx	TH CLIENT unicasts a ZCL <i>store scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	DUT SERVER unicasts a ZCL <i>store scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.
3a	-	TH CLIENT configures <i>AC<sub>2</sub></i> on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with <i>AC<sub>2</sub></i> which is different from <i>AC<sub>1</sub></i> .

Continued...

<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
3b	S.S.C05.Rsp	TH CLIENT unicasts a ZCL <i>recall scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	If requested, DUT SERVER unicasts a ZCL <i>default response</i> command frame to TH CLIENT with the <i>status</i> field equal to 0x00 (SUCCESS). DUT SERVER returns to $AC_1$ .
3c	S.S.A0000, S.S.A0001, S.S.A0002, S.S.A0003	TH CLIENT unicasts a ZCL <i>read attributes</i> command frame for the <i>SceneCount</i> , <i>CurrentScene</i> , <i>CurrentGroup</i> and <i>SceneValid</i> attributes to DUT SERVER.	DUT SERVER unicasts a ZCL <i>read attributes response</i> command frame to TH CLIENT. <i>SceneCount</i> attribute has the value (S.PIXIT01 + 1), <i>CurrentScene</i> attribute has the value 0x01, <i>CurrentGroup</i> attribute has the value $G_1$ and <i>SceneValid</i> attribute has the value TRUE.
4a	-	By application specific means, remove the power source from DUT SERVER.	DUT SERVER is powered off.
4b	-	By application specific means, return the power source to DUT SERVER.	DUT SERVER is powered on.
4c	-	TH CLIENT configures $AC_2$ on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with $AC_2$ which is different from $AC_1$ .
4d	S.S.C05.Rsp	TH CLIENT unicasts a ZCL <i>recall scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	If requested, DUT SERVER unicasts a ZCL <i>default response</i> command frame to TH CLIENT with the <i>status</i> field equal to 0x00 (SUCCESS). DUT SERVER returns to $AC_1$ .
5	S.S.C01.Rsp, S.S.C01.Tx	TH CLIENT unicasts a ZCL <i>view scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	DUT SERVER unicasts a ZCL <i>view scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to 0x0001, the <i>scene ID</i> field set to 0x01, the <i>transition time</i> field set to 0x0000 and a set of extension fields appropriate to $AC_1$ .

Continued...

<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
6	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values (( $SC_0 - 1$ ), 0xfe or 0xff), the <i>group ID</i> field set to 0x0001, the <i>scene count</i> field set to 0x01 and the <i>scene list</i> field containing only the scene ID 0x01.
7a	S.S.C03.Rsp, S.S.C03.Tx	TH CLIENT unicasts a ZCL <i>remove all scenes</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>remove all scenes response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) and <i>group ID</i> field set to 0x0001.
7b	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values ( $SC_0$ , 0xfe or 0xff), the <i>group ID</i> field set to 0x0001 and the <i>scene count</i> field set to 0x00.
8a	S.S.C00.Rsp, S.S.C00.Tx	TH CLIENT unicasts a ZCL <i>add scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001, the <i>scene ID</i> field set to 0x01, the <i>transition time</i> field set to 0x0001 and a set of extension fields appropriate to $AC_1$ .	DUT SERVER unicasts a ZCL <i>add scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.

Continued...



<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
8b	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values (( $SC_0 - 1$ ), 0xfe or 0xff), the <i>group ID</i> field set to 0x0001, the <i>scene count</i> field set to 0x01 and the <i>scene list</i> field containing only the scene ID 0x01.
9a	S.S.C02.Rsp, S.S.C02.Tx	TH CLIENT unicasts a ZCL <i>remove scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	DUT SERVER unicasts a ZCL <i>remove scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.
9b	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values ( $SC_0$ , 0xfe or 0xff), the <i>group ID</i> field set to 0x0001 and the <i>scene count</i> field set to 0x00.
10a	-	TH CLIENT configures $AC_2$ on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with $AC_2$ which is different from $AC_1$ .
10b	S.S.C05.Rsp	TH CLIENT unicasts a ZCL <i>recall scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	If requested, DUT SERVER unicasts a ZCL <i>default response</i> command frame to TH CLIENT with the <i>status</i> field equal to 0x8b (NOT_FOUND).  <i>NOTE: DUT SERVER does nothing else but this is an assumption since this behavior is not described in the ZCL.</i>

Continued...

<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
11a	-	TH CLIENT configures $AC_1$ on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with $AC_1$ .
11b	S.S.C04.Rsp, S.S.C04.Tx	TH CLIENT unicasts a ZCL <i>store scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.	DUT SERVER unicasts a ZCL <i>store scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x01.
12a	-	TH CLIENT configures $AC_2$ on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with $AC_2$ which is different to $AC_1$ .
12b	S.S.C04.Rsp, S.S.C04.Tx	TH CLIENT unicasts a ZCL <i>store scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x02.	DUT SERVER unicasts a ZCL <i>store scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) or 0x89 (INSUFFICIENT_SPACE). If the former, the <i>group ID</i> field set to 0x0001 and the <i>scene ID</i> field set to 0x02. <i>NOTE: If the status field is set to INSUFFICIENT_SPACE, the following tests SHALL NOT be executed.</i>
12c	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values (( $SC_0 - 2$ ), 0xfe or 0xff), the <i>group ID</i> field set to 0x0001, the <i>scene count</i> field set to 0x02 and the <i>scene list</i> field containing the scene IDs 0x01 and 0x02.

Continued...

<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
13a	G.S.C00.Rsp, G.S.C00.Tx	If capacity allows, TH CLIENT unicasts a ZCL <i>add group</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0002.	DUT SERVER unicasts a ZCL <i>add group response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) and the <i>group ID</i> field set to 0x0002.
13b	S.S.C03.Rsp, S.S.C03.Tx	TH CLIENT unicasts a ZCL <i>remove all scenes</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0002.	DUT SERVER unicasts a ZCL <i>remove all scenes response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) and <i>group ID</i> field set to 0x0002.
13c	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0002.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to the value $SC_1$ , the <i>group ID</i> field set to 0x0002, the <i>scene count</i> field set to 0x00.
14a	-	TH CLIENT configures $AC_3$ on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with $AC_3$ which is different to both $AC_1$ and $AC_2$ .
14b	S.S.C04.Rsp, S.S.C04.Tx	TH CLIENT unicasts a ZCL <i>store scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0002 and the <i>scene ID</i> field set to 0x03.	DUT SERVER unicasts a ZCL <i>store scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) or 0x89 (INSUFFICIENT_SPACE). If the former, the <i>group ID</i> field set to 0x0002 and the <i>scene ID</i> field set to 0x03.  <i>NOTE: If the status field is set to INSUFFICIENT_SPACE, the following tests SHALL NOT be executed.</i>

Continued...

<b>S-TC-02S: Primary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
14c	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0002.	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values (( $SC_1 - 3$ ), 0xfe or 0xff), the <i>group ID</i> field set to 0x0002, the <i>scene count</i> field set to 0x01 and the <i>scene list</i> field containing only the scene ID 0x03.

--- End of test case S-TC-02S ---

251  
252

### 5.3.3 S-TC-03S: Secondary functionality with server as DUT

This test verifies the secondary functionality of the *scenes* cluster.

This test case requires an *application configuration*, *AC*, to be set on the device in order to create a scene. An *AC* is essentially a set of cluster attribute settings which affect the scene and is dependent on the application clusters supported on the server device. When the test calls for a specific *AC<sub>i</sub>* it is up to the tester to manipulate the attributes on the DUT according to the supported clusters such that each *AC<sub>i</sub>* is unique.

This test case requires one group to be configured on the device, *G<sub>I</sub>*. Before the test, the tester should evaluate PIXIT items G.PIXIT01 and G.PIXIT02 and select *G<sub>I</sub>* accordingly so that the group IDs are different to those of G.PIXIT02. If the device pre-configures all its groups such that a new group cannot be added, then *G<sub>I</sub>* needs to be taken from group list of G.PIXIT02.

#### 5.3.3.1 Scope

General:

- *Read attributes* command (0x00)
- *Read attributes response* command (0x01)
- *Default response* command (0x0b)

*Groups* cluster (0x0004):

- *Add group* command (0x00)
- *Add group response* command (0x00)



*Scenes* cluster (0x0005):

- *Get scene membership* command (0x06)
- *Get scene membership response* command (0x06)
- *Enhanced add scene* command (0x40)
- *Enhanced add scene response* command (0x40)
- *Enhanced view scene* command (0x41)
- *Enhanced view scene response* command (0x41)
- *Copy scene* command (0x42)
- *Copy scene response* command (0x42)

PICS:

- G.S.C00.Rsp, G.S.C00.Tx
- S.S
- S.S.C06.Rsp, S.S.C40.Rsp – S.S.C42.Rsp
- S.S.C06.Tx, S.S.C40.Tx – S.S.C42.Tx

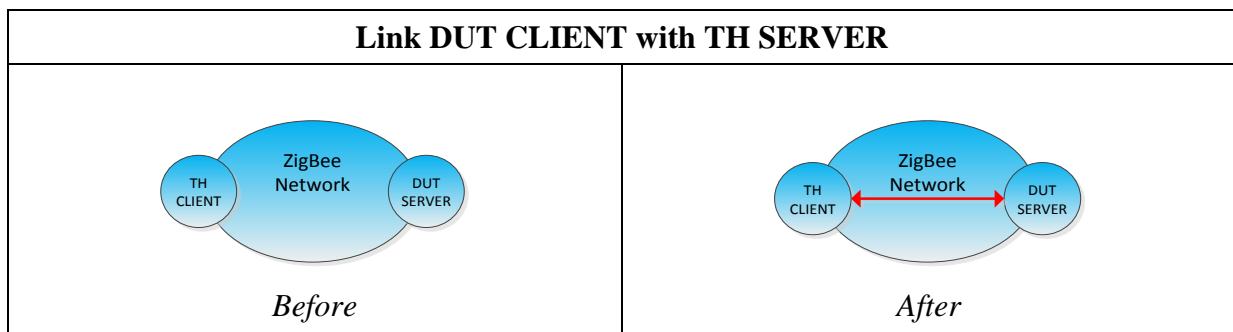
### 5.3.3.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: <ul style="list-style-type: none"><li>• The <i>groups</i> cluster client and</li><li>• The <i>scenes</i> cluster client.</li></ul>
DUT SERVER		Device under test server implementing: <ul style="list-style-type: none"><li>• The <i>groups</i> cluster server and</li><li>• The <i>scenes</i> cluster server.</li></ul>

### 5.3.3.3 Initial conditions

Item	Initial Conditions
1	A packet sniffer shall be observing the communication over the air interface.
2	All devices are factory new and powered off until used.

#### 5.3.3.4 Test preparation



S-TC-03S: Secondary functionality with server as DUT		
Item	Preparation Step	Observation
P1	Form a ZigBee network.	Observe appropriate command frame to form the network.
P2	Power on TH CLIENT and DUT SERVER.	TH CLIENT and DUT SERVER are powered on.
P3	Join TH CLIENT and DUT SERVER to a ZigBee network.	Observe appropriate communication between TH CLIENT, DUT SERVER and any other relevant node on the ZigBee network.

--- End of test case S-TC-03C preparation ---

295 **5.3.3.5 Test procedure**

<b>S-TC-03S: Secondary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
1a	G.S.C00.Rsp, G.S.C00.Tx	TH CLIENT unicasts a ZCL <i>add group</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ .	DUT SERVER unicasts a ZCL <i>add group response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) or 0x8a (DUPLICATE_EXISTS) and the <i>group ID</i> field set to $G_1$ .
1b	S.S.C03.Rsp, S.S.C03.Tx	TH CLIENT unicasts a ZCL <i>remove all scenes</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ .	DUT SERVER unicasts a ZCL <i>remove all scenes response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS) and <i>group ID</i> field set to $G_1$ .
1c	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ .	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to the value $SC_0$ , the <i>group ID</i> field set to $G_1$ , the <i>scene count</i> field set to 0x00.
2	S.S.C40.Rsp, S.S.C40.Tx	TH CLIENT unicasts a ZCL <i>enhanced add scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ , the <i>scene ID</i> field set to 0x01, the <i>transition time</i> field set to 0x000a (1s) and a set of extension fields appropriate to $AC_1$ .	DUT SERVER unicasts a ZCL <i>enhanced add scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to $G_1$ and the <i>scene ID</i> field set to 0x01.
3	S.S.C41.Rsp, S.S.C41.Tx	TH CLIENT unicasts a ZCL <i>enhanced view scene</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ and the <i>scene ID</i> field set to 0x01.	DUT SERVER unicasts a ZCL <i>enhanced view scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group ID</i> field set to $G_1$ and the <i>scene ID</i> field set to 0x01, the <i>transition time</i> field set to 0x000a (1s) and a set of extension fields appropriate to $AC_1$ .

Continued...



<b>S-TC-03S: Secondary functionality with server as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
4	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ .	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values (( $SC_0 - 1$ ), 0xfe or 0xff), the <i>group ID</i> field set to $G_1$ , the <i>scene count</i> field set to 0x01 and the <i>scene list</i> field containing only the scene ID 0x01.
5a	-	TH CLIENT configures $AC_2$ on DUT SERVER for all implemented application clusters supporting scenes.	DUT SERVER is configured with $AC_2$ which is different from $AC_1$ .
5b	S.S.C05.Rsp	TH CLIENT unicasts a ZCL <i>recall scene</i> command frame to group $G_1$ with the <i>group ID</i> field set to $G_1$ and the <i>scene ID</i> field set to 0x01.	If requested, DUT SERVER unicasts a ZCL <i>default response</i> command frame to TH CLIENT with the <i>status</i> field equal to 0x00 (SUCCESS). DUT SERVER returns to $AC_1$ .
6a	S.S.C42.Rsp, S.S.C42.Tx	TH CLIENT unicasts a ZCL <i>copy scene</i> command frame to DUT SERVER with the <i>mode</i> field set to 0x00, the <i>group identifier from</i> field set to $G_1$ , the <i>scene identifier from</i> field set to 0x01, the <i>group identifier to</i> field set to $G_1$ and the <i>scene identifier to</i> field set to 0x02.	DUT SERVER unicasts a ZCL <i>copy scene response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>group identifier from</i> field set to $G_1$ and the <i>scene identifier from</i> field set to 0x01.
6b	S.S.C06.Rsp, S.S.C06.Tx	TH CLIENT unicasts a ZCL <i>get scene membership</i> command frame to DUT SERVER with the <i>group ID</i> field set to $G_1$ .	DUT SERVER unicasts a ZCL <i>get scene membership response</i> command frame to TH CLIENT with the <i>status</i> field set to 0x00 (SUCCESS), the <i>capacity</i> field set to one of the values (( $SC_0 - 2$ ), 0xfe or 0xff), the <i>group ID</i> field set to $G_1$ , the <i>scene count</i> field set to 0x02 and the <i>scene list</i> field containing the scene IDs 0x01 and 0x02.

--- End of test case S-TC-03S ---

## 5.4 Client test cases

### 5.4.1 S-TC-01C: Functionality with client as DUT

This case test verifies the functionality of the *scenes* cluster client.

The DUT client SHALL be on the same network as a suitable server, provided by the user, and this device SHALL be used by the client to exercise its functionality. The test case uses the test harness to prompt the user, based on the declared PICS, to exercise the functionality of the *basic* cluster client and to verify the results. A sniffer tool SHALL be used to log the exercised functionality and to determine its validity.

In this test case, the PICS notation S.C.CdTx represents the list of commands that are declared as being transmitted by the DUT.

#### 5.4.1.1 Scope



*Scenes* cluster (0x0005):

- *Add scene* command (0x00)
- *View scene* command (0x01)
- *Remove scene* command (0x02)
- *Remove all scenes* command (0x03)
- *Store scene* command (0x04)
- *Recall scene* command (0x05)
- *Get scene membership* command (0x06)
- *Enhanced add scene* command (0x40)
- *Enhanced view scene* command (0x41)
- *Copy scene* command (0x42)

PICS:

- S.C
- S.C.C00.Tx – S.C.C06.Tx, S.C.C40.Tx – S.C.C42.Tx

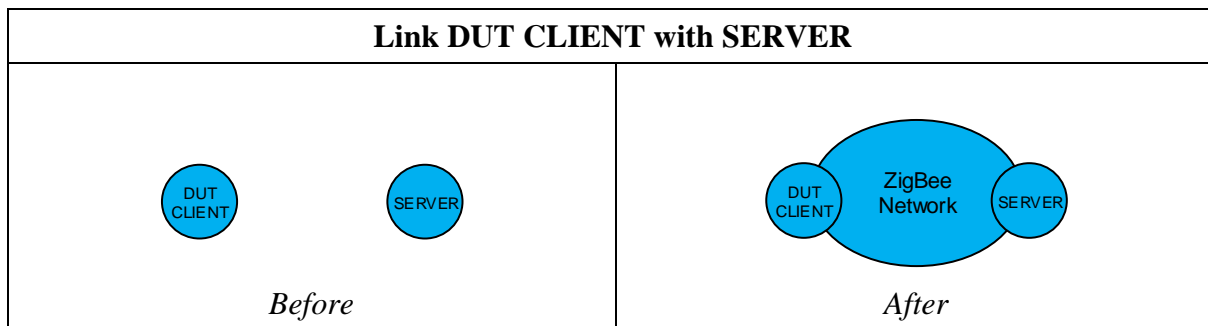
#### 5.4.1.2 Required devices

Designation	Symbol	Description
DUT CLIENT		Device under test client implementing: <ul style="list-style-type: none"> <li>• The <i>scenes</i> cluster client.</li> </ul>
SERVER		Suitable server device implementing: <ul style="list-style-type: none"> <li>• The <i>scenes</i> cluster server.</li> </ul>

#### 5.4.1.3 Initial conditions

Item	Initial Conditions
1	A packet sniffer shall be observing the communication over the air interface.
2	All devices are factory new and powered off until used.

#### 5.4.1.4 Test preparation



#### S-TC-01C: Functionality with client as DUT

Item	Preparation Step	Observation
P1	Power on the DUT CLIENT device and the SERVER device.	DUT CLIENT and SERVER are powered on.
P2	Ensure the DUT CLIENT device and the SERVER device are on the same ZigBee network.	Observe appropriate communication between DUT CLIENT, SERVER and any other relevant node on the ZigBee network.

--- End of test case S-TC-01C preparation ---

#### 5.4.1.5 Test procedure

<b>S-TC-01C: Functionality with client as DUT</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT Pass Verification</b>
1	-	Test harness prompts the user with a list of commands, based on the declared PICS, which the DUT CLIENT indicates it can transmit.	None.
2	S.C.Cd.Tx	None.	DUT CLIENT transmits correctly formed commands in any order and with application achievable values. This is verified using the sniffer log.
3	-	Prompt the user to verify that the cluster commands listed in step 1 were transmitted during step 2.	During step 2, DUT CLIENT has transmitted every command listed by the test harness in step 1.
4	-	Prompt the user to verify that the cluster commands not listed in step 1 were not transmitted during step 2.	During step 2, DUT CLIENT has not transmitted any commands from this cluster that were not listed by the test harness in step 1.

--- End of test case S-TC-01C ---

## 6 Annex A: PICS to test case cross reference

### 6.1 Server

PICS	Test case			
	S-TC-01G	S-TC-01S	S-TC-02S	S-TC-03S
S.S	X	X	X	X
S.S.A0000		X	X	
S.S.A0001		X	X	
S.S.A0002		X	X	
S.S.A0003		X	X	
S.S.A0004		X		
S.S.A0005		X		
S.S.Afffd	X			
S.S.C00.Rsp			X	
S.S.C01.Rsp			X	
S.S.C02.Rsp			X	
S.S.C03.Rsp			X	
S.S.C04.Rsp			X	
S.S.C05.Rsp			X	
S.S.C06.Rsp			X	X
S.S.C40.Rsp				X
S.S.C41.Rsp				X
S.S.C42.Rsp				X
S.S.C00.Tx			X	
S.S.C01.Tx			X	
S.S.C02.Tx			X	
S.S.C03.Tx			X	
S.S.C04.Tx			X	
S.S.C06.Tx			X	X
S.S.C40.Tx				X
S.S.C41.Tx				X
S.S.C42.Tx				X

336 **6.2 Client**

PICS	Test case	
	S-TC-01G	S-TC-01C
S.C	X	X
S.C.Afffd	X	
S.C.C00.Rsp		X
S.C.C01.Rsp		X
S.C.C02.Rsp		X
S.C.C03.Rsp		X
S.C.C04.Rsp		X
S.C.C06.Rsp		X
S.C.C40.Rsp		X
S.C.C41.Rsp		X
S.C.C42.Rsp		X
S.C.C00.Tx		X
S.C.C01.Tx		X
S.C.C02.Tx		X
S.C.C03.Tx		X
S.C.C04.Tx		X
S.C.C05.Tx		X
S.C.C06.Tx		X
S.C.C40.Tx		X
S.C.C41.Tx		X
S.C.C42.Tx		X

337  
338