Mesh Configuration Database

***Bluetooth*® Specification**

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Abstract:

This Bluetooth specification defines fundamental requirements to enable an interoperable Mesh Configuration database for use with the Mesh Profile specification v1.0.

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Revision History

Revision Number	Date	Comments
d05r00	10/22/2017	Initial revision
d05r01	10/29/2017	Changes to retransmit interval and publish period: converted composite object to integer to express values in milliseconds. Change to sample data: added key 1 to relay nodes and corrected model IDs. Description section completed for all the schema's fields.
d05r02	10/31/2017	A new field "allocatedSceneRange" is added to a "provisioner" object. Fixed minimum and maxim values for "allocatedGroupRange" property. Fixes to formatting and references.
d05r03	11/02/2017	Incorporated editorial changes and deleted resolved comments. Moved Section 4 before Section 5.
d05r04	11/07/2017	Incorporated feedback from Tech Pubs. Deleted duplicate definition of 'bind' property and fixed offset.
d05r05	11/09/2017	Introduced "parentAddress" property in "group" object and changed schema and example accordingly. Renamed "address" property in "scene" object and changed type to an array, updated description and modified schema and sample accordingly. Validated the schema for functional correctness and applied necessary fixes (e.g., commas, curly braces, etc).
d05r06	01/03/2018	Updated following Athens F2F discussions: removed IVindex and IVupdate properties from "mesh" object; added "UUID" property in "node" and "provisioner" objects; added "configComplete" and "blacklisted" properties in "node" object; added "dirtyAddressRange" property for "provisioner" object. Addressed feedback from WG: added explanation for "minSecurity" property of "netKey" object. Renamed "provisioning" object to "provisioner" object to better reflect the nature of the entity that the object describes.
d05r07	02/21/2018	Incorporated feedback from Vancouver F2F: flattened "node" object hierarchy by removing "composition" and "configuration" and moving their corresponding properties one level up into "node" object; have only one instance of "elements" array with models; add mesh timestamp. Changed types of "relay", "lowPower", "friend" and "proxy" properties to enumerated integers to align with Mesh Profile specification.
d05r08	03/05/2018	Incorporated feedback from the WG: changed section order, converted property list into tables, removed "phase" property from node's netKeys, modified schema and sample to reflect the changes.
d05r09	03/21/2018	Incorporated feedback from the WG: added more explanatory text, changed section order to better reflect hierarchy, converted the

Revision Number	Date	Comments
		remaining property lists into tables, changed some optional requirements to conditional, restored $schema property, renamed “period” in publish retransmit to “interval” to be consistent with naming conventions for network transmit and relay retransmit.
d05r10	04/03/2018	Incorporated feedback from WG: additional conditional requirements in property tables, added some text clarifications. Test strategy section added for d05 (to be removed in 07).
d05r11	04/25/2018	Incorporated feedback from WG, changed specification name to Mesh Configuration Database Schema, introduced a notion of Configuration Manager as a device that supports provisioning and Mesh Config Client model. Test Strategy section updated.
d05r12	04/30/2018	Addressed comments from WG. Updated some wording.
d05r13	05/18/2018	Addressed Comments from WG. To better preserve Key Refresh State added “timestamp” property in network key object, changed node “appKeys” and “netKeys” properties to be arrays of objects, where each object has key index and optional updated flag to indicate whether the keys have been updated.
d05r14	06/13/2018	Corrections in schema and sample database sections.
d05r15	06/23/2018	SIG staff review comments are addressed.
d05r16	06/27/2018	SIG staff review: minor editorial fixes, fixed broken cross-reference links, changed table caption formatting to match the latest templates on Bluetooth.com.
d07r01	08/19/2018	Removed the test section. Addressed comments from BARB: specified a format for naming vendor specific properties to avoid potential clash of namespaces when the specification is extended with new properties.
d07r02	09/05/2018	Added definitions for group and parent group

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Contents

1 Introduction

This Bluetooth specification defines fundamental requirements to enable an interoperable Mesh Configuration database for use with the Mesh Profile specification v1.0 [1]. The Mesh Profile specification defines procedures for provisioning devices into nodes and configuring nodes using a standard set of messages.

For the purpose of this specification, the term Configuration Manager denotes a device that supports the Provisioner role or the Mesh Configuration Client model as described in [1]. To enable the sharing of provisioning and configuration data between multiple Configuration Managers that may be from different manufacturers, a standardized Mesh Configuration database has been defined. This database can be exchanged between Configuration Managers. Mechanisms to be used to exchange such databases are out of scope for this specification.

1.1 Conformance

If conformance to this specification is claimed, all capabilities indicated as mandatory for this specification shall be supported in the specified manner (process-mandatory). This also applies for all optional and conditional capabilities for which support is indicated.

1.2 Bluetooth specification release compatibility

This specification shall be used with the Bluetooth Mesh Profile specification v1.0 [1].

1.2.1 Acronyms and abbreviations

Acronym or Abbreviation	Meaning
CDB	Configuration Database
CID	Company Identifier
ID	Identifier
IVI	Initialization Vector Index
JSON	JavaScript Object Notation
PID	Product Identifier
RFU	Reserved for Future Use
RPL	Replay Protection List
SIG	Special Interest Group
TTL	Time To Live
TAI	International Atomic Time
UUID	Universally Unique Identifier
VID	Version Identifier

Table 1.1: Acronyms and abbreviations

1.2.2 Terminology

The terminology used throughout this specification is defined in the Mesh Profile specification v1.0 [1], unless otherwise stated.

1.2.3 Requirement status symbols

In this specification, the following symbols are used:

‘M’ for mandatory (used for properties that shall be present)

‘O’ for optional (used for properties that may be present)

‘C’ for conditional (used for properties that shall be present or excluded depending on the value of other properties)

2 Mesh Configuration database format

The Mesh Configuration database specification defines a representation of the Mesh Configuration database in a JavaScript Object Notation (JSON), as defined by [2]. This representation contains a single JSON object that describes the mesh network. A Mesh Configuration database shall only contain information about a single mesh network and associated subnets.

Unless explicitly specified by this document, the value ranges of JSON object properties are constrained by the ranges of the corresponding states that these properties are describing and are defined in the Mesh Profile specification [1].

The Mesh Configuration database may be extended with additional vendor specific objects and properties not defined by this specification. The objects that are not defined by this specification may be ignored by the Configuration Manager.

2.1 Mesh object

A Mesh Configuration database shall contain a single object, called the mesh object. The mesh object documents the current state of a mesh network as known by the device that generates this database

The mesh object contains the following properties as shown in Table 2.1:

Property Name	Requirements
$schema	M
version	M
meshUUID	M
meshName	M
timestamp	M
provisioners	M
netKeys	M
appKeys	O
nodes	O
groups	O
scenes	O

Table 2.1: Mesh object properties

The $schema property contains a URL that points to the location of the proper version of the Mesh Configuration schema that defines the format for this mesh object.

The version property contains a string that represents a revision number of the Mesh Configuration schema to which this mesh object complies. The revision number for the Mesh Configuration schema that is defined by this specification is 1.0.

The meshUUID property contains a 32-character hexadecimal string that represents the 128-bit UUID, which allows differentiation among multiple mesh networks.

The meshName property contains a string, which should be a human-readable name for this mesh network. This is useful when a Configuration Manager knows multiple mesh networks, to enable a human to identify different mesh networks.

The timestamp property contains a hexadecimal string that contains an integer representing the last time the Provisioner database has been modified. The timestamp range is within the range of 0x0 through 0xFFFFFFFFFF. Mesh time representation is based on International Atomic Time (TAI), described in Section 5.1.1 of [6]. The timestamp is expressed in TAI seconds and is the number of seconds after 00:00:00 TAI on 2000-01-01. For example, the value “20E5369D” represents the 2017-06-27T15:30:37 TAI.

The provisioners property contains an array of provisioner objects (defined in Section 2.2) that includes information about known Provisioners and resources that have been allocated to these Provisioners.

The netKeys property contains an array of network key objects (defined in Section 2.3) that includes information about known network keys.

The appKeys property is an array of application key objects (defined in Section 2.4) that includes information about known application keys.

The nodes property contains an array of node objects (defined in Section 2.5) that includes information about known mesh nodes.

The groups property contains an array of group objects (defined in Section 2.9).

The scenes property contains an array of scene objects (defined in Section 2.10).

2.2 Provisioner object

The provisioner object contains the following properties shown in Table 2.2:

Property Name	Requirements
provisionerName	M
UUID	M
allocatedUnicastRange	M
allocatedGroupRange	M
allocatedSceneRange	C.1

Table 2.2: Provisioner object properties

C.1: Mandatory if the network allows scenes to be stored and recalled; otherwise optional.

The provisionerName property contains a string, which should be a human-readable name of this Provisioner, within the mesh network.

UUID: property contains a 32-character hexadecimal string that represents the 128-bit Device UUID [1], which allows differentiation among the devices participating in the mesh network. If a Provisioner is able to perform configuration procedures, then the *nodes* property of the mesh object (see Section 2.1) shall contain a node entry (described in Section 2.5) that matches the Provisioner's UUID.

The allocatedUnicastRange property contains an array of unicast range objects (defined in Section 2.2.1).

The allocatedGroupRange property contains an array of group range objects (defined in Section 2.2.2).

The allocatedSceneRange property contains an array of scene range objects (defined in Section 2.2.3).

2.2.1 Unicast range object

The unicast range object contains the following properties shown in Table 2.3:

Property Name	Requirements
lowAddress	M
highAddress	M

Table 2.3: Unicast range object properties

The lowAddress and highAddress properties contain strings representing hexadecimal integers within the range of 0x0001 through 0x7FFF. The value of the lowAddress property shall be less than or equal to the value of the highAddress property.

The unicast range object is used to represent the range of unicast addresses that this Provisioner can allocate to new devices when they are provisioned into a mesh network without needing to coordinate the node additions with other Provisioners.

The process for allocating the range of unicast addresses is not defined by this specification, and is at the implementer's discretion.

2.2.2 Group range object

The group range object contains the following properties shown in Table 2.4:

Property Name	Requirements
lowAddress	M
highAddress	M

Table 2.4: Group range object properties

The lowAddress and highAddress properties contain strings representing hexadecimal integers within the range of 0xC000 through 0xFEFF. The value of the lowAddress property shall be less than or equal to the value of the highAddress property.

The group range object is used to represent the range of group addresses that this Provisioner can allocate to newly created groups without needing to coordinate the group additions with other Provisioners.

The process for allocating the range of group addresses is not defined by this specification, and is at the implementer's discretion.

2.2.3 Scene range object

The scene range is an object that contains the following properties shown in Table 2.5:

Property Name	Requirements
firstScene	M
lastScene	M

Table 2.5: Scene range object properties

The firstScene and lastScene properties contain integers within the range of 1 through 65535. The value of the firstScene property shall be less than or equal to the value of the lastScene property.

The scene range object is used to represent the range of scene numbers that this Provisioner can use to register new scenes in a mesh network without needing to coordinate the allocated scene numbers with other Provisioners.

The process for allocating the range of scene numbers is not defined by this specification, and is at the implementer's discretion.

2.3 Network key object

The network key object contains the properties shown in Table 2.6.

Property Name	Requirements
name	M
index	M
phase	M
key	M
minSecurity	M
oldKey	C.1
timestamp	M

Table 2.6: Network key object properties

C.1: Mandatory if phase is non-zero, otherwise excluded.

The name property contains a string, which should be a human-readable name for the mesh subnet associated with this network key.

The index property contains an integer within the range of 0 through 4095 that represents the NetKey index for this network key.

The phase property contains an integer with a value of 0, 1, or 2, which represents the Key Refresh phase (as defined in [1]) for the subnet associated with this network key.

The key property contains a 32-character hexadecimal string that represents the 128-bit network key (e.g., "27B55885B2D9D419BEE8F6D489A38473").

The minSecurity property contains a string with two allowed values: “low” and “high”, which describe a minimum security level for a subnet associated with this network key. If all the nodes on the subnet associated with this network key have been provisioned using Secure Provisioning procedure (defined in Section 5.4.3 of [1]), then the value of minSecurity property for the subnet is set to “high”; otherwise, the subnet is considered to be insecure, and the value of the minSecurity is set to “low”.

The oldKey property contains a 32-character hexadecimal string representing the 128-bit network key, and shall be present when the phase property has a non-zero value, such as when a Key Refresh procedure is in progress. The value of the oldKey property contains the previous network key.

The timestamp property contains a hexadecimal string that contains an integer representing the last time the value of the property phase has been updated. The timestamp is within the range of 0x0 to 0xFFFFFFFFFF. Mesh time representation is based on International Atomic Time (TAI) (described in Section 5.1.1 of [6]). The timestamp is expressed in TAI seconds and is the number of seconds after 00:00:00 TAI on 2000-01-01. For example, the value “20E5369D” represents the 2017-06-27T15:30:37 TAI.

2.4 Application key object

The application key object contains the following properties shown in Table 2.7:

Property Name	Requirements
name	M
index	M
boundNetKey	M
key	M
oldKey	C.1

Table 2.7: Application key object properties

C.1: Mandatory if key refresh phase of the network key to which this application key is bound is non-zero, and if this application key is updated by the Configuration Manager; otherwise excluded.

The name property contains a string, which should be a human-readable name for the application functionality associated with this application key (e.g., “Home Automation”).

The index property contains an integer within the range of 0 to 4095 that represents the AppKey index for this application key.

The key property contains a 32-character hexadecimal string representing the 128-bit application key for the given appKeyIndex (e.g. "27B55885B2D9D419BEE8F6D489A38473").

The boundNetKey property contains a corresponding netKeyIndex from the netKeys property of the mesh object. All application keys should be bound to network keys that are documented in the mesh object.

The oldKey property contains a 32-character hexadecimal string representing the 128-bit application key, and shall be present when a Key Refresh procedure is in progress. The value of the oldKey property contains the previous application key.

2.5 Node object

The node object contains the following properties shown in Table 2.8:

Property Name	Requirements
UUID	M
unicastAddress	M
deviceKey	M
security	M
netKeys	M
configComplete	M
name	O
cid	C.1
pid	C.1
vid	C.1
crpl	C.1
features	C.2
secureNetworkBeacon	C.3
defaultTTL	C.4
networkTransmit	C.5

relayRetransmit	C.6
appKeys	C.7
elements	C.1
blacklisted	O

Table 2.8: Node object properties

C.1: Mandatory after the Configuration Manager has received composition data [1] from the node.

C.2: Mandatory after the Configuration Manager has either received composition data or a Config Relay Status, Config Friend Status, or Config Relay Status message from the node [1].

C.3: Mandatory after the Configuration Manager has received a Config Beacon Status message from the node [1].

C.4: Mandatory after the Configuration Manager has received a Config Default TTL Status message from the node [1].

C.5: Mandatory after the Configuration Manager has received a Config Network Transmit Status message from the node [1].

C.6: Mandatory after the Configuration Manager has received a Config Relay Status message from the node that supports the Relay feature [1].

C.7: Mandatory after the Configuration Manager has received a Config AppKey Status message with Status Code set to Success from the node [1].

The UUID property contains a 32-character hexadecimal string that represents the 128-bit Device UUID [1], which allows differentiation among devices participating in the mesh network.

The unicastAddress property contains a string that represents a hexadecimal number within the range of 0x0001 to 0x7FFF that is the primary unicast address of this node.

The deviceKey property contains a 32-character hexadecimal string representing the 128-bit device key for this node.

The security property contains a string with two allowed values, “low” and “high”, representing the level of security for the subnet on which the node has been originally provisioned.

The name property contains a string, which should be a human-readable name that can identify this node within the mesh network.

The netKeys property contains an array of node network key objects (defined in Section 2.9) that includes information about the network keys known to this node.

The configComplete property contains a Boolean value that represents whether the Configuration Manager finished configuring this node. The property’s value is set to “true” once a Configuration Manager is done with this node’s configuration; otherwise, the property’s value is set to “false“.

The name property contains a string, which should be a human-readable name that can identify this node within the mesh network.

The cid property contains a 4-character hexadecimal string that represents a 16-bit Company Identifier (CID) assigned by the Bluetooth SIG [5]. The value of this property is obtained from node composition data (defined in [1]).

The pid property contains a 4-character hexadecimal string that represents a 16-bit, vendor-assigned Product Identifier (PID). The value of this property is obtained from node composition data (defined in [1]).

The vid property contains a 4-character string that represents a 16-bit, vendor-assigned product Version Identifier (VID). The value of this property is obtained from node composition data (defined in [1]).

The crpl property contains a 4-character string that represents a 16-bit hexadecimal value indicating the minimum number of Replay Protection List (RPL) entries for this node. The value of this property is obtained from node composition data (defined in [1]).

The features property contains a features object (defined in Section 2.6).

The secureNetworkBeacon property contains a Boolean value that represents whether or not the node is configured to send Secure Network beacons. The value of this property shall be set when the Configuration Manager receives a Config Beacon Status message from this node [1].

The defaultTTL property contains an integer that represents the default Time to Live (TTL) value used when sending messages (defined in [1]). The value of this property shall be set when the Configuration Manager receives a Config Default TTL Status message from this node [1].

The networkTransmit property contains an object (defined in Section 2.7).

The relayRetransmit property contains an object (defined in Section 2.8).

The appKeys property contains an array of node application key objects (defined in Section 2.10) that includes information about the application keys known to this node.

The elements property contains an array of one or more element objects (defined in Section 2.11).

The blacklisted property contains a Boolean value that represents whether the Node is excluded from the new network key distribution during key refresh procedure.

2.6 Features object

The features object shall contain at least one of the following properties shown in Table 2.9:

Property Name	Requirements
relay	C.1
proxy	C.2
lowPower	C.3

friend	C.4

Table 2.9 Features object properties

C.1: The value shall be set to 2 if the node reports that it does not support the relay feature in the composition data. The value shall be set to 0 or 1 or 2 after the Configuration Manager receives a Config Relay Status message from the node [1]. All other values are prohibited.

C.2: The value shall be set to 2 if the node reports that it does not support the GATT proxy feature in the composition data. The value shall be set to 0 or 1 or 2 after the Configuration Manager receives a Config GATT Proxy Status message from the node [1]. All other values are prohibited.

C.3: The value shall be set to 2 if the node reports that it does not support the low power feature in the composition data; otherwise, the value is set to 1. All other values are prohibited.

C.4: The value shall be set to 2 if the node reports that it does not support the friend feature in the composition data. The value shall be set to 0 or 1 or 2 after the Configuration Manager receives a Config Friend Status message from the node [1]. All other values are prohibited.

These properties indicate whether the node supports the corresponding features, which are defined in the Mesh Profile Specification [1], and whether the feature is enabled/disabled.

Each property contains an enumerated integer with the following values:

- 0 – feature is disabled
- 1 – feature is enabled
- 2 – feature is unsupported

2.7 Network transmit object

The network transmit object contains the following properties shown in Table 2.10:

Property Name	Requirements
count	M
interval	M

Table 2.10: Network transmit object properties

The object shall be written to the database when the Configuration Manager receives a Config Network Transmit Status message from this node [1].

The count property contains an integer within the range of 0 to 7, which represents the number of retransmissions for network messages.

The interval property contains an integer within the range of 10 to 320, which represents the interval (in milliseconds) between retransmissions.

2.8 Relay retransmit object

The relay retransmit object contains the following properties shown in Table 2.11:

Property Name	Requirements
count	M
interval	M

Table 2.11 Relay retransmit object properties

The object shall be written to the database when the Configuration Manager receives a Config Relay Status message from this node [1].

The count property contains an integer within the range of 0 to 7, which represents the number of retransmissions for relay messages.

The interval property contains an integer within the range of 10 to 320, which represents the interval (in milliseconds) between retransmissions.

2.9 Node network key object

The node network key object contains the properties shown in Table 2.12.

Property Name	Requirements
index	M
updated	C.1

Table 2.12: Node network key object properties

C.1: Mandatory if the value of the phase property of the network key object (see Section 2.3) referred by the value of the index property is non-zero, and after the Configuration Manager has received a Config NetKey Status message from the node as an acknowledgement to the Config NetKey Update message during phase 1 of the Key Refresh procedure (described in [1]); otherwise excluded.

The index property contains an integer within the range of 0 to 4095, which represents the NetKey index for this network key.

The updated property contains a Boolean value that represents whether this network key is successfully updated when a Key Refresh procedure is in progress. The property's value depends on the value of the status code in the Config NetKey Status message that the configuration Manager receives from the node as an acknowledgement to the Config NetKey Update message during phase 1 of the Key Refresh procedure. If the status code is Success, the value is set to "true"; otherwise, it is set to "false".

2.10 Node application key object

The node application key object contains the properties shown in Table 2.13.

Property Name	Requirements
index	M
updated	C.1

Table 2.13: Node application key object properties

C.1: Mandatory if the value of the phase property of the network key object (see Section 2.3) corresponding to a network key to which this application key is bound is non-zero, and after the Configuration Manager has received a Config AppKey Status message from the node as an acknowledgement to the Config AppKey Update message during phase 1 of the Key Refresh procedure (described in [1]); otherwise excluded.

The index property contains an integer within the range of 0 to 4095, which represents the AppKey index for this application key.

The updated property contains a Boolean value that represents whether this application key is successfully updated when a Key Refresh procedure is in progress. The property's value depends on the value of the status code in the Config AppKey Status message that the configuration Manager receives from the node as an acknowledgement to the Config AppKey Update message during phase 1 of the Key Refresh procedure. If the status code is Success, the value is set to "true"; otherwise, it is set to "false".

2.11 Element object

The element object contains the following properties as shown in Table 2.14:

Property Name	Requirements
name	O
index	M
location	M
models	M

Table 2.14: Element object properties

The name property contains a string, which should be a human-readable name that can identify an element within the node.

The index property contains an integer that represents the numeric order of the element within this node, where the numeric order starts from zero. The value of the index property for the primary element within the node (defined in [1]) shall be set to zero.

The location property contains a 4-character string that represents a description of the element's location (defined in the GATT Bluetooth Namespace Descriptors section of the Bluetooth SIG Assigned Numbers webpage [4]).

The models property contains an array of model objects (defined in Section 2.12).

2.12 Model object

The model object contains the following properties as shown in Table 2.15:

Property Name	Requirements
modelId	M
subscribe	C.1
publish	C.2
bind	C.3

Table 2.15: Model object properties

C.1: Mandatory after the Configuration Manager has received a Config Model Subscription Status message from the node corresponding to the modelId, and until the Configuration Manager has received a Config Model Subscription Delete corresponding to the modelId or Config Model Subscription Delete All message [1]; otherwise, the zero-size array is optional.

C.2: Mandatory after the Configuration Manager has received a Config Model Publication Status message from the node corresponding to the modelId [1]; otherwise, excluded.

C.3: Mandatory after the Configuration Manager has received a Config Model App Bind Status message from the node corresponding to the modelId, and until the Configuration Manager receives a Config Model App Unbind Status for all app keys [1]; otherwise, the zero-size array is optional.

The modelId property contains a string that is a hexadecimal representation of a Bluetooth SIG-defined model identifier (defined in [1] and [6]) and/or a vendor-defined model identifier. A Bluetooth SIG model identifier is represented as a 4-character string. The Vendor model identifier is represented as an 8-character string, where the first 4 characters correspond to a Bluetooth-assigned Company Identifier [5] and the last 4 characters contain a vendor-assigned model identifier.

The subscribe property contains an array of 4-character hexadecimal strings representing group (or unicast) addresses, and/or 32-character hexadecimal strings representing virtual label UUIDs.

The publish property contains a publish object (defined in Section 2.10.1), which describes the configuration of this model's publication.

The bind property contains an array of integers that represents indexes of the application key to which this model is bound.

2.12.1 Publish object

The publish object contains the following properties as shown in Table 2.16:

Property Name	Requirements
address	M

index	M
ttl	M
period	M
credentials	M
retransmit	M

Table 2.16: Publish object properties

The address property contains the publication address for the model as configured by a Configuration Manager. It can be either a 4-character string representing a group or unicast address, or a 32-character string representing virtual label UUIDs.

The index property contains an integer within the range of 0 to 4095, which represents an application key index that indicates which application key to use for the publication.

The ttl property contains an integer that represents the Time to Live (TTL) value for outgoing publish messages.

The period property contains an integer that represents the interval between subsequent publications in milliseconds.

The credentials property contains an integer within the range of 0 to 1, which represents whether master security materials (0) or friendship security materials (1) are used.

The retransmit property contains an object that has the following properties shown in Table 2.17:

Property Name	Requirements
count	M
interval	M

Table 2.17: Publish retransmit object properties

The count property contains an integer within the range of 0 to 7, which represents the number of retransmissions for published messages.

The interval property contains an integer within the range of 50 to 1600, which represents the interval (in milliseconds) between retransmissions.

2.13 Group object

A Group is defined as a set of nodes which in addition to a unicast addressed can be addressed by a group address. For a node to be a part of a Group, at least one model of the node must be subscribed to the Group's group address.

A Group may have a Parent Group. In that case all the models of a node that are subscribed to the Group's address are also subscribed to the Parent Group's address.

For example, the Second-Floor Group may be a parent of a Bedroom Group and a Guest Bedroom Group. In that case at least one model of all the nodes of the Bedroom Group must be subscribed to a group address of the Bedroom Group and Second-Floor Group; all the nodes of the Guest Bedroom must be subscribed to the group address of the Guest Bedroom Group and the Second-Floor Group.

The group object contains the following properties shown in Table 2.18:

Property Name	Requirements
name	M
address	M
parentAddress	M

Table 2.18: Group object properties

The name property contains a string, which should be a human-readable name for this group within the mesh network.

The address property contains a string representing a hexadecimal number within the range of 0xC000 to 0xFEFF, and is the address of the group.

The parentAddress property represents an address of a parent group in which this group is included. The parentAddress property contains a string representing a hexadecimal number, either 0x0000 or a number within the range of 0xC000 to 0xFEFF. The value of the parentAddress property shall not be equal to the value of the address property. If the group is not included in another group, in other words the group has no parent, then the value of parentAddress shall be set to0x0000.

2.14 Scene object

The scene object contains the following properties shown in Table 2.19:

Property Name	Requirements
name	M
addresses	M
number	M

Table 2.19: Scene object properties

The name property contains a string that represents the name of this scene.

The addresses property contains an array of strings, which represents the addresses of nodes that the scene is stored within.

The number property contains an integer that represents the scene number for this scene.

2.15 Vendor specific object

Mesh object (Section 2.1) and any of the objects within its hierarchy may be extended by vendor specific properties. A vendor specific property is an object that shall be marked by the property tag cidXXXX, where “XXXX” is a 4-character hexadecimal string that represents a 16-bit Company Identifier (CID) assigned by the Bluetooth SIG [5]. This specification does not define the internal format of a vendor specific object.

3 Security considerations

The security of the Mesh Configuration database is critical to the security of the associated mesh network. Therefore, the Mesh Configuration database should be stored in protected location and should never be transferred between Configuration Managers using an insecure mechanism. If it is transferred in an insecure way, then the associated mesh network will be considered insecure.

4 Mesh Configuration database JSON schema

This JSON schema [3] is used to describe the format of a Mesh Configuration database object.

```
{
    "$schema": "",
    "version": "1.0",
    "title": "Mesh Provisioner Database",
    "description": "A representation of a Mesh network to allow provisioning
roles to be distributed between devices",
    "type": "object",
    "definitions": {
        "unicastAddress": {
            "type": "string",
            "name": "hexadecimal unicast address",
            "pattern": "^(([1-7][0-9a-fA-F]{3})|([0-7][1-9a-fA-F][0-9a-fA-
F]{2})|([0-7][0-9a-fA-F][1-9a-fA-F][0-9a-fA-F])|([0-7][0-9a-fA-F][0-9a-fA-
F][1-9a-fA-F]))$"
        },
        "timestamp": {
            "type": "string",
            "name": "hexadecimal TAI seconds",
            "pattern": "^[0-9a-fA-F]{20}$"
        },
         "credentials": {
             "type": "integer",
             "minimum": 0,
             "maximum": 1
         },
         "ttl": {
             "type": "integer",
             "minimum": 0,
             "maximum": 127
         },
         "featureState": {
             "type": "integer",
             "enum": [ 0, 1, 2]
         },
         "publish": {
             "type": "object",
             "properties": {
                 "address": {
                     "$ref": "#/definitions/anyAddress"
                 },
                 "index": {
                     "$ref": "#/definitions/keyIndex"
                 },
                 "ttl": {
                     "$ref": "#/definitions/ttl"
                 },
                 "period": {
                     "type": "integer",
                     "minimum": 0,
                     "maximum": 37800000
```

```
                },
                "retransmit": {
                    "type": "object",
                    "properties": {
                        "count": {
                            "type":"integer", "minimum": 0, "maximum": 7
                        },
                        "interval": {
                            "type": "integer", "minimum": 50, "maximum":
1600
                        }
                    },
                    "required": [
                        "count",
                        "interval"
                    ],
                    "additionalProperties": false
                },
                "credentials": {
                    "$ref": "#/definitions/credentials"
                }
            },
            "required": [
                "address",
                "index",
                "ttl",
                "period",
                "retransmit",
                "credentials"
            ],
            "patternProperties" : {
                "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
            },
            "additionalProperties": false
        },
        "subscribe": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/anyAddress"
            },
            "minItems": 0
        },
        "bind": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/keyIndex"
            },
            "minItems": 0
        },
        "modelId": {
            "oneOf": [
                {
                    "type": "string",
                    "pattern": "^[0-9a-fA-F]{4}$"
                },
```

```
            {
                "type": "string",
                "pattern": "^[0-9a-fA-F]{8}$"
            }
        ]
    },
    "identifier": {
        "type": "string",
        "pattern": "^[0-9a-fA-F]{4}$"
    },
    "group": {
        "type": "object",
        "properties": {
            "name": {
                "type": "string"
            },
            "address": {
                "$ref": "#/definitions/groupAddressOrLabelUUID"
            },
            "parentAddress": {
                "$ref": "#/definitions/parentAddress"
            }
        },
        "required": [
            "name",
            "address",
            "parentAddress"
        ],
        "patternProperties" : {
            "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
        },
        "additionalProperties": false
    },
    "UUID": {
        "type": "string",
        "name": "hexadecimal UUID",
        "pattern": "^[0-9a-fA-F]{32}$"
    },
    "anyAddress": {
        "oneOf": [
            {
                "$ref": "#/definitions/unicastAddress"
            },
            {
                "$ref": "#/definitions/groupAddress"
            },
            {
                "$ref": "#/definitions/UUID"
            }
        ]
    },
    "sceneNumber" : {
        "type": "integer",
        "minimum": 1,
        "maximum": 65535
```

```
},
"keyIndex": {
    "type": "integer",
    "minimum": 0,
    "maximum": 4095
},
"elementIndex": {
    "type": "integer",
    "minimum": 0,
    "maximum": 255
},
"appKey": {
    "type": "object",
    "properties": {
        "name": {
            "type": "string"
        },
        "index": {
            "$ref": "#/definitions/keyIndex"
        },
        "boundNetKey": {
            "$ref": "#/definitions/keyIndex"
        },
        "key": {
            "$ref": "#/definitions/key"
        },
        "oldKey": {
            "$ref": "#/definitions/key"
        }
    },
    "required": [
        "name",
        "index",
        "key",
        "boundNetKey"
    ],
    "patternProperties" : {
        "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
    },
    "additionalProperties": false
},
"nodeKey": {
    "type": "object",
    "properties": {
        "index": {
            "$ref": "#/definitions/keyIndex"
        },
        "updated": {"type": "boolean"}
    },
    "required": [
        "index"
    ],
    "patternProperties" : {
        "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
```

```
        },
        "additionalProperties": false
    },
    "element": {
        "type": "object",
        "properties": {
            "index": {
                "$ref": "#/definitions/elementIndex"
            },
            "location": {"$ref": "#/definitions/identifier"},
            "name": {"type" : "string"},
            "models": {
                "type": "array",
                "items": {"$ref": "#/definitions/model"},
                "minItems": 1
            }
        },
        "required": [
                "index",
                "location",
                "models"
        ],
        "patternProperties" : {
            "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
        },
        "additionalProperties": false
    },
    "model": {
        "type": "object",
        "properties": {
            "modelId": {
                "$ref": "#/definitions/modelId"
            },
            "subscribe": {
                "type": "array",
                "items": {
                    "$ref": "#/definitions/anyAddress"
                },
                "minItems": 0
            },
            "publish": {
                "$ref": "#/definitions/publish"
            },
            "bind": {
                "$ref": "#/definitions/bind"
            }
        },
        "required": [
            "modelId"
        ],
        "patternProperties" : {
            "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
        },
        "additionalProperties": false
```

```
        },
        "groupAddress": {
            "type": "string",
            "name": "hexadecimal group address",
            "pattern": "^(([c-fC-F][0-9a-fA-F]{2}[0-9a-eA-E])|([c-fC-F][0-9a-
eA-E][0-9a-fA-F]{2})|([c-fC-F][0-9a-fA-F][0-9a-eA-E][0-9a-fA-F]))$"
        },
        "groupAddressOrLabelUUID": {
            "oneOf": [
                {
                    "$ref": "#/definitions/groupAddress"
                },
                {
                    "$ref": "#/definitions/UUID"
                }
            ]
        },
        "unassignedAddress": {
             "type": "string",
             "const": "0000"
        },
        "parentAddress": {
            "anyOf": [
                {
                    "$ref": "#/definitions/groupAddressOrLabelUUID"
                },
                {
                    "$ref": "#/definitions/unassignedAddress"
                }
            ]
        },

        "key": {
            "type": "string",
            "name": "key",
            "pattern": "^[0-9a-fA-F]{32}$"
        },
        "keyRefreshPhase": {
            "type": "integer",
            "minimum": 0,
            "maximum": 2
        },
        "securityLevel": {
            "type": "string",
            "enum": ["low", "high"]
        },
        "netKey": {
            "type": "object",
            "properties": {
                "name": {
                    "type": "string"
                },
                "index": {
                    "$ref": "#/definitions/keyIndex"
                },
```

```
                "key": {
                    "$ref": "#/definitions/key"
                },
                "oldKey": {
                    "$ref": "#/definitions/key"
                },
                "minSecurity": {
                    "ref": "#definitions/securityLevel"
                },
                "phase": {
                    "$ref": "#/definitions/keyRefreshPhase"
                },
                "timestamp": {
                    "$ref": "#/definitions/timestamp"
                }
            },
            "required": [
                "name",
                "index",
                "phase",
                "key",
                "minSecurity"
            ],
            "patternProperties" : {
                "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
            },
            "additionalProperties": false
        },
        "networkRetransmit": {
            "type": "object",
            "properties": {
                "count": {"type":"integer", "minimum": 0, "maximum": 7},
                     "interval": {"type": "integer", "minimum": 10, "maximum":
320}
            },
            "required": [
                "count",
                "interval"
            ],
            "patternProperties" : {
                "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
            },
            "additionalProperties": false
        },
        "node": {
            "type": "object",
            "properties": {
                "UUID": {
                    "$ref": "#/definitions/UUID"
                },
                "name": {
                    "type": "string"
                },
                "unicastAddress": {
```

```
                    "$ref": "#/definitions/unicastAddress"
                },
                "security": {
                    "$ref": "#/definitions/securityLevel"
                },
                "deviceKey": {
                    "$ref": "#/definitions/key"
                },
                "cid": {"$ref": "#/definitions/identifier"},
                "vid": {"$ref": "#/definitions/identifier"},
                "pid": {"$ref": "#/definitions/identifier"},
                "crpl": {"$ref": "#/definitions/identifier"},
                "features": {
                    "type": "object",
                    "properties": {
                        "relay": {"$ref": "#/definitions/featureState"},
                        "proxy": {"$ref": "#/definitions/featureState"},
                        "friend": {"$ref": "#/definitions/featureState"},
                        "lowPower": {"$ref": "#/definitions/featureState"}
                    },
                    "anyOf": [
                        {"required": [ "relay" ]},
                        {"required": [ "proxy" ]},
                        {"required": [ "friend"]},
                        {"required": [ "lowPower" ]}
                    ],
                    "additionalProperties": false
                },
                "elements": {
                    "type": "array",
                    "items": {
                        "$ref": "#/definitions/element"
                    },
                    "minItems": 1
                },
                "configComplete": {"type": "boolean"},
                "netKeys": {
                    "type": "array",
                    "items": {"$ref": "#/definitions/nodeKey"},
                    "minItems": 1
                },
                "appKeys": {
                    "type": "array",
                    "items": {"$ref": "#/definitions/nodeKey"},
                    "minItems": 1
                },
                "secureNetworkBeacon": {"type": "boolean"},
                "defaultTTL": {"$ref": "#/definitions/ttl"},
                "networkTransmit": {"$ref":
"#/definitions/networkRetransmit"},
                "relayRetransmit": {"$ref":
"#/definitions/networkRetransmit"},
                "blacklisted": {"type": "boolean"}
            },
            "required": [
```

```
            "UUID",
            "name",
            "unicastAddress",
            "deviceKey",
            "security",
            "netKeys",
            "configComplete"
        ],
        "patternProperties" : {
            "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
        },
        "additionalProperties": false
    },
    "provisioner": {
        "type": "object",
        "properties": {
            "provisionerName": {
                "type": "string"
            },
            "UUID": {
                "$ref": "#/definitions/UUID"
            },

            "allocatedGroupRange": {
                "type": "array",
                "items": {
                    "type": "object",
                    "properties": {
                        "highAddress": {
                            "$ref": "#/definitions/groupAddress"
                        },
                        "lowAddress": {
                            "$ref": "#/definitions/groupAddress"
                        }
                    },
                    "required": [
                        "lowAddress",
                        "highAddress"
                    ],
                    "patternProperties" : {
                        "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
                    },
                    "additionalProperties": false
                },
                "minItems": 1
            },
            "allocatedUnicastRange": {
                "type": "array",
                "items": {
                    "type": "object",
                    "properties": {
                        "highAddress": {
                            "$ref": "#/definitions/unicastAddress"
                        },
```

```
                    "lowAddress": {
                        "$ref": "#/definitions/unicastAddress"
                    }
                },
                "required": [
                    "lowAddress",
                    "highAddress"
                ],
                "patternProperties" : {
                    "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
                },
                "additionalProperties": false
            },
            "minItems": 1
        },
        "allocatedSceneRange": {
            "type": "array",
            "items": {
                "type": "object",
                "properties": {
                    "firstScene": {
                        "$ref": "#/definitions/sceneNumber"
                    },
                    "lastScene": {
                        "$ref": "#/definitions/sceneNumber"
                    }
                },
                "required": [
                    "firstScene",
                    "lastScene"
                ],
                "patternProperties" : {
                    "^CID_[0-9a-fA-F]{4}$" : {"type" : "object"}
                },
                "additionalProperties": false
            },
            "minItems": 1
        }
    },
    "required": [
        "provisionerName",
        "UUID",
        "allocatedUnicastRange",
        "allocatedGroupRange"
    ],
    "patternProperties" : {
        "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
    },
    "additionalProperties": false
},
"scene": {
    "type": "object",
    "properties": {
        "name": {
```

```
                    "type": "string"
                },
                "addresses": {
                    "type": "array",
                    "items": {    "$ref":
"#/definitions/groupAddressOrLabelUUID"
                    },
                    "minItems": 0
                },
                "number": {
                    "$ref": "#/definitions/sceneNumber"
                }
            },
            "required": [
                "name",
                "addresses",
                "number"
            ],
            "patternProperties" : {
                "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
            },
            "additionalProperties": false
        }
    },
    "properties": {
        "$schema": {
            "type": "string"
        },
        "version": {
            "type": "string"
        },
        "meshName": {
            "type": "string"
        },
        "meshUUID": {
            "$ref": "#/definitions/UUID"
        },
        "timestamp": {
            "$ref": "#/definitions/timestamp"
        },
        "netKeys": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/netKey"
            },
            "minItems": 1
        },
        "appKeys": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/appKey"
            },
            "minItems": 0
        },
        "provisioners": {
```

```
            "type": "array",
            "items": {
                "$ref": "#/definitions/provisioner"
            },
            "minItems": 1
        },
        "nodes": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/node"
            },
            "minItems": 0
        },
        "groups": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/group"
            },
            "minItems": 0
        },
        "scenes": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/scene"
            },
            "minItems": 0
        }
    },
    "required": [
        "$schema",
        "version",
        "meshName",
        "meshUUID",
        "timestamp",
        "provisioners",
        "netKeys"
    ],
    "patternProperties" : {
        "^cid[0-9a-fA-F]{4}$" : {"type" : "object"}
    },
    "additionalProperties": false
}
```

5 Example Mesh Configuration database

The following is an example of a Mesh Configuration database.

5.1 Mesh Configuration database

```
{
    "$schema": <TBD>,
    "version": "1.0",
    "meshUUID": "72C6BE40444D2081BEAADDAD4E3CC21C",
    "meshName": "Brian and Mary's House",
    "timestamp": "0000400000005a8dfa8e",
    "netKeys": [
        {
            "name": "Home Network",
            "index": 0,
            "key": "5543950C57EDCC38E442964065720A8B",
            "phase": 0,
            "minSecurity": "high"
        },
        {
            "name": "Molly's Network",
            "index": 1,
            "key":    "6D4B5D861F6C7304C039FD846231E84D",
            "oldKey": "610BB4B4BEC1A5630D6712DE06B95B20",
            "phase": 1,
            "minSecurity": "low"
        }
    ],
    "appKeys": [
        {
            "name": "Home Automation",
            "index": 0,
            "boundNetKey": 0,
            "key": "3FA985DA6D4CA22DA05C7E7A1F11C783"
        },
        {
            "name": "Door Bell (Physically Insecure Devices)",
            "index": 2,
            "boundNetKey": 0,
            "key": "20283753615B66E63D34AF4A4A4E7336"
        },
        {
            "name": "Cat Flap (Physically Insecure Devices)",
            "index": 3,
            "boundNetKey": 1,
            "key": "958CED9C76F1F23A60746F9384CF1E5B",
            "oldKey": "C337ACF959314D9D06C8419158F04617"
        },
        {
            "name": "Home Automation Setup",
            "index": 1200,
            "boundNetKey": 0,
            "key": "A327BB410CF137455A4F234DF8134C78"
```

```
    }
],
"provisioners": [
    {
        "provisionerName": "Brian's Phone",
        "UUID": "70CF7C9732A345B691494810D2E9CBF4",
        "allocatedGroupRange": [
            {"highAddress": "C1FF", "lowAddress": "C100"}
        ],
        "allocatedUnicastRange": [
            {"lowAddress": "0001", "highAddress": "00FF"},
            {"lowAddress": "0301", "highAddress": "03FF"}
        ]
    },
    {
        "provisionerName": "Mary's Phone",
        "UUID": "577C2832B345A6944A4810D2C9DFE456",
        "allocatedGroupRange": [
            {"highAddress": "C0FF", "lowAddress": "C000"},
            {"highAddress": "C2FF", "lowAddress": "C200"}
        ],
        "allocatedUnicastRange": [
            {"highAddress": "01FF", "lowAddress": "0100"}
        ],
        "allocatedSceneRange": [
             {"firstScene": 1, "lastScene": 64}
        ]
    }
],
"nodes": [
    {
        "UUID": "559B8C9732A345B691494865D288CBF3",
        "name": "Bedroom Light Switch",
        "deviceKey": "0FE48D03E41D26E5C5EA327A55E8A218",
        "unicastAddress": "0002",
        "security": "high",
        "cid": "0003",
        "pid": "0003",
        "vid": "0003",
        "crpl": "0003",
        "features": {
            "relay": 2,
            "proxy": 2,
            "friend": 2,
            "lowPower": 1
        },
        "elements": [
            {
                "index": 0,

                "location": "0001",
                "models": [
                    { "modelId": "0000" },
                    { "modelId": "0002" },
                    {
```

```
                    "modelId": "0004",
                    "publish": {
                        "address": "C023",
                        "index": 0,
                        "ttl": 7,
                        "period": 90000,
                        "retransmit": {
                            "count": 2,
                            "interval": 250
                        },
                        "credentials" : 1
                    }
                }
            ]
        },
        {
            "index": 1,
            "location": "0002",
            "models": [
                {
                    "modelId": "0004",
                    "publish": {
                        "address": "C024",
                        "index": 0,
                        "ttl": 7,
                        "period": 90000,
                        "retransmit": {
                            "count": 2,
                            "interval": 100
                        },
                        "credentials" : 1
                    }
                }
            ]
        }
    ],
    "configComplete": true,
    "netKeys": [ { "index": 0 } ],
    "appKeys": [ { "index": 0 } ],
    "networkTransmit": {
        "count": 2,
        "interval": 20
    },
    "defaultTTL": 3
},
{
    "UUID": "347F8A9732D345E79149486AA2887983",
    "name": "Bedroom Light",
    "unicastAddress": "0004",
    "cid": "0011",
    "pid": "0004",
    "vid": "0001",
    "crpl": "0020",
    "features": {
        "relay": 1,
```

```
        "proxy": 2,
        "friend": 1,
        "lowPower": 2
    },
    "elements": [
        {
            "index": 0,
            "location": "0106",
            "models": [
                { "modelId": "0000" },
                { "modelId": "0002" },
                {
                    "modelId": "1203",
                    "subscribe": [ "C023" ]
                },
                {
                    "modelId": "1204",
                    "subscribe": [ "C023" ]
                },
                {
                    "modelId": "1206",
                    "subscribe": [ "C023" ]
                },
                {
                    "modelId": "1207",
                    "subscribe": [ "C023" ]
                },
                {
                    "modelId": "1204",
                    "subscribe": [ "C023" ],
                    "bind": [ 0, 1200 ]
                },
                {
                    "modelId": "1206",
                    "subscribe": [ "C023" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1207",
                    "subscribe": [ "C023" ],
                    "bind": [ 0, 1200 ]
                },
                {
                    "modelId": "1000",
                    "subscribe": [ "C023" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1004",
                    "subscribe": [ "C023" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1006",
                    "subscribe": [ "C023" ],
```

```
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1007",
                    "subscribe": [ "C023" ],
                    "bind": [ 0, 1200 ]
                },
                {
                    "modelId": "1002",
                    "subscribe": [ "C023" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1301",
                    "subscribe": [ "C023" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1302",
                    "subscribe": [ "C023" ],
                    "bind": [ 0, 1200 ]
                },
                {
                    "modelId": "1307",
                    "subscribe": [ "C023" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1308",
                    "subscribe": [ "C023" ],
                    "bind": [ 0, 1200 ]
                }
            ]
        },
        {
            "index": 1,
            "location": "0106",
            "models": [
                { "modelId": "1002" },
                { "modelId": "130a" }
            ]
        },
        {
            "index": 2,
            "location": "0106",
            "models": [
                { "modelId": "1002" },
                { "modelId": "130b" }
            ]
        }
    ],
    "deviceKey": "89DDEFD69B45AEC29DFD545E901CEE64",
    "security": "high",
    "configComplete": true,
    "netKeys": [ { "index": 0 }],
```

```
        "appKeys": [ { "index": 0 }, { "index": 1200 } ],
        "relayRetransmit": {
            "count": 3,
            "interval": 60
        },
        "defaultTTL": 4
    },
    {
        "UUID": "345E82273DD345CC41494865D2334545",
        "name": "Bedside Light (Brian)",
        "deviceKey": "AAA4B4CA3AD5C6D6BE1A8D455EC40BE0",
        "unicastAddress": "0007",
        "security": "high",
        "cid": "000A",
        "pid": "1204",
        "vid": "0041",
        "crpl": "0020",
        "features": {
            "relay": 1,
            "proxy": 2,
            "friend": 0,
            "lowPower": 2
        },
        "configComplete": true,
        "netKeys": [ { "index": 0 } ],
        "appKeys": [ { "index": 0 }, { "index": 1200 } ],
        "elements": [
            {
                "index": 0,
                "location": "0001",
                "models": [
                    { "modelId": "0000" },
                    { "modelId": "0002" },
                    {
                        "modelId": "1203",
                        "subscribe": [ "C023", "C024" ],
                        "bind": [ 0 ]
                    },
                    {
                        "modelId": "1204",
                        "subscribe": [ "C023", "C024" ],
                        "bind": [ 0, 1200 ]
                    },
                    {
                        "modelId": "1206",
                        "subscribe": [ "C023", "C024" ],
                        "bind": [ 0 ]
                    },
                    {
                        "modelId": "1207",
                        "subscribe": [ "C023", "C024" ],
                        "bind": [ 0, 1200 ]
                    },
                    {
                        "modelId": "1000",
```

```
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1004",
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1006",
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1007",
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0, 1200 ]
                },
                {
                    "modelId": "1002",
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1301",
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0 ]
                },
                {
                    "modelId": "1302",
                    "subscribe": [ "C023", "C024" ],
                    "bind": [ 0, 1200 ]
                },
            ]
        }
    ]
},
{
    "UUID": "268E8CA732A345B69149AA44BAAD2346",
    "name": "Bedside Light (Mary)",
    "deviceKey": "B619F5BA671AF2548BA219760294063B",
    "unicastAddress": "0105",
    "security": "high",
    "cid": "000A",
    "pid": "1204",
    "vid": "0041",
    "crpl": "0020",
    "features": {
        "relay": 0,
        "proxy": 2,
        "friend": 1,
        "lowPower": 2
    },
    "secureNetworkBeacon": true,
    "configComplete": true,
```

```
"netKeys": [ { "index":0 } ],
"appKeys": [ { "index": 0 }, { "index": 1200 } ],
"elements": [
    {
        "index": 0,
        "location": "0001",
        "models": [
            { "modelId": "0000" },
            { "modelId": "0002" },
            {
                "modelId": "0005",
                "subscribe": [ "C023", "C025" ],
                "bind": [ 0 ]
            },
            {
                "modelId": "1204",
                "subscribe": ["C023", "C025"],
                "bind": [ 0, 1200 ]
            },
            {
                "modelId": "1206",
                "subscribe": ["C023", "C025"],
                "bind": [ 0 ]
            },
            {
                "modelId": "1207",
                "subscribe": ["C023", "C025"],
                "bind": [ 0, 1200 ]
            },
            {
                "modelId": "1000",
                "subscribe": ["C023", "C025"],
                "bind": [ 0 ]
            },
            {
                "modelId": "1004",
                "subscribe": ["C023", "C025"],
                "bind": [ 0 ]
            },
            {
                "modelId": "1006",
                "subscribe": ["C023", "C025"],
                "bind": [ 0 ]
            },
            {
                "modelId": "1007",
                "subscribe": ["C023", "C025"],
                "bind": [ 0, 1200 ]
            },
            {
                "modelId": "1002",
                "subscribe": ["C023", "C025"],
                "bind": [ 0 ]
            },
            {
```

```
                        "modelId": "1301",
                        "subscribe": ["C023", "C025"],
                        "bind": [ 0 ]
                    },
                    {
                        "modelId": "1302",
                        "subscribe": ["C023", "C025"],
                        "bind": [ 0, 1200 ]
                    }
                ]
            }
        ]
    },
    {
        "UUID": "CBFA8C9732E345B691494822D28856FF",
        "name": "Molly's Access Tag",
        "deviceKey": "C7F91F91AB79F445925BC9B568CA53A9",
        "unicastAddress": "0109",
        "security": "low",
        "cid": "003F",
        "pid": "0001",
        "vid": "0001",
        "crpl": "0008",
        "features": {
            "relay": 2,
            "proxy": 2,
            "friend": 2,
            "lowPower": 2
        },
        "configComplete": true,
        "netKeys": [ { "index":1, "updated": true } ],
        "appKeys": [ { "index": 3 } ],
        "elements": [
            {
                "index": 0,
                "location": "0100",
                "models": [
                    { "modelId": "0000" },
                    { "modelId": "0002" },
                    {
                        "modelId": "003F002A",
                        "publish": {
                            "address": "EA57D9F1975D4EBDA78A37D189AC58F4",
                            "index": 3,
                            "ttl": 0,
                            "period": 1200000,
                            "retransmit": {
                                "count": 2,
                                "interval": 150
                            },
                            "credentials" : 0
                        }
                    }
                ]
            }
```

```
            ],
            "blacklisted": false
        },
        {
            "UUID": "45708C9732A345B5E149486AB247C4EE",
            "name": "Cat Flap",
            "deviceKey": "CA1C7F26BB557BD609777575CEF8E599",
            "unicastAddress": "010A",
            "security": "low",
            "cid": "000C",
            "pid": "0002",
            "vid": "0000",
            "crpl": "0008",
            "features": {
                "relay": 2,
                "proxy": 2,
                "friend": 2,
                "lowPower": 2
            },
            "secureNetworkBeacon": false,
            "configComplete": true,
            "netKeys": [ { "index": 1, "updated": true }],
            "appKeys": [ { "index": 3, "updated": true } ],
            "elements": [
                {
                    "index": 0,
                    "location": "0000",
                    "models": [
                        { "modelId": "0000" },
                        { "modelId": "0002" },
                        {
                            "modelId": "0015",
                            "subscribe":
[ "EA57D9F1975D4EBDA78A37D189AC58F4" ]
                        }
                    ]
                }
            ],
            "blacklisted": false
        },
        {
            "UUID": "27668C9732A345B561494865E288CBC2",
            "name": "Door Bell",
            "deviceKey": "FC846BF0D85AC4D9CEF63AA04E5507CE",
            "unicastAddress": "0103",
            "security": "high",
            "cid": "0007",
            "pid": "0019",
            "vid": "0000",
            "crpl": "0010",
            "features": {
                "relay": 2,
                "proxy": 2,
                "friend": 2,
                "lowPower": 1
```

```
        },
        "configComplete": true,
        "netKeys": [ {"index":0 } ],
        "appKeys": [ {"index": 2 } ],
        "defaultTTL": 9,
        "elements": [
            {
                "index": 0,
                "location": "0100",
                "models": [
                    { "modelId": "0000" },
                    { "modelId": "0002" },
                    {
                        "modelId": "1001",
                        "publish": {
                            "address": "C103",
                            "index": 2,
                            "ttl": 9,
                            "period": 1000,
                            "retransmit": {
                                "count": 3,
                                "interval": 150
                            },
                            "credentials" : 0
                        }
                    }
                ]
            }
        ]
    },
    {
        "UUID": "EAA389973B4345B691494865D2885555",
        "name": "Bell",
        "deviceKey": "31743AFD08DBACECBBA1297BDD0AAEFE",
        "unicastAddress": "0104",
        "security": "high",
        "cid": "0007",
        "pid": "001A",
        "vid": "0003",
        "crpl": "0100",
        "features": {
            "relay": 0,
            "proxy": 1,
            "friend": 0,
            "lowPower": 2
        },
        "configComplete": true,
        "netKeys": [ { "index": 0 } ],
        "appKeys": [ { "index": 2 } ],
        "defaultTTL": 9,
        "elements": [
            {
                "index": 0,
                "location": "010C",
                "models": [
```

```
                        { "modelId": "0000" },
                        { "modelId": "0002" },
                        {
                            "modelId": "1000",
                            "subscribe": [ "C103" ],
                            "bind": [ 2 ]
                        }
                    ]
                }
            ]
        }
    ],
    "groups": [
        {
            "name": "Bedroom",
            "address": "C023",
            "parentAddress": "0000"
        },
        {
            "name": "Bedside (Brian)",
            "address": "C024",
            "parentAddress": "C023"
        },
        {
            "name": "Bedside (Mary)",
            "address": "C025",
            "parentAddress": "C023"
        },
        {
            "name": "Doorbell",
            "address": "C103",
            "parentAddress": "0000"
        },
        {
            "name": "Cat Flap",
            "address": "EA57D9F1975D4EBDA78A37D189AC58F4",
            "parentAddress": "0000"
        }
    ],
    "scenes": [
        {
            "name": "Go to sleep",
            "addresses": ["C023"],
            "number": 7
        },
        {
            "name": "Wakeup",
            "addresses": ["C023"],
            "number": 2
        }
    ]
}
```

6 References

[1] Bluetooth Mesh Profile specification v1.0

[2] IETF RFC 7159 (https://www.ietf.org/rfc/rfc7159.txt)

[3] JSON Schema (http://json-schema.org/)

[4] Bluetooth SIG Assigned Numbers (http://www.bluetooth.com/specifications/assigned-numbers)

[5] Bluetooth SIG Company Identifiers (https://www.bluetooth.com/specifications/assigned-numbers/company-Identifiers)

[6] Bluetooth Mesh Model specification v1.0