ZigBee Cluster Library
Thermostat Cluster (0x0201)
Test Specification
Version 0.90.7

ZigBee Document 16-02865-001	
October 5th, 2017~~September21th, 2016~~	
Sponsored by: ZigBee Alliance	
Accepted by	This document has not yet been accepted for release by the ZigBee Alliance Board of Directors
Abstract	This document describes the certification tests for devices which implement the ZCL Thermostat~~Relative Humidity Measurement~~ cluster.
Keywords	ZCL, Thermostat, cluster

Field Code Changed

508 Second Street, Suite 206 Davis, CA 95616 - USA
http://www.zigbee.org

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Revision history

Revision	Date	Details	Editor
000	September 21st, 2016	First draft.	Bozena Erdmann
001	October 5th, 2017	Fixed CCB #2461.	Phil Jamieson

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1 Introduction

This document contains the PICS, test specification and PICS/test case cross reference for the ZCL *thermostat* 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 16-0xxx.
[R3] ZCL ~~Relative Humidity Measurement~~Thermostat Cluster XML PICS, ZigBee Alliance document 16-0xxx.

2.2 IETF documents

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

3 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].

3.1 Usage

Item number	Feature	Reference	Status	Support
TSTAT.S	Does the device implement the *thermostat* cluster as a server?	3.3.2	O	Yes/No
TSTAT.C	Does the device implement the *thermostat* cluster as a client?	3.3.3	O	Yes/No

3.2 Server

3.2.1 Attributes

Item number	Feature	Reference	Status	Support
Thermostat Information Attribute Set				
TSTAT.S.A0000	Does the device implement the *LocalTemperature* attribute?	Table 6.11, 6.3.2.2.1.1	TSTAT.S: M	Yes/No
TSTAT.S.A0000.Report.Tx	Does the device implement receiving and responding to the global report attribute commands for the *LocalTemperature* attribute and sending reports?	6.3.2.5	TSTAT.S: M	Yes/No
TSTAT.S.A0001	Does the device implement the *OutdoorTemperature* attribute?	Table 6.11, 6.3.2.2.1.2	TSTAT.S: O	Yes/No
TSTAT.S.A0002	Does the device implement the *Occupancy* attribute?	Table 6.11, 6.3.2.2.1.3	TSTAT.S: O	Yes/No
TSTAT.S.A0003	Does the device implement the *AbsMinHeatSetpointLimit* attribute?	Table 6.11, 6.3.2.2.1.4	TSTAT.S: O	Yes/No
TSTAT.S.A0004	Does the device implement the *AbsMaxHeatSetpointLimit* attribute?	Table 6.11, 6.3.2.2.1.5	TSTAT.S: O	Yes/No
TSTAT.S.A0005	Does the device implement the *AbsMinCoolSetpointLimit* attribute?	Table 6.11, 6.3.2.2.1.6	TSTAT.S: O	Yes/No
TSTAT.S.A0006	Does the device implement the *AbsMaxCoolSetpointLimit* attribute?	Table 6.11, 6.3.2.2.1.7	TSTAT.S: O	Yes/No
TSTAT.S.A0007	Does the device implement the *PICoolingDemand* attribute?	Table 6.11, 6.3.2.2.1.8	TSTAT.S: O	Yes/No

Item number	Feature	Reference	Status	Support
TSTAT.S.A0007.Report.Tx	Does the device implement receiving and responding to the global report attribute commands for the *PICoolingDemand* attribute and sending reports?	6.3.2.5	TSTAT.S.A0007: M	Yes/No
TSTAT.S.A0008	Does the device implement the *PIHeatingDemand* attribute?	Table 6.11, 6.3.2.2.1.9	TSTAT.S: O	Yes/No
TSTAT.S.A0008.Report.Tx	Does the device implement receiving and responding to the global report attribute commands for the *PIHeatingDemand* attribute and sending reports?	6.3.2.5	TSTAT.S.A0008: M	Yes/No
TSTAT.S.A0009	Does the device implement the *HVACSystemTypeConfiguration* attribute?	Table 6.11, 6.3.2.2.1.10	TSTAT.S: O	Yes/No
Thermostat Settings Attribute Set				
TSTAT.S.A0010	Does the device implement the *LocalTemperatureCalibration* attribute?	Table 6.13, 6.3.2.2.2.1	TSTAT.S: O	Yes/No
TSTAT.S.A0011	Does the device implement the *OccupiedCoolingSetpoint* attribute?	Table 6.13, 6.3.2.2.2.2	TSTAT.S: M.1[1]	Yes/No
TSTAT.S.A0011.Scene	Does the device implement receiving and responding to the scene cluster commands for the *OccupiedCoolingSetpoint* attribute?	6.3.2.6	(TSTAT.S.A0011 & S.S): M	Yes/No
TSTAT.S.A0012	Does the device implement the *OccupiedHeatingSetpoint* attribute?	Table 6.13, 6.3.2.2.2.3	TSTAT.S: M.1	Yes/No
TSTAT.S.A0012.Scene	Does the device implement receiving and responding to the scene cluster commands for the *OccupiedHeatingSetpoint* attribute?	6.3.2.6	(TSTAT.S.A0012 & S.S): M	Yes/No
TSTAT.S.A0013	Does the device implement the *UnoccupiedCoolingSetpoint* attribute?	Table 6.13, 6.3.2.2.2.4	TSTAT.S: O	Yes/No
TSTAT.S.A0014	Does the device implement the *UnoccupiedHeatingSetpoint* attribute?	Table 6.13, 6.3.2.2.2.5	TSTAT.S: O	Yes/No
TSTAT.S.A0015	Does the device implement the *MinHeatSetpointLimit* attribute?	Table 6.13, 6.3.2.2.2.6	TSTAT.S: O	Yes/No
TSTAT.S.A0016	Does the device implement the *MaxHeatSetpointLimit* attribute?	Table 6.13, 6.3.2.2.2.7	TSTAT.S: O	Yes/No

Commented [be71]: "If the thermostat uses physical DIP switches to set these parameters, this information SHALL be available
read-only from the DIP switches. If these parameters are set via software, there SHALL be read/write access
in order to provide remote programming capability. The meanings of individual bits are detailed in Table
6-12. Each bit represents a type of system configuration."
→PIXIT item

Commented [be72]: "The *OccupiedHeatingSetpoint* attribute SHALL always be below the value specified in the *OccupiedCooling*
Setpoint by at least *SetpointDeadband*. If an attempt is made to set it such that this condition is violated, a
default response command with the status code INVALID_VALUE (see 2.5.3) SHALL be"

[1] M.1: the DUT SHALL implement at least one of the M.1 attributes.

Item number	Feature	Reference	Status	Support
TSTAT.S.A0017	Does the device implement the *MinCoolSetpointLimit* attribute?	Table 6.13, 6.3.2.2.2.8	TSTAT.S: O	Yes/No
TSTAT.S.A0018	Does the device implement the *MaxCoolSetpointLimit* attribute?	Table 6.13, 6.3.2.2.2.9	TSTAT.S: O	Yes/No
TSTAT.S.A0019	Does the device implement the *MinSetpointDeadBand* attribute?	Table 6.13, 6.3.2.2.2.10	TSTAT.S: O	Yes/No
TSTAT.S.A001A	Does the device implement the *RemoteSensing* attribute?	Table 6.13, 6.3.2.2.2.11	TSTAT.S: O	Yes/No
TSTAT.S.A001B	Does the device implement the *ControlSequenceOfOperation* attribute?	Table 6.13, 6.3.2.2.2.12	TSTAT.S: M	Yes/No
TSTAT.S.A001C	Does the device implement the *SystemMode* attribute?	Table 6.13, 6.3.2.2.2.13	TSTAT.S: M	Yes/No
TSTAT.S.A001C.Scene	Does the device implement receiving and responding to the scene cluster commands for the *SystemMode* attribute?	6.3.2.6	(TSTAT.S.A001C & S.S): M	Yes/No
TSTAT.S.A001D	Does the device implement the *AlarmMask* attribute?	Table 6.13, 6.3.2.2.2.14	TSTAT.S: O	Yes/No
TSTAT.S.A001E	Does the device implement the *ThermostatRunningMode* attribute?	Table 6.13, 6.3.2.2.2.15	TSTAT.S: O	Yes/No
Thermostat Schedule & HVAC Relay Attribute Set				
TSTAT.S.A0020	Does the device implement the *StartOfWeek* attribute?	Table 6.20, 6.3.2.2.3.1	TSTAT.S: O	Yes/No
TSTAT.S.A0021	Does the device implement the *NumberOfWeeklyTransitions* attribute?	Table 6.20, 6.3.2.2.3.2	TSTAT.S: O	Yes/No
TSTAT.S.A0022	Does the device implement the *NumberOfDailyTransitions* attribute?	Table 6.20, 6.3.2.2.3.3	TSTAT.S: O	Yes/No
TSTAT.S.A0023	Does the device implement the *TemperatureSetpointHold* attribute?	Table 6.20, 6.3.2.2.3.4	TSTAT.S: O	Yes/No
TSTAT.S.A0024	Does the device implement the *TemperatureSetpointHoldDuration* attribute?	Table 6.20, 6.3.2.2.3.5	TSTAT.S: O	Yes/No
TSTAT.S.A0025	Does the device implement the *ThermostatProgrammingOperationMode* attribute?	Table 6.20, 6.3.2.2.3.6	TSTAT.S: O	Yes/No
TSTAT.S.A0029	Does the device implement the *ThermostatRunningState* attribute?	Table 6.20, 6.3.2.2.3.7	TSTAT.S: O	Yes/No
Thermostat Setpoint Change Tracking Attribute Set				

Commented [be73]: "The attribute value is maintained to have the same value as the *SystemMode* attribute."

Commented [be74]: Test spec indicates it is dependent on the scheduling extension. →PIXIT item?

Commented [be75]: scheduling

Commented [be76]: scheduling

Commented [be77]: The valid range is from 0x0000 – 0x05A0 (1440 minutes within a day).

Item number	Feature	Reference	Status	Support
TSTAT.S.A0030	Does the device implement the *SetpointChangeSource* attribute?	Table 6.25, 6.3.2.2.4.1	TSTAT.S: O	Yes/No
TSTAT.S.A0031	Does the device implement the *SetpointChangeAmount* attribute?	Table 6.25, 6.3.2.2.4.2	TSTAT.S: O	Yes/No
TSTAT.S.A0032	Does the device implement the *SetpointChangeSourceTimestamp* attribute?	Table 6.25, 6.3.2.2.4.3	TSTAT.S: O	Yes/No
AC Information Attribute Set				
TSTAT.S.A0040	Does the device implement the *ACType* attribute?	Table 6.28, 6.3.2.2.5.1	TSTAT.S: O	Yes/No
TSTAT.S.A0041	Does the device implement the *ACCapacity* attribute?	Table 6.28, 6.3.2.2.5.2	TSTAT.S: O	Yes/No
TSTAT.S.A0042	Does the device implement the *ACRefrigerantType* attribute?	Table 6.28, 6.3.2.2.5.3	TSTAT.S: O	Yes/No
TSTAT.S.A0043	Does the device implement the *ACCompressorType* attribute?	Table 6.28, 6.3.2.2.5.4	TSTAT.S: O	Yes/No
TSTAT.S.A0044	Does the device implement the *ACErrorCode* attribute?	Table 6.28, 6.3.2.2.5.5	TSTAT.S: O	Yes/No
TSTAT.S.A0045	Does the device implement the *ACLouverPosition* attribute?	Table 6.28, 6.3.2.2.5.6	TSTAT.S: O	Yes/No
TSTAT.S.A0046	Does the device implement the *ACCoilTemperature* attribute?	Table 6.28, 6.3.2.2.5.7	TSTAT.S: O	Yes/No
TSTAT.S.A0047	Does the device implement the *ACCapacityFormat* attribute?	Table 6.28, 6.3.2.2.5.8	TSTAT.S: O	Yes/No
Global attributes				
TSTAT.S.Afffd	Does the device implement the *ClusterRevision* global attribute?	Table 2-1, 2.3.5.1.1	TSTAT.S: M	Yes/No
TSTAT.S.Afffe	Does the device implement the *AttributeReportingStatus* global attribute?	Table 2-1, 2.3.5.1.2	TSTAT.S: O	Yes/No

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Item number	Feature	Reference	Status	Support
TSTAT.S.C00.Rsp	Does the device implement receiving the *Setpoint Raise/Lower* command?	Table 6.35, 6.3.2.3.1	TSTAT.S: M	Yes/No

Item number	Feature	Reference	Status	Support
TSTAT.S.C01.Rsp	Does the device implement receiving the *Set Weekly Schedule* command?	Table 6.35, 6.3.2.3.2	TSTAT.S: O	Yes/No
TSTAT.S.C02.Rsp	Does the device implement receiving the *Get Weekly Schedule* command?	Table 6.35, 6.3.2.3.3	TSTAT.S: O	Yes/No
TSTAT.S.C03.Rsp	Does the device implement receiving the *Clear Weekly Schedule* command?	Table 6.35, 6.3.2.3.4	TSTAT.S: O	Yes/No
TSTAT.S.C04.Rsp	Does the device implement receiving the *Get Relay Status Log* command?	Table 6.35, 6.3.2.3.5	TSTAT.S: O	Yes/No

3.2.3 Commands sent

Item number	Feature	Reference	Status	Support
TSTAT.S.C00.Tx	Does the device implement sending the *Get Weekly Schedule Response* command?	Table 6.39, 6.3.2.4.1	TSTAT.S.C02.Rsp: M	Yes/No
TSTAT.S.C01.Tx	Does the device implement receiving the *Get Relay Status Log Response* command?	Table 6.39, 6.3.2.4.2	TSTAT.S.C04.Rsp: M	Yes/No

3.3 Client

3.3.1 Attributes

Item number	Feature	Reference	Status	Support
TSTAT.C.A0000.Report.Rsp	Does the device implement sending global report attribute command requests and receiving reports for the *MeasuredValue* attribute?	4.7.2.5	TSTAT.C: O	Yes/No
TSTAT.C.A0007.Report.Rsp	Does the device implement sending global report attribute command requests and receiving reports for the *PICoolingDemand* attribute?	4.7.2.5	TSTAT.C: O	Yes/No
TSTAT.C.A0008.Report.Rsp	Does the device implement sending global report attribute command requests and receiving reports for the *PIHeatingDemand* attribute?	4.7.2.5	TSTAT.C: O	Yes/No
TSTAT.C.Afffd	Does the device implement the *ClusterRevision* global attribute?	Table 2-1, 2.3.5.1.1	TSTAT.C: M	Yes/No
TSTAT.C.Afffe	Does the device implement the *AttributeReportingStatus* global attribute?	Table 2-1, 2.3.5.1.2	TSTAT.C: O	Yes/No

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4 Test specification

4.1 Introduction

4.1.1 Test case overview

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

Test ID	Description	Reference
Global tests		
TSTAT-TC-01G	Global attributes	4.2.1
Server side tests		
TSTAT-TC-01S	Attributes with server as DUT	4.3.1
TSTAT-TC-02S	Setpoint test cases with server as DUT	4.3.2
TSTAT-TC-03S	Schedule test cases with server as DUT	4.3.3
TSTAT-TC-04S	Thermostat cluster with sSeparate temperature sensor and HVAC unit ~~test cases~~functionality with server as DUT	4.3.4
TSTAT-TC-05S	Scenes functionality with server as DUT	4.3.5
TSTAT-TC-~~03S~~06S	Reporting functionality with server as DUT	4.3.6~~4.3.3~~
Client side tests		
TSTAT-TC-01C	Functionality with client as DUT	4.4.1

Commented [PJ8]: CCB #2461

4.1.2 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 ±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 ±15% tolerance should then be applied. All other attribute values presented are expected to be exact.

Commented [be79]: Where are those boundaries coming from?

4.1.3 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.

4.1.4 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 that verifying the attribute manipulation command in question.

4.2 Generic test cases

4.2.1 TSTAT-TC-01G: Global attributes

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

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

4.2.1.1 Scope

General:

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

Thermostat cluster (0x0201):

- All global attributes

PICS:

- TSTAT.S, TSTAT.C
- TSTAT.S.A*gm*, TSTAT.C.A*gm*, TSTAT.S.A*go*, TSTAT.C.A*go*

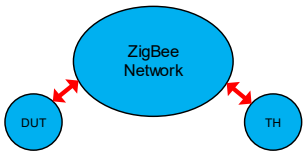
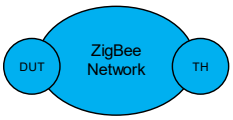
4.2.1.2 Required devices

Designation	Symbol	Description
DUT	DUT	Device under test implementing: • The *thermostat* cluster server or client.
TH	TH	Test harness implementing: • The *thermostat* cluster client or server, i.e. the opposite cluster instantiation as implemented on the DUT.

4.2.1.3 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.

185 **4.2.1.4 Test preparation**

Add TH and DUT to a ZigBee network	
	
Before	*After*

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TSTAT-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 TSTAT-TC-01G preparation ---

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188 **4.2.1.5 Test procedure**

TSTAT-TC-01G: Global attributes			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
1	TSTAT.S.Agm, TSTAT.C.Agm	TH unicasts a ZCL *read attributes* command frame to DUT to read each mandatory global attribute of this cluster one at a time.	DUT unicasts a ZCL *read attributes response* 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	TSTAT.S.Agm, TSTAT.C.Agm	TH unicasts a ZCL *write attributes* 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 *write attributes response* 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	TSTAT.S.Agm, TSTAT.C.Agm	TH unicasts a ZCL *read attributes* command frame to DUT to read back each attribute written in step 2a.	DUT unicasts a ZCL *read attributes response* command frame to TH containing the requested attribute. If the *Status* field of the *write attributes response* command frame was equal to SUCCESS, the updated value is read back. If the *Status* field of the *write attributes response* command frame was not equal to SUCCESS the value is not updated when read back.

Continued…

TSTAT-TC-01G: Global attributes			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
3	TSTAT.S.A*go* , TSTAT.C.A*go*	TH unicasts a ZCL *read attributes* command frame to DUT to read each optional global attribute of this cluster one at a time.	DUT unicasts a ZCL *read attributes response* command frame to TH containing each attribute. If the DUT implements the attribute, the *Status* field will be equal to SUCCESS and the command will contain the requested attribute. If the DUT does not implement the attribute, the *Status* 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	TSTAT.S.A*go* , TSTAT.C.A*go*	TH unicasts a ZCL *write attributes* 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 *write attributes response* 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	TSTAT.S.A*go* , TSTAT.C.A*go*	TH unicasts a ZCL *read attributes* command frame to DUT to read back each attribute written in step 4a.	DUT unicasts a ZCL *read attributes response* command frame to TH containing the requested attribute. If the *Status* field of the *write attributes response* command frame was equal to SUCCESS, the updated value is read back. If the *Status* field of the *write attributes response* command frame was not equal to SUCCESS the value is not updated when read back.

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

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4.3 Server test cases

4.3.1 TSTAT-TC-01S: Attributes with server as DUT

This test case verifies the behavior of the attributes of the *thermostat* cluster server.

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

4.3.1.1 Scope

General:

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

Thermostat cluster (0x0201):

- All non-global attributes

PICS:

- TSTAT.S,
- TSTAT.S.A*m*, TSTAT.S.A*o*

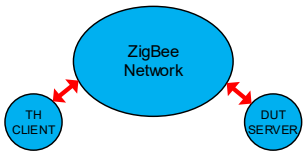
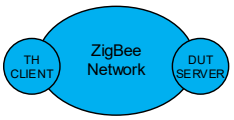
4.3.1.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: • The *thermostat* cluster client.
DUT SERVER		Device under test server: • The *thermostat* cluster server.

4.3.1.3 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.

212 **4.3.1.4 Test preparation**

Add TH CLIENT and DUT SERVER to a ZigBee network	
 *Before*	 *After*

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TSTAT-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 TSTAT-TC-01S preparation ---

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4.3.1.5 Test procedure

TSTAT-TC-01S: Attributes with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
1	TSTAT.S.A*m*	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read each mandatory attribute of this cluster one at a time.	DUT SERVER unicasts a ZCL *read attributes response* 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	TSTAT.S.A*m*	TH CLIENT unicasts a ZCL *write attributes* 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 *write attributes response* 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	TSTAT.S.A*m*	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read back each attribute written in step 2a.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT containing the requested attribute. If the *Status* field of the *write attributes response* command frame was equal to SUCCESS, the updated value is read back. If the *Status* field of the *write attributes response* command frame was not equal to SUCCESS the value is not updated when read back.

Continued…

Commented [be710]: script

TSTAT-TC-01S: Attributes with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
3	TSTAT.S.A*o*	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read each optional attribute of this cluster one at a time.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT containing each attribute. If the DUT SERVER implements the attribute, the *Status* field will be equal to SUCCESS and the command will contain the requested attribute. If the DUT SERVER does not implement the attribute, the *Status* 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	TSTAT.S.A*o*	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the respective default value to each optional attribute of this cluster one at a time.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT for each attribute. 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.

Continued…

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

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

4.3.2 TSTAT-TC-02S: Setpoint Test Cases with server as a DUT

This test case verifies the primary functionality of the *thermostat* cluster server in respect to measuring relative humidity changes.

4.3.2.1 Scope

General:

- *Read attributes* command (0x00)
- *Read attributes response* command (0x01)
- *Write attributes* command (0x02)
- *Write attributes response* command (0x03)

Thermostat cluster (0x0201):

- *AbsMinHeatSetpointLimit* attribute (0x0003)
- *AbsMaxHeatSetpointLimit* attribute (0x0004)
- *AbsMinCoolSetpointLimit* attribute (0x0005)
- *AbsMaxCoolSetpointLimit* attribute (0x0006)
- *HVACSystemTypeConfiguration* attribute (0x0009)
- *LocalTemperatureCalibration* attribute (0x0010)
- *OccupiedCoolingSetpoint* attribute (0x0011)
- *OccupiedHeatingSetpoint* attribute (0x0012)
- *UnoccupiedCoolingSetpoint* attribute (0x0013)
- *UnoccupiedHeatingSetpoint* attribute (0x0014)
- *MinHeatSetpointLimit* attribute (0x0015)
- *MaxHeatSetpointLimit* attribute (0x0016)
- *MinCoolSetpointLimit* attribute (0x0017)
- *MaxCoolSetpointLimit* attribute (0x0018)
- *MinSetpointDeadBand* attribute (0x0019)
- *RemoteSensing* attribute (0x001A)
- *ControlSequenceOfOperation* attribute (0x001B)
- *SystemMode* attribute (0x001C)
- *Setpoint raise/lower* command (0x00)

PICS:

- TSTAT.S
- TSTAT.S.A0003 - TSTAT.S.A0006, TSTAT.S.A0009, TSTAT.S.A0010 - TSTAT.S.A001C, TSTAT.S.C0.Resp

4.3.2.2 Required devices

Designation	Symbol	Description

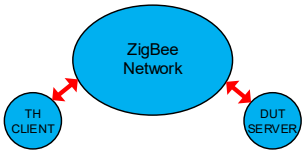
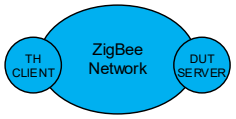
TH CLIENT		Test harness client implementing: • The *thermostat* cluster client.
DUT SERVER		Device under test server: • The *thermostat* cluster server.

252 #### 4.3.2.3 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.

253

254 #### 4.3.2.4 Test preparation

Add TH CLIENT and DUT SERVER to a ZigBee network	
 *Before*	 *After*

255

TSTAT-TC-02S: Setpoint Test Cases 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 TSTAT-TC-02S preparation ---

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257 **4.3.2.5 Test procedure**

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
Setting *LocalTemperatureCalibration*			
1a	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *LocalTemperatureCalibration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *LocalTemperatureCalibration* attribute has a value in the range 0xE7 – 0x19.
1b	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *LocalTemperatureCalibration* attribute to a different but valid value from the range 0xE7 – 0x19.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
1c	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *LocalTemperatureCalibration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *LocalTemperatureCalibration* attribute has the updated value.
1d	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *LocalTemperatureCalibration* attribute to a value above the valid range.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
1e	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *LocalTemperatureCalibration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *LocalTemperatureCalibration* attribute has the unmodified value from step 1c.
1f	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *LocalTemperatureCalibration* attribute to a value below the valid range.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).

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TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
1g	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *LocalTemperatureCalibration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *LocalTemperatureCalibration* attribute has the unmodified value from step 1c.
1h	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *LocalTemperatureCalibration* attribute to a value 0xE7.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
1i	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *LocalTemperatureCalibration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *LocalTemperatureCalibration* attribute has the value 0xE7.
1j	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *LocalTemperatureCalibration* attribute to a value 0x19.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
1k	TSTAT.S.A0010	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *LocalTemperatureCalibration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *LocalTemperatureCalibration* attribute has the value 0x19.
Setting *OccupiedCoolingSetpoint*			
2a	TSTAT.S.A0005	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *AbsMinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *AbsMinCoolSetpointLimit* attribute has a value in the range 0x954d – 0x7fff.

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
2b	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has a value in the range 0x954d – 0x7fff, and greater than the *AbsMinCoolSetpointLimit* as read in step 2a.
2c	TSTAT.S.A0006	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *AbsMaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *AbsMaxCoolSetpointLimit* attribute has a value in the range 0x954d – 0x7fff.
2d	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has a value in the range 0x954d – 0x7fff, and greater than the *AbsMaxCoolSetpointLimit* as read in step 2c.
2e	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedCoolingSetpoint* attribute has a value in the range *MinCoolSetpointLimit* – *MaxCoolSetpointLimit* as read in step 2b and 2d.
2f	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to a different but valid value from the range *MinCoolSetpointLimit* – *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

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TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
2g	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedCoolingSetpoint* attribute has the updated value.
2h	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to a value above *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
2i	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedCoolingSetpoint* attribute has the unmodified value from step 2g.
2j	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to a value below the *MinCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
2k	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedCoolingSetpoint* attribute has the unmodified value from step 2g.
2l	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to a value *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
2m	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedCoolingSetpoint* attribute has the value *MaxCoolSetpointLimit*.
2n	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to a value *MinCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
2o	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedCoolingSetpoint* attribute has the value *MinCoolSetpointLimit*.
2p	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to a value from the mid-part of the range *MinCoolSetpointLimit* – *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
Setting *OccupiedHeatingSetpoint*			
3a	TSTAT.S.A0003	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *AbsMinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *AbsMinHeatSetpointLimit* attribute has a value in the range 0x954d – 0x7fff.
3b	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has a value in the range 0x954d – 0x7fff, and greater than the *AbsMinHeatSetpointLimit* as read in step 3a.

Commented [be713]: Step added, otherwise the DeadBand setting would kick in and mess up the test for UnoccupiedHeatingSetpoint

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
3c	TSTAT.S.A0004	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *AbsMaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *AbsMaxHeatSetpointLimit* attribute has a value in the range 0x954d – 0x7fff.
3d	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has a value in the range 0x954d – 0x7fff, and greater than the *AbsMaxHeatSetpointLimit* as read in step 3c.
3e	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has a value in the range 0x0a – 0x19.
3f	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedHeatingSetpoint* attribute has a value in the range *MinHeatSetpointLimit* – *MaxHeatSetpointLimit* as read in step 3b and 3d, and lower than the *OccupiedCoolingSetpoint* by at least the value of the *MinSetpointDeadBand* as read in step 3e; if the optional *MinSetpointDeadBand* attribute is not supported, the default value of 0x19 (2.5°C) is used.
3g	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to a different but valid value from the range *MinHeatSetpointLimit* – *MaxHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

Commented [be714]: script

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
3h	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedHeatingSetpoint* attribute has the updated value.
3i	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to a value above *MaxHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
3j	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedHeatingSetpoint* attribute has the unmodified value from step 3g.
3k	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to a value below the *MinHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
3l	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedHeatingSetpoint* attribute has the unmodified value from step 3g.
3m	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to a value *MaxHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
3n	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedHeatingSetpoint* attribute has the value *MaxHeatSetpointLimit*.
3o	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to a value *MinHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
3p	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *OccupiedHeatingSetpoint* attribute has the value *MinHeatSetpointLimit*.
Setting *UnoccupiedCoolingSetpoint* ***Test step conditional on the optional* UnoccupiedCoolingSetpoint *attribute being supported***			
4a	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedCoolingSetpoint* attribute has a value in the range *MinCoolSetpointLimit* – *MaxCoolSetpointLimit* as read in step 2b and 2d.
4b	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedCoolingSetpoint* attribute to a different but valid value from the range *MinCoolSetpointLimit* – *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

Commented [be715]: script

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
4c	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedCoolingSetpoint* attribute has the updated value.
4d	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedCoolingSetpoint* attribute to a value above *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
4e	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedCoolingSetpoint* attribute has the unmodified value from step 4c.
4f	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedCoolingSetpoint* attribute to a value below the *MinCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
4g	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedCoolingSetpoint* attribute has the unmodified value from step 4c.
4h	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedCoolingSetpoint* attribute to a value *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
4i	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedCoolingSetpoint* attribute has the value *MaxCoolSetpointLimit*.
4j	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedCoolingSetpoint* attribute to a value *MinCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
4k	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedCoolingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedCoolingSetpoint* attribute has the value *MinCoolSetpointLimit*.
4l	TSTAT.S.A0013	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedCoolingSetpoint* attribute to a value from the mid-part of the range *MinCoolSetpointLimit* – *MaxCoolSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
Setting *UnoccupiedHeatingSetpoint* ***Test step conditional on the optional* UnoccupiedHeatingSetpoint *attribute being supported***			

Commented [be716]: Step added, otherwise the DeadBand setting would kick in and mess up the test for UnoccupiedHeatingSetpoint

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
5a	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedHeatingSetpoint* attribute has a value in the range *MinHeatSetpointLimit* – *MaxHeatSetpointLimit* as read in step 3b and 3d, and lower than the *UnoccupiedCoolingSetpoint* by at least the value of the *MinSetpointDeadBand* as read in step 3e; if the optional *MinSetpointDeadBand* attribute is not supported, the default value of 0x19 (2.5°C) is used.
5b	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedHeatingSetpoint* attribute to a different but valid value from the range *MinHeatSetpointLimit* – *MaxHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
5c	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedHeatingSetpoint* attribute has the updated value.
5d	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedHeatingSetpoint* attribute to a value above *MaxHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
5e	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedHeatingSetpoint* attribute has the unmodified value from step 5c.

Commented [be717]: script

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
5f	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedHeatingSetpoint* attribute to a value below the *MinHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
5g	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedHeatingSetpoint* attribute has the unmodified value from step 5c.
5h	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedHeatingSetpoint* attribute to a value *MaxHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
5i	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedHeatingSetpoint* attribute has the value *MaxHeatSetpointLimit*.
5j	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *UnoccupiedHeatingSetpoint* attribute to a value *MinHeatSetpointLimit*.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
5k	TSTAT.S.A0014	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *UnoccupiedHeatingSetpoint* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *UnoccupiedHeatingSetpoint* attribute has the value *MinHeatSetpointLimit*.
Setting *MinHeatSetpointLimit* ***Test step conditional on the optional* MinHeatSetpointLimit *attribute being supported***			

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
6a	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has a value in the range 0x954d – 0x7fff and greater than or equal to *AbsMinHeatSetpointLimit* as read in step 3a.
6b	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinHeatSetpointLimit* attribute to a different but valid value from the range 0x954d – 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
6c	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has the updated value.
6d	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinHeatSetpointLimit* attribute to a value above 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
6e	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has the unmodified value from step 6c.
6f	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinHeatSetpointLimit* attribute to a value below 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
6g	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has the unmodified value from step 6c.

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TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
6h	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinHeatSetpointLimit* attribute to a value 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
6i	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has the value 0x7fff.
6j	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinHeatSetpointLimit* attribute to a value 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
6k	TSTAT.S.A0015	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinHeatSetpointLimit* attribute has the value 0x954d.
Setting *MaxHeatSetpointLimit* ***Test step conditional on the optional* MaxHeatSetpointLimit *attribute being supported***			
7a	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has a value in the range 0x954d – 0x7fff and greater than or equal to *AbsMaxHeatSetpointLimit* as read in step 3c.
7b	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxHeatSetpointLimit* attribute to a different but valid value from the range 0x954d – 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

Commented [be719]: script

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
7c	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has the updated value.
7d	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxHeatSetpointLimit* attribute to a value above 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
7e	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has the unmodified value from step 7c.
7f	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxHeatSetpointLimit* attribute to a value below 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
7g	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has the unmodified value from step 7c.
7h	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxHeatSetpointLimit* attribute to a value 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
7i	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has the value 0x7fff.

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
7j	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxHeatSetpointLimit* attribute to a value 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
7k	TSTAT.S.A0016	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxHeatSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxHeatSetpointLimit* attribute has the value 0x954d.
Setting *MinCoolSetpointLimit* ***Test step conditional on the optional* MinCoolSetpointLimit *attribute being supported***			
8a	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has a value in the range 0x954d – 0x7fff and greater than or equal to *AbsMinCoolSetpointLimit* as read in step 3a.
8b	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinCoolSetpointLimit* attribute to a different but valid value from the range 0x954d – 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
8c	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has the updated value.
8d	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinCoolSetpointLimit* attribute to a value above 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).

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TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
8e	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has the unmodified value from step 8c.
8f	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinCoolSetpointLimit* attribute to a value below 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
8g	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has the unmodified value from step 8c.
8h	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinCoolSetpointLimit* attribute to a value 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
8i	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has the value 0x7fff.
8j	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinCoolSetpointLimit* attribute to a value 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
8k	TSTAT.S.A0017	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinCoolSetpointLimit* attribute has the value 0x954d.
Setting *MaxCoolSetpointLimit* ***Test step conditional on the optional* MaxCoolSetpointLimit *attribute being supported***			

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
9a	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has a value in the range 0x954d – 0x7fff and greater than or equal to *AbsMaxCoolSetpointLimit* as read in step 3c.
9b	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxCoolSetpointLimit* attribute to a different but valid value from the range 0x954d – 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
9c	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has the updated value.
9d	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxCoolSetpointLimit* attribute to a value above 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
9e	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has the unmodified value from step 9c.
9f	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxCoolSetpointLimit* attribute to a value below 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).

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TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
9g	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has the unmodified value from step 9c.
9h	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxCoolSetpointLimit* attribute to a value 0x7fff.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
9i	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has the value 0x7fff.
9j	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MaxCoolSetpointLimit* attribute to a value 0x954d.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
9k	TSTAT.S.A0018	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MaxCoolSetpointLimit* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MaxCoolSetpointLimit* attribute has the value 0x954d.
Setting *MinSetpointDeadBand* ***Test step conditional on the optional* MinSetpointDeadBand *attribute being supported***			
10a	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has a value in the range 0x0a – 0x19.
10b	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinSetpointDeadBand* attribute to a different but valid value from the range 0x0a – 0x19.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

Commented [be722]: script

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
10c	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has the updated value.
10d	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinSetpointDeadBand* attribute to a value above 0x19.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
10e	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has the unmodified value from step 10c.
10f	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinSetpointDeadBand* attribute to a value below 0x0a.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
10g	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has the unmodified value from step 10c.
10h	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinSetpointDeadBand* attribute to a value 0x19.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
10i	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has the value 0x19.

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
10j	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *MinSetpointDeadBand* attribute to a value 0x0a.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
10k	TSTAT.S.A0019	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *MinSetpointDeadBand* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *MinSetpointDeadBand* attribute has the value 0x0a.
Setting *RemoteSensing* ***Test step conditional on the optional* RemoteSensing *attribute being supported***			
11a	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *RemoteSensing* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *RemoteSensing* attribute has a value lower than 0x08.
11b	TSTAT.S.A001A	TH CLIENT XORs the 3lsb of the received value of the *RemoteSensing* attribute. TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *RemoteSensing* attribute to a value being the result of the XOR operation above.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
11c	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *RemoteSensing* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *RemoteSensing* attribute has the updated value.
11d	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *RemoteSensing* attribute to a value 0x0f.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).

Commented [be723]: Why like that? For 0x01, 0x00 it will not result in a change.

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
11e	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *RemoteSensing* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *RemoteSensing* attribute has the value as read at step 11c.
11f	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *RemoteSensing* attribute to a value 0x07.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
11g	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *RemoteSensing* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *RemoteSensing* attribute the value 0x07.
11h	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *RemoteSensing* attribute to a value 0x00.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
11i	TSTAT.S.A001A	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *RemoteSensing* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *RemoteSensing* attribute the value 0x00.
Setting *ControlSequenceOfOperation*			
12a	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *ControlSequenceOfOperation* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *ControlSequenceOfOperation* attribute has a value lower than 0x06.
12b	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *ControlSequenceOfOperation* attribute to a different but valid value from the range 0x00 – 0x05.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
12c	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *ControlSequenceOfOperation* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *ControlSequenceOfOperation* attribute has the updated value.
12d	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *ControlSequenceOfOperation* attribute to a value 0x0f.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
12e	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *ControlSequenceOfOperation* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *ControlSequenceOfOperation* attribute has the value as read at step 12c.
12f	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *ControlSequenceOfOperation* attribute to a value 0x05.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
12g	TSTAT.S.A001B	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *ControlSequenceOfOperation* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *ControlSequenceOfOperation* attribute the value 0x05.
Setting *SystemMode* ***Consider PIXIT item as not all of the 10 system modes will be supported by each DUT***			
13a	TSTAT.S.A001C	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *SystemMode* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *SystemMode* attribute has a value lower than 0x0A.

Commented [be724]: Why is the min of the range not tested?

Commented [be725]:

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
13b	TSTAT.S.A001C	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *SystemMode* attribute to each of the possible values within the valid range 0x00 – 0x09 in turn. After each write action, TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *SystemMode* attribute.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT. If the DUT supports the written value, the *status* field of the ZCL *write attributes response* equal to 0x00 (SUCCESS), and the *SystemMode* value in the ZCL *read attributes* command is set to the updated value. If the DUT does NOT support the written value, the *status* field of the ZCL *write attributes response* equal to 0x87 (INVALID_VALUE), and the *SystemMode* value in the ZCL *read attributes* command is unmodified.
13c	TSTAT.S.A001C	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *SystemMode* attribute a value 0x0A.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x87 (INVALID_VALUE).
13d	TSTAT.S.A001C	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *SystemMode* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. *SystemMode* attribute has its last value from step 13b.
Setpoint raise/lower command			
14a	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to its default value 0x07d0 (20°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
14b	TSTAT.S.C00.Resp	TH CLIENT unicasts a *setpoint raise/lower* command frame of the *thermostat* cluster to DUT SERVER with: - *mode* field set to Heat (0x00), - *amount* field set to 0xE2 (-30 units = -3 degrees).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
14c	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedHeatingSetpoint* attribute has the updated value 0x06A4 (17°C).
15a	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to its default value 0x07d0 (20°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
15b	TSTAT.S.C00.Resp	TH CLIENT unicasts a *setpoint raise/lower* command frame of the *thermostat* cluster to DUT SERVER with: - *mode* field set to Heat (0x00), - *amount* field set to 0x1E (+30 units = +3 degrees).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
15c	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedHeatingSetpoint* attribute has the updated value 0x08fc (23°C).
16a	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to its default value 0x0a28 (26°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
16b	TSTAT.S.C00.Resp	TH CLIENT unicasts a *setpoint raise/lower* command frame of the *thermostat* cluster to DUT SERVER with: - *mode* field set to Cool (0x01), - *amount* field set to 0xE2 (-30 units = -3 degrees).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
16c	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedCoolingSetpoint* attribute has the updated value 0x08fc (23°C).
17a	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to its default value 0x0a28 (26°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
17b	TSTAT.S.C00.Resp	TH CLIENT unicasts a *setpoint raise/lower* command frame of the *thermostat* cluster to DUT SERVER with: - *mode* field set to Cool (0x01), - *amount* field set to 0x1E (+30 units = +3 degrees).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
17c	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedCoolingSetpoint* attribute has the updated value 0x0b54 (29°C).
18a	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to its default value 0x0a28 (26°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
18b	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to its default value 0x07d0 (20°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
18c	TSTAT.S.C00.Resp	TH CLIENT unicasts a *setpoint raise/lower* command frame of the *thermostat* cluster to DUT SERVER with: - *mode* field set to Both (0x02), - *amount* field set to 0xE2 (-30 units = -3 degrees).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
18d	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedCoolingSetpoint* attribute has the updated value 0x08fc (23°C).
18e	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedHeatingSetpoint* attribute has the updated value 0x06A4 (17°C).
19a	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedCoolingSetpoint* attribute to its default value 0x0a28 (26°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
19b	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *OccupiedHeatingSetpoint* attribute to its default value 0x07d0 (20°C).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
19c	TSTAT.S.C00.Resp	TH CLIENT unicasts a *setpoint raise/lower* command frame of the *thermostat* cluster to DUT SERVER with: - *mode* field set to Both (0x02), - *amount* field set to 0x1E (+30 units = +3 degrees).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).

TSTAT-TC-02S: Setpoint Test Cases with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
19d	TSTAT.S.A0012	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedHeatingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedHeatingSetpoint* attribute has the updated value 0x08fc (23°C).
19e	TSTAT.S.A0011	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *OccupiedCoolingSetpoint*.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT; the *OccupiedCoolingSetpoint* attribute has the updated value 0x0b54 (29°C).
HVACSystemTypeConfiguration attribute			
20a	TSTAT.S.A0009	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *HVACSystemTypeConfiguration* attribute to a value 0b00000100 (Heat Stage 2).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
20b	TSTAT.S.A0009	TH CLIENT unicasts a ZCL *read attributes* command frame to DUT SERVER to read the *HVACSystemTypeConfiguration* attribute.	DUT SERVER unicasts a ZCL *read attributes response* command; the *HVACSystemTypeConfiguration* attribute has a value 0b00000100 (Heat Stage 2).

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

4.3.3 TSTAT-TC-03S: Schedule test cases with server as a DUT

This test case verifies the primary functionality of the *thermostat* cluster server in respect to storing and updating schedules.

4.3.3.1 Scope

General:

- *Write attributes* command (0x02)
- *Write attributes response* command (0x03)

Thermostat cluster (0x0201):

- *TemperatureSetpointHold* attribute (0x0023)
- *TemperatureSetpointHoldDuration* attribute (0x0024)
- *set weekly schedule* command (0x01)

- *get weekly schedule* command (0x02)
- *get weekly schedule response* command (0x00)
- *clear weekly schedule* command (0x03)
- *get relay status log* command (0x04)
- *get relay status log response* command (0x01)

PICS:

- TSTAT.S
- TSTAT.S.A0023, TSTAT.S.A0024,
- TSTAT.S.C01.Rsp, TSTAT.S.C02.Rsp, TSTAT.S.C03.Rsp, TSTAT.S.C04.Rsp, TSTAT.S.C00.Tx, TSTAT.S.C01.Tx

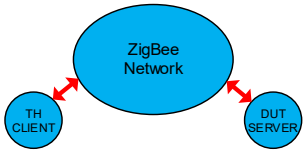
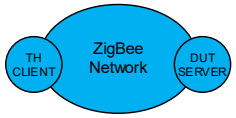
4.3.3.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: • The *thermostat* cluster client.
DUT SERVER		Device under test server: • The *thermostat* cluster server.

4.3.3.3 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.

4.3.3.4 Test preparation

Add TH CLIENT and DUT SERVER to a ZigBee network	
 *Before*	 *After*

TSTAT-TC-03S: Schedule test cases with server as a 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 TSTAT-TC-03S preparation ---

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286 **4.3.3.5 Test procedure**

TSTAT-TC-03S: Schedule test cases with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
1	TSTAT.S.A0023	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *TemperatureSetpointHold* attribute to value 0x01, enabling temperature setpoint hold.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
2a	TSTAT.S.A0023 TSTAT.S.A0024	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER to write the *TemperatureSetpointHoldDuration* attribute to value 0x0001.	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
2b	TSTAT.S.A0023 TSTAT.S.A0024	-	Verify that the *TemperatureSetpointHold* lasts for 1 minute after the DUT receives the updated *TemperatureSetpointHoldDuration* value.
3	TSTAT.S.C01.Rsp	TH CLIENT unicasts a *set weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted and carrying correct parameter values, with: - *Day of week for sequence* set to the current week day; - *Mode for Sequence* field set to 0x01 (Heat mode only).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). If the *set weekly schedule* command frame is not accepted by the DUT SERVER, the DUT SERVER should unicasts a ZCL default response command frame to TH CLIENT with the status field equal to the appropriate value: 0x89 (INSUFFICIENT_SPACE) if the total number of transitions sent is greater than what the DUT SERVER supports; 0x87 (INVALID_VALUE) if any of the set points sent in the entire sequence is out of range of w.r.t. DUT SERVER's absolute min/max setpoint limit.

TSTAT-TC-03S: Schedule test cases with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
4	TSTAT.S.C02.Rsp TSTAT.S.C00.Tx	TH CLIENT unicasts a *get weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted with: - *Days to return* set to the current week day; - *Mode to return* set to 0x01 (Heat mode only).	DUT SERVER unicasts a ZCL *get weekly schedule response* command frame to TH CLIENT, carrying the data as in the *set weekly schedule* command of step 3.
5	TSTAT.S.C01.Rsp	TH CLIENT unicasts a *set weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted and carrying correct parameter values, with: - *Day of week for sequence* set to the current week day; - *Mode for Sequence* field set to 0x02 (Cool mode only).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). If the *set weekly schedule* command frame is not accepted by the DUT SERVER, the DUT SERVER should unicasts a ZCL default response command frame to TH CLIENT with the status field equal to the appropriate value: 0x89 (INSUFFICIENT_SPACE) if the total number of transitions sent is greater than what the DUT SERVER supports; 0x87 (INVALID_VALUE) if any of the set points sent in the entire sequence is out of range w.r.t. DUT SERVER's absolute min/max setpoint limit.
6	TSTAT.S.C02.Rsp TSTAT.S.C00.Tx	TH CLIENT unicasts a *get weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted with: - *Days to return* set to the current week day; - *Mode to return* set to 0x02 (Cool mode only).	DUT SERVER unicasts a ZCL *get weekly schedule response* command frame to TH CLIENT, carrying the data as in the *set weekly schedule* command of step 5, in addition to the data from command of step 3.

Commented [be726]: Since there was no schedule cleaning anyway, and IF heating and cooling can overlap.
????

TSTAT-TC-03S: Schedule test cases with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
7	TSTAT.S.C01.Rsp	TH CLIENT unicasts a *set weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted and carrying correct parameter values, with: - *Day of week for sequence* set to the current week day; - *Mode for Sequence* field set to 0x03 (Heat and cool mode).	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). If the *set weekly schedule* command frame is not accepted by the DUT SERVER, the DUT SERVER should unicasts a ZCL default response command frame to TH CLIENT with the status field equal to the appropriate value: 0x89 (INSUFFICIENT_SPACE) if the total number of transitions sent is greater than what the DUT SERVER supports; 0x87 (INVALID_VALUE) if any of the set points sent in the entire sequence is out of range w.r.t. DUT SERVER's absolute min/max setpoint limit; or 0x85 (INVALID_FIELD), if DUT SERVER cannot handle incoming command with multiple days and/or multiple modes within one command.
8	TSTAT.S.C02.Rsp TSTAT.S.C00.Tx	TH CLIENT unicasts a *get weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted with: - *Days to return* set to the current week day; - *Mode to return* set to 0x03 (Cool mode only).	DUT SERVER unicasts a ZCL *get weekly schedule response* command frame to TH CLIENT, carrying the data as in the *set weekly schedule* command of step 7.

Commented [be727]: PIXIT?

Commented [be728]: What happens is not all schedules requested fit?

TSTAT-TC-03S: Schedule test cases with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
9	TSTAT.S.C01.Rsp	TH CLIENT unicasts a *set weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted and carrying correct parameter values, with: - *Number of Transitions for Sequence* set to 2, - *Day of week for sequence* set to the current week day; - *Mode for Sequence* field bitmask set to 0x01 (Heat Mode), - *Transition Time 1* set to 1 minute (0x0001), *Heat Set Point 1* set to a valid value, - *Transition Time 2* set to 2 minutes (0x0002), *Heat Set Point 2* set to a valid value.	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to ?. From the ZHA test spec: "The DUT does not accept the Set Weekly Schedule Command, verifying that the device supports 1 daily transition." Should it then keep the previous schedule? Test it?
10	TSTAT.S.C01.Rsp	TH CLIENT unicasts a *set weekly schedule* command frame of the *thermostat* cluster to DUT SERVER, correctly formatted and carrying correct parameter values, with: - *Number of Transitions for Sequence* set to 1, - *Day of week for sequence* set to the current week day and the following day; - *Mode for Sequence* field bitmask set to 0x01 (Heat Mode), - *Transition Time 1* set to 1 minute (0x0001), *Heat Set Point 1* set to a valid value.	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to ?. From the ZHA test spec: "The DUT does not accept the Set Weekly Schedule Command, verifying that the device supports 1 weekly transition." Should it then keep the previous schedule?

Commented [be729]: Why?

Commented [be730]: Why?

TSTAT-TC-03S: Schedule test cases with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
11	TSTAT.S.C03.Rsp	TH CLIENT unicasts a payloadless *clear weekly schedule* command frame of the *thermostat* cluster to DUT SERVER.	DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). From the ZHA test spec "If received successfully, the DUT clears its stored weekly schedule." Does it need to respond with the default response? Clear weekly schedule is actually optional (according to the spec): could it fail?
12	TSTAT.S.C04.Rsp TSTAT.S.C01.Tx	TH CLIENT unicasts a payloadless *get relay status log* command frame of the *thermostat* cluster to DUT SERVER.	DUT SERVER unicasts a ZCL *get relay status log response* command frame to TH CLIENT, correctly formatted?

Commented [be731]: Why?

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

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4.3.4 TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit functionality with server as DUT

This test case verifies the primary functionality of the *thermostat* cluster server in respect to storing and updating schedules.

4.3.4.1 Scope

General:

- *Read attributes* command (0x00)
- *Read attributes response* command (0x01)
- *Report attributes* command (0x0a)

Thermostat cluster (0x0201):

- *LocalTemperature* attribute (0x0010)
- *SystemMode* attribute (0x001C)
- *PICoolingDemand* attribute (0x0007)
- *PIHeatingDemand* attribute (0x0008)
- *OccupiedCoolingSetpoint* attribute (0x0011)
- *OccupiedHeatingSetpoint* attribute (0x0012)

PICS:

- TSTAT.S
- TSTAT.S.A0007, TSTAT.S.A0008, TSTAT.S.A0010, TSTAT.S.A0011, TSTAT.S.A0012, TSTAT.S.A001C,

4.3.4.2 Required devices

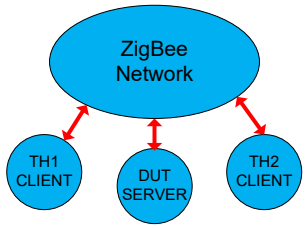
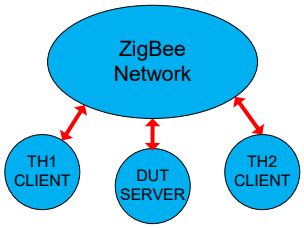
Designation	Symbol	Description
TH1 HVAC UNIT		Test harness implementing: • The *thermostat* cluster client being an HVAC unit.
DUT		Device under test server: • The *thermostat* cluster server • also implementing *temperature measurement* cluster client
TH2 TEMPERATURE SENSOR		Test harness implementing: • The *thermostat* cluster client being a temperature sensor.

310 #### 4.3.4.3 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.

311

312 #### 4.3.4.4 Test preparation

Add TH1, TH2 and DUT to a ZigBee network	
	
Before	*After*

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TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit 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 TH1, TH2 and DUT.	TH1, TH2 and DUT are powered on.
P3	Join TH1, TH2 and DUT to a ZigBee network.	Observe appropriate communication between TH1, TH2, DUT and any other relevant node on the ZigBee network.
P4	Establish a binding for the *thermostat* cluster on the DUT (sending Bind_req from the TH1 HVAC UNIT or using finding&binding, as appropriate).	Observe appropriate communication between TH1 and DUT.
P5	Establish a binding for the *thermostat* cluster on the TH2 TEMPERATURE SENSOR (sending Bind_req from the TH1 or using finding&binding, as appropriate) to the DUT client.	Observe appropriate communication between TH2 and DUT.

Commented [be732]: Set the *RemoteSensing* to 0x01 (local temp remote)?

TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit functionality with server as DUT		
Item	**Preparation Step**	**Observation**
P6	TH1 unicasts a ZCL *write attributes* command frame to DUT to set the following attributes of the *thermostat* cluster: • **0x0011** *OccupiedCoolingSetpoint* = 22°C (0x0898) • **0x0012** *OccupiedHeatingSetpoint* = 18°C (0x0708) • **0x0015** *MinHeatSetpointLimit* = 13°C (0x0514) • **0x0016** *MaxHeatSetpointLimit* = 27°C (0x0A8C) • **0x0017** *MinCoolSetpointLimit* = 13°C (0x0514) • **0x0018** *MaxCoolSetpointLimit* = 27°C (0x0A8C) • **0x001C** *SystemMode* = OFF (0x00).	DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT for each *write attributes* command, with the *status* field equal to 0x00 (SUCCESS).

--- End of test case TSTAT-TC-04S preparation ---

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315 **4.3.4.5 Test procedure**

TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit functionality with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
1	TSTAT.S.A001C	TH2 TEMPERATURE SENSOR starts unicasting to the DUT a ZCL *attribute reporting* command carrying the *LocalTemperature* attribute (**0x0000**) of the *thermostat* cluster. The *LocalTemperature* value sent shall be between the *OccupiedCoolingSetpoint* and *OccupiedHeatingSetpoint* of the DUT, as set in step P6 above. TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *SystemMode* attribute of the *thermostat* cluster.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *SystemMode* attribute set to 0x00 (OFF).
2	TSTAT.S.A0007.Report.Tx TSTAT.S.A0008.Report.Tx	TH2 TEMPERATURE SENSOR unicasts to the DUT a ZCL *attribute reporting* command carrying the *LocalTemperature* attribute (**0x0000**) of the *thermostat* cluster, with the value above the *OccupiedCoolingSetpoint* from step P6 above.	DUT unicasts a ZCL *attribute reporting* command frame to the TH1 HVAC UNIT with the (0x0007) *PICoolingDemand* attribute with a value greater than 0% (0x64 for 100%) and (same or separate ZCL *attribute reporting* command) (0x0008) *PIHeatingDemand* attribute with a value of 0% (0x00).
3	TSTAT.S.A001C	TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *SystemMode* attribute of the *thermostat* cluster.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *SystemMode* attribute set to 0x03 (Cool).

Commented [be733]:

TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit functionality with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
4	TSTAT.S.A0007.Report.Tx TSTAT.S.A0008.Report.Tx	TH2 TEMPERATURE SENSOR unicasts to the DUT a ZCL *attribute reporting* command carrying the *LocalTemperature* attribute (**0x0000**) of the *thermostat* cluster, with the value below the *OccupiedHeatingSetpoint* from step P6 above.	DUT unicasts a ZCL *attribute reporting* command frame to the TH1 HVAC UNIT with the *PIHeatingDemand* attribute (0x0008) with a value greater than 0% (0x64 for 100%) and (same or separate ZCL *attribute reporting* command) *PICoolingDemand* attribute (0x0007) with a value of 0% (0x00).
5	TSTAT.S.A001C	TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *SystemMode* attribute of the *thermostat* cluster.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *SystemMode* attribute set to 0x04 (Heat).
6	TSTAT.S.A0007.Report.Tx TSTAT.S.A0008.Report.Tx	TH2 TEMPERATURE SENSOR starts unicasting to the DUT a ZCL *attribute reporting* command carrying the *LocalTemperature* attribute (**0x0000**) of the *thermostat* cluster. The *LocalTemperature* value sent shall be between the *OccupiedCoolingSetpoint* and *OccupiedHeatingSetpoint* of the DUT, as set in step P6 above.	DUT unicasts a ZCL *attribute reporting* command frame to the TH1 HVAC UNIT with the *PIHeatingDemand* attribute (0x0008) with a value of 0% (0x64 for 100%) and (same or separate ZCL *attribute reporting* command) *PICoolingDemand* attribute (0x0007) with a value of 0% (0x00).
7	TSTAT.S.A001C	TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *SystemMode* attribute of the *thermostat* cluster.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *SystemMode* attribute set to 0x00 (OFF).

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TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit functionality with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
8	TSTAT.S.A0011	Via UI on the DUT, the DUT's *OccupiedCoolingSetpoint* is set to 13°C (0x0514). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedCoolingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedCoolingSetpoint* attribute set to 13°C (0x0514).
9	TSTAT.S.A0011	Via UI on the DUT, the DUT's *OccupiedCoolingSetpoint* is set to 12°C (0x04B0). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedCoolingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedCoolingSetpoint* attribute in NOT set to 12°C (0x04B0).
10	TSTAT.S.A0011	Via UI on the DUT, the DUT's *OccupiedCoolingSetpoint* is set to 27°C (0x0A8C). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedCoolingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedCoolingSetpoint* attribute set to 27°C (0x0A8C).
11	TSTAT.S.A0011	Via UI on the DUT, the DUT's *OccupiedCoolingSetpoint* is set to 28°C (0x0AF0). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedCoolingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedCoolingSetpoint* attribute is NOT set to 28°C (0x0AF0).

TSTAT-TC-04S: Thermostat cluster with separate temperature sensor and HVAC unit functionality with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
12	TSTAT.S.A0012	Via UI on the DUT, the DUT's *OccupiedHeatingSetpoint* is set to 13°C (0x0514). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedHeatingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedHeatingSetpoint* attribute is set to 13°C (0x0514).
13	TSTAT.S.A0012	Via UI on the DUT, the DUT's *OccupiedHeatingSetpoint* is set to 12°C (0x04B0). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedHeatingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedHeatingSetpoint* attribute is NOT set to 12°C (0x04B0).
14	TSTAT.S.A0012	Via UI on the DUT, the DUT's *OccupiedHeatingSetpoint* is set to 27°C (0x0A8C). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedHeatingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedHeatingSetpoint* attribute is set to 27°C (0x0A8C)
15	TSTAT.S.A0012	Via UI on the DUT, the DUT's *OccupiedHeatingSetpoint* is set to 28°C (0x0AF0). TH1 unicasts a ZCL *read attributes* command frame to DUT to read the *OccupiedHeatingSetpoint* attribute of the DUT.	DUT unicasts a ZCL *read attributes response* command frame to TH1 with the *status* field equal to 0x00 (SUCCESS) and the *OccupiedHeatingSetpoint* attribute is NOT set to 28°C (0x0AF0).

--- End of test case TSTAT-TC-04S ---

4.3.5 TSTAT-TC-05S: Scenes functionality with server as DUT (!!!)

This test case verifies the scenes functionality of the *thermostat* cluster server.

4.3.5.1 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)
- *Get group membership* command (0x02)
- *Get group membership response* command (0x02)
- *Remove all groups* command (0x04)

Scenes cluster (0x0005):

- *Remove all scenes* command (0x03)
- *Remove all scenes response* command (0x03)
- *Store scene* command (0x04)
- *Store scene response* command (0x04)
- *Recall scene* command (0x05)

Thermostat cluster (0x0201):

- *OccupiedCoolingSetpoint* attribute (0x0011)
- *OccupiedHeatingSetpoint* attribute (0x0012)
- *SystemMode* attribute (0x001C)

PICS:

- G.S, S.S, OO.S
- G.S.C00.Rsp, G.S.C02.Rsp-G.S.C04.Rsp
- G.S.C00.Tx, G.S.C02.Tx, G.S.C03.Tx
- S.S.C04.Rsp, S.S.C05.Rsp
- S.S.C04.Tx
- TSTAT.S.A0011, TSTAT.S.A0011.Scene, TSTAT.S.A0012, TSTAT.S.A0012.Scene, TSTAT.S.A001C, TSTAT.S.A001C.Scene

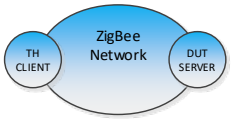
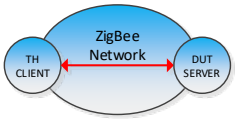
4.3.5.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: • The *groups* cluster client, • The *scenes* cluster client and • The *thermostat* cluster client.
DUT SERVER		Device under test server implementing: • The *groups* cluster server, • The *scenes* cluster server and • The *thermostat* cluster server.

4.3.5.3 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.

353 #### 4.3.5.4 Test preparation

Link TH CLIENT with DUT SERVER	
	
Before	*After*

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TSTAT-TC-05S: Scenes 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 TSTAT-TC-05S preparation ---

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357 #### 4.3.5.5 Test procedure

TSTAT-TC-05S: Scene functionality with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT Pass Verification**
1a	G.S.C04.Rsp	TH CLIENT unicasts a ZCL *remove all groups* command frame to DUT SERVER.	If requested, DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS).
1b	G.S.C02.Rsp, G.S.C02.Tx	TH CLIENT unicasts a ZCL *get group membership* command frame to DUT SERVER with the *group count* field set to 0x00.	DUT SERVER unicasts a ZCL *get group membership response* command frame with the *group count* field equal to 0x00.
1c	G.S.C00.Rsp, G.S.C00.Tx	TH CLIENT unicasts ZCL *add group* command to DUT SERVER, with the *group ID* field set to 0x0001.	DUT SERVER unicasts a ZCL *add group response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS) and the *group ID* field equal to 0x0001.
2	S.S.C03.Rsp, S.S.C03.Tx	TH CLIENT unicasts a ZCL *remove all scenes* command frame to DUT SERVER with the *group ID* field set to 0x0001.	DUT SERVER unicasts a ZCL *remove all scenes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS) and the *group ID* field equal to 0x0001.
3a	TSTAT.S.A0011, TSTAT.S.A0012, TSTAT.S.A001C	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER, to set: - *OccupiedCoolingSetpoint* attribute to 0x06a4 (17°C); - *OccupiedHeatingSetpoint* attribute to 0x07d0 (20°C); - *SystemMode* attribute to 0x01 (Auto).	If requested, DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). DUT SERVER starts adapting the temperature.
3b	TSTAT.S.A0011.Scene, TSTAT.S.A0012.Scene, TSTAT.S.A001C.Scene, S.S.C04.Rsp, S.S.C04.Tx	TH CLIENT unicasts a ZCL *store scene* command frame to DUT SERVER with the *group ID* field set to 0x0001 and the *scene ID* field set to 0x01.	DUT SERVER unicasts a ZCL *store scene response* command frame to TH CLIENT with the *status* field set to 0x00 (SUCCESS), the *group ID* field set to 0x0001 and the *scene ID* field set to 0x01.

TSTAT-TC-05S: Scene functionality with server as DUT			
Item	**PICS**	**Test Harness Step**	**DUT Pass Verification**
3c	TSTAT.S.A0011, TSTAT.S.A0012. TSTAT.S.A001C	TH CLIENT unicasts a ZCL *read attributes* command frame for the *OccupiedCoolingSetpoint, OccupiedHeatinSetpoint* and *SystemMode* attribute to DUT SERVER.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. The attributes have the values as written in step 3b.
3d	TSTAT.S.A0011, TSTAT.S.A0012. TSTAT.S.A001C	TH CLIENT unicasts a ZCL *write attributes* command frame to DUT SERVER, to set: - *OccupiedCoolingSetpoint* attribute to 0x07d0 (20°C); - *OccupiedHeatingSetpoint* attribute to 0x08fc (23°C); - *SystemMode* attribute to 0x00 (Off).	If requested, DUT SERVER unicasts a ZCL *write attributes response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). DUT SERVER turns off.
3e	TSTAT.S.A0011, TSTAT.S.A0012. TSTAT.S.A001C	TH CLIENT unicasts a ZCL *read attributes* command frame for the *OccupiedCoolingSetpoint, OccupiedHeatinSetpoint* and *SystemMode* attribute to DUT SERVER.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. The attributes have the values as written in step 3d.
3f	TSTAT.S.A0011.Scene, TSTAT.S.A0012.Scene, TSTAT.S.A001C.Scene, S.S.C05.Rsp	TH CLIENT unicasts a ZCL *recall scene* command frame to DUT SERVER with the *group ID* field set to 0x0001 and the *scene ID* field set to 0x01.	If requested, DUT SERVER unicasts a ZCL *default response* command frame to TH CLIENT with the *status* field equal to 0x00 (SUCCESS). DUT SERVER starts adapting the temperature.
3g	TSTAT.S.A0011, TSTAT.S.A0012. TSTAT.S.A001C	TH CLIENT unicasts a ZCL *read attributes* command frame for the *OccupiedCoolingSetpoint, OccupiedHeatinSetpoint* and *SystemMode* attribute to DUT SERVER.	DUT SERVER unicasts a ZCL *read attributes response* command frame to TH CLIENT. The attributes have the values as written in step 3b.

--- End of test case TSTAT-TC-05S ---

4.3.6 TSTAT-TC-06S: Reporting functionality with server as DUT

This case test verifies the attribute reporting behavior of the *thermostat* cluster server.

Test 5.20.5 of ZHA test specification (07-5340r15) not copied, pending clarification.

Commented [be736]:

This test case verifies the primary functionality of the *thermostat* cluster server in respect to storing and updating schedules.

4.3.6.1 Scope

General:

- *Configure reporting* command (0x06)
- *Configure reporting response* command (0x07)
- *Read reporting configuration* command (0x08)
- *Read reporting configuration response* command (0x09)
- *Report attributes* command (0x0a)

Thermostat cluster (0x0201):

- *LocalTemperature* attribute (0x0000)
- *PICoolingDemand* attribute (0x0007)
- *PICoolingDemand* attribute (0x0008)

PICS:

- TSTAT.S
- TSTAT.S.A0000, TSTAT.S.A0000.Report.Tx, TSTAT.S.A0007, TSTAT.S.A0007.Report.Tx, TSTAT.S.A0008, TSTAT.S.A0008.Report.Tx,

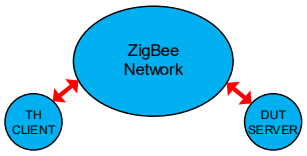
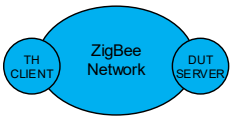
4.3.6.2 Required devices

Designation	Symbol	Description
TH CLIENT		Test harness client implementing: • The *thermostat* cluster client.
DUT SERVER		Device under test server: • The *thermostat* cluster server.
-	-	Heat and cooling source (warm finger and coolant/freeze-spray can do the trick)

379 #### 4.3.6.3 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.

380 #### 4.3.6.4 Test preparation

Add TH CLIENT and DUT SERVER to a ZigBee network	
 *Before*	 *After*

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TSTAT-TC-06S: Reporting attributes with server as a 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.
P4	Establish a binding link from an endpoint on DUT SERVER to a corresponding endpoint on TH CLIENT that both support the *thermostat* cluster.	Observe appropriate communication between DUT SERVER, TH CLIENT and any other relevant node on the ZigBee network.

--- End of test case TSTAT-TC-06S preparation ---

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383 #### 4.3.6.5 Test procedure

TSTAT-TC-06G: Reporting attributes with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
LocalTemperature attribute			
1a	TSTAT.S.A0000 TSTAT.S.A0000.Report.Tx	TH CLIENT unicasts a ZCL *read reporting configuration* command to DUT SERVER for the *LocalTemperature* attribute of the *thermostat* cluster.	DUT SERVER unicasts a ZCL *read reporting configuration response* command to TH CLIENT, carrying default reporting configuration for the *LocalTemperature* attribute of the *thermostat* cluster, with: - *Status* field se to 0x00 (SUCCESS); - *Direction* field set to 0x00 (reported attribute); - *Attribute Data Type* field present and set to 0x29; - *Minimum* and *Maximum reporting interval* fields present; - *Reportable change* field present; - *Timeout period* field omitted.
1b	TSTAT.S.A0000 TSTAT.S.A0000.Report.Tx	If practical (depending on the reporting interval of the default reporting configuration), wait for the attribute report according to default configuration.	At a time as specified by the default reporting configuration of step 0a, DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *LocalTemperature* attribute.
2a	TSTAT.S.A0000 TSTAT.S.A0000.Report.Tx	TH CLIENT unicasts a ZCL *configure reporting* command to DUT SERVER for the *LocalTemperature* attribute with a *direction* field set to 0x00, the *minimum reporting interval* field set to 0x0002 (2 seconds), the *maximum reporting interval* field set to 0x0005 (5 seconds) and the *reportable change* field set to 0x0001.	DUT SERVER unicasts a ZCL *configure reporting response* command to TH CLIENT, confirming the configured attribute and with the *status* field set to SUCCESS.
2b	TSTAT.S.A0000 TSTAT.S.A0000.Report.Tx	Keep the temperature of the DUT SERVER constant.	Approx. every 5 seconds, DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *LocalTemperature* attribute.

TSTAT-TC-06G: Reporting attributes with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
2c	TSTAT.S.A0000 TSTAT.S.A0000.Report.Tx	Via heat source, increase the temperature of the DUT SERVER.	Approx. every 2 seconds (not faster), DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *LocalTemperature* attribute.
PICoolingDemand attribute			
3a	TSTAT.S.A0007 TSTAT.S.A0007.Report.Tx	TH CLIENT unicasts a ZCL *read reporting configuration* command to DUT SERVER for the *PICoolingDemand* attribute of the *thermostat* cluster.	DUT SERVER unicasts a ZCL *read reporting configuration response* command to TH CLIENT, carrying default reporting configuration for the *PICoolingDemand* attribute of the *thermostat* cluster, with: - *Status* field se to 0x00 (SUCCESS); - *Direction* field set to 0x00 (reported attribute); - *Attribute Data Type* field present and set to 0x20; - *Minimum* and *Maximum reporting interval* fields present; - *Reportable change* field present; - *Timeout period* field omitted.
3b	TSTAT.S.A0007 TSTAT.S.A0007.Report.Tx	If practical (depending on the reporting interval of the default reporting configuration), wait for the attribute report according to default configuration.	At a time as specified by the default reporting configuration of step 0a, DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *PICoolingDemand* attribute.
4a	TSTAT.S.A0007 TSTAT.S.A0007.Report.Tx	TH CLIENT unicasts a ZCL *configure reporting* command to DUT SERVER for the *PICoolingDemand* attribute with a *direction* field set to 0x00, the *minimum reporting interval* field set to 0x0002 (2 seconds), the *maximum reporting interval* field set to 0x0005 (5 seconds) and the *reportable change* field set to 0x01.	DUT SERVER unicasts a ZCL *configure reporting response* command to TH CLIENT, confirming the configured attribute and with the *status* field set to SUCCESS.

TSTAT-TC-06G: Reporting attributes with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
4b	TSTAT.S.A0007 TSTAT.S.A0007.Report.Tx	Using method described in the OEM supplied PIXIT, hold the *PICoolingDemand* at a constant value.	Approx. every 5 seconds, DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *PICoolingDemand* attribute.
4c	TSTAT.S.A0007 TSTAT.S.A0007.Report.Tx	Using method described in the OEM supplied PIXIT, set the thermostat into a state such that the *PICoolingDemand* attribute is rapidly changing.	Approx. every 2 seconds (not faster), DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *PICoolingDemand* attribute.
PIHeatingDemand attribute			
5a	TSTAT.S.A0008 TSTAT.S.A0008.Report.Tx	TH CLIENT unicasts a ZCL *read reporting configuration* command to DUT SERVER for the *PIHeatingDemand* attribute of the *thermostat* cluster.	DUT SERVER unicasts a ZCL *read reporting configuration response* command to TH CLIENT, carrying default reporting configuration for the *PIHeatingDemand* attribute of the *thermostat* cluster, with: - *Status* field se to 0x00 (SUCCESS); - *Direction* field set to 0x00 (reported attribute); - *Attribute Data Type* field present and set to 0x20; - *Minimum* and *Maximum reporting interval* fields present; - *Reportable change* field present; - *Timeout period* field omitted.
5b	TSTAT.S.A0008 TSTAT.S.A0008.Report.Tx	If practical (depending on the reporting interval of the default reporting configuration), wait for the attribute report according to default configuration.	At a time as specified by the default reporting configuration of step 0a, DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *PIHeatingDemand* attribute.

TSTAT-TC-06G: Reporting attributes with server as a DUT			
Item	**PICS**	**Test Harness Step**	**DUT pass Verification**
6a	TSTAT.S.A0008 TSTAT.S.A0008.Report.Tx	TH CLIENT unicasts a ZCL *configure reporting* command to DUT SERVER for the *PIHeatingDemand* attribute with a *direction* field set to 0x00, the *minimum reporting interval* field set to 0x0002 (2 seconds), the *maximum reporting interval* field set to 0x0005 (5 seconds) and the *reportable change* field set to 0x01.	DUT SERVER unicasts a ZCL *configure reporting response* command to TH CLIENT, confirming the configured attribute and with the *status* field set to SUCCESS.
6b	TSTAT.S.A0008 TSTAT.S.A0008.Report.Tx	Using method described in the OEM supplied PIXIT, hold the *PIHeatingDemand* at a constant value.	Approx. every 5 seconds, DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *PIHeatingDemand* attribute.
6c	TSTAT.S.A0008 TSTAT.S.A0008.Report.Tx	Using method described in the OEM supplied PIXIT, set the thermostat into a state such that the *PIHeatingDemand* attribute is rapidly changing.	Approx. every 2 seconds (not faster), DUT SERVER unicasts a ZCL *report attributes* command to TH CLIENT with the *PIHeatingDemand* attribute.

--- End of test case TSTAT-TC-06S ---

4.4 Client test cases

4.4.1 TSTAT-TC-01C: Functionality with client as DUT (TBD)

This case test verifies the functionality of the *thermostat* 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 *thermostat* 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 TSTAT.C.C*d*,Tx represents the list of commands that are declared as being transmitted by the DUT.

4.4.1.1 Scope

PICS:

- TSTAT.C
- TSTAT.C.A0000.Report.Rsp
- TSTAT.C.A0003.Report.Rsp

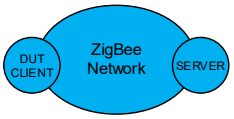
399 #### 4.4.1.2 Required devices

Designation	Symbol	Description
DUT CLIENT		Device under test client implementing: • The *thermostat* cluster client.
SERVER		Suitable server device implementing: • The *thermostat* cluster server.

400 #### 4.4.1.3 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.

401 #### 4.4.1.4 Test preparation

Link DUT CLIENT with SERVER	
	
Before	*After*

402

TSTAT-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 TSTAT-TC-01C preparation ---

403 #### 4.4.1.5 Test procedure

TSTAT-TC-01C: Functionality with client as DUT			
Item	**PICS**	**Test Harness Step**	**DUT Pass Verification**
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	TSTAT.C.C*d*.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 TSTAT-TC-01C ---

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406 # 5 Annex A: PICS to test case cross reference (TBD)

407 ## 5.1 Server

	Test case						
PICS	TSTAT-TC-01G	TSTAT-TC-01S	TSTAT-TC-02S	TSTAT-TC-03S	TSTAT-TC-04S	TSTAT-TC-05S	TSTAT-TC-06S
TSTAT.S	X	X	X	X	X	X	X
TSTAT.S.A0000		X	X				X
TSTAT.S.A0000.Report.Tx							X
TSTAT.S.A0001		X					
TSTAT.S.A0002		X					
TSTAT.S.A0003		X	X				
TSTAT.S.A0004		X	X				
TSTAT.S.A0005		X	X				
TSTAT.S.A0006		X	X				
TSTAT.S.A0007		X			X		X
TSTAT.S.A0007.Report.Tx							X
TSTAT.S.A0008		X			X		X
TSTAT.S.A0008.Report.Tx							X
TSTAT.S.A0009		X	X				
TSTAT.S.A0010		X	X		X		
TSTAT.S.A0011		X	X		X	X	
TSTAT.S.A0011.Scene						X	
TSTAT.S.A0012		X	X		X	X	
TSTAT.S.A0012.Scene						X	
TSTAT.S.A0013		X	X				
TSTAT.S.A0014		X	X				
TSTAT.S.A0015		X	X				
TSTAT.S.A0016		X	X				
TSTAT.S.A0017		X	X				
TSTAT.S.A0018		X	X				
TSTAT.S.A0019		X	X				
TSTAT.S.A001A		X	X				
TSTAT.S.A001B		X	X				
TSTAT.S.A001C		X	X		X	X	
TSTAT.S.A001C.Scene						X	
TSTAT.S.A001D		X					
TSTAT.S.A001E		X					

	Test case						
PICS	TSTAT-TC-01G	TSTAT-TC-01S	TSTAT-TC-02S	TSTAT-TC-03S	TSTAT-TC-04S	TSTAT-TC-05S	TSTAT-TC-06S
TSTAT.S.A0020		X					
TSTAT.S.A0021		X					
TSTAT.S.A0022		X					
TSTAT.S.A0023		X		X			
TSTAT.S.A0024		X		X			
TSTAT.S.A0025		X					
TSTAT.S.A0029		X					
TSTAT.S.A0030		X					
TSTAT.S.A0031		X					
TSTAT.S.A0032		X					
TSTAT.S.A0040		X					
TSTAT.S.A0041		X					
TSTAT.S.A0042		X					
TSTAT.S.A0043		X					
TSTAT.S.A0044		X					
TSTAT.S.A0045		X					
TSTAT.S.A0046		X					
TSTAT.S.A0047		X					
TSTAT.S.Afffd	X	X					
TSTAT.S.Afffe	X	X					
TSTAT.S.C00.Rsp			X				
TSTAT.S.C01.Rsp				X			
TSTAT.S.C02.Rsp				X			
TSTAT.S.C03.Rsp				X			
TSTAT.S.C04.Rsp				X			
TSTAT.S.C00.Tx				X			
TSTAT.S.C01.Tx				X			

5.2 Client

	Test case	
PICS	TSTAT-TC-01G	TSTAT-TC-01C
TSTAT.C	X	X
TSTAT.S.A0000.Report.Rsp		X

	Test case	
PICS	TSTAT-TC-01G	TSTAT-TC-01C
TSTAT.S.A0003.Report.Rsp		X
TSTAT.C.Afffd	X	
TSTAT.C.Afffe	X	