4.7.

ZIGBEE SMART ENERGY STANDARD

Protocol Implementation Conformance Statement (PICS)

Revision 7

Version 1.1b

Sponsored by: ZigBee Alliance

Accepted by: ZigBee Alliance Board of Directors

Abstract: This document lists the PICS for the Smart Energy Standard.

Purpose: Provides a pro-forma on which the capabilities and options of a particular implementation of the Smart Energy Standard can be stated.

Keywords: ZigBee, Qualification, Certification, Standard, Smart Energy, Metering, Energy Management

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23

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Table of Contents

Participants 3
Table of Contents 4
References 6
1.1 ZigBee Alliance documents 6
1.2 IEEE documents 6
1.3 ISO documents 6
Change history 7
2 Introduction 8
2.1 Scope 8
2.2 Purpose 8
3 Abbreviations and special symbols 9
4 Instructions for completing the PICS pro forma 10
5 Identification of the implementation 11
6 Identification of the protocol 13
7 Global statement of conformance 14
8 PICS pro forma tables 15
8.1 ZigBee Device Types 15
8.2 Stack Profile 15
8.3 Stack Profile extensions for SE 16
8.4 SE general requirements support 16
8.5 ZigBee SE device description support 19
8.6 SE common clusters 20
8.7 ZigBee SE Device Description Capabilities 24
8.7.1 Energy Service Interface device functions 24
8.7.2 Metering device functions 25
8.7.3 In-Home display device functions 26
8.7.4 Programmable Communicating Thermostat (PCT) device functions 27
8.7.5 Load Control device functions 28
8.7.6 Range Extender device functions 29
8.7.7 Smart Appliance device functions 30
8.7.8 Prepayment Terminal device functions 31
8.8 Smart Energy Application Specific Cluster function capabilities 32
8.8.1 Basic Cluster 32
8.8.2 Identify 32
8.8.3 Alarms 32
8.8.4 Commissioning 33
8.8.5 Power Configuration 33
8.8.6 Time Cluster attributes and functions 33
8.8.7 Key Establishment Cluster attributes and functions 34
8.8.8 Demand Response and Load Control Cluster attributes and functions 35
8.8.9 Metering Cluster attributes and functions 36

8.8.10 Price Cluster attributes and functions 46
8.8.11 Messaging Cluster attributes and functions 51
8.8.12 Tunneling Cluster attributes and functions 52
8.8.13 Prepayment Cluster attributes and functions 54
8.8.14 Trust Center Swap-out 56
8.8.15 Multiple ESI 57
8.8.16 OTA Upgrade Cluster attributes and functions 58
8.8.17 Support on Non SE clusters 59

References

The following standards contain provisions, which, through reference in this document, constitute provisions of this standard. All the standards listed are normative references. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

1.1 ZigBee Alliance documents

[R1] ZigBee document 053474r18: ZigBee Specification 2007

[R2] ZigBee document 07-5356: ZigBee Smart Energy Standard Revision 18

[R3] ZigBee document 07-5123-04, ZigBee Cluster Library Specification

[R4] ZigBee document 04300r08: ZigBee Network Layer PICS

[R5] ZigBee document 064147r07: ZigBee Application Layer PICS

[R6] ZigBee document 043171r04: ZigBee Security Layer PICS

[R7] ZigBee document 064113r07: ZigBee Cluster Library PICS

[R8] ZigBee document 08006r03: ZigBee 2007 Layer PICS and Stack Profiles

[R9] ZigBee document number 09-5264-19: ZigBee OTA Upgrade Cluster Specification

[R10] ZigBee document number 09-5284-09: ZigBee OTA Upgrade Cluster PICS

[R11] ZigBee document number 09-5473-06: ZigBee OTA Upgrade Cluster Test Specification

1.2 IEEE documents

[R12] IEEE Standard for Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) specifications for Low Rate Wireless Personal Area Networks (LR-WPANs), 2003.

1.3 ISO documents

[R13] ISO/IEC 9646-1:1991, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.

[R14] ISO/IEC 9646-7:1995, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7. Implementation conformance statements.

Change history

The following table shows the change history for this specification.

Table 1 – Revision change history

Revision	Version	Description
R00	-	Initial draft (November, 2007)
R01	-	Updated to Revision 12 of the SE specification and Errata.
R02	-	Updated to Revision 14 of the SE specification
R03	1.0	Fix typo. Update SE specification reference to r14.
R04	1.0	Update SE specification reference to r15. Update section references.
R05	1.1	Update for SE 1.1 release
R06	1.1.1	Update for SE 1.1.1 release Processed CCBs: 1264 - Add support for CV and PTZ (gas conversion factors) to price cluster 1273 - Additional of 'Get Support Tunnel Protocols' Command and Response 1289 - PhysicalEnvironment bit for Mirroring 1301 - Simplified Multi-ESI Time Sync 1430 - PICS requirement (Table 38 - item MCC1) wrong 1431 - PICS requirement (Table 5 - item SEG25) wrong 1432 - PICS requirement (KES1 and KECS1) Mismatch 1437 - DeviceClass is marked read-writeable but write may not be allowed 1486 - End point requirement
R07	1.1b	Update for SE 1.1b release Processed CCBs: 1494 - Add Billing Period Attribute Set to the Price Cluster 1496 - Duplicate Item Number in PICS Document Table [MCS2] 1500 - New metering attribute for block pricing 1570 - Rename Display Device to "In-Home Display" (IHD) Modifications to link the elements of the Block Tariff feature together

2 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given standard. Such a statement is called a protocol implementation conformance statement (PICS).

2.1 Scope

This document provides the protocol implementation conformance statement (PICS) pro forma for the ZigBee specifications cited in Reference [R2] in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7.

This document addresses the ZigBee SE Application Profile.

2.2 Purpose

The supplier of a protocol implementation claiming to conform to the ZigBee SE Application Profile shall complete the following PICS pro forma and accompany it with the information necessary to identify fully both the supplier and the implementation.

The PICS is in the form of answers to a set of questions in the PICS pro forma. The questions in a pro forma consist of a systematic list of protocol capabilities and options as well as their implementation requirements. The implementation requirement indicates whether implementation of a capability is mandatory, optional, or conditional depending on options selected. When a protocol implementer answers questions in a PICS pro forma, they would indicate whether an item is implemented or not, and provide explanations if an item is not implemented.

3 Abbreviations and special symbols

Notations for requirement status:

M	Mandatory
O	Optional
O.n	Optional, but support of at least one of the group of options labeled O.n is required.
N/A	Not applicable
X	Prohibited
Item Number: :*Status*	Status is conditional on support of item number

"*Item Number*": Conditional, status dependent upon the support marked for the "*Item Number*".

For example, FD1: O.1 indicates that the status is optional but at least one of the features described in FD1 is required to be implemented, if this implementation is to follow the standard of which this PICS Pro forma is a part.

4 Instructions for completing the PICS pro forma

If a given implementation is claimed to conform to this standard, the actual PICS pro forma to be filled in by a supplier shall be technically equivalent to the text of the PICS pro forma in this annex, and shall preserve the numbering and naming and the ordering of the PICS pro forma.

A PICS which conforms to this document shall be a conforming PICS pro forma completed in accordance with the instructions for completion given in this annex.

The main part of the PICS is a fixed-format questionnaire, divided into five tables. Answers to the questionnaire are to be provided in the rightmost column, either by simply marking an answer to indicate a restricted choice (such as Yes or No), or by entering a value, set, or range of values.

5 Identification of the implementation

Implementation under test (IUT) identification

IUT name: IP-Enabled Cellular ESI Commercial Meter (SKU: 91UMCSQ2.G02)

IUT version: v7.1.2 (FW); 4.1(HW)

Operating system (optional): Nucleus

Specification Versions Implemented

Smart Energy Specification Document Number (include revision): ZigBee-07-5356-18

Smart Energy Test Specification Document (include revision): ZigBee-07-5384-20

Product supplier

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Telephone number: 601.321.7882

Facsimile number: 601.362.1787

Email address: Ravi.Subramaniam@itron.com

Additional information: _____

Client

Name: _____

Address: _____

_____

Telephone number: _____

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Additional information: _____

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Additional information:

_____

PICS/System conformance statement

6 Identification of the protocol

This PICS pro forma applies to ZigBee SE Application Profile, cited in Reference [R2].

7 Global statement of conformance

The implementation described in this PICS pro forma meets all of the mandatory requirements of the referenced standards:

Application Profile: ZigBee SE – 07-5356-18

(•) Yes

( ) No

Note -- Answering 'No' indicates non-conformance to the specified protocol standard. Non-supported mandatory capabilities are to be identified in the following tables, with an explanation by the implementer explaining why the implementation is non-conforming.

The supplier will have fully complied with the requirements for a statement of conformance by completing the statement contained in this sub-clause. That means, by clicking the above, the statement of conformance is complete.

8 PICS pro forma tables

The following tables are composed of the detailed questions to be answered, which make up the PICS pro forma.

8.1 ZigBee Device Types

Table 2 - Functional device types

Item number	Item description	Reference	Status	Support
FDT1	Is this device capable of acting as a ZigBee coordinator?	[R1]/2.5.5.5.1	[1]O.1	[Y]
FDT2	Is this device capable of acting as a ZigBee router?	[R1]/2.5.5.5.2	O.1	[N]
FDT3	Is this a ZigBee end device?	[R1]/2.5.5.5.3	O.1	[N]

8.2 Stack Profile

Table 3 –Stack Profile

Item number	Item description	Reference	Status	Support
ZSP1	Is the device built on a ZigBee Compliant Platform certified for the ZigBee stack profile [R8]?	[R4] [R2]/5.2	O.2[2]	[N]
ZSP2	Is the device built on a ZigBee PRO Compliant Platform certified for the ZigBee PRO stack profile [R8]?	[R8] [R2]/5.2	O.2	[Y]

[1] O.1 – Device under test must select only one of these options. Devices under test supporting multiple ZigBee device types must serially re-test using each supported ZigBee device type.
[2] O.2 – Device under test must be deployed on either of the ZigBee or ZigBee PRO stack profiles.

8.3 Stack Profile extensions for SE

Table 4 – Stack profile extensions for SE

Item number	Item description	Reference	Status	Support
SPE1	Does the device support Application Link Keys?	[R2]/5.2 [R6]/ASLS6	M	[Y]
SPE2	Does this device use a stack that supports fragmentation?	[R2]/5.2 [R5]/ADF5, ADF6	M	[Y]
SPE3	Does this device use any SE Profile Commands that require the use of Fragmentation?	[R2]/5.2 [R5]/ADF5, ADF6	MC1: M MS1: M	[Y]
SPE4	Does the device adhere to the polling rate specifications given in [R2]/5.2 (i.e. Does your application poll equal to or less often as called out in the specification)?	[R2]/5.2	FDT3:M	[Y]
SPE5	Does this devices support reception of fragmented messages?		M	[Y]
SPE6	Does this device support generation of fragmented messages?		O	[Y]

8.4 SE general requirements support

In the below tables please answer Yes / No for supported , number of instances supported, and end point for each instance. In support one instance can just provide end point number without instance number.

Table 5 – SE general requirements support

Item number	Item description	Reference	Status	Support
SEG1	Does the device support the ZigBee Cluster Library?	[R2]/5.10, 5.11 [R3]	M	[Y]
SEG2	Does the device support the ZigBee Cluster Library List specified for SE including the mandatory/optional clusters detailed in the ZCL	[R2]/5.10, 5.11 [R7]	M	[Y]

Item number	Item description	Reference	Status	Support
	PICs?			
SEG3	Does the device support the ZigBee Cluster Library with the parameters for attribute reporting, reporting configuration and read reporting configuration as detailed in the SE Profile clusters? Editor's Note: Reporting interval constraints and other parameters are mandatory where attribute reporting is used. Support of attribute reporting may be optional or mandatory based on clusters implemented.	[R2]/5.11 [R3]	M	[N]
SEG4	Is the device capable of joining a ZigBee SE network and does it interact with a consumer ZigBee Home Area Network only through a bridge device?	[R2]/5.1	FDT2: M FDT3: M	[Y]
SEG5	Does the device support "E-Mode" commissioning? SE Profile requirement: Those devices that will join an existing network must support button pushes or simple documented user interfaces to initiate the joining process.	[R2]/5.1	FDT2: M FDT3: M For joining devices	[Y]
SEG6	Deleted	[R2]/5.1		N/A
SEG7	Does the device support the compatible Startup Attribute Set, Join Parameters, Security Parameters, End Device Parameters, Link Status Parameters, Concentrator Parameters, APS Transport Parameters and Binding Parameters?	[R2]/5.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.3.6, 5.3.7, 5.3.8, 5.3.9	M	[Y]
SEG8	Does the device support joining with pre-installed link keys? Note: SE specifies use of Install Codes to derive the link key.	[R2]/5.4.1	FDT2: M FDT3: M	[Y]
SEG9	Does the device support joining using the key establishment cluster?	[R2]/5.4.7	FDT2: M FDT3: M	[Y]

Item number	Item description	Reference	Status	Support
SEG10	Deleted	[R2]/5.5		NA
SEG11	Does the device support the list of SE preferred channels?	[R2]/5.8.1	O	[Y]
SEG12	Does the device support the SE broadcast policy?	[R2]/5.8.2	O	[Y]
SEG13	Does the device support the SE frequency agility policy?	[R2]/5.8.3	O	[N]
SEG14	Does the device support the security key update policies for SE networks?	[R2]/5.8.4	M	[Y]
SEG15	Does the device support the ZCL Time Cluster and SE time synchronization? Editor's Note: Support of the ZCL Time Cluster is not mandatory for all SE devices. The SE device descriptions define the required Time cluster support.	[R2]/5.12.1.1	O	[Y]
SEG16	Does the device support discovery of optional attributes?	[R2]/5.12	M	[Y]
SEG17	Does the device application discover and handle unsupported attributes in other devices?	[R2]/5.12	M	[Y]
SEG18	Does the device support an indication to the user that the network has formed properly?	[R2]/5.5.1	O .	[N]
SEG19	Does the device support an indication to the user that a device has joined a network successfully?	[R2]/5.5.1	O	[N]
SEG20	Does the device support the commissioning modes and provide supporting commissioning documentation according to network type?	[R2]/5.5.2, 5.5.3, 5.5.4	M	[Y]
SEG21	Does the device use the appropriate security key per cluster?	[R2]/5.4.6	M	[Y]
SEG22	Does the device support the SE Mirrored Device Capacity – Service Discovery?	[R4]/D.3.3.4.1	O	[N]

Item number	Item description	Reference	Status	Support
SEG23	Does one of the device support the SE Install Code Formats: 48, 64, 96, or 128 bit number and 16 bit CRC?	[R4]/5.4.8.1.1	O	[Y]
SEG24	Does the device expect to receive unsolicited messages from the DRLC, Messaging, Metering or Pricing clusters?	[R4]/5.4.5.1	O	[Y]
SEG25	Does the device support rejoining a secured network?	[R4]/5.4.2	FDT2:M FDT3:M[3]	[Y]
SEG26	Does the device support devices leaving its network?	[R4]/5.4.3	FDT1:M	[Y]
SEG27	Does the device support updating the Network Key?	[R4]/5.4.4	M	[Y]
SEG28	Does the device support updating the Link Key?	[R4]/5.4.5	M	[Y]

8.5 ZigBee SE device description support

Table 6 – SE device description support

Item number	Item description	Reference	Status	Support
SED1	Is the product programmed as an Energy Service Interface?	[R2]/6.3.1	O.3[4]	[Y] [Int: EP# 16]
SED2	Is the product programmed as a Metering Device?	[R2]/6.3.2	O.3	[N]
SED3	Is the product programmed as an In-Home[5] Display?	[R2]/6.3.3	O.3	[N]
SED4	Is the product programmed as a Programmable Communicating Thermostat (PCT)?	[R2]/6.3.4	O.3	[N]

[3] CCB 1431
[4] O.3 – Device under test must select at least one and may select more than one of the SE device descriptions. If multiple SE device descriptions are supported in the same device then each of the supported device descriptions must be deployed on individual endpoints within the device under test.
[5] CCB 1570

Item number	Item description	Reference	Status	Support
SED5	Is the product programmed as a Load Control?	[R2]/6.3.5	O.3	[N]
SED6	Is the product programmed as a Range Extender?	[R2]/6.3.6	O.3	[N]
SED7	Is the product programmed as a Smart Appliance?	[R2]/6.3.7	O.3	[N]
SED8	Is the product programmed as a Prepayment Terminal?	[R2]/6.3.8	O.3	[N]
SED9[6]	Does the product utilize an endpoint using the Physical Device identifier?	[R2]/6.3.9	O	[N]

8.6 SE common clusters

The common cluster ZCL PICs restrictions/requirements are obtained from [R2]/5.11, 5.12.

Table 7 – Common cluster ZCL PICS restrictions/requirements

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
FC100	M	ZCL Cluster ID enumeration is mandatory	[Y]
FC1	M	General ZCL Frame Format is mandatory	[Y]
BCC1	O	Does the device support the Basic Cluster as a client?	[N]
BCS1	M	Does the device support the Basic Cluster as a server?	[Y] [Int: EP# 16]
GCC1	O	Deleted	NA
GCS1	O	Deleted	NA
ACC1	O	Does the device support the Alarms Cluster as a client?	[N]

[6] CCB 1486

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
ACS1	O	Does the device support the Alarms Cluster as a server?	[N]
TCS1		Deleted	NA
TCC1		Deleted	NA

279
280

Table 8 – Common cluster support

Item number	Item description	Reference	Status	Support
ASDC1	Deleted	[R2]/5.10		NA
ASDC2	Deleted	[R2]/5.10		NA
ASDC3	Deleted	[R2]/5.10		NA
ASDS1	Deleted		O	NA
ASDS2	Does the device support the server Price Cluster sent via the Anonymous Inter-PAN transmission mechanism?	[R2]/Annex D.4	O	[N]
ASDS3	Does the device support the server Messaging Cluster sent via the Anonymous Inter-PAN transmission mechanism?	[R2]/Annex D.5	O	[N]
KEC1	Does the device support the Key Establishment cluster as a client?	[R2]/Annex C.3.1	M	[Y]
KES1	Does the device support the Key Establishment cluster as a server?	[R2]/Annex C.3.1	M[7]	[Y] [Int: EP# 16]
PC1	Does the device support the Price cluster as a client?	[R2]/6.1	O	[N]
PS1	Does the device support the Price cluster as a	[R2]/ 6.1	O	[Y] [Int:

[7] CCB 1432

Item number	Item description	Reference	Status	Support
	server?			EP# 16]
DRLC1	Does the device support the Demand Response and Load Control cluster as a client?	[R2]/ 6.1	O	[N]
DRLS1	Does the device support the Demand Response and Load Control cluster as a server?	[R2]/ 6.1	O	[Y] [Int: EP# 16]
SMC1	Does the device support the Metering cluster as a client?	[R2]/ 6.1	O	[N]
SMS1	Does the device support the Metering cluster as a server?	[R2]/ 6.1	O	[Y] [Int: EP# 16]
MC1	Does the device support the Messaging cluster as a client?	[R2]/ 6.1	O	[N]
MS1	Does the device support the Messaging cluster as a server?	[R2]/ 6.1	O	[Y] [Int: EP# 16]
PPC1	Does the device support the Prepayment cluster as a client?	[R2]/ 6.1	O	[N]
PPS1	Does the device support the Prepayment cluster as a server?	[R2]/ 6.1	O	[N]
SECC1	Does the device support clusters with Reporting Capability?	[R2]/6.1.1	O	[N]
SECC2	Are any manufacturer-specific cluster(s) supported?	[R2]/6.1.2	O	[N]
SECC3	Are any non-SE ZCL or other application cluster(s) supported?	[R2]/6.1.3	O	[N]
ICS1	Does the device support the Identify cluster?	[R2]/ 6.1	O	[N]
PCCS1	Does the device support the Power Configuration cluster?	[R2]/ 6.1	O	[N]
SMC2	Does the device support the Block Tariffs Metering cluster attributes as a client?	[R2]/ 6.1	O	[N]
SMS2	Does the device support the Block Tariffs Metering cluster attributes as a server?	[R2]/ 6.1	O	[N]

Item number	Item description	Reference	Status	Support
TUC1	Does the device support the Tunneling cluster as a client?	[R2]/ 6.1	O	[N]
TUS1	Does the device support the Tunneling cluster as a server?	[R2]/ 6.1	O	[N]
TCSW1	Does the device support Trust Center Swap-out ?	[R2]/ 6.1	O	[N]
OTAC1	Does the device support the OTA Upgrade cluster as a client?	[R2]/ 6.1	O	[N]
OTAS1	Does the device support the OTA Upgrade cluster as a server?	[R2]/ 6.1	O	[Y]
ALM1	Does the device support the Alarms as a server?	[R2]/ 6.1	O	[N]

281
282

8.7 ZigBee SE Device Description Capabilities

Tables in the following sub-clauses detail the capabilities specific to a device description.

8.7.1 Energy Service Interface device functions

Table 9 – Energy Service Interface ZCL PICS restrictions/requirements

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCS1	M	Time Cluster server is mandatory	[Y] [Int: EP# 16]

Table 10 provides the SE PICs restrictions based on requirements in [R2]/6.3.1.1.

Table 10 – Energy Service Interface SE PICS restrictions/requirements

SE PICS Item number	Status	Additional Constraints	Support
SMC1	O	Metering Cluster client is optional	[N]
SMS1	O	Metering Cluster server is optional	[Y] [Int: EP# 16]
MS1	M	Messaging Cluster server is mandatory	[Y] [Int: EP# 16]
PS1	M	Price Cluster server is mandatory	[Y] [Int: EP# 16]
DRLS1	M	Demand Response and Load Cluster server is mandatory	[Y] [Int: EP# 16]
PC1	O	Price Cluster client is optional	[N]
MS1	O	Messaging Cluster client is optional	[N]
PPC1	O	Prepayment Cluster client is optional	[N]

SE PICS Item number	Status	Additional Constraints	Support
PPS1	O	Prepayment Cluster server is optional	[N]
TUS1	O	Tunneling Cluster server is optional	[N]
TCSW1	O	Trust Center Swap-out is optional	[N]
OTAS1	O	OTA Upgrade Cluster server is optional	[Y] [Int: EP #16]
TUC1	O	Tunneling Cluster client is optional	[N]
OTAC1	O	OTA Upgrade Cluster client is optional	[N]

293
294
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296 8.7.2 **Metering device functions**

297 **Table 11 – Metering device ZCL PICS restrictions/requirements**

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	O	Time Cluster client is optional	[N]

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299 Table 12 provides the SE PICs restrictions based on requirements in [R2]/6.3.2.1.

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301 **Table 12 – Metering device SE PICS restrictions/requirements**

SE PICS Item number	Status	Additional Constraints	Support
SMS1	M	Metering Cluster server is mandatory	
PPS1	O	Prepayment Cluster server is optional	
PC1	O	Price Cluster client is optional	

SE PICS Item number	Status	Additional Constraints	Support
MC1	O	Messaging Cluster client is optional	
SMS3	SMS2:O	Block Tariffs Metering cluster server attributes are optional	
TUC1	O	Tunneling Cluster client is optional	
TUS1	O	Tunneling Cluster server is optional	
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

8.7.3 In-Home[8] display device functions

Table 13 – In-Home[9] display device ZCL PICS restrictions/requirements

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	O	Time Cluster client is optional	

Table 14 provides the SE PICs restrictions based on requirements in [R2]/6.3.3.1.

Table 14 – In-Home[10] display device SE PICS restrictions/requirements

SE PICS Item number	Status	Additional Constraints	Support
DRLC1	O	Demand Response and Load Cluster client is optional	

[8] CCB 1570
[9] CCB 1570
[10] CCB 1570

SE PICS Item number	Status	Additional Constraints	Support
PC1	O	Price Cluster client is optional	
SMC1	O	Metering Cluster client is optional	
PPC1	O	Pre-payment Cluster client is optional	
MC1	O	Messaging Cluster client is optional	
TUC1	O	Tunneling Cluster client is optional	
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

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312 8.7.4 Programmable Communicating Thermostat (PCT) device functions

313 **Table 15 Programmable Communicating Thermostat (PCT) ZCL PICS restrictions/requirements**

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	

314

315 Table 16 provides the SE PICs restrictions based on requirements in [R2]/6.3.4.1.

316

317 **Table 16 Programmable Communicating Thermostat (PCT) SE PICS restrictions/requirements**

SE PICS Item number	Status	Additional Constraints	Support
DRLC1	M	Demand Response and Load Cluster client is mandatory	

SE PICS Item number	Status	Additional Constraints	Support
PPC1	O	Prepayment Cluster client is optional	
PPC1	O	Pre-payment Cluster client is optional	
PC1	O	Price Cluster client is optional	
SMC1	O	Metering Cluster client is optional	
MC1	O	Messaging Cluster client is optional	
TUC1	O	Tunneling Cluster client is optional	
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

8.7.5 Load Control device functions

Table 17 – Load Control ZCL PICS restrictions/requirements

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	

Table 18 provides the SE PICs restrictions based on requirements in [R2]/6.3.5.1.

Table 18 – Load Control SE PICS restrictions/requirements

SE PICS Item number	Status	Additional Constraints	Support
DRLC1	M	Demand Response and Load Cluster client is mandatory	
PC1	O	Price Cluster client is optional	

SE PICS Item number	Status	Additional Constraints	Support
TUC1	O	Tunneling Cluster client is optional	
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

325

326 8.7.6 **Range Extender device functions**

327 **Table 19 – Range Extender ZCL PICS restrictions/requirements**

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	O	Time Cluster client is optional.	

328

329 Table 20 provides the SE PICs restrictions based on requirements in [R2]/6.3.6.1.

330

331 **Table 20 –Range Extender SE PICS restrictions/requirements**

SE PICS Item number	Status	Additional Constraints	Support
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

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8.7.7 Smart Appliance device functions

Table 21 – Smart Appliance ZCL PICS restrictions/requirements

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	

Table 22 provides the SE PICs restrictions based on requirements in [R2]/6.3.7.1.

Table 22 –Smart Appliance SE PICS restrictions/requirements

SE PICS Item number	Status	Additional Constraints	Support
PPC1	O	Prepayment Cluster client is optional	
DRLC1	O	Demand Response and Load Cluster client is optional	
PC1	M	Price Cluster client is mandatory	
SMC1	O	Metering Cluster client is optional ED NOTE: This is not listed in the specification – should it be?	
MC1	O	Messaging Cluster client is optional	
TUC1	O	Tunneling Cluster client is optional	
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

8.7.8 Prepayment Terminal device functions

Table 23 – Prepayment Terminal ZCL PICS restrictions/requirements

ZCL PICS Item number [R7]	Status	Additional Constraints	Support
TCC1	M	Time Cluster client is mandatory	

Table 24 provides the SE PICs restrictions based on requirements in [R2]/6.3.8.1.

Table 24 – Per-payment Terminal SE PICS restrictions/requirements

SE PICS Item number	Status	Additional Constraints	Support
DRLC1	O	Demand Response and Load Cluster client is optional	
PC1	M	Price Cluster client is mandatory	
SMC1	O	Metering Cluster client is optional	
MC1	O	Messaging Cluster client is optional	
TUC1	O	Tunneling Cluster client is optional	
TCSW1	O	Trust Center Swap-out is optional	
OTAC1	O	OTA Upgrade Cluster client is optional	
OTAS1	O	OTA Upgrade Cluster server is optional	

8.8 Smart Energy Application Specific Cluster function capabilities

8.8.1 Basic Cluster

Table 25 – Basic cluster server capabilities

Item number	Item description	Reference	Status	Support
BCS1	Is the Basic Cluster supported as a server?	[R3]	M	[Y] [Int: EP# 16]
BCS2	Is the *ZCLversion* attribute supported?		BCS1:M	[Y] [Int: EP# 16]
BCS3	Is the *Powersource* attribute supported?		BCS1:M	[Y] [Int: EP# 16]
BCS4	Is the *PhysicalEnvironment* attribute supported?		SEG22:M BCS1:O[11]	[N]

Table 26 – Basic cluster client capabilities

Item number	Item description	Reference	Status	Support
BCC1	Is the Basic Cluster supported as a client?	[R3]	O	[N]

8.8.2 Identify

8.8.3 Alarms

[11] CCB 1289

8.8.4 Commissioning

8.8.5 Power Configuration

8.8.6 Time Cluster attributes and functions

Table 27 – Time cluster server capabilities

Item number	Item description	Reference	Status	Support
TICS1	Is the Time Cluster supported as a server?	[R3]	O	[Y] [Int: EP# 16]
TICS2	Is the Time attribute supported?		TICS1:M	[Y] [Int: EP# 16]
TICS3	Is the TimeStatus attribute supported?		TICS1:M	[Y] [Int: EP# 16]
TICS4	Is the TimeZone attribute supported?		TICS1:O	[N]
TICS5	Is the DstStart attribute supported?		TICS1:O	[N]
TICS6	Is the DstEnd attribute supported?		TICS1:O	[N]
TICS7	Is the DstShift attribute supported?		TICS1:O	[N]
TICS8	Is the StandardTime attribute supported?		TICS1:O	[N]
TICS9	Is the LocalTime attribute supported?		TICS1:O	[Y] [Int: EP# 16]

Table 28 – Time cluster client capabilities

Item number	Item description	Reference	Status	Support
TICC1	Is the Time Cluster supported as a client?	[R3]	O	[N]

8.8.7 Key Establishment Cluster attributes and functions

Table 29 – Key Establishment cluster server capabilities

Item number	Item description	Reference	Status	Support
KECS1	Is the Key Establishment Cluster supported as a server?	[R2]/C.3.1	M	[Y] [Int: EP# 16]
KECS2	Is the KeyEstablishmentSuite attribute supported?		KECS1:M	[Y] [Int: EP# 16]
KECS3	Is the reception of Initiate Key Establishment Request command supported?		KECS1:M	[Y] [Int: EP# 16]
KECS4	Is the reception of Ephemeral Data Request command supported?		KECS1:M	[Y] [Int: EP# 16]
KECS5	Is the reception of Confirm Key Data Request command supported?		KECS1:M	[Y] [Int: EP# 16]
KECS6	Is the reception of Terminate Key Establishment command supported?		KECS1:M	[Y] [Int: EP# 16]
KECS7	Is the generation of Initiate Key Establishment Response command supported?		KECS1:M	[Y] [Int: EP# 16]
KECS8	Is the generation of Ephemeral Data Response command supported?		KECS1:M	[Y] [Int: EP# 16]
KECS9	Is the generation of Confirm Key Data Response command supported?		KECS1:M	[Y] [Int: EP# 16]

Table 30 – Key Establishment cluster client capabilities

Item number	Item description	Reference	Status	Support
KECC1	Is the Key Establishment Cluster supported as a client?	[R2]/C.3.1	M	[Y] [Int: EP# 16]
KECC2	Is the KeyEstablishmentSuite attribute supported?		KECC1:M	[Y] [Int: EP# 16]
KECC3	Is the reception of Initiate Key Establishment Response command supported?		KECC1:M	[Y] [Int: EP# 16]
KECC4	Is the reception of Ephemeral Data Response command supported?		KECC1:M	[Y] [Int: EP# 16]

Item number	Item description	Reference	Status	Support
KECC5	Is the reception of Confirm Key Data Response command supported?		KECC1:M	[Y] [Int: EP# 16]
KECC6	Is the reception of Terminate Key Establishment command supported?		KECC1:M	[Y] [Int: EP# 16]
KECC7	Is the generation of Initiate Key Establishment Request command supported?		KECC1:M	[Y] [Int: EP# 16]
KECC8	Is the generation of Ephemeral Data Request command supported?		KECC1:M	[Y] [Int: EP# 16]
KECC9	Is the generation of Confirm Key Data Request command supported?		KECC1:M	[Y] [Int: EP# 16]
KECC10	Is the generation of Terminate Key Establishment command supported?		KECC1:M	[Y] [Int: EP# 16]

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376 ### 8.8.8 Demand Response and Load Control Cluster attributes and functions

377 **Table 31 – Demand Response and Load Control cluster server capabilities**

Item number	Item description	Reference	Status	Support
DRLCCS1	Is the Demand Response and Load Control Cluster supported as a server?	[R2]/D.2	O	[Y] [Int: EP# 16]
DRLCCS2	Is the reception of Report Event Status command supported?		DRLCCS1:M	[Y] [Int: EP# 16]
DRLCCS3	Is the reception of Get Scheduled Events command supported?		DRLCCS1:M	[Y] [Int: EP# 16]
DRLCCS4	Is the generation of Load Control Event command supported?		DRLCCS1:M	[Y] [Int: EP# 16]
DRLCCS5	Is the generation of Cancel Load Control Event command supported?		DRLCCS1:M	[Y] [Int: EP# 16]
DRLCCS6	Is the generation of Cancel All Load Control Events command supported?		DRLCCS1:M	[Y] [Int: EP# 16]

Table 32 – Demand Response and Load Control cluster client capabilities

Item number	Item description	Reference	Status	Support
DRLCCC1	Is the Demand Response and Load Control Cluster supported as a client?	[R2]/D.2	O	[N]
DRLCCC2	Is the UtilityEnrolmentGroup attribute supported?		DRLCCC1:M	[N]
DRLCCC3	Is the StartRandomizeMinutes attribute supported?		DRLCCC1:M	[N]
DRLCCC4	Is the StopRandomizeMinutes attribute supported?		DRLCCC1:M	[N]
DRLCCC5	Is the DeviceClassValue attribute supported?		DRLCCC1:M	[N]
DRLCCC5.1	Is it permitted to externally write the DeviceClassValue attribute?[12]		DRLCCC1:O	[N]
DRLCCC6	Is the reception of Load Control Event command supported?		DRLCCC1:M	[N]
DRLCCC7	Is the reception of Cancel Load Control Event command supported?		DRLCCC1:M	[N]
DRLCCC8	Is the reception of Cancel All Load Control Events command supported?		DRLCCC1:M	[N]
DRLCCC9	Is the generation of Report Event Status command supported?		DRLCCC1:M	[N]
DRLCCC10	Is the generation of Get Scheduled Events command supported?		DRLCCC1:M	[N]

8.8.9 Metering Cluster attributes and functions

Table 33 – Metering cluster server capabilities

Item number	Item description	Reference	Status	Support
MECS1	Is the Metering Cluster supported as a server?	[R2]/D.3	O	[Y] [Int: EP# 16]

[12] CCB 1437

Item number	Item description	Reference	Status	Support
MECS2	Is the CurrentSummationDelivered attribute supported?		MECS1:M	[Y] [Int: EP# 16]
MECS3	Is the CurrentSummationReceived attribute supported?		MECS1:O	[N]
MECS4	Is the CurrentMaxDemandDelivered attribute supported?		MECS1:O	[N]
MECS5	Is the CurrentMaxDemandReceived attribute supported?		MECS1:O	[N]
MECS6	Is the DFTSummation attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS7	Is the DailyFreezeTime attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS8	Is the PowerFactor attribute supported?		MECS1:O	[N]
MECS9	Is the ReadingSnapShotTime attribute supported?		MECS1:O	[N]
MECS10	Is the CurrentMaxDemandDeliveredTime attribute supported?		MECS1:O	[N]
MECS11	Is the CurrentMaxDemandReceivedTime attribute supported?		MECS1:O	[N]
MECS12	Is the DefaultUpdatePeriod attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS13	Is the FastPollUpdatePeriod attribute supported?		MECS1:O	[N]
MECS14	Is the CurrentBlockPeriodConsumptionDelivered attribute supported?		MECS132:M MECS133:M	[N]
MECS15	Is the DailyConsumptionTarget attribute supported?		MECS1:O	[N]
MECS16	Is the CurrentBlock attribute supported?		MECS132:O MECS133:O	[N]
MECS17	Is the CurrentTier1SummationDelivered attribute supported?		MECS1:O	[N]

Item number	Item description	Reference	Status	Support
MEC18	Is the CurrentTier1SummationReceived attribute supported?		MECS1:O	[N]
MECS19	Is the CurrentTier2SummationDelivered attribute supported?		MECS1:O	[N]
MECS20	Is the CurrentTier2SummationReceived attribute supported?		MECS1:O	[N]
MECS21	Is the CurrentTier3SummationDelivered attribute supported?		MECS1:O	[N]
MECS22	Is the CurrentTier3SummationReceived attribute supported?		MECS1:O	[N]
MECS23	Is the CurrentTier4SummationDelivered attribute supported?		MECS1:O	[N]
MECS24	Is the CurrentTier4SummationReceived attribute supported?		MECS1:O	[N]
MECS25	Is the CurrentTier5SummationDelivered attribute supported?		MECS1:O	[N]
MECS26	Is the CurrentTier5SummationReceived attribute supported?		MECS1:O	[N]
MECS27	Is the CurrentTier6SummationDelivered attribute supported?		MECS1:O	[N]
MECS28	Is the CurrentTier6SummationReceived attribute supported?		MECS1:O	[N]
MECS29	Is the CurrentTier7SummationDelivered attribute supported?		MECS1:O	[N]
MECS30	Is the CurrentTier7SummationReceived attribute supported?		MECS1:O	[N]
MECS31	Is the CurrentTier8SummatioDelivered attribute supported?		MECS1:O	[N]
MECS32	Is the CurrentTier8SummationReceived attribute supported?		MECS1:O	[N]
MECS33	Is the CurrentTier9SummationDelivered		MECS1:O	[N]

Item number	Item description	Reference	Status	Support
	attribute supported?			
MECS34	Is the CurrentTier9SummationReceived attribute supported?		MECS1:O	[N]
MECS35	Is the CurrentTier10SummationDelivered attribute supported?		MECS1:O	[N]
MECS36	Is the CurrentTier10SummationReceived attribute supported?		MECS1:O	[N]
MECS37	Is the CurrentTier11SummationDelivered attribute supported?		MECS1:O	[N]
MECS38	Is the CurrentTier11SummationReceived attribute supported?		MECS1:O	[N]
MECS39	Is the CurrentTier12SummationDelivered attribute supported?		MECS1:O	[N]
MECS40	Is the CurrentTier12SummationReceived attribute supported?		MECS1:O	[N]
MECS41	Is the CurrentTier13SummationDelivered attribute supported?		MECS1:O	[N]
MECS42	Is the CurrentTier13SummationReceived attribute supported?		MECS1:O	[N]
MECS43	Is the CurrentTier14SummationDelivered attribute supported?		MECS1:O	[N]
MECS44	Is the CurrentTier14SummationReceived attribute supported?		MECS1:O	[N]
MECS45	Is the CurrentTier15SummationDelivered attribute supported?		MECS1:O	[N]
MECS46	Is the CurrentTier15SummationReceived attribute supported?		MECS1:O	[N]
MECS47	Is the Meter Status attribute supported?		MECS1:M	[Y] [Int: EP# 16]
MECS48	Is the UnitofMeasure attribute supported?		MECS1:M	[Y] [Int: EP# 16]

Item number	Item description	Reference	Status	Support
MECS49	Is the Multiplier attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS50	Is the Divisor attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS51	Is the SummationFormatting attribute supported?		MECS1:M	[Y] [Int: EP# 16]
MECS52	Is the DemandFormatting attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS53	Is the HistoricalConsumptionFormatting attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS54	Is the MeteringDeviceType attribute supported?		MECS1:M	[Y] [Int: EP# 16]
MECS54a	Is the MeteringDeviceType: Electric Metering?		MECS54:O.1	[Y] [Int: EP# 16]
MECS54b	Is the MeteringDeviceType: Gas Metering?		MECS54:O.1	[N]
MECS54c	Is the MeteringDeviceType: Water Metering?		MECS54:O.1	[N]
MECS54d	Is the MeteringDeviceType: Pressure Metering?		MECS54:O.1	[N]
MECS54e	Is the MeteringDeviceType: Heat Metering?		MECS54:O.1	[N]
MECS54f	Is the MeteringDeviceType: Cooling Metering?		MECS54:O.1	[N]
MECS55	Is the SiteID attribute supported?		MECS1:O	[N]
MECS56	Is the MeterSerialNumber attribute supported?		MECS1:O	[Y] [Int: EP# 16]
MECS57	Is the InstantaneousDemand attribute supported?		MECS1:O	[N]
MECS58	Is the CurrentDayConsumptionDelivered attribute supported?		MECS1:O	[N]
MECS59	Is the CurrentDayConsumptionReceived attribute supported?		MECS1:O	[N]
MECS60	Is the PreviousDayConsumptionDelivered attribute supported?		MECS1:O	[N]
MECS61	Is the PreviousDayConsumptionReceived		MECS1:O	[N]

Item number	Item description	Reference	Status	Support
	attribute supported?			
MECS62	Is the CurrentPartialProfileIntervalStartTimeDelivered attribute supported?		MECS1:O	[N]
MECS63	Is the CurrentPartialProfileIntervalStartTimeReceived attribute supported?		MECS1:O	[N]
MECS64	Is the CurrentPartialProfileIntervalValueDelivered attribute supported?		MECS1:O	[N]
MECS65	Is the CurrentPartialProfileIntervalValueReceived attribute supported?		MECS1:O	[N]
MECS66	Is the MaxNumberOfPeriodsDelivered attribute supported?		MECS1:O	[N]
MECS67	Is the CurrentDemandDelivered attribute supported?		MECS1:O	[N]
MECS68	Is the DemandLimit attribute supported?		MECS1:O	[N]
MECS69	Is the DemandIntegrationPeriod attribute supported?		MECS1:O	[N]
MECS70	Is the NumberOfDemandSubintervals attribute supported?		MECS1:O	[N]
MECS71	Is the reception of Get Profile command supported?		MECS1:O	[N]
MECS72	Is the reception of Request Mirror Response command supported?		MECS1:O	[N]
MECS73	Is the reception of Mirror Removed command supported?		MECS1:O	[N]
MECS74	Is the generation of Get Profile Response command supported?		MECS1:O	[N]
MECS75	Is the generation of Request Mirror command supported?		MECS1:O	[N]

Item number	Item description	Reference	Status	Support
MECS76	Is the generation of Remove Mirror command supported?		MECS1:O	[N]
MECS77	Is the ProfileIntervalPeriod attribute supported?		MECS1:O	[N]
MECS78	Is the IntervalReadReportingPeriod attribute supported?		MECS1:O	[N]
MECS79	Is the PresetReadingTime attribute supported?		MECS1:O	[N]
MECS80	Is the VolumePerReport attribute supported?		MECS1:O	[N]
MECS81	Is the FlowRestriction attribute supported?		MECS1:O	[N]
MECS82	Is the Supply Status attribute supported?		MECS1:O	[N]
MECS83	Is the CurrentDayMaxPressure attribute supported?		MECS1:O	[N]
MECS84	Is the CurrentDayMinPressure attribute supported?		MECS1:O	[N]
MECS85	Is the PreviousDayMaxPressure attribute supported?		MECS1:O	[N]
MECS86	Is the PreviousDayMinPressure attribute supported?		MECS1:O	[N]
MECS87	Is the CurrentDayMaxDemand attribute supported?		MECS1:O	[N]
MECS88	Is the PreviousDayMaxDemand attribute supported?		MECS1:O	[N]
MECS89	Is the Meter Status (Gas) attribute supported?		MECS1:O	[N]
MECS90	Is the Meter Status (Water) attribute supported?		MECS1:O	[N]
MECS91	Is the RemainingBatteryLife attribute supported?		MECS1:O	[N]
MECS93	Is the CurrentInletEnergyCarrierSummation attribute supported?		MECS54e:M MECS54f:M MECS1:O	[N]

Item number	Item description	Reference	Status	Support
MECS94	Is the CurrentOutletEnergyCarrierSummation attribute supported?		MECS1:O	[N]
MECS95	Is the InletTemperature attribute supported?		MECS54e:M MECS54f:M MECS1:O	[N]
MECS96	Is the OutletTemperature attribute supported?		MECS54e:M MECS54f:M MECS1:O	[N]
MECS97	Is the ControlTemperature attribute supported?		MECS1:O	[N]
MECS98	Is the CurrentInletEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS99	Is the CurrentOutletEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS100	Is the EnergyCarrierUnitOfMeasure attribute supported?		MECS54e:M MECS54f:M MECS1:O	[N]
MECS101	Is the EnergyCarrierSummationFormatting attribute supported?		MECS93:M MECS94:M	[N]
MECS102	Is the EnergyCarrierDemandFormatting attribute supported?		MECS98:M MECS99:M MECS107:M MECS108:M MECS109:M MECS110:M MECS111:M MECS112:M	[N]
MECS103	Is the TemperatureUnitOfMeasure attribute supported?		MECS54e:M MECS54f:M	[N]
MECS104	Is the TemperatureFormatting attribute supported?		MECS54e:M MECS54f:M	[N]
MECS105	Is the CurrentMonthMaxDemand attribute supported?		MECS1:O	[N]
MECS106	Is the CurrentYearMaxDemand attribute supported?		MECS1:O	[N]

Item number	Item description	Reference	Status	Support
MECS107	Is the CurrentDayMaxEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS108	Is the PreviousDayMaxEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS109	Is the CurrentMonthMaxEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS110	Is the CurrentMonthMinEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS111	Is the CurrentYearMaxEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS112	Is the CurrentYearMinEnergyCarrierDemand attribute supported?		MECS1:O	[N]
MECS113	Is the HoursInOperation attribute supported?		MECS54e:M MECS54f:M	[N]
MECS114	Is the HoursInFault attribute supported?		MECS1:O	[N]
MECS115	Is the Generic AlarmMask attribute supported?		MECS1:O	[N]
MECS116	Is the Electricity AlarmMask attribute supported?		MECS1:O	[N]
MECS117	Is the GenericFlow/Pressure AlarmMask attribute supported?		MECS1:O	[N]
MECS118	Is the Water Specific AlarmMask attribute supported?		MECS1:O	[N]
MECS119	Is the Heating Specific AlarmMask attribute supported?		MECS1:O	[N]
MECS120	Is the Cooling Specific AlarmMask attribute supported?		MECS1:O	[N]
MECS121	Is the Gas Specific AlarmMask attribute supported?		MECS1:O	[N]
MECS122	Is the reception of Request Fast Poll Mode command supported?		MECS1:O	[N]

Item number	Item description	Reference	Status	Support
MECS123	Is the generation of Request Fast Poll Mode Response supported?		MECS1:O	[N]
MECS124	Is the Mapping of the Status Attribute (Electricity) supported?	[R2]/D.3.2.2.3.1 Table D.16	MECS54a:M	[Y] [Int: EP# 16]
MECS125	Is the Meter Status Attribute (Gas) mapping supported?	[R2]/D.3.2.2.3.1 Table D.17	MECS54b:M	[N]
MECS126	Is the Meter Status Attribute (Water) mapping supported?	[R2]/D.3.2.2.3.1 Table D.18	MECS54c:M	[N]
MECS127	RESERVED			
MECS128	Is the Meter Status Attribute (Heat and Cooling) mapping?	[R2]/D.3.2.2.3.1 Table D.19	MECS54e:M MECS54f:M	[N]
MECS129	RESERVED			
MECS130	Does the device generate fragmented Get Profile Response commands?		MECS74:O	[N]
MECS131	Is the *PreviousBlockPeriodConsumptionDelivered* attribute supported?	[R2]/D.3.2.2.1 Table D.11	MECS132:O[13] MECS133:O	[N]
MECS132	Does the device support Block Charging only?	[R2]/D.4.4.3.2	MECS1:O	[N]
MECS133	Does the device support Block/TOU Combination Charging?	[R2]/D.4.4.3.3	MECS1:O	[N]
MECS134	Are any Block Information 'No Tier' attributes (0x00 to 0x0F) supported?	[R2]/D.3.2.2.8	MECS132:M	[N]
MECS135	Are any Block Information 'TierxBlocky' attributes (0x10 to 0xFF) supported	[R2]/D.3.2.2.8	MECS133:O	[N]

383 **Table 34 – Metering cluster client capabilities**

Item number	Item description	Reference	Status	Support
MECC1	Is the Metering Cluster supported as a client?	[R2]/D.3	O	[N]

[13] CCB 1500

Item number	Item description	Reference	Status	Support
MECC2	Is the reception of Get Profile Response command supported?		MECC1:O	[N]
MECC3	Is the reception of Request Mirror command supported?		MECC1:O	[N]
MECC4	Is the reception of Remove Mirror command supported?		MECC1:O	[N]
MECC5	Is the generation of Get Profile command supported?		MECC1:O	[N]
MECC6	Is the generation of Request Mirror Response command supported?		MECC1:O	[N]
MECC7	Is the generation of Mirror Removed command supported?		MECC1:O	[N]
MECC8	Is the reception of Request Fast Poll Mode Response command supported?		MECC1:O	[N]
MECC9	Is the generation of Request Fast Poll Mode command supported?		MECC1:O	[N]
MECC10	Does the device support reception of fragmented Get Profile Response commands?		MECC5:M	[N]

8.8.10 Price Cluster attributes and functions

Table 35 – Price cluster server capabilities

Item number	Item description	Reference	Status	Support
PCS1	Is the Price Cluster supported as a server?	[R2]/D.4	O	[Y] [Int: EP# 16]
PCS2	Is the Tier1PriceLabel attribute supported?		PCS1:O	[N]
PCS3	Is the Tier2PriceLabel attribute supported?		PCS1:O	[N]
PCS4	Is the Tier3PriceLabel attribute supported?		PCS1:O	[N]

Item number	Item description	Reference	Status	Support
PCS5	Is the Tier4PriceLabel attribute supported?		PCS1:O	[N]
PCS6	Is the Tier5PriceLabel attribute supported?		PCS1:O	[N]
PCS7	Is the Tier6PriceLabel attribute supported?		PCS1:O	[N]
PCS8	Is the reception of Get Current Price command supported?		PCS1:M	[Y] [Int: EP# 16]
PCS9	Is the reception of Get Scheduled Prices command supported?		PCS1:O	[Y] [Int: EP# 16]
PCS10	Is the generation of Publish Price command supported?		PCS1:M	[Y] [Int: EP# 16]
PCS11	Is the Tier7PriceLabel attribute supported?		PCS1:O	[N]
PCS12	Is the Tier8PriceLabel attribute supported?		PCS1:O	[N]
PCS13	Is the Tier9PriceLabel attribute supported?		PCS1:O	[N]
PCS14	Is the Tier10PriceLabel attribute supported?		PCS1:O	[N]
PCS15	Is the Tier11PriceLabel attribute supported?		PCS1:O	[N]
PCS16	Is the Tier12PriceLabel attribute supported?		PCS1:O	[N]
PCS17	Is the Tier13PriceLabel attribute supported?		PCS1:O	[N]
PCS18	Is the Tier14PriceLabel attribute supported?		PCS1:O	[N]
PCS19	Is the Tier15PriceLabel attribute supported?		PCS1:O	[N]
PCS20	Is the Block Threshold attribute set supported?		PCS42:M PCS43:M	[N]
PCS25	Is the reception of Price Acknowledgement command supported?		PCS1:O	[Y] [Int: EP# 16]
PCS26	Is the generation of Publish Block Period command supported?		PCS42:O PCS43:O	[N]

Item number	Item description	Reference	Status	Support
PCS27	Is the reception of Get Block Period(s) command support?		PCS42:O PCS43:O	[N]
PCS28	Is the Commodity Type (server) attribute supported?		PCS1:O	[N]
PCS29	Is the Standing Charge attribute supported?		PCS1:O	[N]
PCS30	Is the *ConversionFactor* attribute supported?		PCS1:O[14]	[N]
PCS31	Is the *ConversionFactorTrailingDigit* supported?		PCS1:O[15]	[N]
PCS32	Is the *CalorificValue* attribute supported?		PCS1:O[16]	[N]
PCS33	Is the *CalorificValueUnit* attribute supported?		PCS1:O[17]	[N]
PCS34	Is the *CalorificValueTrailingDigit* attribute supported?		PCS1:O[18]	[N]
PCS36	Is the reception of the *GetConversionFactor* command supported?		PCS1:O[19]	[N]
PCS37	Is the reception of the *GetCalorificValue* command supported?		PCS1:O[20]	[N]
PCS38	Is the generation of the *Publish Conversion Factor* command supported?		PCS1:O[21]	[N]
PCS39	Is the generation of the *Publish Calorific Value* command supported?		PCS1:O[22]	[N]
PCS40	Is the *CurrentBillingPeriodStart* attribute supported?	[R2]/D.4.2.2.6 Table D.49	PCS1:O[23]	[N]

[14] CCB 1264
[15] CCB 1264
[16] CCB 1264
[17] CCB 1264
[18] CCB 1264
[19] CCB 1264
[20] CCB 1264
[21] CCB 1264
[22] CCB 1264
[23] CCB 1494

Item number	Item description	Reference	Status	Support
PCS41	Is the *CurrentBillingPeriodDuration* attribute supported?	[R2]/D.4.2.2.6 Table D.49	PCS1:O[24]	[N]
PCS42	Does the device support Block Charging only?	[R2]/D.4.4.3.2	PCS1:O	[N]
PCS43	Does the device support Block/TOU Combination Charging ?	[R2]/D.4.4.3.3	PCS1:O	[N]
PCS44	Is the Block Period attribute set supported?	[R2]/D.4.2.2.3	PCS42:O PCS43:O	[N]
PCS45	Are any Block Price Information 'No Tier' attributes (0x00 to 0x0F) supported?	[R2]/D.4.2.2.5	PCS42:M	[N]
PCS46	Are any Block Price Information 'TierxBlocky' attributes (0x10 to 0xFF) supported?	[R2]/D.4.2.2.5	PCS43:O	[N]

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389 **Table 36 – Price cluster client capabilities**

Item number	Item description	Reference	Status	Support
PCC1	Is the Price Cluster supported as a client?	[R2]/D.4	O	[N]
PCC2	Is the reception of Publish Price command supported?		PCC1:M	[N]
PCC3	Is the generation of Get Current Price command supported?		PCC1:M	[N]
PCC4	Is the generation of Get Scheduled Prices command supported?		PCC1:O	[N]
PCC5	Is the PriceIncreaseRandomizeMinutes attribute supported?		PCC1:O	[N]
PCC6	Is the PriceDecreaseRandomizeMinutes attribute supported?		PCC1:O	[N]
PCC7	Is the Commodity Type (client) attribute supported?		PCC1:O	[N]

[24] CCB 1494

Item number	Item description	Reference	Status	Support
PCC8	Is the generation of Price Acknowledgement command supported?		PCC1:O	[N]
PCC9	Is the reception of Publish Block Period command supported?		PCC12:O PCC13:O	[N]
PCC10	Is the generation of Get Block Period(s) command supported?		PCC12:O PCC13:O	[N]
PCC11	Is the TOU charging behavior supported?	[R2]/D.4.4.3.1	PCC1:O	[N]
PCC12	Is the Block Tariffs Block Charging ONLY behavior supported?	[R2]/D.4.4.3.2	PCC1:O	[N]
PCC13	Is the Block Tariffs Block/TOU Combination Charging supported?	[R2]/D.4.4.3.3	PCC1:O	[N]
PCC14	Is the Block Tariffs guideline for extended non-communication supported?	[R2]/D.4.4.3.4	PCC12:O PCC13:O	[N]
PCC15	Is the Block Tariffs guideline for meter installation or swap-out supported?	[R2]/D.4.4.3.4	PCC12:O PCC13:O	[N]
PCC16	Is the generation of the *GetConversionFactor* command supported?		PCC1:O[25]	[N]
PCC17	Is the generation of the *GetCalorificValue* command supported?		PCC1:O[26]	[N]
PCC18	Is the reception of the *Publish Conversion Factor* command supported?		PCC1:O[27]	[N]
PCC19	Is the reception of the *Publish Calorific Value* command supported?		PCC1:O[28]	[N]

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391

[25] CCB 1264
[26] CCB 1264
[27] CCB 1264
[28] CCB 1264

8.8.11 Messaging Cluster attributes and functions

Table 37 – Messaging cluster server capabilities

Item number	Item description	Reference	Status	Support
MCS1	Is the Messaging Cluster supported as a server?	[R2]/D.5	O	[Y] [Int: EP# 16]
MCS2	Is the reception of Get Last Message command supported?		MCS1:M	[Y] [Int: EP# 16]
MCS5[29]	Is the reception of Message Confirmation command supported?		MCS1:M	[Y] [Int: EP# 16]
MCS3	Is the generation of Display Message command supported?		MCS1:M	[Y] [Int: EP# 16]
MCS4	Is the generation of Cancel Message command supported?		MCS1:M	[Y] [Int: EP# 16]

Table 38 – Messaging cluster client capabilities

Item number	Item description	Reference	Status	Support
MCC1	Is the Messaging Cluster supported as a client?	[R2]/D.5	O[30]	[N]
MCC2	Is the reception of Display Message command supported?		MCC1:M	[N]
MCC3	Is the reception of Cancel Message command supported?		MCC1:M	[N]
MCC4	Is the generation of Get Last Message command supported?		MCC1:M	[N]
MCC5	Is the generation of Message Confirmation command supported?		MCC1:M	[N]

[29] CCB 1496
[30] CCB 1430

395

396 8.8.12 **Tunneling Cluster attributes and functions**

397 **Table 39 – Tunneling cluster server capabilities**

Item number	Item description	Reference	Status	Support
TUS1	Is the Tunneling Cluster supported as a server?	[R2]/D.6	O	[N]
TUS2	Is the reception of RequestTunnel command supported?	[R2]/D.6.2.4	TUS1:M	[N]
TUS3	Is the reception of CloseTunnel command supported?	[R2]/D.6.2.4	TUS1:M	[N]
TUS4	Is the reception of TransferData command supported?	[R2]/D.6.2.4	TUS1:M	[N]
TUS5	Is the reception of TransferDataError command supported?	[R2]/D.6.2.4	TUS1:M	[N]
TUS6	Is the reception of AckTransferData command supported?	[R2]/D.6.2.4	TUS1:O	[N]
TUS7	Is the reception of ReadyData command supported?	[R2]/D.6.2.4	TUS1:O	[N]
TUS8	Is the generation of RequestTunnelResponse command supported?	[R2]/D.6.2.5	TUS1:M	[N]
TUS9	Is the generation of TransferData command supported?	[R2]/D.6.2.5	TUS1:M	[N]
TUS10	Is the generation of TransferDataError command supported?	[R2]/D.6.2.5	TUS1:M	[N]
TUS11	Is the generation of AckTransferData command supported?	[R2]/D.6.2.5	TUS1:O	[N]
TUS12	Is the generation of ReadyData command supported?	[R2]/D.6.2.5	TUS1:O	[N]
TUS13	Is the reception of the *GetSupportedTunnelProtocols* supported?	[R2]/D.6.2.4	TUS1:O[31]	[N]

[31] CCB 1273

Item number	Item description	Reference	Status	Support
TUS14	Is the generation of the *Supported Tunnel Protocols Response* command supported?	[R2]/D.6.2.5	TUS1:O[32]	[N]
TUS15	Is the generation of the *TunnelClosureNotification* command supported?	[R2]/D.6.2.5	TUS1:O[33]	[N]

398

399 **Table 40 – Tunneling cluster client capabilities**

Item number	Item description	Reference	Status	Support
TUC1	Is the Tunneling Cluster supported as a client?	[R2]/D.6	O	[N]
TUC2	Is the reception of RequestTunnelResponse command supported?	[R2]/D.6.3.3	TUC1:M	[N]
TUC3	Is the reception of TransferData command supported?	[R2]/D.6.3.3	TUC1:M	[N]
TUC4	Is the reception of TransferDataError command supported?	[R2]/D.6.3.3	TUC1:M	[N]
TUC5	Is the reception of AckTransferData command supported?	[R2]/D.6.3.3	TUC1:O	[N]
TUC6	Is the generation of ReadyData command supported?	[R2]/D.6.3.3	TUC1:O	[N]
TUC7	Is the generation of RequestTunnel command supported?	[R2]/D.6.3.4	TUC1:M	[N]
TUC8	Is the generation of CloseTunnel command supported?	[R2]/D.6.3.4	TUC1:M	[N]
TUC9	Is the generation of TransferData command supported?	[R2]/D.6.3.4	TUC1:M	[N]
TUC10	Is the generation of TransferDataError command supported?	[R2]/D.6.3.4	TUC1:M	[N]
TUC11	Is the generation of AckTransferData command	[R2]/D.6.3.4	TUC1:O	[N]

[32] CCB 1273
[33] CCB 1273

Item number	Item description	Reference	Status	Support
	supported?			
TUC12	Is the generation of ReadyData command supported?	[R2]/D.6.3.4	TUC1:O	[N]
TUC13	Is the generation of the *GetSupportedTunnelProtocols* supported?	[R2]/D.6.2.4	TUC1:O[34]	[N]
TUC14	Is the reception of the *Supported Tunnel Protocols Response* command supported?	[R2]/D.6.2.5	TUC1:O[35]	[N]
TUC15	Is the reception of the *TunnelClosureNotification* command supported?	[R2]/D.6.2.5	TUC1:O[36]	[N]

400

401 8.8.13 **Prepayment Cluster attributes and functions**

402 **Table 41 – Prepayment cluster server capabilities**

Item number	Item description	Reference	Status	Support
PPCS1	Is the Prepayment Cluster supported as a server?	[R2]/D.7	O	[N]
PPCS2	Is the reception of Select Available Emergency Credit command supported?	[R2]/D.7.2.3	PPCS1:O	[N]
PPCS3	Is the reception of Change Supply command supported?	[R2]/D.7.2.3	PPCS1:O	[N]
PPCS4	Is the generation of Supply Status Response command supported?	[R2]/D.7.2.4	PPCS1:O	[N]
PPCS7	Is the Payment Control attribute supported?	[R2]/D.7.2.2.1	PPCS1:M	[N]
PPCS8	Is the Credit Remaining attribute supported?	[R2]/D.7.2.2.1	PPCS1:O	[N]
PPCS9	Is the Emergency Credit Remaining attribute supported?	[R2]/D.7.2.2.1	PPCS1:O	[N]

[34] CCB 1273
[35] CCB 1273
[36] CCB 1273

Item number	Item description	Reference	Status	Support
PPCS10	Is the Credit Status attribute supported?	[R2]/D.7.2.2.1	PPCS1:O	[N]
PPCS11	Are the Top up Date/Time attributes supported? If so, list supported attributes #1-5.	[R2]/D.7.2.2.2	PPCS1:O	[N]
PPCS12	Are the Top up Amount attributes supported? If so, list supported attributes #1-5.	[R2]/D.7.2.2.2	PPCS1:O	[N]
PPCS13	Are the Originating Device attributes supported? If so, list supported attributes #1-5.	[R2]/D.7.2.2.2	PPCS1:O	[N]
PPCS14	Is the Fuel Debt Remaining attribute supported?	[R2]/D.7.2.2.3	PPCS1:O	[N]
PPCS15	Is the Fuel Debt Recovery Rate attribute supported?	[R2]/D.7.2.2.3	PPCS1:O	[N]
PPCS16	Is the Fuel Debt Recovery Period attribute supported?	[R2]/D.7.2.2.3	PPCS1:O	[N]
PPCS17	Is the Non Fuel Debt Remaining attribute supported?	[R2]/D.7.2.2.3	PPCS1:O	[N]
PPCS18	Is the Non Fuel Debt Recovery Rate attribute supported?	[R2]/D.7.2.2.3	PPCS1:O	[N]
PPCS19	Is the Non Fuel Debt Recovery Period attribute supported?	[R2]/D.7.2.2.3	PPCS1:O	[N]
PPCS20	Is the Proposed Change Provider ID attribute supported?	[R2]/D.7.2.2.4	PPCS1:O	[N]
PPCS21	Is the Proposed Change Implementation Time attribute supported?	[R2]/D.7.2.2.4	PPCS1:O	[N]
PPCS22	Is the Proposed Change Supply Status attribute supported?	[R2]/D.7.2.2.4	PPCS1:O	[N]
PPCS23	Is the Delayed Supply Interrupt – Value Remaining attribute supported?	[R2]/D.7.2.2.4	PPCS1:O	[N]
PPCS24	Is the Delayed Supply Interrupt – Value Type attribute supported?	[R2]/D.7.2.2.4	PPCS1:O	[N]

403

404 **Table 42 – Prepayment cluster client capabilities**

Item number	Item description	Reference	Status	Support
PPCC1	Is the Prepayment Cluster supported as a client?	[R2]/D.7	O	[N]
PPCC2	Is the generation of Select Available Emergency Credit command supported?	[R2]/D.7.3.4	PPCC1:O	[N]
PPCC3	Is the generation of Change Supply command supported?	[R2]/D.7.3.4	PPCC1:O	[N]
PPCC4	Is the reception of Supply Status Response command supported?	[R2]/D.7.3.3	PPCC1:O	[N]

405

406 ### 8.8.14 Trust Center Swap-out

407 **Table 43 – Trust Center Swap-out capabilities**

Item number	Item description	Reference	Status	Support
TCSW1	Is the device a Trust Center supporting Trust Center Swap-out?	[R2]/5.4.2.2.3	O	[N]
TCSW2	Is the generation of Trust Center keep-alive command supported?		TCSW1:M FDT1:M FDT2:M	[N]
TCSW3	Is the backup of the Extended PAN ID to an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW4	Is the backup of the registered device EUI-64 to an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW5	Is the backup of the registered device Install Code to an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW6	Is the backup of the registered device hashed CBKE derived link key to an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW7	Is the restore of the Extended PAN ID from an off-chip device supported?		TCSW1:M FDT1:M	[N]

Item number	Item description	Reference	Status	Support
TCSW8	Is the restore of the registered device EUI-64 from an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW9	Is the restore of the registered device Install Code from an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW10	Is the restore of the registered device hashed CBKE derived link key from an off-chip device supported?		TCSW1:M FDT1:M	[N]
TCSW11	Is the discovery of the new Trust Center based on the Extended PAN ID supported?		TCSW1:M FDT2:M	[N]
TCSW12	Is the rejoin using the CBKE derived link key supported?		TCSW1:M FDT2:M	[N]
TCSW13	Is the Recommision of device supported?		FDT1:M FDT2:M FDT3:M	[N]
TCSW14	Does the device support the Trust Center Swap-Out parameters?	[R2] 5.4.2.2.3.7	TCSW1:M FDT1:M	[N]

8.8.15 Multiple ESI

Table 44 – Multiple ESI Client capabilities

Item number	Item description	Reference	Status	Support
MESC1	Is Multiple ESI supported?	[R2]/5.7	O	[N]
MESC2	Is the discovery of all ESIs in a HAN supported?		MESC1:M	[N]
MESC3	Is the generation of bindings on discovered ESIs supported?		MESC1:M	[N]
MESC4	Is determination of the authoritative ESI supported?		MESC1:M	[N]

Item number	Item description	Reference	Status	Support
MESC5	Is processing of events from multiple ESIs supported?		MESC1:M	[N]
MESC6	Is resolution of conflicting events received from multiple ESIs supported?		MESC1:M	[N]
MESC7	Is the notification message for an event sent to at least one ESI that sent the event?		MESC1:M	[N]
MESC8	Is the event processing based on the authoritative time?		MESC1:M	[N]

411

412 **Table 45 – Multiple ESI Server capabilities**

Item number	Item description	Reference	Status	Support
MESS1	Is Multiple ESI supported?	[R2]/5.7	O	[N]
MESS2	Is the *TimeStatus* attribute supported?		MESS1:M	[N]
DELETED[37] ~~MESS3~~	~~Is the *LastSynchronizedTime* attribute supported?~~		~~MESS1:M~~	
MESS4	Is the *ValidUntilTime* attribute supported?		MESS1:M	[N]

413

414 8.8.16 **OTA Upgrade Cluster attributes and functions**

415 **Table 46 – OTA Upgrade cluster server capabilities**

Item number	Item description	Reference	Status	Support
OTAS1	Is the OTA Upgrade Cluster supported as a server?	[R9]	O	[Y] [Int: #16]

416

[37] CCB 1301

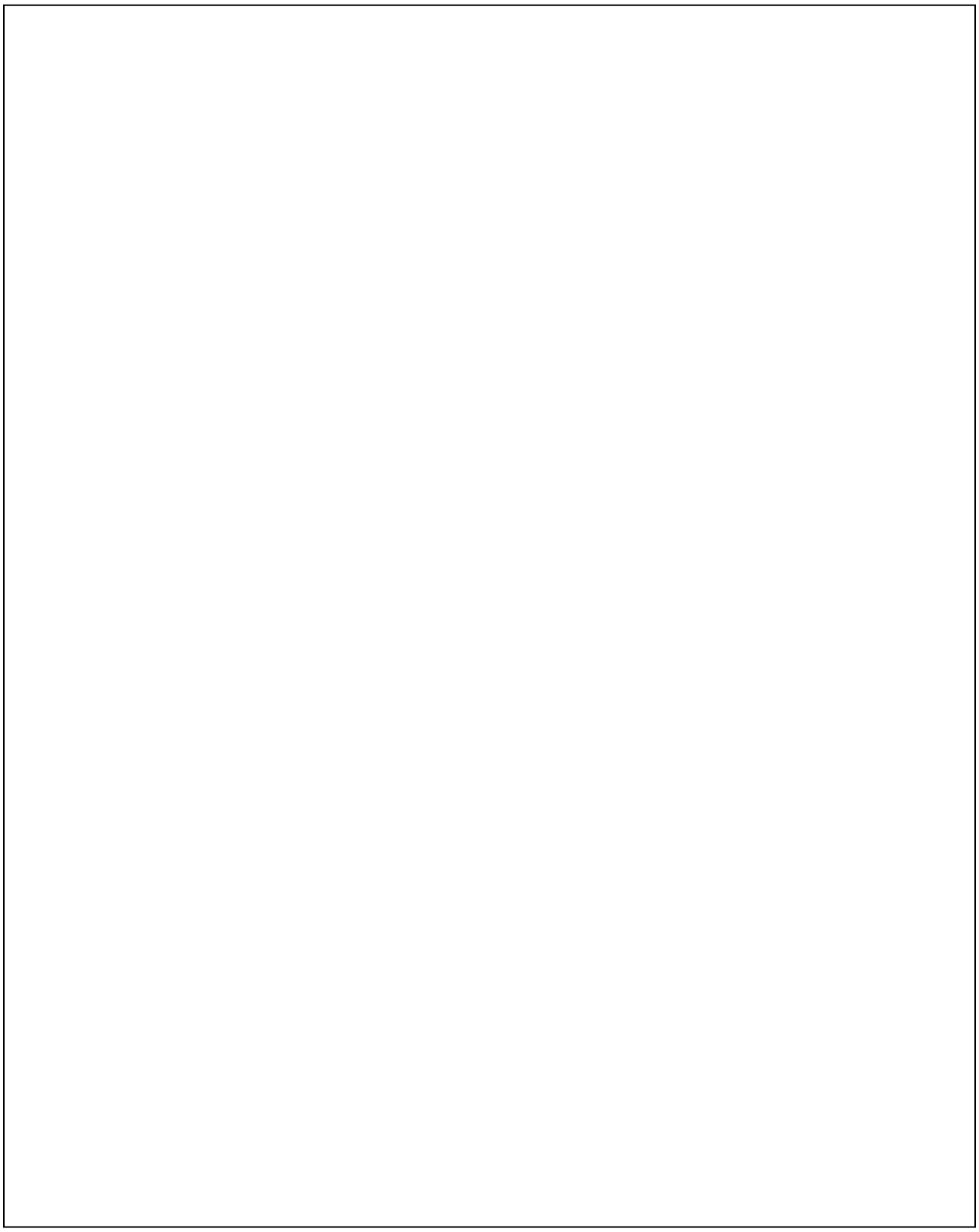
417 **Table 47 – OTA Upgrade cluster client capabilities**

Item number	Item description	Reference	Status	Support
OTAC1	Is the OTA Upgrade Cluster supported as a client?	[R9]	O	[N]

418
419 If supporting OTA upgrade cluster client or server, need to complete OTA Upgrade Cluster PICS
420 document in addition to this document for certification.
421

422 ### 8.8.17 Support on Non SE clusters

423
424 List in the below section all non SE clusters supported on the submitted product:
425



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