OCF Core Specification Extension
WiFi Easy Setup

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1 Scope

This specification defines functional extensions to the capabilities defined in the OCF Core Specification to meet the requirements of Wi-Fi Easy Setup. This specification specifies new Resource Types to enable the functionality and any extensions to the existing capabilities defined in the OCF Core Specification.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

OCF Core Specification, *Open Connectivity Foundation Core Specification*, Version 1.3.1
Available at: https://openconnectivity.org/specs/OCF_Core_Specification_v1.3.0.pdf
Latest version available at: https://openconnectivity.org/specs/OCF_Core_Specification.pdf

OCF Security Specification, *Open Connectivity Foundation Security Capabilities*, Version 1.3
Available at: https://openconnectivity.org/specs/OCF_Security_Specification_v1.3.0.pdf
Latest version available at https://openconnectivity.org/specs/OCF_Security_Specification.pdf

OCF Device Specification, *Open Connectivity Foundation Device Specification*, Version 1.3
Available at: https://openconnectivity.org/specs/OCF_Device_Specification_v1.3.0.pdf
Latest version available at: https://openconnectivity.org/specs/OCF_Device_Specification.pdf

IEEE 802.11:2016, IEEE Standard for Information technology—Telecommunications and information exchange between systems Local and metropolitan area networks—Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications, December 2016
https://standards.ieee.org/findstds/standard/802.11-2016.html

IETF RFC 5646, *Tags for Identifying Languages*, September 2009
https://www.rfc-editor.org/info/rfc5646

IETF RFC 7159, *The JavaScript Object Notation (JSON) Data Interchange Format*, March 2014
https://www.rfc-editor.org/info/rfc7159

IETF RFC 7252, *The Constrained Application Protocol (CoAP)*, June 2014
https://www.rfc-editor.org/info/rfc7252

JSON Schema Validation, *JSON Schema: interactive and non-interactive validation*, January 2013
http://json-schema.org/latest/json-schema-validation.html

OpenAPI specification, *aka Swagger RESTful API Documentation Specification*, Version 2.0
https://github.com/OAI/OpenAPI-Specification/blob/master/versions/2.0.md

3 Terms, definitions, symbols and abbreviations

All terms and definitions as defined in the OCF Core Specification also apply to this specification.

3.1 Terms and definitions

As defined in the OCF Core Specification with the following additions.

3.1.1
Easy Setup Enrollment
Easy Setup Enrollment is a step during Easy Setup in which the Enrollee is contacted by the Mediator to configure the Enroller's information by means of accessing Easy Setup Resources.

3.1.2
Enrollee
The Device that needs to be configured and connected. E.g. Air-conditioner, Printer.

3.1.3
Enroller
Target network entity to which the Enrollee connects. E.g. Wi-Fi AP

3.1.4
Mediator
logical function that enables the Enrollee to connect to the target network (Enroller). The Mediator transfers configuration information to the Enrollee. E.g. Mobile Phone

3.1.5
Easy Setup
Process of configuring an Enrollee using Mediator (by transferring of essential information to the Enrollee).

3.1.6
Soft AP
Software Enabled Access Point hosted on the device which is not a dedicated Access Point.

3.2 Conventions

In this specification a number of terms, conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., Network Architecture). Any lowercase uses of these words have the normal technical English meaning.

3.3 Data types

As defined in the OCF Core Specification.

4 Document conventions and organization

In this document, features are described as required, recommended, allowed or DEPRECATED as follows:

Required (or shall or mandatory)(M).

- These basic features shall be implemented to comply with Core Architecture. The phrases "shall not", and "PROHIBITED" indicate behaviour that is prohibited, i.e. that if performed means the implementation is not in compliance.

Recommended (or should)(S).

- These features add functionality supported by Core Architecture and should be implemented. Recommended features take advantage of the capabilities Core Architecture, usually without imposing major increase of complexity. Notice that for compliance testing, if a recommended feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines. Some recommended features could become requirements in the future. The phrase "should not" indicates behaviour that is permitted but not recommended.

Allowed (may or allowed)(O).

- These features are neither required nor recommended by Core Architecture, but if the feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines.

DEPRECATED.

- Although these features are still described in this specification, they should not be implemented except for backward compatibility. The occurrence of a deprecated feature during operation of an implementation compliant with the current specification has no effect on the implementation's operation and does not produce any error conditions. Backward compatibility may require that a feature is implemented and functions as specified but it shall never be used by implementations compliant with this specification.

Conditionally allowed (CA)

- The definition or behaviour depends on a condition. If the specified condition is met, then the definition or behaviour is allowed, otherwise it is not allowed.

Conditionally required (CR)

- The definition or behaviour depends on a condition. If the specified condition is met, then the definition or behaviour is required. Otherwise the definition or behaviour is allowed as default unless specifically defined as not allowed.

Strings that are to be taken literally are enclosed in "double quotes".

Words that are emphasized are printed in italic.

5 Overview

5.1 Introduction

This specification describes a way to setup and configure a new OCF Device, using an already configured OCF Device or onboarding tool.

The described setup and configure mechanism is optional and other mechanisms are allowed to be used.

Specifically, this method allows the transferring of essential information to the new Device, which includes:

- Local network connection information, e.g. in case of Wi-Fi it will be Wi-Fi access point information.
- Device Configuration: Additional Device configuration information.

Easy Setup can be enhanced in future by incorporating other suitable technologies.

5.2 Architecture

Figure 1 shows the deployment architectural approach.

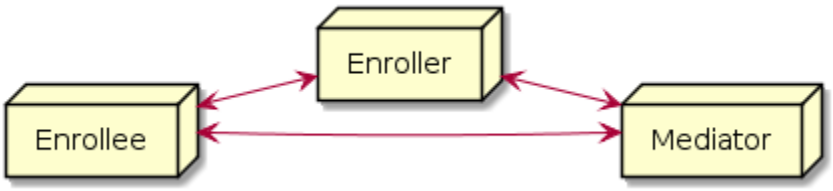


Figure 1. Easy Setup deployment architecture

Easy Setup defines the following roles: Enrollee, Enroller, and Mediator. Please refer to Section 3.1 for definitions thereof.

5.3 Example Scenario

The following scenario presents a typical setup case.

The configuration information and steps taken may vary depending on the Device's type and status.

1. The Enrollee enters Easy Setup mode (when the Device is unboxed for the first time, it may be in this mode by default).
2. The Mediator discovers and connects to the Enrollee.
3. The Mediator performs Security Provisioning of the Enrollee.
4. The Mediator transmits Wi-Fi Setting Information to the Enrollee.
5. Using the information received from the Mediator, the Enrollee connects to the Enroller (Wi-Fi AP).

6 Resource model

6.1 Introduction

Devices capable of Easy Setup shall support the following Resource Types.

1. EasySetup Resource Type
2. WiFiConf Resource Type
3. DevConf Resource Type

The EasySetup Resource Type is a Collection Resource and shall contain Links to instances of at least WiFiConf and DevConf. A vendor may add links to other Resource Types.

Note that the EasySetup Resource Type supports the batch Interface (oic.if.b) which allows for efficient data delivery with a single request rather than multiple requests to each linked Resource.

Figure 2. Easy Setup Resource Types

6.2 EasySetup Resource

6.2.1 Overview

The EasySetup Resource stores useful information including current status of Enrollee and last error code which was produced in the process of Easy Setup.

6.2.2 Resource

The Easy Setup Resource Type is as defined in Table 1. EasySetup Resource Type.

Table 1. EasySetup Resource Type

Example URI	Resource Type Title	Resource Type ID ("rt" value)	Interfaces	Description	Related Functional Interaction
/example/EasySetupResURI	EasySetup	oic.r.easysetup, oic.wk.col	oic.if.baseline, oic.if.ll, oic.if.b	Top level Resource for Easy Setup. Indicates easy setup status. The Resource properties exposed are listed in Table 2.	

Table 2. "oic.r.easysetup" Resource Type definition defines the details for the "oic.r.easysetup" Resource Type.

Table 2. "oic.r.easysetup" Resource Type definition

Property title	Property name	Value type	Value rule	Unit	Access mode	Mandatory	Description
Easy Setup Provisioning Status	ps	integer	enum		R	Yes	Easy setup provisioning status of the Device 0: Need to Setup, 1: Connecting to Enroller, 2: Connected to Enroller,

							3: Failed to Connect to Enroller, 4~254: Reserved, 255: EOF
Last Error Code	lec	integer	enum		R	Yes	Indicates a failure reason if it fails to connect to Enroller 0: NO error, 1: Given SSID is not found, 2: Wi-Fi password is wrong, 3: IP address is not allocated, 4: NO internet connection, 5: Timeout, 6: Wi-Fi Auth Type is not supported by the Enrollee, 7: Wi-Fi Encryption Type is not supported by the Enrollee, 8: Wi-Fi Auth Type is wrong (failure while connecting to the Enroller), 9: Wi-Fi Encryption Type is wrong (failure while connecting to the Enroller), 10~254: Reserved, 255: Unknown error.
Connect	cn	array of integer			RW	Yes	Array of connection types to trigger Enrollee to initiate connection: 1 : Wi-Fi, 2 : Other transport to be added in a future (e.g. BLE))
Links	links	array			R	Yes	Array of links that are WiFiConf and DevConf Resource.

Enrollee shall set the following as default values (for example, when Device is unboxed first time):

- "ps" equal to 0.
- "lec" equal to 0.
- "cn" equal to an empty array.

6.3 WiFiConf Resource Type

6.3.1 Introduction

The WiFiConf Resource Type stores information to help an Enrollee to connect to an existing Wi-Fi AP.

6.3.2 Resource Type

The WiFiConf Resource Type is as defined in Table 3. WiFiConf Resource Type.

300 **Table 3. WiFiConf Resource Type**

Example URI	Resource Type Title	Resource Type ID ("rt" value)	Interfaces	Description	Related Functional Interaction
/example/WiFiConfResURI	WiFiConf	oic.r.wificonf	oic.if.baseline, oic.if.rw	Contains Wi-Fi related properties The Resource properties exposed are listed in Table 4.	

301

302 Table 4. "oic.r.wificonf" Resource Type definition defines the details for the "oic.r.wificonf"
303 Resource Type.

304 **Table 4. "oic.r.wificonf" Resource Type definition**

Property title	Property name	Value type	Value rule	Unit	Access mode	Mandatory	Description
Supported Wi-Fi Mode Type	swmt	array of string	enum		R	Yes	Supported Wi-Fi modes by Enrollee. Can be multiple. ("A", "B", "G","N", "AC")
Supported Wi-Fi Frequency	swf	array of string	Refer to description for valid values.		R	Yes	Supported Wi-Fi frequencies by Enrollee. Can be multiple. ("2.4G", "5G")
Target Network Name	tnn	string			RW	Yes	Target network name (SSID of Wi-Fi AP i.e. enroller)
Credential	cd	string			RW	No	Credential information of Wi-Fi AP (Password used to connect to enroller).
Wi-Fi Auth Type	wat	string	enum		RW	Yes	Wi-Fi auth type ("None", "WEP", "WPA_PSK", "WPA2_PSK")
Wi-Fi Encryption Type	wet	string	enum		RW	Yes	Wi-Fi encryption type ("None", "WEP_64", "WEP_128", "TKIP", "AES", "TKIP_AES")
Supported Wi-Fi Auth Type	swat	array of string	enum		R	Yes	Supported Wi-Fi Auth types. Can be multiple. ("None", "WEP", "WPA_PSK", "WPA2_PSK")
Supported Wi-Fi Encryption Type	swet	array of string	enum		R	Yes	Supported Wi-Fi Encryption types. Can be multiple. ("None", "WEP-64", "WEP_128", "TKIP", "AES", "TKIP_AES")

305

306 ## 6.4 DevConf Resource Type

307 ### 6.4.1 Introduction

308 The DevConf Resource Type stores Device configuration information required in Wi-Fi Easy Setup.

6.4.2 Resource Type

The DevConf Resource Type is as defined in Table 5. DevConf Resource Type

Table 5. DevConf Resource Type

Example URI	Resource Type Title	Resource Type ID ("rt" value)	Interfaces	Description	Related Functional Interaction
/example/DevConfResURI	**DevConf**	oic.r.devconf	oic.if.baseline, "oic.if.r"	Stores device configuration information required in Easy Setup process The Resource properties exposed are listed in Table 6.	

Table 6. "oic.r.devconf" Resource Type definition defines the details for the "oic.r.devconf" Resource Type.

Table 6. "oic.r.devconf" Resource Type definition

Property title	Property name	Value type	Value rule	Unit	Access mode	Mandatory	Description
Device Name	dn	one of: string or array of object			R	Yes	Indicates a pre-configured device name in language indicated by 'dl' in /oic/con. or An array of objects where each object has a 'language' field (containing an IETF RFC 5646 language tag) and a 'value' field containing the pre-configured device name in the indicated language. The pre-configured device name is presented by enrollee to mediator during easy-setup process.

7 Network and connectivity

Both the Mediator and Enrollee communicate via a common connectivity (e.g. Wi-Fi).

If using Wi-Fi for Easy Setup then the Enrollee shall have capability to act as a Soft AP. A Soft AP shall support the access point requirements defined by IEEE 802.11:2016.

8 Functional interactions

8.1 Onboarding, Provisioning and Configuration

The Mediator may be present as a standalone function or in conjunction with other functions or services such as AMS as part of an OBT (Onboarding Tool); please refer to the OCF Security Specification.

8.2 Resource discovery

The Mediator connects to the Enrollee via a mutually supported connection.

When in Easy Setup phase, if using Wi-Fi as the connectivity between the Enrollee and the Mediator then the Enrollee shall make itself discoverable as a Soft AP. The Soft AP has additional availability constraints which are documented in the OCF Security Specification.

8.3 Retrieving and Updating Easy Setup Resources

The Enrollee shall expose Easy Setup Resources such that a Mediator is able to discover them using standard OCF Resource discovery methods (i.e. via a RETRIEVE on /oic/res); see the OCF Core Specification, Section 11.3.

Easy Setup Resources shall expose only secure Endpoints (e.g. CoAPS); see the OCF Core Specification, Section 10.

The Mediator may RETRIEVE a Resource within the Easy Setup Collection or the Collection itself to check the Enrollee's status at any stage of Easy Setup. This applies only when the Enrollee & the Mediator are on a common network.

The Mediator may UPDATE Resource Property(-ies) on the Enrollee. Upon receipt of the request from the Mediator the Enrollee shall update its current Resource Property Values, and shall perform any required action. For example, if the "cn" Property of "EasySetup" Resource is updated by the Mediator, to indicate connection to Wi-Fi, the Enrollee shall start the connection to Enroller.

For details of Easy Setup Resources refer to Section 6.

8.4 Error Handling

The "lec" Property of the EasySetup Resource (i.e. "oic.r.easysetup") is used to indicate the error that occurred in the Easy Setup process while trying to connect to the Enroller (using the information provided by the Mediator in WiFiConf Resource):

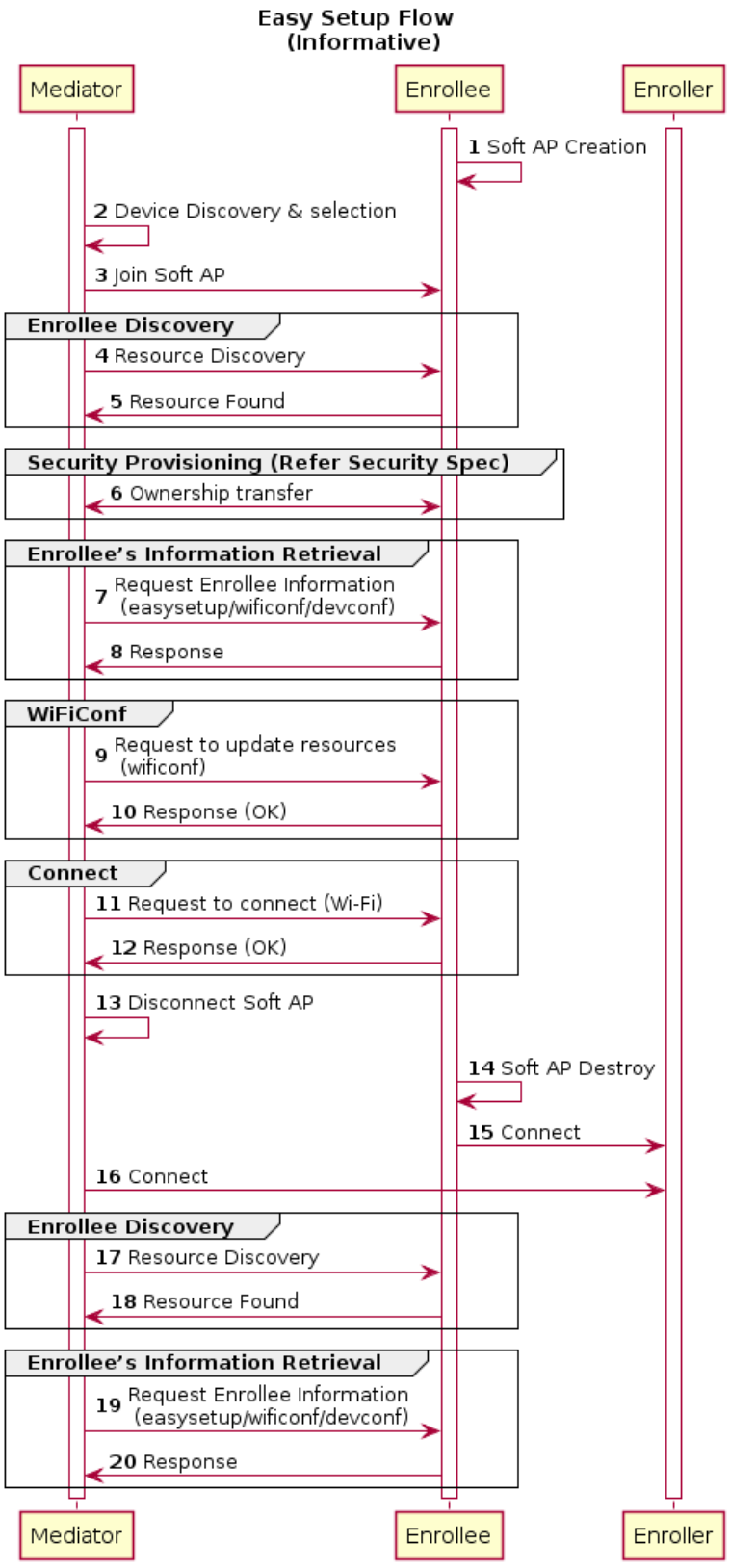
- The Enrollee shall set "lec" Property to 1, if it fails to connect because it can't find the SSID.
- The Enrollee shall set "lec" Property to 2, if it fails to connect due to wrong credential (password) information.
- The Enrollee should set "lec" Property to 6, if the Auth type is not supported by the Enrollee.
- The Enrollee should set "lec" Property to 7, if the Encryption type is not supported by the Enrollee.
- The Enrollee should set "lec" Property to 8, if it fails to connect due to wrong Auth type information (even though it's supported by the Enrollee).
- The Enrollee should set "lec" Property to 9, if it fails to connect due to wrong Encryption type information (even though it's supported by the Enrollee).

When using Wi-Fi as the connectivity between the Enrollee and Mediator, if the Enrollee fails to connect to the Enroller, it shall again make itself discoverable as a Soft AP (in case it destroyed its Soft AP earlier).

8.5 Example Easy Setup Flow

The following figure shows an example Easy Setup flow for informative purposes:

365



366

Figure 3. Easy Setup Flow (Informative)

The example flow above undergoes security provisioning (step 6) during Easy Setup. Alternatively security provisioning can be done before Enrollee Discovery (steps 4 and 5) if preferred. Please refer to the OCF Security Specification for more information on the different scenarios.

8.6 Easy Setup SSID Tags

If using Wi-Fi as the connectivity between the Enrollee and the Mediator then the Enrollee's Soft AP SSID should contain exactly one of the following Easy Setup SSID tags:

- "OCF_"
    - Prefix tag that has to be at the beginning of the SSID.
    - Example: OCF_MySSID
- "_OCF"
    - Suffix tag that has to be at the end of the SSID.
    - Example: MySSID_OCF

These tags are case sensitive.

8.7 Easy Setup Information Element

8.7.1 Overview

If using Wi-Fi as the connectivity between the Enrollee and the Mediator then the Enrollee's Soft AP beacon should contain the Easy Setup Information Element. The information element provides additional information about the device such as a friendly name or device manufacturer for the mediator application. The mediator application can then use this information to provide a better user experience.

8.7.2 OCF Device Information Element (IE)

The Easy Setup Information Element has the following structure:

1 byte	1 byte	3 bytes	1 byte	<252 bytes
Type = 221	Length	CID = 6A 40 65	OCF IE Type = 0	Data

- Type is a unique id allocated by the IEEE registrar to identify different information elements from each other. The Easy Setup Information Element shall have a Type value of 221 which is standard vendor specific information element.
- Length shall indicate the total size of CID, OCF IE Type, and Data in bytes.
- Company ID (CID) is a unique 24-bit identifier for a specific company or organization. The Easy Setup Information Element shall have a CID value of 6A 40 65.
- OCF IE Type is the identifier of the specific IE within OCF. The OCF IE Type shall be set to 0 for Easy Setup.
- Data is a set of type-length-value (TLV) structures that represent the device information in Table 1. The length of this field shall be less than 252 bytes.

Each TLV has the following structure.

1 byte	1 byte	<250 bytes
Type	Length	Value

- Type shall indicate the type of the field from Table 7.
- Length shall indicate the length of the Value in bytes.
- Value shall represent the corresponding information for specific TLV type from Table 7.

Data is a set of TLVs as defined below:

Table 7 Easy Setup Information Element TLVs

Type	Length (bytes)	Value	Description of TLV	# of Occurrences in IE or IEC	Required
1	<65	Friendly name of the device	Device Friendly Name	1	Y
2	<27	Device Type	Device type/Class	>=1	Y
3	<65	Name of Device Manufacturer	Manufacturer Name	1	Y
4	<43	Language tag for strings	See IETF RFC 5646	1	Y
5	16	Protocol Independent ID in network byte order	See OCF Core Specification	1	Y
101	<65	Device Type/Class	Device Type as string	>=0	N

The TLVs may be set in any order inside an IE or IEC. All strings shall be UTF-8 encoded and shall not include a null terminator. All TLVs in Table 7 with a 'Required' value of 'Y' shall be included in the IE or IEC (if multiple IEs are required). The value of each TLV shall meet the length requirements specified in Table 1.

8.7.2.1 Device Friendly Name (Type 1)

User readable string representing the friendly name of the device that is beaconing and ready to undergo Easy Setup. This should match 'n' from oic.wk.d as defined in the OCF Core Specification.

This string is in the same language specified in the type 4 TLV.

8.7.2.2 Device Type (Type 2)

Device type shall be the shortened form of 'Device Type' as specified in the OCF Device Specification. For example:

- 'Device Type' as specified in the OCF Device Specification: "oic.d.airconditioner"
- 'Device Type' as specified in a type 2 TLV: "airconditioner"

In cases where the device supports multiple functions, several type 2 TLVs may be included to represent each function of the device.

If the device does not support any of the functions as specified in the OCF Device Specification, at least one type 101 TLV shall be included. Type 101 TLV contains a user readable string in the same language specified in the type 4 TLV. (Ex: "Lock").

If the device supports more than one function, a mix of type 2 and type 101 TLVs may be used depending on which functions are defined in the OCF Device Specification.

8.7.2.3 Device Manufacturer Name (Type 3)

User readable string representing the manufacturer name of the device that is beaconing and ready to undergo Easy Setup. This should match 'mnmn' from oic.wk.p as defined in the OCF Core Specification.

This string is in the same language specified in the type 4 TLV.

8.7.2.4 Language Tag (Type 4)

The language of all strings shall be specified in a type 4 TLV. The value of the type 4 TLV shall contain a language tag as described in IETF RFC 5646 (Ex: "en-us"). If the actual length of the language tag exceeds 42 bytes the manufacturer shall exclude subtags on the language tag until it is less than 43 bytes.

Please see section 8.7.2.8 for information on supporting multiple languages.

If an IE contains a TLV that is a string (i.e. type 1, type 3 or type 101), then a type 4 TLV corresponding to the language of the string(s) shall also be present in the IE.

8.7.2.5 Protocol Independent ID (Type 5)

This shall match 'piid' from oic.wk.d as defined in the OCF Core Specification.

The piid in the TLV shall be in network byte order.

8.7.2.6 Multiple Information Elements

Additional Easy Setup IEs may be present in the Soft AP beacon in the following situations:

- The total size of the TLVs is larger than the size of 'Data' as defined in an Easy Setup Information Element.
- Support for multiple languages is necessary.

Two or more Easy Setup Information Elements are referred to as an Information Element Collection (IEC).

8.7.2.7 IEC for Large TLV Size Support

If a TLV or set of TLVs will not fit into the current IE, a manufacturer may add additional Easy Setup IEs to contain the TLV/s thereby creating or extending an IEC. The additional IE shall contain the following fields as described in section 8.7.2:

- Type
- Length
- CID
- OCF IE Type

If an IE contains a TLV that is a string (i.e. type 1, type 3 or type 101), then a type 4 TLV corresponding to the language of the string(s) shall also be present in the IE.

8.7.2.8 IEC for Multiple Language Support

A manufacturer may include additional Easy Setup IEs to support multiple languages in the Soft AP beacon. In the case that a manufacturer needs to provide device information in more than one language, they shall include an additional copy of the IE/IEC for each additional language. Each additional IE/IEC shall include all of the mandatory TLVs defined in Section 8.7.2.

9 Security

Wi-Fi Easy Setup security requirements are captured in the OCF Security Specification.

Annex A (normative)

Resource Type definitions

A.1 List of Resource Type definitions

Table 8 contains the list of defined resources in this specification.

Table 8. Alphabetized list of resources

Friendly Name (informative)	Resource Type (rt)	Section
Easy Setup	“oic.r.easysetup”	A.2
Wi-Fi Configuration	“oic.r.wificonf”	A.3
Device Configuration	“oic.r.devconf”	A.4

A.2 Easy Setup

A.2.1 Introduction

Easy Setup resource stores useful information including current status of unboxing device and last error code which are produced in a process of easy setup. Note that, Easy Setup resource is a type of collection resource, which contains links to WiFiConf, DevConf resources and may additionally contain links to other resources.

A.2.2 Example URI

/EasySetupResURI

A.2.3 Resource Type

The resource type (rt) is defined as: oic.r.easysetup.

A.2.4 RAML Definition

```
#%RAML 0.8

title: Easy Setup Resource
version: v0.0.3-20170611

traits:
 - interface-ll :
     queryParameters:

       if:
         enum: ["oic.if.ll"]

 - interface-baseline :
     queryParameters:

       if:
         enum: ["oic.if.baseline"]

 - interface-all :
     queryParameters:

       if:
         enum: ["oic.if.baseline", "oic.if.ll", "oic.if.b"]
```



```
 - interface-batch :
     queryParameters:
       if:
         enum: ["oic.if.b"]

/EasySetupResURI?if=oic.if.baseline:
  description: |
    Easy Setup resource stores useful information including current status of
    unboxing device and last error code which are produced in a process of
    easy setup.
    Note that, Easy Setup resource is a type of collection resource, which
    contains links to WiFiConf, DevConf resources and may additionally contain
    links to other resources.

  is : ['interface-baseline']
  get:
    description: |
      Retrieve useful information during easy setup process :
        1
      A current status in easy setup process.
        2
      A last error code describing reason for failure occurred at the last
          time.

    responses :
      200:
        body:
          application/json:
            schema: |
              {
                "$schema": "http://json-schema.org/draft-04/schema#",
                "description" : "Copyright (c) 2017 Open Connectivity Foundation, Inc. All rights
reserved.",
                "id": "http://openconnectivityfoundation.github.io/core-
extensions/schemas/oic.r.easysetup-schema.json#",
                "definitions": {
                  "oic.r.easysetup": {
                    "type": "object",
                    "properties": {
                      "rt": {
                        "type": "array",
                        "minItems": 2,
                        "maxItems": 2,
                        "uniqueItems": true,
                        "items": {
                          "enum": ["oic.r.easysetup","oic.wk.col"]
                        }
                      },
                      "ps": {
                        "type": "integer",
                        "enum": [0, 1, 2, 3],
                        "description": "Indicates the easy setup status of the device. (0: Need to
Setup, 1: Connecting to Enroller, 2: Connected to Enroller, 3: Failed to Connect to Enroller,
4~254: Reserved, 255: EOF)",
                        "readOnly": true
                      },
                      "lec": {
                        "type": "integer",
                        "enum": [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 255],
                        "description": "Indicates a failure reason (0: NO error, 1: A given SSID is
not found, 2: Wi-Fi's password is wrong, 3: IP address is not allocated, 4: No internet connection,
5: Timeout, 6: Wi-Fi Auth Type is not supported by the Enrollee, 7: Wi-Fi Encryption Type is not
supported by the Enrollee, 8: Wi-Fi Auth Type is wrong (failure while connecting to the Enroller),
9: Wi-Fi Encryption Type is wrong (failure while connecting to the Enroller), 10~254: Reserved,
```



```
255: Unknown error)",
                        "readOnly": true
                      },
                      "cn": {
                        "type": "array",
                        "description": "Indicates an array of connection types that trigger an
attempt to connect to the Enroller to start.",
                        "items": {
                          "type": "integer",
                          "description": "Connection type to attempt. (1 : Wi-Fi, 2 : other
entities / transports to be added in future (e.g. Connect to cloud / BLE))"
                        }
                      }
                    },
                    "required": ["ps", "lec", "cn"]
                  }
                },
                "type": "object",
                "allOf": [
                  { "$ref": "http://openconnectivityfoundation.github.io/core/schemas/oic.core-
schema.json#/definitions/oic.core"},
                  { "$ref":
"http://openconnectivityfoundation.github.io/core/schemas/oic.collection-
schema.json#/definitions/oic.collection.properties"},
                  { "$ref":
"http://openconnectivityfoundation.github.io/core/schemas/oic.collection-
schema.json#/definitions/oic.collection.links.arrayoflinks"},
                  { "$ref": "#/definitions/oic.r.easysetup" }
                ]
              }

            example: |
              {
                "rt" : ["oic.r.easysetup", "oic.wk.col"],
                "if" : ["oic.if.ll", "oic.if.baseline", "oic.if.b"],
                "ps" : 0,
                "lec": 0,
                "cn": [1],
                "links": [
                  {
                    "href": "/EasySetupResURI",
                    "rt": ["oic.r.easysetup", "oic.wk.col"],
                    "if": ["oic.if.b"],
                    "p":{"bm":3},
                    "eps": [
                      {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                    ],
                    "rel":["self", "item"]
                  },
                  {
                    "href": "/WiFiConfResURI",
                    "rt":   ["oic.r.wificonf"],
                    "if":   ["oic.if.baseline"],
                    "p":{"bm":3},
                    "eps": [
                      {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                    ]
                  },
                  {
                    "href": "/DevConfResURI",
                    "rt":   ["oic.r.devconf"],
                    "if":   ["oic.if.baseline"],
                    "p":{"bm":3},
                    "eps": [
                      {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                    ]
                  }
                ]
              }
```


A.2.5 Property Definition

Table 9 Easy Setup Collection Baseline Interface Property Definitions

Property name	Value type	Mandatory	Access mode	Description
rt	array: see schema			
ps	integer	yes	Read Only	Indicates the easy setup status of the device. (0: Need to Setup, 1: Connecting to Enroller, 2: Connected to Enroller, 3: Failed to Connect to Enroller, 4~254: Reserved, 255: EOF)
lec	integer	yes	Read Only	Indicates a failure reason (0: NO error, 1: A given SSID is not found, 2: Wi-Fi's password is wrong, 3: IP address is not allocated, 4: No internet connection, 5: Timeout, 6: Wi-Fi Auth Type is not supported by the Enrollee, 7: Wi-Fi Encryption Type is not supported by the Enrollee, 8: Wi-Fi Auth Type is wrong (failure while connecting to the Enroller), 9: Wi-Fi Encryption Type is wrong (failure while connecting to the Enroller), 10~254: Reserved, 255: Unknown error)
cn	array: see schema	yes		Indicates an array of connection types that trigger an

				attempt to connect to the Enroller to start.

A.2.6 CRUDN behaviour

Table 10 Easy Setup Collection Baseline Interface CRUDN operations

Resource	Create	Read	Update	Delete	Notify
/EasySetupResURI		get			

A.3 Wi-Fi Configuration Resource Baseline Interface

A.3.1 Introduction

WiFiConf resource stores essential information to help an unboxing device to connect to an existing Wi-Fi AP.

A.3.2 Example URI

/WiFiConfResURI

A.3.3 Resource Type

The resource type (rt) is defined as: oic.r.wificonf.

A.3.4 RAML Definition

```
#%RAML 0.8
title: Wi-Fi Configuration Resource
version: v0.0.3-20170611
traits:
 - interface-rw :
     queryParameters:
       if:
         enum: ["oic.if.rw"]
 - interface-baseline :
     queryParameters:
       if:
         enum: ["oic.if.baseline"]
 - interface-all :
     queryParameters:
       if:
         enum: ["oic.if.baseline", "oic.if.rw"]

/WiFiConfResURI?if=oic.if.baseline:
  description: |
    WiFiConf resource stores essential information to help an unboxing device
    to connect to an existing Wi-Fi AP.

  is : ['interface-baseline']
  get:
    description: |
      Retrieve properties of WiFiConf resource.
      The information includes :
      1
      Wi-Fi SSID and password
      2
      Wi-Fi Security type (i.e
      auth type and encription type)
      3
      Wi-Fi hardware capability (i.e
      supported frequencies, modes,
```



```
          auth types and encryption types)

    responses :
      200:
        body:
          application/json:
            schema: |
              {
                "$schema": "http://json-schema.org/draft-04/schema#",
                "description" : "Copyright (c) 2017 Open Connectivity Foundation, Inc. All rights
reserved.",
                "id": "http://openconnectivityfoundation.github.io/core-
extensions/schemas/oic.r.wificonf-schema.json#",
                "definitions": {
                  "oic.r.wificonf": {
                    "type": "object",
                    "properties": {
                      "swmt": {
                        "type": "array",
                        "description": "Indicates supported Wi-Fi mode types. It can be multiple",
                        "readOnly": true,
                        "items":
                          {
                            "type": "string",
                            "enum": ["A","B","G","N","AC"],
                            "description": "Supported Wi-Fi Mode Type."
                          }
                      },
                      "swf": {
                        "type": "array",
                        "description": "Indicates Supported Wi-Fi frequencies by the Enrollee. Can
be multiple. Valid values are ('2.4G', '5G')",
                        "readOnly": true,
                        "items":
                          {
                            "type": "string",
                            "pattern": "^(2\\.4|5)G$"
                          }
                      },
                      "tnn": {
                        "type": "string",
                        "description": "Indicates Target Network Name (SSID of Wi-Fi AP)",
                        "pattern": "^.*$"
                      },
                      "cd": {
                        "type": "string",
                        "description": "Indicates credential information of Wi-Fi AP",
                        "pattern": "^.*$"
                      },
                      "wat": {
                        "type": "string",
                        "enum": ["None", "WEP", "WPA_PSK", "WPA2_PSK"],
                        "description": "Indicates Wi-Fi Auth Type"
                      },
                      "wet": {
                        "type": "string",
                        "enum": ["None", "WEP_64", "WEP_128", "TKIP", "AES", "TKIP_AES"],
                        "description": "Indicates Wi-Fi Encryption Type"
                      },
                      "swat": {
                        "type": "array",
                        "description": "Indicates supported Wi-Fi Auth types. It can be multiple",
                        "readOnly": true,
                        "items":
                          {
                            "type": "string",
                            "enum": ["None", "WEP", "WPA_PSK", "WPA2_PSK"],
                            "description": "Indicates Wi-Fi Auth Type"
```

```
                          }
                        },
                        "swet": {
                          "type": "array",
                          "description": "Indicates supported Wi-Fi Encryption types. It can be
multiple",
                          "readOnly": true,
                          "items":
                            {
                              "type": "string",
                              "enum": ["None", "WEP_64", "WEP_128", "TKIP", "AES", "TKIP_AES"],
                              "description": "Indicates Wi-Fi Encryption Type"
                            }
                        }
                      },
                      "required":["swmt", "swf", "swat", "swet", "tnn", "wat", "wet"]
                    }
                  },
                  "type": "object",
                  "allOf": [
                    { "$ref": "http://openconnectivityfoundation.github.io/core/schemas/oic.core-
schema.json#/definitions/oic.core"},
                    { "$ref": "#/definitions/oic.r.wificonf" }
                  ]
                }

              example: |
                {
                  "rt": ["oic.r.wificonf"],
                  "swmt" : ["A", "B", "G"],
                  "swf": ["2.4G", "5G"],
                  "tnn": "Home_AP_SSID",
                  "cd": "Home_AP_PWD",
                  "wat": "WPA2_PSK",
                  "wet": "TKIP",
                  "swat": ["WPA_PSK", "WPA2_PSK"],
                  "swet": ["TKIP", "AES", "TKIP_AES"]
                }

    post:
      description: |
        Deliver Wi-Fi AP's information for an unboxing device to connect to it.

      body:
        application/json:
          schema: |
            {
              "$schema": "http://json-schema.org/draft-v4/schema#",
              "description" : "Copyright (c) 2017 Open Connectivity Foundation, Inc. All rights
reserved.",
              "id": "http://openconnectivityfoundation.github.io/core-
extensions/schemas/oic.r.wificonf-update-schema.json#",
              "definitions": {
                "oic.r.wificonf": {
                  "type": "object",
                  "properties": {
                    "tnn": {
                      "type": "string",
                      "description": "Indicates Target Network Name (SSID of Wi-Fi AP)",
                      "pattern": "^.*$"
                    },
                    "cd": {
                      "type": "string",
                      "description": "Indicates credential information of Wi-Fi AP",
                      "pattern": "^.*$"
                    },
                    "wat": {
```

```
                      "enum": ["None", "WEP", "WPA_PSK", "WPA2_PSK"],
                      "description": "Indicates Wi-Fi Auth Type"
                    },
                    "wet": {
                      "enum": ["None", "WEP_64", "WEP_128", "TKIP", "AES", "TKIP_AES"],
                      "description": "Indicates Wi-Fi Encryption Type"
                    }
                  },
                  "required":["tnn", "wat", "wet"]
                }
              },
              "type": "object",
              "allOf": [
                { "$ref": "http://openconnectivityfoundation.github.io/core/schemas/oic.core-
schema.json#/definitions/oic.core"},
                { "$ref": "#/definitions/oic.r.wificonf" }
              ]
            }

          example: |

            {
              "tnn": "Home_AP_SSID",
              "cd": "Home_AP_PWD",
              "wat": "WPA2_PSK",
              "wet": "AES"
            }

      responses :

        200:

          body:
            application/json:

              schema: |

                {
                  "$schema": "http://json-schema.org/draft-v4/schema#",
                  "description" : "Copyright (c) 2017 Open Connectivity Foundation, Inc. All rights
reserved.",
                  "id": "http://openconnectivityfoundation.github.io/core-
extensions/schemas/oic.r.wificonf-update-schema.json#",
                  "definitions": {
                    "oic.r.wificonf": {
                      "type": "object",
                      "properties": {
                        "tnn": {
                          "type": "string",
                          "description": "Indicates Target Network Name (SSID of Wi-Fi AP)",
                          "pattern": "^.*$"
                        },
                        "cd": {
                          "type": "string",
                          "description": "Indicates credential information of Wi-Fi AP",
                          "pattern": "^.*$"
                        },
                        "wat": {
                          "enum": ["None", "WEP", "WPA_PSK", "WPA2_PSK"],
                          "description": "Indicates Wi-Fi Auth Type"
                        },
                        "wet": {
                          "enum": ["None", "WEP_64", "WEP_128", "TKIP", "AES", "TKIP_AES"],
                          "description": "Indicates Wi-Fi Encryption Type"
                        }
                      },
                      "required":["tnn", "wat", "wet"]
                    }
                  },
                  "type": "object",
                  "allOf": [
                    { "$ref": "http://openconnectivityfoundation.github.io/core/schemas/oic.core-
```

```
schema.json#/definitions/oic.core"},
                  { "$ref": "#/definitions/oic.r.wificonf" }
                ]
              }

            example: |
              {
                "tnn": "Home_AP_SSID",
                "cd": "Home_AP_PWD",
                "wat": "WPA2_PSK",
                "wet": "AES"
              }
```

A.3.5 Property Definition

Table 11 Wi-Fi Configuration Resource Baseline Interface Property Definitions

Property name	Value type	Mandatory	Access mode	Description
tnn	string	yes		Indicates Target Network Name (SSID of Wi-Fi AP)
swmt	array: see schema	yes	Read Only	Indicates supported Wi-Fi mode types. It can be multiple
swat	array: see schema	yes	Read Only	Indicates supported Wi-Fi Auth types. It can be multiple
cd	string			Indicates credential information of Wi-Fi AP
swf	array: see schema	yes	Read Only	Indicates Supported Wi-Fi frequencies by the Enrollee. Can be multiple. Valid values are ('2.4G', '5G')
wet	string	yes		Indicates Wi-Fi Encryption Type
wat	string	yes		Indicates Wi-Fi Auth Type
swet	array: see schema	yes	Read Only	Indicates supported Wi-Fi Encryption types. It can be multiple

A.3.6 CRUDN behaviour

Table 12 Wi-Fi Configuration Resource Baseline Interface CRUDN operations

Resource	Create	Read	Update	Delete	Notify
/WiFiConfResURI		get	post		

A.4 Device Configuration

A.4.1 Introduction

Device configuration resource stores a preference of device settings like device name. Vender-specfic information can be added to the resource.

A.4.2 Example URI

/example/DevConfResURI

A.4.3 Resource Type

The resource type (rt) is defined as: oic.r.devconf.

A.4.4 RAML Definition

```
#%RAML 0.8
title: Device Configuration Resource
version: v0.0.2-20170604
traits:
 - interface :
     queryParameters:
       if:
         enum: ["oic.if.baseline", "oic.if.r"]

/example/DevConfResURI:
  description: |
    Device configuration resource stores a preference of device settings like
    device name
    Vender-specfic information can be added to the resource.

  is : ['interface']
  get:
    description: |
      Retrieve various settings regarding to device-specific settings
      1
      Device name (human-friendly name to be detected by mediator during
         easy setup)

    responses :
      200:
        body:
          application/json:
            schema: |
              {
                "$schema": "http://json-schema.org/draft-04/schema#",
                "description" : "Copyright (c) 2017 Open Connectivity Foundation, Inc. All rights
reserved.",
                "id": "http://openconnectivityfoundation.github.io/core-
extensions/schemas/oic.r.devconf-schema.json#",
                "definitions": {
                  "oic.r.devconf": {
                    "type": "object",
                    "oneOf": [
                      {
                        "properties": {
                          "dn": {
                            "type": "string",
                            "description": "Indicates a pre-configured device name in language
indicated by 'dl' in /oic/con;  presented by enrollee device to mediator device during easy-setup
process",
                            "pattern": "^.*$",
```



```
                            "readOnly": true
                          }
                        },
                        "required":["dn"]
                      },
                      {
                        "properties": {
                          "dn": {
                            "type": "array",
                            "items": {
                              "type": "object",
                              "properties": {
                                "language": {
                                  "$ref":
"http://openconnectivityfoundation.github.io/core/schemas/oic.types-
schema.json#/definitions/language-tag",
                                  "readOnly": true,
                                  "description": "An RFC 5646 language tag."
                                },
                                "value": {
                                  "type": "string",
                                  "description": "Pre-configured device name in the indicated
language.",
                                  "pattern": "^.*$",
                                  "readOnly": true
                                }
                              }
                            },
                            "minItems" : 1,
                            "readOnly": true,
                            "description": "Localized device name."
                          }
                        },
                        "required": ["dn"]
                      }
                    ]
                  }
                },
                "type": "object",
                "allOf": [
                  { "$ref": "http://openconnectivityfoundation.github.io/core/schemas/oic.core-
schema.json#/definitions/oic.core"},
                  { "$ref": "#/definitions/oic.r.devconf" }
                ]
              }

            example: |
              {
                "rt": ["oic.r.devconf"],
                "dn" : "My Refrigerator"
              }
```

A.4.5 Property Definition

Table 13 Device Configuration Property Definitions

Property name	Value type	Mandatory	Access mode	Description
dn	array: see schema	yes	Read Only	Localized device name.
value (dn)	string		Read Only	Pre-configured device name in the indicated language.
language (dn)	multiple types: see schema		Read Only	An RFC 5646 language tag.

A.4.6 CRUDN behaviour

Table 14 Device Configuration CRUDN operations

Resource	Create	Read	Update	Delete	Notify
/example/DevConfResURI		get			

Annex B (informative)

Swagger2.0 definitions

B.1 Device Configuration

B.1.1 Introduction

Device configuration resource stores a preference of device settings like device name. Vender-specfic information can be added to the resource.

B.1.2 Example URI

/example/DevConfResURI

B.1.3 Resource Type

The resource type (rt) is defined as: ['oic.r.devconf'].

B.1.4 Swagger2.0 Definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "Device Configuration",
    "version": "v0.0.2-20170604",
    "license": {
      "name": "copyright 2016-2017 Open Connectivity Foundation, Inc. All rights reserved.",
      "x-description": "Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:\n        1.
Redistributions of source code must retain the above copyright notice, this list of conditions and
the following disclaimer.\n        2.  Redistributions in binary form must reproduce the above
copyright notice, this list of conditions and the following disclaimer in the documentation and/or
other materials provided with the distribution.\n\n        THIS SOFTWARE IS PROVIDED BY THE Open
Connectivity Foundation, INC. \"AS IS\" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR
WARRANTIES OF NON-INFRINGEMENT, ARE DISCLAIMED.\n        IN NO EVENT SHALL THE Open Connectivity
Foundation, INC. OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL,
EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)\n        HOWEVER CAUSED AND
ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY
OF SUCH DAMAGE.\n"
    }
  },
  "schemes": ["http"],
  "consumes": ["application/json"],
  "produces": ["application/json"],
  "paths": {
    "/example/DevConfResURI" : {
      "get": {
        "description": "Device configuration resource stores a preference of device settings
like\ndevice name. Vender-specfic information can be added to the resource.\nRetrieve various
settings regarding to device-specific settings\n1. Device name (human-friendly name to be detected
by mediator during\n   easy setup)\n",
        "parameters": [
          {"$ref": "#/parameters/interface"}
        ],
        "responses": {
            "200": {
              "description" : "",
              "x-example":
                {
                  "rt": ["oic.r.devconf"],
                  "dn" : "My Refrigerator"
                }
                ,
```

```
                "schema": { "$ref": "#/definitions/DevConf" }
              }
          }
        }
      },
      "parameters": {
        "interface" : {
          "in" : "query",
          "name" : "if",
          "type" : "string",
          "enum" : ["oic.if.baseline", "oic.if.r"]
        }
      },
      "definitions": {
        "DevConf" : {
          "properties": {
            "rt" :
                    {
              "description": "Resource Type of the Resource",
              "items": {
                "maxLength": 64,
                "type": "string"
              },
              "minItems": 1,
              "readOnly": true,
              "type": "array"
            },

            "n" :
                    {
              "description": "Friendly name of the resource",
              "maxLength": 64,
              "readOnly": true,
              "type": "string"
            },

            "id" :
                    {
              "description": "Instance ID of this specific resource",
              "maxLength": 64,
              "readOnly": true,
              "type": "string"
            },

            "if" :
                    {
              "description": "The interface set supported by this resource",
              "items": {
                "enum": [
                  "oic.if.baseline",
                  "oic.if.ll",
                  "oic.if.b",
                  "oic.if.lb",
                  "oic.if.rw",
                  "oic.if.r",
                  "oic.if.a",
                  "oic.if.s"
                ],
                "type": "string"
              },
              "minItems": 1,
              "readOnly": true,
              "type": "array"
            }

            }
            ,"type" : "object"
        }
      }
```



```
}
```

B.1.5 Property Definition

Table 15 The properties definitions of the resource

Property name	Value type	Mandatory	Access mode	Description
if	array: see schema		Read Only	The interface set supported by this resource
n	string		Read Only	Friendly name of the resource
rt	array: see schema		Read Only	Resource Type of the Resource
id	string		Read Only	Instance ID of this specific resource

B.1.6 CRUDN behaviour

Table 16 The CRUDN operations of the resource

Resource	Create	Read	Update	Delete	Notify
/example/DevConfResURI		get			observe

B.2 Easy Setup

B.2.1 Introduction

Easy Setup resource stores useful information including current status of unboxing device and last error code which are produced in a process of easy setup.
Note that, Easy Setup resource is a type of collection resource, which contains links to WiFiConf, DevConf resources and may additionally contain links to other resources.

B.2.2 Example URI

/EasySetupResURI

B.2.3 Resource Type

The resource type (rt) is defined as: ['oic.r.easysetup'].

B.2.4 Swagger2.0 Definition

```
{
  "swagger": "2.0",
  "info": {
    "title": "Easy Setup Collection Link List Interface",
    "version": "v0.0.3-20170611",
    "license": {
      "name": "copyright 2016-2017 Open Connectivity Foundation, Inc. All rights reserved.",
      "x-description": "Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:\n        1.
Redistributions of source code must retain the above copyright notice, this list of conditions and
the following disclaimer.\n        2.  Redistributions in binary form must reproduce the above
copyright notice, this list of conditions and the following disclaimer in the documentation and/or
other materials provided with the distribution.\n\n        THIS SOFTWARE IS PROVIDED BY THE Open
Connectivity Foundation, INC. \"AS IS\" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
```

```
LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR
WARRANTIES OF NON-INFRINGEMENT, ARE DISCLAIMED.\n        IN NO EVENT SHALL THE Open Connectivity
Foundation, INC. OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL,
EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)\n        HOWEVER CAUSED AND
ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY
OF SUCH DAMAGE.\n"
    }
  },
  "schemes": ["http"],
  "consumes": ["application/json"],
  "produces": ["application/json"],
  "paths": {
    "/EasySetupResURI?if=oic.if.ll" : {
      "get": {
        "description": "Easy Setup resource stores useful information including current status
of\nunboxing device and last error code which are produced in a process of\neasy setup.\nNote that,
Easy Setup resource is a type of collection resource, which\ncontains links to WiFiConf, DevConf
resources and may additionally contain\nlinks to other resources.\nRetrieve useful information
during easy setup process :\n1. A current status in easy setup process.\n2. A last error code
describing reason for failure occurred at the last\n   time.\n",
        "parameters": [
          {"$ref": "#/parameters/interface-ll"}
        ],
        "responses": {
            "200": {
              "description" : "",
              "x-example":
                [
                  {
                    "href": "/EasySetupResURI",
                    "rt": ["oic.r.easysetup", "oic.wk.col"],
                    "if": ["oic.if.b"],
                    "p":{"bm":3},
                    "eps": [
                      {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                    ],
                    "rel":["self", "item"]
                  },
                  {
                    "href": "/WiFiConfResURI",
                    "rt":   ["oic.r.wificonf"],
                    "if":   ["oic.if.baseline"],
                    "p":{"bm":3},
                    "eps": [
                      {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                    ]
                  },
                  {
                    "href": "/DevConfResURI",
                    "rt":   ["oic.r.devconf"],
                    "if":   ["oic.if.baseline"],
                    "p":{"bm":3},
                    "eps": [
                      {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                    ]
                  }
                ]
                ,
              "schema": { "$ref": "#/definitions/slinks" }
            }
        }
      }
    },
    "/EasySetupResURI?if=oic.if.b" : {
      "get": {
        "description": "Easy Setup resource stores useful information including current status
of\nunboxing device and last error code which are produced in a process of\neasy setup.\nNote that,
Easy Setup resource is a type of collection resource, which\ncontains links to WiFiConf, DevConf
resources and may additionally contain\nlinks to other resources.\nRetrieve useful information
```



```
during easy setup process :\n1. A current status in easy setup process.\n2. A last error code
describing reason for failure occurred at the last\n   time.\n",
        "parameters": [
          {"$ref": "#/parameters/interface-batch"}
        ],
        "responses": {
            "200": {
              "description" : "",
              "x-example":
                [
                  {
                    "href": "/EasySetupResURI",
                    "rep":{
                      "ps" : 0,
                      "lec": 0,
                      "cn": [1]
                    }
                  },
                  {
                    "href": "/WiFiConfResURI",
                    "rep":{
                      "swmt" : ["A", "B", "G"],
                      "swf": ["2.4G", "5G"],
                      "tnn": "Home_AP_SSID",
                      "cd": "Home_AP_PWD",
                      "wat": "WPA2_PSK",
                      "wet": "AES"
                    }
                  },
                  {
                    "href": "/DevConfResURI",
                    "rep":{
                      "dn" : "My Refrigerator"
                    }
                  }
                ]
                ,
              "schema": { "$ref": "#/definitions/sbatch" }
            }
        }
      },
      "post": {
        "description": "Able to deliver Wi-Fi, Device configuration and other
configuration\ninformation in a batch by utilizing 'batch' interface.\nIf you want to deliver Wi-Fi
and Device configuration information in a batch,\nyou can write all properties you want to send
with a 'batch' interface.\nThe below example is the case to send Easy Setup and Wi-Fi
configuration\n(i.e. connection type, target network, auth type information) in a batch.\n",
        "parameters": [
          {"$ref": "#/parameters/interface-batch"},
          {
            "name": "body",
            "in": "body",
            "required": true,
            "schema": { "$ref": "#/definitions/sbatch-update" },
            "x-example":
              [
                {
                  "href": "/EasySetupResURI",
                  "rep":{
                    "cn": [1]
                  }
                },
                {
                  "href": "/WiFiConfResURI",
                  "rep":{
                    "tnn": "Home_AP_SSID",
                    "cd": "Home_AP_PWD",
                    "wat": "WPA2_PSK",
                    "wet": "AES"
                  }
                }
```



```
                ]
              }
            ],
            "responses": {
                "200": {
                  "description" : "",
                  "x-example":
                    [
                      {
                        "href": "/EasySetupResURI",
                        "rep" : {
                          "ps" : 0,
                          "lec": 0,
                          "cn": [1]
                        }
                      },
                      {
                        "href": "/WiFiConfResURI",
                        "rep" : {
                          "swmt" : ["A", "B", "G"],
                          "swf": ["2.4G", "5G"],
                          "tnn": "Home_AP_SSID",
                          "cd": "Home_AP_PWD",
                          "wat": "WPA2_PSK",
                          "wet": "AES"
                        }
                      },
                      {
                        "href": "/DevConfResURI",
                        "rep" : {
                          "dn" : "My Refrigerator"
                        }
                      }
                    ]
                    ,
                  "schema": { "$ref": "#/definitions/sbatch" }
                }
            }
          }
        },
        "/EasySetupResURI?if=oic.if.baseline" : {
          "get": {
            "description": "Easy Setup resource stores useful information including current status
    of\nunboxing device and last error code which are produced in a process of\neasy setup.\nNote that,
    Easy Setup resource is a type of collection resource, which\ncontains links to WiFiConf, DevConf
    resources and may additionally contain\nlinks to other resources.\nRetrieve useful information
    during easy setup process :\n  1. A current status in easy setup process.\n  2. A last error code
    describing reason for failure occurred at the last\n     time.\n",
            "parameters": [
              {"$ref": "#/parameters/interface-baseline"}
            ],
            "responses": {
                "200": {
                  "description" : "",
                  "x-example":
                    {
                      "rt" : ["oic.r.easysetup", "oic.wk.col"],
                      "if" : ["oic.if.ll", "oic.if.baseline", "oic.if.b"],
                      "ps" : 0,
                      "lec": 0,
                      "cn": [1],
                      "links": [
                        {
                          "href": "/EasySetupResURI",
                          "rt": ["oic.r.easysetup", "oic.wk.col"],
                          "if": ["oic.if.b"],
                          "p":{"bm":3},
                          "eps": [
                            {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                          ],
                          "rel":["self", "item"]
```



```
                    },
                    {
                      "href": "/WiFiConfResURI",
                      "rt":   ["oic.r.wificonf"],
                      "if":   ["oic.if.baseline"],
                      "p":{"bm":3},
                      "eps": [
                        {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                      ]
                    },
                    {
                      "href": "/DevConfResURI",
                      "rt":   ["oic.r.devconf"],
                      "if":   ["oic.if.baseline"],
                      "p":{"bm":3},
                      "eps": [
                        {"ep": "coaps://[fe80::b1d6]:1111", "pri": 2}
                      ]
                    }
                  ]
                }
                ,
              "schema": { "$ref": "#/definitions/EasySetup" }
            }
          }
        }
      }
    },
    "parameters": {
      "interface-ll" : {
        "in" : "query",
        "name" : "if",
        "type" : "string",
        "enum" : ["oic.if.ll"]
      },
      "interface-baseline" : {
        "in" : "query",
        "name" : "if",
        "type" : "string",
        "enum" : ["oic.if.baseline"]
      },
      "interface-all" : {
        "in" : "query",
        "name" : "if",
        "type" : "string",
        "enum" : ["oic.if.baseline", "oic.if.ll", "oic.if.b"]
      },
      "interface-batch" : {
        "in" : "query",
        "name" : "if",
        "type" : "string",
        "enum" : ["oic.if.b"]
      }
    },
    "definitions": {
      "slinks" : {
        "items" :
             {
          "properties": {
            "anchor": {
              "description": "This is used to override the context URI e.g. override the URI of the
containing collection.",
              "format": "uri",
              "maxLength": 256,
              "type": "string"
            },
            "di": {
              "description": "The Device ID formatted according to IETF RFC 4122.",
              "pattern": "^[a-fA-F0-9]{8}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-
9]{12}$",
              "type": "string"
```

```
            },
            "eps": {
              "description": "the Endpoint information of the target Resource",
              "items": {
                "properties": {
                  "ep": {
                    "description": "Transport Protocol Suite + Endpoint Locator",
                    "format": "uri",
                    "type": "string"
                  },
                  "pri": {
                    "description": "The priority among multiple Endpoints",
                    "minimum": 1,
                    "type": "integer"
                  }
                },
                "type": "object"
              },
              "type": "array"
            },
            "href": {
              "description": "This is the target URI, it can be specified as a Relative Reference or
fully-qualified URI.",
              "format": "uri",
              "maxLength": 256,
              "type": "string"
            },
            "if": {
              "description": "The interface set supported by this resource",
              "items": {
                "enum": [
                  "oic.if.baseline",
                  "oic.if.ll",
                  "oic.if.b",
                  "oic.if.rw",
                  "oic.if.r",
                  "oic.if.a",
                  "oic.if.s"
                ],
                "type": "string"
              },
              "minItems": 1,
              "type": "array"
            },
            "ins": {
              "description": "The instance identifier for this web link in an array of web links -
used in collections",
              "type": "integer"
            },
            "p": {
              "description": "Specifies the framework policies on the Resource referenced by the
target URI",
              "properties": {
                "bm": {
                  "description": "Specifies the framework policies on the Resource referenced by the
target URI for e.g. observable and discoverable",
                  "type": "integer"
                }
              },
              "required": [
                "bm"
              ],
              "type": "object"
            },
            "rel": {
              "description": "The relation of the target URI referenced by the link to the context
URI",
              "oneOf": [
                {
                  "default": [
                    "hosts"
```

```
                  ],
                  "items": {
                    "maxLength": 64,
                    "type": "string"
                  },
                  "minItems": 1,
                  "type": "array"
                },
                {
                  "default": "hosts",
                  "maxLength": 64,
                  "type": "string"
                }
              ]
            },
            "rt": {
              "description": "Resource Type of the Resource",
              "items": {
                "maxLength": 64,
                "type": "string"
              },
              "minItems": 1,
              "type": "array"
            },
            "title": {
              "description": "A title for the link relation. Can be used by the UI to provide a
context.",
              "maxLength": 64,
              "type": "string"
            },
            "type": {
              "default": "application/cbor",
              "description": "A hint at the representation of the resource referenced by the target
URI. This represents the media types that are used for both accepting and emitting.",
              "items": {
                "maxLength": 64,
                "type": "string"
              },
              "minItems": 1,
              "type": "array"
            }
          },
          "required": [
            "href",
            "rt",
            "if"
          ],
          "type": "object"
        }

        ,"type" :
              "array"

        ,"title" :
              "EasySetup Object Links List Schema (auto merged)"

      }
      ,
      "sbatch" : {
        "title" :
              "Collection Batch Retrieve Format (auto merged)"

        ,"minItems" :
              1

        ,"items" :
              {
          "additionalProperties": true,
          "properties": {
            "href": {
              "description": "URI of the target resource relative assuming the collection URI as
```



```
anchor",
            "format": "uri",
            "maxLength": 256,
            "type": "string"
          },
          "rep": {
            "oneOf": [
              {
                "description": "The response payload from a single resource",
                "type": "object"
              },
              {
                "description": " The response payload from a collection (batch) resource",
                "items": {
                  "properties": {
                    "anchor": {
                      "description": "This is used to override the context URI e.g. override the
URI of the containing collection.",
                      "format": "uri",
                      "maxLength": 256,
                      "type": "string"
                    },
                    "di": {
                      "allOf": [
                        {
                          "description": "Format pattern according to IETF RFC 4122.",
                          "pattern": "^[a-fA-F0-9]{8}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-
[a-fA-F0-9]{12}$",
                          "type": "string"
                        },
                        {
                          "description": "The device ID"
                        }
                      ]
                    },
                    "eps": {
                      "description": "the Endpoint information of the target Resource",
                      "items": {
                        "properties": {
                          "ep": {
                            "description": "Transport Protocol Suite + Endpoint Locator",
                            "format": "uri",
                            "type": "string"
                          },
                          "pri": {
                            "description": "The priority among multiple Endpoints",
                            "minimum": 1,
                            "type": "integer"
                          }
                        },
                        "type": "object"
                      },
                      "type": "array"
                    },
                    "href": {
                      "description": "This is the target URI, it can be specified as a Relative
Reference or fully-qualified URI.",
                      "format": "uri",
                      "maxLength": 256,
                      "type": "string"
                    },
                    "if": {
                      "description": "The interface set supported by this resource",
                      "items": {
                        "enum": [
                          "oic.if.baseline",
                          "oic.if.ll",
                          "oic.if.b",
                          "oic.if.rw",
                          "oic.if.r",
                          "oic.if.a",
```



```
                            "oic.if.s"
                          ],
                          "type": "string"
                        },
                        "minItems": 1,
                        "type": "array"
                      },
                      "ins": {
                        "description": "The instance identifier for this web link in an array of web
links - used in collections",
                        "type": "integer"
                      },
                      "p": {
                        "description": "Specifies the framework policies on the Resource referenced
by the target URI",
                        "properties": {
                          "bm": {
                            "description": "Specifies the framework policies on the Resource
referenced by the target URI for e.g. observable and discoverable",
                            "type": "integer"
                          }
                        },
                        "required": [
                          "bm"
                        ],
                        "type": "object"
                      },
                      "rel": {
                        "description": "The relation of the target URI referenced by the link to the
context URI",
                        "oneOf": [
                          {
                            "default": [
                              "hosts"
                            ],
                            "items": {
                              "maxLength": 64,
                              "type": "string"
                            },
                            "minItems": 1,
                            "type": "array"
                          },
                          {
                            "default": "hosts",
                            "maxLength": 64,
                            "type": "string"
                          }
                        ]
                      },
                      "rt": {
                        "description": "Resource Type of the Resource",
                        "items": {
                          "maxLength": 64,
                          "type": "string"
                        },
                        "minItems": 1,
                        "type": "array"
                      },
                      "title": {
                        "description": "A title for the link relation. Can be used by the UI to
provide a context.",
                        "maxLength": 64,
                        "type": "string"
                      },
                      "type": {
                        "default": "application/cbor",
                        "description": "A hint at the representation of the resource referenced by
the target URI. This represents the media types that are used for both accepting and emitting.",
                        "items": {
                          "maxLength": 64,
                          "type": "string"
```



```
                        },
                        "minItems": 1,
                        "type": "array"
                      }
                    },
                    "required": [
                      "href",
                      "rt",
                      "if"
                    ],
                    "type": "object"
                  },
                  "type": "array"
                }
              ]
            }
          },
          "required": [
            "href",
            "rep"
          ],
          "type": "object"
        }

        ,"type" :
              "array"

      }
      ,
      "sbatch-update" : {
        "title" :
              "Collection Batch Update Format (auto merged)"

        ,"minItems" :
              1

        ,"items" :
              {
          "$ref": "#/definitions/oic.batch-update.item"
        }

        ,"type" :
              "array"

      }
      ,
      "EasySetup" : {
        "properties": {
          "rt" :
                {
            "items": {
              "enum": [
                "oic.r.easysetup",
                "oic.wk.col"
              ]
            },
            "maxItems": 2,
            "minItems": 2,
            "type": "array",
            "uniqueItems": true
          },

          "ps" :
                {
            "description": "Indicates the easy setup status of the device. (0: Need to Setup, 1:
    Connecting to Enroller, 2: Connected to Enroller, 3: Failed to Connect to Enroller, 4~254:
    Reserved, 255: EOF)",
            "enum": [
              0,
              1,
              2,
```

```
              3
            ],
            "readOnly": true,
            "type": "integer"
          },

          "lec" :
                  {
            "description": "Indicates a failure reason (0: NO error, 1: A given SSID is not found, 2:
    Wi-Fi's password is wrong, 3: IP address is not allocated, 4: No internet connection, 5: Timeout,
    6: Wi-Fi Auth Type is not supported by the Enrollee, 7: Wi-Fi Encryption Type is not supported by
    the Enrollee, 8: Wi-Fi Auth Type is wrong (failure while connecting to the Enroller), 9: Wi-Fi
    Encryption Type is wrong (failure while connecting to the Enroller), 10~254: Reserved, 255: Unknown
    error)",
            "enum": [
              0,
              1,
              2,
              3,
              4,
              5,
              6,
              7,
              8,
              9,
              255
            ],
            "readOnly": true,
            "type": "integer"
          },

          "cn" :
                  {
            "description": "Indicates an array of connection types that trigger an attempt to connect
    to the Enroller to start.",
            "items": {
              "description": "Connection type to attempt. (1 : Wi-Fi, 2 : other entities / transports
    to be added in future (e.g. Connect to cloud / BLE))",
              "type": "integer"
            },
            "type": "array"
          },

          "links" :
                  {
            "description": "A set of simple or individual OIC Links.",
            "items": {
              "properties": {
                "anchor": {
                  "description": "This is used to override the context URI e.g. override the URI of
    the containing collection.",
                  "format": "uri",
                  "maxLength": 256,
                  "type": "string"
                },
                "di": {
                  "description": "The Device ID formatted according to IETF RFC 4122.",
                  "pattern": "^[a-fA-F0-9]{8}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-
    9]{12}$",
                  "type": "string"
                },
                "eps": {
                  "description": "the Endpoint information of the target Resource",
                  "items": {
                    "properties": {
                      "ep": {
                        "description": "Transport Protocol Suite + Endpoint Locator",
                        "format": "uri",
                        "type": "string"
                      },
                      "pri": {
```

```
                        "description": "The priority among multiple Endpoints",
                        "minimum": 1,
                        "type": "integer"
                      }
                    },
                    "type": "object"
                  },
                  "type": "array"
                },
                "href": {
                  "description": "This is the target URI, it can be specified as a Relative Reference
or fully-qualified URI.",
                  "format": "uri",
                  "maxLength": 256,
                  "type": "string"
                },
                "if": {
                  "description": "The interface set supported by this resource",
                  "items": {
                    "enum": [
                      "oic.if.baseline",
                      "oic.if.ll",
                      "oic.if.b",
                      "oic.if.rw",
                      "oic.if.r",
                      "oic.if.a",
                      "oic.if.s"
                    ],
                    "type": "string"
                  },
                  "minItems": 1,
                  "type": "array"
                },
                "ins": {
                  "description": "The instance identifier for this web link in an array of web links
- used in collections",
                  "type": "integer"
                },
                "p": {
                  "description": "Specifies the framework policies on the Resource referenced by the
target URI",
                  "properties": {
                    "bm": {
                      "description": "Specifies the framework policies on the Resource referenced by
the target URI for e.g. observable and discoverable",
                      "type": "integer"
                    }
                  },
                  "required": [
                    "bm"
                  ],
                  "type": "object"
                },
                "rel": {
                  "description": "The relation of the target URI referenced by the link to the
context URI",
                  "oneOf": [
                    {
                      "default": [
                        "hosts"
                      ],
                      "items": {
                        "maxLength": 64,
                        "type": "string"
                      },
                      "minItems": 1,
                      "type": "array"
                    },
                    {
                      "default": "hosts",
                      "maxLength": 64,
```

```
                    "type": "string"
                  }
                ]
              },
              "rt": {
                "description": "Resource Type of the Resource",
                "items": {
                  "maxLength": 64,
                  "type": "string"
                },
                "minItems": 1,
                "type": "array"
              },
              "title": {
                "description": "A title for the link relation. Can be used by the UI to provide a
context.",
                "maxLength": 64,
                "type": "string"
              },
              "type": {
                "default": "application/cbor",
                "description": "A hint at the representation of the resource referenced by the
target URI. This represents the media types that are used for both accepting and emitting.",
                "items": {
                  "maxLength": 64,
                  "type": "string"
                },
                "minItems": 1,
                "type": "array"
              }
            },
            "required": [
              "href",
              "rt",
              "if"
            ],
            "type": "object"
          },
          "type": "array"
        },

        "n" :
                {
          "description": "Friendly name of the resource",
          "maxLength": 64,
          "readOnly": true,
          "type": "string"
        },

        "rts" :
                {
          "description": "Resource Type of the Resource",
          "items": {
            "maxLength": 64,
            "type": "string"
          },
          "minItems": 1,
          "readOnly": true,
          "type": "array"
        },

        "id" :
                {
          "description": "Instance ID of this specific resource",
          "maxLength": 64,
          "readOnly": true,
          "type": "string"
        },

        "rts-m" :
                {
```

```
            "description": "Resource Type of the Resource",
            "items": {
              "maxLength": 64,
              "type": "string"
            },
            "minItems": 1,
            "readOnly": true,
            "type": "array"
          },

          "if" :
                 {
            "description": "The interface set supported by this resource",
            "items": {
              "enum": [
                "oic.if.baseline",
                "oic.if.ll",
                "oic.if.b",
                "oic.if.lb",
                "oic.if.rw",
                "oic.if.r",
                "oic.if.a",
                "oic.if.s"
              ],
              "type": "string"
            },
            "minItems": 1,
            "readOnly": true,
            "type": "array"
          }

          }
          ,"type" : "object"
      }
      ,"oic.batch-update.item" :
          {
        "additionalProperties": true,
        "description": "array of resource representations to apply to the batch collection, using
href to indicate which resource(s) in the batch to update. If the href property is empty,
effectively making the URI reference to the collection itself, the representation is to be applied
to all resources in the batch",
        "properties": {
          "href": {
            "description": "URI of the target resource relative assuming the collection URI as
anchor",
            "format": "uri",
            "maxLength": 256,
            "type": "string"
          },
          "rep": {
            "oneOf": [
              {
                "description": "The response payload from a single resource",
                "type": "object"
              },
              {
                "description": " The response payload from a collection (batch) resource",
                "items": {
                  "$ref": "#/definitions/oic.oic-link"
                },
                "type": "array"
              }
            ]
          }
        },
        "required": [
          "href",
          "rep"
        ],
        "type": "object"
      }
```



```
,"oic.oic-link" :
    {
  "properties": {
    "anchor": {
      "description": "This is used to override the context URI e.g. override the URI of the containing collection.",
      "format": "uri",
      "maxLength": 256,
      "type": "string"
    },
    "di": {
      "allOf": [
        {
          "$ref": "#/definitions/uuid"
        },
        {
          "description": "The device ID"
        }
      ]
    },
    "eps": {
      "description": "the Endpoint information of the target Resource",
      "items": {
        "properties": {
          "ep": {
            "description": "Transport Protocol Suite + Endpoint Locator",
            "format": "uri",
            "type": "string"
          },
          "pri": {
            "description": "The priority among multiple Endpoints",
            "minimum": 1,
            "type": "integer"
          }
        },
        "type": "object"
      },
      "type": "array"
    },
    "href": {
      "description": "This is the target URI, it can be specified as a Relative Reference or fully-qualified URI.",
      "format": "uri",
      "maxLength": 256,
      "type": "string"
    },
    "if": {
      "description": "The interface set supported by this resource",
      "items": {
        "enum": [
          "oic.if.baseline",
          "oic.if.ll",
          "oic.if.b",
          "oic.if.rw",
          "oic.if.r",
          "oic.if.a",
          "oic.if.s"
        ],
        "type": "string"
      },
      "minItems": 1,
      "type": "array"
    },
    "ins": {
      "description": "The instance identifier for this web link in an array of web links - used in collections",
      "type": "integer"
    },
    "p": {
      "description": "Specifies the framework policies on the Resource referenced by the target
```



```
URI",
           "properties": {
             "bm": {
               "description": "Specifies the framework policies on the Resource referenced by the
target URI for e.g. observable and discoverable",
               "type": "integer"
             }
           },
           "required": [
             "bm"
           ],
           "type": "object"
         },
         "rel": {
           "description": "The relation of the target URI referenced by the link to the context
URI",
           "oneOf": [
             {
               "default": [
                 "hosts"
               ],
               "items": {
                 "maxLength": 64,
                 "type": "string"
               },
               "minItems": 1,
               "type": "array"
             },
             {
               "default": "hosts",
               "maxLength": 64,
               "type": "string"
             }
           ]
         },
         "rt": {
           "description": "Resource Type of the Resource",
           "items": {
             "maxLength": 64,
             "type": "string"
           },
           "minItems": 1,
           "type": "array"
         },
         "title": {
           "description": "A title for the link relation. Can be used by the UI to provide a
context.",
           "maxLength": 64,
           "type": "string"
         },
         "type": {
           "default": "application/cbor",
           "description": "A hint at the representation of the resource referenced by the target
URI. This represents the media types that are used for both accepting and emitting.",
           "items": {
             "maxLength": 64,
             "type": "string"
           },
           "minItems": 1,
           "type": "array"
         }
       },
       "required": [
         "href",
         "rt",
         "if"
       ],
       "type": "object"
     }

     ,"uuid" :
```



```
          {
        "description": "Format pattern according to IETF RFC 4122.",
        "pattern": "^[a-fA-F0-9]{8}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-9]{4}-[a-fA-F0-9]{12}$",
        "type": "string"
      }

      ,"oic.wk.col-batch-update" :
          {
        "description": "array of resource representations to apply to the batch collection, using
href to indicate which resource(s) in the batch to update. If the href property is empty,
effectively making the URI reference to the collection itself, the representation is to be applied
to all resources in the batch",
        "items": {
          "$ref": "#/definitions/oic.batch-update.item"
        },
        "minItems": 1,
        "type": "array"
      }

    }
  }
```

B.2.5 Property Definition

Table 17 The properties definitions of the resource

Property name	Value type	Mandatory	Access mode	Description
rts	array: see schema	No	Read Only	Resource Type of the Resource
n	string	No	Read Only	Friendly name of the resource
cn	array: see schema	No	Read Write	Indicates an array of connection types that trigger an attempt to connect to the Enroller to start.
id	string	No	Read Only	Instance ID of this specific resource
lec	integer	No	Read Only	Indicates a failure reason (0: NO error, 1: A given SSID is not found, 2: Wi-Fi's password is wrong, 3: IP address is not allocated, 4: No internet connection, 5: Timeout, 6: Wi-Fi Auth Type is not supported by

				the Enrollee, 7: Wi-Fi Encryption Type is not supported by the Enrollee, 8: Wi-Fi Auth Type is wrong (failure while connecting to the Enroller), 9: Wi-Fi Encryption Type is wrong (failure while connecting to the Enroller), 10~254: Reserved, 255: Unknown error)
ps	integer	No	Read Only	Indicates the easy setup status of the device. (0: Need to Setup, 1: Connecting to Enroller, 2: Connected to Enroller, 3: Failed to Connect to Enroller, 4~254: Reserved, 255: EOF)
if	array: see schema	Yes	Read Only	The interface set supported by this resource
links	array: see schema	No	Read Write	A set of simple or individual OIC Links.
rts-m	array: see schema	No	Read Only	Resource Type of the Resource
rt	array: see schema	Yes	Read Write	
href	string	Yes	Read Write	URI of the target resource relative assuming the collection URI as anchor
rep	multiple types: see schema	Yes	Read Write	
ins	integer	No	Read Write	

				The instance identifier for this web link in an array of web links - used in collections
rel	multiple types: see schema	No	Read Write	The relation of the target URI referenced by the link to the context URI
href	string	Yes	Read Write	This is the target URI, it can be specified as a Relative Reference or fully-qualified URI.
eps	array: see schema	No	Read Write	the Endpoint information of the target Resource
rt	array: see schema	Yes	Read Write	Resource Type of the Resource
p	object: see schema	No	Read Write	Specifies the framework policies on the Resource referenced by the target URI
title	string	No	Read Write	A title for the link relation. Can be used by the UI to provide a context.
di	multiple types: see schema	No	Read Write	
type	array: see schema	No	Read Write	A hint at the representation of the resource referenced by the target URI. This represents the media types that are used for both accepting and emitting.

if	array: see schema	Yes	Read Write	The interface set supported by this resource
anchor	string	No	Read Write	This is used to override the context URI e.g. override the URI of the containing collection.
ins	integer	No	Read Write	The instance identifier for this web link in an array of web links - used in collections
rel	multiple types: see schema	No	Read Write	The relation of the target URI referenced by the link to the context URI
href	string	Yes	Read Write	This is the target URI, it can be specified as a Relative Reference or fully-qualified URI.
eps	array: see schema	No	Read Write	the Endpoint information of the target Resource
rt	array: see schema	Yes	Read Write	Resource Type of the Resource
p	object: see schema	No	Read Write	Specifies the framework policies on the Resource referenced by the target URI
title	string	No	Read Write	A title for the link relation. Can be used by the UI to provide a context.
di	string	No	Read Write	

				The Device ID formatted according to IETF RFC 4122.
type	array: see schema	No	Read Write	A hint at the representation of the resource referenced by the target URI. This represents the media types that are used for both accepting and emitting.
if	array: see schema	Yes	Read Write	The interface set supported by this resource
anchor	string	No	Read Write	This is used to override the context URI e.g. override the URI of the containing collection.
href	string	Yes	Read Write	URI of the target resource relative assuming the collection URI as anchor
rep	multiple types: see schema	Yes	Read Write	

B.2.6 CRUDN behaviour

Table 18 The CRUDN operations of the resource

Resource	Create	Read	Update	Delete	Notify
/EasySetupResURI		get			observe

B.3 Wi-Fi Configuration

B.3.1 Introduction

WiFiConf resource stores essential information to help an unboxing device to connect to an existing Wi-Fi AP.

B.3.2 Example URI

/WiFiConfResURI

B.3.3 Resource Type

The resource type (rt) is defined as: ['oic.r.wificonf'].

B.3.4 Swagger2.0 Definition

```
{
  "swagger": "2.0",
```



```
  "info": {
    "title": "Wi-Fi Configuration Resource Baseline Interface",
    "version": "v0.0.3-20170611",
    "license": {
      "name": "copyright 2016-2017 Open Connectivity Foundation, Inc. All rights reserved.",
      "x-description": "Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:\n        1.
Redistributions of source code must retain the above copyright notice, this list of conditions and
the following disclaimer.\n        2.  Redistributions in binary form must reproduce the above
copyright notice, this list of conditions and the following disclaimer in the documentation and/or
other materials provided with the distribution.\n\n        THIS SOFTWARE IS PROVIDED BY THE Open
Connectivity Foundation, INC. \"AS IS\" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR
WARRANTIES OF NON-INFRINGEMENT, ARE DISCLAIMED.\n        IN NO EVENT SHALL THE Open Connectivity
Foundation, INC. OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL,
EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)\n        HOWEVER CAUSED AND
ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY
OF SUCH DAMAGE.\n"
    }
  },
  "schemes": ["http"],
  "consumes": ["application/json"],
  "produces": ["application/json"],
  "paths": {
    "/WiFiConfResURI?if=oic.if.baseline" : {
      "get": {
        "description": "WiFiConf resource stores essential information to help an unboxing
device\nto connect to an existing Wi-Fi AP.\nRetrieve properties of WiFiConf resource.\nThe
information includes :\n1. Wi-Fi SSID and password\n2. Wi-Fi Security type (i.e. auth type and
encription type)\n3. Wi-Fi hardware capability (i.e. supported frequencies, modes,\n  auth types
and encryption types)\n",
        "parameters": [
          {"$ref": "#/parameters/interface-baseline"}
        ],
        "responses": {
            "200": {
              "description" : "",
              "x-example":
                {
                  "rt": ["oic.r.wificonf"],
                  "swmt" : ["A", "B", "G"],
                  "swf": ["2.4G", "5G"],
                  "tnn": "Home_AP_SSID",
                  "cd": "Home_AP_PWD",
                  "wat": "WPA2_PSK",
                  "wet": "TKIP",
                  "swat": ["WPA_PSK", "WPA2_PSK"],
                  "swet": ["TKIP", "AES", "TKIP_AES"]
                }
                ,
              "schema": { "$ref": "#/definitions/WiFiConf" }
            }
        }
      },
      "post": {
        "description": "Deliver Wi-Fi AP's information for an unboxing device to connect to it.\n",
        "parameters": [
          {"$ref": "#/parameters/interface-baseline"},
          {
            "name": "body",
            "in": "body",
            "required": true,
            "schema": { "$ref": "#/definitions/WiFiConfUpdate" },
            "x-example":
              {
                "tnn": "Home_AP_SSID",
                "cd": "Home_AP_PWD",
                "wat": "WPA2_PSK",
                "wet": "AES"
```

```
                }
              }
            ],
            "responses": {
                "200": {
                  "description" : "",
                  "x-example":
                    {
                      "tnn": "Home_AP_SSID",
                      "cd": "Home_AP_PWD",
                      "wat": "WPA2_PSK",
                      "wet": "AES"
                    }
                    ,
                  "schema": { "$ref": "#/definitions/WiFiConfUpdate" }
                }
            }
          }
        },
        "/WiFiConfResURI?if=oic.if.rw" : {
          "get": {
            "description": "WiFiConf resource stores essential information to help an unboxing
device\nto connect to an existing Wi-Fi AP.\nRetrieve properties of WiFiConf resource that can be
updated by a client.\n",
            "parameters": [
              {"$ref": "#/parameters/interface-rw"}
            ],
            "responses": {
                "200": {
                  "description" : "",
                  "x-example":
                    {
                      "tnn": "Home_AP_SSID",
                      "cd": "Home_AP_PWD",
                      "wat": "WPA2_PSK",
                      "wet": "AES"
                    }
                    ,
                  "schema": { "$ref": "#/definitions/WiFiConfUpdate" }
                }
            }
          },
          "post": {
            "description": "Deliver Wi-Fi AP's information for an unboxing device to connect to it.\n",
            "parameters": [
              {"$ref": "#/parameters/interface-rw"},
              {
                "name": "body",
                "in": "body",
                "required": true,
                "schema": { "$ref": "#/definitions/WiFiConfUpdate" },
                "x-example":
                  {
                    "tnn": "Home_AP_SSID",
                    "cd": "Home_AP_PWD",
                    "wat": "WPA2_PSK",
                    "wet": "AES"
                  }
              }
            ],
            "responses": {
                "200": {
                  "description" : "",
                  "x-example":
                    {
                      "tnn": "Home_AP_SSID",
                      "cd": "Home_AP_PWD",
                      "wat": "WPA2_PSK",
                      "wet": "AES"
                    }
                    ,
```

```
                "schema": { "$ref": "#/definitions/WiFiConfUpdate" }
              }
          }
        }
      },
      "parameters": {
        "interface-rw" : {
          "in" : "query",
          "name" : "if",
          "type" : "string",
          "enum" : ["oic.if.rw"]
        },
        "interface-baseline" : {
          "in" : "query",
          "name" : "if",
          "type" : "string",
          "enum" : ["oic.if.baseline"]
        },
        "interface-all" : {
          "in" : "query",
          "name" : "if",
          "type" : "string",
          "enum" : ["oic.if.baseline", "oic.if.rw"]
        }
      },
      "definitions": {
        "WiFiConf" : {
          "properties": {
            "rt" :
                    {
              "description": "Resource Type of the Resource",
              "items": {
                "maxLength": 64,
                "type": "string"
              },
              "minItems": 1,
              "readOnly": true,
              "type": "array"
            },

            "tnn" :
                    {
              "description": "Indicates Target Network Name (SSID of Wi-Fi AP)",
              "pattern": "^.*$",
              "type": "string"
            },

            "swmt" :
                    {
              "description": "Indicates supported Wi-Fi mode types. It can be multiple",
              "items": {
                "description": "Supported Wi-Fi Mode Type.",
                "enum": [
                  "A",
                  "B",
                  "G",
                  "N",
                  "AC"
                ],
                "type": "string"
              },
              "readOnly": true,
              "type": "array"
            },

            "wat" :
                    {
              "description": "Indicates Wi-Fi Auth Type",
              "enum": [
                "None",
```



```
              "WEP",
              "WPA_PSK",
              "WPA2_PSK"
            ],
            "type": "string"
          },

          "n" :
                  {
            "description": "Friendly name of the resource",
            "maxLength": 64,
            "readOnly": true,
            "type": "string"
          },

          "swat" :
                  {
            "description": "Indicates supported Wi-Fi Auth types. It can be multiple",
            "items": {
              "description": "Indicates Wi-Fi Auth Type",
              "enum": [
                "None",
                "WEP",
                "WPA_PSK",
                "WPA2_PSK"
              ],
              "type": "string"
            },
            "readOnly": true,
            "type": "array"
          },

          "swf" :
                  {
            "description": "Indicates Supported Wi-Fi frequencies by the Enrollee. Can be multiple.
Valid values are ('2.4G', '5G')",
            "items": {
              "pattern": "^(2\\.4|5)G$",
              "type": "string"
            },
            "readOnly": true,
            "type": "array"
          },

          "swet" :
                  {
            "description": "Indicates supported Wi-Fi Encryption types. It can be multiple",
            "items": {
              "description": "Indicates Wi-Fi Encryption Type",
              "enum": [
                "None",
                "WEP_64",
                "WEP_128",
                "TKIP",
                "AES",
                "TKIP_AES"
              ],
              "type": "string"
            },
            "readOnly": true,
            "type": "array"
          },

          "wet" :
                  {
            "description": "Indicates Wi-Fi Encryption Type",
            "enum": [
              "None",
              "WEP_64",
              "WEP_128",
              "TKIP",
```



```
              "AES",
              "TKIP_AES"
            ],
            "type": "string"
          },

          "cd" :
                  {
            "description": "Indicates credential information of Wi-Fi AP",
            "pattern": "^.*$",
            "type": "string"
          },

          "id" :
                  {
            "description": "Instance ID of this specific resource",
            "maxLength": 64,
            "readOnly": true,
            "type": "string"
          },

          "if" :
                  {
            "description": "The interface set supported by this resource",
            "items": {
              "enum": [
                "oic.if.baseline",
                "oic.if.ll",
                "oic.if.b",
                "oic.if.lb",
                "oic.if.rw",
                "oic.if.r",
                "oic.if.a",
                "oic.if.s"
              ],
              "type": "string"
            },
            "minItems": 1,
            "readOnly": true,
            "type": "array"
          }

          }
          ,"type" : "object"
        }
        ,
        "WiFiConfUpdate" : {
          "properties": {
            "rt" :
                  {
              "description": "Resource Type of the Resource",
              "items": {
                "maxLength": 64,
                "type": "string"
              },
              "minItems": 1,
              "readOnly": true,
              "type": "array"
            },

            "wat" :
                  {
              "description": "Indicates Wi-Fi Auth Type",
              "enum": [
                "None",
                "WEP",
                "WPA_PSK",
                "WPA2_PSK"
              ]
            },
```



```
        "n" :
                {
          "description": "Friendly name of the resource",
          "maxLength": 64,
          "readOnly": true,
          "type": "string"
        },

        "cd" :
                {
          "description": "Indicates credential information of Wi-Fi AP",
          "pattern": "^.*$",
          "type": "string"
        },

        "wet" :
                {
          "description": "Indicates Wi-Fi Encryption Type",
          "enum": [
            "None",
            "WEP_64",
            "WEP_128",
            "TKIP",
            "AES",
            "TKIP_AES"
          ]
        },

        "tnn" :
                {
          "description": "Indicates Target Network Name (SSID of Wi-Fi AP)",
          "pattern": "^.*$",
          "type": "string"
        },

        "id" :
                {
          "description": "Instance ID of this specific resource",
          "maxLength": 64,
          "readOnly": true,
          "type": "string"
        },

        "if" :
                {
          "description": "The interface set supported by this resource",
          "items": {
            "enum": [
              "oic.if.baseline",
              "oic.if.ll",
              "oic.if.b",
              "oic.if.lb",
              "oic.if.rw",
              "oic.if.r",
              "oic.if.a",
              "oic.if.s"
            ],
            "type": "string"
          },
          "minItems": 1,
          "readOnly": true,
          "type": "array"
        }

        }
        ,"type" : "object"
      }
    }
  }
```


B.3.5 Property Definition

Table 19 The properties definitions of the resource

Property name	Value type	Mandatory	Access mode	Description
cd	string		Read Write	Indicates credential information of Wi-Fi AP
swf	array: see schema		Read Only	Indicates Supported Wi-Fi frequencies by the Enrollee. Can be multiple. Valid values are ('2.4G', '5G')
tnn	string		Read Write	Indicates Target Network Name (SSID of Wi-Fi AP)
swmt	array: see schema		Read Only	Indicates supported Wi-Fi mode types. It can be multiple
wet	string		Read Write	Indicates Wi-Fi Encryption Type
swet	array: see schema		Read Only	Indicates supported Wi-Fi Encryption types. It can be multiple
id	string		Read Only	Instance ID of this specific resource
swat	array: see schema		Read Only	Indicates supported Wi-Fi Auth types. It can be multiple
if	array: see schema		Read Only	The interface set supported by this resource
rt	array: see schema		Read Only	Resource Type of the Resource
wat	string		Read Write	Indicates Wi-Fi Auth Type

n	string		Read Only	Friendly name of the resource
cd	string		Read Write	Indicates credential information of Wi-Fi AP
if	array: see schema		Read Only	The interface set supported by this resource
tnn	string		Read Write	Indicates Target Network Name (SSID of Wi-Fi AP)
wat	multiple types: see schema		Read Write	Indicates Wi-Fi Auth Type
wet	multiple types: see schema		Read Write	Indicates Wi-Fi Encryption Type
rt	array: see schema		Read Only	Resource Type of the Resource
id	string		Read Only	Instance ID of this specific resource
n	string		Read Only	Friendly name of the resource

B.3.6 CRUDN behaviour

Table 20 The CRUDN operations of the resource

Resource	Create	Read	Update	Delete	Notify
/WiFiConfResURI		get	post		observe

