



# **ZigBee Cluster Library Groups Cluster (0x0004) Test Specification Version 1.0**

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

Keywords                        ZCL, Groups, cluster

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## Revision history

Revision	Date	Details	Editor
00	May, 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 28 <sup>th</sup> , 2015	Added the new mandatory global attributes.	Phil Jamieson
03	October 30 <sup>th</sup> , 2015	Removed the creation of a binding link in the preparatory steps.	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

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## 1 Introduction

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

### 86 1.1 Conformance levels

87 The key words "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT",  
88 "RECOMMENDED" and "MAY" in this document are to be interpreted as described in [R4].  
89

## 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 Groups 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
G.PIXIT01	What is the maximum capacity of the group table of the device?	<i>“Number of entries”</i>
G.PIXIT02	Which group IDs are automatically configured on the device when factory new?	<i>“List of group IDs”</i>

100

## 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
G.S	Does the device implement the <i>groups</i> cluster as a server?	3.6.2	O	Yes
G.C	Does the device implement the <i>groups</i> cluster as a client?	3.6.3	O	No

### 4.2 Server

#### 4.2.1 Attributes

Item number	Feature	Reference	Status	Support
G.S.A0000	Does the device implement the <i>NameSupport</i> attribute?	Table 3.33, 3.6.2.2.1	G.S: M	Yes
G.S.Afffd	Does the device implement the <i>ClusterRevision</i> global attribute?	Table 2-1, 2.3.5.1.1	G.S: M	Yes

#### 4.2.2 Commands received

Item number	Feature	Reference	Status	Support
G.S.C00.Rsp	Does the device implement receiving the <i>Add group</i> command?	Table 3.34, 3.6.2.3.2	G.S: M	Yes
G.S.C01.Rsp	Does the device implement receiving the <i>View group</i> command?	Table 3.34, 3.6.2.3.3	G.S: M	Yes
G.S.C02.Rsp	Does the device implement receiving the <i>Get group membership</i> command?	Table 3.24, 3.6.2.3.4	G.S: M	Yes
G.S.C03.Rsp	Does the device implement receiving the <i>Remove group</i> command?	Table 3.24, 3.6.2.3.5	G.S: M	Yes
G.S.C04.Rsp	Does the device implement receiving the <i>Remove all groups</i> command?	Table 3.24, 3.6.2.3.6	G.S: M	Yes
G.S.C05.Rsp	Does the device implement receiving the <i>Add group if identifying</i> command?	Table 3.24, 3.6.2.3.7	G.S: M	Yes

112 **4.2.3 Commands generated**

Item number	Feature	Reference	Status	Support
G.S.C00.Tx	Does the device implement sending the <i>Add group response</i> command?	Table 3.45, 3.6.2.4.1	G.S: M	Yes
G.S.C01.Tx	Does the device implement sending the <i>View group response</i> command?	Table 3.45, 3.6.2.4.2	G.S: M	Yes
G.S.C02.Tx	Does the device implement sending the <i>Get group membership response</i> command?	Table 3.45, 3.6.2.4.3	G.S: M	Yes
G.S.C03.Tx	Does the device implement sending the <i>Remove group response</i> command?	Table 3.45, 3.6.2.4.4	G.S: M	Yes

113

114 **4.3 Client**115 **4.3.1 Attributes**

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

116

117 **4.3.2 Commands received**

Item number	Feature	Reference	Status	Support
G.C.C00.Rsp	Does the device implement receiving the <i>Add group response</i> command?	Table 3.45, 3.6.2.4.1	G.C: O	No
G.C.C01.Rsp	Does the device implement receiving the <i>View group response</i> command?	Table 3.45, 3.6.2.4.2	G.C: O	No
G.C.C06.Rsp	Does the device implement receiving the <i>Get group membership response</i> command?	Table 3.45, 3.6.2.4.3	G.C: O	No
G.C.C02.Rsp	Does the device implement receiving the <i>Remove group response</i> command?	Table 3.45, 3.6.2.4.4	G.C: O	No

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119 **4.3.3 Commands generated**

Item number	Feature	Reference	Status	Support
G.C.C00.Tx	Does the device implement sending the <i>Add group</i> command?	Table 3.34, 3.6.2.3.2	G.C: O	No

Item number	Feature	Reference	Status	Support
G.C.C01.Tx	Does the device implement sending the <i>View group</i> command?	Table 3.34, 3.6.2.3.3	G.C: O	No
G.C.C02.Tx	Does the device implement sending the <i>Get group membership</i> command?	Table 3.34, 3.6.2.3.4	G.C: O	No
G.C.C03.Tx	Does the device implement sending the <i>Remove group</i> command?	Table 3.34, 3.6.2.3.5	G.C: O	No
G.C.C04.Tx	Does the device implement sending the <i>Remove all groups</i> command?	Table 3.34, 3.6.2.3.6	G.C: O	No
G.C.C05.Tx	Does the device implement sending the <i>Add group if identifying</i> command?	Table 3.34, 3.6.2.3.7	G.C: O	No

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## 5 Test specification

### 5.1 Introduction

#### 5.1.1 Test case overview

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

Test ID	Description	Reference
<b>Global tests</b>		
G-TC-01G	Global attributes	5.2.1
<b>Server side tests</b>		
G-TC-01S	Attributes with server as DUT	5.3.1
G-TC-02S	Primary functionality with server as DUT	5.3.2
<b>Client side tests</b>		
G-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.

## 5.2 Generic test cases

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

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

In this test, the PICS notation G.S.Agm and G.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 G.S.Ago and G.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)



*Groups* cluster (0x0004):

- All global attributes

PICS:

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

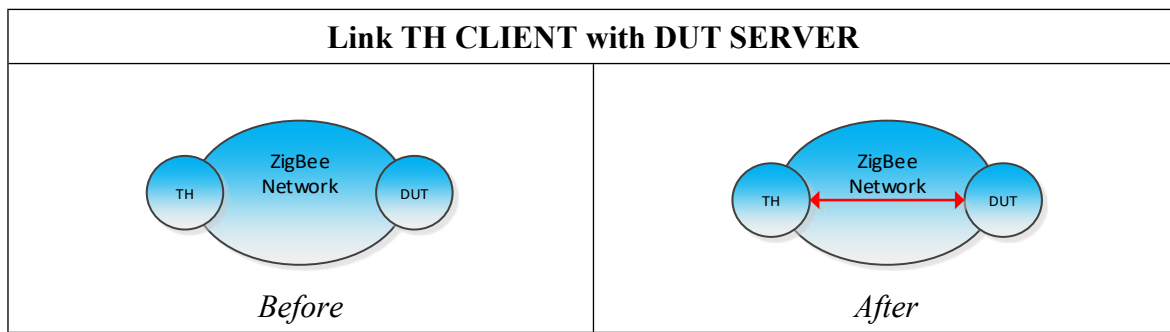
#### 5.2.1.2 Required devices

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



171 **5.2.1.4 Test preparation**

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G-TC-01G: Global attributes		
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 G-TC-01G preparation ---

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174 **5.2.1.5 Test procedure**

<b>G-TC-01G: Global attributes</b>			
<b>Item</b>	<b>PICS</b>	<b>Test Harness Step</b>	<b>DUT pass Verification</b>
1	G.S.Agm, G.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	G.S.Agm, G.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	G.S.Agm, G.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...*

G-TC-01G: Global attributes			
Item	PICS	Test Harness Step	DUT pass Verification
3	G.S.Ago, G.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	G.S.Ago, G.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	G.S.Ago, G.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 G-TC-01G ---

## 5.3 Server test cases

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

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

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

#### 5.3.1.1 Scope

General:

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



*Groups* cluster (0x0004):

- All non-global attributes

PICS:

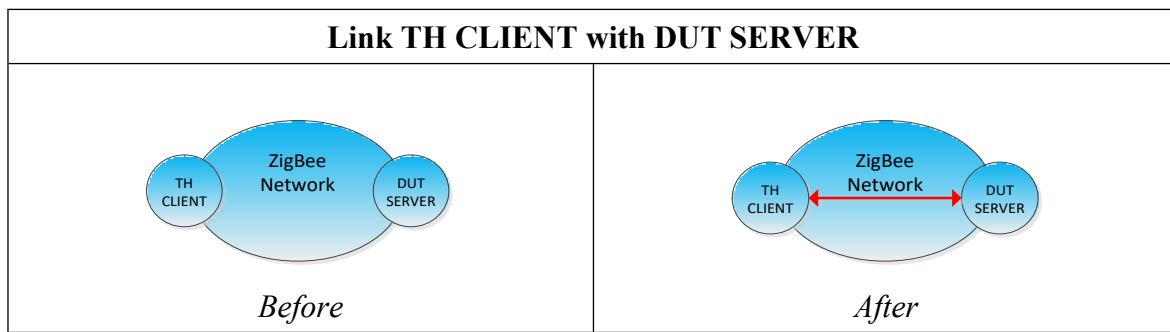
- G.S
- *G.S.Am*

#### 5.3.1.2 Required devices

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

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G-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 G-TC-01S preparation ---

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200 **5.3.1.5 Test procedure**

<b>G-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	G.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	G.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	G.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.

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

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### 203 **5.3.2 G-TC-02S: Primary functionality with server as DUT**

204 This test verifies the primary functionality of the *groups* cluster.

#### 205 **5.3.2.1 Scope**

206 General:

- 207 • *Read attributes* command (0x00)
- 208 • *Read attributes response* command (0x01)
- 209 • *Default response* command (0x0b)

210 *Identify* cluster (0x0003):

- 211 • *Identify* command (0x00)



212 *Groups* cluster (0x0004):

- 213 • *Add group* command (0x00)
- 214 • *Add group response* command (0x00)
- 215 • *View group* command (0x01)
- 216 • *View group response* command (0x01)
- 217 • *Get group membership* command (0x02)
- 218 • *Get group membership response* command (0x02)
- 219 • *Remove group* command (0x03)
- 220 • *Remove group response* command (0x03)
- 221 • *Remove all groups* command (0x04)
- 222 • *Add group if identifying* command (0x05)

223 PICS:

- 224 • I.S.C00.Rsp
- 225 • G.S
- 226 • G.S.C00.Rsp – G.S.C05.Rsp
- 227 • G.S.C00.Tx – G.S.C03.Tx

228 **5.3.2.2 Required devices**

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

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230 **5.3.2.3 Initial conditions**

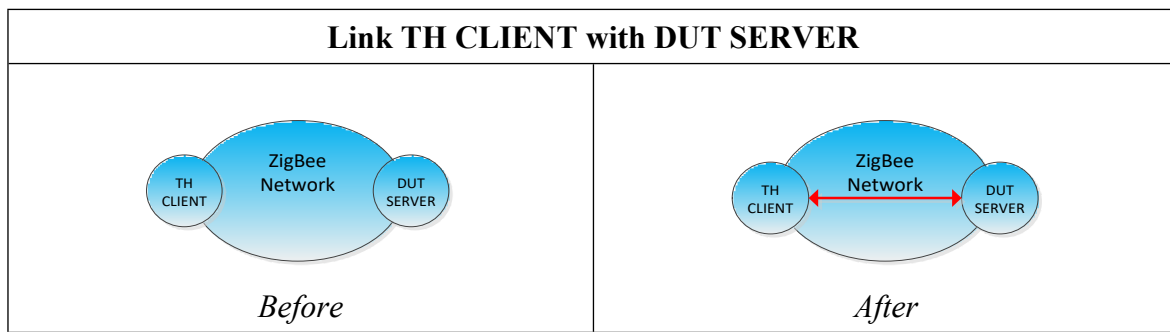
Item	Initial Conditions
1	A packet sniffer shall be observing the communication over the air interface.
2	All devices are factory new and powered off until used.

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### 233 5.3.2.4 Test preparation



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G-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 G-TC-02S preparation ---

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237 **5.3.2.5 Test procedure**

<b>G-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>
1	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).
2	G.S.C00.Rsp, G.S.C00.Tx	TH CLIENT unicasts a ZCL <i>add group</i> command to DUT SERVER with <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.
3	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0000.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01 – 1, 0xfe or 0xff), the <i>Group count</i> field set to 0x01 and the <i>Group list</i> field containing only group ID 0x0001.
4	G.S.C01.Rsp, G.S.C01.Tx	TH CLIENT unicasts a ZCL <i>view group</i> command frame to DUT SERVER with the <i>Group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>view 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.
5	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 0x0003.	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 0x0003.
6	G.S.C01.Rsp, G.S.C01.Tx	TH CLIENT unicasts a ZCL <i>view group</i> command frame to DUT SERVER with the <i>Group ID</i> field set to 0x0003.	DUT SERVER unicasts a ZCL <i>view 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 0x0003.

Continued...

<b>G-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>
7	G.S.C01.Rsp, G.S.C01.Tx	TH CLIENT unicasts a ZCL <i>view group</i> command frame to DUT SERVER with the <i>Group ID</i> field set to 0x002a (42).	DUT SERVER unicasts a ZCL <i>view group response</i> command frame to TH CLIENT with the <i>Status</i> field set to 0x8b (NOT_FOUND) and the <i>Group ID</i> field set to 0x002a (42).
8	G.S.C01.Rsp, G.S.C01.Tx	TH CLIENT unicasts a ZCL <i>view group</i> command frame to DUT SERVER with the <i>Group ID</i> field set to 0x0001.	DUT SERVER unicasts a ZCL <i>view 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.
9	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0001 and the <i>group list</i> field containing only group ID 0x0001.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01 – 2, 0xfe or 0xff), the <i>Group count</i> field set to 0x01 and the <i>Group list</i> field containing only group ID 0x0001.
10	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame with the <i>Group count</i> field set to 0x0001 and the <i>group list</i> field containing only group ID 0x0003.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01 – 2, 0xfe or 0xff), the <i>Group count</i> field set to 0x01 and the <i>Group list</i> field containing only group ID 0x0003.
11	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 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.

Continued...

<b>G-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>
12	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0000.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01 – 3, 0xfe or 0xff), the <i>Group count</i> field set to 0x03 and the <i>Group list</i> field containing group IDs 0x0001, 0x0002 and 0x0003.
13	G.S.C03.Rsp, G.S.C03.Tx	TH CLIENT unicasts a ZCL <i>remove group</i> command frame to DUT SERVER with the <i>Group ID</i> field set to 0x0003.	DUT SERVER unicasts a ZCL <i>remove 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 0x0003.
14	G.S.C03.Rsp, G.S.C03.Tx	TH CLIENT unicasts a ZCL <i>remove group</i> command frame to DUT SERVER with the <i>Group ID</i> field set to 0x0002.	DUT SERVER unicasts a ZCL <i>remove 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.
15	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0000.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01 – 1, 0xfe or 0xff), the <i>Group count</i> field set to 0x01 and the <i>Group list</i> field containing only group ID 0x0001.
16	G.S.C04.Rsp	TH CLIENT unicasts a ZCL <i>remove all groups</i> command frame 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).
17	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0000.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01, 0xfe or 0xff) and the <i>Group count</i> field set to 0x00.

Continued...

<b>G-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>
18a	G.S.C05.Rsp	TH CLIENT immediately unicasts a ZCL <i>add group if identifying</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	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).
18b	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0000.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01, 0xfe or 0xff) and the <i>Group count</i> field set to 0x00.
18c	I.S.C00.Rsp	TH CLIENT unicasts a ZCL <i>identify</i> command frame to DUT SERVER with the <i>identify time</i> field set to 0x000a (10s).	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 begins to identify itself.
18d	I.S.C00.Rsp, G.S.C05.Rsp	<b>Conditional on step 18c being executed:</b> TH CLIENT immediately unicasts a ZCL <i>add group if identifying</i> command frame to DUT SERVER with the <i>group ID</i> field set to 0x0001.	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).
18e	I.S.C00.Rsp, G.S.C02.Rsp, G.S.C02.Tx	<b>Conditional on step 18c being executed:</b> TH CLIENT unicasts a ZCL <i>get group membership</i> command frame to DUT SERVER with the <i>Group count</i> field set to 0x0000.	DUT SERVER unicasts a ZCL <i>get group membership response</i> command frame to TH CLIENT with the <i>Capacity</i> field set to one of the values (G.PIXIT01 – 1, 0xfe or 0xff), the <i>Group count</i> field set to 0x01 and the <i>group list</i> field containing only the group ID 0x0001.

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

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## 5.4 Client test cases

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

This case test verifies the functionality of the *groups* 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 G.C.CdTx represents the list of commands that are declared as being transmitted by the DUT.

#### 5.4.1.1 Scope



*Groups* cluster (0x0004):

- *Add group* command (0x00)
- *View group* command (0x01)
- *Get group membership* command (0x02)
- *Remove group* command (0x03)
- *Remove all groups* command (0x04)
- *Add group if identifying* command (0x05)

PICS:

- G.C
- G.C.C00.Tx – G.C.C05.Tx

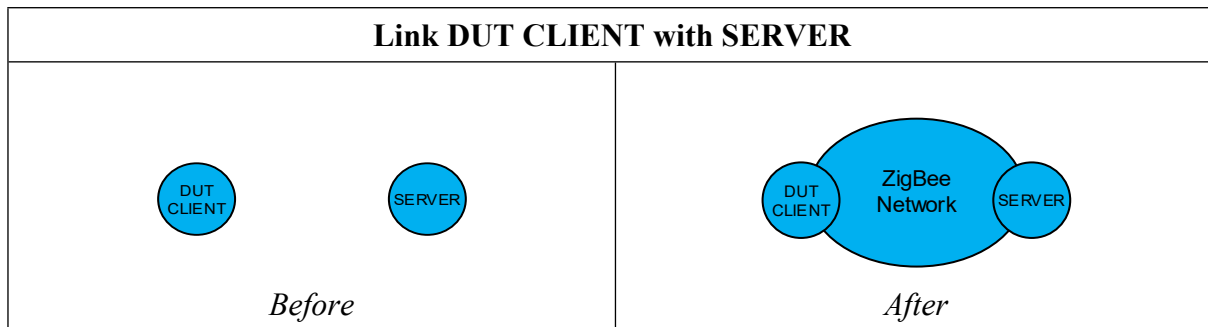
#### 5.4.1.2 Required devices

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



G-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 G-TC-01C preparation ---

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<b>G-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	G.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 G-TC-01C ---

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

### 6.1 Server

PICS	Test case		
	G-TC-01G	G-TC-01S	G-TC-02S
G.S	X	X	X
G.S.A0000		X	
G.S.Afffd	X		
G.S.C00.Rsp			X
G.S.C01.Rsp			X
G.S.C02.Rsp			X
G.S.C03.Rsp			X
G.S.C04.Rsp			X
G.S.C05.Rsp			X
G.S.C00.Tx			X
G.S.C01.Tx			X
G.S.C02.Tx			X
G.S.C03.Tx			X

### 6.2 Client

PICS	Test case	
	G-TC-01G	G-TC-01C
G.C	X	X
G.C.Afffd	X	
G.C.C00.Rsp		X
G.C.C01.Rsp		X
G.C.C02.Rsp		X
G.C.C03.Rsp		X
G.C.C00.Tx		X
G.C.C01.Tx		X
G.C.C02.Tx		X
G.C.C03.Tx		X
G.C.C04.Tx		X
G.C.C05.Tx		X